compares natural and laboratory-produced lignins and their structures. Chapters on ultraviolet, infrared, and paramagnetic resonance spectra follow in part 4. Lignin reactions, including solvolysis, halogenation/nitration, oxidation, reduction/hydrogenolysis, and high energy breakdown, are dealt with in the next six chapters. Lignin reactions in the technologically important sulfite and alkaline pulping processes are described next. The physical chemistry of the lignin macromolecule and its modified forms is then well covered. The two final parts deal with microbiological breakdown of lignin and utilization of lignins, first as a source of chemicals and then as unchanged polymers. Expectedly, the contributions vary widely in length and quality, but all provoke enthusiasm and thought. Only the section on biological deterioration of lignin is rather weak, perhaps reflecting inadequate input from or consultation with biologically oriented workers in the field.

Many may find $35 excessive for a book reproduced photomechanically from typescript, with unesthetic line-end irregularities and some minor typographical errors, but the formulas and figures are clean and generally understandable, and, on deliberation, the price seems reasonable recompense for the marathon effort invested in producing the first text on lignin that is suitable for educating newcomers to the field.

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Ostracoda

Colloque sur la Paléoécologie des Ostracodes. Colloquium on the Paleoecology of Ostracodes. Pau, France, July 1970. H. J. Oertli, Ed. Société Nationale des Pétroles d'Aquitaine, Pau, 1971. 954 pp., illus. 150 F. Bulletin du Centre de Recherches Pau-SNPA, supplement to vol. 5.

Compared to other microscopic organisms, Ostracoda have outstanding potential for providing information concerning salinity, temperature, currents, and other aqueous conditions in the past. These little crustaceans have some advantages over the one-celled Foraminifera, which already have been found valuable for interpreting paleoecology: ostracods thrive in fresh and brackish water where forams cannot survive, and they were abundant and diverse in the Paleozoic, at which time forams were represented mostly by irregular agglutinated types.

Each ostracod of the distant past is assumed to have lived in an environment much like that in which its descendants flourish. Interpretation involves two factors. First, the relationship of the fossil to the living ostracod must be firmly established by taxonomy. Second, the ecology of living ostracods must be known in detail. Extinct taxa pose a special challenge, but even they can be compared against morphologically (and presumably functionally) similar living forms.

Research on Ostracoda has accelerated in recent years. Over half the genera were founded in the last two decades. In the early 1960's the ostracod volumes in the American *Treatise on Invertebrate Paleontology* and the Russian *Osnovy Paleontologii* appeared in quick succession, contributing greatly to taxonomy. Colloquiums held in Naples (1963) and Hull (1967) emphasized the ecology of Recent ostracods. The time was right for an attack on the more difficult problem of ostracod paleoecology. At a colloquium called in Pau, France, in 1970, 84 ostracodologists met for formal presentation of papers and subsequent discussion. More than half were from France, the United States, and Britain, but others came from as far as Israel, Japan, Yugoslavia, and Gabon. The results are impressive.

The 53 published papers (in French or English) cover Ostracoda geologically from Devonian to Recent times and geographically from western Canada to the Kouznetsk Basin. Most either analyze in detail the fauna in a local area or report on geographic distributions of faunas of a particular age. As might have been expected, a few contributions fail to fit the theme of paleoecology: two about classification and one about morphology. Of the numerous new concepts in the interpretation and utility of fossil ostracod occurrences, a few of the highlights can be mentioned here. T. I. Kilenyi discusses various methods of distinguishing the biocoenosis, citing ambiguities arising from postmortem displacement. Vladimir Pokorný uses diversity of the fossil ostracod community to identify transgressive and regressive movements of the sea. H. J. Oertli interprets environments of deposition based solely upon the preservation of ostracods; this is an intriguing approach, independent of taxonomy. Kaesler and Taylor investigate the possibilities of cluster analysis, and Jacobzone and Carbonnel apply Jaccard's coefficient to correlation of Miocene faunas. Articles of more than local interest include K. G. McKenzie on the paleozoogeography of freshwater Ostracoda, D. Ter Keurs on assemblages in transgressive/regressive sequence, and F. Adamczak on ostracod assemblages in Middle Devonian rocks.

The progress made at the colloquium fulfilled all expectations, probed new insights, and suggested lines for future research. Although ostracod paleoecology is still in the exploratory stage, it promises to be a major means of understanding the geologic past.

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Respiration

Comparative Physiology of Respiratory Mechanisms. JOHAN B. STEEN. Academic Press, New York, 1971. x, 182 pp., illus. $10.

An objective of the comparative physiologist is to describe the means by which different organisms solve similar basic physiological problems. The solutions achieved by the animals depend on many factors, including their size and complexity and the nature of the habitat in which they live. In this book the problem at issue is respiratory gas exchange, and solutions to it are described and discussed for animals ranging from Protozoa to man.

The main themes of the book concern the diffusion of gases (oxygen and carbon dioxide) across the (respiratory) interface of the animal and its environment and the transport of these gases between this region and the tissues. For the general reader an introductory chapter is provided which discusses the basic principles of these processes. The largest part of the book is organized according to the respiratory medium involved—aquatic, aerial, or transitional. Later chapters provide brief discussions of specialized topics such as respiratory adaptations to altitude and diving, gas exchange of the placenta and the bird egg, and swimbladder function. Throughout the book, the author chooses examples of the phenomena he deals with and examines them quantitatively.

This book might be considered a