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OUTLOOK FOR SPACE: 1980 - 2000

Report on

The Exploration Ethic
Its Historical-Intellectual Basis

Executive Summary

June 1975

THE EXPLORATION ETHIC

Its Historical-Intellectual Basis

EXECUTIVE SUMMARY OF DRAFT

June 2, 1975

Historical Documentation

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PART I: HISTORICAL DOCUMENTATION

The purpose of the historical documentation section was to answer the question "Is there a historical basis for positing an ethic of exploration?" To answer this broad question, it was necessary to further ask "What are the historical patterns of exploration?"; and "How has exploration been carried out through history?"

Despite the difficulty of excising exploration from its historical context, several general conclusions about the pattern and process of exploration emerged.

- Exploration is most often associated with periods of civilizational transition
- There have been changes in the process of exploration causing changes in types of rationales used, sponsors involved, and explorers interested in exploration
- Exploration has consistently proven prior cost/benefit calculations incorrect.

Civilizational Transition

There has been no predictable frequency or pattern to exploration as Figure 4-4 shows. Frequency, location, political affiliation of explorers, size, and rationales of exploration have varied to such an extent that there is little evidence of the existence of a sub rosa "ethic-to-explore." The only pattern that does emerge is that exploration, for the most part, has been done by members of societies or governments at or near the apex of world power for a variety of competitive reasons.

The most significant pattern of exploration found in the historical documentation section is the concurrence of the incidence of exploration and key transitional points in western civilization. This concurrence was found upon comparing six diverse periodizations of western civilization with the frequency of exploration (see Figure 5-5). Within this pattern two sub-patterns emerged. First, exploration occurs only when there is sufficient stability (lack of internal disturbances) to allow resources to be allocated to the initially unproductive activity of exploration. Second, the rise in exploration activity so closely parallels western economic and political development that it is hard to separate cause and effect.

Process of Exploration

An examination of Figure 4-4 reveals three periods of modern exploration: Renaissance, 1420-1620; Continental, 1750-1875; and Polar. A fourth period, that of mountain, ocean, and moon exploration does not appear on the graph. The historical documentation section examined these four periods in terms of the role of the elements of exploration--explorer, sponsor, location, technology, and cost--played in the various stages of the exploration process--conceptualization, initiation, implementation, reporting, and impact.

The parameters of the exploration process are determined by the prior perception of location of exploration. The activity which takes place within these parameters is shaped by the political, economic, social, and cultural environments of the time. For instance, the perception of nature of the location, especially barriers to its access, set the limits of the returns envisioned and the technology required. The political, social, economic, and cultural environments determine which returns are

FIGURE 4.4 MAJOR CHARACTERISTICS OF EXPLORATION

700 B.C. TO 1960 A.D.

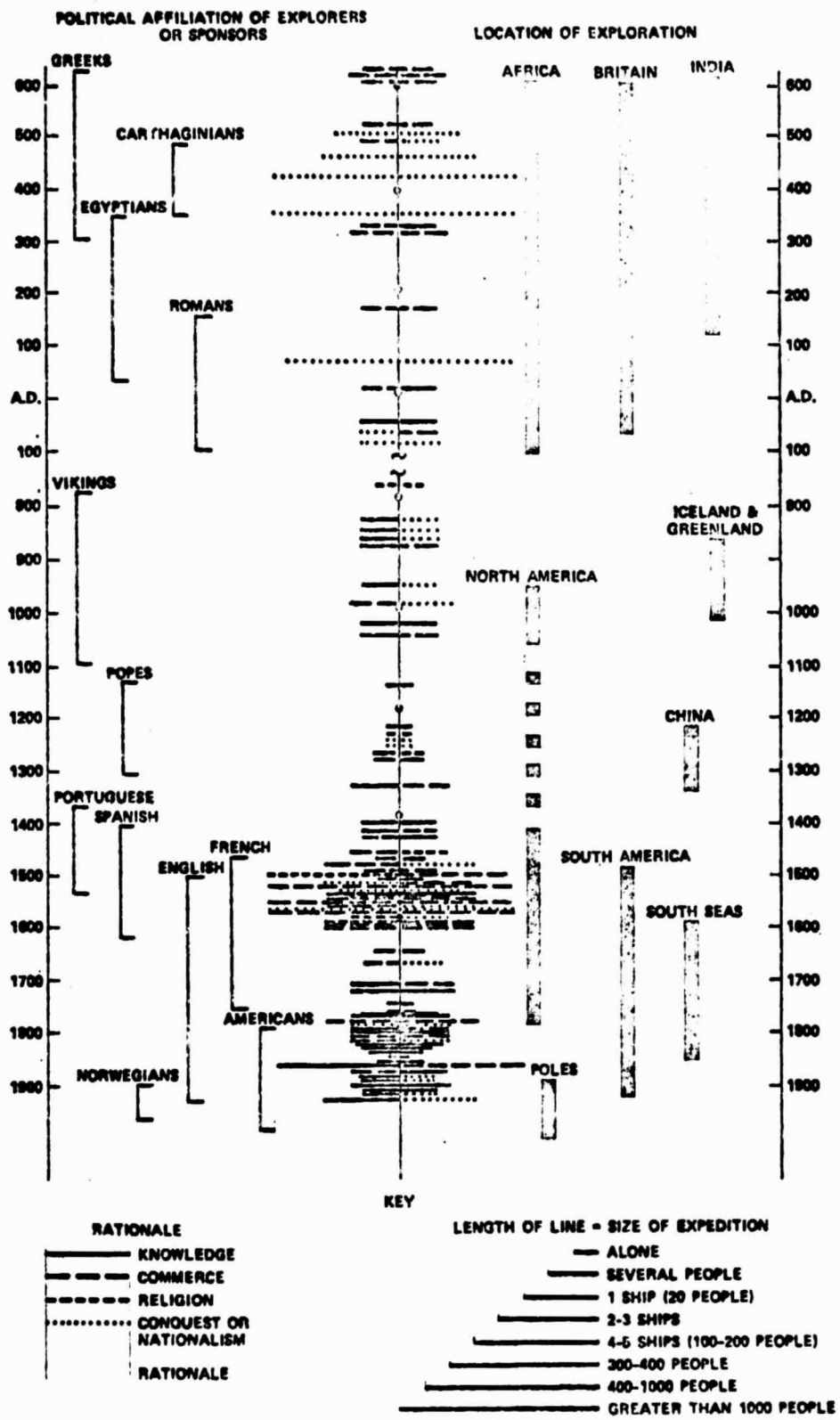
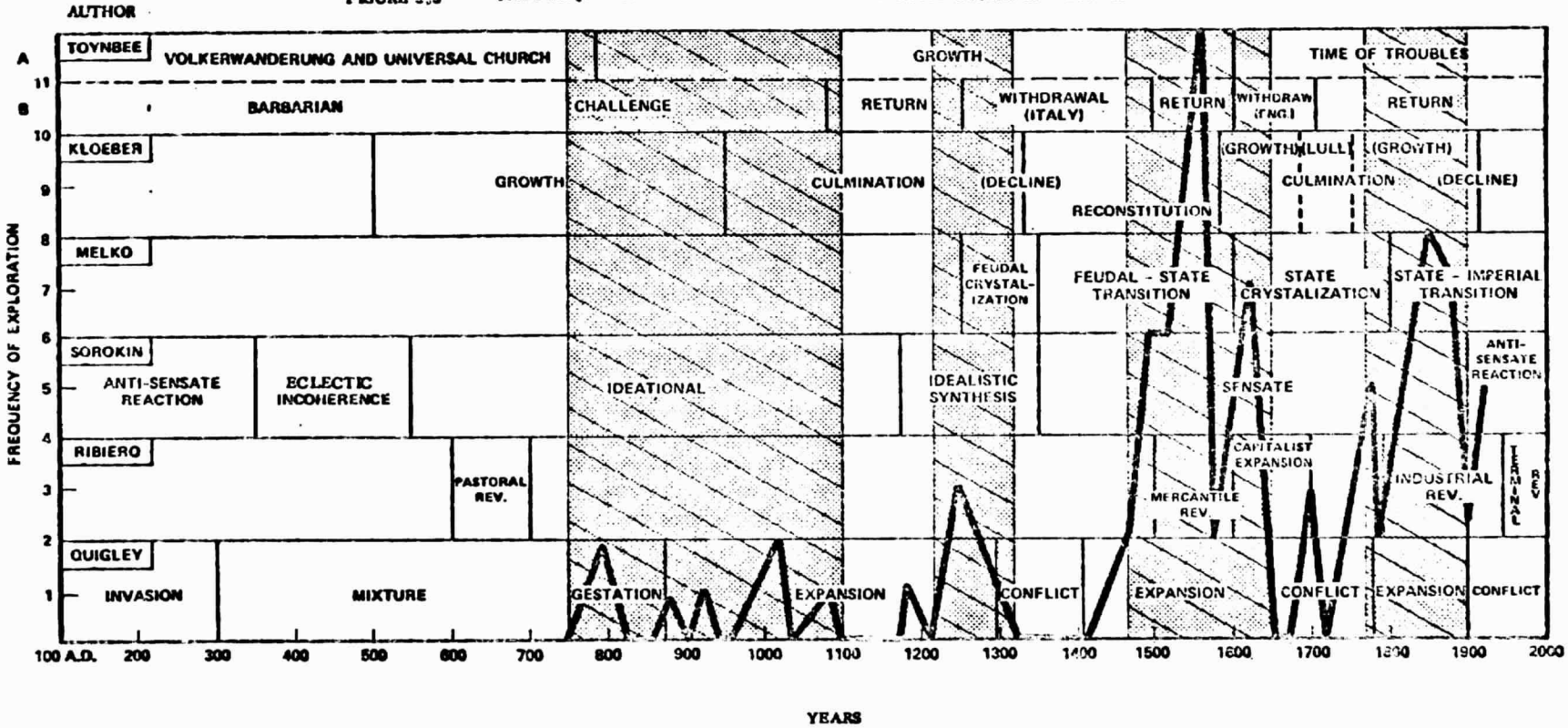


FIGURE 5.5 THE FREQUENCY OF EXPLORATION AND SIX PERIODIZATIONS OF WESTERN CIVILIZATION



valuable and which technologies are viable.

By setting the limits on technology and returns, the prior perception of the location also determines, in concert with the prevailing environments, the sponsors and rationales involved in exploration. During the Renaissance period when the barriers to the location [China] were oceans, only those organizations capable of risking the loss of a ship sponsored explorations. Since these organizations were monarchs or merchants most exploration was done for a combination of trade and nationalistic reasons. The religious climate of the Renaissance gave these explorations an additional crusading element.

With the conquest of the oceanic barrier came the rise of continental barriers such as mountains, jungle, and deserts. Since no specific expensive technology such as ships was required to explore the continental areas, the sponsors and rationales for exploration became pluralized. Scientific associations, individuals, newspapers, governments, and merchants explored the continents for a variety of competitive reasons. With the movement to the Poles and into "third dimensional" exploration of the ocean, mountains, and moon, expensive technology became more essential to successful exploration. Because of the expensive technologies and the types of returns expected, only governments and scientific associations using the symbolic rationales of nationalism and/or science were capable of generating support for Polar and third dimensional exploration.

Two types of explorers have engaged in the process of exploration. One type is the self appointed explorer, who armed with his vision, attempts to get sponsorship for his plan. Columbus, Magellan, Bruce, von Humboldt, Amunsden, and Prince Albert of Monaco are a few of the more

notable self appointed explorers. The other type is the explorer who is selected by a conceptualizing sponsor. Verrazanno, Da Gama, Cook, Stanley, and Armstrong are examples of selected explorers.

Whether an exploration was done by a selected or a self appointed explorer depended mainly on the nature of the barriers to reaching the desired location. In the Renaissance period, it took individual visionaries such as Columbus or Magellan to break the physical/psychological barriers of the ocean; the selected explorers followed in their wake as merchants and monarchs sensed immediate value in exploration. In the Continental period the individual exploits of Bruce, Ledyard and Carver led eventually to the selection of Powell, Pike, Lewis, Clark, Stanley, and Livingstone to explore. Even in the forbidding Polar regions, it was the work of self-appointed explorers such as Amunsden and Peary that led to organization of explorations and selection of explorers.

The importance of individual vision to exploration has declined with the movement to third dimensional exploration. The functions of conceiving, defining, legitimizing, and justifying exploration previously performed by explorers and/or societal intellectuals (royal advisors, religious orders, scientific associations, etc.) are now carried out by bureaucracies staffed by scientific elites. The bureaucratization of exploration has meant increasing segmentation, rationalization, and compartmentalization of the process. As a result modern explorers are mostly selected explorers.

Cost/Benefits of Exploration

The major reason for the bureaucratization of exploration is the increasing societal assumption of the risks of exploration. Previously, individual self-appointed explorers or merchants took on the costs in risk, prestige and in some cases, capital. Now society, because of the magnitude of the barriers to exploration, must assume those costs if exploration is to occur. Since all states, socialist or democratic, capable of overcoming the barriers to exploration are bureaucratic, that exploration will be bureaucratic.

The bureaucracies which will be concerned with exploration will be staffed by military and scientific people because nationalism and science are the prevailing rationales behind third dimensional exploration. Left to themselves, building on conservative scientific rationales, these bureaucracies are not likely to invest the venture capital necessary for large scale exploration.

The bureaucratization of the entire exploration process will probably mean the end of the implementation of exploration per se. Exploration, throughout history, has required a decision that went beyond hard cost/benefit calculations. Given the bureaucratic tendency to do only that from which the results are predictable, those gambles are unlikely to be taken in the future. This is unfortunate given the fact that in the past exploration has created benefits wholly unanticipated at inception. Colonization of America, Africa, and Australia; establishment of scientific establishments, and opening up new resources are just a few of the more obvious unanticipated results of exploration.

Exploration has been a major societal mechanism for man/society to increase his knowledge about his spatial environment; rationalized in

terms of prevailing ideological values of a time period; resulting in impacts not even conceived of in commitment decisions; supported by varying mixes of motives; carried out in varying organizational arrangements by generally influential social non-conformists resulting in "changes-in-rules" of exploration and societal adaptability. The problem of exploration in the modern world is one of allocating venture capital to an activity requiring high level of resources when the only sure historical promise is that the future will somehow be drastically different from the present. Exploration is a testimony to man's view of himself as able to challenge, adapt and survive. Not to explore, leaves man only the option to react and evolve.

> The learn'd is happy Nature to explore,
> The fool is happy that he knows no more;
> (A. Pope, Essay on Man, 1734)

Part II: INTELLECTUAL BASIS

Introduction

The principal effort of Part I was to comprehend the complex features of physical exploration as a cultural process. The course of study was guided by the intriguing question from which the very concept of an exploration ethic arose:

> Does the history of exploratory ventures disclose the existence of a sub rosa directive--an exploration ethic--which has operated as an unstated social imperative requiring human adventure into the unknown?

Despite its persuasive appeal, however, historical evidence alone cannot be expected to convert an implicit ethic-in-practice into an authoritative directive to future social decision. It is by reason, rather than by the weight of habitual practice, that any claim to invariable principle must be made to hold.

This consideration brings into issue the question which is central to Part II: Is there an intellectual justification

(1) for assigning exploration a social value that is ethical in character, rather than aesthetic or pragmatic,

(2) for identifying exploration as a positive aim worthy of concerted societal effort,

(3) for instituting an exploration ethic as a cultural commitment?

The project of Part II involved the following tasks, presented here in the

order of their logical priority:

(1) Formulate the exploration ethic as an explicit regulatory principle relevant to institutional decision making in contemporary society.

(2) Establish a fundamental basis for justification of the principle in terms of ethical theory and method.

(3) Assess the expectations for practical use and effective weight of the ethic in social decision making processes.

Figure 11.1 provides a summary diagram of tasks and resources of Part II.

FORMULATION OF THE EXPLORATION ETHIC

Three large-scale emergent features of the present social context are used to set up a feasible region for formulation of the exploration ethic: (1) the imminence of a major cultural transition (societal stage theories), (2) increasing recognition of a "meta-problem" in cultural redesign, (3) the epochal character of <u>societal</u> exploratory ventures--when viewed as means to adaptivity and learning sufficient to assure the integrity of the existing social "ecosystem." Against this background, explicit formulation of the ethic can be regarded as the initial component of a massive ethical reconstruction in progress, but being worked out so far only intuitively, confusedly. With greater resolution, the ethic can be viewed as one element of the ethics of evolutionary systems: a sector which is still in its formative stage.

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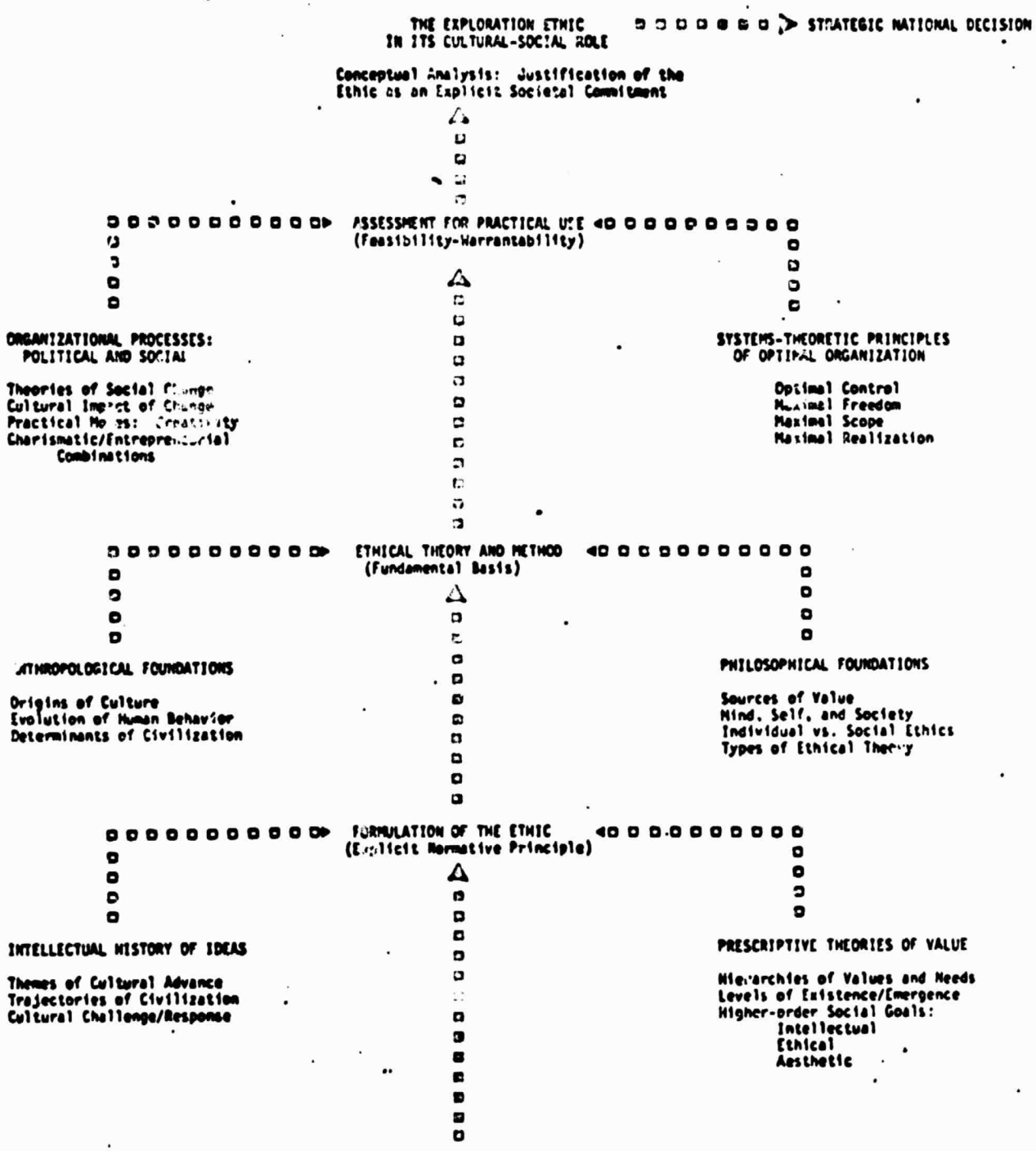


FIGURE 11.1

INTELLECTUAL BASIS OF THE EXPLORATION ETHIC
(Task Sequence with Resources Input)

Ten specific themes are coupled together in the complicated policy position which the exploration ethic explicitly affirms. These are presented in Figure 11.3; and a glossary associates each theme with a more familiar idea by way of analogy or example. As with any conceptual innovation which emerges from the stress of cultural transition, the multi-faceted commitment of the exploration ethic has some of the disconcerting effect of a revolutionary idea. The whole of Sec. 12: Conceptual Analysis is therefore given to response to the common sense question What is the ethic all about?--in terms of (1) the meaning and significance of "normative" concepts, (2) key features, (3) its fundamental status as a rational principle of guidance-control in cultural development.

ETHICAL THEORY AND METHOD

The task of this section is to determine whether a definitive intellectual basis for the exploration ethic can be established by recourse to ethical theory and method. Leading queries which guide this phase of research are:

(1) Is the exploration ethic a legitimate conception?

(2) What justification in principle can be given for commitment to an ethic of this type?

These queries are blocked by a deep-lying incoherency which is disruptive to ethical method in its foundations. The standards of legitimacy and grounds for vindication of value-sensitive principles have been a perennial

Ethics of Evolutionary Systems (component)

Conscious alignment with a process of emergence.
Purposeful self-transformation (individual and society).

(1) SOCIETAL LEARNING AND INSTITUTIONAL ADAPTATION

(2) PROVIDENT VALUES AND PRESCIENT ACTION: CHOICE-OF-CHANGE

(3) PREPARATION OF ADAPTIVE MODES IN ADVANCE OF CRISIS

(4) STRATEGIC "MANAGEMENT" OF SOCIETAL ECOSYSTEM TRANSITIONS

. Design for evolution.
Intelligence-acquisiton function.
Inquiring systems:

Know WHERE-TO:	the next "ice floe" (ecosystem niche) that will support a future.
Know WHAT:	i.e., what cultural pattern will be required for viability <u>there</u>.
Know HOW:	technical means to make the transition when necessary.

(5) CONCEIVING-TESTING-SELECTING-<u>PRACTICING</u> TRANSITIONS

(6) IDEAL-SEEKING BEHAVIOR: LEARNING IN ADVANCE OF "NEED TO KNOW"

(7) "SECURITY" IN THE LARGER SENSE OF CULTURAL VIABILITY

(8) BALANCED "PORTFOLIO" INVESTMENT UNDER UNCERTAINTY

(9) CALCULUS OF POTENTIAL vs. CALCULUS OF PROBABILITY

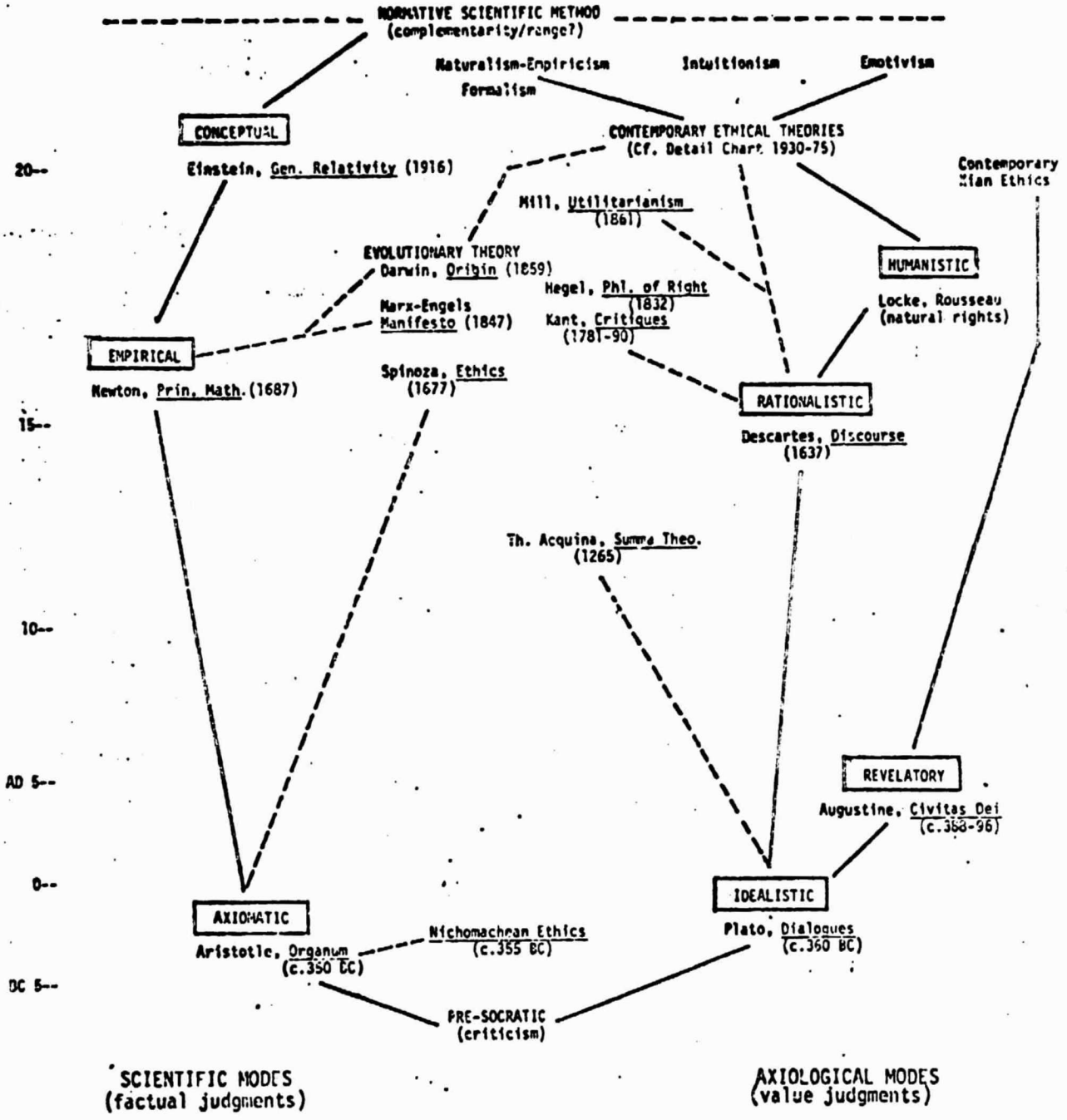
(10) THIRD-ORDER STRATEGIC POSTURE

Adaptedness and adaptability
Survival and survivability
Transition to survival in a new mode

EXPLORATION ETHIC:

(Themes: Explicit Statement)

FIGURE 11.3



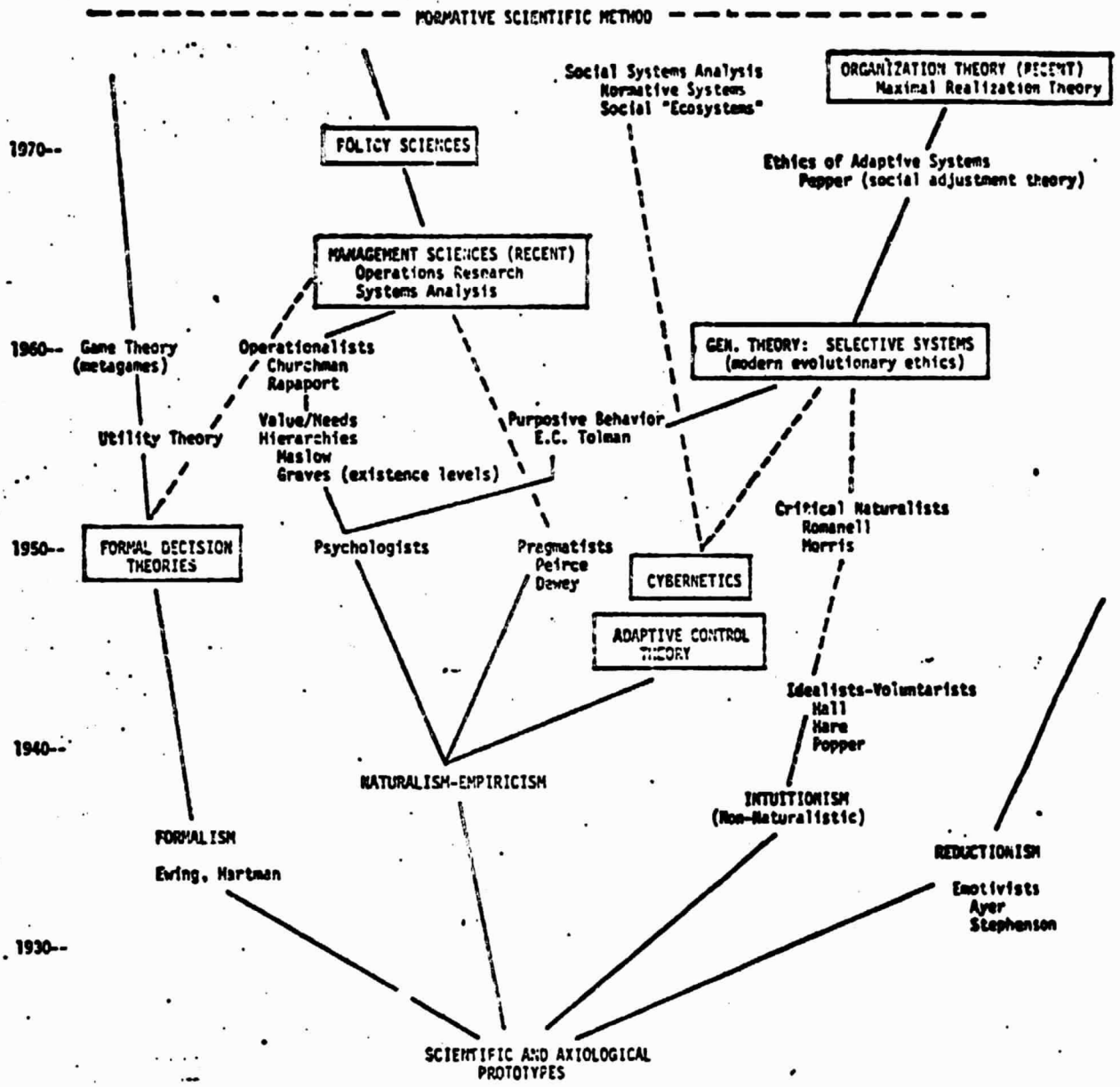
PROTOTYPES OF RATIONAL CONTROL

FIGURE 13.1

"no-man's land" of inquiry throughout Western history. In generating a systematic search for an adequate mode of rational control of value judgment, however, our queries serve better than intended. They lead to new resources for contemporary ethics. Figure 13.1 presents the historic succession of major prototypes of rational control: the emergent modes of scientific thought (factual judgment) posed against their great counterparts, the axiological modes (associated with value judgment).

A survey of historic rational modes appears to drive irretrievably toward acceptance of dualism in value inquiry, i.e., the existence of two unalterably opposed (apparently) incompatible methods--each claiming to represent the legitimate approach to control of judgment and action in each of two mutually exclusive compartments of experience and knowledge. The "blocking" problem which arises is: that a well-grounded and effectual exploration ethic cannot be based on either one of these traditional compartments exclusively.

However, the emergence of a "normative-theoretic" rational prototype--as recently as the decade 1960-70--now indicates a trend toward convergence of the sciences and the humanities. Foundations of normative scientific method admit of the <u>complementarity</u> of objective (fact-oriented) and normative (value-oriented) inquiry: each mode closes the feedback loop of information needed to specify <u>a warrantable process of judgment subject to rational control</u>. Complementarity provides the scope needed for attaining newly effective resources in theory and method for contemporary ethics.



CONTEMPORARY ETHICAL THEORY: RESOURCES

FIGURE 14. 2

SOCIAL SYNTHESIS: PERSONAL-INSTITUTIONAL DUAL

CHARISMATIC motivational	ENTREPRENEURIAL operational
Generic military operation secular "evangelism" hazardous exploration social conflagration	**Specific** Governmental Organization **INSTITUTIONAL** National Administrative Prescriptive Scientific
Historic Army of Servile Revolt Crusades and Cathedrals Antarctica and Los Alamos Paris '89 and Nürnberg '33	**PARA-INSTITUTIONAL** Disciplinary Sectors metatheoretic theoretic applied practical
Élan Max Effort	Max Effect Viability

FIGURE 14.6

OVERVIEW OF CONCLUSIONS: EXPLORATION ETHIC, Part II

RE: ORIGINAL RESEARCH QUERIES	RE: COROLLARY CONCLUSIONS AND IMPLICATIONS	
	Articipated	Unanticipated
FORMULATION?		
Explicit Normative Principle Societal Commitment Institutional Directive	Social Adaptivity/Learning Epochal Societal Risk-Ventures	Context of Cultural Re-design Ethical Reconstruction Component
JUSTIFICATION?		
Anthropological/Behavioral History of Ideas: Continuum Ethical Theory and Method		Full-Scale Synthesis: Scientific and Axiological
FEASIBILITY?	Outlook Role-Prototype	
Organizational Processes (Decision) Strategic-Guidance-Control Principles Effective Weight		Strategic Ecosystems Management-Decision Process (design)
	"Legislative" Principles (fundamental values tradeoff)	Balanced Portfolio Investment (computational aspects)

FIGURE 14.8

THE EXPLORATION ETHIC IN INSTITUTIONAL DECISION MAKING (Warrantability and Practicability)

Under the designation Normative Scientific Method, Figure 14.2 displays the components of a synthesis (an interdisciplinary approach) that is highly relevant to rational control of institutional decision making. These scientific developments make solid contact--across the traditional dualistic barrier--with the humanities in one specific line of development in ethics: i.e., the ethics of adaptive systems. The exploration ethic, as the most recent advance within this sector, shares its unique claim to warrantability. That is, the exploration ethic posits regulatory principles which are (a) interpretable, (b) conformal, and (c) applicable with respect to every division of behavioral science concerned with operational characteristics of adaptive systems control.

In this important regard, the exploration ethic has an extremely strong claim. It is solidly linked to behavior and experience--both as to (a) the source of values posited (evolutionary selection processes, both natural and social) and (b) the applicability of its regulatory principles (explicit directives as optimal policies).

Optimal Organization

The ultimate questions with regard to practicability of the exploration ethic are matters of common sense: What will it actually do if it is accepted as an explicit social commitment? How would it be used as a directive to practical decision making? In brief, the ethic will tend

(1) to improve the rationality of institutional decisions by introducing an explicit evolutionary criterion of admissibility;

(2) to guide the social system toward an idealized status described as optimal organization (via an indefinitely continued process).

It is extremely important to note, however, that the minimally sufficient criteria of "optimal" organization--maximal freedom, optimal control, and maximal scope--are antithetical. The supreme strategic issue will therefore always concern appropriate tradeoff among these value measures which cannot be extremalized simultaneously by any single course of action. As suggested by Figure 14.6, rational tradeoff among fundamental values is achievable by recourse to maximal realization as an intrinsic value requiring allocation of priority in some periods to improvement of control and in other situations to extension of freedom and scope. Balance is determined by best contribution toward "realization" in three senses: (1) comprehension of reality, (2) gain in ecosystem transactions, and (3) exploitation of the potential of a given system design.

Insertion of the Ethic: Social Synthesis

The exploration ethic is shown to be conformal with the central theme of democratic social organization; and the outlines of a general plan for implementation are unmistakable in historical and even anthropological evidence. The requirement is for social synthesis--construed as a dual process characterized by

(1) a personal-charismatic-motivational component concerned with

(a) collective social awareness of a holistic purpose,

(b) distributed decision processes aimed at realization of collective purpose, subject to constraints of resources and natural norms of sub-organizations;

(2) an institutional-entrepreneurial-operational component

(a) serving as a conceptual modeling agency of the society as a whole,

(b) proffering alternative initiatives subject to admissibility under a coherent coupling of the total structure of values and norms.

CONCLUSIONS, Part II: INTELLECTUAL BASIS

Some 18 conclusions are stated (Final Report, pp. 14-57 to 14-62). These are already in compact form and they cannot be further abstracted without loss of meaning. However, Figure 14.8 presents an overview of conclusions which can be tracked (left to right) for bare mention of the nature of outcomes of (a) original research queries and (b) anticipated corollary conclusions, as well as (c) unanticipated corollaries:

Formulation

The exploration ethic can be stated as an explicit normative principle worthy of status as a social commitment and serviceable as an institutional directive to practical decision making. It affirms

(1) the crucial significance of a new social scale of learning and adaptivity, and it emphasizes

(2) the epochal character of societal risk-ventures as a means toward increasing adaptive range and long term viability.

The ethic is a response to present demands for purposeful cultural redesign, and it represents the initial component of a massive ethical reconstruction now in progress as a prominent feature of Western culture.

Justification

Major themes of advance in civilized societies are highly suggestive but not definitive as intellectual justification of the exploration ethic. A survey of prototypes of rational control fails to disclose, either in conventional scientific or axiological disciplines, a rational mode that could provide an unchallengeable basis for this novel ethical commitment.

A full-scale synthesis of traditional modes is required; but this is precisely what has been forthcoming in the very recent development of normative scientific method (1960 forward).

Intellectual justification of the exploration ethic is very strongly grounded on

(1) the complementarity of objective and normative inquiry, as to method; and

(2) the interdisciplinary alliance of ethics of adaptive systems with contemporary decision sciences, as to theoretical basis.

Feasibility

Insertion of the exploration ethic as a recognized guidance-control principle for organizational decision making is feasible by two approaches:

(1) assertion of the ethic, as with any ordinary rule of practical conduct, followed by attempts to secure broad acquiescence to its implications;

(2) a more thoroughgoing process of social synthesis.

In either case, practical use of the ethic entails institutional and technical innovations of considerable significance:

(1) institutional development of an "outlook-role" prototype in which operational agencies, serving an acknowledged entrepreneurial role, proffer initiatives designed to meet emergent social/national needs;

(2) technical development of principles of strategic ecosystems "management" for the societal context, and computational aspects of "balanced portfolio" national investment under uncertainty.