numerous sketches, footnotes, and an extensive bibliography, architect Amos Rapoport tells us that practically everything can and does influence house form, but that the primary determinants lie in the sociocultural realm.

Distinguishing between folk and monumental architectural traditions, Rapoport declares his interest in the work of the nonspecialists. Whereas monumental architecture is described as the work of men of genius, as self-conscious, imposing, and reflective of the culture of the elite, folk architecture is unpretentious, the work of non- or part-time specialists, and is more directly representative of the needs, norms, and world views of the common man. Within the broad classification of folk architecture the author further distinguishes primitive, preindustrial vernacular, and modern vernacular, each type representing greater specialization and sophistication than the one preceding it. (The last, modern vernacular, is mentioned only in passing and refers in part to an American folk idiom expressed by some tract homes, motels, and Doggie Diners.)

The purpose of this classification is to allow the reader to focus on what I might term the functionally equivalent features in the form of folk domestic architecture wherever it is presented. Obviously, to some cultural relativists there are no functionally equivalent features, especially if we exclude from consideration the monumental part of the built environment.

Initially the author is careful to avoid using the words "cause" or "determine": "One must be careful not to speak of forces *determining* form. We must speak of coincidences rather than causal 'relations' since the complexity of forces precludes our being able to attribute form to given forces or variables." Later, however, he freely uses both words when the occasion demands.

Single-factor theories from the physical determinist realm, which postulate as determinants such factors as climate, site, and materials, as well as those from the cultural realm, which find explanations in such factors as defense, technology, economics, or religion, are all reviewed briefly and dismissed as inadequate to explain the varieties of house form of the folk tradition. They do not sufficiently account for situations in which similar forms are found associated with radically different "forces" or, conversely, for situations in which similar forces or environments have very different forms linked to them. But when one attempts to prove the inadequacy of generalizations by presenting contrary examples the proof is subject to the total size of the data base from which they were drawn. Determinists would only have to show a dominant tendency in a more broadly based sample. To Rapoport, climate, materials, site, and technology are secondary shaping forces providing both alternatives and limitations for the expression of sociocultural patterns. There is nothing particularly earth-shaking about such a conclusion. Daryll Forde in 1934 made a similar statement concerning the effects of the perceived environment, in his book *Habitat, Economy and Society*.

Nevertheless, if we were to apply Occam's Razor and ask Rapoport to attempt to predict the general form of a house from his list of sociocultural factors he would probably ask us to provide facts concerning the following: the structure of the primary group, the way such a group makes a living, the social position of women, and the norms and attitudes about food, light, air, comfort, privacy, and social intercourse.

The theme of causality is presented mainly, I think, to allow the author to discuss his subject broadly, for neither the idea of "form" nor that of "cause" is explored to any depth, and the discussion of house form is remarkably diffuse.

In passing, I was unable to discover where the author got his descriptions of Eskimo, Mongol, and Paiute dwellings and I failed to find in the reference list a recent work he cites by Calhoun and Christian and another by Chombart de Lauwe. I enjoyed best the last chapter, "A look at the present," where I learned from a footnote that high-rise buildings now being built in Rangoon and Bangkok are required to have separate abodes in each unit for the guardian spirits.

Of the many objectives Rapoport set for himself in the beginning chapter, the last one listed seems to be the best accomplished: "to suggest some of the ways of looking at these forms in order to give a feel and the sense of the subject—and to awaken interest in it, and sensitivity to it."

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A Little-Known Continent

Biogeography and Ecology in South America. E. J. FITTKAU, J. ILLIES, H. KLINGE, G. H. SCHWABE, and H. SIOLI, Eds. Junk, The Hague, 1968–69. 2 vols. xxviii + 946 pp., illus. $20.80 each volume. Monographiae Biologicae, vols. 18 and 19.

In at least some biological respects South America is the least known continent. Parts of other continents may be less known, but all of South America is inadequately known. A summary of what is known of its biogeography and ecology is for this reason badly needed and quite difficult to provide. It is sad to report that the present two-volume, 29-chapter compilation better reflects the difficulty than fills the need.

The editors clearly intended to provide not critical reviews of selected topics for the specialist but more general and elementary summaries for the novice. Some statements in the introduction appear to imply that the intended audience is primarily South American, that the editors wish to provide the perspective of biogeography on a continental scale for workers whose view has been limited to their own country. If this was the intention, its execution must be given a mixed appraisal. Some chapters are very much better than others, but the good are far outnumbered by the poor.

These are multilingual volumes. More of the papers are in English than in German (several are stated to have been translated from German); only one is in Spanish and one in Portuguese. Summaries in alternative languages are usually but not always provided.

The coverage is broad, partly and deliberately overlapping. Ecology is understood in a rather primitive, descriptive sense and is touched upon only in chapters on ecological regions, climatology, soils, and conservation. Human effect upon South American biota is a major concern and in addition to many casual mentions is discussed in two chapters, one on conservation and one specifically on human ecology in relation to environment.

Biogeography is more fully covered. There is background discussion of geology, including continental drift, and of "geographical substance," and then strict biogeography: fossil floras, liverworts, cacti, the general fauna, "ground water fauna," the freshwater insects, Coleoptera, Arachnida, mites, mollusks, freshwater fishes, birds, and mammals. Many of the papers are so short as to tend to superficiality, however. (Special-

ists tell me that certain of them are also factually unreliable.) There are papers on South America as a source of economic plants (50 pp.), on cultural anthropology (58 pp.), and on poisonous arthropods (27 pp.). It is possible to grant the general interest of these topics without seeing their relevance to volumes in which space is already a difficulty. In contrast, the obviously pertinent biogeographic discussions have page counts such as the following: Coleoptera (13 pp.); Arachnida (16 pp.); mollusks (33 pp.); fishes (19 pp.); birds (25 pp.); mammals (28 pp.). Some topics—fossil pollen, for example—that are of crucial importance for at least the more recent history of South America are ignored. Still others—palms, bromeliads, Lepidoptera, Reptilia, marsupials—are expressly left out because it was "not possible to find a ready and experienced worker" to deal with them.

Unhappily, especially for novices, many of the bibliographies are very short (that for mollusks cites only authors' names, not specific references, that for birds only general works). In addition, there has obviously been delay in publication; rarely is a paper cited later than 1965, and most are far earlier.

The editors have correctly allowed the authors to assert their own opinions on controversial topics, but this again has its disadvantages for the novice. In the case of continental drift, except for the chapter by Martin (verdict: not proven), the authors are very positive either for or against, but merely by assertion, not discussion.

These are clearly badly edited volumes, bungled both in concept and execution. They can only be contrasted unfavorably with the *Handbook of Middle American Indians*, vol. 1, "Natural Environment and Early Cultures," which covers many of the same topics. Some of the difference may indeed be ascribed to the greater maturity of study of the Central American region, which is also a much smaller area. But the ambition that tackles a difficult task can reasonably be called to account for failure in the level of effort put forward. The effort to achieve a synthesis or even an intelligible confrontation of views has not been made.

The article by Fittkau, the senior editor, which endeavors to summarize the South American fauna as a whole, typifies this failure. Presumably here, with the specialists' papers before him, the editor might be expected to harmonize their views or point out significant divergences or offer new points of view. Unhappily the paper is eclectic without being synthetic. Dunn, Darlington and Jeannel, Mayr, Simpson, Hershkowitz, and Brundin are all at various times cited without much admission of the divergence of their views and with a level of zoogeographic information (and generic nomenclature) which for at least vertebrates is far below that of Darlington's *Zoogeography*, now more than ten years old.

Quite beyond deficiencies of performance, it is necessary to ask whether, as pedagogic tactic, summaries that have little novelty and are both simple and dogmatic genuinely have the capacity to capture or instruct the novice. It may be that only reviews with both depth and freshness of viewpoint catch the attention or stir the mind even of the novice.

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Germanium and Silicon

Physicochemical Principles of Semiconductor Doping. V. M. GLAZOV and V. S. ZEMSKOV. Translated from the Russian edition (Moscow, 1967) by Ch. Nisenbaum and B. Benny. D. Slutzkin, Transl. Ed. Israel Program for Scientific Translations, Jerusalem; Davey, Hartford, Conn., 1968. xii + 380 pp., illus. $16.

Although the fundamentals of semiconductor doping are discussed thoroughly, the value of this work lies mainly in the compilation and critical evaluation of available phase equilibria and other data for binary and ternary germanium and silicon systems, together with a detailed treatment of impurity incorporation and interactions in these elemental semiconductors.

In the first chapter the reader is led from elementary semiconductor theory into the familiar mass-action and ion-pairing work of Reiss and co-workers. The second, and longest, chapter deals with experimental methods for the determination of liquidus and solidus curves and then with the "best" phase diagrams for binary systems (diffusion data are also included); also included are treatments of both liquid and solid solution behavior, with emphasis on the factors affecting the distribution coefficient and its temperature dependence. There follows a similar chapter on multiply doped germanium and silicon which even includes some results on the viscosity of ternary liquid solutions. The final chapter treats methods of obtaining doped crystals, including the various crystal growth techniques and related problems such as constitutional supercooling, striations, and the facet effect (translated as "plane effect").

There is one criticism, not of the authors but of the state of the theory of impurities in germanium and silicon at the time the book was published (1967). This deals with the definition of a "neutral" impurity in a semiconductor. For example, for lightly doped germanium one can calculate the occupation probability for an electron on a donor level, thus obtaining the fraction of donor atoms which are neutral, that is, not ionized. However, for heavily doped germanium the shallow donor levels merge into the conduction band and simple Fermi-Dirac statistics lead to high occupation probabilities of the donor levels and hence give an apparent large fraction of neutral impurities. Yet Hall measurements clearly indicate 100-percent ionization of these impurities in heavily doped samples; that is, there is one free electron per donor atom. The "semantic" difficulty of talking about neutral impurities in such cases, though recognized, was conveniently ignored (I helped ignore it!), and the introduction of "neutral" impurities into Reiss's theory resulted in surprisingly good agreement with the experimental temperature dependences of the distribution coefficients for a large number of impurities, even at high doping levels. In 1967, however, Panish, Casey, and Chang showed for zinc in gallium arsenide that it is not necessary to preserve the fiction of neutral impurities in heavily doped materials if one properly considers the activity coefficient of holes and the effect of "band tails" at high impurity concentrations. To the best of my knowledge, similar calculations have not been made for germanium or silicon.

One might hope for a revised edition of this book incorporating the results of such calculations. Until that time, this book should still be of considerable value, especially to those who are concerned with the growth of germanium and silicon crystals.

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