

The Generative Relational Account of Time:
Calendrical Practice, the Stratification of Cosmological
Content,
and the Authority over Time in the Chinese Case

A Preliminary Discussion

Wanhong Huang
huangwanhong@serendip.ngo

Abstract

[Abstract to be written after the body is complete.]

Keywords: calendrical practice; temporal strata; cosmological content; generative relational being; Chinese astronomy and divination

Draft. This is a working draft. It is circulated for comment, and its arguments, formulations, and open questions are subject to revision. Correction and criticism are welcome at huangwanhong@serendip.ngo.

Licence. © 2026 Wanhong Huang. This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International Licence (CC BY-NC 4.0).

You are free to share and adapt the material, under the following terms: you must give appropriate credit, provide a link to the licence, and indicate if changes were made; and you may not use the material for commercial purposes. The full text of the licence is at <https://creativecommons.org/licenses/by-nc/4.0/>.

Use of generative artificial intelligence. Generative AI assistants (Anthropic’s Claude and OpenAI’s ChatGPT) were used extensively in preparing this manuscript: for literature survey, for drafting prose from the author’s specifications, for adversarial review of the argument, and for consistency and citation auditing and typesetting. No simulation or empirical result is used in this paper, and its arguments are discursive throughout; the tables summarise the stratum scheme and the survey argued in the text. Formulations and objections arose in the course of that exchange as well as from the author. Every claim, argument, and citation was reviewed and decided by the author, who is responsible for the content and for any errors. Bibliographic details are to be verified against the primary sources before reliance; on this subject in particular, where popular material is abundant and unreliable, the author has admitted no historical statement that could not be traced to specialist scholarship, and has recorded in the text where a claim rests on a single source.

Suggested citation: Wanhong Huang, *The Generative Relational Account of Time: Calendrical Practice, the Stratification of Cosmological Content, and the Authority over Time in the Chinese Case: A Preliminary Discussion*, working draft, 2026.

1 Introduction

[*Drafted last.*]

2 Relation to Prior Work

[*Drafted after the body.*]

3 The Standing of This Account

This section fixes the standing of the account the paper offers: what kind of claim it makes, on what warrant, in what relation to the literatures it reads, and under what constraints. Its objective is to state these once, in the framework's own terms, so that every later section can be read against them. The section states the relational standing of the account (Section 3.1), the nature of its contribution (Section 3.2), the criterion by which it asks to be judged (Section 3.3), the burden of translation it accepts (Section 3.4), the evidence-type discipline it observes (Section 3.5), and the three constraints that bound it: the anachronism guardrail, the refusal of ranking, and the separation of description from justification (Section 3.6).

3.1 The Relational Standing of the Account

The paper works within Generative Relational Being. **Generative Relational Being (GRB): A theory of how subject, meaning, value, creation, and normativity co-emerge through generative relational processes.** One commitment of that framework governs the paper's own standing before it governs anything the paper says about calendars: knowledge is generated within a historical frame, and its finitude within that frame is acknowledged. An account entering a field as densely worked as the history of Chinese calendrical astronomy, hemerology, divination, and Daoist practice enters as one relation among many, and what it can claim is what becomes visible in that relation. The paper therefore indexes its claims to the relation it forms with the specialist literatures surveyed in Section 2: it claims what those literatures, read together through the scheme proposed here, make available, and on its own authority it makes no claim about the historical record.

3.2 The Coupling Form of the Contribution

The paper contributes no new sinological finding. Every historical statement in it is conceded to and cited from the specialist who established it, and where the paper's reading departs from a specialist's, the departure is marked as the paper's own. What the paper proposes is a coupling device: a scheme of strata for temporal systems (Section 4) and a criterion for comparing systems at matched strata (Section 5). The warrant for proposing such a device is a deficit the survey of Section 2 documents. Several internally rich literatures, on calendrical astronomy, on hemerology and the mantic arts, on almanac and divination culture, on Daoist liturgical and alchemical time, and on the social history of the week, describe different strata of temporal systems and possess no shared vocabulary for saying which stratum each describes. Their findings therefore compose poorly across traditions and across strata, and comparative claims built on them frequently compare non-corresponding parts. That deficit is a deficit of composition; each literature is complete on its own ground, and the deficit lies between them. A device that lets established findings compose is a contribution that takes nothing from any of them.

3.3 The Generativity Criterion of Success

The framework supplies the criterion by which the scheme asks to be judged, and it is a criterion of generativity in place of one of correctness. A coupling device succeeds where it lets findings compose that formerly did not, and where it produces questions answerable inside the specialist literatures, in their own idiom, by their own methods. Section 28 states such questions, literature by literature, and is written as the paper's own test: a scheme that generates no researchable question for the specialists has failed by the paper's own standard, whatever else may be said for it.

3.4 The Burden of Translation

The framework holds, in its account of heterogeneous knowledge systems, that where one vocabulary meets another the burden of translation lies with the vocabulary being introduced. The paper applies that criterion to itself. Every term of the stratum scheme is glossed into the established idiom of the specialist literatures where an equivalent exists, and where no equivalent exists the paper says why it proposes one. Every Chinese term is given with its romanization and a gloss on first use. Where the framework's vocabulary and a specialist's differ over the same phenomenon, the specialist's is given first and the framework's is offered as a restatement.

3.5 Evidence-Type Discipline

Every substantive statement in the paper carries one of three labels, stated or evident from context. An *established finding* is a statement the specialist literature holds and the paper cites to its owner. A *reported dispute* is a matter on which specialists disagree, presented with both positions and no adjudication. *This paper's reading* is a hypothesis of the paper's own, offered for examination by specialists and marked as such. The third class is deliberately small. Two further rules follow from the survey conducted for this paper. Where a claim rests on a single scholarly source, the paper says so. And where the paper could not trace a claim to specialist scholarship, however widely the claim circulates, the claim is absent from the paper; Section 29 records the principal claims excluded on this ground, since their exclusion is itself information about the state of the field.

3.6 The Constraints Binding Every Section

Three constraints bound every section that follows.

The anachronism guardrail. The paper reads historical temporal systems through a framework the historical actors did not possess. It therefore attributes to those actors no concept of the framework's, and it withholds throughout the reading on which ancient practice anticipated a modern relational physics of time. Where the framework describes a structure in a historical system, the description is the framework's; the actors' own understanding is reported from the sources, in the specialists' rendering, and kept apart from the framework's description.

The refusal of ranking. The paper compares temporal systems and traditions in respect of where they deposit cosmological content and how their strata are held. It leaves them all unranked. Every stratum stands equal in worth to every other, no distribution of content across strata is superior to another, and no tradition's handling of time is offered as more advanced, more rational, or more relational than another's. Where a comparison could be read as a ranking, the section restates it so that it cannot.

The separation of description from justification. Parts IV and V describe how authority over temporal strata was held, contested, and revised. Every such description is descriptive. That an arrangement served a state, a priesthood, or a market is a fact about how the arrangement functioned; it supplies no reason the arrangement should have obtained, and the paper supplies no reason of its own. The inference from “this stratum was controlled because governance required it” to “the control was warranted” is prohibited in every form, including the form in which it appears as description.

The three constraints are stated here once and are binding on every later section; where a section’s material makes one of them especially liable to slip, the section restates the constraint at the point of risk.

4 The Strata of a Temporal System

This section defines the paper’s instrument. Its objective is to distinguish three strata at which a temporal system carries content, to show that the strata are distinct in what they do and in how they change, and to state the paper’s first hypothesis, that cosmological content may be carried at any stratum and that its absence from one stratum leaves its presence at another untouched. The section states what a temporal system is for the purposes of the paper (Section 4.1), defines the three strata (Section 4.2), places them in a table with their glosses in the specialist idiom (Section 4.3), states the hypothesis (Section 4.4), and fixes the relation of the scheme to the companion theory of temporal emergence from which it draws (Section 4.5).

4.1 Temporal Systems

A temporal system, for the purposes of the paper, is the apparatus by which a community identifies, names, orders, and qualifies occasions: a calendar together with the practices that depend on it. The definition is broad by design, and it is meant to hold across the cases the paper compares. A lunisolar calendar with its intercalations, cyclical signs, and seasonal nodes is a temporal system; so is the Roman civil year with its market cycle and its fasti; so is a liturgical cycle; so is a hemerological handbook read against a calendar. What the cases share is that each does more than one thing with an occasion, and the paper’s scheme is a way of saying which thing.

4.2 The Strata Defined

Definition 4.1. (Unit naming). The naming stratum of a temporal system is the apparatus by which its units, days, months, years, and any intermediate cycle, are labelled: the vocabulary of names, the ordering within each cycle, and the conventions of reference. Content is carried at the naming stratum when it is present in the labels themselves.

Definition 4.2. (Cycle construction). The construction stratum of a temporal system is the apparatus by which its cycles are generated: which recurrences are tracked, how they are combined, how their incommensurabilities are reconciled, and by what observations or computations their positions are fixed. Content is carried at the construction stratum when it is present in the choice and combination of cycles.

Definition 4.3. (Situational qualification). The qualification stratum of a temporal system is the apparatus by which occasions, once identified and named, are qualified as fit or unfit for actions: the assignment of characters, prohibitions, favours, and correspondences to

Table 1: The three strata of a temporal system, with the terms in which the specialist literatures describe each and the instances that recur in the paper. The arrangement is the paper’s; the contents of each cell are the specialists’.

Stratum	Established idiom	Chinese instances	Mediterranean instances
Unit naming (Def. 4.1)	day-names, month-names, era-names; onomastics of the calendar	干支 (ganzhi, stem-branch) day and year labels; numbered months; reign eras	planetary weekday names; Roman month-names; nundinal letters
Cycle construction (Def. 4.2)	calendrical astronomy; 历法 (lifa, calendrical method); intercalation; luni-solar reconciliation	the lunisolar month and year, the 二十四节气 (ershisi jieqi, twenty-four solar nodes), the sexagenary cycle, the Jupiter cycle	the pre-Julian and Julian year; the seven-day astrological week; the eight-day market cycle
Situational qualification (Def. 4.3)	hemerology; 择日 (zeri, day-selection); 日书 (rishu, day-books); the almanac tradition; <i>fasti</i>	day-book prohibitions and favours; 通书 (tongshu) and 黄历 (huangli) almanac entries; correlative content of the cyclical signs	<i>dies fasti</i> and <i>nefasti</i> ; astrological hours; liturgical qualification of days

positions in the cycles. Content is carried at the qualification stratum when it is present in these assignments.

The three strata are distinct in what they do: naming labels, construction generates, qualification assigns. They are distinct in what changes them: a naming reform substitutes labels and leaves cycles and assignments as they were; a construction reform alters which recurrences are tracked and how, and every label and assignment keyed to the altered cycle moves with it; a qualification reform alters assignments and leaves labels and cycles standing. And they are distinct in who holds them, which is the subject of Part IV. A single temporal system possesses all three, and the paper’s claim is that the specialist literatures have, in the main, each described one.

4.3 The Strata in the Specialist Idiom

Table 1 places the three strata beside the terms in which the specialist literatures already describe them, and beside the Chinese and Mediterranean instances that recur through the paper. The table discharges part of the translation burden of Section 3.4: each stratum has an established idiom, and the scheme’s contribution is the arrangement of the three side by side.

4.4 The Stratification Hypothesis

Hypothesis 4.4. (Stratification; this paper’s reading). Cosmological content may be carried by a temporal system at any of its three strata, and the presence or absence of such content at one stratum is independent of its presence or absence at another. In particular, absence of cosmological content from the naming stratum, from the labels a community gives its days and years, leaves the system’s carriage of cosmological content at the construction and qualification strata untouched.

The hypothesis is offered as the paper’s reading and is the load-bearing claim of Part II. Its motivation is the observation with which the paper began: that a temporal system whose day-labels are numerals or bare cyclical signs, carrying no reference to a planet, a god, or a cosmological principle, has been read as evidence that the community’s time was cosmologically thin, when its construction stratum reconciles several celestial recurrences and its qualification stratum assigns to every day a dense correlative character. The hypothesis says that the reading commits an error of stratum, and Section 5 turns the error into a criterion.

4.5 Relation to the Companion Theory

The scheme is a specialization, for temporal systems as communities operate them, of constructs developed in a companion theory of temporal emergence in heterogeneous relational systems [19], which Section 9 presents as preliminaries. In that theory a temporal mode is the structure a single registered recurrence contributes to a system’s temporality, a mode system is the family of a system’s modes with the relations among them, and modes stand in relations of calibration, refinement, and combination. The correspondence with the present scheme is exact and is stated once. Cycle construction is the generation of modes and their combination into a mode system. Unit naming is the labelling of the recurrence classes the modes define. Situational qualification is the assignment of further registered structure to positions within those classes, in the companion theory’s sense that a distinction is registered where practice depends on it. The paper draws on the companion theory for these constructs and for two results used later, on the combination of cycles and on the possibility of temporal structure with no physical referent; it leaves that theory unrestated, and it adds to it the institutional and historical reading that the companion theory did not undertake.

5 The Criterion of Layer-Matched Comparison

This section turns the stratum scheme into a criterion for comparison. Its objective is to state when a comparison between two temporal systems is well formed, to show how a comparison that violates the criterion produces an artifact, to record the second hypothesis, on the selection of strata by circumstance, and to fix what the criterion does and does not license. The section states the criterion (Section 5.1), analyses the artifact (Section 5.2), states the register-selection hypothesis (Section 5.3), and bounds the criterion’s reach (Section 5.4).

5.1 The Criterion

Claim 5.1. (Layer-matched comparison). A comparison between two temporal systems in respect of the cosmological content they carry is well formed only when it compares corresponding strata: naming with naming, construction with construction, qualification with qualification. A comparison that reads the naming stratum of one system against the qualification stratum of another compares non-corresponding parts, and any conclusion it draws about the two communities’ conceptions of time is an artifact of the mismatch.

The criterion is stated as a claim about the form of comparison and leaves every particular civilization’s time untouched. It is compatible with any finding a layer-matched comparison might reach: that two systems differ greatly at one stratum and little at another, that one deposits its content at a stratum the other leaves empty, or that the two coincide throughout. What it excludes is a class of inference, and Section 5.2 shows the class.

5.2 The Artifact

Proposition 5.2. (Production of the artifact). Let system *A* carry cosmological content densely at its naming stratum and thinly at its qualification stratum, and let system *B* carry it thinly at its naming stratum and densely at its qualification stratum. A comparison conducted at the naming stratum alone concludes that *A*'s time is cosmologically rich and *B*'s is bare; a comparison conducted at the qualification stratum alone concludes the reverse; and a comparison conducted at either stratum alone attributes to a whole community's conception of time a property that belongs to one stratum of its temporal system.

The proposition holds by the independence clause of Hypothesis 4.4, and it identifies the artifact exactly. The artifact is an inference from a stratum to a conception; the correction is to compare stratum by stratum and to draw no inference to a conception beyond what any single stratum can bear. The paper's motivating case is the instance: the planetary week carries its cosmological content in the day-names themselves, so that a European reader finds the cosmos in the labels; the Chinese day carries its content in the correlative character assigned to the day and in the celestial reconciliations from which the day's position is computed, so that the same reader, looking at the labels, finds numerals and cyclical signs and concludes that the cosmos is absent. Part II conducts the Chinese half of the matched comparison, Part III the Mediterranean half and the comparison itself.

5.3 The Register-Selection Hypothesis

Hypothesis 5.3. (Register selection; this paper's reading). Which stratum a temporal system uses to carry a given cosmological content is selected by the circumstances of the system's formation and use, among them the observational resources available, the institutions that hold each stratum, and the practices that draw on the content, and is independent both of the content itself and of the depth at which the community holds it.

The hypothesis is the positive counterpart of the artifact analysis. If stratum selection were fixed by content, the stratum at which a content appears would indicate something about how the community holds it, and the inference from stratum to conception would be sound. Hypothesis 5.3 denies the antecedent and locates the selection in circumstance. It is offered for examination and it is testable in the specialist literatures: it predicts that the same content should be found at different strata in different systems, and at different strata in one system at different periods, as the circumstances vary. Part IV, which treats the holders of each stratum and the paths by which strata are revised, supplies part of the machinery for such a test, and Section 28 returns the prediction to the specialists as a question.

5.4 Reach of the Criterion

Three limits bound the criterion. It concerns comparison in respect of cosmological content, and it leaves comparison in respect of accuracy, of computational sophistication, and of social function to separate criteria; those comparisons lie outside the paper. It is a criterion of form, and it settles no comparison by itself: a layer-matched comparison may still be wrong on the evidence, and the criterion only ensures that its error is an error about the strata compared, in place of an error of stratum. And it presupposes that the three strata are distinguishable in the systems compared, which the paper takes to hold for the cases it treats and does not assert for every temporal system whatever; Section 29 records the presupposition among the paper's limits.

6 Physical Accounts of Time

This section opens the paper’s preliminaries by stating what the physical sciences hold about time and what the paper takes from it. Its objective is narrow: to fix, once, the relation of the account developed here to the physical accounts, so that no reader supposes the paper to be claiming, borrowing, or contesting anything about fundamental physical time. The section states the Newtonian conception as foil (Section 6.1), the relativistic revision (Section 6.2), the relational programmes from Leibniz to the present (Section 6.3), and what the paper takes and leaves (Section 6.4). Every statement in the section is an established finding of physics or of its history and is cited to a standard source; the section makes no physical claim of its own.

6.1 Absolute Time

Newton’s scholium to the definitions of the *Principia* distinguishes absolute, true, and mathematical time, which flows equably without relation to anything external, from relative, apparent, and common time, which is a sensible and external measure of duration by means of motion, such as an hour, a day, a month, a year [41]. The distinction supplies the paper’s foil in a precise sense. Absolute time is a container: change occurs within it, and time is prior to and independent of what changes. Every account the paper draws on, physical, social, cultural, and its own, departs from this picture at some point, and the departures differ in where they place what the container was supposed to hold.

6.2 The Relativistic Revision

The special theory of relativity removes the privileged simultaneity that absolute time presupposed: events simultaneous in one inertial frame are in general non-simultaneous in another, and time is a coordinate on a four-dimensional manifold, with proper time defined along a worldline [9]. The general theory makes the metric of that manifold dynamical, so that the geometry within which duration is measured is itself determined by the distribution of matter and energy [10]. Two consequences are recorded for the paper’s purposes and are the standard ones. There is no unique global time; there are as many time coordinates as there are frames, related by transformations. And duration is a property of a path through the manifold, and the same pair of events can bound different durations along different paths. The revision leaves the container picture standing in a weakened form, since spacetime remains a manifold in which events are located; it removes the uniqueness and the independence the Newtonian container claimed.

6.3 Relational Programmes

The relational conception, on which time is an order among events and only that, has its classical statement in Leibniz’s correspondence with Clarke, where time is the order of successions and space the order of coexistences, and both stand apart from any substance in which things are placed [36]. The conception has been pursued in modern physics in several forms. The Machian and shape-dynamical programme seeks to eliminate external time from classical dynamics, recovering temporal description from the relational configurations of the whole [3]. In the quantum setting, the Page–Wootters mechanism recovers effective dynamical evolution from correlations between a clock subsystem and the remainder of a globally stationary state [42], and the thermal time hypothesis derives a physical time flow from the statistical state of a generally covariant system [5]. Rovelli’s relational interpretation and his popular synthesis present these results as evidence that time, at the fundamental level,

is derived, perspectival, and relational, and that the flow of time is a feature of the coarse-grained, thermodynamic description [52]. The programmes differ among themselves, and the physical questions they address remain open.

6.4 The Paper's Take from the Physical Family

The paper takes from this family one proposition, and it is the proposition the companion theory also took: temporal description can be derived from relations, with no external time parameter consumed in the derivation [19]. That is a demonstrated possibility, an existence proof of a kind of explanation, and the paper takes it as such. It stops there. In particular the paper makes no claim about fundamental physical time; its subject is temporal organization within human systems that inhabit whatever physical time there fundamentally is, and the companion theory's result that its account and the physical programmes stand in mutual logical independence, so that the success or failure of either leaves the other untouched, holds for the present paper with the same force [19, Claim 16.1]. Two further things the paper does with this family are stated so that they are not mistaken for more. It uses the Newtonian container as a foil throughout, since the container picture is what the social and cultural accounts of the next two sections were written against, and since the stratum scheme's claim that a temporal system carries content at several places presupposes that time is a constructed apparatus and no container. And it records that the historical actors whose temporal systems the paper reads possessed these physical accounts in no form, so that, under the anachronism guardrail of Section 3.6, no reading of their practice as anticipating any of them is admitted; where a resemblance of structure appears, Section 14.5 has already shown how the paper handles it, by withholding the reading and reporting the resemblance as the framework's observation, held apart from the actors' own.

7 Social Accounts of Time

This section states what the sociology and social anthropology of time hold, and what the paper takes from them. The family is the one to which the paper stands closest, since it established that temporal categories are socially constituted and plural, which the stratum scheme presupposes; and it is the family whose boundary the paper's contribution is meant to cross, since it possesses no vocabulary for saying which stratum of a temporal system a social temporal category occupies. The section states the founding position (Section 7.1), the classic developments (Section 7.2), the contemporary literature on acceleration and temporal labour (Section 7.3), and what the paper takes and where the boundary lies (Section 7.4). Every account is conceded its ground; the Chinese term 社会时间学 (shehui shijianxue, the sociology of time) is used for the family where the paper's Chinese-language readers would expect it.

7.1 The Founding Position

Durkheim held that the categories of the understanding, time among them, are of social origin: the divisions of time into days, weeks, months, and years correspond to the periodic recurrence of rites, feasts, and public ceremonies, and a calendar expresses the rhythm of collective activity while ensuring its regularity [8]. Hubert and Mauss developed the position for religious and magical representations of time, treating the calendar as a system of qualitatively distinct periods ordered by rites [20]. The founding position, in the paper's terms, places the whole of temporal categorization on the social side of the Newtonian foil: time is a category the group makes, and its divisions are the group's rhythms.

7.2 Classic Developments

Sorokin and Merton, in the paper that gave the family its name, distinguished social time from astronomical time and characterized it by four properties: its units are fixed by the rhythm of collective life; it is qualitatively differentiated according to the beliefs and customs of the group; it is discontinuous, interrupted by critical dates; and all calendrical systems arise from and are perpetuated by social requirements [57]. Evans-Pritchard's ethnography of the Nuer distinguished oecological time, keyed to the seasonal cycle of the environment and the activities it imposes, from structural time, keyed to the genealogical and political relations among lineages, and showed the two to run on different scales and to be reckoned differently [12]. Zerubavel established the sociological study of socio-temporal order, the schedules, calendars, and rhythms through which social life is organized and its groups bounded, and gave the seven-day week its own history as a social artifact [60, 61]. Thompson documented the imposition of clock time on populations whose work had been organized by task [58]. Elias treated time as a symbol of a high order of synthesis, developed over the long term for the purpose of orientation and regulation, and distinct both from a natural datum and from a subjective form [11]. Munn's review of the anthropology of time consolidated the field and its dispute over whether cultural time can be studied apart from the practices that produce it [39]. Adam's timescapes gave the picture of multiple temporalities interlaced in one social landscape [1].

7.3 Acceleration and Temporal Labour

The contemporary literature has turned to the tempo of modern life. Rosa's theory of social acceleration analyzed the unequal acceleration of technical, social, and lived tempos and named their falling-out desynchronization [50, 51]; Sharma turned from acceleration as a general condition to its unequal distribution, arguing that some populations perform temporal labour, recalibrating their own time to serve the tempos of others [54]. The paper treats the normative dimension of this literature elsewhere, in a companion paper on temporal injustice, and takes from it here only its descriptive finding, that temporal orders are imposed, resisted, and unequally borne.

7.4 The Paper's Take from the Social Family and Its Boundary

The paper takes from this family the finding on which the stratum scheme rests: temporal categories are socially constituted, plural within one society, and keyed to the practices of the groups that hold them. Sorokin and Merton's characterization is worth stating in the scheme's terms, since it anticipates the scheme at every point: units fixed by collective rhythm is the construction stratum; qualitative differentiation according to belief and custom is the qualification stratum; interruption by critical dates is the naming stratum's marking of occasions; and the social origin of calendrical systems is the paper's own presupposition, stated in 1937. The paper claims none of this as its own.

The boundary of the family is exactly the deficit Section 3.2 named. The family established that temporal categories are social and plural; it did not develop a vocabulary for saying *where in a temporal system* a given category is carried, at its labels, in its cycles, or in its qualifications. Evans-Pritchard's two times are two systems of reckoning, and the question of at which stratum each carries its content is not his question; Zerubavel's week is a social artifact, and whether its social content sits in the day-names or in the cycle's construction is a question the sociology of the week has had no reason to pose. That the family had no reason to pose it is no deficiency in the family; the question arises only when temporal systems from different traditions are compared, and the comparison is what produces the artifact

of Section 5.2. The paper's scheme is offered as the vocabulary in which the family's own findings can be composed across traditions, and it is offered to that family first.

8 Cultural Accounts of Time

This section states what the cultural anthropology and comparative history of time hold, and what the paper takes from them. The family supplies two things the paper depends on: the layered picture of historical time, and the field's own warning against reading a whole conception of time off a single feature of a temporal system. It also supplies the Chinese-side literature within which the paper's case sits. The section states the anthropological critique (Section 8.1), the historiographical layering (Section 8.2), the comparative philosophy of Chinese time (Section 8.3), and what the paper takes and where the boundary lies (Section 8.4). The Chinese term 文化时间学 (wenhua shijianxue, the cultural study of time) names the family for the paper's Chinese-language readers.

8.1 The Anthropological Critique

Fabian's *Time and the Other* showed how anthropology's own temporal rhetoric placed the peoples it studied in a time other than the anthropologist's, and made the politics of temporal representation a topic [13]. Gell's *The Anthropology of Time* is the field's principal critique of culturalist time-talk: drawing on the distinction between the A-series and B-series of temporal ordering, it argues that claims of the form "culture X has a cyclical (or linear, or timeless) conception of time" conflate time with time-reckoning and with the cultural representation of temporal maps, and that the underlying temporal order is common while its cultural representations vary [14]. Munn's review recorded the field's resulting dispute and the range of positions taken in it [39]. The paper concedes Gell's critique in full and treats it as an ally: the artifact of Section 5.2 is one form of the conflation Gell diagnosed, and the layer-matched criterion is one instrument for avoiding it. What the paper adds to Gell is only the location of the conflation at a stratum, so that the corrective can be applied comparison by comparison.

8.2 Historiographical Layering

Koselleck's *Zeitschichten*, rendered in the English selection as sediments of time, holds that historical time is plural and layered: several temporalities of differing pace and duration coexist, and history is written in the interplay among them [29, 30]. Koselleck also observed that the images by which time is thought are spatial in origin, and that every historical space constitutes itself through the time in which it can be measured, thereby becoming controllable politically or economically [29]. The paper takes both points and cites the second again in Part VI, where it is the thesis of the authority material stated by a specialist. Jordheim's reading of Koselleck as a theory of multiple temporalities against periodization is the paper's guide to the reception [23].

8.3 The Comparative Philosophy of Chinese Time

Needham's Henry Myers lecture, "Time and Eastern Man," set the terms of the comparative discussion in English by arguing against the then-current attribution to China of a purely cyclical conception of time, and for the presence of linear and cumulative conceptions in Chinese historiography and science [40]. Sivin's work placed calendrical astronomy within its cultural and institutional manifold and set the standard for reading Chinese science on its

own terms [55]. On the Chinese side, the historiography of 天学 (tianxue, the study of the heavens) has framed the astronomical and astrological traditions as one enterprise, held that in antiquity astronomer and astrologer were the same person, and traced the enterprise's institutional history [21, 22]; the astrological system as a whole has been treated as organized around the running of yin–yang and five-phase doctrine through the stem–branch system [38]; and the doctrine of field-allocation, 分野 (fenye), has received its first systematic historical study as an expression of world-view and an instrument of political culture [47]. The comparative discussion in both languages has thus already moved from “the Chinese conception of time” to the plurality of Chinese temporal practices, and the paper's scheme is offered as a way of holding that plurality in one frame.

8.4 The Paper's Take from the Cultural Family and Its Boundary

The paper takes two things. From Gell, the warning: a conception of time is to be read from the whole of a temporal system and from no single feature of it, and comparison must be conducted at the level at which the systems in fact differ. From Koselleck, the layering: temporalities of different pace coexist, and any account of a period's time must hold several at once. From the Chinese-side literature it takes the plural framing of Chinese temporal practice, and the specific findings conceded in Part III.

The boundary is one the paper states with care, because the family's layering and the paper's strata share a metaphor and differ in kind. Koselleck's layers are historical strata: temporalities of different duration coexisting in a period, the long-term structure beneath the medium-term conjuncture beneath the event. The paper's strata are operative strata of a temporal system: the places within a calendar and its practices at which content is carried. A historical layer may run through all three operative strata, and an operative stratum may carry content from several historical layers. The two schemes are complementary and must not be confused, and the paper uses “layer” for Koselleck's sense and “stratum” for its own throughout, so that the reader can tell at every point which is meant.

9 The Generative Relational Account of Temporal Emergence

This section presents, as preliminaries, the account of temporal emergence on which the paper's framework rests. The account is developed in a companion theory [19]; the section leaves that theory's arguments where they stand and imports only the constructs the present paper uses, each with its definition in the companion theory and one statement of content here. The section is placed after the three families of Sections 6–8 so that its relation to each is visible: what it takes from each, and what it adds. The section states the imported constructs (Section 9.1), the two results the paper draws on (Section 9.2), the account's boundary (Section 9.3), and its relation to the three families (Section 9.4).

9.1 The Imported Constructs

Registration. A distinction between configurations of a system is registered in that system when some dynamic of the system depends on it; a distinction available only to an external describer, with every dynamic of the system indifferent to it, is unregistered [19, Def. 4.1]. Registration is internal, a matter of what the system's own processes depend on, and relational, a matter of a structure's standing for a system.

Temporal mode. A temporal mode is the structure a single registered equivalence over a system's history contributes to its temporality: the recurrence classes it defines, the calibra-

tion of intervals it permits, and, where further conditions hold, the rhythm and phase built on it [19, Def. 6.1]. Modes are as plural as the equivalences a system registers.

Mode system. A system's mode system is the family of its modes together with the registered relations among them: calibration, where one mode's occurrences measure another's separations; refinement, where one mode's classification partitions another's cycles; and combination, where two modes generate a joint mode [19, Defs. 6.2, 6.4, 6.6, Prop. 6.8]. Rhythm and phase are, on this account, relations between modes, and each requires two.

The correspondence between these constructs and the stratum scheme of Section 4 was stated at Section 4.5 and is recalled in one line: cycle construction is the generation of modes and their combination into a mode system; unit naming is the labelling of the recurrence classes the modes define; situational qualification is the assignment of further registered structure to positions within those classes.

9.2 The Imported Results

Two results of the companion theory are used in later Parts and are stated here as imports.

Product modes. Two registered modes with coprime periods, combined, generate a joint mode of period equal to the product, whose recurrence is generated by combination alone with no third external cycle contributing [19, Prop. 6.8]. The paper uses this in Part IV to read the combined cycles of the Chinese and Mediterranean systems, and in Part V for the comparison.

Temporal structure with no physical referent. A mode system may contain modes generated by combination or coarse-graining that answer to no single physical recurrence, so that a system's temporal organization can exceed, and can be irreducible to, the external cycles that force it [19, Defs. 7.3, 8.2]. The paper uses this in Part IV to read the computed positions of the Chinese mantic arts, and it is the construct on which the account of virtual modes in Section 17 depends.

9.3 The Account's Boundary

The companion theory is a theory of temporal organization: it says how temporal structure emerges in heterogeneous relational systems, and it contains no normative term. Every claim the present paper makes about authority, in Part VI, is made under the separation stated in Section 3.6, and the constructs imported here are premises of descriptive claims only. The account also takes change as primitive and declines to explain why systems undergo it; the present paper inherits that position, and reads the temporal systems of the historical record as organizations of change without asking of any of them why change occurred.

9.4 Relation to the Three Families

The account's placement after the three families lets its debts and its addition be stated together. From the physical family it takes the demonstrated possibility that temporal description can be derived from relations, and it stands in the mutual independence from the physical programmes that Section 6.4 recorded. From the social family it takes the finding that temporal categories are socially constituted and plural, and it treats the family's founding characterization, in Sorokin and Merton, as already describing the strata it will distinguish.

From the cultural family it takes the layered picture and the warning against reading a conception off a feature, and it keeps the layer-stratum distinction of Section 8.4. What it adds is registration: a criterion, internal to a system, for whether a temporal distinction exists for that system at all. None of the three families possesses such a criterion in explicit form; each has, in its own idiom, an operative sense of it, the physical family in what an observer can measure, the social family in what a group's practices depend on, the cultural family in what a community's representations mark. Registration names the common structure, and it is what allows the paper to say, of any content at any stratum, whether the system in question possessed it or a describer imposed it. That question, and its answer, is what the reading of Part IV turns on.

10 The Lacanian Account: Time and Cultural Analysis

This section presents, as preliminaries, the two parts of the Lacanian tradition the paper draws on: its account of time, and the cultural analysis conducted on its grounds. Both are presented concession-first: what Lacan and the tradition after him hold is stated as theirs, in their terms, before the paper says what it takes. The section states the account of time (Section 10.1), the constructs of the Symbolic order that cultural analysis employs (Section 10.2), the cultural-analytic tradition itself (Section 10.3), what the paper takes (Section 10.4), and the boundary it observes (Section 10.5). The paper's own integration of these preliminaries with its questions is the work of Section 18, in Part IV, and is withheld here.

10.1 The Account of Time

Lacan's "Logical Time and the Assertion of Anticipated Certainty" distinguishes logical from chronological time and articulates the former in three moments: the instant of the glance, the time for comprehending, and the moment of concluding [33]. The temporality involved is specifiable by no clock; it is a product of logical articulation among subjects, each of whom acts on an anticipation of what the others will conclude, and the moment of concluding is reached in haste, before the certainty it asserts could be verified. Two further constructs bear on time and are held throughout the tradition. Retroaction, *après-coup*, Lacan's rendering of Freud's *Nachträglichkeit*, names the structure by which a later event fixes the meaning of an earlier one, so that in the psyche the past exists as a set of traces continually reworked in the light of the present [31]. And the *point de capiton*, the quilting point, names the signifier that halts the sliding of meaning along a chain and fixes, retroactively, the sense of every signifier before it [31]. On this account time in the subject is structured by anticipation and retroaction, and its order is logical before it is chronological.

10.2 The Symbolic Order

Three constructs of the Lacanian account of the Symbolic order are used by the cultural-analytic tradition and are stated here as Lacan states them. The Symbolic order is the shared structure of signifiers into which a subject is inscribed, prior to and independent of any individual, and governing what can be said and meant [31]. The big Other is the locus of that order, the place from which the signifying chain is guaranteed and to which the subject's speech is addressed; it is a structural position, occupied by institutions, languages, and codes, and it possesses no consciousness of its own [31]. The master signifier is the signifier that organizes a field of signification without itself being defined within it, holding the field together by its position [32]. The paper records these constructs and states now, without yet arguing it, the observation that Part IV will develop: a calendar is a Symbolic order in

exactly this sense, a shared chain of signifiers, held by a locus, organized by master signifiers such as the era-name and the sovereign's date, into which every member of a community is inscribed and to which every dated act is addressed.

10.3 The Cultural-Analytic Tradition

The tradition that turned these constructs into cultural analysis is large; the paper concedes three of its principal moves. Laclau and Mouffe's theory of hegemony treats a social field as a chain of floating signifiers whose meaning is fixed by nodal points, and hegemony as the operation by which a particular content comes to occupy the position of the universal [35]; Laclau's later work develops the empty signifier as the signifier that, emptied of particular content, can hold a field together [34]. Žižek's *The Sublime Object of Ideology* takes the point de capiton as the central mechanism of ideology: a set of floating signifiers acquires stable meaning only when a master signifier quilts the chain, retroactively organizing the field into a coherent configuration, and Žižek reads the master signifier alongside Kripke's rigid designator as a name whose reference outlasts every variation in its description [59]. Copjec's *Read My Desire* defended the Lacanian analysis of culture against historicist reduction, holding that the subject and the social field are structured around a lack no historical content exhausts [6]. Each of these moves is a reading of culture in which the fixing of meaning is an operation of authority, exercised from a locus, and each is conceded to its author.

10.4 The Paper's Take from the Lacanian Account

The paper takes two things, and states each with its source. From the account of time it takes the retroactive structure, and it takes it as complementary to the account of Section 9: registration in the companion theory is prospective, since a dynamic depends on a distinction that precedes it, and the Lacanian structure is retroactive, since a later signifier fixes an earlier meaning. The two are placed at strata in Section 18, where the paper argues that the naming stratum is where registration runs backward. From the cultural-analytic tradition it takes the description of a temporal system as a Symbolic order held by a locus and organized by master signifiers. That description gives Part VI a vocabulary in which the authority exercised at the naming stratum, the fixing of era-names, the imposition of a calendar, the revision of a date, can be described as the operation of a locus over a chain of signifiers, and can be described in those terms without importing any value function, which is what the constraint of Section 3.6 requires. The paper's debt to the tradition is therefore descriptive: it borrows a way of saying what a calendar is, and a way of saying what is done when a calendar is fixed.

10.5 Boundary

The paper uses the Symbolic-order description and the retroactive structure, and it uses them alone. It leaves aside the psychoanalytic theory of the subject taken wholesale, and every thesis about the desire, fantasy, or enjoyment of the historical actors whose temporal systems it reads; under the anachronism guardrail it attributes to those actors no unconscious, and under the evidence-type discipline it reports their understanding from the sources in the specialists' rendering. The distinction among the Real, the Symbolic, and the Imaginary is used only as far as the description of the Symbolic order requires it, and the paper's own architecture is the stratum scheme of Section 4 and no Lacanian triad. Where the tradition's readings of culture carry a critical or political charge, the paper takes the description and leaves the charge, and it says so where the borrowing occurs.

11 Method: Reading Historical Temporal Systems Through the Framework

This section states the method by which the paper reads a historical temporal system through the framework of Sections 9 and 10. Its objective is to make the reading procedure explicit, so that every application of it in Parts III through VI can be checked against it, and to state the rules of evidence and translation under which the procedure operates. The section states the procedure (Section 11.1), the rules of evidence (Section 11.2), the anachronism guardrail as a rule of the method (Section 11.3), and the discharge of the translation burden family by family (Section 11.4).

11.1 The Reading Procedure

The procedure has five steps, applied to a temporal system as the specialist literature presents it.

- (i) *Locate the stratum.* For each item of content the literature reports, ask at which stratum of Section 4 it is carried: in the labels, in the construction of the cycles, or in the qualification of occasions. Where the literature's own idiom already answers, its answer is taken; where it does not, the assignment is the paper's and is marked.
- (ii) *Identify what is registered, and by whom.* For each item, ask which practices of the community depend on it, in the sense of Section 9.1: an item is registered where some practice would proceed otherwise were the item otherwise. The answer identifies both the content the system possessed and the parties who held it.
- (iii) *Identify representations.* Ask whether the community externalized its registration in an artifact whose states track the joint configuration of several cycles, a board, a table, an almanac, and what that artifact let practice do that unaided registration did not.
- (iv) *Trace positions to entities.* Where a representation contains positions computed from the cycles, ask whether the community's practices came to depend on the positions themselves, and whether the positions were treated as entities, named, characterized, or addressed.
- (v) *At the naming stratum, ask what a name fixes retroactively.* Where a label is imposed or revised, ask what earlier occasions its imposition re-signifies, and from what locus the imposition was made.

Steps (i)–(ii) apply the stratum scheme and registration; step (iii) introduces the construct of representation that Part IV develops; step (iv) applies the result on temporal structure with no physical referent; step (v) applies the retroactive structure. The five are applied in order and each is reported in the sections that follow.

11.2 Rules of Evidence

The evidence-type discipline of Section 3.5 governs every step. Each finding the procedure operates on is an established finding, cited to its owner; each dispute it encounters is reported with both positions; each assignment, identification, or reading of the paper's own is marked as this paper's reading. Two rules of the survey are restated as rules of the method. A claim resting on a single scholarly source is flagged as such where it occurs. A claim the paper could not trace to specialist scholarship is absent, and Section 29 lists the principal absences.

11.3 The Anachronism Guardrail Applied to Each Step

The framework describes structure; the sources report the actors' understanding; the method keeps the two apart at every step. When the procedure finds, at step (ii), that a community's practices depended on a distinction, it reports that the distinction was registered, and it reports separately, from the sources, whatever the community said about the distinction. When it finds, at step (iv), that a computed position was treated as an entity, it reports the treatment, and it withholds any claim that the community mistook the position for a physical body or knew it for a computation, unless the sources say so. When it finds, at step (v), that a name re-signified a period, it reports the re-signification as the framework's description of a structure, and it reports the actors' own account of the naming, where the sources give one, as theirs. The rule is the anachronism guardrail of Section 3.6 restated for each step at which the framework's vocabulary and the actors' could be confused.

11.4 The Translation Burden Discharged

The burden of translation, accepted in Section 3.4, is discharged family by family. To the physical family the paper owes the statement that its "relational" means the relations among a community's practices and cycles, and carries no physical sense; Section 6.4 made the statement. To the social family it owes the statement that its strata are places within a temporal system where the family's own categories are carried, and Section 7.4 made it, mapping Sorokin and Merton's characterization onto the three. To the cultural family it owes the layer-stratum distinction, made at Section 8.4. To the Lacanian tradition it owes the statement that it takes description and leaves the theory of the subject, made at Section 10.5. And to the specialist literatures on Chinese astronomy, hemerology, divination, and Daoist practice it owes, at every citation, the specialist's idiom first and the framework's as restatement, which the sections of Part III observe. Where the paper introduces a term of its own, representation in the sense of step (iii), virtual mode in the sense of Section 17, it says why no existing term serves.

12 Astronomical Content in the Chinese Date

This section conducts the first half of the Chinese case at the naming and construction strata together. Its objective is to show that the Chinese date carries astronomical content at its construction stratum, since the date is a position in a system that reconciles several celestial recurrences, and to show that the correlative content of the cyclical signs, which a reader might take for content at the naming stratum, in fact operates at the qualification stratum, the signs functioning as position counters when they serve as labels. Every historical statement in the section is an established finding of the calendrical-astronomy literature and is cited to it; the paper's contribution is the assignment of each finding to its stratum. The section treats the construction of the date (Section 12.1), the cyclical signs (Section 12.2), and the consequence for the comparison (Section 12.3).

12.1 The Date and the Reconciled System Behind It

The Chinese calendar of the historical period is lunisolar. Its months are lunations, beginning at the astronomical new moon; its year is kept in step with the tropical year by intercalation, the insertion of a thirteenth month at intervals fixed by rule; and its seasonal structure is carried by the twenty-four solar nodes, 二十四节气 (ershisi jieqi), which divide the sun's annual course into equal parts by longitude and which fix the placement of the intercalary month. The rules by which these recurrences were reconciled, the 历法 (lifa, calendrical

methods) of successive dynasties, are the subject of a specialist literature that has reconstructed their algorithms and their observational bases in detail [4, 62, 55]. The methods changed across the imperial period; the structure they reconciled, lunar month, solar year, and solar node, did not.

Two features of this construction bear on the paper's argument. The first is that a date in such a system is a position fixed by computation from observed recurrences: to state that a day is the fifteenth of the seventh month in a given year is to state where that day falls relative to a new moon, a solar node, and an intercalation rule, and thereby relative to the moon's phase and the sun's longitude. In the paper's terms this is content at the construction stratum, and it is astronomical content in the strictest sense.

Claim 6.1. (The date as an astronomical statement). A Chinese calendrical date, at any period in which the lunisolar calendar with solar nodes was in force, is an astronomical statement: it locates its day relative to the lunation and to the sun's annual course, and it does so through the reconciliation of those two recurrences by intercalation. The content is carried at the construction stratum (Definition 4.2) and is present in the date whatever the label the day bears.

The claim is an established finding restated in the paper's vocabulary; the finding belongs to the calendrical-astronomy literature, and the vocabulary is the paper's. The second feature is that this content is invisible at the naming stratum. The month is numbered, the day within the month is numbered, and the year is named by reign era and by cyclical sign; each of these labels is free of any planet, god, or cosmological principle in its form. A reader who inspects the labels alone finds numerals and counters and may conclude, as Section 5.2 anticipated, that the cosmos is absent from the Chinese day. The conclusion is the artifact.

12.2 The Cyclical Signs and Their Content

The sexagenary cycle, formed by pairing the ten stems 天干 (tiangan) with the twelve branches 地支 (dizhi) into sixty binomials, labels days continuously and years continuously, and in the historical period the day-count in this cycle is unbroken [4]. As a labelling apparatus the cycle is a counter: a day's binomial states its position in a run of sixty and states that alone, and the sequence of binomials is the sequence of the integers modulo sixty. This is content at the naming stratum in the thinnest sense: a label that carries an ordinal position.

The signs also carry correlative content. Each stem and each branch is assigned to a phase among the five 五行 (wuxing), to yin or yang, to a direction, a season, an organ, a color, and much else, and these assignments are what hemerology and the mantic arts operate on. The specialist literature holds that the stem-branch system was regarded in antiquity as the fundamental symbolic system, and that the astrological system as a whole was organized around the running of yin-yang and five-phase doctrine through it [38]. The paper accepts that finding entire and asks at which stratum the correlative content operates.

Claim 6.2. (Stratum of the correlative content). The correlative content of the cyclical signs operates at the qualification stratum (Definition 4.3). It is applied to a day through the sign the day bears, and it qualifies the day for actions; it is inert in the sign's function as a label, where the sign is a position counter, and it becomes active where a practice, hemerological, divinatory, or ritual, reads the sign's correspondences and assigns the day a character on their basis. The same sign therefore carries no correlative content at the naming stratum and dense correlative content at the qualification stratum, and the two functions are separable in practice: a day is dated by its binomial by everyone who dates it, and qualified by its binomial by those who consult the arts.

The claim is the paper's reading of an established finding, and it turns on a distinction the specialist literature makes in other terms. Hemerology, in the accounts of the excavated day-books, is a set of procedures that take a day's position as input and return a qualification as output [25, 37, 16]; the sign is the input, and the correspondences are what the procedure applies. That the sign can be read without the procedure, as a bare date, and can be read through the procedure, as a qualified occasion, is exactly the separability Claim 6.2 asserts.

12.3 Consequence for the Comparison

The Chinese date, on this analysis, carries astronomical content at its construction stratum, ordinal content and only ordinal content at its naming stratum, and correlative content at its qualification stratum through the same signs that serve, at the naming stratum, as counters. Section 13 takes up the qualification stratum in its own right, through the day-books and the almanac tradition that carry it, and Section 14 the deposit of cosmology in cycle construction itself. Together the three sections supply the Chinese half of the matched comparison, and they supply it stratum by stratum, so that the Mediterranean half can be laid beside it in Part III without the error the criterion of Section 5 was written to prevent.

13 Cosmological Content in the Almanac Stratum

This section conducts the Chinese case at the qualification stratum. Its objective is to show, from the specialist literature on hemerology and the almanac tradition, that the qualification of days in the Chinese system was dense, continuous over two millennia, and carried in a distinct textual apparatus, and to draw the consequence that matters for the criterion: that a comparativist reading either the naming stratum or the qualification stratum alone obtains an artifact, so that the separateness of the strata is itself significant. The section presents the excavated day-books (Section 13.1), the almanac tradition that succeeded them (Section 13.2), the instrument through which qualification was computed (Section 13.3), and the argument from separateness (Section 13.4).

13.1 The Day-Books

The earliest substantial evidence for the qualification stratum in China is the corpus of 日书 (rishu, day-books) recovered from tombs of the Warring States, Qin, and Han periods, of which the manuscripts from Shuihudi (Hubei), tomb 11, discovered in 1975, have received the closest study [37, 25, 26]. The day-books are hemerological handbooks: they assign to days, identified by their cyclical signs and their position in the month, favours and prohibitions for classes of action, travel, marriage, building, burial, the taking of office, and they do so through a plurality of systems, keyed to different cycles, that coexist within one manuscript. The specialist literature has established the editorial logic of the collections, the systems they employ, and their relation to the calendrical structure on which they operate [26, 16]. The paper takes these findings as given.

Two features are recorded here for the argument. The day-books are keyed to the calendar and are separate from it: they presuppose that a day has been dated, and they supply what the date does not, the day's character for action. And they are plural in their systems: a single day may be favoured under one system and prohibited under another within the same manuscript, so that the qualification stratum, at its earliest attested stage, is already a layered apparatus in its own right.

13.2 The Almanac Tradition

The qualification of days did not end with the day-books. It persisted, through the imperial period and into the present, in the almanac tradition, the 通书 (tongshu) and 黄历 (huangli, imperial almanac), whose annual issues assign to each day its favours, prohibitions, and correspondences, and in the practice of 择日 (zeri, day-selection) that consults them. The specialist literature on divination culture has documented the tradition's continuity, its social range, and its place among the mantic arts [56], and the astrological handbooks and horoscopic systems that grew alongside it have their own treatment [18]. The state's own almanac was an instrument of the calendrical monopoly, which Part IV takes up; the popular almanacs carried the same qualification stratum to a wider readership. In every form the almanac does what the day-book did: it takes a dated day and returns its character.

13.3 The Instrument of Qualification

Between the calendar and the qualification stood, in the early period, an instrument. The 式 (shi), rendered in Western scholarship as cosmic board or cosmograph, is a device consisting of a rotating disk representing the heavens mounted on a square plate representing the earth, its rims inscribed with astro-calendrical signs and its centre bearing the Northern Dipper; the earliest known examples come from the Shuanggudui tomb, sealed in 165 BCE [17, 7, 24, 27]. The board was set to the current configuration and read for the day's qualification; it was, in the specialists' description, a space-time reference frame that placed directions, stems, branches, and other symbols so as to model the cosmos, and this symbolic framework, once detached from direct astronomical reference, formed the basis of subsequent divinatory practice [16]. Two points are drawn from this for later sections and are stated here in the specialists' terms. The board computes a joint configuration of several cycles at once, which is what qualification requires. And the board's symbolic framework came to operate independently of the astronomy it modelled, which is a finding of the specialists and which Section 27 will read within the framework.

13.4 The Significance of Separateness

Claim 7.1. (Density and separateness of the qualification stratum). The Chinese qualification stratum was, from the earliest excavated evidence, dense in content, plural in its systems, and carried in an apparatus, day-book, almanac, and board, distinct from the apparatus that constructs and names the date. Its content is cosmological in the sense the paper uses: it assigns to occasions characters derived from correspondences among celestial, terrestrial, and human orders.

The claim is an established finding of the hemerology and divination literatures restated at its stratum, and its bearing on the criterion is the argument the section is written to make. Because the qualification stratum was carried separately, a comparativist could inspect the Chinese date and find its labels bare, and could inspect the almanac and find its content dense, and each inspection would be accurate to its stratum. The error would lie in taking either as the whole. A comparativist working from the naming stratum alone concludes that Chinese time carried no cosmology; a comparativist working from the qualification stratum alone concludes that Chinese time was saturated with it; and both attribute to a conception what belongs to a stratum. That the two strata were carried in separate apparatus is therefore itself significant for the comparison: separateness is what makes the artifact of Section 5.2 available, and separateness is what the layer-matched criterion is designed to see past. Section 14 completes the Chinese half by showing that the construction stratum too

carried cosmology, in a distribution the paper offers as a hypothesis, and that within one civilization more than one distribution of content across strata coexisted.

14 The Heaven–Earth–Human Relation and the Daoist Treatment of Change

This section completes the Chinese half of the matched comparison at the construction stratum, and it does so as a reading of a specialist literature that has already treated its subject at length. The objective is threefold: to report the classical vocabulary of timeliness and the participation cosmology of 天地人 (tian di ren, heaven, earth, and the human) as the specialists render them, with the one dispute the paper reports left open; to read the Daoist liturgical and alchemical treatment of time, as the specialist volume on that subject presents it, for what it shows about where cosmology is deposited; and to state, as a hypothesis, that Daoist practice deposits cosmology in cycle construction itself, so that two distributions of content across strata coexist within one civilization. Section 14.1 treats timeliness, Section 14.2 the participation cosmology, Section 14.3 the Daoist treatment of time, Section 14.4 the hypothesis, and Section 14.5 what the section withholds.

14.1 The Vocabulary of Timeliness

Classical Chinese thought possesses a vocabulary in which the fitness of an occasion for action is a property of the occasion's configuration. 时 (shi) names both the season and the timely moment; 时机 (shiji) the opportune juncture; 几 (ji) the incipient tendency, the point at which a change is beginning and can be seized; 势 (shi, written differently) the disposition of a situation, the momentum its configuration carries. The vocabulary has received philosophical study, and the study contains a reported dispute that the paper does not adjudicate: whether the classical Chinese treatment of change and process supports a reading of Chinese thought as fundamentally processual, or whether that reading imports a contrast with a static Western metaphysics that the sources do not sustain [2, 15]. The paper reports the dispute and takes from the vocabulary only what both sides grant, that these terms treat the fitness of an occasion as a property of its configuration among relations, and that this treatment sits at the qualification stratum, where an occasion is read for action. A parallel is conceded to the Greek *kairos*, the opportune moment; the parallel is one of function, at the qualification stratum, and the paper draws no genealogy from it. The almanac tradition of Section 13.2 may be read, in this vocabulary, as timeliness mechanized: the day's character, once a matter of reading the configuration, becomes a matter of consulting the table.

14.2 The Participation Cosmology

The triad 天地人 names a cosmology in which heaven, earth, and the human are three participants in one order, and in which the human participant's actions are to accord with the seasons of heaven and the dispositions of earth. The seasonal ordinances of the classical texts, which prescribe for each month the ruler's activities and prohibitions, are the ordinance form of this cosmology; ritual, with its calendar of sacrifices, is its liturgical form; and the qualification of days is its everyday form. In the paper's terms the participation cosmology is deposited at the qualification stratum in all three forms: what it does, in each, is qualify occasions for action by their place in the order. Whether it is also deposited at the construction stratum, in the choice and combination of the cycles themselves, is the question the Daoist material lets the section pose.

14.3 The Daoist Treatment of Time

The Daoist treatment of time in liturgy and in alchemy is the subject of a specialist volume, *Time in Daoist Practice: Cultivation and Calculation* [28], and of the studies of Daoist ritual, cosmology, and internal alchemy on which it draws [53, 48, 49, 43, 44, 45]. The section is a reading of that literature; it adds no finding to it and it presents the specialists' account before the paper's.

Three findings are taken from that account. First, Daoist ritual operates two directions of time: a progressive cycle, following the order of cosmogenesis from the One through differentiation to the many, and a regressive cycle that returns through the differentiations to the origin, and the two are enacted in liturgy as ordered sequences [53]. Second, internal alchemy structures its practice by the fire phases, 火候 (huohou), a schedule of the intensification and abatement of the inner fire keyed to the emblems of the calendar, the stems and branches, the trigrams, the lunar phases, and the practice gives the practitioner a dual temporal experience, a progression through the phases together with a reversal of the ordinary course of time [46]. Third, Daoist practice condenses time: the ten months of embryonic gestation, divided into thirty thousand segments, are made to correspond to a cosmic cycle of thirty thousand years, so that a schedule of the body is set in ratio to a schedule of the cosmos [28]. The paper cites these as established findings and reads them at their strata in the next subsection.

14.4 The Hypothesis of Deposit in Cycle Construction

Hypothesis 8.1. (Deposit in cycle construction; this paper's reading). Daoist liturgical and alchemical practice deposits cosmology at the construction stratum: the cycles it operates, progressive and regressive sequences, fire-phase schedules, and the ratio between the gestational and the cosmic period, are themselves built from cosmological content, so that the cosmology is present in the choice and combination of the cycles and is present there before any occasion is named or qualified. Within one civilization, therefore, two distributions of cosmological content across strata coexist: the calendrical and hemerological distribution of Sections 12 and 13, in which cosmology is thin at naming, astronomical at construction, and dense at qualification, and the Daoist distribution, in which cosmology is dense at construction itself.

The hypothesis is the paper's reading and is offered for examination by the specialists whose findings it rests on. Its evidence is the three findings of Section 14.3, read at their strata. A regressive cycle is a cycle whose direction is a cosmological choice; a fire-phase schedule is a cycle whose segments are cosmological emblems; and the thirty-thousand ratio is a calibration between two cycles set by construction, in the companion theory's sense that one mode's occurrences are made to measure another's, and set to a cosmological purpose. In each case the content is in the cycle, and the reading of Definition 4.2 applies. The hypothesis has a consequence the section states with care: the coexistence of two distributions within one civilization is a counterexample to any account that assigns a civilization a single conception of time and reads it off a single stratum. That consequence is stated as a consequence of the hypothesis, and stands or falls with it.

14.5 Withheld Readings

Two readings the material invites are withheld, in accordance with the constraints of Section 3.6. The vocabulary of timeliness and the participation cosmology invite the reading that classical Chinese thought anticipated a relational physics of time; the paper withholds

it, since the anachronism guardrail forbids attributing to the sources a concept the framework supplies, and since the specialists' dispute reported in Section 14.1 shows the sources to be contested on the point at issue. And the two distributions of Hypothesis 8.1 invite the reading that one is deeper, more integrated, or more advanced than the other; the paper withholds it, since the refusal of ranking forbids it, and since Hypothesis 5.3 already holds that the stratum at which content is deposited is selected by circumstance and is independent of the depth at which it is held.

- 15 Perception, Representation, and Semantics of Time**
- 16 The Cosmograph and the Externalization of Registration**
- 17 Virtual Modes and the Emergence of Entities from Computed Positions**
- 18 Retroactive Registration at the Naming Stratum**
- 19 The Planetary Week and Its Mediterranean Genealogy**
- 20 The Comparison Conducted at Matched Strata**
- 21 The Revision Path of a Stratum**
- 22 The Granting of Seasons and Bureaucratic Astronomy**
- 23 Coordination Technologies and the Cost of Timing**
- 24 The Standardization of Civil Time**
- 25 Calendrical Accuracy and the Refutability of a Mandate**
- 26 The Distinction Between Carrying and Owning a Warrant**
- 27 Deposit Sites Compared Across Traditions**
- 28 Questions Returned to the Specialist Literatures**
- 29 Limits and Refutation Conditions**
- 30 Conclusion**

References

- [1] Barbara Adam. *Timescapes of Modernity: The Environment and Invisible Hazards*. Routledge, London, 1998.

- [2] Sarah Allan. *The Way of Water and Sprouts of Virtue*. State University of New York Press, Albany, 1997.
- [3] Julian Barbour. *The End of Time: The Next Revolution in Physics*. Oxford University Press, Oxford, 1999.
- [4] Zungui 宗桂 Chen. 中国天文学史 [A History of Chinese Astronomy]. 上海古籍出版社, Shanghai, 1982. Multiple volumes.
- [5] Alain Connes and Carlo Rovelli. Von Neumann algebra automorphisms and time-thermodynamics relation in generally covariant quantum theories. *Classical and Quantum Gravity*, 11(12):2899–2917, 1994.
- [6] Joan Copjec. *Read My Desire: Lacan against the Historicists*. MIT Press, Cambridge, MA, 1994.
- [7] Christopher Cullen. Some further points on the shih. *Early China*, 6:31–46, 1980–1981.
- [8] Émile Durkheim. *Les formes élémentaires de la vie religieuse*. Félix Alcan, Paris, 1912.
- [9] Albert Einstein. Zur elektrodynamik bewegter körper. *Annalen der Physik*, 17:891–921, 1905.
- [10] Albert Einstein. Die grundlage der allgemeinen relativitätstheorie. *Annalen der Physik*, 49:769–822, 1916.
- [11] Norbert Elias. *Time: An Essay*. Blackwell, Oxford, 1992. Translated by Edmund Jephcott.
- [12] E. E. Evans-Pritchard. *The Nuer: A Description of the Modes of Livelihood and Political Institutions of a Nilotic People*. Clarendon Press, Oxford, 1940.
- [13] Johannes Fabian. *Time and the Other: How Anthropology Makes Its Object*. Columbia University Press, New York, 1983.
- [14] Alfred Gell. *The Anthropology of Time: Cultural Constructions of Temporal Maps and Images*. Berg, Oxford, 1992.
- [15] Christoph Harbsmeier. *Language and Logic*. Science and Civilisation in China, vol. 7, pt. 1. Cambridge University Press, Cambridge, 1998.
- [16] Donald Harper and Marc Kalinowski, editors. *Books of Fate and Popular Culture in Early China: The Daybook Manuscripts of the Warring States, Qin, and Han*. Brill, Leiden, 2017.
- [17] Donald J. Harper. The han cosmic board (shih 方). *Early China*, 4:1–10, 1978–1979.
- [18] Peng Yoke Ho. *Chinese Mathematical Astrology: Reaching Out to the Stars*. Routledge, London, 2003.
- [19] Wanhong Huang. A generative relational theory of temporal emergence in large-scale heterogeneous systems, 2026. Working draft.
- [20] Henri Hubert. étude sommaire de la représentation du temps dans la religion et la magie. *Annuaire de l'École pratique des hautes études, Section des sciences religieuses*, 1905. Reprinted in H. Hubert and M. Mauss, *Mélanges d'histoire des religions*, Paris: Alcan, 1909.

- [21] Xiaoyuan 江晓川 Jiang. 江晓川 [The True Origins of Chinese Astronomy]. 上海古籍出版社, Shenyang, 1991. Revised editions 2004, 2011, 2018.
- [22] Xiaoyuan 江晓川 Jiang. 江晓川 [Astrology in World History]. 上海古籍出版社, Shanghai, 1995. Revised edition, 上海古籍出版社, 2014.
- [23] Helge Jordheim. Against periodization: Koselleck's theory of multiple temporalities. *History and Theory*, 51:151–171, 2012.
- [24] Marc Kalinowski. Les instruments astro-calendériques des han et la méthode liu ren. *Bulletin de l'École française d'Extrême-Orient*, 72:309–419, 1983.
- [25] Marc Kalinowski. Les traités de shuihudi et l'hémérologie chinoise à la fin des royaumes combattants. *T'oung Pao*, 72:175–228, 1986.
- [26] Marc Kalinowski. Les livres des jours (rishu) des qin et des han: la logique éditoriale du recueil a de shuihudi (217 avant notre ère). *T'oung Pao*, 94, 2008.
- [27] Marc Kalinowski. The notion of “shi” 时 and some related terms in qin-han calendrical astrology. *Early China*, 35–36:331–360, 2012–2013. doi:10.1017/S036250280000535.
- [28] Livia Kohn, editor. *Time in Daoist Practice: Cultivation and Calculation*. Three Pines Press, St. Petersburg, FL, 2021.
- [29] Reinhart Koselleck. *Zeitschichten: Studien zur Historik*. Suhrkamp, Frankfurt am Main, 2000.
- [30] Reinhart Koselleck. *Sediments of Time: On Possible Histories*. Stanford University Press, Stanford, 2018. Translated and edited by Sean Franzel and Stefan-Ludwig Hoffmann.
- [31] Jacques Lacan. *Écrits*. Éditions du Seuil, Paris, 1966. English: *Écrits: The First Complete Edition in English*, trans. Bruce Fink, Norton, 2006.
- [32] Jacques Lacan. *Le Séminaire, livre XVII: L'envers de la psychanalyse, 1969–1970*. Éditions du Seuil, Paris, 1991. English: *The Other Side of Psychoanalysis*, trans. Russell Grigg, Norton, 2007.
- [33] Jacques Lacan. Logical time and the assertion of anticipated certainty. In *Écrits: The First Complete Edition in English*. W. W. Norton, New York, 2006. Original 1945; translated by Bruce Fink.
- [34] Ernesto Laclau. *Emancipation(s)*. Verso, London, 1996.
- [35] Ernesto Laclau and Chantal Mouffe. *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*. Verso, London, 1985.
- [36] G. W. Leibniz and Samuel Clarke. *The Leibniz–Clarke Correspondence*. Manchester University Press, Manchester, 1956.
- [37] Lexian 刘立群 Liu. 刘立群 [A Study of the Shuihudi Qin Bamboo-Slip Day-Books]. 上海古籍出版社, Taipei, 1994.
- [38] Yang 卢 Lu. 卢 [Ancient Chinese Astrology]. 上海古籍出版社, Beijing, 2008.
- [39] Nancy D. Munn. The cultural anthropology of time: A critical essay. *Annual Review of Anthropology*, 21:93–123, 1992.

- [40] Joseph Needham. Time and eastern man. In *The Grand Titration: Science and Society in East and West*. George Allen & Unwin, London, 1969. The Henry Myers Lecture, 1964.
- [41] Isaac Newton. *Philosophiæ Naturalis Principia Mathematica*. Royal Society, London, 1687. Scholium to the Definitions.
- [42] Don N. Page and William K. Wootters. Evolution without evolution: Dynamics described by stationary observables. *Physical Review D*, 27(12):2885–2892, 1983.
- [43] Fabrizio Pregadio. *Great Clarity: Daoism and Alchemy in Early Medieval China*. Stanford University Press, Stanford, 2006.
- [44] Fabrizio Pregadio. *The Seal of the Unity of the Three: A Study and Translation of the Cantong qi, the Source of the Taoist Way of the Golden Elixir*. Golden Elixir Press, Mountain View, CA, 2011.
- [45] Fabrizio Pregadio. *Taoist Internal Alchemy: An Anthology of Neidan Texts*. Golden Elixir Press, Mountain View, CA, 2019.
- [46] Fabrizio Pregadio. Views of time in chinese alchemy. In Livia Kohn, editor, *Time in Daoist Practice: Cultivation and Calculation*. Three Pines Press, St. Petersburg, FL, 2021.
- [47] Jingjia 丁家 Qiu. 天地人三才 [Between Heaven and Earth: A Historical Study of Astral Field-Allocation]. 中国书店, Beijing, 2020.
- [48] Isabelle Robinet. *Introduction à l’alchimie intérieure taoïste: De l’unité et de la multiplicité*. Éditions du Cerf, Paris, 1995.
- [49] Isabelle Robinet. Role and meaning of numbers in taoist cosmology and alchemy. In *The World Upside Down: Essays on Taoist Internal Alchemy*, pages 45–73. Golden Elixir Press, Mountain View, CA, 2011.
- [50] Hartmut Rosa. *Social Acceleration: A New Theory of Modernity*. Columbia University Press, New York, 2013. Translated by Jonathan Trejo-Mathys.
- [51] Hartmut Rosa. *Resonance: A Sociology of Our Relationship to the World*. Polity Press, Cambridge, 2019. Translated by James C. Wagner.
- [52] Carlo Rovelli. *The Order of Time*. Allen Lane, London, 2018. Translated by Erica Segre and Simon Carnell.
- [53] Kristofer M. Schipper and Hsiu-huei Wang. Progressive and regressive time cycles in taoist ritual. In J. T. Fraser, N. Lawrence, and F. C. Haber, editors, *Time, Science, and Society in China and the West*, The Study of Time V. University of Massachusetts Press, Amherst, 1986.
- [54] Sarah Sharma. *In the Meantime: Temporality and Cultural Politics*. Duke University Press, Durham, 2014.
- [55] Nathan Sivin. *Granting the Seasons: The Chinese Astronomical Reform of 1280, With a Study of Its Many Dimensions and a Translation of Its Records*. Sources and Studies in the History of Mathematics and Physical Sciences. Springer, New York, 2009. doi:10.1007/978-0-387-78956-9.
- [56] Richard J. Smith. *Fortune-Tellers and Philosophers: Divination in Traditional Chinese Society*. Westview Press, Boulder, 1991.

- [57] Pitirim A. Sorokin and Robert K. Merton. Social time: A methodological and functional analysis. *American Journal of Sociology*, 42(5):615–629, 1937.
- [58] E. P. Thompson. Time, work-discipline, and industrial capitalism. *Past & Present*, 38(1):56–97, 1967.
- [59] Slavoj Žižek. *The Sublime Object of Ideology*. Verso, London, 1989.
- [60] Eviatar Zerubavel. *Hidden Rhythms: Schedules and Calendars in Social Life*. University of Chicago Press, Chicago, 1981.
- [61] Eviatar Zerubavel. *The Seven Day Circle: The History and Meaning of the Week*. Free Press, New York, 1985.
- [62] Peiyu 裴宇 Zhang, Meidong 梅东 Chen, Shuren 舒仁 Bo, and Tiezhu Tiezhu Hu. 中国古代历法 [Ancient Chinese Calendrical Methods]. 中国书店, Beijing, 2008.