in *Chronologies*, sub-Saharan Africa [*Annals of the Cape Provincial Museum* **5** (1966)]. *Chronologies* is not alone in jumping the gun, and it is evident that a certain amount of confusion over the exact radiocarbon ages of a number of sites is bound to occur. Here the necessity for quoting the laboratory number of radiocarbon dates in any publication becomes apparent.

For the barbarian worlds outside the historically documented civilizations, the half-life change, if it is finally and universally accepted, is of little importance, but for those areas for which another basis for chronology exists, any proposed alteration to all of the radiocarbon determinations will clearly involve some serious reappraisals. Hence the inclusion, in all studies of this kind, of "archeologically inacceptable" radiocarbon dates is of importance. In certain areas known to me these may well outnumber those dates that seem to fit our crude systems of ordering. In general, the authors of *Chronologies* have cited "difficult" dates as well as those immensely pleasing ones that fit their archeological opinions.

Chronologies performs a valuable service in presenting in concise form the archeological systemization of cultural materials, sometimes in quite extraordinary depth and detail. I hope the authors and readers do not forget for a single moment that the establishment of a chronology is only one aspect of what we archeologists are trying to achieve.

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Sexuality in Fungi

Study of incompatibility in the higher fungi promises, and has promised over the last quarter of a century, to make major contributions to biology. In these organisms nuclear migration, outgrowths of cell walls, and ultimately the development of fruiting bodies are triggered by a series of alleles such that any two different alleles react to release the processes. As in the corresponding situation in flowering plants, a number of interesting experiments can be performed pairing wild and mutant alleles in various complex combinations using heterokaryons and diploids.

Some 15 years ago John R. Raper, then at the University of Chicago, began working with these organisms, and he and his students and collaborators in various laboratories now constitute an enthusiastic group that has amassed a large amount of data published widely. This, together with contributions of other workers, is now available in Raper's **Genetics of Sexuality in Higher Fungi** (Ronald, New York, 1966. 283 pp., illus. $12).

An excellent account of the biology of the higher fungi and a historical review are given in the first four chapters, which in many ways constitute the best part of the book. The next four chapters describe in detail the behavior of heterokaryons and mutants and make rather heavy reading despite the titillating style of the author. With a keen sense of the popular acclaim for developments in molecular biology, chapter 9 introduces a model based on two regulator substances. These react in complex ways to control an operator. An O^0 mutation is fitted into the model. Nothing is known of the chemical basis for any of the phenomena, and it would have been preferable to postulate unspecified inhibitors which might act on enzymes rather than to commit oneself to an operon. In any case, models based on antigen-antibody reactions or tissue incompatibility have more kinship with these phenomena. A comparative consideration of models proposed for flowering plants would have been useful.

A central issue is whether the incompatibility factors are controlled by single genes with a rather large amount of crossing-over in a localized region or whether there are two genes producing two molecules, regulator or otherwise. The claim is made that the gene *pab* lies between two incompatibility genes; this is crucial, and the evidence for the proposed ordering should have been presented and discussed, since the published data on this point are ambiguous.

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Chemistry in England, 1557–1640

Its title notwithstanding, Allen G. Debus's **The English Paracelsians** (Watts, New York, 1966. 222 pp., illus. $5.95) is largely devoted to showing that from the first mention of Paracelsus in an English book in 1557 up to about 1640 there were scarcely any true English Paracelsians. On the Continent there were continual controversies between the followers of Galen and those of Paracelsus. The English alchemists and physicians remained almost unaffected by these disputes. In general they showed little tendency to accept the theoretical ideas of the founder of iatrochemistry, while they utilized those metallic medicines which he advocated whenever these seemed of value. This Debus calls the Elizabethan compromise, though it lasted into the reign of Charles I.

Of the two groups most concerned in this compromise, the alchemists sometimes gave lip service to the sulfur-mercury-salt theory of the composition of metals, but in practice they more often used the four elements of Aristotle. An extreme example of alchemists' thought is provided by the ideas of Robert Fludd, to whom considerable space is devoted in this book. It is significant that Fludd's elaborate mystical system received little attention in England but was widely discussed in Germany, where Paracelsus had a strong appeal.

The chemically minded physicians were more willing to accept Paracelsus, because they felt free to accept any remedies which appeared useful. They were concerned with laboratory studies of the composition of urine and of mineral waters, and so knew something of the chemistry of inorganic bodies. Thus metallic medicine did not appear strange to them. So it was that when the first national pharmacopoeia, the *Pharmacopoeia Londinensis*, appeared in 1618 it described both Galenical and Paracelsian drugs. This was a clear example of the Elizabethan compromise.

The present volume, then, is really a rather detailed account of the development of chemistry and chemical ideas in England over a period of 80 years. It reveals the British genius for taking the middle ground when controversies occur, and it shows the trends and currents which led up to the work of Robert Boyle in the latter half of the 17th century.

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