adelphia in 1876 to the Panama California International Exposition in San Diego in 1916.

Social Darwinism takes a number of forms: Survival of the fittest can become a rationale for unfettered free enterprise; the slow pace of evolutionary change can justify political conservatism; and the notion that living peoples represent stages in human evolution from lower to higher can be seen as a mandate for racism and imperialism.

It is this last theme that Rydell stresses, by paying particular attention to the ethnological displays that were a part of every exposition. These displays varied from solemn scientific exhibitions of skulls in series to the "missing link," a trained chimpanzee in a suit and top hat shown on the midway at the Pan American Exposition in Buffalo in 1901. Living peoples were also arranged in evolutionary sequence, notably at the Louisiana Purchase Exposition in St. Louis in 1904. Here a series of constructed villages ranged across the grounds, with African pygmies and Philippine Igorots representing the most "primitive" stages of humanity. The exhibit was under the charge of W. J. McGee, president of the American Anthropological Association. Anthropologists, famous and forgotten, played considerable roles in collecting and arranging these evolutionary and ethnological displays. Major John Wesley Powell collected for the Centennial Exhibition of 1876; Franz Boas, E. H. Thompson, and G. A. Dorsey for the World's Columbian Exposition in Chicago in 1893; James Mooney, J. R. Swanton, and Matilda Coxe Stevenson for the St. Louis fair of 1904; and Edgar L. Hewett and Aleš Hrdlička for the San Diego Exposition of 1915–1916.

American Indians were featured in every exposition. The Smithsonian put on elaborate displays of artifacts, dioramas, and life-sized models. There was a huge Indian congress at the Trans-Mississippi and International Exposition in Omaha in 1898 that featured a sham battle every day between whites and Indians. In these displays Indians were pictured as backward savages whom the whites would civilize. A similar philosophy animated the Philippine exhibits at the 1901 Buffalo and 1904 St. Louis fairs. These exhibits also served to celebrate America's emergence as a colonial power following the conquests of the Spanish-American War.

Behind all these displays Rydell implies that there was an organized ideology at work, an ideology intended to placate and control the masses in order to further the aims of corporate capitalism. He calls the expositions "triumphs of hegemony." Even the amusement zones were not just for fun but "reflected the growing efforts by the upper classes, threatened by class conflict at every turn, to influence the content of popular culture" (p. 236).

The evidence for this argument is less convincing than that advanced for the presence of social Darwinism. Ethnological displays were not all that was on view at the fairs; indeed, they were not even the major exhibits. Exposition grounds abounded with palaces of transportation, machinery, mining and metallurgy, food products, liberal arts, forestry and fishing, electricity, fine arts, and so on. In all of these the emphasis was on technological progress, not white supremacy or cultural hegemony. The supremacy that was being presented was American supremacy over the industrial nations of Europe or the supremacy of one manufacturer's product over another's. The fairs were festivals of advertising, and ad men are not known for the consistency of their views. Rydell often seems to take exposition rhetoric too literally.

In his eagerness to demonstrate the racism and imperialism of the fairs, Rydell also fails to distinguish the educational exhibits from midway attractions. Indeed, he sees both as parts of the same plan by the upper classes to "legitimize racial exploitation at home and the creation of an empire abroad" (p. 236). But the midway concessionaries were there to take money, not to promote ideology. Some concessionaries exhibited humans as curiosities so that the wild man of Borneo was in the same category as the fat lady. Others showed Philippine, Polynesian, or Indian "villages" but showed Irish, Tyrolian, or Belgian villages as well. Did the Streets of Cairo, an extremely popular concession from the 1893 Chicago fair, provide a demonstration of racism and imperialism or a chance to ride a donkey and see the gyrations of "Little Egypt"?

Rydell sees the fairs chiefly as American phenomenon, but, of course, they derived from Europe and they were international. The book gives very little attention to the competition between nations. Not only did countries vie with each other to put on expositions, within exposition grounds each tried to outdo the other in the pavilions they constructed. National prestige was surely as important as cultural hegemony in motivating exhibitors.

Local boosterism was even more important. European expositions were almost always held in capital cities, but American fairs were held in cities across the country that hoped they would stimulate local development. By concentrating so heavily on U.S. government exhibits, Rydell neglects the importance of local support for the fairs. European fairs were almost always heavily subsidized by their governments. American fairs were financed largely by local businessmen and state and city governments. For Rydell's hegemonic theory to work, one has to assume a high degree of cooperation over 40 years among the leaders of Philadelphia, Chicago, New Orleans, Atlanta, Nashville, Omaha, Buffalo, St. Louis, Portland, Seattle, San Francisco, and San Diego.

The fact is that the fairs were about too many things and expressed too many views for any single conspiratorial explanation to be convincing. What Rydell has found was there, but there were many other things as well. Despite this shortcoming *All the World's a Fair* is excellently researched and will be an essential source for anyone interested in the American phase of these curious secular rituals.

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Chinese Micropaleontology

Marine Micropaleontology of China. WANG PINXIAN *et al.* China Ocean Press, Beijing, and Springer-Verlag, New York, 1985. x, 370 pp., illus. $85. Translated from the Chinese.

Acta Micropalaeontologica Sinica. Sheng Jin-zhang, Ed. Science Press, Beijing (distributed by China International Book Trading Corp., P.O. Box 2820, Beijing). Quarterly. Vol. 1, 1984 (two issues only); vol. 2, 1985. Annual subscription (airmail), $60; single issues, $15.

Like most sciences in China, micropaleontology is making itself known outside that country. There is a large, active group of micropaleontologists in China, and much of their work is of interest and value to others elsewhere in the world, as characterized by the papers in this book and new journal.

The book results from an effort to make available in English recent work on marine micropaleontology in China. It contains 17 papers, all dealing with calcareous microfossils of the shelf seas of China, areas that are potentially petroleum producers. Half of the papers are translations, some with revisions, of papers originally published in Chinese in 1980, and the others are new contributions. Wang Pinxian coauthored all the papers with various of 12 collaborators. Eleven papers deal with the distribution of foraminifera, ostracods, or calcareous nannofossils in modern sediments; the remaining six concern these microfossils in Cenozoic deposits. Each contribution is well done, and each demonstrates familiarity with worldwide literature on the subject. Anyone con-

cerned with the marine geology and micropaleontology of the Chinese seas will find this book very useful.

Acta Micropalaeontologica Sinica has just begun appearing, but clearly it will be a premier paleontologic journal. The papers in the first two issues cover all aspects of micropaleontology from Precambrian to modern studies. Charophytes, conodonts, and algae, as well as the more common foraminifera and nannofossils, are represented. Again, the authors are very much aware of the world's current literature on their groups. Although all the contributions are in Chinese, each is followed by a long English abstract. Plates showing photomicrographs of thin sections, scanning electron micrographs, and reflected-light photographs are reasonably well done. The articles in this journal will be of interest to a wide variety of micropaleontologists.

These two publications demonstrate that Chinese micropaleontologists are very busy, that they are attacking problems of importance to the discipline in general, and that their work is worthy of the most careful consideration by workers elsewhere. Chinese micropaleontology has extended itself to the rest of the world, and we should pay attention.

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Glirology

Evolutionary Relationships among Rodents. A Multidisciplinary Analysis. W. PATRICK LUCKETT and JEAN-LOUIS HARTENBERGER, Eds. Plenum, New York, 1985. xvi, 721 pp., illus. $110. NATO Advanced Science Institutes series A, vol. 92. From a workshop, Paris, July 1984.

Rodents are all around us, living without invitation in our homes, gnawing at our crops and stored supplies, giving us diseases, and serving as laboratory animals. There are thousands of species of them spread over the world at present, and thousands more in the known fossil record. Yet until recently we have known little about their interrelationships and, indeed, even their place among other orders of mammals.

Until the 1930's, known rodent diversity was largely confined to the living fauna, with few students devoting even a portion of their time to fossils. Robert W. Wilson and Albert E. Wood had the field of fossil rodents pretty much to themselves in those days. Since World War II the situtation has changed spectacularly. Like primatology within mammalogy, there is now "glirology," whose practitioners hold their own meetings and symposia. Even within glirology, sizable splinter groups—for example, students of the family Muridae—threaten to form subdisciplines.

Two schools of glirological thought have long waged war on one another. The issue is whether the porcupine-like rodents (Hystricognathi) of the world are a natural group. Wood has long held that parallelism in rodents is rampant and that close similarities between South American and Old World porcupine-like rodents were independently derived. Stuart Landry and René Lavocat have championed the naturalness of the porcupine-like rodents but have not been able to explain their geographic distribution without recourse to unknowable dispersals across the South Atlantic Ocean or long cryptic occupancy of landmasses on which their fossils should have become known by now if the animals were truly resident. Now the fight seems to be ending, as new studies of comparative biochemistry and morphology of living rodents are combined with study of new fossil finds. New perspective is emerging. Willi Hennig's techniques of phylogenetic analysis are also being brought to bear. The time has been ripe for the appearance of a major work on rodent interrelationships. Luckett and Hartenberger have produced one; a new era of tighter intellectual discipline and of many-faceted approaches to the subject has begun.

The book addresses two major questions: what is the position of the orders Rodentia and Lagomorpha among other orders of mammals? and how are the rodents interrelated?

Certainly, the meatiest discussions in the book result from new information about the early Cenozoic Asian family Eurymylidae, long considered early members of the order Lagomorpha rather than Rodentia. However, nearly complete eurymylid skulls described in a chapter by C.-k. Li and S.-y. Ting are unmistakably rodent-like. Moreover, both M. J. Novacek and Li and Ting note various cranial similarities of eurymylids to Lagomorpha as well as to rodents, thus supporting a superordinal collocation of rodents and lagomorphs in Cohort Glires. Novacek's cladogram (p. 77, fig. 5) is not the most parsimonious one that could be constructed from his data (pp. 68–71, table 2), but it is interesting because Dermoptera are hypothesized to share some features with rodents and lagomorphs. Inasmuch as Dermoptera are similar in some ways to primitive primates, it may be that McKenna (*Am. Mus. Novit.* **2037**, 1 [1961]), Wood (*Trans. Am. Philos. Soc.* N. S. **52**, no. 1, 1 [1962]), and P. M. Butler (this volume) are not far off the mark in suggesting that the rodent dental pattern is somewhat like that of very primitive primates, even though the astragalo-calcaneal structure of Primates diverged early from a more primitive structure. My analysis of Novacek's data suggests that, among the animals analyzed, Primates are a sister group of Dermoptera, Rodentia, and Lagomorpha. However, Butler's attempt to derive the dental pattern of lagomorphs from that of an early eurymyloid does not work, as one can see from studies of *Pseudictops* (which lacks gliriform incisors but has a lagomorph astragalus and calcaneum) and *Hsiuannania*. Lagomorph foot structure is very different from that of rodents, which implies either long evolution apart or rapid divergence of the lagomorph foot from an earlier rodent-like foot.

In chapters devoted to different approaches, V. M. Sarich, J. Shoshani et al., N. Lopez Martinez, and F. S. Szalay reach independent but similar conclusions for both molecular and anatomical reasons, but Luckett puts in a strong bid for naturalness of Glires and remoteness of Glires from Primates on the basis of dental homologies and a penetrating study of fetal membranes. (In a note added in proof, Shoshani supports the Glires hypothesis on unspecified morphological grounds.) If Glires is valid, differentiation into rodents and lagomorphs was nevertheless probably a Cretaceous event. Indeed, as Li and Ting note, an Asian late Cretaceous eurymyloid with a gliriform incisor may already have been found.

The treatment of the second major question addressed by many contributors, naturalness or convergence of the hystricognath rodents, leaves me with the impression, in spite of some strong rearguard action by Wood, that Landry and Lavocat are vindicated. Porcupine-like rodents of both the New and the Old World are a natural group with an ancient but unknown continuous distribution. However, in agreement with Wood, I see no need for an unlikely South Atlantic oceanic crossing in order to explain their distribution.

Early Asian ctenodactyloid rodents also emerge as closely similar in dental pattern to the archaic eurymyloids. W. George shows that ctenodactyloids have a number of hystricognath characters, although they are usually put with the sciurognaths. On the basis of Lavocat and Parent's studies of the ear region, paramyids lose ground as ur-rodents. On the other hand, W. W. de Jong shows that muroids, which have primitive ear regions for rodents, are unique among vertebrates in the possession of a duplicate alpha crystallin A chain (a lens protein) that has an intron of 23 amino acids between loci 63 and 64 of the chain.

I was struck by the fact that most of the