correctness of his views that he seems to think that controversy should have ended simply because he has stated those views and provided supporting arguments. Opponents who were not converted are "muddle-headed." This is particularly apparent in the later chapters, which are devoted to a series of biological issues on which Ghiselin has previously written extensively. Here, he is often traversing familiar territory to support views he has expressed elsewhere. As a result, it is harder than it should be to connect these views with the general issues and the metaphysical framework established in earlier chapters. Also, Ghiselin undermines his own effort to engage fully with those holding muddled or opposing views.

Despite my concerns about lost opportunities and the excessively controversial tone into which Ghiselin occasionally slips, his project is extremely promising. It deserves serious attention from everyone interested in biological ontology or foundational questions in cladistics, evolution, and systematics.

BOOKS: ANTHROPOLOGY

Rescued Account of a Vanished People

Gustavo Politis

Coming more than 20 years after the tragic death of the French anthropologist Pierre Clastres, the publication of the English translation of his *Chronicle of the Guayaki Indians* is long-delayed justice. The novelist Paul Auster had become ardently attracted to the original (*1*) when it first appeared. While trying to earn a living as a translator, he had prepared the manuscript for a publisher that became insolvent just before the book's planned publication. His translation was lost for 18 years, and Auster thought it had disappeared forever. (Living hand to mouth at the time, he had not retained a copy of his own.) The translator was reunited with his work two years ago, while signing books after a lecture in San Francisco; a passionate collector of books had rescued a copy of the bound galleys from the remainder bin at a secondhand bookstore. Auster's deep, positive feelings about Clastres's narrative emerge throughout his translation, which captures the original's freshness, sense of humor, and intellectual insight.

Chronicle of the Guayaki Indians
by Pierre Clastres
Translated by Paul Auster
Zone Books, New York, 1998. 352 pp. $25.50, £21.95. ISBN 0-942299-77-9. Paper, Faber and Faber, London. 253 pp. £9.99. ISBN 0-571-19398-6.

Pierre Clastres, a typical representative of the French ethnological tradition, spent much of 1963 and 1964 among the Guayaki, a small Indian group living in the rainforest of Paraguay. Although he is best known for his research in political anthropology (at his death he was director of studies at the Ecole Pratique des Hautes Etudes in Paris), Clastres's fieldwork among the Guayaki shaped his future thoughts and deeply influenced his subsequent research. The chronicle is not only about the life of the Guayaki soon after their contact with the Paraguayans. It is also about a young ethnologist's perceptions of them, and his worries over the obscure destiny he envisioned for their future.

Clastres lived with two Guayaki groups: the Atchei Gatu and the Atchei Iroiangi. The Atchei Gatu had been settled in a permanent camp at Arroyo Morotí for over three years when Clastres arrived there, but the Iroiangi had come out of the forest only a few months prior to his arrival. The two groups had always lived in the forest without trying to know each other. Clastres found the Atchei Gatu were helpful and collaborative upon his arrival; the Iroiangi, however, only began to talk to him five months later, after they became sick. Although this was a difficult period for Clastres, it provided a unique opportunity to learn from the recently contacted Iroiangi with the help of the more friendly Atchei Gatu.

Although the Atchei were known since the 18th century (Jesuit Father Lozano accurately described them and named them Ka'aygua), Clastres' study was one of the first complete reports on these groups and provided a new interpretation of their lack of horticulture prior to their settling in Arroyo Morotí. Horticulture was absent not because the group had never acquired it, but because it had been lost. The idea that a nomadic lifestyle precludes horticulture is no longer assumed—at least for Amazonia, where hunter-gatherers (like the Nukak) may tend some orchards in the forest while still maintaining a very high rate of mobility.

The book illustrates the life of the Guayaki extremely well, focusing on aspects of traditional hunter-gatherer groups that are not usually given such attention. Although the Guayaki were settled and eating manioc every day (and meat less often) when Clastres lived among them, their spiritual life had not been shaken and their cosmology remained very much alive. Therefore, he was able to record—with great detail and sharp observations—the ritual around the birth of a child, the initiation ceremonies of both girls and boys,

PIERRE CLASTRES/LIBRAIRIE PLON

Incomplete initiation. After being painted for the traditional ceremonies, this girl refused to undergo the ritual scarification.

and the protocols for hunting and eating forest animals. Clastres describes a Guayaki cosmology that, like those of most indigenous groups in the Americas, differs from our western view of the world, which is deeply embedded in a narrow rationalism and is essentially materialistic. The Guayaki did not consider themselves as occupying any position in the natural and supranatural order. Instead, plants, animals and rocks are part of an intricate network of spirits, "owners" or "masters" who dominate the world and with whom humans have to negotiate in order to live their lives. This explains why for the Guayaki, hunting was not simply a matter of killing animals, why some animals were taboo as food, and why making fire with a smoldering stick was a serious, almost sacred act—no one would speak and the women were not allowed to watch while the reed was spun between a man's hands.

The entire book is written in a flowing narrative through which the difficulties that Clastres had during his stay are easy to recognize. ("Indians are not information machines, and it would be a great mistake to think that they are always ready to answer questions.") Sometimes Clastres makes fun of himself: "...I was there to ob-

The author is in the Departmento de Arqueología, Facultad de Ciencias Sociales, Universidad del Centro de la Pcia. de Buenos Aires, Del Valle 5737, 7400 Olavarría, Argentina; and in the Universidad Nacional de la Plata, Argentina. E-mail: politis@isis.unlp.edu.ar

serve, notebook and pencil, rather stupidly in my hand; I did not dare leave, in spite of the heat, the mosquitoes and my own hunger." With the author's reflections on his research and his feelings, the reader can easily see the dynamic intersection between the scientist and the objects of his study and follow how these relations changed through time. Thoughts and emotions, experiences and ideas, happiness and sadness, are all brought together in sharp focus in this account of the traditional Guayaki world. Today the Atchei Gatu and Iroiangi have vanished, as Clastres anticipated. And the world of the surviving Guayaki is quite different, as they have lost much of their culture and traditional knowledge. At least, however, their spirit still survives in Clastres's *Chronicle*.

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1. Published in France as *Chronique des indiens Guayaki* (Librairie Plon, Paris, 1972).

NEW MEDIA: MULTIMEDIA

Making Multimedia

Hamid Ghanadan

Traditional film techniques, relying on hand-drawn animation for illustrating scientific principles, are expensive, laborious, and noninteractive. Modern multimedia presentations for viewing on personal computers and electronic displays, however, are relatively easy to create and are effective in communicating scientific information.

Multimedia presentations are assembled from various elements, such as two-dimensional (2D) static images (for example, charts, graphs, and still pictures), computer-generated three-dimensional (3D) structures, sound, and video. 2D images can be created with standard graphic or plotting software on personal computers (including built-in charting routines that come with spreadsheets, for instance) and then converted to any of several popular image file formats, including TIFF, PICT, JPG, or GIF.

3D molecular structures can be prepared in two ways. First, one can design the object's frame (shape) from scratch and give it an appropriate surface texture in 3D rendering programs such as Lightwave 3D, Ray Dream Studio, or Strata Studio Pro. The basics of 3D modeling can be relatively easily mastered. Realistic 3D scenes containing shadows and depth of field are much more difficult to create. They require both technical and artistic skills beyond the abilities of a novice. Alternatively, objects for which the 3D coordinates are known, such as molecular structures in Protein Data Bank (PDB) format, can sometimes be imported into 3D rendering software for creating animations.

It should be noted that the common 3D file format called DXF is poorly standardized and that not all DXF files are compatible with all programs. For example, none of the three popular programs mentioned above can open DXF files created by the popular MolView program, which reads PDB files. Worse, 3D rendering programs cannot directly read PDB files either. Converting PDB files into a suitable DXF format is, unfortunately, difficult and indirect. Such conversions can most readily be made by employing two applications: the free Linux program called Medit (http://sunsite.unc.edu/pub/Linux/apps/editors/X/medit-1.7.1.lsm) and the commercially available UNIX application called Ribbons. The resulting files may then be exported to the 3D rendering program of choice.

Audio for presentations can be captured from virtually any source (including a cassette recording) through a computer's audio input interfaces: the microphone jack, the RCA-style input jacks, or the CD-ROM drive. Macromedia SoundEdit 16 is a popular software package for editing sound files and converting them into common multimedia file formats, such as WAV, AIFF, and QuickTime. Video from videotape can be imported in a similar manner, if one has an AV-equipped personal computer with video input jacks. Programs like Adobe Premier and Adobe After Effects allow one to capture, edit, and stylize (apply effects to) digital video.

Authoring software, such as Macromedia Director, provides a way to bring the various elements together onto a "stage" for assembling the finished presentation, which may range from a simple movie to a complex, multicomponent presentation that responds to user actions. It is at this point that the choice of an appropriate file format is critical. If the presentation is a simple movie or audio presentation (such as a lecture), formats such as Real Audio/Real Video offer nice cross-platform solutions viewable on Web browsers. If interactivity is desired, ShockWave, QuickTime, or Macromedia Director formats work best. Interactivity requires an integrated programming language, such as Lingo (which is built into Macromedia Director) or the QuickTime Media Layer (QTML). Each language provides conditional responses to user actions and a way to define relationships between the elements. The finished product can be platform-dependent (that is, a Macromedia Director movie specific for Mac or Windows) or platform-independent, if it is output in a format such as QuickTime or ShockWave. Platform-dependent presentations are self-running and are usually distributed on CD-ROM. They offer the advantage of being free of browser considerations and optimized for a particular system. The downside, of course, is that codes must be prepared separately for each platform. ShockWave- or QuickTime-formatted presentations, on the other hand, are platform independent and require a ShockWave- or QuickTime-equipped browser, like Netscape Navigator or Microsoft Internet Explorer. The finished presentation has the advantage, however, that it can be delivered either on fixed storage media like CD-ROM or through the Web.

The author is with gh multimedia, Bend, OR 97701, USA. E-mail: hamid@ghmedia.com

VIGNETTE

Scientific Reformation

It has been argued that when Europe was united as 'Christendom,' contradictory elements of Church doctrine—such as the idea that the One True God consists of 'three persons'—were neutralized in practices that stressed different elements on different occasions. However, with secularization came the elimination of many of these buffering practices, which in turn served to make the doctrinal contradictions appear stark and irresolvable. Similarly, if the end of state funding for science were to end the perception of a unified conception of science, the fact that the physical, life, and social sciences operate with fundamentally different aims and orientations would perhaps rise to the surface to become a point of public contention. In any case, the public already seems to have an instinctively clearer sense of such cross-disciplinary differences than practising scientists who, despite their clear theoretical and methodological differences, continue to talk in terms of a 'Science' common to them all. Indeed, what scientists often see as the public's 'confusion' about the nature of science may simply be the public's recognition that there is no 'nature' to science.

–Steve Fuller
in *Science*
(University of Minnesota Press/Open University Press, 1997)