

Towards Generative Relational Governance

Discussion II

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Abstract

Two demands are made on contemporary governance, and this discussion treats them as distinct: the government of complex systems under uncertainty, and the sustained generation of value together with its return to those who produce it. Two research lineages are read here as responses to the one and to the other, the first assembled around adaptive, polycentric, and resilience-oriented governance, the second around the commons, generative justice, and peer production. Each is criticized from within for a limit that the other's competence would address.

A theoretical gap is not by itself a reason to act. The discussion therefore examines a class of contemporary objects that are complex and generative at once: peer-produced software infrastructure, the encyclopedic commons, and platform moderation. In each, both lineages return a verdict of health by their own criteria, output improves, and the system fails. The failures appear to share a structure. What is consumed is the capacity of a particular set of participants to bear the cost of sustaining the arrangement, a quantity that neither framework measures.

A relational reading of this quantity is proposed as an induction from the three cases. It is distinguished from labor, from network centrality, and from social capital, and the conditions of its refutation are stated. The discussion establishes no theory of generative relational governance and proposes no institutional design. Its purpose is prior to both, being to determine whether such a theory is warranted at all, by asking whether a problem exists that the available frameworks cannot see. Questions of scale are posed and left open, since a quantity must be operationalized before it can be tracked across scales, and that operationalization is the work this discussion identifies as next.

Keywords: public governance; complexity governance; generative governance; relational structure; scale.

A note on the standing of this discussion. This is a discussion paper. It surveys existing governance thought and practice, compares two contemporary lineages, and examines three cases in which both appear to fail together. Its contribution is a diagnosis. A theory of generative relational governance is named in the title and left unbuilt; the work here is the prior one of asking whether such a theory would be warranted, and the answer depends on whether the problem identified in Part III is real.

The order of exposition follows the order of the argument. The taxonomy, the comparison, and the cases come first, and the relational reading appears in Part IV as what they suggest. Should the limits documented in Section 10 fail to hold, or should the three cases prove to share only a surface resemblance, the later parts lose their ground.

The author would welcome objection, correction, and counter-evidence, and can be reached at huangwanhong@serendip.ngo. The purpose of setting the argument out at this length is to make it easy to disagree with.

Part I. A Taxonomy of Governance

1 THE QUESTION AND THE METHOD

The question that organizes this part is the following. As the scale of cooperation has grown and the relations to be coordinated have multiplied, what mechanisms has the human record produced for governing public affairs, what did each solve, and under what conditions did each fail.

The method requires two prior decisions, and both are departures from the usual practice.

The first concerns the unit of comparison. What will be compared is the coordination mechanism. The institutional form will not be, and the distinction is not pedantic. The institutional forms that the record presents are almost never pure. A contemporary open-source foundation coordinates simultaneously through hierarchy, through community norms, and through network reciprocity; a socialist state coordinates through hierarchy and, in its actual operation, through informal networks and quasi-market exchanges that its official self-description does not acknowledge; a corporation is internally a hierarchy and externally a market participant. If the comparison is conducted at the level of institutional forms, these composites cannot be analyzed, and the analysis collapses into a comparison of ideologies. Conducted at the level of mechanisms, the composites become tractable: one asks which mechanisms a given arrangement combines, in what proportion, and at which of its interfaces.

Four coordination mechanisms may be distinguished. Hierarchy coordinates through command and rule, and its characteristic instrument is the directive. The price mechanism coordinates through exchange and competition, and its characteristic instrument is the market signal. Norm coordinates through shared expectation and mutual monitoring, and its characteristic instrument is sanction by the group. Network coordinates through negotiated interdependence among parties none of whom commands the others, and its characteristic instrument is the ongoing relation itself.

Coordination mechanism. The means by which action is aligned among participants who cannot align it by direct mutual visibility alone. Four are distinguished. *Hierarchy* coordinates through command and rule. *Price* coordinates through exchange and competition. *Norm* coordinates through shared expectation and mutual monitoring. *Network* coordinates through negotiated interdependence among parties none of whom commands the others. Institutional forms are composites of these; the mechanism, not the form, is the unit of comparison.

The second decision concerns the shape of the history. It will be argued in Section 6 that these mechanisms stand in a determinate relation to one another, in which the residue of each

becomes the problem of the next. This argument must be insulated at the outset against a misreading to which it is exposed. That one mechanism historically succeeds another does not establish that the successor is superior, and it does not establish that the predecessor failed by its own internal logic. The record contains, with some frequency, cases in which a functioning arrangement was destroyed by external force and in which the destruction was justified by an appeal to progress that the subsequent evidence did not support. Two of the cases examined below are of exactly this kind. A history of governance that could not distinguish an arrangement superseded by its own contradiction from an arrangement abolished by a state that considered it archaic would not be a materialist history. It would be a philosophy of progress with a materialist vocabulary.

2 CENTRALIZED GOVERNANCE

2.1 *The Mechanism*

Centralized governance coordinates through hierarchy. A center receives information, decides, and transmits directives downward through an apparatus whose members are bound by rule rather than by personal loyalty. Its achievement is that it permits coordinated action at a scale, and over a duration, that no face-to-face arrangement can reach: it makes conduct calculable, it makes outcomes predictable, and it renders the apparatus independent of the persons who happen to staff it at any moment.

2.2 *The Practices*

The Weberian ideal type is not the only realization of the mechanism and it is not the earliest. The Chinese imperial examination system, whose systematic implementation began under the Tang, established the principle of selecting officials by merit rather than by birth; recent research places the institutional turning point from pedigree-based aristocracy to bureaucratic recruitment in the seventh and eighth centuries, and by the Song the examinations had become the primary method of recruitment for official posts. The precedence is not merely chronological, and the direction of influence is documented: the Northcote-Trevelyan reforms that established merit-based entry into the British civil service were recommended with explicit reference to the Chinese examinations, and the method was first tried in the East India Company.

The Chinese case does more than antedate the European one; it modifies the concept. Analysis of Qing provincial appointments finds that the selection mechanism corresponded neither to the ideal type of meritocracy nor to Weberian patrimonialism, but that rulers adapted to conflict dynamics, with selection becoming more merit-based when internal conflict raised the demand for capability. And the examination system operated as something other than

a recruitment device. It has been argued that its principal function was the projection of the ideational power of the state: it did not merely select officials but shaped how they thought, producing a culturally coherent bureaucracy bound by shared texts and habits of thought, so that the system was an instrument of political reproduction and not only of staffing. Those recruited through it were masters of a common scholarship and shared values with the local gentry, whose support was necessary for the provision of public goods and the resolution of local disputes.

2.3 *Achievement and Limit*

The advance of centralized governance, assessed against what preceded it, is genuine and it is threefold: speed of decision, capacity for coordination at scale, and the establishment of uniform standards across a territory. Against the alternative of allocation by birth, the examination system in particular represents an enlargement of access whose significance should not be diminished by the observation that the enlargement was partial.

The limit is internal to the achievement. The rule secures calculability by abstracting from the particular, and the same abstraction renders the particular invisible. Information degrades in ascent, since each level summarizes for the level above and every summary is a decision about what may be omitted. Local knowledge is lost, because it is precisely what the rule abstracted from. Innovation is constrained, since the categories through which the apparatus perceives are fixed in advance of what it might encounter. And the knowledge of the governed cannot ascend, for there exists no channel by which it could, the construction of such a channel requiring the very categories whose insufficiency is at issue.

The Chinese case discloses a further limit, which the Weberian type obscures. An apparatus that reproduces a common formation among those it recruits achieves coherence at the cost of variance. The uniformity that made the bureaucracy governable is the uniformity that narrowed what it could conceive.

3 MARKET GOVERNANCE

3.1 *The Mechanism*

Market governance coordinates through price. No agent need possess the dispersed information that the system uses, since the price aggregates it and each participant acts on the signal alone. Incentive is aligned with contribution automatically, dispensing with the supervisory apparatus that hierarchy requires.

3.2 *The Practices*

The mechanism is realized in market exchange as theorized from Smith onward, in the Hayekian account of the price system as an information-processing device, and in the sequence of liberalizations conducted under that account in the late twentieth century. It should be noted that no actual economy is coordinated by price alone, and that the firms which populate markets are internally hierarchies, which is a fact about the composite character of institutional forms rather than an objection to the analysis of mechanisms.

3.3 *Achievement and Limit*

The advance is precisely located: the mechanism solves what hierarchy could not, namely the use of knowledge that no center can assemble. It supports innovation because it does not require permission, and it coordinates dispersed decision without any decision about dispersal having been made.

The limits are equally located. The price registers what is exchanged and therefore fails to register whatever is produced or destroyed outside the transaction. Goods from which none can be excluded are undersupplied, because the mechanism that funds provision is the mechanism that excludes. Inequality is generated in the ordinary operation of the mechanism rather than as a deviation from it.

The deepest limit concerns the destination of value. The mechanism permits value to move toward whoever occupies the position from which it may be appropriated, and the movement of value away from the relations that produced it is constitutive of the mechanism. This is the point at which the sixth category below takes its bearings, and the observation is a structural description.

4 COMMONS GOVERNANCE

4.1 *The Mechanism*

Commons governance coordinates through norm. The users of a resource make the rules that bind their use of it and monitor one another's compliance. Neither directive nor price is required, because the mutual visibility of the participants performs the work that both would otherwise perform.

4.2 *The Practices*

The practices are numerous, ancient, and distributed across cultures, and this distribution is itself the finding. Irrigation communities, forest commons, and inshore fisheries have been documented across a large body of cases as long-enduring, self-organized, and self-governed. The European Alpine and Iberian cases belong to this record, and so do the Japanese *iriai*

forests, whose institutions were established largely during the Edo period and which supplied firewood, forage, and grass under local rules that protected the resource from overexploitation.

The Balinese *subak* deserves separate treatment, because it is the case in which the mechanism is seen in its greatest development. Irrigation cooperatives that manage the terraces are, together with the terraces themselves, approximately a thousand years old, and the system of water temples that links them in a nested hierarchy is of comparable antiquity, with *subak* and water temples described in royal inscriptions of the eleventh century. Its structure is worth stating with precision, since it is the structure that the later parts of this discussion will need. Each *subak* performs ritual offerings at its own water temple, and the temple is also the venue at which farmers elect leaders and decide irrigation schedules. *Subak* sharing a common water source form a congregation at a regional temple, at which agreement is reached on cropping schedules at the scale of the watershed. Coordination is thereby achieved at successive scales: the village temple governs the water entering the nearby terraces, the regional temple governs the water flowing into the larger area. The arrangement has been characterized as one in which sustainability and social coordination are emergent properties of a complex network of cooperation. When the system was modeled computationally, water-temple management was found to provide the optimal balance between pest suppression and water sufficiency.

4.3 *Achievement and Limit*

The advance is the use of local knowledge that neither hierarchy nor price can incorporate, rules that adapt to the particular conditions of the resource, and a level of participation from which compliance follows without external enforcement. The *subak* case suggests, further, that the mechanism may not be confined to the single small group. Nested coordination across an entire watershed, sustained for a millennium, is at least one instance in which norm-based coordination reached a scale that the mechanism's critics have supposed closed to it. How far the instance generalizes is not settled by the instance.

The limits are two, and they must be distinguished sharply, because the distinction is the methodological point of this part.

The first limit is internal. Coordination through norm requires mutual visibility, and mutual visibility is what growth in the number of participants destroys. The mechanism requires a boundary, since trust is maintained by knowing who belongs, and the boundary that makes trust possible constitutes those outside it as external to the community's obligations. These are properties of the mechanism.

The second is not a limit of the mechanism at all, and to record it as one would be to falsify the history. The *iriai* were dismantled in the postwar period by a government program to modernize them, undertaken on the view that collective management was archaic and inefficient, which shifted management from collective to individualized form. The *subak* were disrupted by the Green Revolution of the 1970s, when farmers were required to plant as often

as possible with new varieties, fertilizers, and pesticides, bypassing the cropping patterns that the water temples had regulated; local authorities assumed control of water management and traditional schedules were ignored. The consequence was not improvement. Pest outbreaks followed and harvests were lost on a large scale, year after year. In the 1980s the Balinese government abandoned the imposed regime and the authority of the water temple system was restored.

The subak did not fail. The subak was overridden by a state acting on a theory of its own backwardness, and the theory was refuted by the outcome. Whatever else the history of governance may be, it is not a sequence in which the superior mechanism displaces the inferior. Any account that reads the decline of commons arrangements as their supersession has mistaken the exercise of power for the movement of history.

An arrangement superseded by its own contradiction and an arrangement abolished by a power acting on a theory of its backwardness are two different terminations, and a history that cannot distinguish them is a philosophy of progress in materialist vocabulary. The subak and the iriai did not fail. They were overridden, and in the Balinese case the outcome told against the theory that had justified the overriding, the imposed regime being abandoned after the harvests failed.

5 COLLABORATIVE AND NETWORK GOVERNANCE

5.1 *The Mechanism*

Collaborative governance coordinates through network. Government, firms, non-governmental organizations, residents, and universities participate in the governing of a matter that none of them commands, and coordination proceeds through negotiated interdependence rather than through directive, price, or the norms of a bounded community.

5.2 *The Practices*

The practices are those of co-production, multi-stakeholder governance, and network governance as developed over the past several decades, and they are found in urban regeneration, community development, and environmental governance. The mechanism is the characteristic response to problems that cross the boundaries of existing jurisdictions and that no single actor possesses the authority or the knowledge to address alone.

5.3 *Achievement and Limit*

The advance is that the mechanism operates where the others cannot: across boundaries, among parties of unequal kind, on problems that belong to no one's jurisdiction. It permits lo-

cal knowledge to enter without requiring the bounded community that commons governance requires, and it permits coordination without the authority that hierarchy requires.

The limits are three. Coordination costs are borne as unremunerated participation, and they do not distribute evenly but concentrate on those who take responsibility. Networks are not flat, and those through whom coordination must pass acquire an influence that no rule granted and that is therefore not subject to the procedures by which granted authority is checked. And accountability becomes diffuse in proportion as authority becomes shared, so that the mechanism's characteristic virtue and its characteristic pathology have the same source.

6 THE SEQUENCE AND ITS RESIDUES

The four mechanisms may now be placed in relation. The relation is one of residues: each mechanism, in solving its problem, leaves something unsolved that becomes the problem to which the next mechanism is the response.

Hierarchy secures coordination at scale and cannot recover the local knowledge from which its abstraction departed. Price recovers exactly that: dispersed knowledge acting locally, its effect propagating through the signal, with no ascent through any hierarchy required. The remedy is specified by the contradiction it answers. Price, in turn, secures the use of dispersed knowledge and permits value to be drawn away from the relations that produce it; and in dissolving the traditional community it renders visible, in the only way available to it, what that community had been supplying unpriced: trust, situated knowledge, and the disposition to cooperate absent enforcement. Norm-based governance takes up what price consumed. Norm secures cooperation through mutual visibility and cannot survive the loss of mutual visibility that scale imposes, nor extend its obligations past the boundary that constitutes it. Network takes up what norm could not: coordination across boundaries, among unlike parties, without a bounded community. And network leaves the coordinator's position unaccountable and the coordinator's burden unremunerated.

Two residues have not been taken up by any of the four. The first is the government of systems that do not hold still, which hierarchy could not manage and which network addressed only at the level of the individual problem. The second is the destination of value, which price made into a structural feature and which none of the subsequent mechanisms has recovered. This discussion reads the two contemporary lineages as descending from these two residues, and offers the descent as an account of why the two bodies of work have engaged one another so little.

Two residues survive the sequence unclaimed: the government of systems that do not hold still, and the destination of the value produced. The complexity lineage descends from the first and the generativity lineage from the second. Their descent from different residues would account for their having developed in isolation, and their having reached, at approximately the same moment, the limit that the other's competence would address is the reason offered here for thinking them together.

The comparison may be summarized. The table records, for each category, the dominant coordination mechanism, whether local rule-making is admitted, whether the arrangement learns, and how it treats the destination of value. The last column is the one that the received comparisons omit, and its omission is the reason the sixth category had to be constituted separately.

Category	Mechanism	Local rules	Learning	Destination of value
Centralized	Hierarchy	Low	Weak	Upward to the center
Market	Price	Medium	Strong	To the appropriating position
Commons	Norm	High	Strong	Retained by the user group
Collaborative	Network	High	Strong	Unspecified; diffuse
Complexity	Any	High	Very strong	Not theorized
Generativity	Norm, net-work	Very high	Strong	Returned to generators

The horizontal rule in the table is not decorative. Above it are coordination mechanisms realized in institutional forms; below it are lineages that combine mechanisms and have not settled into a form. Reading the table as a single list of six options would obscure precisely the distinction on which Part II depends.

The digital condition should be recorded here, since it supplies the material possibility of both. By collapsing the cost of coordination, it makes possible a coordination neither hierarchical nor priced at scales beyond the reach of mutual visibility, which is the condition of contemporary peer production. And it reproduces the contradiction of price in a new medium, since the infrastructure through which coordination passes becomes a coordinating node, and data becomes the new object of extraction, drawn from the relations whose coordination the platform enables.

Part II. The Two Contemporary Lineages

7 THE STANDING OF THESE TWO

The two categories examined in this part are not a fifth and sixth mechanism to be set beside the four. They are of a different kind, and stating the difference is necessary if the comparison in Section 10 is to be intelligible.

The four preceding categories are coordination mechanisms that have been realized in durable institutional forms. The two that follow are research and practice lineages, which is to say programs that are still in motion and that have not settled into an institutional form. Complexity governance is a governance perspective rather than an institution, and it can be pursued within a state apparatus, within a firm, or within a community. Generative practice is a family of experiments, and it can adopt the norm-based form of the commons or the network form of peer production.

That these two are the ones that a relational reading approaches most closely is therefore not a coincidence and not a preference. It follows from what they are. A mechanism that has settled into an institutional form has, by settling, fixed its answer to the question of what it coordinates and how. A lineage still in motion has not, and it is in the space of what has not yet been fixed that the questions of this discussion can be posed at all.

8 THE COMPLEXITY LINEAGE

The first lineage descends from the residue of coordination. Its problem is the government of systems that do not hold still, and its formative context is environmental and natural-resource management, where the inadequacy of centralized expert control became evident earliest.

Adaptive governance is understood in this literature as the range of interactions among actors, networks, organizations, and institutions that emerge in the pursuit of a desired state for social-ecological systems, invoked in response to the complexity and uncertainty of rapid environmental change; its emergence is traced explicitly to the failure of earlier management regimes to construct governance structures robust enough to secure sustainability under uncertainty. Its normative content has been summarized as the devolution of management authority to promote participation, the construction of collaborative networks across levels, the maintenance of arrangements flexible enough to permit response to surprise, and learning through those networks. Polycentricity supplies the structural correlate: an arrangement is polycentric when its constituent decision-making entities possess considerable *de facto* autonomy from one another, whether or not they are formally independent, and adaptation in such arrangements emerges among multiple centers of agency as a relatively self-organized process marked by innovation and social learning. Resilience supplies the criterion of success,

characterizing the degree to which a system endures perturbation without collapsing into an alternative stable state.

The lineage's governing question is thereby fixed. It asks how a system may persist.

9 THE GENERATIVITY LINEAGE

The second lineage descends from the residue of extraction. Its problem concerns the value that circulates within a system and whether that value returns to those who produced it. The persistence of the system is a separate question, and this lineage does not pose it.

Its diagnosis is that both received alternatives extract. In the formulation that has organized much of the recent work, communism extracts value for the state and capitalism extracts it for the corporation, so that both destroy communities and individuals; against both is proposed the circulation rather than the extraction of value, defined in terms of the universal right to generate unalienated value and participate directly in its benefits, the right of value generators to create their own conditions of production, and the right of communities of value generation to sustain paths for its circulation. The criterion follows: sustainable systems return value to its sources, and crises arise where value is expropriated with little return. It is worth recording that this account takes its bearings explicitly from indigenous practice, holding that a better model than the top-down solutions is found in the bottom-up approach of indigenous traditions, which practiced value circulation rather than value extraction.

The empirical field is populated by practices in which the return can be observed: peer production of the open-source and encyclopedic kind, which has challenged proprietary control over intellectual property through a gift exchange of labor value; agroecological practice, which establishes a return cycle of ecological value through composting and intercropping; worker-owned cooperatives and artisanal production, in which profits, skills, and responsibilities circulate back to those generating the original value. Community currencies and the maker movement belong to the same family.

The lineage's governing question is thereby fixed, and it is not the question of the first lineage. It asks how value may continue to be generated and to return.

10 THE BLIND SPOT OF EACH LINEAGE

The claim of this section is that each lineage has a limit, that the limit of each is documented within its own critical literature, and that the two limits are complementary. This is the section on which the remainder depends.

10.1 *The Limit of the Complexity Lineage*

The lineage answers the persistence of systems. It has been criticized from within for the thinness of its treatment of power and of the sources of cooperation, and the criticism has become one of its recognized internal problems rather than an external objection.

The critique has been formulated as concerning the process, power, and meaning dimensions of environmental and natural-resource governance. Resilience research has been characterized as depoliticized, as failing to recognize social contingency, and as failing to recognize the variable capacities of different actors to shape governance systems. The judgment has been rendered that resilience thinking has failed to deal with issues of power and has attended too much to governance structures and functions and too little to political, historical, and cultural context, so that the literature has emphasized the management of policy problems at the expense of the politics of governing itself. The point has been put with particular sharpness in the observation that adaptive co-management, like all environmental management, is an inherently political and not simply a technical undertaking, and that management institutions are embedded in unequal relations of production such that their reform is unlikely by itself to produce equitable outcomes.

A second and structurally distinct limit concerns what happens when adaptive arrangements meet incumbent institutions. In the study of adaptive governance initiatives in urban regeneration it has been found that such initiatives can institutionalize and materialize, but that the resilience of incumbent institutions against them causes the emergent adaptive institutions to lose their core features over time, so that the transformational effect remains limited; the mechanism identified is that existing institutions run on a particular distribution of power maintained by those who benefit from it. The limit is therefore not that the lineage fails to describe complex systems. It is that the adaptive form, on entering a field structured by power, is reshaped by that field.

What the lineage does not supply is an account of why participants continue to cooperate, of where the value sustaining their cooperation originates, and of what becomes of that value once produced. Its criterion is persistence, and a system may persist while extracting comprehensively from those who sustain it.

10.2 *The Limit of the Generativity Lineage*

The lineage answers the return of value. Its limit concerns scale, and it appears with unusual clarity because its exemplary practices have now run long enough for their failure modes to have been documented.

Peer production exhibits the limit as the exhaustion of those who maintain. The reported condition of open-source maintenance is that a majority of maintainers work unpaid, that a majority have quit or considered quitting, and that a substantial proportion of those who

leave cite exhaustion as the reason. The consequence is not confined to individual well-being: a widely deployed component of a major infrastructure project was retired not because it had become obsolete but because those maintaining it could no longer sustain the work. The structure of the failure is what matters here. Value circulates, in the sense the lineage requires, since the software returns to the community that produced it. What does not circulate is the labor of maintenance, which concentrates on a few and is drawn upon by an ecology of corporate users that treats the resource as free. A vicious circle has been described in which overworked maintainers lack the time to onboard assistance, which deepens the exhaustion and raises the probability of abandonment. This is a governance failure occurring inside a system whose value circulation is functioning as designed.

Commons arrangements exhibit the limit as the difficulty of extension. The received response is the nesting principle, according to which local organization is neither absorbed nor sidelined but included within a multi-level polycentric system operating from local to regional levels. The difficulty is that the up-scaling of community-based approaches has run well ahead of knowledge about how such up-scaling might work. It has been argued that the design principles scale for some classes of global public good and are not conducive to others, and it has been acknowledged that the principles proposed for global commons are not yet solidly established or strongly tested, resting on a limited empirical base at that scale.

A qualification is required here, and it is the qualification that Part I was constructed to make available. The scale limit of the commons is not established by the historical decline of commons arrangements, because that decline was, in the cases examined, not a failure of the arrangements. The subak coordinated a watershed for a millennium and were disrupted by state imposition, not by their own limits; the iriai were dismantled by a modernization program premised on their obsolescence. The evidence for the scale limit is the contemporary evidence: the documented difficulty of extending commons governance to global resource problems, and the documented concentration of maintenance burden in peer production. These are limits observed in functioning systems, not inferred from the fate of systems that were overridden.

10.3 The Complementarity

The two limits are the inverse of one another. The complexity lineage possesses an account of persistence at scale and lacks an account of value and of why cooperation is sustained. The generativity lineage possesses an account of value and of its return, and lacks an account of persistence at scale. Each is strongest where the other is weakest.

The complexity lineage possesses an account of persistence at scale and lacks an account of value and of why cooperation is sustained. The generativity lineage possesses an account of value and of its return and lacks an account of persistence at scale. Each is strongest where the other is weakest. This discussion reads the complementarity as the residue structure of the historical sequence, and not as a coincidence of two literatures.

This discussion reads the complementarity as the residue structure of Part I, and not as an artifact of the characterizations offered here. On that reading the complexity lineage inherits the problem of coordination, which hierarchy raised and which price and network transformed without resolving, and the generativity lineage inherits the problem of extraction, which price made structural and which the digital condition reproduced. These are the two residues the sequence leaves unclaimed, and the two lineages are the forms in which each is presently being worked. Their descent from different residues would account for the slightness of the engagement between them. The reason offered here for thinking them together is that each has reached, at approximately the same moment, the limit that the other's competence would address.

The separation itself is asserted here as a reading and not as a documented fact about the two literatures. What the discussion documents is the limit of each and the complementarity of the two limits. Whether the two bodies of work have in fact proceeded in mutual ignorance is a bibliometric question, and it is one this discussion does not settle.

11 THE QUESTION LEFT OPEN BY THE HISTORY

The question left standing may now be stated. Whether there is a mode of governance that answers both demands at once, sustaining complex systems while sustaining the generation and return of value within them.

The status of this question requires precision. It is not posed because a framework was available that could answer it. It has been arrived at by constructing a taxonomy, examining the practices under each category and the limits of each, and reading the critical literature internal to the two lineages that the sequence produced. Had that literature not documented these limits, the question would not arise and the remainder of this discussion would have no object.

Part III. The Convergence

12 THE INSUFFICIENCY OF A THEORETICAL GAP

Part II established that each lineage has a limit and that the two limits are complementary. This establishes the existence of a theoretical gap, and a theoretical gap is not a reason to do anything. Gaps in the literature are numerous and most of them deserve to remain open. A research program is warranted not by the incompleteness of the theories that precede it but by the existence of objects that those theories fail to describe, and the burden of this part is to show that such objects exist.

The claim to be defended is narrow and it should not be inflated in the reading. It is not that society requires a new governance theory, which is a proposition that could not be established by any evidence and which the discussion does not assert. It is the following. There exists a class of contemporary governance objects that possess complexity and generativity simultaneously; when the two lineages are applied to such an object, each returns a verdict of health by its own criterion; and the object fails nonetheless. Where this occurs, the failure is invisible to both frameworks, and it is invisible not because either framework has been misapplied but because each is functioning as designed.

An object of this kind is a double blind spot rather than a gap. The distinction matters practically. A gap is a region no theory has yet described, and it is discovered by surveying the literature. A double blind spot is a region that the available theories describe as unproblematic, and it is discovered only when the object fails. The first can be filled at leisure. The second is found by casualties.

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13 THE STRUCTURE OF THE CONVERGENT OBJECT

The digital condition, as recorded at the end of Part I, supplies the material possibility of both lineages at once, and it is therefore unsurprising that it should have produced objects in which both properties are present. Such an object may be characterized by two conditions holding together.

It is complex in the sense the first lineage requires. Many actors, no center, non-linear propagation of disturbance, and an environment that does not hold still. It is governed, to the extent that it is governed at all, through adaptive and polycentric arrangements rather than

through directive.

It is generative in the sense the second lineage requires. Its value is produced continuously by its participants, it circulates back to them, and the system persists only for as long as the production continues. No stock underlies it. There is no reservoir on which it can draw when generation stops.

The two conditions were, for most of the history reconstructed in Part I, satisfied by different objects. A watershed is complex and its value is largely given rather than continuously produced. A workshop is generative and it is not complex. What the digital condition has produced is a class of objects in which both hold at once, and the members of this class are neither exotic nor peripheral. They include the software infrastructure on which the technical civilization runs, the largest reference work ever assembled, and the moderation systems that make the major discussion platforms usable.

14 THREE CASES

The three cases that follow are presented in the same order in each instance: the verdict of the first lineage, the verdict of the second, and the failure that both verdicts miss. The point is the isomorphism. One case is an anecdote and three with the same structure are a pattern.

14.1 *Peer-Produced Infrastructure*

Consider the maintenance of the open-source components on which contemporary computing depends.

The complexity lineage returns a verdict of health. The ecosystem is polycentric in the strict sense, its decision-making entities possessing considerable *de facto* autonomy; it is adaptive, learning through distributed networks and revising its arrangements in response to disturbance; it is resilient in the sense of the definition, having absorbed decades of perturbation without shifting into an alternative stable state. By the criteria the lineage most prominently supplies, the system reads as a success, and it is in fact frequently offered as an exemplar of the very properties the lineage recommends. Whether some criterion internal to the lineage would register the failure is the first of the refutation conditions stated in Section 22.

The generativity lineage returns a verdict of health. Value is generated by the participants and returns to them: the software produced by the community is available to the community, unalienated in precisely the sense the lineage specifies. There is no expropriation of the artifact. Judged by the criterion that sustainable systems return value to their sources, the system is functioning as designed.

The system is nonetheless failing. A majority of maintainers work unpaid; a majority have quit or considered quitting; a substantial proportion of those departing cite exhaustion. A widely deployed component of a major infrastructure project was withdrawn from security

maintenance not because it had been superseded but because those maintaining it could no longer sustain the work. A vicious circle has been documented in which overworked maintainers lack the time to onboard assistance, which deepens the exhaustion and raises the probability of abandonment.

The failure is located precisely where neither framework looks. The artifact circulates; the labor of maintaining it does not. The burden of sustaining the system concentrates upon a small number of participants and is drawn upon by an ecology of corporate users for whom the resource is free. This is neither a failure of value circulation nor a failure of adaptive capacity. It is a failure in the distribution of the cost of sustaining the relations through which value circulates and adaptation occurs, and neither lineage possesses a term for that quantity.

14.2 The Encyclopedic Commons

Consider the largest collaborative knowledge project yet undertaken.

The complexity lineage returns a verdict of health, and the generativity lineage returns a verdict of health, on the same grounds as before. The project is self-organized, polycentric, adaptive, and has absorbed a quarter-century of disturbance. Its value is generated by volunteers and returns to the public without appropriation.

The output metrics confirm both verdicts. Content quality is up, article count is up, and the number of featured articles is up. The encyclopedia has never been better. This is the finding of those most concerned about the project's condition, and it is offered by them as a warning.

The system is nonetheless failing. Acquisition of new contributors has fallen by more than a third while total edits have risen, which is to say that more work is being extracted from a shrinking base of committed volunteers. The system is concentrating. The administrator corps of the English project has declined from nearly eighteen hundred to slightly more than eight hundred, not all of whom are active, so that a project of increasing importance is held together by a shrinking body of unpaid volunteers. Efficiency gains, for years the compensation for a contracting contributor base, are reported to have reached their limit, an experienced editor who departs now costing more to replace for want of a pipeline behind them. The quality metrics, on this reading, are not evidence of health. They are evidence that the people maintaining the system have become irreplaceable.

The isomorphism with the preceding case is exact and it is worth stating without ornament. Value circulation is functioning. Adaptive capacity is functioning. The output is improving. And the relational structure that bears the cost of producing the output is being consumed by the production. Both frameworks measure the output; neither measures the consumption.

14.3 Platform Moderation

Consider the volunteer moderation systems on which the major discussion platforms depend.

Here the two verdicts are again favorable. The system is polycentric to a degree that its own operators emphasize, with communities self-organizing and devising rules tailored to their particular circumstances; it is adaptive, with moderators developing sophisticated understanding of local context and adapting general policy to local norm. Value is generated by participants and returns to the community, which is the ordinary self-description of the moderator and is not false.

The system is nonetheless failing, and this case makes visible a feature that the first two cases contain but do not display so plainly. The labor performed by volunteer moderators on a single platform has been valued at no less than several million dollars annually, against a platform revenue in the hundreds of millions, and the platform employs no paid moderators while relying on more than a hundred thousand unpaid ones. Moderators face exhaustion from the volume of work, from being targeted for their decisions, and from the emotional labor the role requires; the two principal reasons given for quitting are insufficient available time and conflict with other moderators. The position has been characterized as one in which unpaid volunteers bear a substantial burden of emotional labor while serving platform operators who may remove them at will.

What this case adds is the extraction channel. In the first two cases the beneficiaries of the uncompensated maintenance are diffuse, an ecology of users and readers. Here the beneficiary is a single corporate entity whose valuation depends on the labor it does not pay for. The generativity lineage possesses the concept that would name this, since it is extraction in the strict sense; but it does not detect it, because the value whose circulation the lineage tracks, namely the content, does circulate. What is extracted is the labor of governing the content. The content itself is not extracted, and the cost of governing it is a relational cost, not a value flow.

15 THE CONSEQUENCES OF THE ISOMORPHISM

The three cases have the same structure and the structure may now be stated in general form.

In each, the object is simultaneously complex and generative. In each, the first lineage's criterion returns health, because the system persists and adapts. In each, the second lineage's criterion returns health, because value is generated and returns to its generators. In each, the output improves even as the failure advances, so that the metrics both lineages would consult are actively reassuring. Their silence would be the lesser difficulty. And in each, the failure occurs in the same place: in the relations that bear the cost of sustaining the system, whose burden grows with the system while the relations bearing it do not.

Three consequences follow, and they should be distinguished carefully.

Three documented cases exhibit the same structure. Each object is complex and generative at once. In each, both leading frameworks return a verdict of health by their own criteria, the output metrics improve as the failure advances, and the system fails nonetheless. In each, the failure falls in the same place: on the relations that bear the cost of sustaining the system, whose burden grows with the system while the relations bearing it do not. If the three are indeed isomorphic, and Section 22 states what would show they are not, then neither framework is wrong and both are incomplete in the same respect. Each answers correctly the question it asks. Neither asks the question on which these objects die. Two frameworks that are each silent on a quantity do not become articulate about it by being placed side by side.

The first is that the frameworks are not wrong. Nothing in the foregoing constitutes a refutation of adaptive governance or of generative justice. Each answers correctly the question it asks. The difficulty is that neither asks the question on which these objects fail, and their conjunction does not ask it either, since two frameworks that are each silent on a quantity do not become articulate about it by being placed side by side.

The second is that the failure mode is invisible in advance. Where both criteria return health, the frameworks in use emit no warning, and the withdrawal of a critical component from security maintenance was not, so far as the documented record shows, anticipated by either. The community around such a project may know its condition well; the claim here concerns the analytical frameworks and not the tacit knowledge of participants. This is what distinguishes a double blind spot from a gap, and it is the reason the matter is urgent.

The third concerns the trajectory. The class of convergent objects is not shrinking. The material condition that produces them, namely the collapse of coordination cost that permits generative production at complex scale, is not being withdrawn. Each addition to the class is an object for which the available frameworks will report health until it fails.

16 THE CONSEQUENCE OF NON-ADDRESS

The question may be answered without prophecy, because the answer has already been observed three times.

What happens is that systems whose output is improving, whose value circulation is functioning, and whose adaptive capacity is intact, are consumed from within by the concentration of the cost of their own maintenance, and that this consumption is not detected until the moment of failure because the instruments in use are measuring other things. A component on which a large part of the technical infrastructure depends ceases to receive security patches. A reference work of unmatched scale becomes dependent on a corps of maintainers who cannot be replaced. A platform's governance runs on labor that its own governance model does not

acknowledge as labor.

None of this is a forecast. It is a description of events that have occurred, and the forecast that follows from them is the modest one that they will recur, because the conditions that produced them persist and because nothing in the available frameworks would announce their recurrence in advance.

This is the practical motivation, and the discussion advances no more than this. The claim is not that a relational account of governance is correct, and it is not that society requires one. The claim is that a class of objects exists for which the two leading frameworks report health while the object dies, that the failures share a structure, and that the structure concerns a quantity neither framework measures. Whether that quantity is well described as relational, and whether a governance account organized around it would do better, remains to be shown. It is shown nowhere in this discussion. What has been shown is that the question is not idle.

Part IV. A Relational Reading

17 THE UNMEASURED QUANTITY

The three cases converge on a quantity that neither framework measures, and the task of this part is to characterize it as precisely as the evidence permits and no more precisely than that.

The quantity is not value, for value circulated in all three cases and its circulation was correctly registered. It is not the persistence of the system, for the systems persisted and adapted, and this too was correctly registered. It is not output, which improved in all three. What was consumed, in each case, was the capacity of a particular set of participants to continue bearing the cost of sustaining the arrangement through which value circulates and adaptation occurs.

This capacity has three features that the cases display jointly. It is borne by relations. The burden fell on the maintainers, the administrators, and the moderators, and it did not fall on the arrangement at large. It is consumed by the operation it enables, since the very activity through which the system produced its output was the activity that exhausted those who bore it. And it does not appear in the output, which is why the output metrics were reassuring throughout and why in the encyclopedic case the improvement of quality was itself the evidence of the danger, the maintainers having become irreplaceable precisely by maintaining well.

A quantity with these features is a property of the relations among participants. It is a property neither of the system nor of the value. This is the induction, and it is offered as an induction. The term that would have made the three failures visible is the same term in each case, and the discussion proposes, provisionally, to call it the relation.

18 THE STANDING OF THE TERM

The modesty of the proposal must be preserved against two inflations to which it is exposed.

It does not follow that relations are the object of governance, and the discussion does not assert this. The objects of governance remain what they have always been: resources, organizations, communities, enterprises, knowledge, technologies, and, among these, relations themselves. To reduce the object of governance to the relation would reproduce, in a relational vocabulary, exactly the reductive move for which the critical literature has already convicted the others.

Nor does it follow that a relational account will succeed. What the three cases support is the weaker proposition that some quantity, unmeasured by the available frameworks, is implicated in a documented class of failures. That such a quantity exists as a well-defined magnitude, and that it is relational in character, is an induction from three cases and awaits the operational account of Section 23. That a governance account organized around it would detect the failures in advance is a conjecture, and it is a conjecture that the present discussion does nothing to establish.

The distinction that permits the term to be used without inflation may be put as follows. The relational is a perspective, a way of seeing what a governance arrangement is doing to those who sustain it. The generative is an orientation, an account of what the arrangement should be producing. Complexity is a condition, the circumstance under which contemporary governance operates. These occupy three different positions, and the collapse of the three into a single object is the failure mode against which the whole of this part is a guard.

19 THE DISTINCTION FROM LABOR

The most parsimonious objection to the foregoing is that a name already exists for what the three cases exhibit, and that the name is unpaid labor. On this reading the maintainers, the administrators, and the moderators are performing work; the work is uncompensated; the beneficiaries are firms and publics that do not pay for it; and the classical analysis of the appropriation of surplus labor accounts for the whole of the phenomenon without any new term. The objection is serious and it must be met before the term relation is permitted to stand, since a concept that adds nothing to an available concept is not underdeveloped but superfluous.

Three features of the cases are not captured by the labor analysis, and they are stated in ascending order of difficulty for it.

The first concerns the direction of the remedy. If the quantity consumed were labor, compensating it would restore the system. This is a testable proposition and the cases speak against it. The reasons volunteer moderators give for departure include, prominently, conflict with other moderators, which payment does not address; the exhaustion documented in peer production is attributed to the volume of demand, to being targeted for decisions taken, and to the

absence of tools and support, of which only the first is a quantity that money straightforwardly converts. The vicious circle identified in peer production is that overworked maintainers lack the time to onboard successors, and payment relieves this only if the paid maintainer's time is thereby freed for onboarding. Where the same demand returns at greater volume, the time is absorbed again. Funding is a necessary component of any remedy and it is not sufficient, and the insufficiency is not incidental.

The second concerns the encyclopedic case, where the labor analysis produces a false negative. What was documented there was not primarily that volunteers were unpaid, which had been true throughout the project's history including its period of growth. It was that the acquisition of new contributors fell while total edits rose, that the administrator corps contracted from nearly eighteen hundred to slightly more than eight hundred, and that the departure of an experienced editor now costs more to replace because no pipeline stands behind them. The quantity in decline is the capacity to replace those who bear the burden. A labor analysis that attended only to compensation would have registered no change, since the compensation was zero before and zero after. What changed was the structure of succession, and succession is a property of the relations among participants rather than of the exchange between a worker and a beneficiary.

The third feature, and the one on which the distinction principally rests, is the locus. Labor is a relation between a worker and one who appropriates the product, and it is measured on the axis of that appropriation. What the cases display is a burden that falls on the relations by which participants sustain one another: the relations of onboarding, of mutual support, of conflict resolution, of the transmission of tacit knowledge to those who might succeed. The moderator who departs because of conflict with other moderators is not describing appropriation by a beneficiary. The maintainer who cannot onboard is not describing an unequal exchange. In the platform case the appropriation is present and is correctly named by the labor analysis, and it is precisely there that we can see the labor analysis running out, since it names the extraction and remains silent on why the moderators who are not extracted from also leave.

The upshot is not that the labor analysis is wrong. In the platform case it is right, and the generativity lineage's concept of extraction is the correct concept for what a corporation with a billion in revenue and no paid moderators is doing. The upshot is that the labor analysis is incomplete in a specific way. It analyzes the axis running from the participant to the beneficiary and it does not analyze the axis running from participant to participant, and the three cases fail on the second axis. The term proposed here is a name for the second axis and it earns its place only if the second axis is real. Whether it is real is a question the cases can be made to answer, and Section 22 states how.

20 THE DISTINCTION FROM NETWORK AND SOCIAL CAPITAL

Two further concepts stand close enough to require discrimination.

Network analysis supplies a formal apparatus for representing relations, and the objection is that the quantity at issue is a network property already available for measurement, such as the centrality of the maintainer or the connectivity of the moderator team. The apparatus is indeed the natural one for any subsequent formalization and nothing here is offered against it. The difficulty is that a network is a representation of relations at an instant and the quantity at issue is a rate. What the cases exhibit is not that maintainers occupy central positions, which is true and unremarkable, but that the burden borne by those positions grows while the positions do not multiply. The network is a snapshot; the finding is a divergence between two trajectories. A network representation can express the divergence, but only after one has been told which two quantities to place in ratio, and that is the contribution claimed here rather than the apparatus.

Social capital names a stock of trust, obligation, and reciprocity that a group possesses and can draw upon, and the objection is that the three systems are simply depleting theirs. This is closer, and the distance is worth marking exactly. Social capital is conceived as a resource that inheres in a group and that facilitates coordinated action; its characteristic questions concern how much of it a community has and what it enables. The quantity here is a load-bearing capacity. It is not a stock, and the relevant question concerns whether what it must bear is growing faster than it is. How much of it exists is a different question. A community may possess abundant trust and fail nonetheless if the burden placed on the relations that carry the trust outruns them, which is what the encyclopedic case displays: the community's cohesion is not in question and its administrators are disappearing. Social capital would predict failure when the stock is low. The cases fail while the stock, so far as any indicator shows, remains high.

21 THE DANGER OF THE UNIVERSAL VARIABLE

There is a standing objection to relational vocabularies which this discussion cannot evade and does not wish to. Trust is a relation. Power is a relation. Institutions, communication, identity, and norms are relations. If everything is a relation, then relation explains everything and therefore predicts nothing, and the term has purchased its scope at the price of its content. The objection has been put with force from within the relational literature itself, in the observation that pure relationality cannot create objects, that relations require substances as substances require relations, and that the opposition between the two has been overdrawn by its partisans.

The objection is accepted. It is accepted, further, that a relational governance account is more exposed to it than most, since governance is a domain in which every term of art can be redescribed relationally without effort and without gain.

What follows from accepting it is a restriction, and the restriction is the substance of this part's claim to have said anything. The term relation is not offered here as a general ontology, and the discussion asserts nothing about what the world is made of. It is offered as a name for one specific quantity, which the three cases isolate and which the available frameworks do not measure: the load borne by the relations through which participants sustain one another's continued participation, taken in ratio to the capacity of those relations to bear it. This quantity is not trust, though trust may condition it. It is not power, though its distribution is a question of power. It is not the network, which is its representation. It is not labor, which runs on the other axis. It is not social capital, which is a stock where this is a load.

The maintenance burden. The load borne by the relations through which participants sustain one another's continued participation, taken in ratio to the capacity of those relations to bear it. It is not trust, though trust may condition it. It is not power, though its distribution is a question of power. It is not the network, which is its representation. It is not labor, which runs on the axis from participant to beneficiary. This quantity runs on the axis from participant to participant. It is not social capital, which is a stock where this is a load.

A term so restricted is falsifiable and it is nearly useless for most purposes, and those two properties are the same property. The discussion prefers a term that cannot explain everything.

22 THE CONDITIONS OF REFUTATION

The claim of Part IV is that a quantity exists, that it is relational in the sense just restricted, and that the two lineages do not measure it. Each conjunct can fail, and the ways it can fail should be stated so that the discussion can be held to them.

The claim fails if either framework detects the three failures by its own criteria. If it can be shown that a resilience metric, properly constructed, would have declined in advance of the withdrawal of the infrastructure component, or that a measure of unalienated value circulation would have registered the contraction of the administrator corps, then no unmeasured quantity exists and Part IV is empty.

The claim fails if compensation is sufficient. If projects that have secured funding for maintenance are found to exhibit no residual failure of succession, of onboarding, or of conflict resolution, then the labor analysis of Section 19 is complete and the second axis is not real.

The claim fails if the three cases are not isomorphic. If the maintainer's exhaustion, the administrator's disappearance, and the moderator's departure are found to have distinct causal structures that share only a superficial resemblance, then the induction has been drawn from a coincidence.

The claim fails, finally, if the restriction of Section 21 cannot be held. If the quantity proposed here proves impossible to distinguish in practice from trust, from power, or from social capital, then the term has become the universal variable it was constructed to avoid, and it should be discarded rather than defended.

None of these tests is performed here. They are stated because a diagnosis that cannot say what would refute it is not a diagnosis.

23 THE PRIORITY OF OPERATIONALIZATION

The third of the four conditions carries the weight of the others, since a failure of isomorphism would leave nothing for the remaining tests to be performed upon. The obvious response is to enlarge the sample. If three cases are a slender basis for an induction, then twenty cases across domains, cultures, and scales would be a firmer one, and the natural next step appears to be their collection.

This discussion holds that the natural next step is the wrong one, and the reason is worth stating plainly because it is a constraint on the author before it is a claim about the world.

The quantity proposed in Section 21 is a ratio between a load and a capacity, and neither term has been given an operational definition. It has been said what the quantity is not: not labor, not centrality, not a stock of social capital. It has not been said, in terms that would permit a judgment in a new case, what would count as an instance of the load or as a measure of the capacity. In the absence of such terms, the addition of a twentieth case cannot confirm the induction, because there exists no criterion by which the twentieth case could be found to exhibit the same structure. Resemblance to the three is all that could be established. Cases would accumulate and the charge of superficial resemblance would accumulate with them. An enlargement of the sample conducted before the concept is operationalized does not strengthen an induction. It multiplies anecdotes.

An enlargement of the sample conducted before the concept is operationalized does not strengthen an induction. It multiplies anecdotes. Operationalization is prior to the collection of further cases, since without an operational criterion no further case can be found to exhibit the structure, and resemblance is all that could be shown.

The order of work is therefore the reverse of the apparent one. Operationalization is prior to the enlargement of the sample, and the three cases are sufficient for the purpose of operationalization because they were sufficient to isolate the quantity. What they are not sufficient for is its confirmation, and the discussion does not claim confirmation.

The materials for the operational account are present in the cases and may be indicated, though not developed, here. In each case the load is borne by an identifiable subgroup, the maintainers, the administrators, the moderators, and it is not borne by the membership at

large. In each, the work that constitutes the load is of three kinds, and the three recur: the onboarding of successors, the resolution of conflict internal to the group, and the transmission of knowledge that is not held in the artifact. None of the three is output, which is the structural reason for their invisibility to both lineages, since both measure what the system produces and this work produces nothing that the system's beneficiaries consume. In each case the load grows with a quantity the system exports, namely the population of dependents, of readers, of users. And in each the capacity is indexed by the size and the replaceability of the subgroup, which is why the contraction of the administrator corps and the bus factor of a software project are measures of the same thing.

An operational account built from these materials would be an account of the maintenance burden, and it would have a property that the present discussion lacks: it would generate a criterion by which an unseen case could be classified. Comparison is all the present account permits. Whether the criterion, once constructed, identifies the same structure in the household, the enterprise, and the state, or identifies it nowhere outside the digital commons, is the question on which the generality of the whole account turns, and it is not a question that further philosophical argument can settle. It is prior to Part V, since a renormalization requires a quantity to renormalize, and the discussion notes that the parts are here presented in an order that their dependency does not follow.

24 GOVERNANCE DESIGN PRINCIPLES

If the relation is admitted as a dimension of analysis, certain questions become available that were not available before. They are stated as questions, since questions are what the present state of the argument supports.

Which relations bear the cost of sustaining the arrangement, and how is that cost distributed among them. Whether the burden borne by those relations grows with the system while the relations bearing it do not. Which feedback loops permit the cost of maintenance to be drawn from participants without return, in systems whose value circulation is otherwise sound. Which relations obstruct generation, and which sustain the disposition to continue that neither rule nor price supplies.

These are analytical questions and not institutional prescriptions. They do not specify what any governance arrangement should be, and they do not substitute for the design principles the existing literatures have established. Their claim is to supply a dimension along which existing arrangements may be interrogated, and their value is to be judged by a single test: whether the interrogation would have disclosed, in advance, the three failures that the existing dimensions reported as health.

Part V. Scale

25 THE PROBLEM OF SCALE

The practices in which the generativity lineage has demonstrated its results are practices of limited scale: the irrigation community, the forest commons, the makerspace, the software project. This is not an accident of research design. Those are the scales at which the lineage's mechanisms operate, and the documented failures at larger scale are the evidence that they do not simply extend.

The problem may be stated exactly. The failures documented in Section 10 are not failures of the mechanisms, which function as specified. Value circulates in the open-source project, and the software returns to the community that produced it. The commons arrangement allocates the resource and enforces its rules. What fails is the passage from one scale to another, and this makes scale a problem of the first order. It is not a subsequent question of application. A governance account that holds only where mutual visibility obtains is an account whose domain of validity has been misdescribed, and it does not await extension.

The sequence at issue runs from the family through the community, the enterprise, the city, the state, and the international organization. Whether these share a common relational structure, and if so which of its properties survive the passage between them, is the question. Three sub-questions must be separated, because they are ordinarily conflated and because they have different answers.

26 RELATIONAL SCALE

The first concerns what a relational scale is. The sequence above is ordinarily read as a sequence of magnitudes, and read that way it is a sequence in the number of persons. This reading is inadequate, and its inadequacy is visible in the material of Part II. A software project with a hundred thousand users and three maintainers is not, in any sense that governs its failure, a large system. The relational scale that determines its behavior is the scale of the maintaining relation, which is small, and the failure occurs precisely because a small relational structure is loaded by a large population.

What is required, then, is a notion of scale internal to the relational field. A scale external to it will not serve. Candidate constructions suggest themselves: the number of relations a participant can sustain with attention; the length of the path through which value must travel to return to its generator; the depth of mediation between the point of production and the point of decision. Each of these varies to some degree independently of population, and each is a plausible determinant of where the documented failures occur. Which of them, if any, is the right variable is not settled here, and settling it is prior to any claim about invariance,

since one cannot ask what is preserved across a transformation before one has said what the transformation is.

27 COARSE-GRAINING AND ITS RESIDUE

The second concerns what happens in the passage upward. To govern at a larger scale is to treat some multiplicity as a unit: the household stands for its members, the delegate stands for the constituency, the state stands for its population. This is coarse-graining, and it is the operation by which large-scale governance is possible at all. It is not an incidental administrative convenience.

The question is what the operation destroys. Every coarse-graining discards the internal structure of what it aggregates, and the discarding is not neutral with respect to the concerns of this discussion. The internal asymmetries of the aggregated unit become invisible at the coarser description, and they become invisible in exactly the way the critical literature of the complexity lineage has identified: the coarse description registers the system's persistence while the fine description would have registered who within it bears the cost of that persistence. The bureaucratic contradiction reconstructed in Part I is a statement about coarse-graining. The degradation of information in ascent through a hierarchy is the residue of the aggregation performed at each level.

This yields a formulation of the problem more precise than the one with which the discussion began. The question is not whether governance can be conducted at large scale. It is whether there exists a coarse-graining that preserves what matters. And the two lineages, read in this light, may be understood as having answered a prior question differently. The complexity lineage coarse-grains toward the system, and its invariant is persistence. The generativity lineage refuses the coarse-graining, remains at the fine scale, and preserves the visibility of value and its return, at the cost of an account that does not extend.

28 INVARIANCE

The third concerns what, if anything, is preserved. The interest of the renormalization analogy lies here, and its interest is precise. The technique to which it refers is a systematic procedure for passing between descriptions at different resolutions, and its central discovery is that certain quantities transform in a controlled way under such passage, so that the behavior at one scale can be derived from the behavior at another. Applied here, the corresponding question is whether any property of a governed relational field transforms in a controlled way as the relational scale changes, and could therefore serve as the stable object that a governance account might hold to in place of a fixed institutional form.

The material of Part III permits one preliminary observation, and it is offered as an observation. It is not a result. The three cases converge on a single quantity, namely the capacity of a

particular set of participants to bear the cost of sustaining the arrangement, and they converge further on a single mode of its failure: the burden grows with the system while the relations bearing it do not. The maintainers did not multiply as the dependent ecosystem multiplied. The administrator corps contracted as the encyclopedia grew. The moderator population did not scale with the platform's valuation.

This suggests that the quantity to be tracked across scales is the ratio between the burden of sustaining the relational field and the relational capacity available to bear it. The number of participants would be the wrong quantity. The suggestion has a consequence worth stating, since it converts the observation into something that could be wrong. If the ratio is the right quantity, then the documented failure of commons arrangements to extend beyond the local is not a separate difficulty belonging to a separate literature. It is the same divergence appearing at a different point, the passage upward in scale being precisely the operation that increases the burden without increasing the capacity. Whether the ratio can be given a determinate sense, and whether it transforms in a controlled way as the relational scale changes, is what a generative renormalization would have to establish.

29 THE LIMITS OF THE ANALOGY

The analogy must be stated together with the points at which it fails, since an analogy defended only where it succeeds has not been defended.

The technique in its original setting presupposes a system whose components are of a determinate kind and whose interactions are specified in advance. A relational field satisfies neither condition. Its participants are constituted by the relations they enter, and their properties are therefore not given prior to the interaction. There is, further, no external observer for whom the coarse-graining is performed. The coarse-graining in governance is itself an act of governance, undertaken by participants within the field, and it therefore alters what it describes. This has no counterpart in the original setting and it may be the point at which the analogy breaks. Whether a procedure that presupposes an exterior can be adapted to a field that admits of none is not known, and the difficulty should not be minimized by the observation that the analogy is illuminating elsewhere.

What can be claimed is narrower and it is claimed without embellishment. The language of scale and of transformation between scales appears better suited to the difficulty than the language of institutional design, since the difficulty is a difficulty of passage between scales and not a difficulty of arrangement at any one of them. The mathematics that such a study would require is not developed here and should not be. What is recorded is that the question has been posed in a form that makes an answer conceivable, and that this is the whole of what the present discussion is in a position to do with it.

Parts I and II are the substance of the discussion, and they are the parts that can be completed. Part I constructs a taxonomy at the level of coordination mechanisms rather than institutional forms, examines the practices realized under each category across the cultures in which they are found, assesses the achievement and the limit of each, and arranges them in a sequence of residues. It insists on a distinction that the usual histories elide, between an arrangement superseded by its own contradiction and an arrangement abolished by a power acting on a theory of its backwardness, and it grounds the distinction in the record: the subak and the iriai did not fail. Part II shows that the two contemporary lineages are of a different kind from the four mechanisms, being programs still in motion rather than settled forms; it documents, from the critical literature internal to each, a complementary pair of limits; and it shows that the complementarity is the residue structure of Part I.

Part III is the practical motivation, and it is the part that answers the question of why any of this should be undertaken. It does not argue that society requires a new governance theory, which could not be established by any evidence. It argues that a class of objects exists for which both available frameworks report health while the object fails, that three such failures share a structure, and that the structure concerns a quantity neither framework measures. If the three cases do not exhibit that structure, this part fails and the discussion fails with it.

Part IV is preliminary in its positive claim and firm in its negative one. Its positive claim, that the unmeasured quantity is a property of relations, is an induction from three cases and is conjectured. It is not shown. Its negative claim is that the available concepts do not already cover the quantity, and this claim is argued: labor is shown to run on a different axis, network centrality to be a representation and not a finding, social capital to be a stock where the quantity is a load. The part accepts the standing objection that relational vocabularies purchase scope at the price of content, and it responds by restricting the term to a single quantity narrow enough to be wrong. Four conditions are stated under which it would be wrong.

Part IV also states, in Section 23, a constraint on what may be done next. The account is not to be strengthened by the collection of further cases, because no criterion yet exists by which a further case could be judged to exhibit the structure. Resemblance is all that could be judged. Operationalization of the load and the capacity is prior to the enlargement of the sample, and the discussion is therefore not a foundation on which more of the same may be built. It is a diagnosis awaiting the instrument that would test it.

Part V is programmatic, and its status requires distinguishing. It has attempted to convert the question of scale from a gesture into a problem, by separating the three questions that the gesture ordinarily conflates: what a relational scale is, what coarse-graining destroys, and whether anything is preserved under the passage. It has offered one preliminary observation, that the quantity on which the three cases converge is the ratio between the burden of sus-

taining a relational field and the capacity available to bear it, and it has stated the point at which the renormalization analogy may break, namely that the coarse-graining in governance is performed from within the field it describes. None of this is settled. What is claimed is that the question has been given a form in which it could be worked on, and not that it has been worked on.

It should be added that Part V stands on a quantity that Part IV has not operationalized, so that the order of presentation is not the order of dependency. A renormalization requires something to renormalize. The scale questions have been posed here because posing them is what the present state of the argument permits, and they cannot be worked until the instrument of Section 23 exists.

The conditional character of the whole should be stated without qualification. The discussion rests on two claims that could be false. The first is that the limits documented in Section 10 are real, and it fails if the critical literature does not sustain them. The second is that the three cases of Part III exhibit the structure attributed to them, and it fails if either framework can be shown to detect those failures by its own criteria, or if the failures do not in fact share the structure claimed. Should either claim fall, Parts IV and V have no ground and should be abandoned. A theory whose motivating problem does not exist requires withdrawal, and the diagnosis has been made falsifiable so that this judgment can be reached.

The title names a destination the discussion does not reach. What has been attempted is the prior task of asking whether the journey is warranted, and the answer rests on the three cases of Part III. Readers who find the cases unconvincing, who know of a fourth that breaks the pattern, or who can show that either framework detects these failures by its own criteria, would be doing the argument the service it most needs. Correspondence is welcome at huangwanhong@serendip.ngo.

End of Discussion II. The problem has been given a history and a diagnosis. Whether it admits of a solution, and at what scales, is not established here.