

CALL FOR PAPERS

The International Society for the Study of Time will hold its tenth conference, July 5-11, 1998, at the Evangelische Akademie in Tutzing, on Lake Starnberg in Bavaria. The occasion will also mark the 32nd anniversary of the founding of the Society.

The theme of the conference is:

TIME AT THE MILLENNIUM: CHANGES AND CONTINUITIES

Proposals for papers are solicited concerning the significance and role of time in sciences, the humanities, and the arts at this juncture in history.

The broad scope of the theme, reflecting the interdisciplinary dedication of the Society, is intended to encourage contributions ranging from papers on scientific and scholarly topics to creative work and performances. Time for presenting individual papers at the conference will be limited to thirty minutes, including a brief discussion period.

Collective proposals for formats other than individual reading and discussion, including discussion of pre-circulated papers in panels, will also be considered.

All papers delivered at the conference will be considered for publication in Volume Ten of The Study of Time series.

Proposals should be approximately 300 words in length and submitted in triplicate to the Executive Secretary (P.O. Box 67, Westerville, OH 43081, USA) no later than May 31, 1997.

A MESSAGE FROM THE PRESIDENT

We have now reached the mid-point of the triennial period between ISST Conferences. Following the 1995 meeting in Canada, on the North American continent, it is quite appropriate to return to Europe again. The next conference site is in Bavaria, Germany; it appears hospitable and attractive, according to J. T. Fraser who has visited the Akademie and was favorably impressed by our prospective hosts.

Your council met last June in Westport, CT, and deliberated on a number of issues of concern to the Society. Most important was the decision concerning the theme of the next Conference: Time at the Millennium: Changes and Continuities. The theme was agreed upon following a thorough discussion, in a friendly and amicable atmosphere.

The breadth and scope of the theme will permit the members of the Society to mobilize their creativity in their research projects and papers which are invited for presentation in July 1998 at the 10th Conference of the International Society for the Study of Time.

A. I. Rabin
President

THE FOUNDER'S COLUMN

The call for papers for our tenth conference, July 5-11, 1998, was mailed in September to all members. The location of the conference is the Evangelische Akademie in Tutzing, Bavaria, on Lake Starnberg.

Summer surprised us, coming over Starnebergersee / With a shower of rain . . . This is from T. S. Eliot's cubist poem, "The Waste Land."

Cubist, because it has no connective or transitional passages; meaning resides in the juxtaposition of images. The poem is a landscape that can only be appreciated when beheld in its totality and placed into a perspective of received cultural values. But, as a critic remarked, the poem was written for "a culture where there is no longer any assurance on the part of the poet that his public has a common cultural heritage, a common knowledge of the past."

By the turn of the century, Eliot's 1921 exploration has become a report. We are submerged in a juxtaposition of images and voices whose over all meaning is difficult to discern. While our scientific store of knowledge and our humanistic world of expressions overflow and the means of exchanging fragments of information are efficient, there is no satisfactory connecting text that could help arrange the parts into a whole.

Genuine awareness of the past fell victim to the time-compactness of the globe, upon which a common cultural matrix is only now being constructed. We live in a stunningly rich wasteland.

Such a topography is well known to timesmiths. They have learned to hammer out novel shapes of understanding the experience and idea of time, using contributions from the sciences, the humanities and the arts.

TIME AT THE MILLENNIUM: CHANGES AND CONTINUITIES will permit the participants to take stock of the goings-on in their own and in other members' bailiwicks.

And summer 1998 on Starnbergersee will surprise everyone with the natural beauty of the region, the elegance and comfort of the manor house and the 21st century meeting facilities of the Akademie.

Eliot's "The Waste Land" ends in a Sanskrit benediction: "Shantih shantih shantih." In my copy of the poem (edited by the late George Ford, ISST President 1979-83 and others) there is a footnote to that benediction. "The fragments with which the poem ends seem like a desperate attempt at ordering chaos, but it breaks down in madness."

Deadline for proposals is May 31, 1997. For details, see page one.

JTF

TIME'S BOOKS

The Time's Books column has two editors.

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Address all correspondence concerning this column to either editor.

The total number of books so far reviewed in this column is 256. The opinions stated are those of the reviewers and the reviews are their intellectual properties. But, since they are copyright *Time's News*, if you wish to quote from any of the reviews or republish a review written by you, please cite the newsletter (and its date) as your source.

If you wish to write an unsolicited review—in English—of any serious time-related book, in whatever language, please check with either book review editor for a preliminary approval, length, and deadline. Note that we are not looking for synopses but for professional peer evaluations.

Reviewers in this issue:

(CB) Cynthia Baker, Sackville, NB, Canada
 (CK) Clemens Krümmel, Düsseldorf, Germany
 (JAP) Jo Allison Parker, Narbeth, PA
 (JTF) J. T. Fraser, Westport, CT
 (LWF) Lawrence W. Fagg, Stephens City, VA
 (MHA) Mark H. Aultman, Westerville, OH
 (PLB) Patrick L. Baker, Sackville, NB, Canada
 (RL) Rémy Lestienne, Paris, France
 (SLM) Samuel L. Macey, Victoria, BC, Canada
 (AU) Andras Ungar, Concordia University
 (TW) Thomas Weissert, Philadelphia, PA

Appleby, Joyce, Lynn Hunt, and Margaret Jacob.
Telling the Truth about History. New York and
 London: W.W. Norton & Company, 1994.

In this book three accomplished historians, writing in a single voice, argue that despite the contributions made by such areas of thought as postmodernism, multiculturalism, and deconstruction, there still exists an historical truth that is worth pursuing. The heroic model of science, in which seekers of truth find neutral ever-true laws or explanations, has been dethroned in history as well as in other disciplines. Nonetheless, objectivity is still possible, they argue, through practical realism and a pragmatic approach to truth.

Nineteenth century history, they explain, rested upon a Newtonian conception of time as real, universal, sequential, and directional, independent and everywhere the same, with all people, structures, and institutions arrayed along a line of evolutionary development. In answer to this multiculturalists have insisted that international or national units of time be replaced or counterbalanced with alternative versions of time more specific to particular group identities.

The authors confront the deconstructionist argument that the self or narrator is ephemeral or illusory. For Foucault, they write, the modern individual or self is a creation of the discourses of disciplines or institutions talking of madness, or health, or crime and punishment. For Derrida, language, text, and social communication create a mental prison where people are misled by the assumption that signifiers correspond to what they signify. Deconstructionists maintain that since discourses need a subject about which to speak, the individual exercising personal responsibility was created and came into being as a mental construct necessary to sustain both legal and social thought.

In the postmodern view facts do not present themselves objectively to the historian, but are selected according to ideological presupposition. Nevertheless, the authors argue, just because the objective may also be subjective does not make it untrue. There is a human need for self-understanding through coherent narratives of the past. There is a gap between reality and its narrative or representation, but that in itself does not undermine the validity of narratives or make them all

equally true or untrue. While time may not have a beginning, middle, or end, narratives or stories about time do, and this makes action not only possible but also meaningful. Written history and texts tend to take over from memory, but they cannot do so entirely; memory must still serve as a check for consistency. Truth emerges, from text, memory, and institutions, as a consensus of practitioners. Structures, even while aspects of language and the mind, are real and do shape reality. To fail to understand such structures is to abandon efforts to reconstruct them.

This book is very worthwhile, though I regret the authors' preoccupation with national identity. The book describes how history defines nations, creating a sense of common purpose or situation from a shared past, and how postmodernism and multiculturalism create different identities. But nationality is a mental structure, and the mind can change. As changes in social communication and the flow of capital render national boundaries less meaningful, ethnic, religious, and other group identities reassert themselves as a kind of counterbalance. Communication technology facilitates a global village where we experience others all at once in the same time, and where we also rebel against imperial notions of time that rob us of our own time. But what else do we have to share, with national identities breaking down, if not our time together?

(MHA)

Barreau, Hervé Le Temps Presses Universitaires de France, collection Que sais-je?, 1996.

To survey the philosophy of time on the 120 small pages of a book of the popular collection "Que sais-je?" (What do I know?) is a real challenge. The French publisher assigned this task to Hervé Barreau, philosopher, well known to members of ISST for having been the Chairman of the local organizing committee of the VIIIth conference in Cerisy-la-Salle in 1993.

The work is divided into two parts ("Time in everyday life" and "Time in scientific knowledge"), and six chapters. The first three are devoted to the time of action, the time of communication, and the time for the representation of the world.

Then we embark in the scientific realm with the measurements of time, the topology and geometry of time (with a short account of the status of time in general relativity and quantum mechanics). A long familiarity with science has taught Barreau that, in physics, the geometrical properties of time are

separated, if not divorced, from Time's orientation from past to future. Another trench divides the status of time in relativity from its status in quantum mechanics. Without denying that a more harmonious view of time in science may soon be within reach, Barreau astutely observes that "although determinism is appropriate to a universe completely unfolded in space-time without past or future probability [used by quantum mechanics] is an appropriate text in principle".

The last chapter is devoted to the science of the arrow of time, in face of the reversibility of the fundamental laws of physics. The discussion of the works of Boltzmann, Poincaré—and of their followers is briefly summarized. Barreau, however, is more interested in the modern developments of cosmology, which have opened new roads for interpreting the arrow of time as related to the expansion of the Universe. "Whatever the scenario, still largely speculative, which is offered to explain the birth of our Universe, we must recognize that the latter is there, in the sight of our telescopes—and that it manifests a tendency to non-equilibrium and complexity, while it could have been otherwise."

But the most personal and original part of the dissertation is to be found in the conclusion, where Barreau brushes his views as philosopher and moralist, enlisting, together with the respect for life, the respect for lived duration of our human brothers and sisters, as the sources of modern moral philosophy. (RL)

Bedini, Silvio A. The Trail of Time: Time Measurement with Incense in East Asia. New York: Cambridge University Press, 1994. 342 p.

There is no part of the world where people would not have heard of pendulum clocks. Time measurement by incense is a different story. Although, from its early simple forms to the devices known as incense seal clocks, keeping time by burning incense and telling time by scent has a fifteen century history, outside China and Japan hardly anyone has ever heard of it.

Handsomely produced by Cambridge University Press, The Trail of Time is a study of the origins, history and technique of time measurement by burning incense. Its material derives from historical documentation and artistic and literary records in China, Japan and Europe. It is a summary of over thirty years of scholarly labor by Silvio Bedini an historian of science and horology, formerly Keeper of Rare Books of the Smithsonian Institution. I first became aware of

Dr. Bedini's work through his "The Scent of Time: A Study of the use of Fire and Incense for Time Measurement in Oriental Countries" published in 1963 as a volume in the Transactions of the American Philosophical Society.

Burning of incense has been a vital part of daily life in Far Eastern countries, a subject of philosophical reflections, and a source of poetic inspiration. A reader intending to explore this fine volume, written in a stern matter-of-fact style, is well advised to begin by examining the 132 illustrations (pp. 255-325) and read their captions. Although they will not be totally intelligible without the text, at least he or she will have a preliminary visual impression of incense clocks seldom seen in Western lands.

In the West, mechanical clockworks were constructed before clocks. (See: D. de Solla Price, "Clockwork Before the Clock and Timekeepers Before Timekeeping," The Study of Time II). Likewise, the Chinese and Japanese art and science of incense clocks did not begin by plans to measure time but by the appreciation of the scent of incense and the increasing skill of making many varieties of it. Incense was known in ancient Egypt during the 16th and 15th centuries B.C.; it appears in the great Indian epics and was featured in ancient China at meetings of officials because it was believed to help maintain a pleasant state of mind. (p. 26) In Japan, as late as the 19th century, incense smelling was an elegant party pastime. People played games designed to help develop greater sensory appreciation of scent.

Part I of the book is the history of time measurement and the use of incense in East Asia by the populace at large, in official functions, in religious rites, and for time measurement. Part II deals with the origin and development of incense seals in Buddhist rites and in civic and social life in China. Part III deals with the same developments in Japan. The Appendices include a chronological table of Chinese history, notes for museums and collectors, a select glossary and a conversion table between Wade-Giles and Pinyin romanization.

Incense clocks are devices in which a trail of incense powder is laid out to burn slowly and evenly, like a long fuse, indicating the time of day by the location of its glow or change in scent. Through the centuries the techniques improved. The first improvements were in making the trail of uniform thickness to assure even burning.

Incense was blended from many essences, from indigenous plants and animal products, and even specially prepared for such occasions as love making or

poetry contests. (pp. 28-9). Incense burners were first used as prayer devices in Buddhist rituals. Their history from religious use to civil timekeeping reminds one of the parallel history of Western clocks from signalling the times of prayers to serving as clocks of mercantile societies. An incense clock may burn for a day or a month, with the longer burners replacing malfunctioning clepsydrae. The "seal" aspect of the burner enters this way: the trails engraved in stone or formed from metal followed the shape of individual seal characters. These are Chinese cousins to the designs of family or individual signets in rings used in the West for impressing family emblems into sealing wax.

The incense seal clocks represent in East Asia the same kind of merger of traditions, knowledge and techniques as do the astronomical clocks in the West: they combine daily and calendrical time measurements with religious traditions and civic practices. Incense seal clocks of intricate artisanry were known by individual names, as were the books of hours in the West. The "Hundred Graduations Incense Seal" (p. 95), for instance, was designed to accommodate the long, medium and short nights of the different seasons.

Incense clocks, measuring time by the lengths of the trail of incense, matched well with the Chinese preference for non-mechanical devices: measuring time by the motion of the sun's shadow, the flow of water and sand, and the consumption of candle by fire. The merger of the use of incense in social life and religious rites with an intricate calendrical system and divisions of the day illustrate the way collective practices integrate various elements into their concern with controlling the temporal organization of society. The Trail of Time is a unique and important document in the cultural history of time measurement for it brings together for East Asia the social, scientific, technical, artistic and religious dimensions of time measurement, paralleling the many similar studies of the cultural significance of horology in the West. (JTF)

Eco, Umberto. The Island of the Day Before New York: Harcourt Brace & Company, 1994, 515 p.

Tan, Amy. The Hundred Secret Senses, New York: Putnam, 1995, 358 p.

Sobel, Dava. Longitude. The True Story of a Long Genius Who Solved the Greatest Scientific Problem of His Time, New York: Walker, 1995, 184 p.

Umberto Eco is an Italian semiotician. His novels are set in worlds created by the rich ambiguity of language and informed of the author's familiarity with the history of science. Amy Tan is a successful American novelist whose writings are loving insights into the lives of Chinese Americans trying to balance their received tradition with the demands of a rapidly changing America, to which no one is qualified to serve as a guide. Dava Sobel is a science reporter who wrote a best seller on a theme from the history of horology. All three are grappling with the same problem: how to anchor yourself in the passage of time and know or at least believe that you know, where you are.

The Island of the Day Before is a you-were-there in the 17th century. Its main message comes from the history of thought via arguments that were rational then, not so now. It is a fable appealing to theories rooted in applied philosophy, Catholic dogma, and down to earth tensions. Its hero is a young man with a semi-imaginary brother. He is shipwrecked in love and shipwrecked on an abandoned ship, sharing it with a theologian. They are a few hundred yards from the 180 degree longitude from Greenwich, on the western side of the Tuesday-Wednesday line. They see an island where time is always a day before what it is on their ship. The young man is a prisoner of what Gerald Edelman called the remembered present.

The book is a torrent of information, interesting from the point-of-view of the history of natural science but its plot is as flat as Eco's The Name of the Rose was mountainous. Central to the many problems of concern to the shipwrecked travelers is the question of how to know the instant of noon in Greenwich so that by comparing it with their local noon they could calculate their longitude. Philosophically, the problem gives rise to many arguments. In practice, they are carrying a dog that was wounded back in Greenwich, where they left a bandage saturated with its blood. A cohort in Greenwich dips the bloody bandage into a "sympathy solution" each noon. This is supposed to make the dog yelp in pain at that instant halfway around the world, informing the navigators of when noon is in Greenwich. The poor creature had to be cut again and again to keep its wound fresh. So much for experimental philosophy.

The Hundred Secret Senses are the "senses related to primitive instincts, what humans had before their brains developed language and the higher functions...." (p. 211-212) It is the story of Olivia, a Chinese-American woman with a semi-imaginary sister named Kwan "who sees those who have died and now dwell in the world of Yin." (p. 3) Kwan succeeds

in spiring Olivia and her on-again off-again husband—both as American and as end of the millennium as they can be—to the China of the Taiping Rebellion of The Heavenly Kingdom of Great Peace, mid-19th century. Eco's hero never reconciled himself to having left his lady love in the past to which he could not return. Olivia and her husband learn to live with the past by learning to live with the memory of a dead lover, and by integrating Kwan's world into their world including the belief that the dead are still around. The novel is a heart-warming cadence of feminine love and search for the self and the self of others. It is seen from the point of view of a turn of the century American woman, atypical only in the breadth of her education, rooted both in America and in China. It is a lyric parable of tensions and reconciliation in history, temperament, and love.

The "sympathy solution" that would make a dog yelp at Greenwich noon even halfway around the world did not work (p. 40-41 Longitude). Neither did a score of other methods, rational but impractical, sketched interestingly by Dava Sobel. The plot is the story of John Harrison and his forty years labor to construct a reliable timekeeper. To appreciate Harrison's work the reader is introduced to the problem: to construct a clock that will remain accurate within three seconds per day throughout a voyage from England to the Caribbean. This, as the author properly states, was "the great technological challenge of Harrison's age." (p. 68) Unfortunately, the subtitle of Harrison's time, perhaps because "scientific" sells more books than "technological." The difference detracts nothing from the inspiring story of Harrison or from the writing that is thoroughly enjoyable. The historical and cultural background sketches are well done but technical details are sparse. A similarly handsome small volume containing the missing drawings and illustrations would surely have at least one purchaser (this reviewer) but possibly no one else. (JTF)

Gould, Stephen Jay. Full House, The Spread of Excellence from Plato to Darwin. Harmony Books, 1996.

"Progress or no Progress? That is the question" would be an appropriate epitome of the latest J. S. Gould's book, with its Shakespearian accent. The question is indeed quite fundamental and is treated here with all the scientific rigor of the much respected paleontologist, in the light of Darwinian evolution. What has been once called Dollo's law (stating that

evolution tends to ever increasing complexities) is here challenged, or rather its metaphysical scope is laminated by the observations that: 1) evolution has always been overwhelmingly dominated by bacteria, with no intrinsic trend for complexification, 2) the available space open to variations through mutations of a new species is very often widely opened in the direction of larger sizes and greater complexities, while they are severely constrained in the opposite direction by a wall of minimum sustainable size and complexity. Thus, the drift toward complexification, which many see as obvious in the life tree, is simply due to our propensity to focus on the consideration of the maximum complexity reached by organisms of successive species, rather than to consider the much more stable mode of the dominant forms of life.

The demonstration given is unquestionable. To give only one example, Gould tells us the history of planktonic forams, that appeared more than 100 million years ago but were decimated on two occasions at later geological times, when only a small subgroup of minute size survived. In all three examples of evolution over geological times, whereas the size of the largest representatives of the group grew markedly, most of the forum species remained of the same size as their ancestor.

Such a conclusion may shake some of our convictions about our special situation, as humans, in the world of life. We are indeed quite prompt, "for more parochial reasons", says Gould, to consider ourselves as a kind of chef-d'oeuvre of nature, the long sought-for end product of evolution, which is a modern name for creation. No, says Gould, humans just happened as the product of pure chance, due to the play of the "full house" of Darwinian variations; they for sure would not be reproduced, should the life history start again under conditions similar to those which prevailed 3.5 billion years ago.

In such a circumstance, is there any escape for the numerous defendants of opposite philosophies, biologists with a more Lamarckian reading of evolution, or cosmologists inclined to give credence to some form of the anthropic principle? For the present reader, their defense cannot and should not rely on questioning the fact that variations are indeed blind to progress, but on the nature of chance itself. In the realm of biology, chance has no direction, but its effects are never to return. A biologist, such as F. Jacob, would not say that evolution tends to complexity, but to autonomy. And, in the realm of biology, complexity may request an adaptive definition, taking into account the hierarchical organization of organisms, where one

sees not only integration of the parts in the whole, but also a reflection of the whole on the parts. The biological examples given may be short in this respect. What about, for instance, the explosion of the brain capacity in primates during the last millions of years? Is it likely to be explained by cultural evolution, the only field that Gould specifically abandons to Lamarckism?

Gould's book is an important book, written in his rich, sport-minded style. It will no doubt stimulate all readers that would like so much to consider themselves metaphysical animals. (RL)

Grant, George. Time as History. Edited with an Introduction by William Christian. Toronto: UP, 1995. 81 pp.

George Grant's 1969 Massey Lectures addressed the temporal experience of modernity and Friedrich Nietzsche's role in the articulation of a distinctively modern experience of time. Originally broadcast as five lectures on CBC Radio, they first appeared as Time as History, published by CBC Learning Systems in 1971. The University of Toronto Press is now reissuing the lectures with a thirty page introduction by William Christian which contains biographical information and some hitherto unpublished extracts from Grant's 1974-1975 graduate Nietzsche seminar at Dalhousie. This new edition is likely to remain the definitive text.

Time as History seeks to account for the understanding of time which pervaded the era of nuclear stalemate and the Vietnam war.

Four centuries ago, those who thought of mastering the future were a dreaming minority, forced to work subtly against those with some other account of time. Today such men are the unquestioned rulers, welcomed by the overwhelming majority of both East and West. (p. 17)

Grant does not argue with this mode of envisioning experience. His interest is the cost of subordinating "time" to this pragmatic vision of future mastery. He regrets "the disappearance of words of receptivity...[of] words of passion" from the modern accounts of experience. Why he asks, should we have "to speak of Tolstoy as *creating* [my emphasis] War and Peace or of Mozart as *creating* his piano concertos?" (p. 62). How have we arrived at this impoverished legacy, this poverty of language?

Time as History is a five-part meditation on how the experience of human agency in time might be thought about more adequately. Whereas once the "realm of history" was clearly different from "the realm of nature," (p. 12) historical thinking has annexed Reason, Nature, and, finally, even the personal dimension of Time. While not arguing directly for a different mode of envisioning time, Grant proposes to indicate the limits of time-conceived-as-history. He uses the term "enucleation"—"to extract the kernel of a nut, the seed of a tree." (p. 13) — to describe his procedure. He means to seize the phenomenon *in vivo* as it were in order to become aware of the consequences of our commitment to this mode of delineating experience.

Parts I and II of Time as History analyze "willing" and "orientation to the future" as components of our thinking about time. Parts III and IV focus on Nietzsche who, according to Grant, "thought the conception of time as history more comprehensively than any other thinker before or since" (p. 32). Historicism culminates in Nietzsche's dictum that "only that which has no history can be defined" (p. 41) and in the injunction to transform history/time through dynamic willing: *amor fati* (p. 53). We are not only "looking at the flowering tree at the height of this wildest blooming" with Nietzsche. We are very near, to take up Grant's "enucleation" metaphor, to "its seed and its seed bed" (p. 32).

Grant argues that we sense the limits of Nietzsche's sense of time when we note its unsuitability to human need. *Amor fati* is not, for Grant, a feasible human project. We cannot, he believes, love "beyond good and evil." The injunction "to take in...all the pain and anguish and ghastliness that has ever been and also all the loathing of that ghastliness and pain" (p. 59) uncouples *amor* and *fati*.

This is hardly an alternative to Nietzsche's view of time and Grant does not think he has to offer an alternative. Part V of Time as History hints that alternatives do exist. How can "anybody love fate," Grant asks, "unless within the details of our fates there could, appear, however rarely, intimations that are illumined?" (p. 60). Such intimations involve experiences of time which are willfully subordinated to a desired future. For Grant, desiring, remembering, thinking, and loving have genealogies that do not originate in the will. The implication is that our thinking about time might be motivated by something other than the desire for perfection.

Grant, an admirer of Leo Strauss and, as William French reminds us in the "Introduction," Simone Weil,

hoped that the sustained effort to think time as history would enhance our appreciation of modes of thinking about time which the Western, secular consensus on the centrality of human agency discounted. (AU)

Hughes, Diane Owen and Trautman, Thomas R. eds.
Time: Histories and Ethnologies Ann Arbor:
University of Michigan Press, 1995.

This book, the fourth volume in *The Comparative Studies in Society and History Book Series*, comprises ten articles that examine "the problem of time, in both history and anthropology" (p. 1). Hughes, in her introduction, argues that each discipline approaches the shared interest in the temporal nature of our experience differently. History constructs linear and sequential patterns to *explain* temporal events. Anthropology deconstructs the sequences of events to reveal the underlying consciousness and patterns of depth and simultaneity. Both see humans constructing time and relating it to a moral and political order. The contributors then pursue five 'dimensions' of time that emerge from their studies. I call these dimensions (1) the plurality of "times", (2) the characteristics of time, (3) the politization use of time, and (4) the relationship of time to the disciplines.

The 'plurality' oftentimes is noted by several contributors. Barnes describes a *traditional* past and an *historic* past in Senapur, a rural Indian village. All twenty three village castes as well as the Muslims, ascribe to both. Thus, to characterize India as a traditional society is to open oneself to many traditions and many pasts (p. 28). Minicuci compares the idea of history and the measurement of time in two Italian villages less than two miles apart. The villages are unaware of the well documented history going back several centuries that exists. "Their" history is made up of different durations, measured by internal village standards, and employing (selective) memory particularly in the creation of genealogies. 'Local history' is a myriad of histories built on space, time, memories and the organization of the community (p. 79). Time is seen as both cyclical and linear. Each village views the past very differently—memory is extensive in Zaccanopoli but is shorter in Fitili, and each scans time, calculates speed, and represents these differently. Another example of plurality is presented by Barnes with respect to pasts in Lamalera, a community in Eastern Indonesia. History, in its written form is a familiar to the community. But there are other ways of capturing time: church bells, calendars, radio

programs as well as the production cycle associated with the seasons. These annually recurring activity patterns have suggested a cyclical notion of time to anthropologists. Barnes argues that all conceptions of time incorporate both linear and cyclical time (p. 246). We may choose to organize events according to lines or cycles, alterations and reversals. But humans experience time irreversibly.

A second theme in the book is the characteristics of time. Wylie, for example, compares the ideas of time (as the past), in Dominica, West Indies, and Alvaubour, the Faroe Islands. In the former, the past is shallow and unimportant, while, in the latter, the past is deep and significant (p. 32). Arris discusses time and the past among the Maya Indians of Yucatan. She argues they were obsessed with the passage of time (p. 110) and operated with a dual conception of it. They preferred a cyclical view of time, the best known representation of which was in the *katun* round, which portrays a circle of an endlessly recurring sequence of 13 twenty year periods each with designated and characteristic events. 'History' here is not a sequence but a lumping of events. The Maya also used linear sequencing, particularly in the creation and use of genealogies to stake claim to authority. Trautman discusses Indian and European time. Using the lawbook of Manu as a starting point, he notes that time and its divisions proceed from the body of the Creator, according to the day/night periodicity of the level of being. Each of the five gradations of being has its own time scale: humans (day), ancestors (day is equivalent to a human month), gods (a human year), the Creator Brahma (4,320,000 years), and the Manus (306,720,000 years). Indian culture multiplies cycles of world ages without limit. Because their cycles were so large, Europeans argued that Indians had no sense of history, nor linear conception of time. Trautman argues that this European interpretation was used to bolster their superiority. Finally, Rigby discusses the character of time among the Maasi, of Tanzania and Kenya. Time is measured in 30 day months and 12 month years, but historical events are always reckoned in terms of age-sets (p. 201). Rigby briefly reviews four basic anthropological approaches to the study of time, what he calls *abstract mentalism* (time is linked to linguistic analysis and is 'structural' in the sense of 'genealogical time' (p. 206)), *structural totalization* (time is symbolic) and *philosophical-theological* (time is seen eclectically). Rigby presents his approach, which emphasizes the creation of specific structures and histories in conjunction with social formations arising from a determinate mode of production (p. 214).

The politicization of time is already evident in the work of Trautman, and Arris. Grafton focuses on this in his discussion of the history of chronology since the sixteenth century. The stereotypical view is that the science of chronology arose in the late sixteenth century, emphasizing its technological and modern quality, with its obsession for time lived, time remembered and time lost (p. 139). Mercantile society assigned time a new value and intellectuals a new language for measuring it. But, in reality, many images of time proliferated, often contradicting one another. Chronology was a contested field. But it was used to define the 'civilized' world and mark it off as superior.

The final theme of the relationship of time to the disciplines is taken up by Hughes. Both anthropology and history have a shared origin in an experience of time for they recount human affairs. But their truth depends on their sense of time and duration. Ethnography and history use narrative time to rework what is past in the present. In the process they ruin time because they put things in sequence and project presence and aesthetic order.

This book is a good balance between interesting description and theoretical discussion. Importantly, it emphasizes the inseparability of time from its cultural definitions. As such it provides important materials for continued research in the field and a caveat to hasty generalization.

(PLB)

Kahn, Paul W. Legitimacy and History (Self-Government in American Constitutional Theory). New Haven: Yale University Press, 1992.

This book analyzes the philosophical foundations of American constitutional theory from a temporal perspective, as illustrated in over two hundred years of American political thought and case law. How is it possible, Kahn asks, for constitutional government to be self-government when those subject to its authority did not participate in its creation? In American constitutional theory there can be no anchor in "time immemorial" because there was a moment in time, the American Revolution, when the creation took place. Self-government and historical continuity, Kahn concludes, are incompatible and can only exist in an unresolvable ongoing tension.

Kahn traces four conceptual models of how the state, as an instrument of self-governance, maintains an authoritative identity through time. The first is that of making, the artisan creating with an eye to an ideal model. The second is organic maintenance, in which

the ideal model is replaced by a reference to the organism's past and identity maintained through time. The third is the model of growth, where change becomes not just a reference to a maintained past, but growth toward a projected (i.e., future) end. The final conceptual model, Kahn suggests, is that of community, and in particular, the community of discourse, where there is sustained conversation over time about values and proposed courses of action.

The task of the framers was to make a constitution. With the passing of time, though, the authority of law could only be seen as coming from the past. Lincoln addressed a new generation confronted with the task of preserving what they had ["(f)our score and seven years ago our forefathers brought forth..."] and shifted and broadened the community protected by the constitution while maintaining the authority of the state and the past.

After the Civil War, ideas of an evolving unwritten constitution and conceptual innovation prevailed. They tended to be conservative ideas (exemplified by Herbert Spencer's Darwinism) built upon (in legal theory) the mythical identification of the present generation with the founders. This identification was necessary in order for the maintenance of past law to appear to be ongoing self-government rather than the dead hand of the past. The New Deal brought a shift from evolutionary science as historical to science as a process in which government might intervene using scientific principles, including economics.

There was nothing in the model of evolutionary growth, however, that required that growth or progress be measured by the increasing rationalization of the state—or of any other particular form of social organization. Growth through the application of rational scientific principles still left open the question of who should apply them. When viewed as an aspect of the theory of self-government, this created a problem as to the locus of legitimizing will.

Modern thought, in communitarian and discourse theory, expanded the idea of the individual self to the self as extended in relationships, institutions or communities, that facilitate autonomous self-creation—to families, extended families, religious and social institutions, neighborhoods, and organizations. This was reflected in law and led to the conscious elaboration of theories of law grounded in communities of discourse in which history and the past have become increasingly irrelevant. This eventually led to a view of law as ensuring and protecting process rather than maintaining past or given structure.

Communitarian theories of legitimacy ultimately fail, Kahn says, because of time—they cannot anchor authority within existing structures. At any one time there are multiple communities of discourse, and communities change over time, partly as a function of the discourse. An anarchy of discursive communities lies at the end of communitarian theory unless authority can be attributed to one community, or forum of discourse, with a final say.

Kahn's discussion is thorough, but ultimately he does not surmount the problems created by extending ideas of individual autonomy, through human thought and identity, to society and social institutions. At one point (p. 214) he argues that social institutions not only maintain a formal identity over time, but are self-perpetuating and self-authenticating, referring only to their own past for a measure of what they will be.

In institutions, though, there is no "self" to perpetuate or authenticate, but rather a number of people, informed but not always bound by memories, rules, and expectations, taking more and less concerted action over both space and time. Institutions do not maintain what they view as their own past. Sometimes people do, working within institutions and feeling bound by the precedential weight of the institution, which they experience as authority or structure from the past, but that is something different from institutional self-consciousness. Institutions, and all forms of social organization, either work for us or they do not, and to suggest that they ought to be permitted to work for themselves is dangerous and delusional.

(MHA)

Levich, A. P., ed. On the Way to Understanding the Time Phenomenon: The Constructions of Time in Natural Science. St. Petersburg: World Scientific, 1995.

In some degree this book which is Part 1 of a comprehensive interdisciplinary study might be considered the Russian response to The Voices of Time (1966) edited by J. T. Fraser. It is indeed interdisciplinary as far as the biological and physical sciences are concerned but does not include the "softer" sciences and humanities as does The Voices. However, this may come in Part 2. The text consists of an Introduction and five chapters dealing respectively with time concepts in physics, biology, mathematics, earth sciences, and systems theory.

The introduction by A.P. Levich, posits two images of time that are expressed in terms of questions:

(1) What is the origin of the world's dynamic variability and change? Why do events and their associated instants follow the way they do? 2) What is the nature of the quantitative measure of time? How can one relate a number to a variation? Seeing time as among the basic undefined concepts of science, Levich holds the achievement of such a definition is the principal task in the study of time.

The chapter treating time concepts in physics contains two contributions: "Structure of Physical Space-Time" by Yu. S. Vladimirov and "Relative Model of Clocks and Physical Properties of Time" by V. V. Aristov. The chapter essentially asserts that classical concepts of "space and time conceal deeper concepts and relations from which both space-time and fundamental physical interactions are formed." Vladimirov holds that "space and time describe only relations between material objects (events) and lose the right to exist in their absence." He describes the construction of a unified theory of space-time and physical interactions based on Yu. I. Kulakov's binary physical structure theory and Kaluza-Klein multidimensionality. In the ensuing mathematical development of Kulakov's theory two component spinors are used, considered to be essentially equivalent to Penrose's twistors.

In Aristov's contribution the pace of a clock is modelled as a function depending on the motion of a very large number of particles, the limiting number being 10^{80} . A time interval is defined for infinitesimal displacements of all particles, the integral and differential characteristics of which appear in a unified equation that can be relativistically generalized.

In Chapter 2 on time in biology there are four contributions, two of which discuss the work of other researchers: A. Maurins treats G. Backman's conception of organic time and A. A. Sharov analyzes the concepts of the Russian paleobotanist, S. Meyen. Also in this chapter G. E. Mikhailovsky studies biological time and its organization and T. A. Detlaff discusses clocks for studying temporal laws of animal development.

In Maurin's treatment of Backman's work biological phenomena are considered describable by a logarithmic function of time. Multicell organisms are classified into three groups: ovular, primordial (or embryonal), and infantile, with a fourth cycle for mammals in the development of sexual maturity. Detlaff points out that it is difficult to measure time for biological systems, because developmental time for animals depends on temperature and that "each species has its own hereditary dependence between

developmental role and temperature." He shows that within a certain optimal temperature range there is a proportionality between the duration of various organogeneses and the developmental periods of certain animal embryos.

In R. I. Pimanov's Chapter on mathematical temporal constructions he defines and describes some one hundred mathematical and/or geometric terms associated with the colloquial word time. He deals with the concept of a set and its relation to temporality. Then a number of examples of the temporal characteristics of linear structures are described, followed by a similar treatment of structures irreducible to linear ones. Pimanov concludes with a section on causality and determinism, arguing that the latter concept is groundless.

Chapter 4 consists of A. D. Armand's article entitled "Time in the Earth Sciences." He points out that the earth sciences deal with processes having vastly different characteristic times. Armand presents an interesting table of the characteristic times for geological processes varying from 10^9 years to 10^{-5} minutes in the lithosphere, atmosphere, pedosphere, biosphere, and hydrosphere as well as for electromagnetic fields. In discussing the philosophical interpretation of his results he concludes that the nature of time is conditional, and conjectures that it may be a derivative concept rather than a basic undefinable one.

In the final chapter A. D. Levich uses a systems theory approach in studying the time variability of natural systems. The chapter contains three sections the first of which deals with the substitutional construction of time, the meaning of which for this reviewer is never really explained. This is followed by a discussion of an entropy parameterization of time, an extremum principle for motion, and the nature of time flow.

The book concludes with an article on the "Time Structure of the World" by V. M. Sarychev. He maintains that it is necessary to utilize differential equation language for separate descriptions in various processive levels in nature.

This book to a considerable extent is highly mathematical and so is not for the casual reader. However, it performs a worthy service by acquainting the western reader with the work of a number of researchers not generally known, such as Kulakov, Backman, and Meyen in addition to the book's authors.

(LWF)

Negrey, Cynthia. *Gender, Time, and Reduced Work*. Albany: State University of New York Press. 1993. 148pp.

Over the last several decades, increasing numbers of women have entered the workforce, for reasons of economic necessity, personal fulfillment, or both. Dual-career families are now the norm, rather than the exception, and it is not uncommon for both partners to be subject to, in Cynthia Negrey's words, "the tyranny of the forty-hour workweek" (89), struggling to make the most of that limited commodity—time. Clearly, traditional notions about how we can balance work time and leisure time are no longer adequate in these changed circumstances. As Negrey points out toward the end of *Gender, Time, and Reduced Work*, "We as a society must face that fact that the 1950's 'cult of domesticity' no longer exists, and our social institutions must be altered to reflect that fact" (120). By comparing different forms of reduced work and analyzing their impact on "the temporal rhythm of life" (6), this book explores whether reduced work can fulfill its promise of liberation, allowing workers to experience the best of both worlds. It deals with a timely and important subject, but the conclusions it draws are not quite as well supported as I could wish.

Negrey, an assistant professor of sociology at the University of Louisville, Kentucky, begins in Chapter 1 by putting reduced work in socio-historical context and by raising the questions of how reduced work interacts with the sex/gender system and whether reduced work hours benefit society and the individual. In Chapter 2, Negrey examines the various theories of reduced work that inform and are informed by her study; she challenges their basis "in favor of uninterrupted full-time employment" (a male-based model), which "precludes adequate treatment of reduced work and women's paid and unpaid work" (19). Chapter 3 explains Negrey's research methods, and Chapters 4 through 7 explore four categories of reduced work—traditional part-time work, temporary work, job-sharing, and work-sharing based on the empirical data which Negrey gathered through interviews with workers. In Chapter 8, Negrey draws conclusions about how reduced work seems to reinforce, rather than challenge, traditional gender divisions and how its beneficial aspects depend on the amount of control that workers have over their schedules.

There are several admirable features about Negrey's text. Negrey is conscientious about defining her terms, and she writes in a style accessible to

someone outside the field of sociology, such as myself. Although she does not push the notion of the ideological construction of time, her discussion prompts the reader to consider the ideological implications of certain societal assumptions about work and time—for example, the necessity of the forty-hour work-week, the unskilled nature of part-time work, the notion that time off the job is "leisure time." She makes a convincing case for the way in which workers' control over their schedules impacts on whether they are able to benefit from their time off. She does well, too in considering how the various categories of reduced work influence the way in which free time can be used, analyzing, for example, how the low wages that generally go along with reduced work often preclude pleasurable use of "leisure time" and how temporary employment cannot be integrated with childcare responsibilities.

With regard to the intersection of reduced work and gender issues, Negrey raises some provocative points. She discusses the fact that men and women use their time off the job in different ways, pointing out that for women, such time is often absorbed by household and childcare responsibilities; thus, according to Negrey, women's reduced work, which is often "subsidized" by a partner's full-time income, can tend to reinforce traditional gender roles of the woman as housekeeper and childcare provider and the man as breadwinner. She discusses, albeit briefly, the cultural expectations about the male as provider for the family—expectations that make men inclined to seek full-time, rather than part-time work.

Yet, although provocative, Negrey's points about gender and the nature of reduced work are not as well supported as they should be. With regard to work-sharing, she deals with only one group of "informants": autoworkers, primarily male, who agreed to be laid off temporarily under an inverse seniority lay-off scheme, a group that Negrey herself acknowledges is "exceptional" among worker-sharers (10). In Chapter 3, Negrey explains that the sample for the study was constructed according to "a theoretical sampling procedure," which "requires only collecting data on categories for the generation of properties, not the fullest statistical coverage for a group" (31). Nevertheless, the generalizations that Negrey makes about the concentration of men in superior forms of reduced work seem somewhat hasty considering the homogeneity of the informants; and the conclusions she draws about their very superiority are problematic considering that few other groups of workers have the benefits that this group does. Although Negrey claims

that job-sharing reinforces traditional gender roles in that women spend their time off the job in household responsibilities, she does not deal sufficiently with the experience of male job-sharers.

Perhaps, ultimately, some of the problems that I have with the book have to do with the way in which it puts forward its hypotheses about the intersection of reduced work and gender. As Negrey looks at particular categories of reduced work, she often makes general statements about gender issues. The global theory would be more appropriately put forward in a sustained discussion at the end of the text so that Negrey could draw on her findings throughout the categories to support her points. As well, I would like to see Negrey draw some conclusions about how her data might enable us to make significant changes in the way we think about and perform work. As it is, the book gives us at once too much and too little. In a modest way, however, it provides an interesting guide to forms of reduced work and raises important questions about how we might begin to balance our work time and leisure time. (JAP)

Orlock, Carol. Inner Time. New York: Birch Lane Press, 1993

This book brings together a wide range of work on biological cycles. Observations of ancient Greek philosophers, experiments by European scientists during the seventeenth, eighteenth, and nineteenth century, and recent work by chronobiologists are woven together to present a universe of intersecting rhythms. Human beings are portrayed as a multitude of internal biological cycles whose rhythms interact with a world that is itself constantly cycling. Orlock provides an overview of ultradian, circadian, and infradian cycles throughout the life span and describes two master clocks that govern and synchronize them. She maintains that these physiological schedules vary somewhat from one person to another, are genetically determined, and affect all aspects of a person's life.

A central argument in this work is that inner clocks are an important determinant of health. To function effectively, Orlock believes, people must respect their own particular physiologically determined rhythms. She discusses, as well, how disruptions of wake/sleep habits, in, for instance, rotating shift workers or air travellers, affects health. Apparently, rhythms governed by one master clock adapt readily to change in a person's routine whereas the cycles associated with the second take longer to be reset.

There is a resulting desynchronization of the two clocks for about a week reducing both well being and performance. Orlock considers even heart disease, cancer, and depression to reflect problems in inner rhythms and refers to studies that suggest biological cycles may be involved in the etiology or treatment of these disorders.

Inner Time is broad in scope and serves as a good introduction to chronobiology. A large amount of work is covered and presented in a conversational and informal style. Unfortunately, references for the studies described in the book are not provided. Furthermore, there is an implicit reductionism that is problematic. Biological rhythms are isolated from the multitude of nonlinear interactions that characterize dynamic complex systems and are presented as the causal agent in most areas of human functioning. Similarly, flexibility, interaction, and resetting mechanisms are mentioned but are left unexplored.

(CB)

Ramos, Alcida Rita. Sanumá Memories: Yanomami Ethnography in Times of Crisis. Madison: University of Wisconsin Press, 1995.

This is an excellent book, a work of considerable reflection, insight, honesty and sensitivity. Ramos describes the way of life of over time of the Sanumá Indians, located in the upper reaches of the Auris River on the northern Brazil-Venezuela border, a quite distinct subgroup of the famous Yanomami Indians of Venezuela who are to their south. The book is the product of a long dialogue, with Sanumá, with herself, with her diaries, with her data, with her discipline, with historical events, and with translation. But time does not emerge simply as a dialogic accompaniment. It is raised as a methodological issue, presented as a substantive (Sanumá) concept, reviewed as an ontological fact, used as an analytic device and rendered a political concern.

The Sanumá number about 1000 in Brazil. They are foraging and horticultural people, living in some twenty scattered communities. Ramos lived with them in 1968 and 1970 for her Ph.D., written in 1971. She briefly returned in 1974 and again in 1989. She started to write the book in 1988 and then to translate it into English in 1993. During this twenty year period, the Sanumá changed from being relatively isolated to undergoing the usual decimation by "western" diseases and culture contact from the impact of the Brazilian gold rush. By 1989, some communities were bordering

on extinction. During the twenty four year period, Ramos also changed, her experience deepened and her research strategies refined. Anthropology changed, from a theoretical emphasis on 'lifeless' systems, to a reflexive humanistic style cognizant of the writer's voice. In 1987, Ramos reread her diaries written in 1968 with the eyes of a changed person, in the context of changed discipline, and aware of a changed people. What did the diaries now mean? She could see things in them now that she did not see in her writing of the period and vice versa. She describes the writing of the book as the outcome of a long cooking process in which, presumably, her data were gradually "transformed". In doing so she depicts the past as a human construct, itself the product of a temporal process.

Ramos argues that time is a key to understanding the Sanumá who frequently transform space into time and vice versa (p. 60). For example seasonal variation (time) leads to resource variation which affects social patterns on the ground (space). The use of trails and streams constitutes an elaborate historicised topography (p. 23). Time constitutes the sib (a kinship category) but the nexus of the sib is patriliney which is associated with place of origin. In fact, "the most striking aspect of Sanumá ethnography is the systematic transformation of space into time via patriliney" (p. 60). What starts as a spatial referent (coresidence) becomes the cornerstone of temporal-historical descent construction (lineage). But, lineage formation is a problem, because to achieve this a man, his sons, and their sons, must stay together in a society that practices an uxori-local residence rule and bride-service, which demands that sons leave when they marry. So, while Sanumá lineages are an example of how space can be translated into time, "this is an unpredictable time". It may range all the way from a short interlude to a period of several generations" (p. 98). Time is a key to an analytical understanding of Sanumá kinship "because it renders chaotic the synchronic manifestations of a process that lasts much longer than the life of any specific lineage" (p. 101).

What does time mean to the Sanumá? Ramos emphasizes the problem of translation here. "How," she asks, "does one translate the idea of remote time, be it in the past or in the future, which derives from the single expression *sutaha*? How does one lead the reader into the merry-go-round of a life cycle that does not start with birth and does not end with death (p. 154)? All that one can do is produce an intelligible version rather than reproduce the original. The Sanumá have several notions of time, individual, social eschatological and historical time. Each can be

represented metaphorically. For example, one is a seemingly endless series of cycles, another is human beings, animals and spirits crossing paths with each other, a third is represented as the living and dead stepping onto the carousel, and finally, there is the natural and the supernatural fusing with space turning into time, and memory becoming history. In contrast to Indo-European languages which arrange the distant past and the distant future in linearity, the Sanumá language collapses them into a single concept. Whether the action has already occurred or is yet to come is indicated by the verbal suffix, which determines both when the action occurred and the speaker's relation to the action (witness, hearsay, etc.). Time is either given an existence of its own, or is divided entirely according to human behavior. Whereas individual microtime spatializes time—Jorge lives three sleeps from here—social group macrotime temporalizes space—residence is patrilineal which is a product of descent. Ramos wonders at the precision of the Sanumá system. She comments, "No matter how imprecise this may seem to us...the Sanumá system with its three numerical categories—one, two/several, and many—always surprised me with its infallibly satisfactory results...It is an inseparable union of time and space that I could observe, but could not myself comprehend. It consists of particles of cognition so intangible and fleeting that one would have to be a Sanumá to be able to totally share it" (p. 158). The Sanumá construct their temporality by bringing together and pulling apart activities, ritual states and changing conditions of life to create a complex web of interlocking persons, living and dead, individuals and collectivities, humans and non-humans. Ramos represents their view of life in a diagram as an open circle because birth and death do not isolate the persons in a biological chronology, as they do in Western culture.

There is much in this book of interest beyond its considerations of temporality. But temporality is a key to understanding the Sanumá and they, through this work, contribute to our understanding of temporality.

(PLB)

Schama, Simon. Landscape and Memory. New York: Alfred A. Knopf. 1995.

Schama is an historian attempting to rediscover what landscape has meant in human life. The forest primeval is old, teeming with life and mystery. Flowing water signifies adventure and movement,

going somewhere, as well as a source, coming from somewhere. Rock endures, in strange, sometimes monumental, form. Humans have lived with these landscapes, both being formed by them and forming them in return. Landscapes are sources of myth and memory that have left their marks—on our psyches, in our art, in our monuments and architecture, in our social institutions, in our sense of territoriality, in what we describe as wild or domestic, as mortal or immortal, in our origins and our destinations. Time flows, endures, and recreates itself in these landscapes.

Schama in his book traces multiple histories of the interactions between humans and landscapes. As experienced by humans, the significant interactions have not been with the raw matter of nature or with the scientifically known and manipulable, but have occurred with landscapes invested with significance. Schama begins with the material of wood, with the forests. He investigates stories of ancient wildness, forests as places of natural virtue contrasted with cities, wood as a source of fuel and game, wood as necessary to maintain imperial navies, or as a playground for royalty and the powerful, and finally woods as disappearing places in need of preservation. Water is seen as flowing from mysterious sources, carrying, as the Nile, nourishment. Water circulates like blood. It also forms barriers. Hydraulic engineering creates fountains, and flowing water combines with the monumental. Rocks may be inaccessible and forbidden or a challenge to be conquered, climbed, or molded into a Mount Rushmore. Mountains may suggest a dwelling place of gods or chasms of evil and danger.

The landscape myths which the human race has lived have been recreated and tamed in modern, redesigned Acadias: Fontainebleau, Central Park, and suburban lawns. Schama agrees with Thoreau that landscapes are not esoteric, and that indeed the whole world may be revealed in our backyard, if we would only pay proper attention. The author states that what he has to say, or to remember, is not offered as a panacea against ecological disaster; he rejects any such facile consolation. What he tries to do is to reintroduce us to those connections with landscape that are still inside us, connections we have forgotten to cultivate or to nourish.

Schama is a narrative historian, telling history as stories to reawaken memories of the past. The student of time may, however, wish to ask a question: as landscape becomes increasingly subject to manipulation as a result of human intervention, to what extent is the recovery of memory and mythology both a solution and

a part of the problem. False visions of the future to confront both visions in the present. Remembering landscape is not as important as seeing clearly what landscape is now, and what it is becoming, and why that is happening. (MHA)

Serres, Michel with Bruno Latour. *Conversations on Science, Culture, and Time*. Ann Arbor: University of Michigan Press, 1995. Translated by Roxanne Lapidus, 204p.

Elected to the prestigious Académie Française in 1990, French philosopher Michel Serres has published over twenty books in the past twenty-five years. His work often defies classification as he weaves together tapestries of theory transgressing both historical and disciplinary boundaries. Under the figure of Hermes, the messenger, Serres has given us readings of Lucretius and chaos theory, Leibniz and metaphysics, Verlaine and information theory, Zola and whiteness, the Challenger accident and sacrifices to Baal, and the list goes on. In single elegant strokes, Serres paints landscapes that astonish and infuriate. His books take us on erudite journeys through our cultural history; but his connections seem ever to ignore historicism, causality and cultural episteme. Instead of traditional philosophical arguments, Serres prefers mathematical elegance and demonstrations that juxtapose disparate elements and structures from different epochs, different cultures, and different disciplines. His critics are many. Most philosophers ignore his work, or simply do not take it seriously. Until now, Serres had refused to respond to his critics, explain his method, or justify his exotic passages through our cultural encyclopedia.

Originally published in French as *Eclaircissements* in 1990, *Conversations on Science, Culture, and Time* is a collection of five very long conversations between Serres and sociologist Bruno Latour. Here, finally, we have Serres explaining his background and training, his method, his opinions on philosophy, criticism, and morality, his perception of the need for connections between science and the humanities, and his chaotic theory of time and knowledge. Ever the outsider, with degrees in mathematics, classics and philosophy, and graduate study in science and literature, Serres describes himself as a "half-caste," or "quadroon" (21). He completed a thesis under the direction of Bachelard and then became one of the first to teach mathematical logic in Europe. His attitude and his direction have been profoundly influenced by World War II and the

horror of Hiroshima.

But Serres does indeed have a definite method. Many of his books are based on and named for a single relation: "*Inter-fence*, for the space and times that are *between*; *communication* or *contract* for the relation expressed by the preposition *with*; *translation* for *across*; the *para-site* for *besides* . . . and so on" (101). His metalanguage or preferred mode of abstraction is one based on prepositions: "To talk only by means of substantives or verbs, and thus to write in a telegraphic code, as ordinary philosophy does, defines a different form of abstraction . . . *the being*, or *I think*, *causality*, *freedom*, *essence*, *existence*, *immanence*, *transcendence*, and so on . . . Relations spawn objects, beings and acts, not vice versa" (103-107). Relations or prepositions for Serres are the synthesizing elements. "One must seize the gesture as the relation is in progress and prolong it. There is neither beginning nor end; there is a sort of vector. That's it—I think vectorially. Vector: vehicle, sense, direction, the trajectory of time, the index of movement or transformation" (104).

In order to understand how Serres can bridge time, space and culture and make connections between ancient philosophers, romantic literature and modern postmodern science, we need only see the workings of his radically different theories of time and knowledge. Instead of linear, historical, causal, deterministic or positivistic, time for Serres is folded, pleated, chaotic, turbulent: "it percolates" (58). He is holding out hope "of a chaotic theory of time" (59). In the face of Kuhnian paradigms and Foucauldian epistemes, Serres's theory of knowledge is tectonic: "The regimes of revolutions is no doubt only *apparent*. What if, behind them, or beneath these schisms, flowed slow and viscous fluxes? . . . Are the breaks in history similarly brought about from below by an extraordinarily slow movement that puts us in communications with the past, but at immense depths? The surface gives the impression of totally discontinuous ruptures, earthquakes, . . . but which, at a very deep level, continue an extraordinary regular movement, barely perceptible, on an entirely different scale of time" (139). Together, these theories form a history of ideas that is not unlike the hypothetical dough of the baker's transformation, two points coming close together one moment and then appearing far apart at another: "Lucretius and the modern theory of fluids are considered as two places separated by an immense distance, whereas I see them as in the same neighborhood" (57).

Throughout the conversations, Bruno Latour tugs and pulls at Serres, often with the somewhat

tedious refrain: "But wait, you go too fast . . ." or else the ubiquitous: "But nobody believes you . . ." Yet he manages to bring Serres along, through discussions of his work in relation to epistemology, to philosophy of science, to criticism, which Serres calls the "philosophy of suspicion." According to Serres: "The critic's ultimate goal is to escape all possible criticism, to be beyond criticism. He looks over everyone else's shoulder and persuades everyone that he has no shoulder" (133).

Michel Serres incorporated chaos and information theory into cultural studies back in the 1970's; he did it then and does it still, better than most of us do today.

(TW)

Tholen, George C., Scholl, Michael, Heller, Martin, Eds. *Zeitreise: Bilder, Maschinen, Strategien, Rätsel*. [Time Travel: Images, Machines, Strategies, Riddles] Exhibition catalog. Basel: Stroemfeld/Roter Stern, 1993. 414p. (In German).

Institutions of public education have an increasingly difficult yet rewarding task in conveying recent, specialized ideas about the nature of temporal phenomena to a lay public. Such a mission becomes even more difficult than it would be in itself because of the immensity of specialized literature and the labyrinth of contradictory schools of thought.

Museums, whatever their domain of interest, employ the techniques and principles of presenting their material through its history. First and foremost they tend to offer visual displays. In that task cinematography and the electronic media have been considered as suitable "time machines." Recent rivalry between traditional time machines and new ones (i.e. the electronic media) came to complicate the employment of historical representation in museums. The prevailing concept of traditional museum display uses synecdoche—using a part to represent the whole—to suggest the historical development of whatever they display. This technique remained a modest solution that serves a diminishing public. The principle of most current exhibits thus remains the display of presumed historical coherence in their subject matter.

Few museums would object to financial support that leads them to perpetuate such a technique of display. Yet this conservatism remains particularly painful when the theme of the exhibit touches the conceptual foundations of the institution. This leads to a positivist, progress-boosting media fair, in which

artistic resourcefulness, sometimes called creative misuse, is covetously observed by the media industry and translated into new product features.

The Museum für Gestaltung in Zürich has been active for many years in the field of exploring the boundaries of validity of concepts of design and those of museum representation. Although meagerly funded, it can claim to have produced some of the most ambitious thematic exhibitions in Europe. Not surprisingly, in a conservative environment it has been facing a constant danger of financial collapse. Under these conditions the curators of this small institution have concluded that displaying and labelling objects is not sufficient anymore, and that more abstract topics, such as time, are to be addressed.

The book under review is the catalog of one of their exhibitions, *Zietreise*...held from March through May, 1993. The museum space, in a fading gem of Swiss modernist architecture, had to be altered significantly to accommodate the exhibition. The entry, an example of the congenial settings created by architect Tristan Kobler, was changed into a walk-through time tunnel. The main exhibition space took on the form of a huge waiting room, thus suggesting a playful approach of expectations and giving a casual quality to the visitor's experience. After a period of accommodation to the setting, a visitor could grasp the applied metaphor of "waiting room." They could relate it to the objects and models displayed, and to the historical and theoretical time machines. The waiting room also seemed to offer an ideal surrounding for both the scrutiny of the improbable exhibit and the time-oriented literature displayed. The catalogue thus constituted part of the exhibition. It is a highly inspiring, interdisciplinary collection of popular and scientific theories about time. It contains thirty-five short contributions amounting to that many different associations with the idea and experience of time, ranging from the genesis of H. G. Wells' time machine to psychoanalysis and the unconscious in cinematic time travel. (CK)

Woodward, Philip. *My Own Right Time: An Exploration of Clockwork Design*. Oxford, New York, and Tokyo: Oxford University Press, 1995.

Woodward's book is essentially an autobiography that spans the period from the great depression to the present time, and deals in detail with his own development as an amateur and scientific horologist.

During this period he built a series of mechanical clocks, of which the last varied as little as "one second in one hundred days—occasionally." The book's title, "My Own Right Time," derives from the days before World War II when, as a schoolboy, he could not afford his own watch and was obliged to request "the right time, please" from passing strangers. He soon realized that even the most expensive pocket watches rarely agreed, and decided that he would build his own clocks. The first, "which went by the name of UMAKA clock," was purchased in a toy shop and assembled from a kit. It used a bent strip of metal as a primitive form of anchor escapement. Woodward next offered himself as a watch adjuster to wealthier schoolmates at a fee of one apple per job, and he subsequently built another pendulum clock from Meccano.

After a couple of years reading mathematics at Oxford, Woodward was drafted into the (then) highly secret Telecommunications Research Establishment during World War II, and worked on radiolocation or radar alongside some of the best of Britain's young scientists. His work involved maximizing the signal to noise ratio in radar, and he eventually became aware of the parallel with the performance of a precision clock that "is ultimately limited by random disturbances which fall in the same category as noise." The five increasingly precise clocks that Woodward subsequently manufactured during the course of a lifetime as a professional mathematician but an amateur enthusiast in horology were numbered W1 to W5. With intermittent chapters on relevant scientific subjects—such as escapement theory, the phase circle, error correction, noise modulation, flicker noise, and noise and chaos—the story of the clocks provides the substance of a highly informative book. Although Woodward begins by being unaware of the work of some of his horological predecessors, he eventually accumulates a great deal of knowledge regarding the nature and value of their inventions, and the work therefore offers some valuable insights into horological history as we know it.

W1 used a gravity escapement of the type which reached its zenith with the design adopted by Lord Grimthorpe for Big Ben, but Woodward employed the electrical contact for resetting the gravity arm rejected by Grimthorpe though incorporated in the Froment escapement. W1 used an electromagnet that Woodward had taken from his electric razor; it was therefore very extravagant in batteries, in addition to being very noisy (in the vernacular meaning of the word). As a result of moving to a new home, Woodward later converted W1 to W2. For this he was

influenced by the Synchronome of Hope-Jones that employed two solenoids which constitute an electromagnet. Since the solenoids in W2 clanked only once, instead of thirty times a minute, Woodward had hoped in vain that it would be less noisy. As Woodward puts it, the early demise of W2 was "triggered by a visit from an amateur cellist who wished me to play the piano part of a Brahms sonata."

For W3, Woodward was convinced that he must avoid solenoids, and, as a result, was influenced both by the Congreve's rolling ball clock and by Harrison's grasshopper escapement in its earliest form. Woodward has called what he eventually produced for W3 an intermittent grasshopper escapement. The clock proved to be his first real success as a horologist, and a compliment, resulting from his publishing an account of the new escapement in the *Horological Journal*, encouraged Woodward to experiment with the possibility of producing something closer to a free pendulum, even though he knew that this could never be totally isolated from its environment. For W4, he was influenced by the free pendulum clock designed by William Hamilton Shortt in 1922, which did, however, use electricity. The W4 was a compact wall clock about the size of a Vienna regulator but with a master and a slave pendulum of different lengths swinging side by side. The shorter slave pendulum took impulse every fifteen seconds, but the longer master pendulum swung freely for four minutes before receiving an impulse. Woodward did not regard W4 as a success and it remained unused until he had retired from his professional work. He then decided that for W5 he would imitate the Shortt clock but by employing mechanical means instead of using electricity. This was achieved some two years later with encouragingly good results.

Woodward's work belongs to a long and proud British tradition of outsiders who have made important contributions to mechanical horology, but with the advent of the electronic age in our own time one wonders for how long there will be amateurs willing and able to spend their lives contributing to the design and construction of mechanical clocks. (SLM)

TIME & SOCIETY

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February 1996. No time for Rest? An exploration of women's work, engendered leisure and holidays. Time into Space: the myth of 'backward' Italy in modern Europe. Cohabitation Contracts and the private Regulation of Time. A cultural Exploration of Time: some implications of temporality and mediation. Time Travels: Time, oral histories and British-Polish identities. 'Until the End of the World'? Time and the futures of nationalism.

June 1996. The Family Historian and Temporal Orientations Towards the Ancestral past. The Changing Dynamics of Working Time. Rethinking Social Time: feminist perspectives. The End of Time? Aboriginal temporality and the British invasion of Australia. the Ecological Impact of Time. For What and For Whom Do You Need More Time? Time Allocation and Marketing.

October 1996. Reworking E. P. Thompson's 'Time, Work-discipline and Industrial Capitalism. 'History Balancing the Scales': time and trauma in psychoanalysis. Beyond the Present: nature, technology and the democratic ideal. Gender and the Use of Time. An International Forum. Introduction. Gender, Work Time and Flexible Employment: the case of Denmark. Procreation Time: pregnancy and childbirth in EC sex equality law. Psychological Time: the case of time and consumer behavior.

ANNOUNCEMENTS

STUDIES OF THE TIME PHENOMENON: TIME, LIFE, SOCIETY

MOSCOW UNIVERSITY is continuing the work of Moscow City Interdisciplinary Seminar on the studies of time in natural science. The purpose of the seminar is to stimulate professional activities in studying time in natural science.

Research includes:

- development of time constructions,
- creation of dynamical theories of natural-scientific objects,
- experimental studies of substantial entities representing time.

In 1996 the Proceedings of the Seminar will be published:

1. Constructions of Time in Natural Science. Part 1. Interdisciplinary Studies. Moscow University Press, 304 pp., in Russian. (World Scientific, 1995, in English)
2. On the way to Understanding the Time Phenomenon. Part 2. The "Active" Properties (Singapore, New Jersey, London, Hong Kong), 236 pp.

FROM THE EDITOR...

Hokusai illustrated 36 views of Mt. Fuji in 46 wood block prints. One of these wonderful polychrome prints, *The Red Fuji*, came to me as a gift and now hangs by my desk as a backdrop to the waves of paper and drifts of thought that come and go there. While preparing this newsletter, my eye was drawn again and again to the reddish brown mountain brushed by clouds and southerly breezes as my mind touched on matters of change and continuity and the span of a millennium. This image of Mt. Fuji has the particularity of an instant in time and the evocative power of a long cultural heritage. Thus, we may come to experience the continuity of millennia in the ephemeral moment.

The topic of ISST's next conference, "Time at the Millennium: Changes and Continuities," will certainly inspire an interesting range of approaches that fit into members' individual interests and research areas. This issue of *Time's News* is an invitation to begin pondering and planning for 1998.

Publication of *The Study of Time IX*

As we look to the future, I am also pleased to report on the past and to announce significant progress on *The Study of Time, Vol IX: Time, Order and Chaos*. IUP has completed copy-editing of the manuscript and has projected a publication date of July 1, 1997. Thus, this volume will appear in print faster than the other 8 volumes!

M. P. Soulsby

MEETINGS

On 21-24 May, 1996, the University of Aarhus, Denmark, hosted a series of public lectures and a small symposium entitled "Ideas of Time, Creation, and World-Order (Mythology, Philosophy, Cosmology)." Most of the lectures dealt with familiar themes: lawfulness and cosmology in science and theology, time's flow or lack of it, determinism and predictability. For the symposium the scene changed to an inn, the Skanderborg house, at some distance from Aarhus, where food was piled on our plates, glasses were ever full, the audience disappeared, and the symposium began to realize its etymological nature, a drinking together. Professor Mogens Wegener of the University's Institute for the History of Ideas, who together with Professor Anindita Balslev organized the four days with admirable skill and moderation, had provided participants with a catalogue of seventy-two time-related problems which would have provided themes for twenty symposia like this one. Its main divisions were: What is Time, Time and World-

Order, and Time and Creation. Each participant spoke briefly on one or two of these themes, there was ample time for comments, and the symposium ended with a plenum discussion and a promise by the participants to expand their remarks into papers to be issued later. Of all the manifestations we can expect to commemorate the 600th anniversary of the birth of Nicholas of Cusa in 1401, this meeting can claim to have been the first, for it was dedicated to his memory.

David Park

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MEMBERS' NEWS

Javier Santiso, a new ISST member, is searching for others who may be interested in the changing representations and conceptualizations of time in Latin America.

Address:

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The International Society for the Study of Time

The International Society for the Study of Time is a professional organization of scientists and humanists interested in exploring the idea and experience of time and the role time plays in the physical, organic, intellectual, and social world.

By holding meetings once every three years, the Society provides a forum for the exchange of ideas among its members. Selected papers from these meetings have been published in a reference library, consisting thus far of the eight volumes of *The Study of Time* series with over 190 articles, making for a total of 3400 printed pages. The ninth volume will appear in 1997.

Why should there be an interdisciplinary study of time?

Time is a fundamental feature of the physical universe. It is intimately connected with the life process. The human mind, setting our species apart from all other species, is characterized by its ability to formulate and pursue long-term plans and to meet present contingencies based on the advantages of long-term memory. The passage of time has been of concern to all great religions and philosophies, and has found an infinite variety of expressions in the arts and letters. No other single aspect of reality relates more directly to basic human needs and desires than does time.

Although time has been a staple of all human knowledge and modes of expression, no systematic attempts have been made in modern times, before the founding of the International Society for the Study of Time (ISST) in 1966, to explore the nature of time through the collective power of scientific knowledge and humanistic insight.

If there exists a unity in the studies of the nature of time, conducted through the different fields of human knowledge, it is likely to reveal itself to the open mind through the course of our work.

But even without assuming the possibility of a universal theory to time, the interdisciplinary efforts of our meetings have been found rewarding, as demonstrated by the unique stimulus that ISST conferences have provided to their participants. The recent upsurge of professional and popular works dealing with time may well be credited to the two decades of quiet pioneering work of members of ISST.

The Society was founded in 1966 by Dr. J. T. Fraser, acknowledged to be the world's leading scholar in the interdisciplinary study of time.

At the end of 1996 the Society's membership was close to 300, consisting of scholars from 33 countries

around the world. The disciplines represented by members of the Society include anthropology, astronomy, the biological sciences, economics, geology, history, law, linguistics, literature and the arts (including the history of art), mathematics, medical science, music, philosophy, physics, political science, psychology and psychiatry, religion, and sociology.

Individual members of ISST, writing in their own fields, have published scores of books relevant to the study of time, directed both to the scientist and academic, and to the inquisitive lay reader.

The Society has published 8 volumes of papers selected from its 8 conferences.

1969, Oberwolfach, West Germany: *The Study of Time* (New York: Springer-Verlag, 1972)

1973, Lake Yamanaka, Japan: *The Study of Time II* (New York: Springer-Verlag, 1975)

1976, Alpbach, Austria: *The Study of Time III* (New York: Springer-Verlag, 1978)

1979, Alpbach, Austria: *The Study of Time IV* (New York: Springer Verlag, 1981)

1983, Castellodi Gargonza, Arezzo, Italy: *Time, Science, and Society in China and the West (The Study of Time V)* (Amherst, University of Massachusetts Press, 1986)

1986, Dartington Hall College, Totnes, Devon, England: *Time and Mind (The Study of Time VI)* (Madison, CT: International Universities Press, 1989)

1989, Glacier National Park, Montana, USA: *Time and Process (The Study of Time VII)* (Madison, CT: International Universities Press, 1991)

1992 Cerisy-la-salle, France: *Time and Life (The Study of Time VIII)* (Madison, CT: International Universities Press, 1996)

1995 Sainte Adèle, Québec Canada: *Time, Order, and Chaos (The Study of Time IX)* (Madison, CT: International Universities Press, 1996)

1998 July 5-11 Evangelische Akademie, Tutzing (Bavaria), Germany: *Time at the Millennium: Changes and Continuities.*