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COVENANCE: EXPERIMENTS IN THE DEVELOPMENT OF SOCIAL ORDER

FINAL [redacted] Report

15 January 1969

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TECHNICAL MEMORANDUM

(TM Series)

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COVENANCE: EXPERIMENTS IN THE DEVELOPMENT OF SOCIAL ORDER

FINAL [redacted] Report

by

Beatrice and Sydney Rome

15 January 1969

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The research carried out under this contract has been to analyze the development of covenance and community in a laboratory-cultivated, complex social organization. A full report was submitted to SDC at the conclusion of the contract between SDC and Syntality.

The full report has two parts, the first on method, the second on the analysis of experiments. In Part I we develop conceptual foundations (Chapter I), show how the foundations can be applied in experiments (Chapter II), and explain the design of a suitable operant laboratory environment for conducting experiments (Chapters III & IV). In the second part, on the experiments themselves, we describe how the method and laboratory environment were actually used (Chapters V through VIII) and assess the significance of the experimental findings. The table of contents is appended to the present report.

* * *

We have formulated an experimental method for cultivating complex social organizations in a computer-based operant laboratory environment, for bringing these organizations to progressively higher levels of performance, and for observing the accompanying development of social order within them. Using this method, a hierarchically structured, functionally specialized, productive organization was brought into existence and its performance was cultivated to successively higher levels over a three-month period.

Two significant findings resulted from this effort. First, the development of this organization exhibited a simple, coherent logic or rationale. It consisted of five major progressive transformations, each comprehending subordinate developments (Table A). Second, every momentary cross section of this development manifested at least five concurrent levels of abstraction. In order of decreasing abstraction and increasing concreteness, these concurrent levels are: (1) the overall integral development itself, (2) discrete (all-or-none) constituent macro-stages within the integral development (the major stages), (3) discrete molar developments within each macro (the subordinate stages), (4) transitional phases or modifications of the ongoing molars, (5) surface events in the unfolding history of the organization.

The five concurrent levels of abstraction (second finding) are, we speculate, universally present in complex organizations. The five successive macro-transformations (first finding) seem to have narrower but still fairly comprehensive application; they constitute a scale of potential development that can be realized within most hierarchically articulated, functionally specialized organizations that render external services, provide products or otherwise regulate massive logistic flows. As important as are these two major findings is the fact that results such as these have been attained by use of our conceptual framework and method. This implies that a new direction has been successfully opened in social science research and that a model of how to conduct such research now exists.

Table A

Major and Subordinate Stages in Organizational Development, Experimental Runs 301-305. Each stage of development is defined by the emergence of a new kind of collective endeavor within the evolving organization.

Emergent Endeavor

Major Stage	Subordinate Stage
Pathology (Reference State)	
I. Bare Survival	1. Sensitivity to Internal Technological Environment
	2. Sensitivity to External Bureaucratic Environment
	3. Sensitivity to Norms and Obligations
	4. Sensitivity to the Basis of Norms
	5. Sensitivity to Reciprocal Collaboration
	6. Sensitivity to Designed Environment
	7. Collective Action at Middle Echelon
II. Homeostatic Control	8. Adaptation to Crisis Demand--Omni-Collective, Mono-Functional
	9. System-Wide Strategy--Poly-Functional at Middle Echelon
	10. Consolidated Corrective Action
	11. Crystallization of Roles
	12. Towards Multi-Level Assessive Tactical Expertise
	13. Exploitation of Established Tactics
	14. Satisfaction of Demand Crisis

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Table A (continued)

Emergent Endeavor

Major Stage		Subordinate Stage	
	Pathology (Reference State)		
III.	Administrative Control	15.	Overt Expression & Codification of Control Policy
		16.	Execution of Codified Policy
		17.	Nested, Autonomous Middle-Echelon Administration
		18.	Demand for Decentralized Administrative Roles
IV.	Control under Shifting Objectives	19.	Unified, Solicitous Leadership
		20.	Forward Emergency Planning
		21.	Shifting Objectives
		22.	Concerted Contingency Planning
V.	Innovative Control	23.	Towards Positive Cybernetic Control

Our research was undertaken to unite experimental rigor with humanistic relevance in the experimental study of complex organizations. This objective cannot be realized successfully within the presuppositions common to the now classical forms of behaviorism currently dominant in American behavioral science. To convey the significance of our research, we begin by reviewing four reductionistic tendencies that characterize contemporary behaviorisms and which bar the way to conducting humanistically relevant research. Following this review we shall indicate the alternative foundations on which we base our own experimental investigations.

First, the mechano-morphic reduction. A fashionable way to lend a seeming scientific cast to technical terms in the behavioral sciences has been to use metaphors derived from rational mechanics (which was dominant in eighteenth century physics). Human actions are said to be stamped in, acquired, stored, excited, driven, manipulated, reinforced, transferred, retrieved, shaped, emitted, extinguished. Actions, both those primarily

social in intent and those primarily individual, have accordingly been affirmed to be identical in kind with subhuman behavior, for example, with the behavior of apes or of special laboratory strains of rats. Skinner affirms, "We study the behavior of animals because it is simpler." [Science and Behavior, 1953, p. 12.] 'Simplicity' here implies that an unbroken ordinal scale exists along which subhuman animal behavior merges gradually into the highest forms of human actions in a homogeneous advance, without break or transformation in kind along the scale.

Secondly, the causal reduction. Human actions have been treated exclusively as rationally, probabilistically or operantly determined. They have been reduced to the status of purely dependent variables, of effects of causes. Thus Skinner summarizes his views concerning the nature of a science of behavior as follows, and almost every contemporary behaviorist agrees with his statement:

> The external variables of which behavior is a function provide for what may be called a causal or functional analysis. We undertake to predict and control the behavior of the individual organism. This is our 'dependent variable'--the effect for which we are to find the cause. Our 'independent variables'--the causes of behavior--are the external conditions of which behavior is a function. Relations between the two--the 'cause-and-effect relationships' in behavior--are the laws of a science. A synthesis of these laws expressed in quantitative terms yields a comprehensive picture of the organism as a behaving system. [P. 35.]

In short, no human action can be a proper object of scientific investigation, unless it can be functionally related to variables different from it and external to it, on which it is wholly dependent. Under this reduction, persons and organizations can be studied only as mere objects whose behavior can be predicted, controlled and thereupon manipulated. Within behavioristic methodologies, no way exists to study scientifically actions that are undetermined, independent, freely initiated, such as deliberate free choice and social communion--such as freely constructing and sustaining community in collective endeavor. Actions like these behaviorists have to equate with wild or superstitious behavior, and free community and morality have been emptied of scientific meaning.

Thirdly, the particularlistic reduction. Abstract general patterns of individual and social actions have been reduced to statistical correlations among particular events. This reduction equates generality with generalization. It turns away from behavior itself to the circumstances of the repetition of the behavior. Functional relationships are restricted exclusively to entire populations of particular events:

> No matter how accurate or quantitative it may be, the report of a single case is only a preliminary step. The next step is the discovery of some sort of uniformity.... [Pp. 13-16, author's italics.]

Since, strictly speaking, there is no way to achieve a leap to universality simply by multiplying particulars; the alternative is to take refuge in probabilities:

> Suppose now we bring someone into a room and place a glass of water before him. Will he drink? There appear to be only two possibilities: either he will or he will not. But we speak of the chances that he will drink... What we want to evaluate is the probability that he will drink. [P. 32, author's italics.]

This approach shuts out the possibility of seeking and finding immanent, universal patterns directly in individual personal and social actions themselves. Concern with inner personal or social development over time is accordingly rendered scientifically illegitimate.

Fourthly, the combinatory reduction. Social systems and subsystems, integrated on higher system levels, have been reduced to the status of aggregates logically summated from component elements. The existence of higher-level integrations, of wholes, as ultimate facts of social transaction, directly on a par with individual parts and subordinate integrations, has been denied. Skinner, for example, constructs what seems to be "a discrete unit of behavior," a "total act," "a functionally coherent unit of behavior," by an additive process:

> We first give the bird food when it turns slightly in the direction of the spot from any part of the cage. This increases the frequency of such behavior. We then withhold reinforcement until a slight movement is made toward the spot. This again alters the general distribution of behavior without producing a new unit. We continue by reinforcing positions successively closer to the spot, then by reinforcing only when the head is moved slightly forward, and finally only when the beak actually makes contact with the spot.
>
> ....In this way we can build complicated operants which would never appear in the repertoire of the organism otherwise. ....The total act of turning toward the spot from any point [of] the box, walking toward it, raising the head, and striking the spot may seem to be a functionally coherent unit of behavior; but it is constructed by a continual process of differential reinforcement from undifferentiated behavior. [P. 92.]

Underlying this approach of Skinner to building 'complicated operants' is the paradigm of dividing the sought-for behavior into components, operantly conditioning the individual components, and thereby shaping the total concatenated behavior as the logical sum (the 'and-ing") of the components. That the total act can be both an irreducible, functionally coherent unit in its own right and also be analyzable into subordinate constituent units is not allowed, much less that such irreducible higher-level reintegrations can co-exist concurrently through many levels in a hierarchy of systems within systems. Functional wholes, on the contrary, are reduced without acknowledgment of essential loss to aggregations, to mere constellations of components. If you have each component, you have all; and nothing more is granted. To be simpler is to be a component.

* * *

The foregoing reductions have not gone unchallenged. Recently even the citadel of American behavioral psychology has been penetrated. This entry has been effected through natural language and linguistics. James J. Jenkins, writing on "The Nature of Psychological Theory,"* describes the action:

> There is a wealth of evidence that the established theoretical positions in psychology are currently under serious attack. This is dramatically demonstrated in Dixon and Horton's book Verbal Behavior and General Behaviour Theory (1968). The conference reported in that book was to have been a straightforward attempt to relate the experimental and theoretical work in verbal behavior research to general learning theory, the dominant theoretical area of American psychology. Instead of a quiet scholarly exploration, however, the result was more like a pitched battle. Traditional associative learning theory was attacked violently, defectors from the established positions gave testimony to new faiths; and revolutionary credos were shouted at conference table and dinner table alike. [P. 55.]

The source of the conflict was a renewed interest on the part of some linguists in the structures of syntax. Each of the four behaviorist reductions renders behaviorism inadequate to explain how speakers can achieve an ability to speak sensibly in their native languages. First, the sense of verbal meanings is dissolved away under the mechano-morphic reductions. The written tokens, c, a, t, for example, stand either for a feline animal or for an obsolete form of whip. But which sense meaning is intended by a speaker cannot be formulated under a behavioristic reduction. Similar ambiguities of sense arise in entire sentences, for example, "They are cooking apples." Behaviorists reject--and have to reject--sense meanings as mentalistic constructs, ghostly pretenders to real existence, since sense meaning is not a matter of just the overt physical motions of any organism. But thus to ignore sense meanings is to reject by arbitrary fiat the sense of all human linguistic utterance.

*In the "Symposium" conducted in Psychological Scene, Volume 2, September, 1968, p. 55.

Second, sense meaning is not a matter of any stimulus controlling some response. Stimulus-response at best allows of the relation of sign to thing signified; but by sign-relationships alone no hearer could ever determine (except by innate intuition) which sense a speaker intends.

Next, behind ordinary usage or surface language are abstract general structures, those of grammar. Because these structures are abstract universals, exemplified in particular occurrences of natural language, they cannot be adequately formulated just as generalizations, just as statistical correlations. A particular syntactical structure either is or is not present in a particular linguistic expression; whether or not the structure is exemplified can be ascertained only by analysis; it cannot be ascertained by counting.

Finally, syntactical structures are intrinsically hierarchical, integrated on different levels of comprehension; and therefore not reducible without essential loss to strung-along aggregations of single words. Consider by way of illustration the sentence, "The teacher consoled the child." The phenomenologically presented utterance in the surface language participates successively in <u>all</u> the following structures:

(Article, Noun), [Verb, (Article, Noun)]
Noun Phrase, (Verb, Noun Phrase)
Noun Phrase, Verb Phrase
Noun Phrase, Predicate
Sentence

The conclusion is inescapable--each reduction disqualifies the behaviorisms that adopt it from being adequate to investigate the structures of natural language or the abilities of native speakers to learn them. Jenkins interprets the source of the conflict that broke out among the conferees thus: "The psychologists asked what kind of model, written in the surface language alone, might be adequate to describe language and the new linguist replied 'None!'. The linguist went on to add that he had a formal proof that natural language could not be produced by a left-to-right Markov process--just the sort of machinery that the psychologist had tried to use." [P. 56.]

The foregoing reductions, moreover, as Jenkins observes, are advocated by behaviorists, not on empirical grounds, but only as presuppositions. The reductions clear away behavioristically intractable concepts and leave the behaviorist with the kinds of denuded objects that <u>he</u> can manage experimentally. While thereby much constructive work has been produced, nevertheless behaviorists have been forced to leave uninvestigated many areas of humanly significant phenomena.

* * *

Our particular research interests lie in the area of social transactions and complex organizations. Four affirmations counter to the four behaviorist reductions point the direction of our research.

Opposed to the mechano-morphic reduction, we assert a phenomenological affirmation--that, in their original, unreduced forms, human actions which express reciprocity and community provide ultimate data on which to ground inferences concerning social processes. An example is ratifying an amendment to an organization's charter. Note how much can be affirmed of a ratifying act without reducing it to anything else: The act involves convenanting and compacting; hence it is dyadic or one-many in form. Ratifying implies agents acting in roles within the organization. The act is meaningless without peers who collectively participate in the act, but no peer participates as a mere object; hence ratification implies mutual agreement between participants. What the participants succeed in accomplishing is to revise the organization's generating essence, its charter or constitution; therefore, once uttered, the act of ratification thereafter constrains large numbers of subsequent individual actions.

All these implications are implicit in the plain sense of the word, ratifying; and this sense meaning cannot be reduced, without essential change or loss, to overt motions of an organism. Hence it is a mistake to describe the individual behaviors of the participating organisms as "simpler" than the social action. The individual behaviors are only sub-social and therefore different. No constellation of operants, however copiously aggregated, we affirm, can acquire the mutual qualities of reciprocity and community.

Starting with these data of reciprocity and community in their unreduced form, our second affirmation prescribes a depth analysis of them. In depth analysis of complex organizations, the source data are considered to be a medium in which is enacted the history of an organization; and in this history can be discerned an underlying development. The development organizes the endless float of surface phenomena--utterances by the agents, workers, clients, suppliers and spectators of an organization--just as genetic development organizes the progressive growth of a biological organism, or personal development, the kinds of expression that can be and are uttered by an individual.

Note that while depth analysis penetrates the phenomenologically given surface of social utterances, it does not reduce the surface. Persuading, negotiating, deciding, choosing, planning collectively, communicating collective values and objectives, all help to discriminate, not to dissolve an organization's surface history.

A behaviorist has to reject depth analysis as unnecessarily redundant--it fails to reduce higher-level phenomena to allegedly simpler, component elements. He has to argue not only that a "social law" can be generated by the sub-social behavior of individuals, but also that individual behavior fully explains group phenomena. In turn, the sub-human methods of the natural sciences, of physics, chemistry, and biology, suffice to explain the behavior of individuals. Social behavior arises only because one organism is important to another in the latter's environment. Skinner explains that social reinforcement is just a matter of inert mediation: "...In certain forms of sexual and pugilistic behavior, the other person participates merely as an object." [P. 298.] Elegantly "simple" as such causal reductions may be, they are systematically inadequate and incomplete as social explanations; for they omit the very social realities to be understood--the reciprocal interactions, the shared intents, the commonly projected collective goals, the mutual concernments that are directly accessible to depth analysis.

Thirdly, we assert that embedded within the foregoing unreduced social phenomena (that are directly accessible to depth analysis) are universal structures or abstract general patterns of social action. This affirmation opposes the behaviorists' strategy for obtaining generality. Theirs, we have noted, is to correlate intrinsic, dependent variables that characterize the behavior of organisms with extrinsic, independent, controlling variables. But we seek universal statements just in terms of universal variables that are intrinsic to the phenomena themselves. Specifically, the objective of our research is to detect "milestones" of organizational development, that is, variables that either are or are not present at each new stage of development in an evolving organization.

Once such milestones become manifested in the evolution of an organization, they display a universal aspect; and they can thereafter be exemplified repeatedly in the organization's subsequent development. Successive occurrences of the same kind can take many different particular forms within the history of a single organization or within the histories of different organizations that participate in the same developments.

Once a universal pattern is discovered in any particular event, its rediscovery in other particulars only attests to how widely the pattern is distributed in the real world, but need not yield further information concerning the nature of the pattern itself. Since Aristotle, philosophers have noted that no amount of additional experience teaches anything new concerning a particular shade of the color white to one who has discriminated it once. Why? Because all subsequent occasions of its appearance share identically in its combination of hues, saturations and felt intensities.

Our affirmation of universal structures, accordingly, forces a distinction between universality and generality--some universals have more generality than others. For example, our second finding--which asserts the concurrent presence at all times in any complex organization of its surface history, its phases, its subordinate and its major stages of development as shown in Table A, and its integrated overall development--represents a ladder of generality. At the lowest rung, having little or no generality, are the particular details of an organization's surface history. Each detail belongs properly to just the one organization, and there is little likelihood that most of the details will ever be exactly repeated. At the topmost rung, having a very high degree of generality, on the other hand, is the overall succession of major stages of development shown in Table A. This succession seems capable of characterizing all of a comprehensive class of organizations. Between the lowest and the top rung of generality, the subordinate stages of development within the major stages have less generality than do the major stages, and the specific phases of the subordinate stages still less.

But whatever degree of generality a universal possesses, i. e., scope of distribution, the explanatory power proper to each level is derivative from the universal's intrinsic character, from its being the very quality that it is. In brief, while behaviorisms at best offer generalizations, patterns of correlation among events that must always remain unique and antecedently unrelated, depth analysis offers instead patterns that unite discrete phenomena--universals in which the phenomena directly participate.

Finally, we affirm the unity and simplicity of complex wholes. Our affirmation opposes behaviorisms that identify the simple with the component and seek to build complex wholes simply by combining components. Wholes are pure redundancies, runs the behaviorist credo; if you have the parts, you have all there is. By this strategy, behaviorists seek to control their subject matter. If complex structures can be thus constructed, control over components (by manipulating extrinsic independent variables in the external environment) yields control over the aggregation.

The behaviorist strategy fails, however, with the integrated higher-level unities that are exhibited in complex social organizations. Under the combinatory reduction, complex organizations deflate into smaller groupings and the latter in turn into mere interactions of individuals, which eventually reduce to mere behavior. In small groups, however, patterns and features of social actions, that are differentiated in complex organizations, merge. Legislative, executive and judiciary functions, for example, are executed by a single officer acting successively in each of these capacities; and he functions both as direct producer and manager. What is functionally distributed and separate in larger organizations thus becomes complexly intertwined in smaller groups. At the level of mere behavior, these patterns

and features ultimately become totally fused. Using the term 'degenerate' as it is used in mathematics, small, face-to-face or primary groups are degenerate cases of more complex organizations, and individuals are degenerate forms of primary groups. The collapsed form is, in the sense, paradoxically more complex than the expanded form.

Not only does the combinatory reductive strategy fail in the investigation of complex organizations, it is also, again paradoxically, unnecessary. The alternative hierarchical approach preserves two kinds of simplicity that are lost under combinatory reduction. First, large complex organizations are integrated systems that in turn are constituted of integrated systems, and these integrations are reiterated through many system levels. Each integration behaves in part as an individual system, and to this extent it is functionally simple and can be analyzed autonomously. Secondly, complex organizations have functional subsystems that cut vertically across the subordinate integrated systems. Accounting and procurement systems are examples. Although no vertical functional subsystem can subsist independently of an intact complex organization, each is a simple constituent, having its own special properties and functioning integrally within the whole.*

Respect for the integrity of complex wholes not only opens the subject matter of complex organizations to investigation, it also makes possible a kind of experimental findings that are precluded by the behaviorist reduction. We have already noted that in linguistics depth analysis yields universal structures on multiple levels in the syntactical deep structure of surface expressions. For complex organizations, depth analysis yields similar results. An example is that reported in our second finding, namely, that at least five levels in the deep structure of the history of any large complex organization can be concurrently true of the organization. Each of the four more-general levels (phase, subordinate stage, major stage, overall) can be connected with overlapping or identical phenomena on the surface level. Such hierarchical depth of abstraction is not representable within any paradigm of stimulus controlling response or of combinatory operant conditioning; these are all systemically flat; their phenomena all lie on the same level of abstraction.

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*Among behaviorists, operationalists do have a basic strategy that is adequate for coping with higher-level phenomena. Operationalists can accordingly acknowledge that both the level-specific and the vertically functioning kinds of subsystems can be suitable objects of investigation in their own rights; and therefore operationlism does not require that the higher-level integrations and simplicities of these systems be reduced. Operationalism lacks any suitable method for coping with multi-level phenomena, however--integrally functioning wholes that are comprised in turn of subordinate integrally functioning wholes.

Respect for the integrity of complex wholes is also required to support our first finding concerning the stages or developments listed in Table A. Each of these is a transformation of its predecessor; the successive developments thus constitute a hierarchical climb in complexity of a kind that cannot be expressed under the combinatory reduction.

* * *

Now it is appropriate to ask, how can complex organizations be studied experimentally, given the foregoing affirmations? How can results of the kinds stated in our findings be obtained? Having rejected the behaviorists' position, that internal, intrinsic variables are all functionally dependent on and conditioned by external, extrinsic variables, the intrinsic variables now become independent and unconditioned in their own right. Now the question is, how can independent, unconditioned variables be studied in an orderly manner? Into what order to these enter?

It is our contention that, just as language manifests an order (syntax) which is different from but as rigorously ruly as statistical causality, similarly, social organizational process displays order or grammar of its own. This order lies in the sphere of covenance. Convenantal order includes the tacit and explicit agreements that individuals build when they act as agents for organizations--the social codes, charters, organizational images by which human agents structure complex organizations.

Human discourse is a special case of persons building covenance, and what applies to the study of structural linguistics applies as well to the wider social context in which organizational dialogue takes place. Structural linguistics demonstrates (in principle) how every possible utterance in a natural language can be produced in ruly ways by formulating and selectively applying substitution rules.

Covenantal processes have similar abstract formal order. By successive substitutions, the social transactions actually uttered by agents in complex social organizations can follow as consequences of covenantal rules. From the evolution of such covenantal generating processes in complex social organizations emerge the universal structural patterns postulated by our four affirmations.

But now the problem is, how can we empirically detect or uncover specific developments of covenantal orders? One way is to study complex social processes within the controlled environment of a laboratory, in which a very full record of social development can be obtained and later subjected to appropriate analysis. Eventually, general principles of social development can emerge. Such an undertaking, however, raises many problems.

Given a laboratory facility, how should appropriate forms of complex social process be brought into existence within it? The phenomena to be studied have to be "cultivated," and a method of cultivation is required. But to cultivate the phenomena you wish to study may seem bizarre to those accustomed to current fashions in social research, although they would grant that natural scientists might have to bring their objects of study to ideal states in specially controlled environments. Would not cultivation bias the social phenomena that you might wish to study? How would you control your observations? Is not an unbiased control group required as basis of comparison? But would not an uncultivated group really be irrelevant to assessing the development of a cultivated group since the control would grow wildly?

Supposing this question concerning cultivation, biasing and control were resolved satisfactorily, how do you cultivate a complex, hierarchically structured, functionally articulated social group within a laboratory? What kind of laboratory would be required? Would real time interaction of humans with a computer provide the means? If so, what "software"--what system of computer routines should be designed to aid in the processes of cultivation and observation? It would seem reasonable to design an operant environment in which subjects could see the results of their own social conduct and could exercise freedom within limits provided by the cultivation process. The computer would have to be used in such a way that the subjects themselves could fashion their own development. This implies the design of a vehicle, the adaptation of computing machinery to simulate the environment of a large, bureaucratically articulated organization. How should this be done?

Assuming a simulation vehicle has been designed, how shall it be adapted to serve as an operant setting for the emergence of higher forms of social transaction?

Successful resolution of these problems would provide experimenters with an operant facility in which intrinsically human social action could be cultivated, abstract general patterns of social action discerned, and the history of the development of a complex, hierarchically structured organization enacted. But now the experimental use of such a facility becomes an issue. How shall the experimenters comport themselves? Shall they enter into dialogue with the subjects, in order to guide the development of social process? How can this be done without producing the phenomena the experimenters wish to study? What shall their repertory of experimental interventions include? Exclude? How shall the interventions be administered?

Next come questions of analysis. Suppose that a very complete transcript of transactions uttered by the subjects be provided to the experimenters and suppose that this is supplemented by great quantities of raw and reduced data provided by the computer as it records the products of its own program systems. How shall such protocols be analyzed? How, too, shall the dramatic developments of the subjects' collective history be detected, formulated--how shall a history be compiled? And next, given a history, how shall it be analyzed in depth, in order to discern the underlying patterns of rational development? What kinds of variables should be sought? Continually changing variables, homogeneous in kind from epoch to epoch in the history? Radically heterogeneous transformations, milestones of development? Will a rationale, a logic, a generating essence of development emerge? And if such a development should, by good fortune, manifest itself, what would it mean? What significance should be accorded the development of covenance within complex social organizations? Since covenance is not causality but an expression of social freedom, what can be the significance of discovering pattern, not in functionally dependent variables, but in independent variables?

* * *

All these issues--their challenge, their resolution, and their pregnant implications for a science of large organizations--are discussed in detail in the full report. Chapters I through IV are completely devoted to these discussions, and the discussions are continued passim in the subsequent chapters and in the Conclusion.

In addition, the major part of the report (contained in Chapters V through VIII and in the Conclusion) describes and analyzes a sequence of experiments that were conducted in a computer-based laboratory that was designed and employed on the basis of the foregoing principles.

COVENANCE: EXPERIMENTS IN THE DEVELOPMENT OF SOCIAL ORDER

by

Beatrice and Sydney Rome

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13. ABSTRACT

An experimental method was formulated for cultivating complex social organizations in a computer-based operant laboratory environment, for bringing these organizations to progressively higher levels of performance, and for observing the accompanying development of social order within them. Using this method, a hierarchically structured, functionally specialized, productive organization was brought into existence and its performance was cultivated to successively higher levels over a three-month period. Two significant findings resulted from this effort. First, the development of this organization exhibited a simple, coherent logic or rationale. It consisted of five major progressive transformations, each comprehending subordinate developments. Second, every momentary cross section of this development manifested at least five concurrent levels of abstraction. In order of decreasing abstraction and increasing concreteness, these concurrent levels are: (1) the overall integral development itself, (2) discrete (all-or-none) constituent macro-stages within the integral development (the major stages), (3) discrete molar developments within each macro (the subordinate stages), (4) transitional phases or modifications of the ongoing molars, (5) surface events in the unfolding history of the organization.

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