sonably brief and digestible volume. The topics presented range from the global to the molecular and are in general those on which research is the most active. At the high end of biological complexity are descriptions of new virus diseases by Pattison *et al.* and a discussion of prospects for eradication of viruses by Tyrrell. To our surprise, measles and polio are judged the best candidates to follow smallpox into oblivion, although perhaps not very soon. Proceeding to the less complex there are a comprehensive, up-to-date, and readable account of the newly appreciated role of many different viruses in human cancer by Weiss and a general discussion of important aspects of the interaction of viruses with their animal hosts by Fields. A treatise on retroviral carcinogenesis by Bishop is accurate and readable despite an occasional tendency to endow viruses with human characteristics, as in "a retrovirus intent upon the seizure of a cellular gene." At the greatest level of resolution are detailed discussions of the structure and replication of viroids, plant pathogens devastating despite their small size, by Sanger, of the initiation of poliovirus replication by Baltimore, and of the importance of recombinational events to the lifestyle of bacteriophages, particularly μ, by Symonds. Finally, there are papers on the structure of viruses, by Harrison, the nature of viral genetic material, by McGeoch, and the molecular evolution of viruses, by Reanney. The paper by Harrison contains a particularly clear analysis of a difficult subject and could easily be used to introduce students to the way one should think about virion structure.

The volume on the bacteria is even broader in scope. Most of the papers in it deal with environmental and evolutionary aspects of the microbial world. The first paper, by Schlegel, is entitled "Global impact of prokaryotes and eukaryotes." It is followed by "Microbial behaviour in natural environments" by Pfennig, which illustrates with exciting examples how much is known about this topic. A more detailed example, Jannasch's presentation of the amazing world of life at the deep-sea thermal vents, should convert the most hardened reductionist. Harder *et al.* review environmental regulation of metabolism and Thauer and Morris update our knowledge of the chemotropic anaerobes. Shapiro proposes that molecular genetics may permit the study of cellular differentiation via colony morphology. The only totally specific paper, by Reznikoff, is on the promoter of the lactose operon. The impact of the microbe in medicine is discussed by Arbuthnott, but only from the point of view of prevention and treatment. Newly recognized microbes from varied environments are described by S. T. Williams *et al.* The production of new strains that result from genetic engineering is discussed by Hopwood and Johnston. The book terminates with an appropriately futuristic essay by Postgate, who reminds us that the microbial world—and those who study it—will be involved in both disasters and utopian developments. Orwell would have approved.

These volumes represent a celebration of an essential aspect of life on this globe and the jubilation that comes from our knowledge of it.

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A Naturalist of Means

Dear Lord Rothschild. Birds, Butterflies and History. MIRIAM ROTHSCHILD. Balaban, Philadelphia, and Hutchinson, London, 1984 (U.S. distributor, ISI Press, Philadelphia. xxiv, 398 pp. + plates. $29.95.

The Balfour Declaration of 1917, promising British support for "the establishment in Palestine of a national home for the Jewish people," was not proclaimed as a public document but as a personal letter to "Dear Lord Rothschild," titular chief of the great banking family and de facto head of Britain's Jewish community. But Walter Rothschild found banking distasteful and felt indifferent to politics (though he worked hard for the declaration); his true love lay elsewhere. When Chaim Weizmann, the Zionist leader, left for Palestine to see if he could facilitate the implementation of Balfour's declaration, Rothschild gave him another mission: "I want to find out what has become of two ostriches." Rothschild, world's greatest collector and dedicated professional taxonomist, had left the ostriches in care of a naturalist-schoolteacher near Jaffa and had lost contact with him during the disruptions of wartime. Weizmann dutifully located the ostriches, and Rothschild eventually described them as a new subspecies, *Struthio camelus syriacus*.

A passion for natural history is not rare; many of us (but not me) happily arise at an hour fit only for the closing of New York's bars, all to watch things that go tweet in the dawn. But combine this passion with unbounded energy, the devotion of a powerfully eccentric personality (who loved to drive his four-in-hand of zebras right down Picadilly), and (as bottom line) the wealth of the Rothschilds, and you have a force that can move mountains and greatly augment nomenclature. Walter Rothschild did both. His life was like the set of *Cats*, everything scaled way up, from his person (he weighed more than 300 pounds), to his resources, to his collections.

Walter Rothschild, specializing in birds and butterflies, built the largest collection in natural history ever assembled by one man. At times, he employed more than 400 collectors spread throughout the world. One cartographer, looking at a map with red dots marking Rothschild's sites of operation, said that it resembled "the world with a severe attack of measles." Rothschild built a museum at Tring (still well worth a visit) so stuffed with specimens that the zebras kneel or lie down so that one or two more rows may be inserted in the floor-to-ceiling display.

But Walter Rothschild was not a mere gatherer or mindless collector interested only in augmenting his life list. He established two of the world's finest taxonomists as curators at Tring, E. Hartert and K. Jordan (quite an act of ecumenicism, especially amid the jingoism of World War I, and for an English Jew, since both were German). He founded a journal, *Novitates Zoologicae*, to print their taxonomic results, and then he, and Hartert and Jordan, published and published and published—more than 5000 new species in 1200 books and papers. Moreover, the Tring trio were not mere describers but thinkers and reformers as well. They pushed the trinomial system (adding a subspecific name to the Linnaean binomial to characterize geographic variation) when it represented a real reform and departure from the static, typological concept of species. They advocated the collection of large series, not just typical individuals, for defining species, thereby reinforcing again the cardinal evolutionary idea that variation is irreducible and the stuff of change.

Miriam Rothschild is the world's greatest taxonomist of the Siphonaptera (fleas to the uninitiated), and Walter's niece. She has written a partly fascinating, always enlightening, and thoroughly maddening book to celebrate her uncle's (larger than) life. It contains more than anyone but a dutiful relative could ever want to know about Walter and his family, all written from a perspective assuming that the whole world knows and grew

up with the trappings of wealth (and therefore becoming more than a bit off-putting for that vast majority, including me and most of you, who didn't). Its level of insignificant detail, clouding and obscuring generalities in the manner of the worst descriptive monograph in taxonomy, reminded me of the classical genre of the retired English vicar: the comprehensive history of his parish.

I am interested in Walter Rothschild, his life and his works, but I do not care about the tea parties and social graces of every fourth cousin. I would even have waded through these details with equanimity if the important personal insights needed for understanding the man had been dispersed among them. But Miriam Rothschild is a dutiful niece, silent or impenetratingly discreet just when it really matters—and you will learn next to nothing about the suicide of Walter's brother and fellow zoologist, about his personal life with women, or about the persistent blackmail that clouded his life and eventually led to the sale of his beloved bird collection (now in New York).

For those (that is, nearly all of us) who grew up in ordinary circumstances, Miriam Rothschild's pervasive assumption that wealth is a natural state and upbringing provokes both offense and amusement. Thus, for example, she speaks of her unfortunate sister-in-law, who grew up "as poor as the proverbial church mice," as proved by the deprivation that her father could only provide an allowance of £50 per year (an amount that I could never hope to reach at the prevailing rate of 2¢ per returned pop bottle). I was particularly amused by the silliest *ad hoc* argument for biological determinism that I have ever read. Miriam Rothschild traces interest in animals through the Rothschild pedigree, notes the rarity of such a trait among "Jews in the ghetto, virtually isolated from wild life for a thousand years," then assumes that this supposed trait results from a single gene and that Walter and his brother Charles received it either as "odd mutations—or perhaps the expression of a recessive gene due to the double first cousin marriage of their parents." Many of the Rothschilds loved animals, and Miriam therefore concludes that the genealogy "must convince the most skeptical environmentalist that an interest in animals and plants was probably an hereditary character." I don't know. As I scan the genealogy, one property is even more widespread, and I doubt that anyone would care to postulate a specific gene for it: great wealth.

Walter Rothschild was a big man who made a big difference. He had courage and means to do just as he liked. He lucked into the second, but controlled the first. The world survived with one less banker; it is far richer for a million more butterflies.

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Endangered Primates

The Barbary Macaque. A Case Study in Conservation. JOHN E. FA, Ed. Plenum, New York, 1984. xviii, 369 pp., illus. $49.50. Based on a conference, Gibraltar, June 1982.

The genesis of this volume was a conference on the status of both wild and managed populations of the Barbary macaque (*Macaca sylvanus*), a vulnerable species once widespread in Europe and North Africa but today reduced to relatively small and disjunct forest pockets in Morocco and Algeria. The effects of human interference on the Barbary macaques maintained by the British Army on Gibraltar, site of the conference, prompted John Fa, both a primatologist and a Gibraltarian, to organize the conference.

The book represents a dual approach to species conservation in that protection of wild populations and their habitats and captive propagation (ultimately for reintroduction to the wild) are viewed as complementary. Elsewhere the extent to which conservation moneys should be diverted from habitat protection to captive breeding remains a topic of debate. The Barbary macaque is identified as one of only three primate species with potentially viable captive populations. Three tourist parks with large enclosures have been established for the species in France and Germany, and in 1980 over 200 macaques from the two French parks were reintroduced into Morocco. No details are provided in the present volume that would bear on the debate over captive propagation, however.

Part 1 contains six chapters that define the status of the Barbary macaque in the wild, including a 4000-year historical survey of the human contribution to the decline of the fragile Mediterranean forest ecosystems in North Africa and examinations of the current pressures exerted on forests by grazing livestock and the way in which human overuse of a forest ecosystem can lead to overt conflict between humans and macaqu Such factors prove important in rank Barbary macaque habitats according priority for conservation.

Part 2 contains five chapters that amine the genetic, social, and envir mental factors necessary for self-susta ing populations of Barbary macaques zoos and semi-natural environments, cluding Gibraltar. The book conclu with a series of recommendations conservation action largely derived fr those formulated at the Gibraltar conf ence.

Some general conclusions reached the book include the following: (i) C servation efforts should be maximized protecting populations in less disturb and larger areas, rather than protect all known populations irrespective their viability (a "triage system"), though marginal populations in uniq ecosystems may receive priority rank to facilitate determination of the limits a species' behavioral plasticity. (ii) P ulations of threatened monkeys gener ed in captivity should not be establish as a source of laboratory animals sir such use could become a potential thr to wild monkeys, especially if the c tive populations were to decline. (iii) be successful, species and habitat c servation must be integrated with p grams of socioeconomic developm for human populations.

The holistic approach taken in t book to the situation of the Barb macaque may well serve as a model studies of other threatened species a their ecosystems.

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Island Biota

Biogeography and Ecology of the Seyche Islands. D. R. STODDART, Ed. Junk, T Hague, 1984 (U.S. distributor, Kluwer B ton, Hingham, Mass.). xii, 691 pp., ill $115. Monographiae Biologicae, vol. 55.

The Seychelles Republic consists o unique and complex group of islands the western Indian Ocean. They are v small and isolated both from each ot and from major land masses. Three e logical types are represented: gran islands, low sand cays, and elevated r limestones. The granitic group consi of some 40 islands rising from the S chelles Bank, where depths are less t 60 meters. Low sand cays on sea-le