by natural selection and a tendency toward diversification which have parallels (not merely analogies) in the biological realm. However, the biological notion of the population and Meggers's concept of "culture" or "cultural configuration" are not equivalent. The latter are catchall labels that cover an unsystematic assortment of beliefs, practices, and objects "that characterize a particular group and distinguish it from similar groups" (p. 42). A culture thus consists of *traits* which are each assumed to be separately "adaptive" in a particular ecological situation. Natural selection is reduced to a functional adjustment of miscellaneous traits to environmental pressures, and evolution as applied to culture remains an analogy, despite the author's insistence to the contrary.

More successful are the descriptive sections of the book, in which Meggers analyzes the selective pressures in two distinct geographical zones, the *terra firme* or unflooded land, and the *várzea* or periodically inundated floodplain. In my opinion, however, the ethnographic illustrations do not adequately demonstrate the significance of these pressures for the *terra firme*. It is surprising that Meggers does not refer to published sources (including the work of Goldman, Carneiro, Murphy, and Wagley and Galvão) which contain considerably more ecological information than some of those upon which she relies, whose data are fragmentary.

Despite these shortcomings, *Amazonia* provides the most comprehensive anthropological discussion so far of the Amazon basin as a human habitat. For this reason, and because it does indeed pose some critical questions about modern man's attempts to exploit the tropical rain forest, this book will stimulate interest in what is most obviously needed: a program of intense, multidisciplinary research in the Amazon basin.

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Evolutionary Anthropology

The Brain in Hominid Evolution. PHILLIP V. TOBIAS. Columbia University Press, New York, 1971. xviii, 170 pp., illus. $10.

Tobias has written, as we have come to expect, a solid and scholarly book that will be of great interest to paleoanthropologists. Tobias concentrates his efforts mainly on brain size, since that is the parameter most easily measurable, although he cautions that studies of brain size and external shape have to be approached with great care. The primary brain data with which paleontologists generally deal are endocranial casts, and these differ from actual brain casts to a greater or lesser extent because of the presence of the meninges, blood vessels, cranial nerves, and so forth between brain and bone.

Nonetheless, Tobias's useful review of volume measurements, including many new ones, indicates that the hominid brain was expanding steadily from at least 2 million to around 40,000 years ago. When adjustments are made for new dates and other stratigraphic details, this expansion is seen as being steady and fairly regular. The chapters dealing with volume measurements are exhaustively detailed, and are marred only by the fact that the author constructs confidence limits on both means and populations incorrectly.

Tobias emphasizes that paleoanthropologists concentrate on brain size only because that is all they can measure. In fact, increasing brain volume of itself tells us little, since it merely reflects changes in internal brain organization at a variety of levels. The interrelationships are represented by Tobias thus:

Increasing brain size ⇌ Increasing complexity of internal organization ⇌ Changing functional patterns ⇌ Changing behavior patterns.

For the first time, a distinguished physical anthropologist has shifted away, however tentatively, from an excessive concentration on brain size alone. For this shift in emphasis, we must thank most of all the work of Ralph Holloway, Jr., on whom Tobias relies quite heavily for much of chapter 7.

In the final chapters, Tobias discusses the reasons for the brain expansion during hominid evolution. Here he gives what has come to be the "traditional" or "consensus" view, that tool-making was the most important factor, or one of the most important ones, in molding man's evolution. This idea can be traced back at least to Darwin's *The Descent of Man*. Recently, however, a variety of lines of evidence are beginning to suggest that tool- or weapon-oriented theories may not be telling the whole story of human origins and evolution.

There is more to human cultural behavior than the ability simply to learn, or to chip flint. Our behavior differs from the learned behavior of all other animals, including chimpanzees, in such important ways as to render descriptions of nonhuman primate learned behavior as examples of "crude and primitive culture" potentially highly misleading. Human cultural behavior involves a very special form of learning, depending upon learned rules, norms, and values which vary arbitrarily from one culture group to another; our behavior is highly context-dependent, contexts being defined or delimited by the arbitrary learned rules. Tools can be detected in the fossil record; this helps explain, at least in part, the emphasis that anthropology has placed on them. Context-dependent cultural behavior is much harder to detect in the fossil record. One of the great challenges for anthropologists with evolutionary interests in future will be to propose plausible model schemes of behavioral evolution based on what we know of behavior, at all levels, in living primates, including man. There are a few brave souls working in these areas already, but evolutionary anthropology will not come of age until such problems are tackled in a much more sophisticated way.

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Paleoecological Methodology

Introduction to Quantitative Paleoecology. R. A. REYMENT. Elsevier, New York, 1971. xiv, 226 pp., illus. $16.75.

This relatively small book, a first in its field, is well written, lucid, and a delight to read. Potential readers should not be put off by the somewhat austere title, which does little to encourage would-be readers with scanty mathematical knowledge. In fact the book presents a clear account of how one mathematically inclined paleoecologist tackles his subject, and it requires of the reader little more than high school mathematics. The highly personal style will not suit all tastes, but it does result in a very readable account of subject matter which easily could become heavy going.

Apart from a brief, but nonetheless useful, introduction to statistical ideas, the book consists of 28 examples of common paleoecological problems, which are grouped according to the broad topics of orientation dynamics; environ-