tions. Specialists will question minor aspects of Taube's arguments and identifications, but they are basically sound. Readers wanting to learn more about the ways in which deities were and are integrated into ancient and modern Maya myth and ritual will need to read further, but *The Major Gods of Ancient Yucatan* will provide anyone interested in ancient Maya religion with an excellent introduction.

Jeffrey Kowalski
Department of Art,
Northern Illinois University,
DeKalb, IL 60115–2883

■

Language and Prehistory

Linguistic Diversity in Space and Time. JOHANNA NICHOLS. University of Chicago Press, Chicago, IL, 1992. xvi, 358 pp., illus. $39.95.

Much of modern linguistics is devoted to identifying what all human languages have in common: which characteristics of languages are necessary and essential and which are accidental or contingent. The field of linguistic typology has tended to approach this problem empirically, by examining the characteristics of large numbers of diverse languages. For example, it has been shown that languages that put demonstratives like *this* or *that* after the noun rather than before it have a strong (though not exceptionless) tendency to put adjectives after the noun also.

Other approaches (such as Noam Chomsky's) reject deriving linguistic universals from such linguistic beauty pageants and focus instead on intensive study of particular problems in particular languages, arguing that, if properly investigated, even a single language, like a holographic image, can enable us to fill in much of the picture of language in general.

The approach of the book under review is more akin to the first approach, but with an important difference: Nichols examines the global distribution of linguistic features not in order to identify linguistic universals but rather in order to focus on the differences among human languages and on what the distribution of these differences might indicate about the prehistory of human language. Nichols argues that more traditional methods—such as the comparative method that was used to reconstruct the history of the Indo-European language family—cannot take us earlier than about 8,000 to 10,000 years ago and that to go to greater time depths new methods are necessary. The power of the comparative method, and its very definition, is still under debate in the linguistic community, and it is possible that Nichols's pessimism about it is unfounded. But new tools for investigating linguistic prehistory would clearly be welcome in either case.

Nichols's investigation of the distribution of linguistic traits is not based on the assumption that some of them are more primitive than others, but rather assumes that some features remain relatively stable in a given geographical area or within a single language family and may thus be used as markers to track early speech communities, much as blood types are used as guides to population movements.

For example, Nichols defines a feature she calls "head/dependent marking," which characterizes a language's morphological tendencies. In a sentence like "Noam reads French," the verb *reads* is marked by the

Vignettes: Obscurer Vices

It would be fascinating to have a study of the after-lunch alcohol content of the American workforce, and of the variations in productivity, work quality, and safety that accompany variations in drinking short of actual drunkenness. Such a study would be expensive and technically difficult, which is one reason it has never been attempted. Another reason is that it would weaken the identification of the alcohol problem with "alcohol abuse and alcoholism" by paying attention to the costs of nonproblem drinking.

—*Mark A. R. Kleiman*, in *Against Excess: Drug Policy for Results* (Basic Books)

Private discourse . . . grew cruder in the decades after World War II. One 1969 study of actual use of language, for example, showed that a group of adults in a leisure setting used *damn* and a four-letter word for excrement more frequently than they did *the* or *and*.

—*John C. Burnham*, in *Bad Habits: Drinking, Smoking, Taking Drugs, Gambling, Sexual Misbehavior, and Swearing in American History* (New York University Press)

third-person singular agreement suffix *-s* to agree with its subject *Noam*. This is head marking, because the verb is considered the head of the sentence. But in "muchas gracias," the dependent word *muchas*, "many," is marked with a feminine plural suffix *-as* so as to agree with the head word *gracias*, "thanks"; this is dependent marking. Nichols assigns scores to languages depending on which type of morphological marking they favor.

Nichols argues that this feature is of typological importance, that it shows considerable stability, and that its geographical distribution is not random. For example, New World languages tend to mark heads more than dependents, whereas Old World languages tend toward dependent marking. The Pacific region is intermediate between the two. Nichols interprets this distribution as a trace of the earliest expansion of human settlement from Africa and nearby areas to more remote parts of Eurasia and the New World.

Nichols identifies ten major structural features of this kind and investigates their patterns of distribution within a sample of 174 languages. Points of analysis include correlations among features; stability within both language families and geographical areas; evenness of distribution within geographical regions of varying sizes; and areas of maximum diversity. On the basis of such patterns (and other assumptions), Nichols sketches a general picture of linguistic prehistory, consisting of three stages: an initial development of linguistic diversity in the tropical areas of Africa and the nearby parts of Asia; an early expansion from the Old World tropics to Europe, the remainder of Asia, the Pacific, and the New World; and a third, post-glaciation stage in which more complex social groups spread their languages over large areas of the world, thereby removing much of the original linguistic diversity (which remains only in peripheral areas).

In a study involving such a large corpus, it is of course easy to find particular judgments to disagree with. For example, Nichols treats colloquial French as a verb-initial language and assumes that Mandarin Chinese has no prepositional phrases. Though both languages have indeed been analyzed this way, the analyses are certainly debatable.

A more serious problem is that many of the mathematical arguments in the book (and there are quite a number of them) do not inspire confidence. Some examples:

1) In one passage, Nichols says that in measuring the stability of certain features within language families, "two metrics are used" and that "both yield the same hierarchical ranking" of the features' stability. But the two metrics are entirely interdependent: one is the sum of the number of different types in each family for the eight families under consideration, and the other is the mean number of types per family—that is, just the first number divided by 8 (pp. 166–167 and table 52).

2) Data are sometimes inconsistent between tables (as in tables 50 and 53).

3) Nichols makes extensive use of what she calls "Dryer's test"—referring to a procedure for testing hypotheses about linguistic universals proposed by the linguist Matthew Dryer. Though there is no room here for details, her adaptation of Dryer's procedure to measure "significance of divergence" (pp. 187–188) is certainly idiosyncratic and appears to be invalid (as far as may be judged from her laconic description of it).

Of course, these problems do not prove that Nichols's conclusions are wrong: she does make a convincing case that the distribution of typological features among the world's languages is nonrandom and that this distribution may have much to tell us about linguistic—and therefore human—prehistory. Her scenario for the spread of human language must be considered preliminary, but it is not unreasonable. Her book will be a rich source of ideas and techniques for those who wish to pursue this line of investigation further.

William H. Baxter
Department of Asian Languages and Cultures, and Program in Linguistics, University of Michigan, Ann Arbor, MI 48109–1285

Mathematical Malaises

Pi in the Sky. Counting, Thinking, and Being. JOHN D. BARROW. Clarendon (Oxford University Press), New York, 1992. xii, 317 pp., illus. $25.

The Rock of Gibraltar of most mathematics, indeed of almost all reasoning, is the principle of the excluded middle. We use a two-valued logic where statements are either true or false. No middle ground is possible.

A man of Seville is shaved by the Barber of Seville if and only if the man does not shave himself. Does the Barber shave himself?

If he does he doesn't; if he doesn't he does. The statement can be neither true nor false. The conclusion: the barber cannot exist. The problem is that in a mathematical sense the barber does exist, or at least did by the permissible definitions of the turn of this century. This innocent paradox, recast by Bertrand Russell in only slightly more erudite terms, deeply shook both Russell and the foundations of mathematics. Since it is possible to deduce irrefutably the truth of anything from a contradiction, a single inconsistency in the fabric causes the entire structure to crumble. If Russell's paradox is not resolved then unicorns exist and pigs fly.

The foundations crumbled but the building stood. Mathematicians worked on, largely unimpeded by the most profound crisis imaginable in the philosophy of mathematics. (This is the usual direct impact of philosophy on mathematics.) But inexorably, over this century, the effects of a close examination of the underpinnings of math-