spectral properties of given enzymes (Groves and McClusky; Chang; Traylor *et al.*). Interpretations that relied on analogies with known heme proteins can now be verified by these model studies. Spectral similarity, of course, does not guarantee similar reactivity; in fact, it is clear that the reactivity of the heme group in an enzyme is governed by the dynamic structure of the protein. A detailed elaboration of these ideas is yet to come.

Roughly a quarter of the proceedings is concerned with the detrimental forms of oxygen, that is, singlet oxygen, superoxide, peroxide, and hydroxyl radical. Their effects on lipids and on the lens of the eye are described, and the enzymes that inactivate the reactive O_2 derivatives are discussed, in particular superoxide dismutase, peroxidase, and catalase. Other papers treat the bactericidal effect of leukocyte-generated activated oxygen species and the toxicity of elevated O_2 pressure. Related topics ranging from clinical studies to experiments at the molecular level are briefly touched upon.

Many of the papers capture the excitement of current research; all are informative, and together they provide an overview of the state of the art in this burgeoning field.

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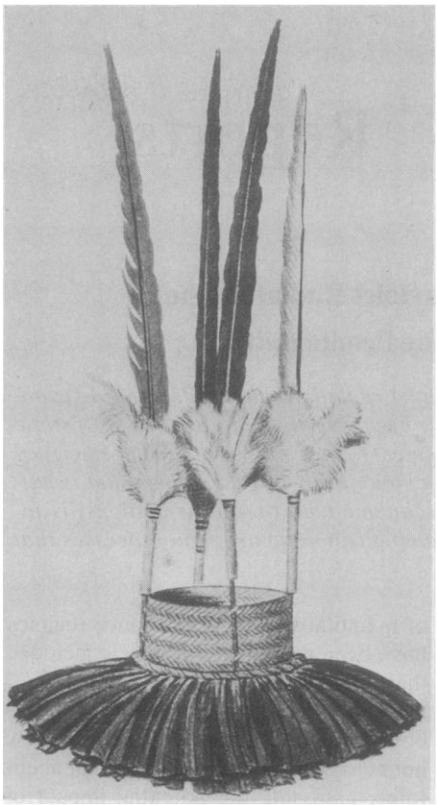
Pre-Columbian Societies

Ancient Panama. Chiefs in Search of Power. MARY W. HELMS. University of Texas Press, Austin, 1979. xvi, 228 pp., illus. $16.95. Texas Pan American Series.

The concern of this book is with the cultural evolution of ranked societies and their sociopolitical systems in pre-Columbian Panama and with the economic and intellectual values associated with the political life of the area. Its principal subjects are power relationships that depended on education of individuals, the maintenance of power, and far-flung trade. Helms draws her basic material from the Spanish chroniclers and ethnohistoric sources and utilizes comparisons with chiefdoms from the San Blas Cuna and peoples of northern Colombia and to some extent Polynesia.

When the Spanish Conquest began, the dominant form of social organization



Headdress of a Cuna *kantule* (chief). The tall feathers are (*left to right*) red, blue, and yellow. [From S. H. Wassén, "Original Documents from the Cuna Indians of San Blas Panama," *Etnologiska Studier*, No. 6, 1938, plate 1, by permission of the Göteborgs Etnografiska Museum; from *Ancient Panama*]

in Panama was the clan with patrilineal succession. Settlements ("pueblos") were composed of kinship groups each under a chief. If many people were involved, the "pueblos" were called "provinces." These were rank societies. Generally chiefly power was hereditary, falling to the eldest son, but there were occasions when the lack of male lineage drew the oldest daughter or the son of the second daughter because of his demonstrable ancestry. There was also a provincial chief or "cacique mayor," whose domain was marked by water (river, stream, or ocean) boundaries.

The resources of a province were limited according to its geographical position, and trade, local, regional, and long-distance, was necessary whether for subsistence items, raw materials, or luxury goods. Alliances for trade and war between provinces developed as means of controlling resources and of maintaining leadership as well as the social setting. Even when in power, the high chiefs were immersed in politics to assure or better their position and to push aside or use as tributing vassals less ranking rulers. To this it might be added that almost constant warfare was waged between rival alliances composed of non-related groups on account of the pressure for slaves, who sometimes were sold but whose principal role was for religious sacrifice. One does not mind killing a stranger but family is a different matter.

All of Panama shared an ideology that had its roots in northern Colombia, the seat of an elite group of teacher-scholars who excelled in esoteric knowledge. Colombia was likewise one of the most important centers of gold working in the Americas. Helms suggests that the recognition of the Colombian authorities formed one of the major elite "resources." Certain young chieftains journeyed to locations in Colombia to be schooled in cosmography and versed in sacred symbols, lore, ritual, and a special language, thus acquiring knowledge that was necessary for the acquisition of a mystical character to enhance political standing. At the same time, these distant voyages provided a commodity exchange network, making it possible to obtain prestige articles, particularly of gold, which gave the esoteric knowledge material expression and also contributed politically to the maintenance and expansion of chiefly power.

As Helms makes clear, gold artifacts were restricted to the sociopolitical elite. However, her premise that all Panamanian gold objects were imports from the south is debatable. Archeologically, gold-working tools and defective pieces that would have been unsuitable for trade are known from Veraguas, and in Costa Rica, which has the same pre-Columbian sociopolitical and ethnological background as Panama, one clay mold has been excavated and at least three unique styles of figures can be identified, offering evidence of this art in lower Central America.

From the point of view of plant geography, Helms's inclusion of citrus fruits in a list of foodstuffs enjoyed by pre-Columbian Panamanians (p. 11) bears mentioning. Citrus did not exist in the Americas until brought by Europeans during Conquest times. This error does not detract, however, from Helms's stimulating and careful account of the power struggle among the chieftains of ancient Panama.

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