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The linear time model in history

KRISTOF GLAMANN
Høeghsmindeparken 10, DK-2900, Hellerup, Denmark.

Chronology has been called the backbone of history and it is true that the linear time model in the shape of a chronology is an indispensable tool always at hand in the historian's workshop. It furnishes him or her with the four parameters of sequence, duration, setting and frequency, all necessary and most useful in the deployment of the historian's material. The chronological concept of time also underlines the irreversibility of time, which is part of the historian's creed and an assumption that governs his or her ideas of causality. The influences emanating from the physical time-scale are, in fact, far-reaching and some of them may easily deceive the scholar in his interpretation of the Past. Among these are the magic of figures, the concept of continuity as well as the idea of universality and the determinist view of the Past, and, furthermore, the ideas of contemporaneity, globalization and the uniqueness of phenomena. This paper maintains that the Universe of the Past is inexhaustible and heterogeneous. It cannot be measured by a common chronological standard. Periods based on chronology alone are empty vessels in which many times and many ages roll back and forth in contrast to periods with an individuality of their own (such as the Renaissance or the Enlightenment). After all, periodization is a process involving a combination of the two dimensions of setting and sequence, this means an intriguing operation imbued with puzzles, which the historian has in common with the social scientist.

A sense of time is something at once casual and exceedingly complicated. That is an old observation, and let us at once get it over with and quote the celebrated words of St Augustine: 'I know well what time is when no one asks me. But when I am asked, I no longer know what it is.' We are all familiar with time from our daily experience. It is part of our consciousness, *Vulgärzeit* – so called by Martin Heidegger – is a *continuum*, yet it falls into three segments: the past, the present and the future. Each segment is distinct, yet the three of them glide into one another, fluid and without boundaries. Time moves in a fixed direction and is a medium for all happenings, but it is itself a happening since it becomes and dies. At the same time it is not a happening, because it is always there. The normal experience of time depends on a congruence between, on the one hand, the outer, public, objective time (world-time), which

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rests upon the movements of celestial bodies, the cycle of the seasons and the chronometer, and, on the other hand, the inner, personal, subjective, experienced time (self-time or 'I-time').

Sociologists have interested themselves in time as related to social class. There are as many 'times' as there are classes or groups. The family has its time: the school has its time; so have the office, the factory and the barracks. The farmer's time follows the rhythm of nature. The church's time follows the festivals. The businessman's time is money. It is discontinuous, sometimes hectic, sometimes laggardly.

Is our intuitive grasp of time primitive or derivative? Is it identical with our intuitive grasp of velocity? These questions, suggested by Albert Einstein in 1931, led Jean Piaget, the Swiss psychologist, to study the genesis and development of children's conception of time. Piaget found that time is not an *a priori* intuition, but must be constructed. His experiments were centred particularly around physical time. Pedagogues and others have tried to study the relationship of the child to such dimensions as abstract time and historical time. These efforts have demonstrated convincingly the difficulties children have in understanding historical time.

Children may have a particular liking for tales of the Past, especially dramatic ones, and they may fancy colourful reconstructions of ancient houses and villages, as well as the performance of historical plays involving Vikings, knights, musketeers, and such like, but it is not until the age of 11, more or less depending on their educational and family background, that any concept of historical time in the traditional sense emerges and becomes differentiated into various historical periods. A full understanding of chronology may not develop before the age of 16.

Not only children but also many adults have difficulty with historical time. In 19th-century London, members of the cultural elite were amused to learn that Prime Minister Disraeli's wife was never able to remember who came first, the Greeks or the Romans. Such confusion also happens nowadays. A young economist having just graduated from my university was asked which came first: 'The French Revolution or Napoleon?' Somewhat hesitatingly he answered: 'Napoleon'. Asked how he came upon this answer he said: 'To be honest I didn't know, but Napoleon was a dictator and usually dictators are followed by a revolution.' A social scientist might give him credit for his reasoning, but the historian will be inclined to ask the candidate to reconsider his general ideas of dictatorship and revolution in the light of his wrong answer.

We may suppose that the mental process involved in going back into the past via the ordered chapters of a history book is a faculty relatively recently acquired and one that has to do with instruction and training. The same applies to the abstract concept of a uniform worldwide time, which is scarcely more than a couple of hundred years old and closely associated with literary education as well as with improved and synchronized timekeeping.

Thus, the historical time-sense is something in which children and adults alike have to be educated. It rests on a conglomerate of memorization, socialization, scholarship, education, and of the imprint of the media. The study of the Past means finding one's way amongst Man's activities in space and time and, like all navigation, it needs instruments and instructions. One tool that has constantly and with much diligence been used in the historical workshop is the chronological yardstick.

The measurement and calculation of time are among the basics of a civilization. The

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chronometer and the calendar together form a complex and fascinating construction in both the literal and the figurative sense. Instruments are seldom neutral: they affect those who create them and those who use them. The mechanical clock, for example, not only improved timekeeping and produced impressive practical results (in astronomy, in navigation and in working disciplines), but the underlying designs and principles affected the speculations of philosophers and scientists in a more general sense. Thus, Kepler asserted that the universe should no longer be viewed as a divine living being, but ought instead to be compared to the mechanism of a clock, an utterly revolutionary way of looking at things indeed. God ceased to be God and became a watchmaker.

Behind the mechanics and the systems there lurks the science of mathematics, of which it has been said that it is a discipline at once both abstract and concrete – abstract inasmuch as it is founded upon general concepts, concrete in the sense that it never affords grounds for misinterpretation. First and foremost, mathematics says something about the fundamental human thought processes. Its essence is freedom, which means that its habits of thinking cannot be applied directly to other fields. Nevertheless it has shown itself capable of describing the real world to a surprising degree.

However, everything that is true of a symbol or sign, e.g. a number, is not necessarily true of that which the number represents. We may transfer the properties of the measuring system to the object being measured. And indeed this does happen when a continuous figure-series in the form of a chronology is imposed on the reality which we call history. Some of the properties of the figure-series are transmitted to the material and influence our interpretation.

The chronological concept of time is linear, presenting a sequence of natural numbers, a continuous function, that can be drawn graphically in its entirety without lifting the pencil from the paper – to put it in a popular sense. It has no 'gaps' or 'breaks'. The arrow of time points forward, spurred on by the growing figures. Historians may be called backward-looking prophets, but the irreversibility of time is part of their creed and a presumption that governs their ideas of causality. Chronology reveals the sequence or the order in which events of the past unfold themselves (A cannot cause B if B lies prior to A on the time-scale), furthermore, the chronological yardstick allows the historian to measure the duration of an event or a process, it also indicates where the events take place in point of time, i.e. the setting or the context of the phenomena ('tell me the names of your friends and I shall tell you who you are'), and, finally, the time-scale reflects the frequency of the happenings. These four parameters (sequence, duration, setting and frequency) are of fundamental importance to the historian. So the linear time model in the shape of a chronology is indispensable. It may be compared to the botanist's botanical guide, helping the scholar to identify the plants growing in the garden of the Past, but letting him or her down when it comes to the interpretation of more complex phenomena, such as habitat, ecology, evolution and other organic and behaviouristic matters of life.

Perhaps the shortcomings of a strictly applied linear interpretation of the Past stand out most clearly when the historian deals with periods. Historiography abounds in periods. To a very large extent, periodization can be said to be identical with the writing of history and a considerable part of historical scholarship springs from discussions of the demarcation, appropriateness and nature of periods. Periodization rests upon the belief that, during a given

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time-span, a cluster of characteristics permeates many areas of life and may be supposed to relate diverse trends and events in society to each other. During this process of clustering-together, the linear concept willingly offers its services with some easy but dubious interpretations. The influences emanating from the physical time-scale are, in fact, far-reaching. In the following I shall deal with some of them.

First, I shall consider the magic of figures, then the concept of continuity and its consequences: universality and the determinist view of the past. Thereafter, the twin ideas of contemporaneity and globalization, and finally the uniqueness or *Einmaligkeit* of past events will be discussed.

We know from daily experience the historical sensation generated by peals of bells and the calendar. It manifests itself most especially when we come to round numbers, i.e. calendar dates ending in a zero. At the transition from one decade to the next, the posthumous reputation of the just-ended becomes organized virtually automatically. People, especially those who work in the media, suddenly rush about attaching labels. Some of these stay fixed, but others fall off and are replaced by new ones, for the decades as such are tenacious of life and are regarded as entities in their own right. They form a motley spectacle: Naughty Nineties, Roaring Twenties, Swinging Sixties and all the rest of them. The situation is even more frantic when two zeros come together. When the centuries turn, apocalyptic forebodings and visions of a new age dance a veritable can-can of confused sensations, with prophets as choreographers. Such was our experience at the expiry of the 19th century, when a *fin-de-siècle* atmosphere went hand in hand with popular theories of degeneration and equally superficial evolutionistic expectations of the newly born twentieth century. To cross the watershed from one millennium to the next is like witnessing some stupendous eclipse presided over by sorcerers. I need not tell you that we are in the midst of it.

Calendar-fetishism, let it be said, casts its spell over people, institutions, movements and nations alike. The round year numbers and the magic that radiates from them may be likened to hormones that ripen the History Body. When the great date arrives, commemorative volumes appear, speeches are delivered, and now and then some simple or not so simple monument is raised. Round numbers are among the vital forces of historiography, often disregarded by members of the profession but impossible to evade. The *post mortem* is a major operation: scholars initiate debates on how long the sixteenth century really lasted, the duration and geographical extent of the seventeenth century crisis, when did the eighteenth century close as an epoch, or should we let the nineteenth century end in 1870, 1899 or 1914?

Let me turn to another quality that is derived from the chronological scale, that of continuity.

Philosophically, the continuous character of all empirical phenomena is derived from the continuity of space and time. Leibnitz considered it to be one of his most important maxims that 'Nature never makes jumps'. He called this principle the law of continuity, and *lex continui* has had a firm grip on the minds of many scholars and scientists. The English political economist Alfred Marshall, the last great systematizer of the liberal era, chose this law as the motto of his *Principles of Economics* (1890), thus indicating his fundamental belief in the gradualness of all economic and social processes while at the same time, and for the very same reason, rejecting any policy that would involve over-rapid changes in society.

The continuity approach strikes deep chords in the breast of the historian too. Very few of them would deny its necessity and utility. Nevertheless, it must be remarked that uninhibited

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application of this principle can lead to results of such implausibility that the capacity for observation must be said to have been damaged. A couple of examples may illustrate this.

The idea of time as a forward-moving, continuous figure-series has been clothed in many metaphors, the best-known of which is the 'current of time' or 'river of time'. In an essay on history written in 1904, Bertrand Russell conceives the past to live by virtue of the universal phenomenon of death, which constantly and inexorably delivers its harvest to that temple, built by all the ages, in which all things are stored away. By the pathways along the river of time the children of men walk slowly towards the grave. Their long march ends in the silent domain of the past. There the weary lay themselves to rest; the sorrowful find their ultimate peace.

This satellite view of Man's fate is linear to the point of being almost 'timeless'. Beautiful as it is, it has little appeal to the historian who always feels his feet getting heavier and heavier the further he proceeds in the direction of the general.

Alongside the Great Book-of-Time Concept flourishes the notion of the inevitability of the tide of time, the determinist view of history. Everything and everybody have their appointed places on the time-scale. No man can escape his destiny. The consequences of every action emerge more clearly the greater the distance in time from which one appraises it. This applies to one's personal evaluation of existence, as well as to the historian's evaluation of the past.

The tide of time engulfs everything and everyone. From continuity to universality is but a short step. A generation ago it was fashionable to define the historian's trade as being a totality. Another fashion was the so-called holistic concept, formed under the influence of, *inter alia* biology and social theory. History in all its aspects was the thing. This conception is based upon the assumption that the entire historical universe is capable of being charted and exhausted. There are some who still believe that if only we could know everything about the past we should have found a kind of flow of living reality, without gaps, in fact a *continuum*. But this is not so. The aspects of history shift with the generations, and there is no collective sum of all the aspects. The idea of universality derives from the concept of continuity in its unfruitful version.

Globalization is another catchword of our day, it rests on the conception of the contemporaneity of all things. We are so easily deceived by the media. Everything happens in front of us on the TV-screen: earthquakes in Chile, repair of spaceships in orbit, air-raids on Belgrade, dying aids-victims in Africa, tornadoes in Arkansas, forest fires on Borneo, from Mt Everest the dying mountaineer's farewell to his wife in Australia. We hear the voices and we see the pictures. The global NOW is the heartbeat of our modern standardized totality of time monitored by hoards of journalists and photographers who call themselves the second-hands of history. Everything is being woven into a synchronized flow of events running through a long continuous cable of time engulfing us all.

The linear time-model also induces the *Einmaligkeit* of history. Automatically the years become obsolete. Time devours itself like the cruel god Chronos who ate his children. When a year has gone and joined the sequence of bygone figures it cannot be recalled. *Es gibt nur einmal, es kommt nicht wieder*. In this sense history does not make room for *anachronisms* and yet, anachronisms are a fact of life. We all know that life is not interlocked with the clock or with the calendar. Man's psychosomatic and mental equipment defies his age and so does society's. The cultural layers of a civilization do not follow any chronological order and are unverifiable. Beneath the surface lies a deep sea of latent possibilities, some benign, others

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fatal. When they emerge they play havoc with the idea of contemporaneity, pushing themselves into contexts to which they do not belong chronologically.

To sum up, the historical universe is inexhaustible and heterogeneous. It cannot be measured by a common chronological standard. At any given point of the scale, the historian is faced with a number of events and phenomena which, because of their localization in different regions, are contemporary merely in the formal sense. Each of these events or phenomena can be understood only when its position in specific sequences is taken into account. Putting it another way, contemporary events are often asynchronous (not happening at the same time) in their intrinsic nature, hence it does not make much sense to view the historical process as a homogeneous flow or as a march of time.

Once it is agreed that calendar time as such is an empty vessel, calendar history viewed as a great continuous flow also has to be scrapped as a category of explanation. From being thought of as a meaningful, spatio-temporal unity, calendar history is reduced to a sort of waiting room. Many times and many ages meet and intersect within this framework. Historians are well aware of that. It is a long time since they availed themselves of pure calendar time in the annalistic sense as an expository principle. Nowadays, they follow a chronological pattern in deploying the material, but in their interpretation and in their writing, chronology is combined with periods based on other categories, reposing like pearls on a string, each with its own individuality. These periods or sequences have upper and lower thresholds, a 'before' and an 'after' indicate their place on the time scale.

In historiography, the time-factor is of very variable length, from the short, linear, causal explanation to long series, e.g. of the genetic type. The length is governed not only by the nature of the phenomena, but also by the spatial span of the investigation. It is a belief held by many that the more comprehensive an insight, the more significant it is. According to this axiom, the highest abstractions contain the essence of everything that exists on the lower and more concrete levels. How valid a concept this is in the case of history, however, is debatable. Most historians feel that when they move beyond a certain boundary, the value of their insight decreases rather than increases, which does not preclude the existence of long-lasting phenomena forming meaningful entities or units.

Economic and social history deals with the sort of transformations of which decades and centuries, rather than years, months and days, constitute the framework. Without knowledge of these vast and often gradual processes, essential portions of our understanding of the human condition may be lost, including the conditions under which we live in the world today. Other disciplines too are interested in the structural changes in the life of the community and therefore in the long historical perspective. This applies, for example, to archaeology or social anthropology.

Today, historical research is rapidly expanding in three areas, all of which are relevant to the discussion concerning periodization: (a) the basic living conditions of people, demographic data on births and deaths, marriages, family size, the average lifespan of generations, data on diet, illness and housing, how the household is organized, the relationship with nature, history without people (climate etc), ecology; (b) the structures and organization, production forms and technology of economic and social life; (c) the collective mentality, religious and political systems, conceptions of the outside world, the general perceptual framework within which people react both to day-to-day problems and to the more extraordinary vicissitudes of

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existence. This historical groundwork implies interdisciplinary cooperation and is most demanding. In terms of methodology, it assumes that the time factor is made into an analytical concept of the same character as space.

Let me conclude by declaring that no sensible historian would deny that coincidence in the wider sense involves common effects. To revert to the simile of the waiting room: the people staying in the room are brought together more or less by chance, but they probably do speak a language that is coloured by their region and time, their conceptual world is common to most of them and so is their attire, and they may share tragic or uplifting experiences, such as 'the lost generation' of World War I or the Beat Generation of the 1950s.

His or her own experience of life as much as anything will cause the historian to refuse to reject the period-category as an ordering principle. He or she will declare, and with good reason, that in the case of certain periods there is a convergence of regional sequence in which the elements are bound together in a time-pattern that has its own individuality. The 'Renaissance' and the 'Enlightenment' may be cited as examples of such period-categories within Early Modern History. They will continue to be meaningful to most historians. They are homogeneous and have a different kind of life, almost organic, from the periods driven merely by the ticking of the time-machine and the automatism of the calendar.

The greatest coherence is exhibited in the culturally-stamped periods. The historiography concerning Early Modern History shows that. Arguments over periodization are not so much about what events occurred, for most historians will agree about this, but rather over the meaning of those events for an interpretative unit of a certain time-span. A period should, as I have said, display a cluster of characteristics permeating many areas of life. It is supposed to relate diverse trends and events in a society.

In theory, one period should bear little or no relationship to another, because each is a whole, but in the historical analysis of a society, the second period must have derived from the first because of the continuity of the society. In historical research there usually exists a period of transition that is blurred analytically but is nevertheless existent in the past of a society and important to the written history of the past. These perplexities of distinguishing one period from another are evident, for example, in the long controversy over the existence of the Renaissance. Are the Middle Ages and Renaissance only two parts of the same period or two separate periods? This is what you may call the dilemma of continuity and change in periodization.

The concept of time as historical setting is static. Even in the case of a period that might embrace many years' duration (as do all my examples in this paper) the passage of time as measured by change is held constant in order to study the configuration of that period. For this reason, one might say that the study of time as historical setting poses the same problems in regard to wholes and parts as any static or stable equilibrium study of a system.

The attempt to combine the two dimensions (of historical setting and flow or sequence) poses grave problems not only for historians, but also for social scientists in general. They find it hard to reconcile what they call a synchronic analysis of a whole with a diachronic analysis of its parts. As the etymology of the words would suggest, a synchronic analysis is the study of a cross-section of the whole at a single point in time, whereas a diachronic analysis is the study of an item through time.

'Time is the space wherein man evolves'. That old dictum is topical in today's world where

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we are witnessing an alarming curtailing of the collective memory both in the media, with the electorate, and in the sector of education. The historical time scale has shrunk into almost nothing, the beneficiaries having been the Present or (in the words of the sociologists) the Extended Now, which has pushed itself forward at the expense of both Past and Future. A keen observer of the modern scene has maintained that living memory now covers only seven days. Seven days are the biblical span of time of the Creation. At the turn of our millennium we know that we need only a split-second to destroy it all, so let that be the sombre omen to those who are now steering the vessel towards the Future unacquainted with any experience of the Past and left high and dry by our educational system.

About the Author

Kristof Glamann was a Professor of History in the University of Copenhagen 1960–1981, Chairman of the Carlsberg Foundation 1976–1993 and of Carlsberg Ltd 1977–1993. He is an Honorary Fellow of the British Academy, Honorary President of the International Economic History Association and a founding member of Academia Europaea. He has written extensively on economic and business history.

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