est of the entire book. With a thin reading of historical studies, they provide an idealized image of an American past, freer of crime than today. They may bolster their attack on the liberal program of crime prevention through institutional change, but they lose the credibility that their patient analysis of other studies has provided.

In attacking sociological theories Wilson and Herrnstein are flogging a dying horse. The present mood is pessimistic about the prospects for any overall explanation of crime, and the rehabilitative ideal in punishment is already on the defensive. Nevertheless they do raise vital issues of the role of genetic and developmental factors. *Crime and Human Nature* is already being heralded as a landmark book and is the topic of talk shows and newspaper accounts. Pushed into the public arena, its findings are likely to be distorted. Agreement and disagreement will doubtless depend less on the analysis of materials than on whether the reader's pet ox has been gored or massaged.

Yet it is a limited perspective that leads criminologists, including Wilson and Herrnstein, to attend only to individuals and to illegal acts in explaining crime. As laws change, the law-abiding citizen of yesterday may be the violent criminal of today and vice versa. Consider the shift into or out of criminality of slave ownership, child abuse, driving under the influence of alcohol, and marital rape. These examples, not to mention the experiences of many millions in this century of genocide, political terror, and intergroup massacre, suggest that the very definition of the object of study—criminal behavior—is itself an issue. Only scholars with a restricted, ahistorical vision could write that "most people in most places do not live under a pervasive fear of criminal victimization" (p. 525).

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German Science Abroad

Cultural Imperialism and Exact Sciences. German Expansion Overseas 1900–1930. LEWIS PYENSON. Lang, New York, 1985. xvi, 342 pp., illus. $40. Studies in History and Culture, vol. 1.

What was the historical role of modern science in the development of European overseas imperialism? Did the European powers promote the exact sciences for purposes of "cultural imperialism," as distinct from economic and military motives? The answers to these questions are still far from clear. Thus it is good to see them addressed in regard to at least one power, Imperial Germany, in this pioneering new book. The book consists mainly of three case studies of far-flung outposts of German scientific culture during the years around the First World War: a geophysical observatory in German-controlled Apia, Western Samoa; a provincial university staffed in part by first-rate German physical scientists and astronomers in La Plata, Argentina; and a German naval observatory in Tsingtau, in the German colony of Kiautschou, China, as well as German-Chinese institutions of higher education in Tsingtau and Shanghai. Working from disparate sources written in seven languages and scattered around the globe, Pyenson has gathered copious details about how these institutions were established, staffed, and financed, what their scientific purposes were and how well they were achieved, and how they contributed to "cultural imperialism" by spreading the knowledge and methods of exact science to the local populations and cultures. In each case he finds that German cultural influence was significant and long-lasting, albeit less extensive than the Germans originally hoped.

Pyenson tells his story as a straightforward narrative; he is methodologically conservative, and he does not fit his disparate cases into a framework that would facilitate point-by-point comparison. As a result, though the book is extremely informative about the institutions and scientists involved, it is sometimes necessary to flip through pages to compare information on specific aspects of each case such as institute budgets. The introductory and concluding chapters, though helpful, do not make up for this deficiency.

Samoa and Argentina receive the most attention, some hundred pages of text each, with the Chinese case receiving only half as much. Samoa is the most coherently discussed. The geophysical observatory was a single institution devoted to a single purpose and moreover had a clear beginning as well as an equally clear end as a result of the First World War, in which Germany's defeat forced her to relinquish control. The story in this case is also particularly interesting because, despite difficulties relating to the tropical environment and early inadequacies in funding and equipment, the Samoan station for a time was one of the most important geophysical observatories in the world. Data collected there contributed significantly to the development of modern geophysics by Emil Wiechert and his school at Göttingen, whose scientific society supervised the institution.

The treatments of German scientists in Argentina and in China are less coherent, because more disciplines and institutions were involved and because the war did not effectively terminate the German scientific presence in these countries. Conditions in Argentina were far less difficult than in Samoa, though the first German director of the physics institute at La Plata died of typhus. Serious funding problems also did not arise, because money came from a progressive Argentine administration that was trying to create a "modern and experimental" (p. 153) institution for higher education in La Plata and was thus willing to spend large sums to get the best possible scientific equipment and staff. Pyenson notes that the budget of the physics institute there was comparable to that at Berlin, and he considers La Plata to have been "the single strongest overseas center" of theoretical physics in 1913 (p. 17). Despite his evidence for the importance of the theoretical physics done at La Plata, the absence of a systematic comparison with work done elsewhere may well leave readers not wholly convinced on this score.

A further conceptual problem with the story of Argentina arises from the fact that, in contrast to Samoa and China, the scientists and institutions there were not appointed or supported by the German government or German academic institutions. This raises the question whether Argentina should really be discussed under the rubric of "imperialism," cultural or otherwise, even though the German government expected gains from the presence of its scientists there. When a country's acceptance of a foreign culture occurs at its own initiative, would it not be more appropriate to use the term "modernization," which has been applied to Japan during the same period and to China today?

To justify the term "cultural imperialism," Pyenson is at pains to emphasize his interest in the exact scientific as opposed to the practical side of the institutions he discusses. By playing down technology and the applied sciences, he can distinguish strictly cultural imperialism from forms motivated by hopes of economic or political gains. In practice, of course, none of his cases exhibits clear-cut "cultural imperialism" alone. Overall the impression from Samoa as well as from the German efforts in China, where government money had to be supplemented by contributions from German businessmen, is that before the war the German public and the imperial bureaucracy had little interest in supporting the exact sciences unless they were combined with practical applications. Yet a powerful stimulus came from German fears that to withhold support

from science in China or Samoa would open the field to foreign competitors such as the United States. The account brings out the characteristically modern tension that German scientists already felt between the old ideal of science as an international enterprise above politics and their growing realization that government-supported science must serve, or seem to serve, political ends. More detail on the broader political context in which funding decisions were made by the bureaucracy would have further clarified this point.

Overall, this is a thoughtful book about an important subject. It is generally quite readable, although the editing could have been stricter and a more analytical approach would have made it easier to use. The note on sources is helpful, and the reader can only be sympathetic when realizing the obstacles the author had to overcome in obtaining and working with his material. May other scholars be encouraged by the results to follow his example.

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Algal Fossils

Paleoalgology. Contemporary Research and Applications. D. F. TOOMEY and M. H. NITECKI, Eds. Springer-Verlag, New York, 1985. xii, 376 pp., illus. $65. From a symposium, Golden, CO, Aug. 1983.

Calcareous red and green algae and stromatolites are widely distributed in Phanerozoic carbonate rocks, and their practical value has long been appreciated. Algal carbonates are economically important as hydrocarbon reservoirs and host rocks for Mississippi-Valley–type mineralization, and many fossil algae are sensitive indicators of paleoenvironment. These traditional concerns of paleoalgology clearly motivated much of the research reported in the 29 papers that make up this volume. But what about the paleobiological potential of fossil calcareous algae? Did multicellular red, green, and brown algae (which represent three or more independent origins of tissue-grade multicellularity) originate contemporaneously with metazoans, and do they show the same logistic pattern of diversification? To what extent have mass extinctions influenced the course of algal evolution? Has the evolution of calcareous algae been influenced by evolutionary events in marine invertebrates or vertebrates? To me, the major appeal of *Paleoalgology* lies in the fact that such questions are addressed in a number of chapters, allowing the reader to ponder the all-important question of whether an emerging pattern in the fossil record of benthic algae will require us to reconsider existing interpretations of evolutionary history in Phanerozoic oceans.

Macroscopic carbonaceous structures occur in Precambrian rocks as old as 2000 million years and are relatively widespread and morphologically diverse in Late Proterozoic shales and siltstones. H. J. Hofmann here presents an important guide to the scattered and underappreciated literature on these remains. Hofmann's own discoveries of elongated, sausage-shaped remains in 850 to 1100 million-year-old rocks from northwestern Canada consititute the best evidence for a significantly pre-Ediacaran attainment of megascopic multicellularity. These structures are morphologically regular and display a distinctly allometric growth pattern. Reports of older metaphytes, however, are less well substantiated, and I cannot be as generous as Hofmann in accepting published reports at face value. Ripped-up and redeposited fragments of microbial mats can mimic algal morphologies, as can a number of physically produced structures. The real problem in evaluation stems from high-grading. In outcrop, only one in a hundred carbonaceous fragments may appear "determinate," but if that fragment preferentially finds its way into museum drawers and journal illustrations it may elicit misleading interpretations. Most reports of Proterozoic metaphytes remain in need of evaluation, but no student of Precambrian or Paleozoic evolution can afford to ignore them. Hofmann's discussion and bibliography greatly facilitate entry into the literature.

R. Riding and L. Voronova's discussion of latest Proterozoic and Early Cambrian calcareous algae should also be of interest to a wide audience. A great deal of research, conducted mainly by Soviet paleontologists, has demonstrated that, like skeletonized invertebrates, calcareous algae radiated dramatically near the Precambrian-Cambrian boundary. Chaotic taxonomy has made analysis of this record difficult, but a new approach to classification proposed by Riding and Voronova promises to bring order to these fossils, especially if their "morphological series" can be restated with more specific reference to developmental patterns known to characterize algal morphogenesis.

In another chapter, E. Flügel demonstrates that the generic diversity of dasycladacean algae dropped by at least 80 percent across the Permo-Triassic boundary. This is a significant finding, although I wish Flügel had discussed more explicitly the constraints that dasyclad extinction patterns place on general scenarios for terminal Paleozoic mass extinction, especially given the sophisticated knowledge of Permian algal paleoecology displayed by him and several other contributors to this volume. Flügel's contention that differences in the ecological distributions of Permo-Triassic and Recent dasyclads reflect changing substrate availability must be regarded as suspect in light of the chapter by R. S. Steneck on adaptations of crustose coralline algae to herbivory in space and time. Steneck uses ecological experiments to determine the important influence of carbonate-excavating herbivores on the morphology and distribution of coralline algae. He then applies the data to an interpretation of evolutionary trends in the algal fossil record. His conclusion that the late Mesozoic and Cenozoic radiation of crustose corallines is genetically related to the radiation of carbonate-excavating animals is relevant to the evolutionary history of dasyclad algae, as well as to hypotheses linking the evolution of shell-crushing predators to the great Mesozoic revolution in marine invertebrate communities.

The chapters in this book vary widely in scope and quality. Most authors seem to have made little attempt to address an audience beyond the small fraternity of paleoalgologists. Interpretation of many chapters is also impaired by the indifferent quality of photographic reproduction. Paleoalgologists long ago convinced sedimentologists of the importance of fossil algae. With a little effort, they could equally well move into the mainstream of paleobiology.

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Cell Proliferation

The Biology of Cell Reproduction. RENATO BASERGA. Harvard University Press, Cambridge, MA, 1985. xii, 251 pp., illus. $25.

The Biology of Cell Reproduction is an in-depth and comprehensive account of our present understanding of how cells divide. Written by a scientist who for a number of years has consistently made major contributions to our knowledge of the control of cell growth, the book conveys a sense of first-hand experience with many of the key steps in the evolution of the subject.

Baserga begins by considering the biological parameters of cell reproduction. The cell cycle and its various phases are defined within the context of several biological systems. Particularly noteworthy are discussions of methods for the synchronization of cells in culture, the morphology of cells