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

An Aperiodic Newsletter

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CONFERENCE ANNOUNCEMENT

The Ninth Conference of the ISST will be held from 2 - 8 July 1995, at the Hotel Le Chantecler, Ste—Adèle, Québec, Canada. The theme of the conference will be "Time, Order, Chaos." See page 4 for details. The Call for Proposals will be issued in April 1994; to receive consideration, proposals must be received by the Executive Secretary by 15 August 1994. The conference site is located in the Laurentian Mountains, about an hour north of Montreal, and can be easily reached from Montreal's two international airports— Mirabel (from Europe) and Dorval (from North America). Le Chantecler offers comfortable accommodations, excellent meeting facilities, and French cuisine in a spectacular setting in the middle of French-speaking (but bi-lingual) Canada.

A MESSAGE FROM THE PRESIDENT

"THE TIME IS OUT OF JOINT"

The theme of the next time conference has been set with "Time - Order - Chaos." It is a timely theme, full of associations and interconnections to the troubling world we find ourselves in today. Flashes of thoughts and insights keep crossing my mind about the topic, and concerns arise from my daily work and from keeping an open eye on that part of the world that I am most familiar with—the social.

In a famous passage, Shakespeare has Hamletsay: "The time is out of joint." It is also a striking diagnosis of our times. Indeed, wherever we care to look, time has suddenly sprung out from its previous, and hence reasonable predictable course. It has become disconnected, dismembered, as though detached from itself-pluralized and fragmented. It is moving on its own, and so are parts of ourselves, parts of society and parts of the globe. Even the time of the natural environment and the social calendar of society seem to be drifting apart. Time out of joint strives in different directions, at different speeds, at cross-purposes. Not surprisingly, this is experienced as a painful process. Contrary to the possibility of at least temporary relief when our joints get disjointed, no chronopractitioner is ready to put time back where it belongs. So much, or more, for the metaphor and its richness.

In Budapest, where I now live and work as Permanent Fellow of the first Institute for Advanced Study in Eastern Europe, the Collegium Budapest, one of my colleagues recently made an interesting remark during a seminar on "time, history and the individual." He argued that in 1989 in Eastern Europe, the period came to an end during which people lived in a staggering plurality of times, including that of their own private phantasies and that of Communist officialdom and repression. Since then, a rush has set in for a future which most people saw already realized in the West only to find out that it is extremely difficult to catch up. Indeed, doubts are increasing as to whether this is the future they aspire to. New temporal incompatibilities arise when attempts are made to restructure the memories and weight of the past in an already overburdened present, facing a future that has not yet acquired any weight. The future's extreme volatility is in the air and cannot but affect the present. Time is indeed out of joint.

There are times of convergence, when social, political, cultural and economic energies and trends somehow come together, creating synergistic effects. And there are times of dispersion, of fragmentation, when instabilities reign supreme and cultures appear to be in disarray. As with many such concepts, they are intuitively appealing and difficult to demonstrate empirically. In detailed empirical work, definitions and classifications matter but the categories employed themselves change their meaning over time. On my desk is a working document that criticizes the forthcoming "White Book" of what now is the European Union, the former European Communities. The burning issues discussed are unemployment in Europe and how to overcome it. The official "White Book" argues for a renewed political offensive to restart economic growth in Europe. The critics attempt to show in some detail why this will no longer work and that we need deep structural changes. They propose detailed schemes of sharing work, of rearranging work and leisure, of bringing solidarity back into the cold climate of economic competitiveness that has now reached Europe. In short, they deal with the politics of time. Given the fact that unemployment in Europe is likely to rise, the politics of time is also likely to assume more weight in the near future. But here again we come up against a contradiction that shows time to be somehow out of joint: it is the time embodied in the new technologies and their relentless further development, time which becomes diffused in networks and in decentralized new technological infrastructures, in communication highways and in virtual reality (apparently de-coupled from the ordinary constraints of time and space). Set against this is the time of millions of individuals who have lost or will lose their jobs. They find themselves with lots of unemployed time on their hands, devoid of economic means and of social ties. Why are our societies so impotent when confronted with time out of joint?

There is thus an obvious need to re-synchronize, to put time back into joint or, more likely, to invent new joints. Our brain synchronizes and re-synchronizes continually, otherwise we could not exist and live in the present. For society, the need to synchronize, to bring together the plurality of times that has moved out of joint, often in divergent directions and in highly dispersed ways, presents a major challenge.

What are the insights and analyses that we, as students of time, can provide in order to meet this challenge?

Helga Nowotny

THE FOUNDER'S COLUMN

Professor Helga Nowotny's "A Message from the President" in <u>Time's News</u> #21 spoke of the truly interdisciplinary nature of our theme and our membership. This column is a continuation of her reflections.

According to the Constitution of ISST, "The object of the Society shall be to encourage the interdisciplinary study of time in all its aspects." I equate this object with work toward an integrated study of time, one that draws equally on our intellectual and passionate faculties and creates, with their help, a viable appreciation of the dynamic unity between time felt and time understood. Others may perceive the interdisciplinary study of time differently.

At a 1966 conference of the New York Academy of Sciences, the day ISST was founded, I read a paper on "The Interdisciplinary Study of Time." It concluded that to grant such an approach "its charter," it will be necessary to support "an intellectual climate where creativity common to all knowledge is permitted to flourish, and aspects of reality previously separately understood are permitted to produce their synthesis, by interacting through the common idea of time." ISST supports such an intellectual climate.

I have attempted to direct my own writings toward integrative studies, as did G. J. Whitrow in his pioneering <u>The Natural Philosophy of Time</u>. But I have not pressed for interdisciplinary papers at our conferences because of a wellfounded fear. Unless a writer bases his or her reasoning on critical, firsthand knowledge of all fields to which the paper appeals—at least to the extent the appeal is made—if his or her arguments derive from secondary and popular sources and are pursued in a manner unacceptable to specialists, the resulting paper is unlikely to be publishable in <u>The Study of</u> Time series. Certain general principles useful for the interdisciplinary study of time may be found in my 1979 foreword of <u>Time</u> <u>IV</u> ("A Backward and a Forward Glance: the Uses and Problems of the Study of Time") and in the 1981 introduction to the 2nd edition of <u>The Voices of Time</u> ("Toward an Integrated Understanding of Time"). Furthermore, the purpose of the hierarchical theory of time, proposed and discussed in my books and papers is, as Professor Rowell noted in a review many years ago, to serve as "a comprehensive natural philosophy [of time] as well as a model for the interdisciplinary study of time."

In a 1991 paper Alexander Argyros outlined his ideas on the checks and balances necessary for interdisciplinarity in general, basing his model on the hierarchical theory of time. In a recent memo, Barbara Adam and Nicholas Tresilian pointed out that there are really two tasks at hand. One is in my words—the identification of the ontological and epistemic issues involved in the interdisciplinary study of time. The other is an actual call for papers that would address their themes on a nontrivial interdisciplinary manner which can withstand peer criticism.

Twenty-seven years after its founding, ISST is old enough to be able to ask the right questions about the study of time and young enough to give reasonable answers. Our membership is in a unique position to be able to set the standards for interdisciplinary work. I hope there will be a number of competent proposals for papers which approach their subjects in an integrated fashion. The theme of the 1995 conference is particularly suitable for correlating insights from different perspectives. For details of the conference, see the Report by the Executive Secretary.

REPORT OF THE EXECUTIVE SECRETARY

I am pleased to report that the office of the Executive Secretary is now open for business. Our address is as follows: Box 6195, Bloomington, IN 47407, USA. Telefax communications may be sent to (812) 855-4936, directed to the attention of Professor L. Rowell, School of Music, Indiana University. Please note, however, that I do not have the facilities to reply via fax. Members who wish to telephone me may do so at (812) 332-5034, bearing in mind that the best times to reach me are between 0900 - 1200 EST. Members will still wish to communicate directly with J. T. Fraser on professional and personal matters, but it is hoped that the new Executive Secretary will be able to relieve him of the burden of routine correspondence and thus allow him to focus on his own scholarship.

The Council of the ISST met on 9-10 October 1993 in Westport, CT, having in hand recommendations made by European Council members meeting in London on 4 September 1993. The primary business was the selection of the next conference site, dates, and theme, for which see above. Here are some other items from the meeting which will be of interest to the membership:

1. Treasurer Richard A. Block reported a healthy balance of ca.\$12,000 in our treasury. With this in mind, the Council rejected a suggestion that membership fees be increased. Members who fail to pay their dues when billed will be removed from the membership list and will not receive any further information on the activities of the Society. TreasurerBlock reported that the 1994 membership statements will be mailed in January.

2. The Editors of **The Study of Time VIII** (J. T. Fraser and Marlene P. Soulsby) reported that the manuscript has now been delivered to the publisher. The new title of the volume is **Dimensions of Time and Life**, and it contains twenty articles.

3. Before final selection of the next conference site and theme, the Council took careful note of the evaluations received from the previous conference and a communication received from a group of younger members of the Society.

4. The Council considered, in principle, a number of proposed constitutional initiatives for submission to the membership. The following items were approved by Council and will be drafted into appropriate constitutional language for presentation to the membership at a later date. Some comments follow.

a. Add the office of Vice-President to the Society's roster of offices (not, it should be noted, as a President-Elect).

b. appoint a Nominations Committee well in advance of each conference, so that the committee will function not during but before the conference.

c. hold elections by mail, thus offering all members the opportunity to vote (instead of just those in attendance at a conference).

d. whenever possible, the Nominations Committee shall propose two candidates for each office.

e. designate the Council as the body responsible for planning and convening conferences, and thus eliminate the Conference Committee as a separate group. (This is, in fact, what we have always done.)

f. eliminate the Evaluation Committee. (We shall of course continue to evaluate each conference, but there is no reason to specify the exact procedure in our constitution; we have in fact generally not been following the procedure outlined in the constitution, because it has proved expensive, time-consuming, and ineffective.)

g. given the choice between waiting until the 1995 conference or acting more quickly, the Council decided to proceed on the basis of Article X, section 4 of our current constitution, which provides that questions may be submitted to the membership for vote when approved by fifteen members. A two-thirds majority of those voting is required for passage. We are hoping to submit these changes for your approval during 1994. The materials that you will receive will include, of course, the full text of the proposed changes and the rationale behind them.

Comments: Some of the proposed changes (e and f) fall under the category of periodic "housecleaning" and merely recognize that we have been deviating from strict constitutional procedures. The proposal for a Vice-President was based on our observation that on several recent occasions we have lacked a presiding officer; the present constitution specifies that the Executive Secretary shall preside in the absence of the President, and the present Executive Secretary finds this an unsatisfactory solution. Also, the vice-presidency might be an appropriate office for a younger member of the Society. And finally, several of the remaining proposals will have the effect, not only of making our election process more open and democratic, but also of improving chances that it will be **perceived** as open and democratic.

Members are invited to send their comments on any of the above issues to the Executive Secretary, who will be pleased to supply the full reasoning behind each of the proposed changes.

Lewis Rowell

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CONFERENCE THEME: TIME, ORDER, CHAOS

The themes of our past conferences have been traditional, such as "Time and Life, "Time and Process" or "Time and Mind." The subject of our Ninth Conference is also constructed from concepts of traditional interest: "time," "order" and "chaos." However, after early theoretical work in mathematics and computer science, the constellation of these three concepts acquired new significance as a family of ideas in philosophy, literary theory, cultural criticism, and in some of the sciences, notably in biology and in the dynamics of nonlinear systems. The same configuration of notions became important for the social and political sciences and the arts because of the unique problems of the time-compact globe, related to its level of complexity.

Theoretical interest in order and disorder has been continuous in the history of Western thought since the pre-Socratics first speculated about the creation of <u>kosmos</u> (order, harmony) from the complete disorder of primeval <u>chaos</u> (dark abyss). The emergence of order from disorder has served as the paradigm of creative change or becoming. Together with the idea of constancy or being, it came to form the two logically contradictory aspects of the Western idea of time. Current enthusiasm about the science of chaotic systems is a turn-of-the-millennium form of the perennial search for order in disorder, time-honored occupation of scientists, writers, artists and of each and every man and woman. Indeed, order that makes predictions possible and disorder that makes anticipating the future difficult or impossible have always played important roles in daily life. Distinguishing necessities from contingencies—the orderly from the disorderly lies at the foundations of mathematized science in the form of separating scientific law from its boundary conditions.

The purpose of the 1995 conference will be to bring together mature scholarship and science from all departments of knowledge for the purpose of tracing the relationships between on the one hand, the experience and idea of time and on the other hand, the processes of matter, life, the human mind and society which, each in its own way, endeavors to create order out of chaos and change order into chaos.

The call for papers will be issued in April. It will contain non-normative examples of sample topics, suggestive of the broad spectrum of issues which may be addressed under the theme, TIME, ORDER, CHAOS.

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 outstanding timerelated book published during the preceding three years. The recipient will be chosen by a selection committee, and 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, USA, along with a brief letter of nomination.

MEMBERS' NEWS

Lewis Rowell, ISST Executive Secretary and Professor of Music Theory at Indiana University, was presented with the Otto Kinkeldey Award (for excellence in a musicological book) at the 1993 annual meeting of the American Musicological Society in Montreal. His book on **Music and Musical Thought in Early India** (University of Chicago Press, 1992) was cited by the Kinkeldey Award Committee as "remarkable both for its exceptional erudition and crystalline clarity. While explaining the always intricate and subtle practices of Indian music, the author never loses an opportunity to contrast these practices with those of other musical cultures in the East as well as those of the European West. For this reason, we believe, it represents the very best sort of comparative musicology that our profession can create." <u>Music and Musical Thought in Early India</u> is a part of the series Chicago Studies in Ethnomusicology, edited by Philip V. Bohlman and Bruno Nettl. The Otto Kinkeldey Award is named after the founding president of the American Musicological Society. Rowell has also been designated by Indiana University's Division of Research and the University Graduate School as the Distinguished Faculty Research Lecturer for 1993-94.

TIME'S BOOKS

The opinions stated are those of the individual reviewers. Reviews in this column are intellectual properties of their authors. But, since they are ©1994 <u>Time's News</u>, if you wish to quote from any of the reviews or republish a review written by you, please cite this newsletter. With the appearance of the present issue, the total number of books reviewed in <u>Time's</u> <u>News</u> reaches 207.

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Reviewers

- (AB) Andrea Sabbadini (London)
- (IW) Ingo Walter (Singapore)
- (JFF) Jane F. Fraser (Westport, Connecticut)
- (JTF) J. T. Fraser (Westport, Connecticut)
- (LF) Lawrence W. Fagg (Washington, DC)
- (MA) Mark Aultman (Westerville, Ohio)
- (RB) Richard A. Block (Bozeman, Montana)
- (RL) Rémy Lestienne (Washington, DC)
- (SLM) Samuel L. Macey (Victoria, British Columbia)
- Braun, Marta. <u>Picturing Time: The Work of Etienne-Jules</u> <u>Marey</u> (1830-1904). Chicago: The University of Chicago Press, 1992. 450 p.

Etienne-Jules Marey was known in his time as a physician and inventor interested in the scientific study of motion. Seen in retrospect he was a pioneer in motion picture photography and projection. He earned his medical degree with a thesis on the variations in the rhythm of blood flow in normal and pathological states then set himself up as a lecturer on experimental and applied physiology. Later he held the chair on natural philosophy in the Collège de France.

In 1860 he constructed a sphymograph or pulse-writer. When attached to the wrist, it plotted a graph of the pulse, revealing its structure: an ancestor of our oscilloscopic displays of the heartbeat. By means of increasingly more sophisticated sensors he began to graph other rhythmic changes; muscular contractions in frogs and horses, wing movements of insects and birds, pressure variations on a runner's shoes.

From plotting graphs he turned to photographing brief, consecutive instants of motion, a technique pioneered by the American photographer Eadweard Muybridge. The two men began their studies in photographing instants of motion independently and they both constructed different display devices but we learn that their inventive insights merged and, together, signalled the beginning of the cinema.

It was the finding in 1980 of Marey's collection of 1400 previously unlocated negatives that led to Picturing Time. Although the focus of this book is Marey, about threequarters of it deals with the turn of the 19th century technique and art of making still pictures of moving objects, then displaying them so as to create the impressions of motion. Because of this broad scope, the book may also be read as an early history of cinematography. With its almost 200 illustrations it offers an elegant visual journey into the world of stationary images of motion. We see men and women jump, run, carry different objects, ride, fence and throw balls. There are wiggling fish, falling cats, the hands of a magician and embarrassed ladies photographed from three directions. "Miss Blanche Epler has removed her chemise by the seventh frame, only to find it on again in the eighth" says a caption on p. 241.

There are elephants and people marked for chronophotography, the name for taking a closely timed series of brief exposures. The markings were white on dark background. When copied together on stills or projected with the aid of one or another ingenious early device, they leave the reader with the feeling of having observed the skeletal structure of motion itself.

The second half of the book is a treatise on the influence of chronophotography—by Marey, Muybridge and many others—upon modern art. It tells of the ways cubists, futurists and dadaists made use of the instant images of moving objects and how, through these arts, early cinematography influenced as well as reflected the increasing interest in motion and change.

The text has some minor uncertainties. The claim that "the Morley-Michelson experience led to hypotheses about a slowing down of time from its movement through the either" (p. 277) is difficult to interpret. So is the caption to Fig. 29 which speaks about an object "rotating at five meters per second." Angular velocity cannot be measured in units of linear velocity.

Apart from such details which bother only scientists, <u>Picturing Time</u> is a fine and very interesting example of a cultural historical biography, one that traces the increasingly dynamic technology of photography in its relation to changes in public taste and in attitude to the significance of time.

The central theme of this book is a technological version of Zeno's paradox of the flying arrow. Stated in contemporary terms: how may motion be constructed from elements of rest? On p. 59 we see 12 images of a rotating arrow, taken with Marey's "photographic rifle." I assume he borrowed the arrow from Zeno for the purposes of taking images of it at 1/720 sec. shutter speeds. In our own day, pictures of bullets are taken with exposures of small parts of a millionth of a second. The lower limit to recording a flying (or rotating) arrow at rest will be reached when the exposure lengths approach their quantum mechanical boundaries; beyond that, time, space and motion meld into a matrix of likelihoods.

The reason for the logical difficulties with constructing motion from rest, and for the boundaries of recording an instant of motion as rest, are the same. Motion is not constructed from stationary states; reality is the other way around. It is stationarity which is constructed from motion by the mind's need to identify continuity and permanence, as I have reasoned elsewhere. Everything in the world continuously moves, nothing corresponds to our idea of rest or lasting identity.

Those interested in time, in the early history of motion pictures—and perhaps in the paradox of Zeno's flying arrow—will do well by consulting this impressive work. See also, Sabine Gross, "Real Time, Life Time, Media Time: the Multiple Temporality of Film" in <u>Dimensions of Time and</u> <u>Life (The Study of Time VIII)</u>. (JTF)

Coyne, Kevin. <u>A Day in the Night of America</u>. New York: Random House, 1992. 316 p.

This is a perceptive and interesting travelogue among groups which represent the ten million Americans who work at night. The geographical organization of the visits follows, more or less, the ZIP code system. It starts with New England fishermen, works its way down to Florida, moves a bit west then up to the Canadian border; then down and up again until it ends in the Pacific northwest. With the author we pass along the highways and byways of the night.

Though humans are diurnal creatures, night life is hardly new; it has been with us all along. But the timecompactness of the globe makes for a continuity of days during which the non-sleeping half of humankind is present, through its needs, gifts and challenges, in the life of the sleeping half.

Within the four time zones of the continental United States it is not only Massachusetts fishermen who work at night. So do the people who process the checks deposited during the day, bakeries (a traditional night work but never before did that many people need bread), food deliverers of all kinds, stock traders who handle billions of dollars and the brigades of cleaning people who come at dawn to bury the night garbage of those traders and get the offices ready for the day. Prostitutes, police and a goodly part of the criminal justice system are at work during the night, as are the people who control the satellites, carry on with radio and television news, journalists, and the government.

During the night telephone operators listen to the voices of loneliness in telephone calls whose sole purpose is to lessen that loneliness by hearing the impersonal "AT&T, may I help you?" They also encounter the intensity of a business and political day half way around the world. The book dwells at some length on the lives of the homeless in their shelters (in Chicago) and on the streets, on the military in continuous alert, the emergency rooms of hospitals, the patrols along the Mexican border and on the lives of the engineers who drive the mile long freight trains across the heartland of the nation.

We read about the Trappist monks in Colorado, chanting their Vigils at 3:30 A.M., living witnesses to how ancient is the night in man's relation to God; and about astronomers who explore a world that knows neither night nor day. There are night weddings (for reasons known only to the universe and to those who get married at night) and preparations here and there for early morning executions.

As far as I know, this is the only book which surveys the life of the night in terms of individual experience; the acknowledgments lists 450 names. Because the book was written for the general trade, it has no documentation. But its material is rich enough to serve as the beginning of an expanded, systematic study, as it is already being done in bits and pieces. Many books in the sociology of time deal with night work as do periodicals dedicated to the problems of night shifts. Murray Melbin's <u>Night as Frontier: Colonizing the World after Dark (Time's News</u> No. 15) is a pioneering inquiry, the first to define the vocabulary and method of studying the social and human night.

For those who do not work at night, the respect for and even the uncanniness of night life, remains. This is what Robert Louis Stevenson must have had in mind when he wrote in <u>A Child's Garden of Verses</u>:

Whenever the moon and stars are setWhenever the wind is high,All night long in the dark and wet,A man goes riding by.Late in the night when the fires are out,Why does he gallop and gallop about?

(JTF)

Elias, Norbert. Time: An Essay. Blackwell, 1992; 216 pp.

In this book Elias, an eminent and innovative social scientist, focuses on social time and the nature of time reckoning. Where other writers might study the experience of time or the historical development of time consciousness Elias sets out to explain the development of time as a social tool. The key ideas in his theory of time are *symbol* and *synthesis*: time as symbol for social orientation and regulation, and time as synthesis of universal, physical, biological and human processes. Time for Elias is always social time, even as individual experience or as representation of events and processes of nature. It is a social symbol of instrumental value which may take different forms in different societies and historical periods but which remains, nevertheless, a universal human construction.

Elias is not content, however, with the mere construction of a social theory of time. By exploring problems of time, he argues in the preface (p. 1), one can find out a good deal about human beings and about oneself that was not properly understood before. Problems in sociology and the human sciences in general that were not clarified by previous theories now become accessible. The explicit focus on time furnishes him with a tool for historical exploration: how human knowledge has developed from low levels of synthesis to the present capacity for integrating all levels of reality and all known historical periods. The study further provides him with answers to some classical disputes in philosophy. Thus, Elias is able to demonstrate that the measurement of time can be understood neither on the basis of a world split into nature and culture nor of a reality dichotomised into subjects and objects. Instead, he shows that it depends on a mental synthesis that grasps together what classical theories have set apart. Moreover, he argues, with a synthesized conceptualization of time human knowledge has shifted to a new dimension. It has moved from a four- to a five-dimensional understanding where people as subjects of knowledge are incorporated into an analysis, where they encompass themselves as "observers and perceivers in their observations and perceptions" (p. 36).

The study is bounded within a clearly defined, narrow frame of reference and from this base Elias offers an analysis of time and time reckoning in terms of development, function and meaning. Despite its rather conventional approach to time, however, this treatise is highly stimulating and manages to stretch sociological theory beyond its traditional range of expertise. (BA)

Finogentov, Valeri N. [<u>Time, Being, Man</u>] In Russian. Ufa (Baskhiria) Russia. 1992. 221 p.

The author is Assistant Professor of Philosophy and Chairman of the Department, the University of Ufa (Bashkiria), Russia. His first degree was in physics, his doctoral degree in philosophy, both taken at the Ural State University in Yekaterinburg. In addition to this book, I have a 30 page summary of his doctoral work on <u>The Temporality of Being</u>, also in Russian.

I have been unable to find a qualified reviewer for <u>Time</u>, <u>Being</u>, <u>Man</u>. Also, in spite of having a German translation of the summary of his dissertation, I have been unable to render a satisfactory summary of it.

Anyone qualified to read Russian philosophical texts is welcome to all the material I have, in return for a 400-450 word review of the two writings. (JTF)

- Glass, Leon and M. C. Mackey. <u>From Clocks to Chaos: the</u> <u>Rhythms of Life</u>. Princeton: Princeton University Press, 1988, 248 p.
- Touito, Yvan and Erhard Haus, eds. <u>Biologic Rhythms in</u> <u>Clinical and Laboratory Medicine</u>. New York: Springer-Verlag, 1992. 730 p.

The first paragraph of the preface to <u>From Clocks to</u> <u>Chaos</u> comes to the purpose of the book with a direct, clear and concise statement, a mode of writing which characterizes the volume. "This book deals with the application of mathematics to the study of normal and pathological physiological rhythms." (xi) It has two aims. "The first is to make physical scientists aware of the enormous complexity and beauty of dynamic phenomena in physiology and medicine. The second is to show physiologists and physicians that the techniques of nonlinear mathematics are applicable, and in some cases essential, to the analysis of dynamic phenomena in physiology" (182). Another, long term goal is to provide or at least commence to provide "novel diagnostic and therapeutic strategies for the treatment of humans" (179). In preparation for this goal the notion of "dynamical disease" is defined as any abnormal temporal organization. (16)

Galileo, inventor of the application of mathematics to the analysis of motion, used to switch back and forth between verbal descriptions of motion and geometrical representations of that motion. This method of alternate representations, basic to mathematized science, is followed here many times through steps of an introduction of mathematical principles, description of physiological cycles, then returning to the formulation of differential equations suitable for modeling those cycles. The elements of the reasoning are suggested by the title of the book. <u>Clocks</u> stand for the broad spectrum of oscillators that comprise the life process, <u>chaos</u> stands for the deterministic chaos as understood in chaos theory, <u>the rhythms of life</u> refer to the experimentally and experimentally recognizable collective manifestations of biological cycles.

Ch. 2 introduces the key mathematical concepts, each of which pertains to time-related peculiarities of solutions to differential equations which model biological rhythms. Those solutions may be steady state (representing states constants in time), periodic, stable (states that reestablish themselves after perturbation) or chaotic. Transitions between any two states, a concept in mathematics as well as a phenomenon in physiology, is called bifurcation.

An aside is appropriate here. There is no complete agreement on the definition of chaos in the current enthusiasm for chaos theory. Definitions are usually given by offering examples. The situation reminds this reviewer of the Socratic dissatisfaction: if Iask you what a bee is, he said, don't tell me that there are many kinds of bees. But the following seems to be common to all uses of the concept of chaos. If a function has a region in its independent variable such that for that range long term prediction or prediction through inspection is imposible because of extreme sensitivity to the numerical value of the variable, than that region of the function is said to be chaotic. The reasons for the absence of precision of the initial conditions (or in the subsequent calculations) may be computational (due to necessary roundoff errors) or physical or biological (due to complexity or uncertainty set by nature or by experiment). The chaos is said to be deterministic because if one would know the initial conditions to the necessary accuracy, or would not need to round off numbers, or would have life enough and time, the solutions could, in principle, be calculated. What the

conoscenti appreciate in deterministic chaos is that although long-term predictions are impossible, chaotic processes (as defined) have the tendency to approach stable solutions suggesting that there is a degree of ordering even in what appears to be chaos.

These thoughts lead us to the subject of noise and chaos (Ch.3). The difficulties of generating random numbers are well known. The subject of this chapter is the opposite: how can one tell whether a set of data which appears random has elements of deterministic chaos? The answer is simple. "Clear operational definitions that can be used to evaluate the relative contributions of noise or chaos in a given experimental record are not now available" (55).

Chapters 4-8 address the details of the task set by the authors. First comes a family of mathematical models, followed by the description of different methods for turning biological oscillators on and off, and exploration of single pulse pertrubations delivered to a spontaneously oscillating physiological system, then responses to periodic stimulation. Throughout there is parallel processing of physiological examples and the appropriate mathematical tools. Then follows a chapter on spatial changes controlled from one or more centers of oscillators.

Examples from physiology are drawn from the rhythmic behavior of the autonomous nervous system, of the hormonal system, respiration, motion of the pupils, cardiac rhythms and arrhythmias, locomotion of animals and humans, from cell physiology and genetics and many other stores of biological cycles. The authors, professors of physiology at McGill University, even offer an example that appeals to the Bible. The caption to a graph says that it is an "electromyographic record [a record of electric potential generated by muscles] from the muscle of the pelvic floor of a healthy male volunteer during ejaculation using a method attributed to Onan" (93). The graph is an illustration of the "subcritical Hopf bifurcation of hard excitation" (90).

The closing chapter returns to the issue of dynamical diseases. We learn that, "A goal for many of those interested in the application of non-linear dynamics to physiology is to develop practical techniques for diagnosing pathological conditions and deciding on...therapeutic strategies for treating them" (176). The chapter serves as a review of what has been said as well as a program for diagnosis and healing, based on a model of life which sees it—in my words—as that of a coordinated clockshop whose integrity depends on the maintenance of that coordination. A twenty-five page mathematical appendix is a vade mecum for the mathematics of dynamical systems, in the form of selected solutions to certain differential and finite difference equations.

The use of dysrhythmia for the diagnosis of illness, whether on a scale of seconds or years, and the incorporation of timing in therapy, from sleep disorders to heart fibrillation, are not at all new. But as far as I know, this is the first textbook in physiology which recognizes that the life process consists of the instant by instant non-destructive coordination of the innumerable oscillators which comprise an organism and points toward the eventual replacement of emphasis in physiology from structure to process.

<u>Biologic Rhythms</u> belongs in the family of similarly massive volumes on the same theme, such as L. E. Scheving et al, eds. <u>Chronobiology</u> (1974, 784 p) and Jürgen Aschoff, ed. <u>Biological Rhythms</u> (1981, 51 p.). These three and similar other volumes, together with thousands of papers in the periodical literature, form the substance of chronobiology. The purpose of the volume is to offer "a general review of the role of biological rhythms in the normal and abnormal functions of different organ systems" (vi).

Just as the earliest astronomy consisted of the observation of the cycles of the planets and the stars, with coherence among their motions emerging only through the work of millenia, so chronobiology records cyclic biological proceses, offers increasingly more sophisticated understanding of such processes and, as a body of raw and analyzed data, serves those who care to seek overall patterns in the phenomena observed. An example is the Glass and Mackey book, reviewed above.

The general principles of chronobiology have often been outlined. With the maturing of the field, those summaries themselves improved. The chapter on the "Principles of Clinical Chronobiology" by the two editors is the best I recall having read, and the same may be said for the concluding "Chronobiology in Laboratory Medicine."

A third chapter by the editors, "Biological Rhythms in Aging" also deserves attention. In its first decades, chronobiology concentrated entirely upon the cyclic order of life, playing little or no attention to the aging order. The neglect of aging is being repaired. "The chronobiological approach to aging attempts to verify the widely held hypothesis that aging corresponds to or is accompanied by an alteration and/ or partial or total loss of our time structure" (188). After reviewing age-dependent variations in a dozen well-known cyclic processes in humans, it is concluded that changes with aging in those cyclic processes are not uniform. The reasons for the non-uniformity are such that "chronobiology alone is not able to provide response to the fundamental question of the cause of aging" (204). For an understanding of aging as a process one ought to first look to evolutionary origins of death by aging, being a corollary of the division of labor provided by the mergence of sexual reproduction. As exually reproducing organisms may, of course, die but they do not die by aging: after a cell splits, there is no body left to be buried.

The book is divided into twenty sections with a total of 47 chapters; some of them I already mentioned. Of interest to the present review is a chapter on data processing by J. De Prins and B. Hacquet (90-113) which gives a brief and cautious but totally reliable description of the current cocnept of chaos which dovetails well with <u>From Clocks to</u> <u>Chaos</u>. There are several such correspondences. In at least one of them this book comes out ahead: What in <u>Clocks and</u> <u>Chaos</u> is called "dynamic disease" is known in chronobiology by the more satisfactory name of chronopathology.

The chapters address issues in chronopharmacology and chronotoxicology, child development (represented by pa-

pers on cyclicity in pregnancy, in growth hormones and bone development), issues in physical and mental performance, sleep shift work and jet lag. there is an interesting paper by M. H. Smolensky of the School of Public Health, University of Texas, exploring examples of chronobiology as they apear in epidemiology. The variable selected for exploration is rhythmicity in susceptibility and resistance to illness, both in its individual and social dimensions.

Chronobiology is defined as a science of "quantifying phenomena and mechanisms of the biologic time structure, including the rhythmic manifestations of life" (710). It takes the experience and the idea of the flow of time for granted: time is what the clock shows. This view is consistent with the brief preface by the editors, "Biological Rhythms from Biblical to Modern Times." Providing such a review on five pages makes for a rather truncated but still satisfying overview. The preface assumes, as does the literature of biological cycles in general, that life is older than its adaptively acquired and internally generated spectrum of cycles. I believe this to be an incorrect assumption, for life itself comprises the instant by instant coordination of cyclic changes across 24 orders of magnitude in frequency (JTF).

Hoffnung, Michele. <u>What's a Mother To Do? Conversations</u> <u>on Work & Family</u>. Pasadena: Trilogy Books, 1992. (225 p.)

This book contributes to our understanding of the special needs of working mothers, as mirrored in the budgeting of time among the many, often incompatible, demands of their lives.

Professor Hoffnung has interviewed thirty women about their attitudes toward both work and family. While she recognizes that the number is too small for empirical generalizations, the interviews provide her with an understanding of the quality of these women's lives. Her book focuses upon six of the subjects in detail.

There is no clear-cut shared pattern among these women in their attitudes toward work and/or family. On the contrary, there are great variations in the lives and attitudes of each. However, one theme is maintained throughout the stories of the career women who also have children. It is what Hoffnung calls "strategic planning. . . a quality that showed up in the lives of the career women again and again, so often that it appeared to represent nothing less than an approach to live" (p. 180). These women planned many things: careers, the timing of their children, childbirth, help with child care, as well as the daily and weekly schedules which facilitated smoother running of both their families and their work.

The career women were all middle class, mobile, and educated. The decision to continue working was an active one, made either before pregnancy or at the beginning of it. Both education and prosperity seem to have encouraged planning. Those women with college degrees appeared to have the feeling that they could exercise control over their The author reiterates what we are witnessing in this country--that a growing number of young women are facing the dilemmas of how to balance family with a career. Through these stories she has demonstrated that there is no single way to work out the logistics of both. However, strategic planning appears to increase life satisfaction while it reduces the stress which accompanies having a family and career at the same time. (JFF)

<u>The Lawyers' Book of Days</u>. Hugh Lauter Levin Assocs. (1990).

A calendar/notebook, marketed for lawyers, that evokes time, associating law with time, mostly past. Popular imagery makes law (in contrast to medicine) appear to come from the past: lawyers pose for pictures with leather-bound books as a background, and invoke precedent, making reason an aspect of continuity. The overall effect of this book is to reinforce that image of law as wisdom from the past, providing security to those it protects.

The cover shows English lawyers and judges in white wigs, worn not as disguises, but as hats. One easily detects darker hair beneath, as if law places the eminence and wisdom of age on younger heads. Inside are other reproductions. A goddess of justice has usually been depicted as female.) Moses receiving the tablets of law, and presenting them to the people. Scenes of the courts of rulers and kings, where the central visual imagery is that of a throne. European scenes after 1600 begin to show lawyers in private settings, away from thrones or courts, in offices or homes, with a document, written or printed, as a center of attention. Later ones show trials in courts, some formal and (in American art) informal. Only three scenes are post-1900, one of these Rockwell nostalgia.

The introduction tells of the importance of time for lawyers. Time limits when cases may be filed and rights terminated. Specific dates and time periods are negotiated. Courts are divided into terms and have calendars with days for motions.

The format is eccentric. It seeks freedom from a weekly calendar, dividing the year into days of the month (without year to year change), but retains a preference for seven days on a page. Every date of the year recalls an historical event. Recollections may interest lawyers, but cover more than legal matters. Jan. 10: France abolished its poll tax (1784). Sept. 7: Jesse James staged his last holdup (1888). June 23: the feast day of a patron saint of prisons. June 7: the U.S. Supreme court held the use of contraceptives a constitutional right (1965). June 8: it upheld a state law prohibiting Communist publications (1925).

There would be little significance in the book's daily anniversary information without the years. Links between days of the year in different years are attenuated in modern society. There is some seasonal link that remains (more skiing accidents in winter) but as to legal matters not much is left. One might expect some patterns on significant holidays that recur on the same date every year. Jan. 1: the Emancipation Proclamation (1863); Dec. 25: Andrew Johnson's proclamation pardoning Jefferson Davis and other confederates (1868). President Bush recently evoked Christmas imagery of mercy in issuing Christmas Eve pardons. But the book, in listing only one event per date, misses these patterns.

The book has a table for holidays at the end, showing the date (not day of the week) on which significant holidays occur. Many U.S. holidays have been moved to provide longer weekends, and only a few recur on the same date: New Years, July 4th, Veteran's Day, and Christmas. Others retain independent links with weekdays: Good Friday, Easter Sunday, Thanksgiving. Holidays evoke common social memories by yearly associations that can link up, it seems, with either of the divisions into weekdays or dates of the year.

There are entries in the book of days that are "modern," though many of them are nostalgic or naive, bringing to mind dashed hopes and the limits or pretensions of law. March 28: Three Mile Island nuclear accident "raised major legal claims" (1979). December 12: President Reagan signed Gramm-Rudman law to eliminate the federal deficit (1985). Some entries recall legal repression, tending to relegate it, as legal imagery usually does, to distant times (August 2: by order of the inquisitor general Jews were expelled from Spain--1492), or places (March 23: the British in India convicted Gandhi of sedition--1922). Some comes closer--May 4: four students killed by National Guard while protesting at Kent State (1970)--but not so close as to threaten current authority.

There is, then, enough in the variety of entries to remind the reader of what much of modern law has become, but there is almost no artwork that captures modern images of futility or repression (one exception: a professor/judge and two undertaker/lawyers standing over the coffins of Sacco and Vanzetti). The past, in the psychological "background," is not only prologue but protection.

An image of the actual days of modern lawyers intrudes once to break the spell: the introduction mentions tht lawyer's calendars are now complex tools, used electronically with computers. Other than this there is no mention of the telephones, computers, moderns, and fax machines that have, with the revolution in electronic communication, redefined social, and thus legal, time for everyone. (MA)

Macar, Francoise, Viviane Pouthas, and William J. Friedman, eds. <u>Time, Action and Cognition: Towards</u> <u>Bridging the Gap. Dordrecht, The Netherlands: Kluwer</u> Academic Publishers, 1992. 407 pp.

Because cognitive psychology emphasizes human information processing and mental representations of knowledge, it is sometimes accused of leaving the person lost in thought. Although "hidden" internal processes are crucial and central, people largely construct psychological time, or nootemporality, based on their continual interactions with the external environment. Central to the whole enterprise of time psychology, then, is studying both the processes by which organisms encode temporal affordances in the flow of external events, thereby representing inherent temporal relationships among them, and the processes by which organisms act at particular times, thereby enabling or optimizing a desired outcome.

This nicely conceived, organized, and edited volume confronts issues at the interface of cognition and action, the person and the environment. It contains 38 diverse chapters, mostly review papers, empirical reports, and short communications, which were originally presented during a workshop at Saint-Malo, France, in October 1991. Books containing conference proceedings sometimes lack a unifying focus and flow, presenting instead a smattering of diverse views and research. The editors of this volume, however, circumvent this potential difficulty by placing a brief introductory chapter and a lengthy review chapter at the start of each of the five major sections. I also congratulate the editors for rapid publication, which ensures that the volume is a timely addition to researchers' libraries on the psychology of time. Nonpsychologists will find value in some of the articles, although the empirical reports and short communications are technical and intended mainly for specialists.

Some articles in Section 1 review the seminal work by Guyau and Piaget on the genesis of temporal concepts in children, but most reflect the "second wave" of research, which uses concepts, theories, and methods of modern cognitive psychology. Section 2 covers processes by which adult humans make various temporal judgments, focusing mainly on the distinction between duration in passing and in retrospect. Sections 3 and 4 are the shortest and most technical in the volume. One concerns neural-network and other formal models of internal clocks and similar timing mechanisms. The other explores how people sequence and time synchronized responses, simple movements, and complex actions. Section 5 addresses cognitive representations of temporal information, ranging from perceptual experiences to linguistic productions. The final two chapters contain an excellent concluding account by Marc Richelle and an invited address by the eminent French time psychologist, Paul Fraisse, Surprisingly, the latter contains a remembrance of Proust's past, not Fraisse's; although the essay is valuable in its own right, it only remotely relates to the rest of the volume.

This book, much better than most such volumes, documents the formal contents of a scientific conference, archivally suspended in time. It does not and cannot possibly record the informal interactions of temporal beings with each other in the striking environment of Saint-Malo.

(RB)

Mletzko, Ingrid & Horst-Gerald Mletzko. Die Uhr des Lebens. Leipzig: Urania Verlag, 1985. 128 p.

-- Biorhythmik. Wittenberg: Siemsen Verlag, 1985, 184 p.

-- <u>Die Zeit und der Mensch</u>. Leipzig: Urania Verlag, 1991, 132 p.

Die Uhr des Lebens is an enthusiastic, popular introduction to the study of biological cycles. There is nothing in the book that would be new to readers of this review, but the three volumes taken together are interesting illustrations to the sociology of science.

While an American or a (then) West German book would have been illustrated with glossy photographs, this book is illustrated with drawings in water color hues which give it a non-intrusive, understated and warm appearance. The ever-present animals teach about natural rhythms. They range from squirrels to a sow suckling her piglets, to honey bees doing their cyclic duties with the help of brooms, swords and a level, to a female lark winking at a male owl, representing the larks (early risers) and owls (night people) among us, humans. The text, I might call it the narrative, is appropriate for all ages between 6 and 96; the illustrations are those of an agricultural land closer to the world of German fairy tales than to the mismanaged, industrial and environmental mess of the former East Germany where the first two volumes were published.

In American terms, <u>Biorhythmik</u> could be described as an undergraduate text. The owls, larks and happy rodents have been replaced by graphs with carefully calibrated axes and equations with carefully defined variables. The exploration is systematic, concise, and aware of chronobiological literature. The treatment is quantitative and where models exist, analytical. Beyond treating the timers and the timed (the <u>Zeitgeber</u> and the <u>Zeitnehmer</u>) it goes on to discuss the evolution and development of biological rhythms and to a number of related social, cultural, ecological and medical issues.

Between the publication of the first book and Die Zeit und der Mensch the Wall between East and West Germany came down. Die Zeit...has a glossy hard cover that misses the warmth of Die Uhr...but the sine curves of the text became sine curves rather than arcs drawn with compass. The introductory sections are perspectives of the first two books, more or less, presented for an intelligent lay reader of the general trade; there are many graphs and illustrations but no equations. Emphasis is placed on the development of biological cycles, their systematic changes with age, their relations to the day, the season, to weather and (possibly) to solar cycles. Then follow four sections on the pathology of biological rhythms and chronopharmacology. The last third of the book deals with biological cycles in their social settings, the biorhythm of the work place and concludes with man the music maker and the beneficiary of same.

(JTF)

Polkinghorne, John. <u>Science and Creation: the Search for</u> <u>Understanding.</u> Boston: Shambala, 1989 128p.

With the appearance of the quantum and relativity theories, and especially since World War II, there has been a rapidly growing community of scientifically oriented theologians and theologically oriented scientists engaged in reinterpreting Christian theology to render it more consistent with 20th Century scientific knowledge. Certainly one of the outstanding leaders in this effort is John Polkinghorne, a former theoretical physicist at Cambridge University and now Dean and Chaplain of Trinity Hall, Cambridge.

His <u>Science and Creation</u> is a short (97 pages), highly readable book of six chapters, which focusses on some fundamental questions on how scientific and theological world views relate to each other, and in particular how they can be reconciled. It is an articulate well-written volume that presents his own thoughtful and stimulating insights on how God may interact with the world.

His first chapter reviews the case for natural theology, the apprehension of God through a reasoning understanding of nature. Stating that his book is in essence concerned with a link between belief and understanding, and using St. Thomas Aquinas' five arguments for the existence of God, he seeks not only a revived, but a revised, natural theology. It must be a non-anthropocentric theology, meeting modern needs, and finding its place in a larger more encompassing theology.

In his second chapter he primarily examines the relevance of the quantum theory and related concepts of modern physics to God's interaction with the world. It is essentially an outline of faith's search for understanding as well as understanding's search for faith.

Polkinghorne's third chapter deals with order and disorder, the relation of the effects revealed by modern thermodynamics to the Christian doctrine of creation. Chaos and order are complementary, and it is the interplay of chance and necessity that characterizes the evolution of the universe. Although moral evil remains perplexing, the interaction of chance and necessity render physical evil (earthquakes, etc.) comprehensible.

Understandably it is in this chapter that Polkinghorne presents his views on the problems of time. He maintains that the law of conservation of energy (first law of thermodynamics) and the tendency of macroscopic systems to progress to states of greater entropy (second law of thermodynamics) are "mutually interacting aspects of the one way things are." Citing Boltzmann's observation that the most probable state of a complex system is that of maximum entropy, he characterizes entropy as the "orienter of evolution" and the "pointer of the arrow of time."

Polkinghorne goes on to discuss the irreversible temporal character of a quantum measurement, i.e., the irreversible collapse of the wave function, a point clearly expressed in Prigogine's "From Being to Becoming." He continues by discussing the idea expressed in Prigogine's more recent book with Stengers, "Order Out of Chaos," that it is the randomness inherent in a system that generates its irreversibility, which he compares with the symmetric and timeless order often characterizing Einstein's thought. Polkinghorne quotes Prigogine and Stengers saying, "The arrow of time is the manifestation of the fact that the future is not given," and proceeds to support this by describing how even "billardball" classical systems are unpredictable after many collisions and are extremely sensitive to initial conditions.

The fourth chapter probes the relation between creation and the Creator. Creation is seen as an expression of the creator's purpose, and the laws of nature are signs of God's fidelity and love. With God as a ground for both being and becoming, creation is also a continuing process which by its nature is precarious. God is not just for humans alone, but the whole universe.

Polkinghorne invokes a generalization of Bohr's Complementarity Principle to reconcile the mind-matter dualism in his fifth chapter. The mental is associated with an indefinite degree of organization of the material, involving "a sort of openness of pattern." However, God is not found in the noetic world alone; this world may contain God's energies, but not God's essence.

In his final chapter Polkinghorne synthesizes the considerations of the previous chapters in seeking a "theological science" wherein the unity of knowledge comes through synthesis and not reduction. He agrees with Ian Barbour in feeling that God is known through interpretation of 1) religious experience, 2) patterns of the world, and 3) historical events. He calls for a more enlightened use of symbols and myth: the latter he says "is concerned with conveying truth so deep that only story can afford the appropriate vchicle." In his concluding remarks the case is made for a mutually enriching dialogue between science and religion:

> The scientist will find in theology, a unifying principle more fundamental than the grandest unified field theory. The theologian will encounter in science's account of the pattern and structure of the physical world a reality which calls forth his admiration and wonder.

In sum <u>Science and Creation</u> is an enjoyable, thoughtprovoking book which in an engaging and readable style presents Polkinghorne's insightful perspective not only on the problem of time but also on the abiding question of how God and creation are related (LW)

Quinones, Ricardo J. <u>Mapping Literary Modernism: Time</u> <u>and Development</u>. Princeton: Princeton University Press, 1985.

This is an excellent book (based on a paper originally given at ISST's 1973 Meeting in Japan) in which Quinones delivers precisely what his title promises. His "historical center of gravity" for Modernism extends from about 1900 to about 1940, and he argues that his greater historical distances may well help recent critics like himself to "get a sense of the shape of the mountain." Quinone's first two chapters ("The Collapse of Historical Values" and "The Family, the Machine and the Paradox of Time") show how Modernism reacted initially against nineteenth-century temporal values including the more recent Taylorism (the time-and-motion studies of Frederick Winslow Taylor) epitomized by Gerald Crich, the "Industrial Magnate" of D. H. Lawrence's Women in Love (Literary Modernism, pp. 77-81).

The process of mapping or tracing the development of Modernism leads Quinones to its second phase, in respect of which the next chapters ("Transformations" and "The Modernist Sensibility") both derive from and move beyond the "largely negative critiques of the earlier works." In the third phase of Modernism's development (discussed in the chapters "The Songs That I Sing" and "Three Major Works"), Quinones tentatively suggests that Modernism had arrived at a "culmination." He feels, however, that students of Modernism will themselves have to decide "whether, indeed, as work ofart, Four Quartets is superior to The Waste Land, Finnegan's Wake to Ulysses, or Joseph and His Brothers to The Magic Mountain." Quinones's last phase (in his final chapter "The Bite of Time") suggests something of a pulling back and a return "with most Modernists here expressing a revived sense of the reality of history, of the event and of time itself."

Mapping Literary Modernism deals with what may prove to have been the most creative literary period in our century. But as one might expect from the author of the now standard Renaissance Discovery of Time and the more recent Changes of Cain (which traces the Cain and Abel Story from the Bible to Citizen Kane and beyond) Quinones, though he refers back in particular to the Renaissance, frequently enriches his "mapping" by viewing the subject from a broad perspective. He argues in his Introduction that "Mapping Literary Modernism is...based upon the understanding that the particular time-world establishing a connection among the nineteenth-century industrialized countries (England, Germany, America and, to a certain degree, France) had its origins in the Renaissance. Consequently, the confrontation with the Renaissance is an essential one for Modernism," and he argues further that "The Renaissance, Romanticism and Modernism...are the three pivotal cultural movements and mutations of the modern world." Quinones may well be right.

If this reader were to take issue with him, however, it would be not so much because of his almost complete omission of the Neo-Classicism of the Restoration and eighteenth century, but because of the omission of a whole series of crucial inventions during that same period of the Watchmaker God and his clockwork universe. I refer in particular to such essential time-related inventions as the pendulum escapement, the marine chronometer, and the stopwatch, which surely gave rise to accurate timekceping, to the British hegemony at sea, to the British Empire, to the Industrial Revolution, and later even to Taylorism and to the related assembly-line of Henry Ford. Clearly these were the inventions that very directly influenced many of the factors which Quinones rightly credits with providing some of the initial antagonisms that gave rise to Modernism.

But it would be misleading to end on such a note. This is an excellent book by a sensitive, widely read, and perceptive critic and it deals with a period of literature and social history of great importance to anyone anxious to understand what has made Western civilization the phenomenon with which we are all concerned. Any quibbles should be attributed to Quinones's considerable ability to engage his reader. (SLM)

Reale, Paola. <u>Tempo e Personalità</u>. <u>Una Tecnica Psicodiag-</u> nositca. Roma: Bulzoni, 1992; pp. 201

Paola Reale, an Italian psychologist, has already published three excellent books about the meaning of time in our lives, and how to evaluate it.

Her more recent work has led her to develop a psychodiagnostic projective test, the "Circles Technique", for assessing *time orientation*, and more specifically *temporal dominance* (i.e. the affective priority of either past, present or future). Reale's hypothesis is that time orientation relates to basic personality dynamics and structures, but is also conditioned by cultural factors.

This present research, including both statistical and clinical investigations, was carried out on some 1,500 adolescent and adult subjects of different sociocultural backgrounds. They were required to graphically represent past, present and future by drawing three circles, which were then analyzed according to configuration, size and relative position. In most cases temporal dominance revealed a dynamic distribution of psychic energy in the future; when, on the other hand, its investment was found predominantly in the past or in the present, this was evidence of a conflictual situation (e.g. in mourning). By also submitting some of her subjects to other tests, Reale found a statistically significant confirmation of her results. For instance, both the "Circles Technique" and the "Rorschach" demonstrated that dominance of the past reflects a tendency toward introversion, while dominance of the future reveals extroverted attitudes.

In conclusion, Reale's inquiry about the subjective experience of time orientation proves also a valid source of information concerning the subject's vital energy, maturity, psychological balance, ego development and adjustment to reality, and can be usefully employed, in conjunction with other tools, for the diagnosis of emotional difficulties. We welcome <u>Tempo e Personalita</u> because it provides psychologists with a helpful methodology and an original investigative tool. (AS)

Rotenberg, Robert. <u>Time and Order in Metroplitan Vienna</u>, <u>a Scizure of Schedules</u>, Washington: Smithsonian Institution Press, 1992. Several different strands of social time run through this study. A predominant one is urban time, both as it contrasts with a rural tempo, and as it has developed over the last two centuries through industrialiation. The book views social time as not merely a gradual accumulation of conventions, but as a mirror of insitutional, group, and household power relationships.

Rotenberg traces the development of public schedules in Vienna from a 1792 benchmark to the present. On the eve of modernization there was a fully developed public schedule, quite different from today's, with more variation based upon one's place in the social hierarchy. The workday was divided into more segments, marked off by five times for eating meals of varying length. Activity was structured by clock time, the clocks of bell towers rather than individual watches. Still the functioning of even this pre-industrial society required the discipline of monitoring one's activities by a clock.

Industrialism changed the public schedule, but built upon it, saving quaint remnants (laws still, as then, require some private residences to be locked at certain hours at night). The modern work schedule, after the battles of labor gainst capital, is shorter than a century ego, closer in duration to 1792, but structured differently. Aristocracy has been redefined and restructured by organization—the more rcsponsibility and power the worker has the more likely is the work scheduled to be later in the day (later arrival, lunch, and departure) and the more likely there is to be greater flexibility (and more pay) in work.

Rotenberg goes beyond the industrial translation of time and money into each other, and considers, sometimes very briefly, such matters as the effects of shopping hours (more tightly regulated than in other economies) on households; changes in daily life (the five versus three meal day); architectural design as raising consciousness of the past to draw attention to present and future; the destruction of the neighborhood specialty store as a result of changes in work and meal times; conflict between work schedules and children's school schedules; and the role of suburban beer gardens as a playtime activity linking an urban order and a rural, differently ordered, past.

A theme running throughout is that social scheduling, the "seizure of schedules" in the title, affects us more than we recognize, and these schedules interact to form us. The case is overstated, as illustrated by an opening riddle. A young man has two women friends he likes equally who live in different directions served equally by a subway. He cannot decide between the two, so he just takes whatever train comes first after his arrival. After a year he has visited one nine times, and the other only once. Why?

The naswer is accurate, and hopelessly abstract. Even though both trains on both lines leave every ten minutes, it is the interval between the two trains that determines the train he actually took. If the downtown train arrives one minute after the uptown train, chances are nine in ten that, for a person arriving at random times, the uptown train will arrive first. The problem with this riddle, though, is why anyone, other than someone incapable of choice, would behave this way. The woman visited only once, one suspects, might in the real world ask why, if her feckless friend knew he had visited the other the last time, he could not simply choose to visit her next.

Social schedules, in other words, create certain orders of social time, but they are orders between or within which people can still choose. Rotenberg recognizes that an awareness of the temoral constrainsts of social structure gives one more flexibility to operate within them, and that different social <u>orders</u> battle for dominance, but in making social orders the object of study, misses much of the freedom, disorder, even chaos if you prefer, that maintains itself between the orders. (MA)

Stalk, George Jr. and Thomas M. Hout. <u>Competing Against</u> <u>Time</u>. New York: The Free Press, 1990. 285 pp.

The death at an uncommonly advanced age of Professor C. Northcote Parkinson in March 1993 recalls one of his lectures during his long and iconoclastic career. Economic growth, according to Parkinson, will have a profound impact on the future of culture and the arts. As income expands, the enjoyment of ever more things becomes possible. Everything is variable, but only one thing is constant-time. So as growth proceeds, time-intensive art forms such as the opera and symphony concerts, or culture-appreciation trips to Angkor Wat in Kampuchea or Borobudur in Indonesia will inevitably sufferat the expense of museums and books on art, which can be breezed-through on fast-forward and checked-off on the list eventually to be presented to St. Peter on checking-in at the Pearly Gates. So the performing arts and out-of-the way cultural attractions had better prepare for lean times, while the more time-efficient visual arts should prepare for boom years ahead.

While tinged with Parkinsonian wit, such theorizing makes the point that time, as both a constraint and a variable, has clear economic dimensions that can be critical determinants of behaviour and performance on the part of businesses, consumers, lenders and investors, among others.

This book deals with the dimension of time as a variable in the new world of global competition. In an era conditioned by high private and social discount rates (money now is worth a lot more than money later; social benefits now dominate worrying about the next generation) the adage "time is money" takes on a whole new meaning There are time dimensions imbedded in productivity, service quality and innovation. And as Japan's time-based competitors have demonstrated only too well, lack of attention to time as a competitive weapon allows the enemy to "clean one's clock" (to use a Swiss expression) in the marketplace.

The authors consider time-based competition in each of the forms in which it appears on the global competitive playing field—just-in-time production, time to market, cycle time in product examples are cited of companies that have successfully used time as a competitive weapon, alongside others where rivals have had a clear time-based edge. Anecdotes are drawn from the experiences of Federal Express, Ford Motor Company, John Deere, Honda, Toyota, Wal-Mart, Citicorp, Sun Microsystems, Harley Davidson and many more. Some of the war stories are very well known and seem to have been clipped from articles in the newspapers, but they are fitted into a structure that gives the book as a whole considerable substance.

Besides making the case that time has become a critical variable in economic life, the authors also dispel some widespread myths. Among the conclusions: faster, greater variety, and greater quality do not necessarily mean more costly, provided the value of time is properly accounted-for. Unless the customer can have what he wants when he wants it, he will turn elsewhere even in the face of a better product or a lower price. Time-sensitivity can actually produce new market niches capable of supporting higher profit margins that other forms of market segmentation.

As Type-A management consultants who presumably run up escalators toward the ultimate reward Gurudom, the authors of this book provide plenty of advice for managers looking for helpful hints on how to put the lessons into practice. They have informative chapters in how to design even large and complex organizations for improved performance in time-based competition, how to motivate managers and employees to buy into the concept and "walk the talk" (to use a term that will hopefully perform a just-in-time disappearing act), how to use time upstream and downstream at the interface with suppliers and customers, and how to incorporate the time dimension into overall business strategy.

This is a good book. It is well written and easily accessible to managers and intelligent laymen. Although a bit stem-winding at times for those who would rather be sailing, there is enough of value here to make it well worth the time it takes to read.

But as Parkinson would doubtless suggest from his perch on high, this book is probably a good candidate for an abridged "books on tape" version, to digest in the car on the way to and from the office. Or maybe, for those old enough to remember the time-efficient ways of preparing book reports in grade-school—there's room for a Classic Comics version conveying an instant version of the story. (IW)

Taber, Anthony. <u>The Boy Who Stopped Time</u>. New York: Margaret K. McElderry Books, 1993. (unpaged)

The author has illustrated the magical thinking of young children with regard to a concept like time. In this book for preschoolers or early readers the central character stops time, or specifically, he stops the clock in an effort to avoid his bedtime.

The consequence of his actions are, at first, interesting and later become somewhat frightening as he explores a world where everything and everyone is frozen and silent at the moment in which he stopped the pendulum on the family clock. When the reality of what he has done becomes stronger, he accepts the fact that he must go to bed, in fact he welcomes the return to a normal pattern.

Second graders who read this book were intrigued but not excited by it. Some related it to TV or movie fantasy. One child criticized the illustrations, feeling that the author/ illustrator did not present the child's appearance in a consistent way. This group of children felt that this story would be more appropriate as a read aloud for younger children.

(JFF)

Tarkowska, Elizbieta <u>Time in Polish Life: Results of Re-</u> scarch, <u>Hypotheses</u>, <u>Impressions</u>. Warsaw: Polish Academy of Sciences, Institute of Philosophy and Sociology, 1992; 167 p. In Polish.

"This work is an outlook on Polish society of the eighties from [the point of view of the] sociology of time. This point of view—relatively little known and not applied by Polish sociologists—will deepen and supplement...the knowledge about this society and the transformation it has been undergoing. [It will also] be a contribution to general chronosophical knowledge concerning regularities of temporal phenomena in a society during the period of crisis and change.... The case of present day Polish society with its temporal obsessions and fascinations, may be almost a bookish exemplification of changes in the attitude toward time closely connected with the changes in other spheres of social life.

"Recent developments in Poland...[which] is a break in continuity and permanent instability, impose the necessity of using temporal categories as the categories of description and understanding....

"...instability and lack of continuity result in concentration on the present...with the striking lack of prospective orientation. In this work I try to reconstruct the characteristic presentist orientation accompanied by a reduced future perspective (a set of phenomena which I analyze under the heading of 'uncertain future')....

"...I am interested in the attitude towards the future, for I consider these phenomena [as being] neglected by the researchers of Polish reality....

"The book ends with an essay on Americans' attitude towards time and on new trends showing up in the sphere of temporal phenomena. In my opinion this element of comparative view broadens the outlook on the Polish situation placing it not only in the sphere of cultural differentiation but also on the scale of civilization distances."

From the 1300 word English summary on pp. 165-7 of the book.

TEMPORALISTES

<u>Time's News</u> salue "TEMPORALISTES", publication en langue française qui se veut un instrument de liaison entre les chercheurs attachés à l'étude des temps en sciences humaines.

Publication trimestrielle informelle, elle est prête à accueillir de courts articles, voire de simples notes susceptibles de lancer des dèbats d'idées. Les thèmes sont empruntés à toutes les disciplines des sciences humaines, et particulièrement la sociologie. "Temporalistes" ne relève d'aucune école", assure un éditorial, "et toutes les études concrètes, tous les travaux de terrain, à quelque domaine des sciences humaines qu'ils appartiennent, y trouvent leur place."

L'équipe animatrice paraît persuadée de l'existence de multiples temps qui se complètent et parfois s'opposent (à l'instar du temps linéaire et du temps cyclique). Elle semble penser que la technique, par le développement des contraintes temporelles croissantes qu'elle a entraînées, a opéré un appauvrissement de l'appréhension de cette notion dans la société contemporaine. "Le mot temps employé au singulier ne deviendra un terme abstrait (et non la désignation d'une entité) que lorsqu'il recouvrira une grande multiplicité de temps découverts, reconnus et recensés. Pour le moment quand on parle "du" temps, ou bien on désigne le seul temps dominant des sociétés industrielles, celui des horloges, qui nous hante, ou bien on éveille une image, une mythologie, on affirme un postulat philosophique. Dans un cas comme dans l'autre, l'impérium du mot sur le chercheur paralyse ses efforts et en dénature le fruit" (William GROSSIN).

C'est dire que la lettre encourage les contributions les plus variées, suceptibles d'éclairer la pluralité des temps. Temps et musique, temps et relations sociales, le "temps dollar" (pour une comptabilité temporelle plutôt qu'économique des actions de solidarité), le temps mûri par le souvenir chez un Proust, sont quelques-unes des facettes récemment évoquées de la notion de temps.

Animée par le Pr Roger SUE, de l'Université Paris V et par le Pr. William GROSSIN, de l'Université de Nancy, elle compte parmi les membres du Comité-Conseil la Présidente de l'ISST, le Pr. Helga NOVOTNY. Correspondence: "Temporalistes", c/o Roger Sue et William Grossin, UFR des Sciences de l'Education, Université de Paris V, 28 rue Serpente, F 75006 PARIS. (R.L.)

TIME & SOCIETY. An International Interdisciplinary Journal

January 1993 Time and the Significance of the Rural in a British Soap Opera/Time and the local Constitution of Society: A Northern Philippine example/ Present Concern with Future Time: The evidence of building permanence and mutability/ The Historian's Time/ Father Time/ Across the Great Divide: Animal psychology and time in humans / The Role of Event Time in Attending

<u>May 1993</u> The Gender of Time in Professional Occupations/ Technological Evolution, Working Time and Remuneration / Political Time: the problem of fime and chance / Temporal Experiences and Time Knowledge in Infancy and Early Childhood / Toward a Formalization of the Semantics of Some Temporal Prepositions / Symbolic and Other Cognitive Models of Temporal Reality

September 1993 Time, Information and Communication Technologies and the Household / Time and Strategic Action: A cross-cultural view / A Temporal Approach to the Relationship Between Education and Generation / Past and Future in Young Women's Experience of Time / Attitudinal Identification, Stimulus Complexity and Retrospective Duration Estimation

FUTURES

The Journal of Forecasting, Planning and Policy

<u>September 1992</u> Transitional economics / A possible solution to tropical troubles? / Green management: the next competitive weapon / Future fall-out from the genetic revolution / Gorbachev as dramaturge

October 1992 Environmental problems and sustainable futures / Does sustainable development lead to sustainability? / Structural and institutional adjustments and the new technological cycle / Using GDSS to examine the future European automobile industry / Computer technology and the location of economic activity

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December 1992 The good, the true and the post-modern / Reconceptualizing the cultural dynamics of the future / The Third World and the New World Order in the 1990s / Modernizing innovations / Regulating the electricity supply industry by valuing environmental effects / Telework remains 'made to measure'

January/February 1993 World 2000 / The contours of integrated Europe / Simple gifts: complex environmental hazards and the responsibility to leave a controllable world / International trends in construction technologies and the future of housebuilding / Information-decision structures and futures research

<u>March 1993</u> Reading the project, 'Global Civilization: Challenges for Sovereignty, Democracy, and Security' / Scenarios on economic and social cohesion in Europe / is it <u>April 1993</u> The substantive knowledge base of futures studies / From 'who am I?' to "where am I?' / A way through the maze / Metaphors and the language of futures / Futures concepts / Stranger than fiction / Social innovation an citizen movements / An overview of Western futures organizations

<u>May 1993</u> The earth summit and Japan's initiative in environmental diplomacy / The economy as an organism not a machine / Forecasting scenarios for South Africa / Cultural trends, troubles and transformations / Dematerialization: long-term trends in the intensity of use of materials and energy.

June 1993 Time and Society / A major change in working time / An international comparison of working times / The social-organization of time / The evolution of working time in Germany / Recent working time developments in the UK / Japan: the reduction in working time / More work for some, less work for others / The economic effects of reducing the reorganizing working time / Post-industrial convergence in time allocation / French policies on working time

<u>July/August 1993</u> The future of industrialization / Technical change and future trends in the world economy / The new age of capitalism / Services in the new industrial economy / The hidden dimension of industrialization / Rethinking development / Flexible specialization, new technologies and future industrialization in developing countries

September 1993 Science for the post-normal age / Technology forecasting in Japan / Communicating with the future

October 1993 Looking for the real 'megatrends'/Review and impacts of climate change uncertainties/Growth and impact of the subterranean economy in the Third World / Do not adjust your mind: Post-modernism, reality and the Other / Pacific science in the 21st century / Valuation in development projects: enlarging the analytical framework

Also received:

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

Swart, Gerhardus Paulus. <u>Time and Architecture: the</u> <u>Interrelationship between Time Concepts and Meaning in</u> <u>Western Architecture</u>. Bloemfontain (South Africa): University of Orange Free State, 1989. Duplicated typescript with illustrations of master's thesis, 245 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.

This newsletter was projected for December, but instead will greet you as the year turns new. The timing and the season seem appropriate for thoughts on time. Past and future are more clearly defined than at any other time of the year as we take stock of what's been done and project or resolve to do everything 10 times better tomorrow.

Likewise ISST completes its three-year cycle with <u>The</u> <u>Study of Time</u> VIII ready at the publisher and Conference IX distinctly in the air. "Time, Order, and Chaos" is a topic with much promise of stimulating lively and fruitful discussion in the beautiful setting of the Laurentian Mountains.

Even the season speaks of time—outside my window is a world turned white, and erased of all imperfections, jagged edges, drab colors, and busyness. The snow falls and everything slows down; cars barely make it up the hill and gradually stop trying altogether. Schools and businesses close. People, whose activities have been suspended, retreat to their homes and quiet themselves too, watching distinctions blur in the frozen stillness. There is a period, before the hustle and bustle of shovels, snow plows, kids on sleds, and whizzing snow balls, when, as Elizabeth Bishop says of the winter air, "Time's in her pocket, ticking loud on one stalled second." For a while, "atmosphere" not change holds the world together...until, inevitably, the stalled clock "falls in wheels and chimes of leaf and cloud."* The next newsletter is scheduled for the Spring thaw and will be devoted to information about the 1995 Conference. Any information, announcements, letters, or temporal tidbits should be sent to me at the address below.

In conclusion, I would like to give special recognition to Carol Bresnock whose secretarial finesse makes this newsletter possible. Carol has been with Penn State for 16 years and heads the Word Processing Center. She works on the newsletter by finding time in between her other job responsibilities. The task is quite time-consuming since the copy goes through many versions, changes, shifts, and arrangements before completion, but Carol handles it all with remarkable patience, persistence, and skill. She is everready and willing to do her utmost on a project. Hats off and sincerely felt thanks!

> Marlene P. Soulsby Penn State University Worthington Scranton Campus 120 Ridge View Drive Dunmore, PA 18512 U.S.A.

*Taken from Elizabeth Bishop's poem, "The Colder the Air"

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The Study of Time VIII DIMENSIONS OF TIME AND LIFE Edited by J. T. Fraser and Marlene P. Soulsby (Tentative Publication Date: December 1994)

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Time's News No. 22

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 six volumes of *The Study of Time* series with over 150 articles, making for a total of 2800 printed pages. The eighth volume will appear in 1994.

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 of 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 rk 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 1991 the Society's membership was 250, 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 six volumes of papers selected from its six 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: Castello di 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, 1994)

From the pamphlet The Study of Time Has Come of Age.

