"but let Time's news Be known when 'tis brought forth"

Time's News

An Aperiodic Newsletter

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A MESSAGE FROM THE PRESIDENT

Spending the summer vacations, as I recently did, in a small alpine village in the Southern part of France, I came across a number of sundials placed on the walls of old houses. Dating largely from the 19th century, most of them had recently been carefully restored. The writings and symbols that adorned them spoke of time situated between daily life and eternity; others reminded the viewer that "it is later than you think," or that there are two sides to everything: time and life: the sunny side and shadows: lightness and darkness. . . It was the seeming simplicity of these messages and the unintended evocation of their symbolism that I found intriguing. These are villages that spring to life in the short summer tourist season, with the population suddenly increases manyfold. When in the rest of the year unemployment and old age prevails. The young, who have left to seek occupational opportunities elsewhere, return for a brief spell during summer, while the old pensioners are bound to stay behind during the long, drab "dead" season--with TV antennas and a few phones installed as generous gifts from a pulsating and hectic life out of their reach.

Fixed to the walls of old houses with cracks still visible despite restoration, these sundials are more than primitive time-keepers: they show proud consciousness of time and place. At the same time, they formed part of a shared network of daily routine and life patterns, long before standard time reached these remote alpine villages. In their obstinate backwardness they display a sense of time and place that precedes and yet transcends modernity; a reminder of what being "anchored" to the walls of a house could mean; of the shifting flux of time and change of seasons; of being in-phase and out-of-phase; of the tension between infinite time and the very finite life-span of its inhabitants. On one of the houses, the current owner had chosen to paint a "modern" version with an inscription reading "on ne voit bien qu'avec le coeur": the heart had found its proper rhythm.

I found myself wondering what a modern city-version of these "cadrans solaires" would look like. Next to the TV antennas and glittering lights of a metropolis, sticking out near windows that all look alike in buildings many floors high, the inhabitants would choose to install their own sun dials with their "personalized" inscriptions. Some inhabitants would opt for electronic means of display while others would decide to transfer theirs to their computers, adjusting them and being greeted daily by a different inscription to be shared with other users. How would awareness of time and temporal processes change? How would one's own time be linked to that of others and to the temporal multiplicity of times? Would a new order arise out of chaos or would the sometimes chaotic temporal fluctuations of modern life lapse into new rigidities? How would an array of sun dials spread around the globe affect its time-compactness?

Very soon the Coucil of ISST will meet in order to prepare the next conference. My vacation dreams are over and yet--I wanted to share them with you.

Helga Nowotny

THE FOUNDER'S COLUMN

When an English inn keeper is ready to close the pub for the night, he flicks the lights a number of times and says, 'It's time, gentlemen!" He does not mean to signal that he is quitting his business but only that he wants to go home to be with his family, do his accounts, watch television, and sleep.

I have been flicking various lights to signal that, after some thirty years of service to ISST, "it's time, ladies and gentlemen," for others to take on more responsibilities in informing the policies and administering the life of this Society. I am not announcing that I am about to abandon this enterprise nor am I interested in watching television. But I would like to see more of my family and spend more time in the true home of the mind which, for me, is perchance to dream, perchance to write, perchance to organize small, select meetings.

Our Constitution is being fine-tuned; the amendments will be useful. But the future of ISST will depend primarily on the availability of younger scholars and scientists who perceive sufficient common causes between their life plans and the professional labor of this Society, to make it worth their while to serve as its officers.

Fortunately, my flicking of the lights has turned up some remarkably encouraging responses.

JTF

REPORT OF THE EXECUTIVE SECRETARY

In my field (music) as well as in poetry, we recognize a phenomenon known as anacrusis--more popularly known as "upbeat," the upward gesture of preparation before a conductor brings his baton down as a signal for the orchestra to begin. The secretariat of the ISST is now in the midst of a series of upbeats in preparation for the moment when President Helga Nowotny calls the Ninth Conference to order next July.

The ISST Council will meet from 16-18 September in Westport, CT, to approve paper proposals that have been submitted, and I will be notifying proposers shortly thereafter. The full program and hotel information will appear in the next issue of Time's News and should reach you in early 1995. In the meantime please refer to the information published in the last issue of this newsletter. I have checked the Canadian exchange rates and they are, if anything, slightly more favorable than quoted previously.

The Call for Paper Proposals did not mention the poster sessions that have become a regular feature of our conferences. We now invite members to propose topics appropriate for a poster presentation, topics that may or may not fall within the main theme of the conference--"Time, Order, Chaos." If you have hesitated to propose a paper because this theme does not apply to your work, here is an opportunity to bring your work before the Society. Poster proposals must still be approved by the Council, and should be received in my office no later than 1 December 1994: Box 6195, Bloomington, IN 47407, USA. I can receive faxes at (812) 855-4936, but they must be addressed to me by name.

Voting for the proposed constitutional amendments has concluded, and I can report that 100% of those voting approved the amendments. Approximately 40% of the membership cast ballots. The new constitution is effective immediately, and I will ask the Council to set an election for sometime in early 1995. President Nowotny has appointed a nominations committee consisting of the President, the Founder, the immediate Past President, and members Sabine Gross and Olga Hasty. I urge you to send me the names of persons you think should be nominated for the Society's various offices, and I will forward your suggestions to the committee members. Returning to the constitutional amendments, the only other immediate change you will notice is that the slate of nominees will include a candidate or candidates for Vice-President.

Finally, I also urge you to nominate recently published books for the J. T. Fraser Prize, to be awarded at the 1995 conference. President Nowotny is appointing a selection committee, and I will receive publications and collect opinions from the committee. We have received several nominations so far, but I am not convinced that the news of this award has spread sufficiently. Please do everything you can to bring new books in time-related fields to our attention, and we will contact the publishers. A completed nomination requires a brief letter of nomination and a deposit copy of the book, which most publishers will provide. Send all nominations and deposit copies to the Executive Secretary, Box 6195, Bloomington, IN 47407, USA.

Lewis Rowell
Executive Secretary

J. T. FRASER PRIZE

To honor our Founder and in recognition of his scholarly contributions to the study of time, the ISST Council announces a new book award, to be known as the J. T. Fraser Prize. The prize ($250 USD) will be presented at each conference to the author of an outstnding time-related book published during the preceding three years. The recipient will be chosen by a selection committee. Members of this committee and current officers of the Society will not be eligible. Nominations for the prize may be made by any member or publisher, and self-nominations are acceptable. To make a nomination, simply arrange to have a copy of the book sent to the Executive Secretary, Box 6195, Bloomington, IN 47407, along with a brief letter of nomination.

TIME'S BOOKS

Book Review Editor, J. T. Fraser

With this issue, the total number of books so far reviewed in this column reaches 229.

The opinions stated are those of their authors and the reviews are their intellectual properties. But, since they are copyrighted 1994, Time's News, if you wish to quote from any of the reviews or republish a review written by you, please cite this newsletter.

In 1993, because of a mistake I made, one of the books received two reviews. It was Hawking's A Short History of Time. One of the reviewers was Dr. David Park, Professor of Physics at Williams College, the other Dr. Joseph Zycinski, Bishop of Tarnow, Poland. The very different perspectives led several people to compliment this (unplanned) experiment. Later, it led to the idea that if appropriate reviewers can be found, some books have independent, multiple reviews. Accordingly, the present column carries a second review of Elias' Time: an Essay (cf. Time's News No. 22), Macar et al, Time, Action and Cognition (cf. No. 22) and two reviews, back to back, of Lightman's Einstein's Dreams. All these reviews were written independently, none is a rejoinder.

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(JWB) Jason W. Brown, New York, New York
(JTF) J. T. Fraser, Westport, Connecticut
(SG) Sabine Gross, Madison, Wisconsin
(PAH) Paul A. Harris, Los Angeles, California
(MHL) Margaret H. Layman, Arlington, Washington
(RL) Rémy Lestienne, Washington, DC
(DTN) Dan Thu Nguyen, Leiden, Holland
(HN) Helga Nowotny, Vienna, Austria
(JP) Joel Pouthas, Paris, France
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Alverson, Hoyt. Semantics and Experience. Baltimore: Johns Hopkins University Press, 1994; pp.151.

How do human beings structure their experiences with time, and how are such experiences represented by linguistic expressions? Is time experience "relativistic," differing in incommensurable ways with linguistic and cultural diversity? Or is there a universal, panhuman concept of time that enables people everywhere to experience time and linguistically express that experience in fundamentally similar ways? Hoyt Alverson inquires into such fundamental questions through a substantive analysis of time expressions in four languages (English, Mandarin, Hindi, and Sesotho) belonging to widely different cultures. Despite superficial differences related to cultural and ideological factors, Alverson finds that time expressions reveal a basic similarity that points to the existence of a panhuman universal cognitive basis that is responsible for the way we structure and express time experience.

Alverson's findings contravene a substantial segment of the anthropological literature, which argues essentially that the way the individual experiences time is relative to how time is categorized in the individual's language and culture. A classical example of this linguistic/cultural relativism is found in the writings of Benjamin Whorf, who hypothesized that differences in the structures of languages are causally related to differences in the structure of experience. Under such a relativistic view, languages may differ in incommensurable ways from one another, and, since human experience is causally related to lingustic differences, human experience may also differ in incommensurable ways.

Alverson's analysis shows that the "exoticizations" of time experience reported in the relativistic literature are misleading. In fact, the results of his analysis support the opposite point of view, since they show that "linguistic/cultural experience sexhibit clearly properties and effects of an underlying universal structure of embodied, enculturated mental experience" (p. 7).

Given that time cannot be directly experienced, how can we organize our time experience? Alverson proposes that time experience is interpreted and organized by reference to the cognitive/linguistic categories we construct to organize the more transparent spatial experience. If temporal experience is structured parallel with the cognitive/lingusitic categories developed for space, Alverson argues, it is plausible to suppose that temporal experiences and the linguistic expressions associated with them also form a universal template. Hence, "the linguistic expression of the experience of time will also have a universal invariant component or aspect across languages and cultures" (p. 38).

The question of how temporal experience is linguistically expressed is dealt with in Chapters 4 and 5. According to Alverson, it is most reliably expressed by collocations and metaphors about time (e.g., expressions such as "save time," "face the future"). Collocations "reflect cultural patterning" in language use and constitute a universal linguistic process of typification of experience which makes them suitable for cross-linguistic/cross-cultural investigation. Collocations referring to temporal experience in all languages, Alverson claims, can be subsumed under five basic categories, in which time is regarded as: (1) a divisible entity (e.g., 'allocate/divide time'); (2) a causal force or effect (e.g., "time destroys"); (3) a medium in motion (e.g., "the flow of time"); (4) a linear/orbital course (e.g., "look back in time," "life is a circle"); (5) an artifact of ascertainment/measurement (e.g., "run out of time").

In Chapters 6 and 7, Alverson demonstrates that all five categories are present in all the languages under study, which belong to widely different cultures and have different philosophies about time. Since the categories of temporal collocations remain invariant despite wide cultural and linguistic diversity, Alverson concludes—plausibly—that they are universal: "In large measure the experience of #time# is constituted by the embodied, enculturated mind as such and appears in language use or language patterning as a universal stock of collocations" (p. 25). [A term enclosed by crosshatches, e.g. #time# means that here time represents "some typical experience glossed by the word." (p.30) Ed.]

Semantics and Experience is the first book to offer a comparative linguistic analysis of time expressions based on extensive data of four radically different languages and cultures. The material is rich, and the theoretical points are well argued and formulated, for the most part, in non-technical terms, which renders the book accessible to a wide range of readers. Although one may disagree with aspects of his analysis, Alverson's overall thesis is well supported by the evidence and represents a significant contribution to our understanding of how language relates to human experience.

(ACQ)

Balslev, A.N. and Mohanty, J.N., Religion and Time. Leiden: E. J. Brill, 1993, 207pp.

This work, volume LIV in the prestigious Numen series, Studies in the History of Religions is divided into two parts. The far more extensive section, Part Two, provides approaches to time in Judaism, Christianity, Islam, Hinduism and Buddhism; Part One includes essays on phenomenological and existential time. Indeed, methodologies derived from phenomenology have had a determinative influence, in the last three quarters of the Twentieth Century, on the study of religions. Considering that phenomenological hermeneutics appropriate to the study of religion as an independent non-reducible phenomenon is still daunting even to highly trained academicians, James G. Hart, in the first essay, undertakes the task of combining a general introduction to phenomenology with an explanation of such methodogical "moves" as 'bracketing" and "reduction" and with an exploration of time in Husserlian transcendental phenomenology. With clarity and directness in her essay dealing with existential time, Joan Stambaugh provides a perceptive investigation of the similarities and differences between Kierkegaard's experience of eternity in time and Heidegger's ontology of authentic being within temporality.

In the light of the first two essays we discover in the presentations on particular religious traditions that approaches to Time derived neither from cosmology nor metaphysical speculation nor ideologies of history, but from introspective consciousness or interior reflection on experience. We can then see that conversations between contemporaneous Western philosophic outlooks, Buddhist approaches to time, and the Advaita Vendanta of Hinduism could be, not only valid and possible, but also fruitful.

The collection results from two "connecting interests," the phenomenology of religion and inter-religious dialogue, which have become increasingly dependent on one another. With a sensitivity and erudition that encompasses a wide grasp of philosophic and religious approaches as well as various academic methodologies, Mohanty's introduction highlights salient points in the essays to follow. By raising key questions, it enables us to read the essays more critically. He also reminds us that the religious traditions are not only variegated and complex in their historic sweep but are still in flux.

This leads us to a salient dynamic in the entire collection. The editors, by design, did not, in the interests of a so-call unified structure , impose any template of fixed topics on the scholars represented. This is all to the good. We are well aware of how many times the imposition of preconceived assumptions and even prejudices of Western "civilization" have resulted in distorted views of non-Western "primitive" spiritualities with results from which we are, in every area of the humanities and social studies, still recovering.

Rather, in the interest of fresh thinking, the editors have allowed each of the writers to go their own way, and indeed in this respect a remarkable variety of approaches result. Encountering the long sweep of Jewish history from the Bible to contemporary Jewish theologians, P. Steengard's survey of texts engages the issue of the linearity of time in Judaism (long accepted as a "given" of the academic consciousness). Steengard cites evidence of a persistently recurring presence of time-cyclicity (the regeneration of myth-cult time) in Jewish texts and observance. There is

Peter Manchester's frontal theological exposition of time in Christianity as the transfiguration of mundane time by the revelation of the Christ event represented in the Eucharist. This is followed by an examination by E. L. Goodman of time in the Islamic philosophic schools which, from the first, confronted the pre-Islamic apprehension of time as a powerful independent (and negative) force determining human destiny, and then developed various rational analyses of space, motion and time with a view always to preserving the absolute sovereignty of God. A. N. Balslev's essay leads the reader through the complexity of Hindu schools and texts on time in relation to elemental continuing precepts in Hinduism such as Atman and Samsara in a way that cannot but leave the reader, no matter how extensive his background, with a more sophisticated understanding both of Hinduism and other faiths as well. Finally, there is an in-depth brilliantly detailed philosophical analysis of time in Buddhism as a contingent notational aspect of conditioned phenomenal existence to be overcome by the transcendence of the craving for becoming in time (G. C. Pande).

However, despite the freedom accorded the authors, and therefore the distinctiveness of each of their approaches, certain commonalities emerge in the over-all collection. There is to begin a validation of the assumption on the part of the editors that time structures would be a useful "horizon" by which to approach each of the religions. And, indeed, through the lens of the structure of time one can bring into sharp focus the salient design and apprehensions of a given spirituality. For example, the very process of confronting the problematics of temporality and eternity, salient elements such as Atman and Samsara and their exposition in various schools in Hinduism are brought into sharper relief, or for that matter, the emptiness of phenomena in Buddhism.

Again, throughout the work there is a corrective testing, or minimally, a refinement of received truths of the academic world that have become accepted as given, such as the contrast, going as far back as St. Augustine, between the Judaic/Christian view of time as linear as opposed to the "foolish" Greek or "despairing" Hindu cyclicity. This particular issue is addressed not only by Steengard but Balslev as well. What emerges in each of the essays are clear, distinctive self-defining structures and stances toward existence and salvation in each of the spiritualities; but, at the same time there is an incredible complexity as well. We discover in the religious traditions a close relationship, or more accurately, a concordance between conceptualizations of time and the particular soteriological stances of each of the spiritualities or particular schools of thought within spiritualities. And the views of time in each of the spiritualities have dimensions which are not only philosophical but ethical and salvific as well.

The collection fulfills the aspirations of its editors in that it serves to open further questions and, when the essays are read as a whole, implicitly suggests other kinds of investigations relating to time and religion. Perhaps there should be more studies of time and religion with a particular focus shared by the representatives of religious studies, the social sciences and humanities, of a kind that emerged in the current interdisciplinary investigations of Karl Jasper's influential axial time scheme of history.

Along these lines, on the basis of the symposium presented in Time and Religion, there can be a move to more focused study of the segmentation of mundane time (periodization) in each of the religious traditions. Peter Manchester's essay, for example, moves in a different direction than Oscar Cullman's (Christ and Time) whose foundational study of Christianity used the segmentation of mundane time (B.C./A.D.) as a means of revealing the structure of Christianity itself. Manchester, instead, provides an entirely different diagrammatic structurization based on the interpretation of the Gospel of John. A new stage of comparison along these lines of the various time-schema (cyclical or linear) and, at the same time, with "time schemes" of modernity would be most useful.

After reading these essays, one begins to think that the various approaches to time within the spiritualities, such as the classical cyclical and linear in Judaism, may best be perceived as processes of adjudication of different "kinds" of time, born, perhaps, of opposing cultural contexts. In Judaism, for example, there is a bifocal vision of each of the holy festivals as representing at one and the same time a cyclical outlook derived from an agricultural context, and an historic event born perhaps out of a pastoral/nomadic background.

In conclusion, one should say that the book, while assuming a general knowledge of the subject matter within each of the religious traditions, and therefore useful for the specialist, will be extremely interesting to the non-specialist as an introduction not only to the subject of time and religion but also to the religions themselves.
(HB)

Bender, John and David E. Wellbery, eds. Chronotypes. The Construction of Time. Stanford: Stanford University Press, 1991. 158pp.

"Time asserts itself in contemporary inquiry less as a given than as a range of problems, the solutions to which are constantly open to renegotiation." (15) Bender and Wellbery offer a highly commendable collection of contributions to this process of renegotiation through research and intellectual inquiry. It offers thorough, well-written, and sophisticated articles from a number of humanistic disciplines--anthropology, sociology, literature, and philosophy. The editors deserve praise not the least for having provided an exemplary introduction in which they situate the articles,

relate them to each other, and point out their significance for the general area of research about time.

The title of the volume is a variation on Mikhail Bakhtin's term "chronotope", chosen by the editors to emphasize the "diversity of prototypical cultural forms within which time assumes significance" while "making explicit its typological function". (3) The contributions are of almost uniformly high quality (only one article, the final one, gives the impression that the focus on time might have been imposed as an afterthought on the material presented), and their theoretical sophistication is well suited to the complexity of their subject matter. The intelligent differentiation which virtually all contributors apply to broadly accepted generalizations or universalizing concepts of time makes reading a pleasure--beginning with the introduction in which the editors point out that the universalist view of time itself is subject to historical conditionality. The editors cite the "diversification of models" and "multiplication of times" (15) as characteristic of a postmodern orientation, part of a movement away from totalizing conceptions and from the detemporalization imposed by structuralism.

Another unifying feature is the shared emphasis on the constructedness of time. The subtitle announces the position elaborated throughout the volume that "time is not given but[...] fabricated in an ongoing process". (4) Rather than focus on its effect, most contributors take issue with the preconceptions and presuppositions in which our concepts of time are grounded. Time is, so to speak, set in motion; several contributors juxtapose static Time to dynamic timing. In comparing "Time in Physical and Narrative Structure", philosopher van Fraassen replaces a Newtonian concept of time as real with a relational concept of time. Time, so the editors say, "loses its character as a locational market and becomes the productive medium that generates, at an accelerating rate, innovative experiential configurations". (1) Two other authors, Castoriadis and Luckmann, emphasize the inevitable interrelatedness of subjective and objective, internal and social time, while van Hareven, focusing on family time and historical time, shows that "the periodization of family history does not fit the neat categories of established historical periodization". (167)

Of particular interest are the essays by Goody, Spivak and LaCapra. All three address issues that tend to be neglected in the study of time, namely the role of ideology and power in shaping concepts of time and culture, of dominant versus Other. Fabian reinforces this focus by pointing out that in anthropology the assignment of "present" versus "past" status is based on ideology, power relations, and perceived superiority respectively 'otherness', rather than on chronology. Fabian's engagingly personal and perceptive article shows anthropology as distinct from ethnography (with which it is frequently all but equated) and moves into the field of psychology. He records how he came to "shift attention from the semiotics of time to the pragmatics of temporality (from what time 'means' to what we do with time)" (188) and focuses on the cognitive and effective factors that contribute to determining what counts as "same place" or "same time" in a given context. His attention to narrative is complemented by several other contributions: Cohen's article analyzes the use of time and tense in two ethnographic narratives in the context of power and identity, while Goody dispels myths about oral narratives and cultures which, he argues, are "partly a result of the demands and the expectations of the European observer, partly of the context of 'myth,' and partly of the reduction of oral forms to written ones". (91) He offers a useful differentiation between different kinds of oral traditions and illustrates how specific historical time enters narrative.

This brief review does justice neither to the quality of the contributions nor to the dialogue in which they engage. Chronotypes is a welcome and valuable addition to the scholarly literature on time; it offers stimulating arguments and opens avenues for further research. (SG)

Berlinische Galerie, Janos Frecot, Inka Graeve et al.: Sprung in die Zeit. [Leap into Time.] Berlin: Ars Nicolai, 1992. 271 pp.

This volume of photographs and texts doubles as a catalogue of an exhibition presented in Berlin from November 20, 1992 to January 27, 1993. Besides a splendid selection of images and a chronology of the photographic depiction of movement, it features several essays by art historians and philosophers (in both German and English) and three essays by artists: Auguste Rodin on movement in art, A.G. Bragaglias's "Fotodinamismo Futurista", and photographer Dieter Appelt on "Time (Space)".

In his introduction, Janos Frecot observes: "The photographic representation of time turns into a stage for reflections about time and space time and transitoriness, time and eternity." (13) Historically, photography marks a shift in emphasis from space to time. Photography - and the collection in this volume bears this out - not only captures a specific moment in time; it also makes time visible by depicting that which the human eye cannot see. It encompasses fractions of time as well as lapses in time. The subtitle Movement and Time als Compositional Principles in Photography from the Beginnings to the Present affirms that photography adds a new twist to the link between time and motion. We perceive and experience time through motion, and it is this time-as-motion which the photographic image, in its turn, arrests. From its beginning, photography has had a privileged relationship with time. Long before pictures turned into movies, it placed time in the center of attention.

Photographic time is always an interplay between different kinds of temporality, as Janos Frecot seems to

imply in his essay "Two Kinds of Time" when he says: "To speak of time in the context of photography means to speak of measurable time and experienced time." (264) The relationship between experienced time, real time and time captured in a photograph is complex and mediated - in addition to the precision of the photographic apparatus, it requires "light, time, silver, and a mind and heart aware of images". (264) Photographs have different ways of displaying time: "In order to make motion visible as time in space [. . .], more than simple exposure in high-speed shots is required." (265) But the photographic depiction of time as image also bears on our perception of reality, as Inka Graeve points out in her essay "Fleeing Time. On the Vanishing of Objects from Pictures." Graeve focuses on images which show the progression of time via a disappearance of what is depicted and emphasizes that "the decline and the dematerialization of an image of reality once viewed as binding always becomes a theme in photographic depiction when basic doubts exist in the unambiguity and tangibility of reality." (263)

The photographs assembled in this volume illustrate the stunning range of artistic means which can be used to "make time visible". Many of the images presented derive their impact from the fact that they combine the photographic "reality effect" with an emphasis on transitoriness. Their visual impact is nicely complemented by the written contributions which tease out different strands of meaning and provide a theoretical background for the significance of the photographic images presented.
(SG)

Bertram, Stephen. Doorways through Time: The Romance of Archeology. Los Angeles: Tarcher, 1987. 265 p.

It is easy for modern archaeologists, surrounded by so many refined quantitative techniques, to forget their qualitative mission, writes Stephen Bertram. "Their purpose is and always should be fundamentally a human one: to discover and narrate with honesty and compassion the story of lives once lived" (p.9). Doorways through Time follows its own advice: it tells the story of twenty-six persons and attempts, in the author's words, to see our own faces in earlier days and recognize in the cold and inanimate objects that survive, the fullness of past lives.

The chapters have identical structures. Each one begins with a vignette which sometimes is contemporary in its setting, sometimes it leads the reader to the past through present conditions, sometimes it is about the discovery of an object. Ch. 17, "Bodies in the Bog" opens with an exchange between the Prince of Denmark and a grave digger. "how long will a man lie i' the earth ere he rot?" "Eight or nine years" was the answer, "but a tanner will last nine." Then we learn about bodies in the Danish bogs dating between 100 B.C. and 500 A.D. kept in good condition by the chemistry of the bogs. All of them appear to have been either human sacrifices offered to secure the fertility of harvests, or people executed for some reason. One of the bodies is that of a young woman executed by drowning. Her red, yellow and brown head band was placed as a blindfold over her eyes, her hair has been shaved from the left side of her head, possibly as punishment for adultery. And so perished the ancient ancestors of Hamlet and Ophelia (p. 162). For those who wish to know more, there are suggestions for further readings.

Not all the 26 chapters are so somber. The story of Tutankhamun and his queen is introduced by an ancient love poem. "I am thy first love, I am thy garden / Scented with spices, fragrant with flowers. / Deep runs my channel, smoothed by thy tillage, / Cooled by the North Wind, filled by the Nile" (p. 39).

Each chapter has its frontispiece. That to Ch. 1 on prehistoric cave paintings is the image of human hands from Pechmerle, France. The illustration to a chapter on Etruscan tombs shows a husband and wife from a sarcophagus in the Via Giulia museum in Rome, which I remember from my stay on Via Giulia in 1945.

With Ch. 8, "Greek Gods from the Sea," we read about the findings by two Greek sponge fishermen of "horses and naked women" near the island of Antikythera, together with what turned out to have been an instrument from around 80 B.C. that could show that phases of the moon and the movements of the planets. (For details, see deSolla Price, "Clockwork before the Clock and Timekeepers before Timekeeping" in The Study of Time II).

In an age when a commercial enterprise wants to use Mickey Mouse and Donald Duck to teach history and depict how it felt to be a slave in antebellum America, it is encouraging to come upon a writing about the past that combines the command of details by a scholar of the classics with the lyric sensitivity of a professor of literature. (JTF)

Borst, Arno, The Ordering of Time. Translated from the German by Andrew Winnard. Cambridge, UK: Polity Press, 1993. 168 p.

The subtitle to Arno Borst's The Ordering of Time is, "From the Ancient Computus to the Modern Computer". The work seems to promise, therefore, a historical survey of temporal orders as defined by the art of computation. Indeed, Borst provides a detailed history of the medieval computus or compotus, understood as both the method of calendrical computation and the text resulting therefrom, and wants to show thereby that medieval time-reckoning was in many ways far superior to modern time-measurement, the latter being no more than empty mathematical calculations. Whereas time-reckoning and the computus

brought together in a meaningful way the various orders of time, such as the physical-astronomical, the religious-liturgical, and the practical-experiential, modern time-measurement has only been able to offer precision and accuracy at the cost of meaning and truth. The Ordering of Time is thus to be a reframing of the study of time which dares to suggest, if not claim outright, certain normative differences between time-reckoning and time-measurement.

The chronological survey of temporal orders in Borst's work is structured as an excursion into medieval philological archaeology. It is both an etymological dig for the manifestations and transmogrifications of the word computus and a literary search for the texts which comprise the archive of medieval computation. As such, the survey is necessarily temporally biased. Out of a total of fifteen short chapters, nine--including the introductory chapter--are devoted to the Middle Ages. Ancient Greek cosmology is summarily defined within "herodotus's historical and political proposal, Plato's religious and mathematical proposal, and Aristotle's philological and physical proposal" (12). Likewise, the Roman era is but casually mentioned. No clue is given as to how the first Western European Empire dealt with temporal diversity and fragmentation resulting from spatial expansion. Only a brief note is made of some changes in nomenclature, reflecting the relative power and egoism of certain Roman emperors.

According to Borst, the history of the computus began with the work of the Anglo-Saxon monk Bede in the eighth century A.D. As the founder of medieval computation, Bede had developed a chronological typology which differentiated, yet sought to reconcile the various orders of time. Experiential, historical-creationist, and martyrological time could be reckoned according to divine or natural standards. The overlapping of Christian authority and astronomical measures meant that religious conviction made mathematical accuracy in the measurement of time unnecessary: "Christians. . .needed no shorter measure of time than the God-given hour" (p. 39). Herein lies the heart of true time-reckoning. The computus ordered time in a meaningful and purposeful way insofar as it provided an ethic and re-affirmed religious doctrine. In this regard, the work undertaken by Bede and his followers is judged to be far superior to more recent endeavours, which are calculations and not explanations of time.

Borst thus deplores the gradual mathematization of time which began to give the word computus "overtones of measurability, standardization and the written form" (p. 69). As early as the twelfth century, it was already evident that "The computus was on the verge of abandoning the theoretical and invariable explanation of temporal concepts and becoming closely submerged in current arithmetical practice" (p. 70). Although the mathematization of time was manifestly coeval with technological innovation and a radical reorganization of economic practices, these developments receive scant attention from Borst. Mechanical time is dismissed altogether as an invention "whose revolutionary influence tends to be overrated by modern scholars" (p. 92). Borst's weak argument to this effect is the observation that no amount of scholarship can reveal with any confidence the actual date or author of this invention. This is a rather bizarre argument in an otherwise careful, scholarly work, for the "revolutionary influence" of mechanical time is clearly evident in the sudden death of medieval computation itself and in its seemingly unending trajectory towards ever more science-fictionesque precision and mathematical accuracy in practically all aspects of daily life.

Perhaps it is this very death of a transcendental and absolutely authoritative standard which accounts for Borst's pessimism in the last few chapters of his book. These deal rather superficially with the history of temporal orders after the computus. Borst laments that calculating machines masquerading as timepieces can only indicate time as an "ahistorical moment"; further, "its number is but the amassed quantity rather than qualitative evaluation, its language a system of symbols lacking any deeper meaning." (112) Borst dismisses as well, erroneously, the importance of computer time, claiming that, "Far from creating an awareness of time, their capacity enables them apparently to process everything at once, thus rendering time insignificant" (126). Nothing, however, could be further from the truth. In the development of computer technology, a technology which underlies all forms of modern technology, the successful miniaturization of electronic components is crucial, for miniaturization reduces the cost per unit increases the density of elements per area of chip, and the speed of operation. Computer time may not be experiential duration, but, for scientists, technologists and "users" alike, the definition of and interaction with computer time remain a constant challenge, since it is never a given, but rather a characteristic of the latest hardware technology.

In this sense, Borst is correct in his observation of the death of a transcendental and universal time but is wrong to suggest that the present epoch is no longer concerned with time-reckoning. When the security and preservation of one's religious and philosophical convictions can no longer be safeguarded by the castle moat, it is then perhaps the case that a relative and ever changing (chaotic?) order of time may be the best compromise in a pluralist world. Despair, pessimism, and melancholic nostalgia may in the end be quite detrimental to any effort to formulate new concepts, for which we are still and always searching in order to understand our being in time. (DTN)

Brown, Jason W. Self and Process: Brain States and the Conscious Present. New York: Springer-Verlag. 1991. 201 pp.

Self and Process presents the philosophical working-out of Jason Brown's theory of Microgenesis--a neuropsychological theory which offers a strikingly novel approach to much that is taken for granted in contemporary neuropsychology. Microgenesis argues that mental activity involves the development of action and perception from a state which is unconscious, affect laden, and internally generated. The final outcome of this process is a representation of the fine detail of the world of which we are consciously aware. Thus, the physical world is constructed by the mind--a construction which is sufficiently accurate in the healthy mind so that we have the illusion of veridical perception: although this may fail temporarily (with vertigo), or more chronically (in schizophrenia). This account of mental life is virtually the obverse of the 'bottom-up' information processing approach which is prominent in much of current cognitive psychology. On cognitive accounts, our representation of the world is an accurate description, derived almost exclusively (ill-defined 'top-down' influences aside) from a piece-by-piece processing of sensory input.

Microgenesis also offers an account of the neural structures over which mental life takes place--in a rapid process of 'unfolding' over a series of brain structures which have been traversed in ontogeny and phylogeny. This fascinating idea implies that each mental act involves a re-tracing of the individual's personal and species past. Each unfolding takes a fraction of a second to move, wave-like, from the upper brain-stem towards the primary areas of the cerebral cortex. Again, this is an entirely different description from that understood in contemporary neuropsychology, which stresses the primacy of the cortical perceptual regions, and largely ignores the role of deep-brain structures in mental life.

Microgenetic theory is no less novel when discussing the experience of time. For example, time awareness, and duration judgments are neatly explained as by-products of the microgenetic process. On Brown's account the rate of microgenetic unfolding is several iterations per second--a rate which is constant. Our impression of the 'present,' and of time duration, is derived from the stability of such unfoldings. Thus, the past can be differentiated from the present because the current unfolding, and the form of its state on the neural apparatus, differs from the previous unfolding. The subjective rate of time passing is calculated by the change from the current brain state. In mentally uneventful circumstances the form of the neural state alters little, previous states can easily be tracked, and time appears to pass slowly. The greater the change of state between iterations, the more difficult it becomes to track previous states, and the more rapidly time will appear to pass (as time 'flies' when you're having fun). Thus, even though the 'internal clock' ticks at a regular rate, the subjective experience of duration alters.

Self and Process offers many novel ideas about temporal experience-for example on duration judgments in sleep, dreaming, and in amnesics. However, the real strength of Brown's account is not merely that it has a few novel ideas, but that it offers an explanation of time awareness which is embedded within a coherent theory--something which is not available to current neuropsychological models. These tend to focus exclusively on the structural aspects of cognition--the issue of the 'component parts' of the mental apparatus. Indeed, cognitive theories face a constant struggle over the manner in which such modular components might coordinate their activity across time, and how this might offer us a unified conscious experience. In contrast, microgenetic theory offers the biological basis for the 'internal time-keeper' necessary for the coordination of mental activity. Also, the fact that a microgenetic unfolding begins at a central focus and spreads over the structures responsible for higher level cognition offers a parsimonious account of the unity of conscious experience. Such arguments offer the basis for Brown's claim that microgenesis is "not only a theory of mind, but a psychology of time as well" (p. 127).

This is an excellent book--but it is no easy read. This is not because Jason Brown's theory is complex. On the contrary, the theory is marvelously simple, and is summarized in a compact and lucid review in the book's first chapter. However, perhaps because of the novelty of the microgenetic approach, Brown's writing style leans more towards the philosophical--a change of pace for those who spend their days reading a more technical literature. But don't let that deter you--this book is full of counter-intuitive yet plausible suggestions on the nature of mental life and the experience of time. And, unlike each microgenetic unfolding, most readers are unlikely to be able to say that they have experienced the basis of these ideas before. (OT)

Dennis, Carl. Meetings with Time. New York: Viking, 1992. 73p.

The act of creating poetry is itself a paradox of time: the distillation of experience into a structure that endures, repeating for the reader at will the moment of the experience. Dennis balances this paradox so well that his poems are almost transparent, reading easily, like a letter from a friend. It is difficult to find a word that stands out, a well-turned phrase that catches and holds the imagination. Instead, the poetry he builds is cumulative in its effect, like a mosaic put together piece by careful piece from otherwise unremarkable bits of language.

The assemblage he builds is a group portrait across time of family and friends, literary characters and innocent bystanders--ordinary people confronting the choices or accidents of their lives. The title of the collection revolves about this last consideration--the difference, if any, between choice and accident. In "The Window," he writes:

Outside the few rooms of embodied life
The field of the never-to-be embodied
Stretches in all directions
Step to the picture window and look.

Dennis' talent is that he is able to hold the ordinary embodied life we each experience and the life of the imagination up to the same light. Thus juxtaposed, the differences between them vanish, allowing both our choices and the accidents of our lives and history to be appreciated in new ways. (MHL)

Edelman, Gerald M. Neural Darwinism: the Theory of Neuronal Group Selection. New York: Basic Books, 1987. (Abbreviated: ND).

--The Remembered Present: a Biological Theory of Consciousness. New York: Basic Books, 1989. (Abbreviated: RP)

--Bright Air, Brilliant Fire: on the Matter of the Mind. New York: Basic Books, 1992. (Abbreviated: BA).

The fundamental question of the brain-mind relationship, from the neurological point of view, was formulated in 1963 by Russell Brain, founder of the journal Brain as follows: If memory corresponds to a brain state, expectation or intentionality or hope to another, and sense impression yet to another, and since these three coexist, just how are they told apart? We may immediately add this: since the continuous classification and re-classification of mental content into categories of future, past and present is what we describe as the experience of time's flow, if we had an answer to Lord Brain's question, we might be able to identify the neural basis of the noetic sense of time.

Gerald Edelman is a Nobel laureate in physiology and Director of the Neurosciences Institute at the Scripps Institute. What does his reasoning suggest about the human experience of time's passage? Extracting from his trilogy an answer to the question is difficult because the books focus on conscious experience as a biological epiphenomenon and on the development and functions of the human brain, "the most complicated object in the universe" and not on time (BA p.5). Yet the question of time is always close at hand, it is there to tease and intrigue as in the title, The Remembered Present. "To be aware of a conscious datum is to be sure that it has passed." (RP p. vii). But how do we know that something has passed or may be in the future but not in the (remembered) present?

Neural Darwinism outlines the theory of neural group selection. It is a theory that helps explain how our brains have and do become what they are. Knowing that path is necessary for Edelman's program which consists of putting "mind back into nature [by remaining] concordant with how it got there in the first place," to wit, through organic evolution (BA, p. 15). The essence of the theory is that the immense neuron population of the brain is subject to Darwinian selection. Neurons are organized into groups, and these groups are subject to a selection process which leads to the development of those connections among neurons and neuron groups which are responsible for the functioning of the human brain. The development of the brain is brought about by the internal and external environment favoring and disfavoring certain neural configurations.

As did Aquinas in his Summa contra Gentiles, Edelman offers a summa contra explanations of conscious experience through physics, artificial intelligence or computational processes. The case against them is that they fail to acknowledge that (my words) reality is species--and even person-specific.

The manner in which events and objects are partitioned is relative to the nervous system of an animal; it is not absolute, not preexistent. How can we explain "how perceptual categorization could occur without assuming that the world is prearranged in an informational fashion or that the brain contains a homunculus?" (ND p. 3-4). A purpose of Edelman's theory of neural group selection is to answer this question.

He maintains "that perceptual categorization must both precede and accompany learning. One of the. . .tasks of the nervous system is to carry on adaptive perceptual categorization in an 'unlabeled' world" (RP p. 7). There is "no macroscopic theory outside of psychology to account for the physical orders or the shapes of macroscopic objects [and] while the physical scientific descriptions. . .describe the rules governing the properties of the physical universe, they offer no independent means of categorizing the objects of perception for a given species" (ND p. 39).

If this be the case, then for the roots of the human experience of passage one should not look to the sciences of the inanimate but only to the sciences of life and the mind subject, of course, to physical restraints. In search for an answer Edelman maintains with William James and others that consciousness must be thought of as a process and not a thing. In my words, we may speak about minding but not about minds. (For relevant material see Time and Mind - The Study of Time VI).

In exploring the mind as a process Edelman distinguishes between primary and higher order consciousness (RP p. 24 and passim), paralleling the psychoanalytic distinction between primary and secondary processes. Doing so is appropriate to the dedication of Bright Air "To the memory of two intellectual pioneers, Charles Darwin and Sigmund Freud. . ." Primary consciousness signifies mental awareness of the present, unaccompanied by personhood and an awareness of future and past. Higher order consciousness recognizes the thinking self. It "is based . . .on

the ability to model the past and the future" (BA p. 167).

Higher order consciousness arises from the biological matrix of lower order consciousness when intentionality expands to embrace long term futures and relate them to memories of long term pasts. "This 'slippage' in time of the consequences of patterns of world events transformed by complex selectional, categorical and intentional systems to yield additional directed consequences is unique to conscious systems" (RM p. 258). Higher order consciousness involves the continuous classification and reclassification of constraints by a scale Edelman identifies with that of values. Here value is defined as "evolutionarily and teleonomically derived constraints favoring behavior that fulfills homeostatic requirements or increases fitness in an individual species" (RP p. 287-8). Psychologists and philosophers would subsume such a notion of value under intentionality. The substance of such values, in Edelman's work on consciousness are the qualia. "Qualia are discriminable parts of a mental scene which nonetheless has an overall unity" (BA p. 114).

Reading these three volumes, rich and original in thought though sometimes heavy in style, was a reward and a challenge. But. . .what do they say about the experience of time's passage?

Futurity, pastness, presentness and the flow of time are taken for granted; they are unquestioned. The situation may be represented by a visual metaphor I have used elsewhere. It is that of the cable of the San Francisco cable car.

That cable is hidden; it is invisible, inaudible, and is moved by some distant, irresistible power. The cars themselves move because they attach themselves to a point along the moving cable. Likewise, one may imagine a cosmic present across the universe, a cosmic now, to which sticks and stones, dry bones, living bodies and human brains attach themselves and by doing so, they travel through time.

But physics disclaims a moving present both locally and globally. It describes the physical world as being without it. Edelman's reasoning, though emphatic on the biological basis of consciousness, leaves unacknowledged the role of life in creating the organic present. It also leaves the question of the neural origins of noetic time unanswered, though it implies, rather than explicitly suggests as its possible source, the process of mental classification and reclassification of qualia along a scale of values.

(JTF)

Elias, Norbert. Time: an Essay. Oxford: Blackwell, 1992.

From an originally sound theoretical basis which posits time measurement as a symbolic means of human orientation in the world, Norbert Elias proceeds to construct in Time: an Essay a normative evolutionary scale of individual and collective personality structures. Sociological analysis is thereby reframed within the parameters of an interactive five-dimensional world of human consciousness and physical spacetime. In so doing, Elias hopes to break down the barriers between the so-called subjective and objective worlds.

According to Elias, human knowledge can be said to be "true" to the extent that it is congruent with "reality." Moreover, the development of knowledge over time is both linear and progressive, as "the reality-congruence" of knowledge increasingly lessens its "fantasy content" (180). In this regard, the history of timing provides for Elias a prime example. Timing as a symbolic means of orientation is crucial, for it serves both as an individual anchor of consciousness in the world and as a form of social regulation between humans living in groups. Elias claims thus that the history of timing temporal order of past societies was neither pervasive nor uniform. The extent of its fantasy content was evident in the oscillation between strict but infrequent temporal rites and a relatively free-flow of lived time or temporal indulgence. In contradistinction to this arbitrariness and heterogeneity in timing, the time-discipline of later stages in the "civilizing process" "is no longer point-like and patchy. It covers the whole life of the people. It admits of no fluctuations; it is even and quite inescapable" (147).

Elias sees, therefore, a parallel progression in both the epistemological and the socio-political aspects of timing. In the first instance, the hegemony of Western scientific time appears to provide for its own self-evident truth; the fact of its global dominance makes it reality-congruent. In the second instance, a more reality-congruent epistemology leads necessarily to a more "civilized" social formation, in so far as universal and homogeneous knowledge is conducive to individual and social restraint, and, thus, to a decrease in violent behavior.

This rosy evaluation of the history of timing as part of the triumphant progress of human civilization is, however, blatantly ethnocentrist and far from any being "reality-congruent". The linearity of Elias' eschatological liberalism precludes any possibility of serious sociological comparative analysis. Elias has indeed managed to place at the same "stage of development" his European ancestors "social habitus" and that of today's inhabitants of the Amazonian rain forest (135, 153). Surely, to base one's arguments on texts which refer to people who live in other-than-nation-states as "savages" would inevitably lead one to racist rhetoric (154).

Finally, the "civilizing" claims of modern Western time-discipline do not appear to be very congruent with the reality of our present global community. It is indeed quite true that Western forms of time measurement have conquered the world, that, as J. T. Fraser puts it, we live in a time-compact globe. There is, however, very little evidence that this universalization and homogenization of timing

have brought about either a decrease in violent behaviour or any significant change in the forms of jingoism in so-called civilized nation-states. In this respect, Time: an Essay is shockingly inadequate; Elias' evolutionary sociology can only provide sensationalist descriptions of ritualistic violence performed by "savages", but it remains suspiciously silent about recent genocides aided by railway time, missile warfare based on electronic and atomic time, and the great violence done to the non-human world by the "civilizing process". (DTN)

Gendolla, Peter. Zeit. Zur Geschichte der Zeiterfahrung. [Time. Towards a History of Experiencing Time.] Köln: Dumont, 1992. 113 pp. Numerous illustrations.

This is a slim volume in which modesty and ambition wrestle with each other. In the beginning, Gendolla explains that he does not expect to add new information to our knowledge about time. Rather, his aim is to reorganize existing information by imposing a specific "reading" on it--a metaphor in which time becomes a text for him and for us. He has also discovered the ISST, a "society of members dispersed across the globe" (6), and flatteringly attributes to Time's News the "painstaking researching and reviewing of every (!) publication on the subject" (of time, that is).

Gendolla's essay ranges from myth to the physiology of perception, from philosophy to the history of technology in an attempt to include as many different dimensions of time--and disciplines researching it--as possible. The result, while very well-written, is a somewhat scattered and eclectic assortment. Gendolla incorporates a large body of research and numerous quotes into what he nevertheless calls an essay. He selects and synthesizes, choosing and combining very diverse elements into his model of how time works, which is a three-phase image: a cycle opening up into a line which then disperses into individual points. (Gendolla has addressed the contemporary experience of time as "point-time" in a previous article. Gendolla's fact-studded text is characterized by his readable and rhetorically polished style. It offers a form of quasi-poetic criticism which is frequently image-driven. His arguments tend to use analogy rather than analysis, for instance when he parallels developments in Indian and Chinese culture with the Western tradition: While in the former, according to Gendolla, zero comes into being through a "radical evisceration" and "loss of substance" which turns the mythical cycle into a nought, Christian thinking dissolves those same cycles by "cutting them open and bending them, transforming them into directional lines with beginning and end" (30,33).

Gendolla presents striking formulations rather than a sustained argument. His generalizations are supported by sometimes dizzying jumps between different cultures and areas of research, and between the literal and the figurative. Authors whose research he draws on include historian of writing Jan Assmann, cultural sociologist Norbert Elias, J. T. Fraser, mythologist and religious scholar Miercea Eliade, physicist Stephen Hawking, media theorist Friedrich Kittler, sociologist Helga Novotny, child epistemologist Jean Piaget, railroad historian Wolfgang Schivelbusch, and historian of technology and velocity Paul Virilio. All this Gendolla fashions into a tour de force through the history and theory of time, yoking together in one sentence, for instance, such disparate elements as cars, the novella, futurism, war, electricity, and artificial reality (96). He addresses clocks, money (which for him, solidifies "liquid, untouchable time" into pieces of metal or paper), calendars, writing systems, alpha rhythm and monasteries.

There are major--and recurrent--emphases. One is the decisive role played by the media (of communication, of transport, of synchronization) in shaping our experience of time. Another is the movement from myth to history. And in accordance with Virilio (and Kittler), Gendolla views war as the origin of information technology and velocity.

The result is a feat of compilation which, while it is readable, informative, and entertaining, may leave the reader disoriented and vaguely unsatisfied. The informational domains Gendolla draws from are too large and disparate. In the end, the information does not cohere sufficiently. The wealth of detail falls short of actual historic specificity, and the text is too long for its essayistic form and style. Nevertheless, taken as a miniature coffee-table book for intellectuals, the volume provides stimulating reading. Not a pièce de resistance; rather, a smorgasbord arranged along a "master image" of time. (SG)

Hayles, N. Katherine. Chaos Bound: Orderly Disorder in Contemporary Literature and Science. Ithaca, NY: Cornell UP, 1990. (308p.)

This book provides a commanding synthesis of how "chaos" has come to the fore in disciplines ranging from physics, mathematics and thermodynamics to fiction and literary theory. Hayles combines encompassing overviews of how a paradigm of orderly disorder spreads itself across western culture since about 1960 with specific analyses of chaos within particular fields or how certain concepts in different fields display isomorphic characteristics.

For such a demanding task, Hayles boasts impressive credentials: in addition to her Ph.D. in English, she holds an M.S. in Chemistry from Cal Tech. The book's hands-on feel for science sets it apart from other books in the emerging academic genre of literature and science. After sketching out a theory of cultural change in her introduction, Hayles then alternates scientific and literary discussions. Chapter

2 uses a close reading of information theorists to show how the rhetoric of science encounters its own metaphors as self-reflexive tropes where scientific language and metalanguage collapse into one another. In chapter 4 Hayles argues that the philosophical agenda of Ilya Prigogine's work extrapolates too much too quickly from its scientific foundations. While the discussion in chapter 3 of Henry Adams remains rather straightforward, her interpretation of Stanislaw Lem in chapter 5 skillfully demonstrates how the ideas that inform his work are enfolded into its form, and the intellectual bent of Lem pushes her discussion to a very sophisticated theoretical examination of the "space of writing."

Hayles's great gift as a writer though, is her ability to explicate the context, concepts and terminology of science in a lively manner. In laying out the essentials of chaos theory in chapter 6 and showing how they display structural parallels with poststructuralist literary theory in chapter 8, I think that she surpasses even the most heralded popularizations of chaos theory. (Speaking of which, Hayles articulates a very deft, suggestive feminist critique of James Gleick's book.)

Hayles does not treat time as an independent theme very often. In her concluding section, she argues that time has been "denatured" (no longer accepted as a natural or given category, but a human construct), that time is compressed and flattened in postmodern experience to the point that "the future is already used up before it arrives" (p. 279). Here we might apply Hayles's critique of Prigogine to her work: she makes hasty cultural generalizations on the basis of limited conclusions. To be fair, the voice Hayles adopts of cultural theorist here is the least her own--one senses that she feels pressed by feminists and cultural critics of science (e.g., Donna Harraway) to speculate along these lines.

Hayles's expositions of chaos will provide timesmiths with much material that can be integrated into larger investigations. For instance, Hayles explains that the graphic representations of chaotic behaviors are plotted as orbits in phase space, which are in essence maps of a system as it passes through repeated cycles. In this way, the scientific graph moves beyond a representation of movement as a trajectory in space: models of complex systems describe not points and trajectories but the "evolution of internal structural principles that describe the propogation of self-similar symmetries" (p. 218).

Hayles then notes ways in which this way of plotting time reflect a larger cultural tendency. She links this mode of representing change over time to the poststructuralist historian Michel Foucault's notion of history as a series of epistemes, on the basis that Foucault also does not measure a whole (culture) by atomistic units (individuals), but sees governing internal principles (the dominant discourses of a period) linking up local components within a global pattern. In general, Hayles makes pervasive use of the local/global problematic to describe parallels between chaos theory and contemporary critical theory.

Chaos Bound places the dangerously trendy stuff of chaos theory on a sound, interdisciplinary, and broad cultural footing. If Hayles's quite rational mode of thought and writing blunt some of the subtleties of the poststructuralist philosophers and literary texts she examines, this will only be a blessing to the vast majority of her readers. For this is a truly wondrous text: a book written by a leading contemporary literary critic, eminently readable to all. (PAH)

Lestienne, Rémy. Le hasard créateur. Paris: Editions La Découverte, 1993

By raising the issue of the irreversibility of time, most notably in Les Fils du temps (1990), R. Lestienne has stressed the "continuous intervention of chance." His newly published book, Le hasard créateur, is an attempt to delineate a notion which has not yet received a positive definition. First appearing with practice of gambling and applications in insurance in the 17th century, chance paved the way for probability theories. Chance was introduced to conceal lack of knowledge, as in La place's Théorie analytique des probabilitiés (1812). Lestienne prefers Cournot's works (1843) in which chance is defined as the simultaneity of two independent causal series. The author argues, however, that chance remained to be re-invented and further used in "nature theories." The major part of the book is devoted to the emergence of chance and the progressive affirmation of its role in the life sciences (chapter 2) and in physics (Chapter 3). The author considers the year 1859 as "the beginning of the very scientific career of chance" with the foundation of statistical mechanics by Maxwell and the explanation of the evolution of species by Darwin appearing. He then compiles analyses extracted from previous books to present the developments of this "double intellectual revolution." There is nothing really new, but the interest comes from the confrontation of different ideas about chance as developed in various fields such as evolutionary biology, genetics, immunology, neural networks, thermodynamics, cybernetics, quantum mechanics and cosmology. Chapter 4, entitled "For a philosophy of chance," begins by questioning the limits of a mathematical definition of chance such as exemplified in the construction of random numbers. It carries on with a miscellaneous collection of citations (Einstein, Holton, D'Espagnat, Sartre, Kierkegaard and especially Bergson), linked with the author's own ideas. The epistemological discussion referring to Lakatos and Popper relies principally on Chalmers' book, Qu'est-ce que la science? Lestienne defends clearly only his own philosophical thesis on the conclusion, even though he has prepared his argument about 'creative chance" in the preceding chapters, such as

in the differentiation between "mathematical chance" and "physical chance", only the latter creates. According to him chance does not exist without law and then is neither the enemy of rationality, nor of the scientific ideal. It is an operational concept. "I believe in chance because with this concept as a tool, it is easier for me to understand the difference between heat and kinetic energy... It is easier for me to understand temporality and temporal irreversibility as a property inherent in nature. I believe in chance because it helps me see the power of life". (J.P.)

Lightman, Alan Einstein's Dreams. New York: Pantheon, 1993. 179pp, $17.00

Late June, 1905. A clerk in the Berne, Switzerland, patent office has dreamed a succession of strange dreams, each expressing a different version of time. Now that the exhausting dreaming is finished, only one dream seems compelling and true. Einstein will gather the crumpled pages containing his new theory of time and mail them to a physics journal.

Thirty dreams are recorded here in Alan Lightman's wonderful short novel, one of the finest works of fiction ever produced by a scientist. The dreams express widely diverse temporal realities. Time as an endlessly repeating cycle; time having three dimensions; time influenced by earth's gravity; the passage of time bringing increasing order; people without memory living in a perpetual present; time flowing unevenly, *fitfully*; time passing more slowly for people in motion; time flowing backwards; time as a flock of nightingales.

What's remarkable about the dreams isn't so much the various conceptions of time, but Lightman's ability to imagine the day-to-day realities of people living under each. Lightman's predictions are shrewd and plausible; people's goals, social relationships, and coping strategies are vastly different in each of these worlds.

The dreams are clearly those of a budding physicist, not the experiences of people for whom unnatural circumstances have altered their temporal Umwelt. Reading Einstein's Dreams, I kept thinking of the altered realities of hypnotized volunteers who had been given the suggestion that they would experience a loss or expansion of one or more of the temporal zones--past, present, future (e.g., B.S. Aaronson, 1972, The Study of Time). Or the woman with Tourette's syndrome who appears to have a form of dyscalculia accompanied by dyschronia, a profound inability to appreciate and to judge the passage of time (I. McGilchrist et al., British Journal of Psychiatry, 1994). Or the man who suffered an aneurysm (apparently localized in the prefrontal cortex of his right cerebral hemisphere), forcing him to pull his car to the side of the road, unable to drive any further because events now seemed to be rushing toward him at an incredible rate (F. Binkofski, personal communication, September 26, 1993). But Einstein's Dreams is a work of the imagination and doesn't aspire to catalogue an exhaustive set of temporal realities. Einstein's dreams are so engrossing that, nearly lost in time one wonders whether they too are real. (RAB)

Lightman, Alan. Einstein's Dreams. New York: Warner Books, 1993. (179p.)

In a telling formulation, a colleague recently inquired, "Have you seen Einstein's Dreams yet?--it's a beautiful little book." While one is not supposed to judge a book by its cover, the marketing ploys selling this novel do everything they can to create a certain disposition in the reader before they ever actually read a word of it. Superbly nifty packaging and sheer hype immediately engulf the eye: on the cover of this unusually small book, precision measurement meets dreamy aura--clock and watchfaces hang suspended over what appears to be a planet's horizon. Its rag-paper pages are cut irregularly, giving it the air of an artifact from an older time of higher literary values and learning.

The first five pages (!) inside the cover feature snippets from reviews whose sources establish both the book's scientific credibility (*Nature*) and literary merits (*TLS, Village Voice, The New York Times*). This novel ostensibly provides insight into Einstein's "inner world," shows how he "worked more like an artist--by intuition and imagination--than a scientist," all the while conveying "the strangeness of Einstein's ideas." In a book so covered in judgments, how can one not help but...?

To dismantle such hyperbole is hardly the point. This novel is a symptom not only of the mythic stature of Einstein, but of a postmodern cultural craving to render science enchanting, mystical. Roland Barthes acutely diagnosed the contradictory impulses expressed in the myth of Einstein: pointing out that photos of Einstein show him at a blackboard covered with equations while cartoons depict him having just splashed the formula on the board, Barthes observes that the myth of scientific "research proper brings into play clockwork-like mechanisms and has its seat in a wholly material organ" (Einstein's brain, itself bequeathed to science for research), while "discovery, on the contrary, has a magical essence" (Mythologies, p. 69). Einstein therefore "embodies the most contradictory dreams" people harbor about science--dreams that Lightman's novel and its marketing exploit masterfully.

The text's actual content alternates two formats. In the "interludes," Einstein and Michel Besso meet; the upshot of these episodes is that Einstein is absentmindedly lost in thought, distracted by his work. The other chapters depict the worlds Einstein dreams: each one is governed by a specific form or rule of time. In various dreams, time is a

circle, a sense, or gets stuck; it is discontinuous, negentropic, or flows backward; people live forever, live one day, or have no memories. In short, we read fictional renderings of thought experiments, where different formalisms or theories of time are taken literally and used as premises for the unfolding of a world. The range of these journeys into the "as if" is presumably justified by the notion that the larger (cosmic?--only in a New Age sense) implication of the special theory of relativity is that there are any number of scales, types and qualities of time.

My attitude toward this novel is shaped by the fact that it parrots Italo Calvino's Invisible Cities, a veritable postmodern classic. Yes, "parrots": not borrows from, mimics, echoes, but parrots. The structure exactly replicates Calvino's alternating conversations between Kublai Khan and Marco Polo with discrete descriptions of cities in the Empire; but in Calvino's novel, the former serve as a metalanguage, a theoretical reflection on the latter. Lightman's style also is baldly lifted from Calvino: short declarative sentences, acute eye for detail, the economy of the fairy-tale. Lightman attempts to follow Calvino's penchant for inverting the premise of worlds he depicts, of pulling the magic carpet out from under the reader, but succeeds only in giving heavy-handed turns to fictions already suffering under the weight of labored contrivance. Probably the wisest marketing decision made was to remove Salman Rushdie's comparison of *Einstein's Dreams* to Invisible Cities when the paperback came out, so that Lightman's book appears out of the blue like the cartoon version of Einstein's formula, rather than as a product of meticulous "research."

There is an increasing need, in our climate of specialized education, for serious work that spans the "two cultures" and/or explores our more intuitive sensibility toward time. Illuminating popularizations of science are at a premium now as well; in fact, I benefitted immensely from reading Lightman's book on cosmology, Ancient Light. It is uplifting to see science thought of once again as a source of wonder, a humanistic enterprise in itself. While Mr. Lightman is unlikely to have been responsible for the Time-Warner packaging of his work, it nonetheless has all the appearance of opportunistic cultural intervention. (PAH)

Macar, Francoise, Viviane Pouthas, and William Friedman, eds. Time, Action and Cognition: Towards Bridging the Gap. Kluwer Academic Publ., Dordrecht 1992, p. 407.

This collection includes 38 papers on experimental studies of duration judgments, serial order, temporal discrimination and related topics. The volume is an excellent source for theory and method in time research and contains much that is valuable for our understanding of the psychology of time perception. As with so much work in modern psychology, the studies in this collection tend to reflect current trends in cognitive "science," the implications of which for the study of psychological time may not be fully appreciated by the readership of this newsletter, nor even by those working in the field. Since the collection has been previously reviewed, (Time's News No. 22) I would like to devote my commentary to a discussion of some problems with cognitive psychology from the standpoint of a neurologist who has to resolve this material with what we have learned over the years from the study of pathological cases. The starting point for my critique was nicely put by one of the contributors, "...for many of the authors in this volume, the study of time is secondary to the focus of their research...the importance of temporal issues only becoming apparent given the failure of static approaches (p. 183)."

Cognitive psychology developed in the union of linguistics and language philosophy with computer science, the computer metaphor giving the illusion of scientific control of parameters that is usually not possible in natural systems. The principle that (syntactic) rules operate on logical solids such as representations or propositions is the basis for the concept of entities as box-like demarcations with change introduced as an extrinsic factor. Certain of the assumptions underlying this approach deserve closer scrutiny.

First, the approach is synchronic and constructivist. The foundational units of various functional domains are conceived as atomic entities that recombine as building blocks for more complex concepts rather than holistic entities that fractionate. The synchronic perspective gives parts with boundaries that are artificial and wholes that are mere compilations, not the process through which parts become wholes, or the reverse. Thus, one author writes of the "quantity of attention (p. 177)", another of a "unique processor (or) cognitive counter (p. 115)", as if attention and processors are discrete systems or mechanisms that interact. Since change is an addition to a function space of solid objects, not a determinant of which objects materialize, process is inserted secondarily to accommodate transitions across elements. Components such as buffers are readily ad hoced to shore up weak points in theory. These issues have to be confronted directly if it is to be argued that cognitive psychology uncovers abstract entities and does not simply generate them.

In this respect, the approach is homuncular for it requires decisional nodes, i.e. homunculi or switchmen, at successive branches in multi-route models. Homunculi are also necessary to direct or combine units to larger aggregates as in the so-called command or grandmother cells. More recent accounts acknowledge the need for unity across a multiplicity of units. The concept of "binding" attempts to resolve this problem through physiological timing mechanisms. However, the alternate possibility that

elements are specified out of wholes, i.e. that diversity is elaborated out of unity, and that the diachronics of this specification constitute the "binding" properties, is not given serious consideration. There is antipathy to diachronic or process-based theories in which the antecedent properties of an event are ingredient in the occurrent state. While researchers in time perception could hardly be accused of indifference to diachronic features, it is important that mental process be conceived diachronically, not as a perspective added to more basic operations. Temporality is not a metapsychological judgment adduced from the perception of serial order but an inherent feature on which such judgments are based.

The diachronic aspect enters theory mainly by way of ontogenetic not evolutionary concepts. The phyletic history of the brain is ignored, especially the possible role of developmental growth trends in laying down the cognitive process, e.g. the role of morphogenetic sculpting or neoteny in determining patterns of mature cognition. The anti-evolutionary stance is seen in the attack on the chimpanzee language studies which argue for gradualism in the evolution of language. Or, the postulation of input-output devices in a computer brain that ignores the obvious hierarchic features of action and perception systems and their distribution over evolutionary growth planes. This follows on the assumption that the manner of brain, i.e. machine, construction is unrelated to its function.

Further, cognitive *neuro*psychology is built on the study of deficient performances, or dissociations between what is intact and defective or conscious and non-conscious, not on error or symptom data. These methods derive from studies with normal individuals, e.g. inferring process form reaction times. In people with brain-damage, however, process is directly revealed as a symptom. The symptom is a piece of mentation that becomes actual prematurely. The difference in a quantitative versus a qualitative approach is ostensibly between an experimental and a clinical method. However, it entails a 3rd as opposed to a 1st person stance toward the mental. Cognitivism is object-centered; I believe it is antithetical to perspectival theories of time. Michon writes that "much of the rich phenomenology of experiential time is largely in the eye--and the mind/brain--of the beholder, not out there (p. 303)", but he goes on to cite work by Dennett and Pylyshyn, who take strongly anti-subjectivist positions. In this regard, the critique by Richelle of a paper by Michon is a valuable counter to this position, as is his argument for continuities between various aspects of psychological time (p. 380).

Although many of the contributors to this volume acknowledge the importance of context in temporal judgments, cognitivist theory tends to be largely indifferent to context. The approach attempts to regain the context that is lost in the isolation of an entity by the compilation of entities into larger assemblies. For example, models of feature detection (edges, color etc.) are elaborated independent of object perception or recognition. A psychology should address the whole upon which any concept of locality depends. The temporal context is critical. For many cognitivists an actual or occurrent object is not the outcome of recurrent change from past to present, i.e. not a convergence to actuality. Flow diagrams tend to be concatenations in which objects are foci in a divergence toward the future. The orientation from present to future aligns the field with the *predictive* character of causal science.

The basic question for cognitive studies is whether temporal relations can be reintroduced in the interstices of elements to account for their linkage when those very elements depended for their demarcation on the abolition of temporal relations. Time inheres in mental content. Process deposits this content. Indeed, content is the outcome of a process that is time-creating. The real problem is the nature of change. Is change fundamental to theory from the very beginning or, as cognitive psychologists hope, can it be added to cognitive solids after their delineation? On this question rests the fate not only of a theory of time but the legitimacy of all contemporary work in cognitive psychology. (JWB)

Macey, Samuel L. Encyclopedia of Time. New York and London: Garland Publishing, Inc., 1994. pp. xxiv, 699.

This is a considerable work on all aspects of time and comprises about 360 articles. A useful feature is a list of articles arranged by major disciplines, e.g. archeology, astronomy, horology, philosophy, in alphabetical order. There are numerous illustrations, including various types of clocks. The editor has been assisted by an advisory board of ten members covering a wide variety of fields. The first article is on the age of the oldest stars in our galaxy, and the last is on the x-ray universe. Each article concludes with advice on further reading.

An important contribution is that by David Park on time in physics, which he treats historically. In it he discusses time in modern physics, but he also considers the influence of relativity in several other articles. There is an excellent piece by Dr. A. J. Turner on instruments of time measurement up to about 1275 A.D., i.e. before the invention of the mechanical clock. The oldest of all time-measuring instruments are water-clocks, the earliest evidence for such a clock being an Egyptian example of the sixteenth century B.C. It was a sophisticated device which compensated for the change in water pressure as the head got smaller and for the changing length of the hour throughout the year.

An important feature of the Encyclopedia is the discussion of biological rhythms, including applications to medicine. Their study in physiology, pathology and pharmacol-

ogy has led to the development of chronotherapy and the determination of the optimal time for drug administration. Cellular rhythms range in period from a few milliseconds for action potentials to annual and longer cycles of reproduction processes. Circadian rhythms, i.e. rhythms of about a twenty-four hour period, are endogenous rhythms within individual cells or cell populations which can be entrained by periodic signals such as light and temperature changes. Many diseases exhibit circadian rhythms in their symptoms, e.g. rheumatoid arthritis.

There is an interesting discussion of cultural differences as regards time, covering such concepts as punctuality, temporal perspective and the general pace of life. The most fundamental difference in this respect is between those societies for whom time is measured by social events and those for whom clock time predominates. The latter occurs in cultures where "time is money", e.g. the United States. On the other hand, in event-time societies time is dependent on social experience without reference to the clock. Many cultures define their clocks by means of social activities rather than the other way round. Although most societies have some kind of week, it is not always of seven days, e.g. the Incas of Peru had a ten-day week.

Articles covering twenty or so pages are devoted to music in different cultures, including ancient music, particularly the treatises of Aristoxenus of Tarentum (fourth century B.C.) and Aristides Quintilianus (fourth century A.D.). Whereas for the Greeks interest in time was primarily concerned with its precise division and measurement, for the Indians the time of music was regarded as a manifestation of the cosmic process of continuous creation and dissolution.

An article of several pages is devoted to the "Clock Metaphor". It permeated intellectual thought during the period of the horological revolution from the middle of the seventeenth to the middle of the eighteenth century when watchmaking represented the epitome of advanced mechanical engineering. Descartes was the first major thinker to incorporate the clock analogy into a philosophical system. Among others who were influenced by it was Robert Boyle, who maintained that God is a superior engineer analogous to a man who could make a good watch. Leibniz argued that the mind operated with the mechanical nature of a watch. After the middle of the eighteenth century the influence of the watch analogy declined, but nevertheless Lewis Mumford has claimed, that "the clock, not the steam engine, is the key machine of the modern industrial age."

The psychology of time is a subject that has undergone a remarkable renaissance in recent years after a period of neglect. It was stimulated by a monograph by the French psychologist Paul Fraisse, Psychologie du Temps, in which a century of work in the field was reviewed. Since its publication in 1957 an increasing number of studies have resulted from developments in experimental psychology, particularly those concerning the study of internal timers in behaviour and mental activity, notably in domains such as pattern recognition, speech perception, decision making and musical skills. As a result the psychology of time has become part of the mainstream of experimental psychology.

One of the more unexpected articles is on Daniel Defoe (1660-1731). The author, Paul Alkon of the English Department, University of Southern California, points out that to create verisimilitude Robinson Crusoe's adventure is anchored firmly in calendar time, although there is no concern with the actual events in history. On the other hand, in A Journal of the Plague Year Defoe was concerned solely with a major historical event. The slow tempo of that book served to emphasize the long course of that dismal year. As a result, Defoe succeeded as no one had previously in portraying subjective as well as objective features of duration.

Generally speaking, the choice of authors seems to be well-balanced and the articles are authoritative. The book can be warmly recommended to a wide readership. (GJW)

Sciences et Avenir. Special issue, 1994. "Les énigmes du temps." In French. 98p.

"The Enigmas of Time" is the title of a remarkable issue of *Science et Avenir* (Science and the Future), a magazine devoted to building and encouraging scientific culture in France and among francophone modernists.

The issue consists of fourteen articles written by scholars, many from the CNRS (the French public fundamental research agency). These authors, specializing in fields ranging from physics to philosophy, from biology to musicology, paint an expansive picture of the quiet revolution that has affected our knowledge about time and the existential dilemma for the past two decades. "On dit volontiers que cette fin de siècle n'aura pas été accompagnée d'une véritable révolution théorique. Mais comment ne pas corriger ce pessimisme lorsqu'on est attentif à la révolution conceptuelle de la physique qui s'opère devant nos yeux. Elle s'illustre de manière particulièrement sensible dans la mise en question du temps," writes Laurent Mayet in his editorial.

The fourteen scholarly contributions are leavened with humor by three comic strips summing up, in a funny yet scientifically sound way, the information given in the main articles. In the first part of the issue are articles dealing with:

The History of Calendars and Time Reckoning, by Harvé Barreau,

The Thermodynamic Origin of Irreversibility, by Réme Lestienne,

The Breakthrough brought about by the Development of Chaos Theory, by Isabelle Stengers,

The Problem of Measurement, by Michel Bitbol, and The Role of Time in Cosmology, by Marc Lachieze-Rey.

The second half of the special issue enlarges upon the question of time, addressing "Time and Life." Alain Reinberg details the many internal clocks that regulate all living organisms from bacteria to man. Bernard Pottier analyzes the relationships between time *as it is lived* and *time as spoken of* in the numerous human tongues throughout history and around the globe. And Eric Emery, in a superb article, describes the subtlety of the projection of lived time in music, with its three aspects: sensory, affective and cerebral.

The general trend of the essays is to show just how essential the question of time is in our ability to understand ourselves. Demonstrating the indissoluble link between irreversibility and molecular chaos, and thus the kinship between irreversibility and chance (or chaos), does not negate the fact that human philosophy has always attempted to neutralize time by trying, as did Plato, to "reconcile Heraclitus, the philosopher of becoming, with Parmenides, the philosopher of the timeless being" (Jean-Michel Besnier). This external, existential frustration of the "Children of Time" is expressed beautifully by François Fénélon, the seventeenth century French philosopher, cited in one of the articles: "L'être humain n'a jamais le temps d'être, il n'a jamais le temps que de devenir"... (R.L.)

Voisé, Waldemar. Le Temps. Polskiej Akademii Umiejetnosci. Krakow, 1993.

A slender book with less than 90 pages based on the wisdom of entire libraries. The author modestly proposes to take us through four domains: time and man; time and art; time and science; time and philosophy. The leitmotif consists in emphasizing the futility of seeking for the "essence" of time or to engage in quests to seize the unseizable. Instead, "comaprative reasoning" is advocated, based upon hypotheses, conjectures and experience. Comparative reasoning may not be so much more reasonable, but to comparing for better reasoning. There is indeed much to be compared. Under Voisé's expert guidance, centuries, cultures, domains of experience, reasoning and what are called "intellectual sentiments" are connected through temporal threads. There is hardly a topic that remains outside; no major thinker, poet, scientist or artist who is not interlocked in comparative reasoning somewhere. How is this possible, you highly specialized reader, may ask? It is itself the result of lifelong experience, scholarship and comparative reasoning.

The book sets out with individual time as experienced through the course of life which is enriched, contrasted and complemented by an equally succinct treatment of time of the community. But such seeming simplicity comes wrapped in a multilayered and colourful garment, made up of insights and quotes ranging from Conrad to Sartre and Platon, Camus and others. But beware: this is no name-dropping game, no fashionable selection from a book of quotations. The art of linking themes, of comparing through association is Voisé's virtuosity. The cock that served as alarm clock for soldiers makes his way from a book published in 1564 by a Lausanne reformer to an exhibition organized in 1979 in Warsaw and ends up on the cover of the 4th volume of "The Study of Time" edited by J. T. Fraser in 1981. In a fascinating discussion of the "conjugal or temporal triangle" of past, present and future, Lucretius sets the tone of "presentism" continued by Bergson and Husserl. There is an exposé of "musical circular time," but also of modern music tending towards becoming a
"mass of decomposed time." Messiaen's chronochronie has its firm, or rather moving place, as does Klee with his "space itself is a temporal notion." The chapter on time and science, itself a masterpiece of a brief "physicist" history of time, ends with both, Bergson and Einstein, figuring as representatives of a by-gone age.

But the heart of the book beats rhythmically in the last chapter on time and philosophy intended to serve as guide to "contemporary chronosophy." Husserl and Heidegger, Costa de Beauregard, Prigogine and others enliven the discussion. J. T. Fraser's two books "Of Time, Passion and Knowledge" and "Time as Conflict" are seen to combine both mind and emotion. The hierarchical structure of time, Fraser's important contribution to chronosophy, is singled out as allowing us to see through many conceptual difficulties with time, which otherwise might appear unsolvable. Conflict, Voisé reminds us, was defined by Kant as a kind of intellectual antinomy, "a conflict of Reason with itself" and therefore capable of transforming temporal elements into the creative force of daily existence.

I can now understand better why this kind of scholarship was able to survive the darkest years in Eastern Europe. (H.N.)

Wendorff, Rudolf. Tag und Woche, Monat und Jahr: Eine Kulturgeschichte des Kalenders. Opladen: Westdeutscher Verlag, 1993. 220 p.

This modest volume is a digest of the calendar-related parts of Wendorff's massive Zeit und Kultur (Time's News #15), his Mensch und die Zeit (Time's News #17) and his other writings. The book is directed to that desirable breed of readers the Germans call *Kulturmenschen*. The concept has no good translation but it means a person with a good

humanistic education who has not lost his or her intellectual curiosity. To those already familiar with Wendorff's extensive work this book will add little new material. Its value is in the enticement it offers to those who are unaware of the vast literature on public time reckoning. The conclusion of the first chapter sums it up well: The history of calendars is quite a story.

The work is heavy on European / Judeo-Christian calendrical history and, within that, on the German tradition. Among its many illustrations I found a reproduction of a page from an 1804 calendar, Lahrer Hinkende Bote (p. 176) and one from the 1813 edition of the yearbooks, Rheinländischen Hausfreund (p. 179) which look every bit like pages from the American Farmer's Almanac for the Year of our Lord 1994 I picked up at a local fair. It is good to know that something in our very discontinuous world remains continuous. (JTF)

FUTURES

The Journal of Forecasting, Planning and Policy

November 1993 Business models for the computer industry for the next decade / Integrating Turkey into the European Community / Virtual reality in the real world / Building scenarios for education in South-east Asia / 20th Century future-think / Of unexpected and unintended futures

December 1993 Transormations: the eight new ages of capitalism / What future generations need from us / Dissolving the stranglehold of the fix / Rethinking the central institutions of modern society: science and business / Environment, development and belief systems / Falling into a black hole between philosophy, mysticism and policy / Emergence of a circumspect society: introducing reflexive institutions / The evolution of spirit / Post-Newtonian paradigm or bust! / In quest of the socioeconomics of non-action / The future formula; or, are there lessons in history?

January/February 1994 From forecasting to informed choices / Educating beyond violent futures in children's media / Futures assessment by field anomaly relaxation. A review and appraisal / Global modelling in the 1990s. A critical evaluation of a new wave / The divination of reality. The conflict between mythical and instrumental, oral and written narratives, and the future of poetry / Adversary Delphi / Dogs don't bark at parked cars / The future of good news; social responsibility and visionary journalism.

March 1994 Special Issue: Visions of Sustainability. Introduction. Part I: Key elements of sustainability: Stumbling blocks to a sustainable society. Incoherences in key premises about the way the world works / Paths to sustainable development. The role of social indicators / Changing the USA's population signals for a sustainable / Alternative images of a sustainable future / Burden sharing in the transition to environmental sustainability / A transition from agriculture to regenerative food systems / Integrating human needs into our vision of sustainability / The future of work in North America. Good jobs, bad jobs, beyond jobs. Part II: Moving towards sustainability. Sustainability as an evolving process / Changing course: an outline of strategies for a sustainable future / Social marketing for sustainability. The case of residential energy conservation / Building a sustainable species-civilization. A challenge of culture and consciousness / Infoglut and competing problems. Key barriers suggesting a new stragegy for sustainability.

April 1994 A conflict of visions. Reflections on African futures studies / Global scenarios. Geopolitical and economic context to the year 2000 / Assessing the validity of the Delphi technique / The greening of Swedish energy policy: a critique / The social management of environmental change / World War II, or, what did the future hold? / Profutures. the birth of the Strategic Prospective and Future Studies International Network for Applied Methodology.

May 1994 The end of strategy / The end of strategy Selected bibliography / The next forty years. A reprise / Marketing as strategy. Beyond territorial boundaries / The board's role in strategy formulation. Some cross-cultural comparisoins / Managing the information revolution. Lessons for business from the French Revolution / High power computing and the value chain. IT use in the packaged consumer goods industry.

June 1994 Scenarios for the industrialization of the western Mediterranean *Teresa Rojo* / Weak states and the emerging taxonomy of security in world politics / The cycle and meaning of the existence of humankind / Cyberculture, cyborg post-modernism and the sociology of virtual reality technologies. Surfing the soul in the information age / Progress, nature and technology in later-modern transition / Is preservation inventing the past or creating the future?

SOCIOLOGICAL INQUIRY.

v.63, No. 4. Fall, 1993. Special issue.

Guest editorial: Time and Time Again / Conceptualizing Variations in the Experience of Time / Space, Time, Space-Time and Society / Marking Time / Disaster Anniversary: A Social Reconstruction of Time / In the Beginning: Notes on the Social Construction of Historical Discontinuity.

TIME & SOCIETY. An International Interdisciplinary Journal.

February 1994 The Search for the Invisible 8 Hours: The gendered use of time in a society with a high labour force participation of women / Spacing Times, Telling Times and Narrating the Past / No Time for Utopia: The absence of Utopian contents in modern concepts of time / Punctuality and the Everyday Ethics of Time: Some evidence from the Mass Observation Archive / A Time to Be Concerned: A position paper on time and management

June 1994 Time, Leisure and Social Identity / Leisure, Work and Gender: A sociological study of women's time in France / Social Time Patterns, Contingency and Gender Relations / 'When Discourse is Torn from Reality': A psychometric scale.

Also received . . .

Magduerova, Andreana Stepanova. On Time's Models of Mathematical Physics. Sofia (Bulgaria): Bulgarian Academy of Sciences, 1992. Duplicated typescript of doctoral dissertation. In English, 75 p.

Swart, Gerhardus Paulus. Time and Architecture: the Interrelationship between Time Concepts and Meaning in Western Architecture. Bloemfontain (South Africa): University of Orange Free State, 1989. Duplicated typescript with illustrations of master's thesis. 246 p.

Any member who has a good reason to own either of these volumes is welcome to it, in return for a review. Details upon request.

MEETINGS

The ISST convenes the only comprehensively interdisciplinary meetings concerned with time; time is nevertheless the subject each year of many professional conferences besides our own. It has been suggested that a listing of such conferences might be useful to the membership of the ISST as a continuing feature of "Time's News," and I have agreed to be responsible for compiling it. As a start I offer a chronologically-ordered list (with no pretensions to completeness) of time-related professional conferences that have been announced since 1990:

--"Lifetime--Systemtime? Time research between the flexibilization of working time and the development of leisure time." Seventh Bielefeld Winteracademy, Bielefeld-Sennestadt, Germany, 13-16 February 1990.

--"Zeit und Raum als Determinanten gesellschaftlicher Kommunikation." Oesterreichische Gesellschaft für Publistizik und Kommunikationswissenschaft / Deutsche Gesellschaft fur Publistizik und Kommunikationswissenschaft, Salzburg, Austria, 23-25 May 1990.

--"Die Welt am Wochenende: Entwicklungsperspektiven der Wochenruhetage im interkulturellen Vergleich." Deutsches Institut für Urbanistik (among other sponsoring institutions), Schwerte (Dortmund), Germany, 4-6 December 1991.

--"Zeit und Ethik." Siemens Kultur Programm, Hamburg, Germany, 31 May and 1 June 1991.

--"Achilles und die Schildkröte. Die Sache mit der Zeit." 18th Römerberggespräche, Frankfurt, Germany, 21-22 June 1991.

--"Origins, Time and Complexity." Fourth European Conference on Science and Theology (European Society for the Study of Science and Theology), Mondo Migliore, Italy, 23-29 March 1992.

--"The Resurgence of Time." First Bamberg Philosophical Mastercourse, Otto-Friedrich-Universität Bamberg, Germany, 28-30 June 1993.

--"Il Banchino del Tempo." Florence, Italy, February-March 1994.

--"Time, Space, and Identity: The First International Colloquium on Deixis. December 2-4, 1994. Contact Joachim Knuf, Dept. of Communication, 127 Grehan Building, University of Kentucky, Lexington, KY 40506-0042, (606) 257-7805, E-Mail: jKnuf@ukcc.uky.edu

--"Chaos and Order." Fundação Calouste Gulbenklan in Lisbon February 25-26, 1994. Gulbenkian Foundation has started arrangements to repeat this philosophical symposium next May in the Portuguese Cultural Center in Paris.

--"Zeit in der Oekonomik." Normative Grundfragen der ökonomischen Theoriebildung (Evangelische Akademie Tuzing), Tutzing, Germany, 14-16 March 1994.

--"Rhythmen der Zeit." Tutzinger Zeitakademie zur Oekologie der Zeit (Evangelische Akademie Tutzing), Tutzing, Germany, 29 April-1 May 1994.

--"Time and Consumer Behavior." InstitutoSuperiore per Imprenditori e Dirigenti di Azienda, Palermo, Italy, 18-20 May 1994.

--"Time and Work." Eleventh Annual Conference of the Association for the Social Studies of Time, Dartington Hall, Devon, England 8-10 July 1994.

--"Time and Mind," Universität Regensburg, Institut für Psychologie, December 1-3, 1994. Contact: Prof. Dr. Hede Helfrich, Postfach 101042, 93040 Regensburg, Germany

--"Time and the Dynamic Control of Behavior," Universite de Liège, Belgium. November 7-8, 1994. Contact: Dr. M. Richelle, Universite de Liège, Boulevard du Rectorat 5 (B32), 400 Liège (Sart Tilman) Belgique.

Please send news about time-related meetings, for inclusion in Time's News to:

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EDITORIAL REFLECTIONS

During a discussion of Lucretius' De Rerum Natura, a rather bewildered Freshman spoke up in desperation, "But it's a cheat!!...Isn't it?" He was referring to the *clinamen* or atomic swerve, that element of predictable unpredictability in an otherwise orderly universe. Without it, nothing could be created, nothing new come into being; the universe and all of humankind would be rigidly determined. This student was beginning to probe into the fascinating topic of chaos and order. Where he will go with his thoughts beyond the class is hard to say but he had that look that says, "I've been hooked. I've got to think about this."

The most intriguing problems and questions are those that confound and fascinate the ancients and the moderns, the young and the learned. The topic of "Time, Order, Chaos" opens up a number of such questions, and the 1995 conference of ISST promises much food for thought. The next issue of Time's News will be sent in January with detailed information about the conference site and registration. Be sure to contact me if you have not received it by the end of February.

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MEMBERS' NEWS

Jack Ofield, filmmaker in residence and director of The Production Center for Documentary & Drama at San Diego State University, received the 1994 Silver Award in Performance for New Programming on June 3 from the Corporation for Public Broadcasting, as well as three Southwestern Emmys on June 26, for his weekly, half-hour series *1st Frames*, the public television showcase of international short film and video. The Emmys were awarded for original music, decor and graphic design (composer Warren Dale, set designer Don Benke and graphic artist Tom Okerlund). *1st Frames* is a one-of-a-kind series that presents rarely-seen, multicultural short works under 25 minutes in length in narrative, documentary, animation and experimental genres. The 1994-95 season includes works from the U.S., Central and South America, Europe, Australia and New Zealand.

PENNSTATE

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