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Systems Theory and Judicial Behavioralism

Ovid C. Lewis

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There are more things in heaven and earth, Horatio,
than are dreamt of in your philosophy.—

Hamlet, Act I, Sc. 5
line 166.

I. INTRODUCTION

A DISTINGUISHED judicial behavioralist not long ago observed that just as most sciences have progressed from mere speculation (theory without facts) to empiricism (facts without theory) and finally to maturity (theory empirically verified), so too has analysis of judicial behavior moved from the traditional approach, *i.e.*, philosophical, analytical, historical, and sociological jurisprudence (theory without facts), to legal realism (facts without theory) and finally to judicial behavioralism (theory empirically verified).[1] Although it surely smacks of hyperbole,[2] the statement reflects the current demand for an infusion of scientific methods into analysis of judicial behavior. Indeed, we find that demands are be-

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1 *See* Schubert, *Introduction* to JUDICIAL BEHAVIOR 1, 2-3 (G. Schubert ed. 1964). For a more charitable evaluation of the realists, see Rumble, *Rule — Skepticism and the Role of the Judge: A Study of American Legal Realism*, 15 J. PUB. L. 251 (1966). It is now clear that the theoretical and empirical dimensions are inextricably interrelated. *See* A. KAPLAN, THE CONDUCT OF INQUIRY 54-62 (1964); Bierstedt, *A Critique of Empiricism in Sociology*, 14 AM. SOCIOLOGICAL REV. 584 (1949); Meadows, *Model Systems, and Science*, 22 AM. SOCIOLOGICAL REV. 3 (1957); Merton, *The Bearing of Empirical Research Upon the Development of Social Theory*, 13 AM. SOCIOLOGICAL REV. 505 (1948); Sewell, *Some Observations on Theory Testing*, 21 RURAL SOCIOLOGY 1 (1956).

2 Sociological jurisprudence, for example, has long evinced an interest in both theory (the law-in-books) and facts (the law-in-action). *See* T. COWAN, AMERICAN JURISPRUDENCE READER 135-246 (1956); Page, *Professor Ehrlich's Czernowitz Seminar of Living Law*, in 1914 PROCEEDINGS: AMERICAN ASSOCIATION OF LAW SCHOOLS 46; Nussbaum, *Fact Research in Law*, 40 COLUM. L. REV. 189 (1940).

ing made with increasing frequency for an application of the scientific approach to all aspects of legal processes and institutions.

This is justified, since given the increasing interaction of law and science, it clearly does behoove both lawyers and scientists to try to understand better the other's perspective. This intersection of law and science, as Professor David Cavers has noted,[3] is today especially apparent in at least the following areas: (1) In determining both adjudicative and legislative facts, the courts more and more turn to science for answers, *e.g.*, in cases involving personal injury, patent law, and criminal responsibility.[4] (2) Scientific and technological developments that require reexamination and modification of legal doctrine.[5] For example, the technology that enables the uninvited to invade our lives by keeping an extensive and permanent record of our daily existence has great significance for the law of privacy.[6] The use of computers, one of the prodigious progeny of scientific technology, necessitates a reexamination of innumerable areas of the law,[7] as does the rapid development of communication sciences.[8] The legal problems portended by genetic manipulation, cloning, ESB, hallucinogenic drugs, organ transplants, and medical experimentation are staggering.[9] (3) Science produces new hazards which law must necessarily limit and control. Consider the dangers presented by new and potent drugs,[10] pesti-

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[3] *See* Cavers, *Law and Science: Some Points of Confrontation*, in LAW AND THE SOCIAL ROLE OF SCIENCE 5 (H. Jones ed. 1967). *See also* Caldwell, *Jurisprudence in Interdisciplinary Environments*, 8 JURIMETRICS J. 1 (1968).

[4] *See* Korn, *Law, Fact, and Science in the Courts*, 66 COLUM. L. REV. 1080 (1966); Note, *The Criminal Trial Process — Fight for Truth*, 19 CASE W. RES. L. REV. 713 (1968). Judges are not entirely hospitable to these developments. *See, e.g.*, York, *Austern Notes Judicial Hostility to Probability*, HARV. L. RECORD, Dec. 12, 1968, at 3. *See also* Solomon, *Jurimetrics*, 8 JURIMETRICS J. 7 (1968).

[5] *See Symposium — The Impact of Science and Technology on International Law*, 55 CALIF. L. REV. 419 (1967).

[6] *See* A. WESTIN, PRIVACY AND FREEDOM 349-65 (1967); Ruebhausen & Brim, *Privacy and Behavioral Research*, 65 COLUM. L. REV. 1184 (1965).

[7] *See* COMPUTERS AND THE LAW 85-116 (R. Bigelow ed. 1966); R. MCBRIDE, THE AUTOMATED STATES: COMPUTER SYSTEMS AS A NEW FORCE IN SOCIETY (1967); Mermin, *Computers, Law and Justice: An Introductory Lecture*, 1967 WIS. L. REV. 43.

[8] *See* COMMUNICATION SCIENCES AND LAW: REFLECTIONS FROM THE JURIMETRICS CONFERENCE (L. Allen & M. Caldwell eds. 1965) [hereinafter cited as JURIMETRICS CONFERENCE].

[9] For a good bibliography, see LAW AND THE SOCIAL ROLE OF SCIENCE 168-69 (H. Jones ed. 1967). *See also Symposium — Science Challenges the Law*, 19 CASE W. RES. L. REV. 5 (1967); *Symposium — Reflections on the New Biology*, 15 U.C.L.A.L. REV. 267 (1968).

[10] *See* B. BARBER, DRUGS AND SOCIETY 115-61 (1967).

cides and pollution,[11] weather modification,[12] and most terrifying of all — nuclear power.[13] (4) Government through law in allocating only certain portions of scarce resources to science, significantly effects the scientific enterprise.[14]

The law schools have begun to react, albeit slowly, to these demands. Legal literature is replete with suggestions for injecting more social science into the law school curriculum.[15] Recently the Special Commission on the Social Sciences, established by the National Science Board in 1968, recommended incorporation of more social science material in law curricula, appointment of social scientists to law school faculties, and increased collaboration between the law-trained and social science professionals.[16]

The vigorous reaction of legal scholars to the challenge of the intersection of law and science is manifest in the proliferation during the last two decades of literally thousands of studies that pur-

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[11] *See* Reitze, *Pollution Control: Why Has It Failed?*, 55 A.B.A.J. 923 (1969); Train, *Crimes Against the Environment*, TRIAL, Aug./Sept. 1969, at 19.

[12] *See generally* WEATHER MODIFICATION AND THE LAW (H. Taubenfeld ed. 1968); Oppenheimer, *The Legal Aspects of Weather Modification*, 1958 INS. L.J. 314; Taubenfeld, *Weather Modification and Control: Some International Legal Implications*, 55 CALIF. L. REV. 493 (1967); Pierce, *Legal Aspects of Weather Modification Snowpack Augmentation in Wyoming*, 2 LAND & WATER L. REV. 273 (1967).

[13] The elaborate precautions necessary to avert the danger of disaster created by storage of the waste products of atomic fusion reactors are dramatically described by Lord Ritchie-Calder:

> At Hanford [Washington] . . . live atoms are kept in tanks constructed of carbon steel, resting in a steel saucer to catch any leakage. These are enclosed in a reenforced [*sic*] concrete structure and the whole construction is buried in the ground with only the vents showing. In the steel sepulchers, each with a million gallon capacity, the atoms are very much alive. Their radioactivity keeps the acids in the witches' brew boiling. In the bottom of the tanks the temperature is well above the boiling point of water. There has to be a cooling system, therefore, and it must be continuously maintained. In addition, the vapors generated in the tanks have to be condensed and scrubbed, otherwise a radioactive miasma would escape from the vents. Some of the elements in those high-level wastes will remain radioactive for at least 250,000 years. It is most unlikely that the tanks will endure as long as the Egyptian Pyramids. Ritchie-Calder, *Polluting the Environment*, 2 THE CENTER MAGAZINE, May 1969, at 7, 12.

[14] *See generally Symposium — Science and Public Policy*, 27 PUB. AD. REV. 95 (1967).

[15] *See, e.g.*, S. FOX, SCIENCE AND JUSTICE (1968); Hazard, *Challenges to Legal Education*, in THE PATH OF LAW FROM 1968: PROCEEDINGS AND PAPERS AT THE HARVARD LAW SCHOOL CONVOCATION HELD ON THE 150TH ANNIVERSARY OF ITS FOUNDING 185-94 (1968); Haskell, *Some Thoughts About Our Law Schools*, 56 GEO. L.J. 897, 904-05 (1968); Massel, *Science and Technology and the Future Law School Curriculum*, 44 DENVER L.J. 36, 40-41 (Special Issue, Fall 1967); Traynor, *What Domesday Books for Emerging Law?*, 15 U.C.L.A.L. REV. 1105 (1968).

[16] *See* SPECIAL COMMISSION ON THE SOCIAL SCIENCES, NATIONAL SCIENCE BOARD, KNOWLEDGE INTO ACTION: IMPROVING THE NATION'S USE OF THE SOCIAL SCIENCES xiii, 23 (1969).

port to analyze *scientifically* some aspect of the legal process.[17] Many of these studies are subsumed under the rubric "jurimetrics,"[18] a term coined in 1949 by Lee Loevinger.[19] It is highly debatable, however, whether all these studies are appropriately denominated "scientific,"[20] although the most frequently offered definition of jurimetrics is the "scientific investigation of legal problems."[21] The lack of understanding of what constitutes science is exemplified when one considers some of the arguments proffered for justifying jurimetric ventures as scientific. Some suggest that the analytical techniques and tools employed by the jurimetrician distinguish him from other nonscientific legal scholars. Various lists of distinctive jurimetric tools are proposed, such as digital computers, modern logic, and quantitative methods of the behavioral sciences,[22] or communication and information theory, mathematical logic, and mechanical and electronic means of data retrieval. Unfortunately, the jurimetrician is not readily identified by enumeration of analytical tools or methods of inquiry, since it is the way a tool is used, not the tool, that is the significant factor in identifying a school of thought, especially where the tool involved is as versatile as a digital computer or as varied as quantitative analysis. In many instances it seems as though a jurimetrician has discovered a behavioral sci-

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[17] It is generally agreed that the interest in scientific inquiry has had far more impact on research and writing than on law school activities. *See* Loevinger, *Law and Science as Rival Systems*, 8 JURIMETRICS J. 63 (1966); Schubert, *Behavioral Jurisprudence*, 2 LAW & SOC'Y REV. 407, 409 (1968); Schubert, *The Future of Public Law*, 34 GEO. WASH. L. REV. 593 (1966). An excellent collection of studies covering a broad spectrum of legal processes and institutions appears in THE SOCIOLOGY OF LAW (R. Simon ed. 1968). Two other valuable sources of behaviorally oriented studies are the *Law and Society Review*, first published in 1966, and the *Jurimetrics Journal*.

[18] *See, e.g.*, JURIMETRICS CONFERENCE, *supra* note 8; Baade, *Foreword to Symposium — Jurimetrics*, 28 LAW & CONTEMP. PROB. 1 (1963).

[19] *See* Loevinger, *Jurimetrics — The Next Step Forward*, 33 MINN. L. REV. 455 (1949).

[20] *See* SPECIAL COMMITTEE ON JURIMETRICS, AMERICAN ASS'N OF LAW SCHOOLS, REPORT OF PROCEEDINGS 134-35 (1961). The Jurimetrics Conference involved discussions and presentation of papers dealing with modern logic, quantitative methods and decision theory, information processing and technology, programmed instruction, and linguistics. *See also* JURIMETRICS CONFERENCE, *supra* note 8.

[21] *See* Baade, *supra* note 18; Kayton, *Can Jurimetrics be of Value to Jurisprudence?*, 33 GEO. WASH. L. REV. 287 (1964); Loevinger, *Jurimetrics: Science and Prediction in the Field of Law*, 46 MINN. L. REV. 255 (1964); Loevinger, *Jurimetrics: The Methodology of Legal Inquiry*, 28 LAW & CONTEMP. PROB. 5, 8 (1963); Loevinger, *Science and Legal Thinking*, 25 FED. B.J. 153 (1965). Also, the reports of the Special Committee on Jurimetrics each stress that the Committee is concerned with the scientific investigation of legal problems. *See, e.g.*, AMERICAN ASSOCIATION OF LAW SCHOOLS, PROCEEDINGS 100 (1965).

[22] *See* Kayton, *supra* note 21, wherein the author contends that "[m]odern logic and digital computers are the stuff of which jurimetrics is made." *Id.* at 289.

ence technique which he immediately inflicts on some aspect of the legal process to produce "scientific" findings. Perhaps jurimetricians provide an example of Abraham Kaplan's *Law of the Instrument*: "Give a small boy a hammer, and he will find that everything he encounters needs pounding."[23]

Numerous other "scientific" studies have appeared under the banner of judicial behavioralism.[24] Fortunately, the tenets of behavioralism are considerably more well-delineated than those of jurimetrics. In addition, these tenets are in accord with norms generally considered as necessary, if not sufficient, conditions for doing science:

> [Behavioralism] calls for an effort . . . to advance hypotheses about relationships, to discover uniformities or regularities or laws, and to suggest theories; the higher the level of generalization, the better. At the same time [there is] . . . an insistence that the generalizations be verified or verifiable. Normative propositions are avoided; the object is description, including explanation and descriptive statements about normative attitudes. If prescriptive statements are made, their normative component falls outside the realm of science. The requirement that the generalizations be verified or verifiable calls for empiricism—for reliance on observation and refusal to rely on alleged a priori truths. It also calls for precision in the definition of concepts, clarity in the formulation of hypotheses, and, in effect, restraint about calling a generalization anything other than a hypothesis until it has been demonstrated to be true. In addition to generality and verifiability, the notion of scientific purpose connotes system; that is, the object is to develop a set of verified generalizations that fit together in a coherent system—a coherent interlocking network—giving a comprehensive description and explanation of the realm of behavior in question.[25]

The proponents of a closer liaison between science and law, however, are not without critics, some quite vituperative. The characterization of the work of the judicial behavioralist as "intellectual

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[23] A. KAPLAN, *supra* note 1, at 28. The Law of the Instrument was also manifest in much of the early work of American legal realists. *See, e.g.*, E. PATERSON, JURISPRUDENCE: MEN AND IDEAS OF THE LAW 538, 546 (1953).

[24] *See, e.g.*, L. FRIEDMAN & S. MACAULAY, LAW AND THE BEHAVIORAL SCIENCES (1969); S. NAGEL, THE LEGAL PROCESS FROM A BEHAVIORAL PERSPECTIVE (1969); JUDICIAL BEHAVIOR: A READER IN THEORY AND RESEARCH (G. Schubert ed. 1964). Sometimes these studies are identified as "political jurisprudence." *See, e.g.*, Shapiro, *Political Jurisprudence*, 52 KY. L.J. 294 (1964).

[25] V. VAN DYKE, POLITICAL SCIENCE: A PHILOSOPHICAL ANALYSIS 159 (1960). The assumptions and tenets of behavioralism are clearly manifest in studies characterized as jurimetric, as well as in judicial behavioralist studies. *See* Lewis, Book Review, 20 RUTGERS L. REV. 162, 165-66 (1965). For a sample of some of the problems involved in defining behavioralism, compare Davis, *Behavioral Science and Administrative Law*, 17 J. LEGAL ED. 137, 138-41 (1965), with Easton, *Introduction: The Current Meaning of "Behavioralism" in Political Science*, in THE LIMITS OF BEHAVIORALISM IN POLITICAL SCIENCE 1, 7 (J. Charlesworth ed. 1962).

masturbation"[26] is not unrepresentative of many of the critiques.[27] Often this hostile stance of the law-trained who inveigh so strongly against incursions by alien "scientific" approaches to legal problems is supported by calling attention to past failures.[28] Dean Rostow in 1950 thus concluded: "Despite 40 years or more of thought . . . and several promising experiments, a successful integration of law and the other social sciences . . . is still for the future."[29]

This pessimistic prognostication has not at all abated. Critics still object that: (1) Scientific methodology is not appropriate for investigation of legal problems;[30] (2) to accept findings made by scientists is to abdicate professional responsibility;[31] and (3) scientific analyses will ultimately result either in a mechanical adherence to general rules with too little attention given to the demands of the particular case[32] or in too much precision and complexity in legal doctrines.[33]

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[26] Bush, *The Application of Learning Models to Interactive Behavior*, in MATHEMATICAL METHODS IN SMALL GROUP PROCESSES 69, 70 (J. Criswell, H. Solomon & P. Suppes eds. 1962).

[27] *See, e.g.*, Strauss, *Epilogue* to ESSAYS ON THE SCIENTIFIC STUDY OF POLITICS 312 (H. Storing & W. Berns eds. 1962); Becker, *Inquiry into a School of Thought in the Judicial Behavior Movement*, 7 MIDWEST J. OF POL. SCI. 254 (1963); Berns, *Law and Behavioral Science*, 28 LAW & CONTEMP. PROB. 185 (1963); Davis, *supra* note 25; Mendelson, *The Neo-Behavioral Approach to the Judicial Process: A Critique*, 57 AM. POL. SCI. REV. 593 (1963); Spengler, *Machine-Made Justice: Some Implications*, 28 LAW & CONTEMP. PROB. 36 (1963); Wiener, *Decision Prediction by Computers: Nonsense Cubed — and Worse*, 48 A.B.A.J. 1023 (1962). *But see* T. BECKER, POLITICAL BEHAVIORALISM AND MODERN JURISPRUDENCE: A WORKING THEORY AND STUDY IN JUDICIAL DECISION-MAKING (1964).

[28] *See* Llewellyn, *Social Significance in Legal Problems*, in CONFERENCE ON AIMS AND METHODS OF LEGAL RESEARCH 8, 11 (A. Conard ed. 1955); Riesman, *Law and Sociology: Recruitment, Training and Colleagueship*, 9 STAN. L. REV. 643 (1957).

[29] Rostow, *The Study of Economics in Relation to Education in Law*, 2 J. LEGAL ED. 335, 342 (1950). *See also* Dean Maxwell's pessimistic statement quoted in Schorr, *The Law and the Computer*, 8 DATAMATION, July 1962, at 25. Happily, by the early 60's there was a trend toward a "closer working relationship between legal scholars and scholars from other disciplines." E. Jones, *Some Current Trends in Legal Research*, 15 J. LEGAL ED. 121, 123 (1962). *See also* Skolnick, *The Sociology of Law in America: Overview and Trends*, LAW AND SOCIETY: A SUPPLEMENT TO THE SUMMER ISSUE OF SOCIAL PROBLEMS (1965); Young, *The Behavioral Sciences, Stability, and Change*, 17 VAND. L. REV. 57 (1963).

[30] *See* Cohen, *Factors of Resistance to the Resources of the Behavioral Sciences*, 12 J. LEGAL ED. 67, 68 (1959); Cowan, *Some Problems Common to Jurisprudence and Technology*, 33 GEO. WASH. L. REV. 3, 6 (1964).

[31] *See* Wiener, *supra* note 27, at 1027. This objection seems to ignore the fact that the behavioralist is primarily interested in attaining a scientific explanation of judicial behavior. No behavioralist has seriously proposed that computers replace judges. *But see* Bartholomew, *The Supreme Court and Modern Objectivity*, 33 N.Y.S.B.J. 157 (1961).

[32] *See* Spengler, *supra* note 27, at 36.

[33] *See* Dickerson, *Some Jurisprudential Implications of Electronic Data Processing*, 28 LAW & CONTEMP. PROB. 53, 63 (1963).

The most serious and perplexing difficulty, acknowledged by behavioralists themselves, is presented by the absence of any unifying theoretical framework for relating and organizing the pullulating mass of diverse scientific studies that deal with judicial behavior.[34] The "systems approach," the latest development appearing in the literature of judicial behavioralism, is designed to fill this theoretical gap. The behavioralist who is *au courant* will speak knowingly of "cybernetic control" [*sic*], feedback, load, gain, "boundary-maintenance," and the like. Indeed, the Dean of judicial behavioralists, Glendon Schubert, recently predicted that systems analysis will constitute the major emphasis in behavioral jurisprudence in the years ahead.[35]

We shall examine, in the following pages, the systems approach and discuss its significance for judicial behavioralism. Although primarily concerned with the explication of the problems involved in arriving at a scientific explanation of judicial behavior, our inquiry will touch on matters relevant to all aspects of the intersection of law and science. The broad scope of such an enterprise dictates that we provide, in fairness to the reader, a roadmap indicating the general route and nature of the terrain covered.

Part II commences with a consideration of the grandest system of all — our all-encompassing universe. During his tenure on the earth man has engaged in an extensive dialogue with the cosmos. Early he asked about God, then of himself, and finally of the world. Who is God? Who am I? What is the world? All manner of unanswerable questions apparently insist on being entertained by creatures capable of creating, encoding, and using information in their interaction with reality. In carrying on the dialogue, man fashioned elegant and useful conceptual systems which, however, distorted his perception of reality. Viewing these conceptual systems as merely hypotheses or possibilities, we ask how we can reduce to a minimum their distorting effect. If we agree with Socrates that we acquire knowledge by first accepting the fact that we know

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[34] *See, e.g.*, T. BECKER, *supra* note 27, at 2-6.

[35] *See* Schubert, *Behavioral Jurisprudence*, *supra* note 17, at 426. Schubert and other behavioralists have already published a variety of systems analyses of judicial behavior and other aspects of legal processes and institutions. *See also* J. SIGLER, AN INTRODUCTION TO THE LEGAL SYSTEM (1968); Raab, *Suggestions for a Cybernetic Approach to Sociological Jurisprudence*, 17 J. LEGAL ED. 397 (1965); Schubert, *The Rhetoric of Constitutional Change*, 16 J. PUB. L. 16 (1967); Sigler, *A Cybernetic Model of the Judicial System*, 41 TEMP. L.Q. 398 (1968). Roy Freed, discussing the use of computers in court administration flatly states that "a systems approach is essential." Freed, *Computers in Judicial Administration*, 2 LAW & COMPUTER TECHNOLOGY, July 1969, at 19, 22.

nothing and then discovering what we don't know, the dilemma is accentuated. For as soon as some conceptual context is invented for appreciating what we do not know, we lose forever the opportunity for an immaculate perception. This situation is analogous to that of the violin maker who knows that although varnish detracts from the tone of the violin, without varnish the wood will deteriorate. He resolves his dilemma by applying the varnish that will preserve the instrument while detracting *least* from its tone. In like spirit, we adopt the systems approach, believing that it constitutes the conceptual scheme which, for a variety of reasons, *distorts least.*

The first segment of the discussion is surely the most tedious. The reader is asked to accept a rather large dose of new terms and concepts in anticipation of their clarifying usefulness in the subsequent portions of the inquiry. Initially we explore the concept of a system and contrast conceptual and natural systems. We shall find that there are different levels of discernible systems, each exhibiting varying characteristics requiring different analytical models and methods. For example, living systems which seem to violate the second law of thermodynamics in their tendency to become more ordered over time, are not appropriately treated by using a simple equilibrium model.

Our analysis narrows as our attention turns from systems generally to complex adaptive systems capable of maintaining their integrity over a protracted period of time. Recognizing that there is a continuum of adaptive systems, it is nonetheless possible to generally discern four reference points — the low, moderately low, moderately high, and high integration index levels. Man, and appropriately programmed computers, appear capable of operating at all levels. The fact that the computer displays this facility is of special interest to the behavioralist. In the physical sciences one simplifies and analyzes. In the behavioral sciences to simplify is to lose the organization and complexity that is the very essence of the system studied. Only with the advent of a system, like the computer, capable of operating functionally parallel to man, is it possible to retain complexity of variables during analysis. It is for this reason, and because of the significant impact of the computer on all phases of social and legal institutions, that a brief analysis of the functioning of computers is included in our discussion.

The next step is the obvious. We move to the complex adaptive system most pertinent to an analysis of behavior — personality.

In taking this step we remain as open as possible, adopting Gordon Allport's view that personality is a unique and open complex adaptive system composed of interrelated psychophysical subsystems that determine a person's characteristic behavior. We do here add some substantive information about human nature, emphasizing those facets of personality most relevant to the behavioralist's enterprise. Thus ends part II.

We recall that our specific query is whether it is possible to attain a scientific explanation of judicial behavior. The reader is now knowledgeable concerning systems terminology and behavioral systems. Our inquiry, however, necessarily requires an exposition of what constitutes a *scientific* explanation and the variables involved in *judicial* behavior that differentiate it from nonjudicial behavior. This requires an understanding of what constitutes science and of the impact of the legal system on the behavior of judges. With this understanding we can return to our primary question with some assurance of knowing what we do not know. Thus, in part III, adopting a system's stance, we recognize the futility of attempting to define science. Instead we view science from the perspective of seven significant parameters. There is no mystery about how the seven are selected. In the scientific enterprise, conversion processes are accomplished by individuals (*decisionmakers*), operating within social and institutional systems (*institutional context*), using a variety of means of communication (the most significant of which is *language*). Problems are resolved by using normatively and pragmatically prescribed *methods* with the goodness of the methods and resulting *product* (decision, theory, etc.) generally evaluated and justified in relation to the institutional *goals* of the system, which in turn are dependent on the nature of the system on which the scientific enterprise operates (*referent*). The interrelation of these seven parameters is extremely complex. Consider that on the input side, language, decisionmakers, prior products, goals, and institutional context are all significant and fluctuating with complicated feedback processes generated by output and conversion processes.

Upon the completion of this analysis, we turn our focus to the *judicial* behavioralist. Our preliminary work enables us to identify quite readily many problems confronting the judicial behavioralist in his attempt to commit science on a judge. But, all this is only propaedeutic to the next step, which of course is to explain scientifically the behavior of *a* judge deciding *a* case. We set forth a few remarks concerning how one might go about such a venture, select-

ing Mr. Justice Hugo Black as an example. The reader finds then that at the end of the piece he is only at the beginning, which is of course consistent with Socrates' view that the road to knowledge is travelled only by first learning what you do not know.

Already the reader is aware of how ambitious and formidable is the task. Faced with the dilemma of a mass of specialized sophisticated knowledge which no one mind can assimilate and, on the other hand, the need for welding that mass into a coherent system, we have adopted the spirit of Erwin Schrödinger's solution:

> I can see no other escape from this dilemma . . . than that some of us should venture to embark on a synthesis of facts and theories, albeit with second-hand and incomplete knowledge of some of them — and at the risk of making fools of ourselves.[36]

II. SYSTEMS THEORY

A. *The Basic Tenets*

God, according to the myth of Genesis, was not satisfied with the formless void that He created, and so He labored for 6 long days to transform it into a world manifesting a high degree of order and form. On the 6th day He demonstrated He was not perfect, as Mark Twain once observed, for He made a mistake: He created "man" — a curious spatio-temporal entity "a little lower than the angels," with dominion over all earthly things. Man, made in God's own image, naturally also displayed a desire to impose order on the "great blooming, buzzing confusion"[37] that greeted him. He ate from the seductive but forbidden tree of knowledge, invented language, and constructed complex and elegant conceptual systems. God never instructed disobedient man about how to build conceptual systems; nor were there many clues in the great external confusion of the perceived environment. This, however, did not deter man, who busily set about sculpting reality into his kind of world. It was not an easy task, for few natural joints appeared in the continuity of time and space. But through diligent application man became a virtual virtuoso at concept construction.

And so it came to pass that two orders appeared on the scene — the empirical constrained variety of God's universe and the conceptual scheme of man. The empirical order appeared in some ways as necessarily subordinate to the conceptual scheme since the environment was always perceived in a particular theoretical context.

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[36] E. SCHRÖDINGER, WHAT IS LIFE? vii (1945).

[37] 1 W. JAMES, THE PRINCIPLES OF PSYCHOLOGY 488 (1890).

This subordination is, of course, a crucial matter for the questions asked by epistemology (how do you know?) and semantics (what do you mean?). What man *knows* through proception of the environment must filter through the semipermeable boundary of his conceptual system that defines what he *means*.[38] It happened thus that man's order was not always God's order, although man generally believed that the two coincided. Postulating anthropomorphic Gods helped enormously, for Man Writ Large was quite compatible with the ways of man.[39] But ultimately "the cumulative strokes of choice"[40] sculpted the conceptual scheme to the point where man finally had no choice but to see the gap between the empirical and theoretical.[41]

Man has made fantastic progress since Eve sampled the apple, if progress is measured by the availability of alternative cultural patterns and conceptual schemes for ordering and perceiving reality. The conceptual system proliferated until we now speak of the "knowledge explosion."[42] The exponential expansion of knowledge

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[38] Proception, a term borrowed by Gordon Allport from Justus Buchler [*see* J. BUCHLER, NATURE AND JUDGMENT (1955)], refers to sensation plus meaning and "recognizes the fact that each individual carries with him his past relations to the world, his emotional dispositions, and his own expectancies for the future. These 'proceptive directions' provide his potentialities for seeing, hearing, doing, thinking, making and saying." G. ALLPORT, PATTERN AND GROWTH IN PERSONALITY 264-65 (1961).

[39] *See* 1 W. DURANT, THE STORY OF CIVILIZATION 199-200 (1935). Man, highly susceptible to seductive fallacies, still appears to be "not just a seeker of truth, but of deceptions." B. BERELSON & G. STEINER, HUMAN BEHAVIOR: AN INVENTORY OF SCIENTIFIC FINDINGS 664 (1964).

[40] W. JAMES, *supra* note 37, at 288-89.

[41] *See* G. ALLPORT, *supra* note 38, at 267; W. JAMES, THE WILL TO BELIEVE AND OTHER ESSAYS IN POPULAR PHILOSOPHY 118-19 (1898); B. LANDHEER, PAUSE FOR TRANSITION 29 (1957). This most significant gap is rather clearly illustrated by considering the following problem.

Assume that an individual possesses an *infinite* quantity of marbles, each identified by a number (1, 2 . . . n). At 1 minute to midnight he places the first 10 of these marbles (1, 2 . . . 10) in a container and then takes out the first marble (#1). At 30 seconds before midnight he places the next 10 (11, 12 . . . 20) in the container and extracts the second marble (#2). At 15 seconds before midnight in go the next 10 (21, 22 . . . 30) and out comes the third marble (#3), etc. Assuming further that our marble manipulator can perform an infinite number of operations in a finite time, we ask ourselves just how many marbles remain in the container at midnight. The answer: none. This is because under our theoretical assumptions any marble that remained at midnight would have a number and for that marble we could always find an instance among the infinite operations carried out in which that particular marble was removed. An empirical impossibility is achieved within this theoretical scheme. For a discussion of the converse paradox, see M. CAPEK, THE PHILOSOPHICAL IMPACT OF CONTEMPORARY PHYSICS 20-21 (1961); Thomson, *Infinity in Mathematics and Logic*, in 4 THE ENCYCLOPEDIA OF PHILOSOPHY 183, 187-90 (1967).

[42] *See generally* L. ALLEN, R. BROOKS & P. JAMES, AUTOMATIC RETRIEVAL OF LEGAL LITERATURE: WHY AND HOW 1-22 (1962); Bar-Hillel, *Is Information Ap-*

has not occurred, however, independently of radical changes in relevant nonconceptual areas of human activity. It has developed in tandem with technology, each often providing a new, ratchet-like foundation for the other, facilitating movement to "higher" levels. Of most significance in the technosphere were the Industrial Revolution in the 18th century and the advent of the computer in the 20th. In the biosphere, man's population explosion (from 5 million persons in 6,000 B.C. to 3.5 billion in 1970) increased drastically the ratio of biomass to that of the geosphere.[43] Progress has, in fact, led to an era of paradoxes. With all our sophisticated knowledge and technology human survival is at best precarious. In the sociosphere we are confronted with a perplexing array of disheartening problems: Aggression and insecurity manifested in riots, crime, ethnic strife, and outright war; a sense of alienation and ego disturbances exacerbated by elimination of man's role as *homo faciens*; an increasing disparity between the affluence of the developed and undeveloped countries, as well as between upper and lower socioeconomic groups within societies; and, cities best characterized as "solidified chaos." Man is also doing a great job as steward of "spaceship earth." Pollution (DDT, Iodine 131, Strontium 90, sulfur dioxide, garbage, CO_2, noise, etc.) and a wanton disregard for conserving resources are too conspicuous to warrant extensive comment. It is true that we have lowered the death rate, nearly acquired the facility for genetic manipulation and behavior control, and made other notable technological and scientific advances.[44] Yet, man appears at best myopic when it comes to perceiving the "big picture." He accepts the dismal prognosis that "in the long run we are all dead," but excludes a consideration of how much he is shortening that run.

The complexity of the current state of man's world requires much broader vision than that used to create this paradoxical era. Examples abound. DDT is used to eliminate insect pests and to enhance food production. But the same DDT kills predators of the pests and sets in motion a cycle of positive feedback such that the pests actually increase and food production is depressed. The Aswan Dam is built to improve man's condition, but no one con-

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proaching a Crisis?, 14 AMERICAN DOCUMENTATION 95 (1963); Burck, *Knowledge: The Biggest Growth Industry of Them All*, 70 FORTUNE, Nov. 1964, at 128; Garfield, *The Information Implosion*, 41 CHEMISTRY, July-Aug. 1968, at 24.

[43] *See generally* Lamm, *The Reproductive Revolution*, 56 A.B.A.J. 41 (1970).

[44] For an excellent discussion of these and other advances, see P. Ehrlich, *The Biological Revolution*, 2 THE CENTER MAGAZINE, Nov. 1969, at 28.

siders the economic effect on fishermen downstream or the resultant increase in a virulent liver fluke parasite due to a population explosion in the snail colony of the Nile. Sometimes the causal concatenations are extremely attenuated, yet nonetheless real. Consider the extent to which western man's belief that he has dominion over all things has made him a poor steward of his environment. If, instead of believing that his environment was completely subservient to his will, he had adopted the view of those oriental religions that emphasize a quest for harmony with nature, then might not he have acted as a better steward of his spaceship?[45] Some experts suggest that the present ecological crisis would resolve itself favorably if the populace viewed pollution as "dirty" in the Victorian sense.[46] But absent such a fortuitous and improbable reorientation, the foregoing examples illustrate the necessity of adopting a systems approach in order to see the big picture and to arrive at feasible solutions to contemporary problems.

Ironically, the theoretical systems that have permitted the development of the contemporary precarious situation are in large measure responsible for our myopia. Admitting, arguendo, that reality is a seamless web, have our conceptual schemes cut and tangled it in such a way that no one man can hope to disengage himself from that small portion which he has chosen to take as his province? Is it possible to fashion a method for seeing the big picture while relating knowledge from the many diverse and sophisticated disciplines that are clearly relevant to a solution of the problems that beset us? The vast amount of knowledge involved confronts us with the locus problem, *i.e.*, the selection of the appropriate subject matter, attribute space, and conceptual structure within which the resolution of problems can proceed most expeditiously.[47] The systems approach provides us with a useful scheme for elucidation of the locus problem itself, as well as for synthesis generally,[48] by offering a theoretical structure more flexible and comprehensive than other existing models.[49] Though it does not purport to be *the* approach,[50] it can,

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[45] *See* Ritterbush, *Environment An Historical Paradox*, 13 GENERAL SYSTEMS 107, 108 (1968).

[46] *See* Reitze, *supra* note 11, at 924. On the perplexing nature of our ecological crisis, see *Symposium — Society and Ecology*, 11 AM. BEHAVIORAL SCIENTIST, July-Aug. 1968, at 1.

[47] *See* A. KAPLAN, *supra* note 1, at 78-80.

[48] *See* Rapoport, *General Systems Theory*, in 15 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 452 (1968).

[49] *See* D. EASTON, A SYSTEMS ANALYSIS OF POLITICAL LIFE 21 (1965).

[50] Thus, modern systems theory avoids the criticism leveled at functionalism — that

however, claim at least the following virtues: (1) It meets the criticisms aimed at much of contemporary behavioral science theory — failing to deal adequately with morphogenesis, deviance, and conflict, as well as morphostasis, conformity, and cooperation.[51] As we shall discover, most of the strictures levelled at functionalism[52] and the equilibrium and organic models,[53] are met by the systems model. (2) The systems model deals with wholes, organization, teleology, goal seeking, directiveness — concepts "considered as illusory or metaphysical"[54] by many contemporary "hard" science approaches.[55] (3) Focusing on systems and processes results in a broader perspective which in turn encompasses more aspects of complex phenomena. This enhances the facility for analysis of multivariate and polycentric problems.[56] (4) The systems perspective may provide a veri-

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it claims "to be unique in relating all social phenomena into one system of thought." Whitaker, *The Nature and Value of Functionalism in Sociology*, in FUNCTIONALISM IN THE SOCIAL SCIENCES: THE STRENGTH AND LIMITS OF FUNCTIONALISM IN ANTHROPOLOGY, ECONOMICS, POLITICAL SCIENCE, AND SOCIOLOGY 127, 143 (D. Martindale ed. 1965) [hereinafter cited as F.T.S.S.]. *See* von Bertalanffy, *General System Theory — A Critical Review*, 7 GENERAL SYSTEMS 1, 4 (1962).

[51] Critics offer that there is an undue emphasis on stability in equilibrium theory. *See* D. EASTON, *supra* note 49, at 21. Functionalism is criticized as reflecting a conservative bias by overemphasizing integration and not recognizing the dysfunctional. *See* Martindale, *Limits of and Alternatives to Functionalism in Sociology*, in F.T.S.S. 144, 157; Whitaker, *supra* note 50, at 140, 142-43. It seems clear that all human activity has dysfunctional as well as eufunctional aspects and that "cost-free social action is only a sociological chimera." Merton, *Social Problems and Sociological Theory*, in CONTEMPORARY SOCIAL PROBLEMS 697, 736 (R. Merton & R. Nisbet eds. 1961). *See* Buckley, *Society as a Complex Adaptive System*, in MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 490, 509 (W. Buckley ed. 1968).

[52] The primary objections to the functional approach are noted in F.T.S.S. at 7, 9, 14, 22-25, 30, 33, 78, 87, 121-24, 140, 142-43, 157-59. Of course, functionalism is a rubric that subsumes a variety of methodological and philosophical positions. *See generally* Dore, *Function and Cause*, 26 AM. SOCIOLOGICAL REV. 843 (1961). For a defense of functionalism, see W. GOLDSCHMIDT, COMPARATIVE FUNCTIONALISM 118-39 (1966).

[53] *See* W. BUCKLEY, SOCIOLOGY AND MODERN SYSTEMS THEORY 10-36 (1967).

[54] One criticism of functionalism is that its teleological flavor implies a metaphysical ordering or anthropomorphic projection into nature. *See* Spencer, *The Nature and Value of Functionalism in Anthropology*, in F.T.S.S. 1, 14. Spencer, however, feels that it is "scarcely necessary to impute either [a metaphysical ordering or ethical preference] to functional analysis." *Id.* at 14. There is no hint of metaphysical ordering in the systems approach to goal-directed behavior.

[55] *See* von Bertalanffy, *supra* note 50, at 12-14.

[56] *See id.* at 14; Buckley, *supra* note 51, at 510. "A problem is 'polycentric' when it involves a complex of decisions, judgment upon each of which depends upon the judgment to be made upon each of the others." H. HART & A. SACKS, THE LEGAL PROCESS: BASIC PROBLEMS IN THE MAKING AND APPLICATION OF LAW 669 (tent. ed. 1958). It is difficult to determine precisely functional relationships because of the extremely complex nature of the variables of human behavior. *See* F. KEESING, CULTURAL ANTHROPOLOGY: THE SCIENCE OF CUSTOM 150-55 (1958); Spencer, *supra* note 54, at 9.

table Periodic Table for theory construction, and thus aid immeasurably in integrating diverse areas of study and in exposing theoretical lacunae.

Of course, if system is defined broadly enough then everything is a system,[57] and it is hard to say more than next to nothing about everything.[58] This leads to the criticism most often aimed at general systems theory — "So what?" To draw hazy analogies is not very helpful.[59] To this demurrer, Ludwig von Bertalanffy, the originator of general systems theory, proffers the following confession and avoidance:

> Generally speaking, the use of "analogy" (isomorphism, logical homology) — or, what amounts to nearly the same, the use of conceptual and material models — is not a half-poetical play but a potent tool in science. Where would physics be without the analogy or model of "wave," applicable to such dissimilar phenomena as water waves, sound waves, light and electromagnetic waves, "waves" (in a rather Pickwickian sense) in atomic physics? "Analogies" may pose fundamental problems, as for example, the analogy (logically not dissimilar from that of chessboard and dinner party) of Newton's and Coulomb's law which raises the question (one of the most basic for "Unified Science") of a general field theory unifying mechanics and electrodynamics. It is commonplace in cybernetics that systems which are different materially, *e.g.*, a mechanical and an electrical system, may be formally identical; far from considering this as a meaningless So what? The researcher has to work out the common structure (flow diagram), and this may be of incomparable value for practical technology.[60]

We might add that the language of the systems approach is especially suited for interdisciplinary communication and, unlike the relatively obscure terminology of some functionalists, *e.g.*, Talcott Parsons,[61] the language of systems theory is clear, and readily com-

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[57] This is analogous to the criticism of the functional approach for assuming that (1) there exists a function for all institutions and events, and (2) there are not nonfunctional elements in extant societies. "The first [assumption] is useful but unfalsifiable; the second is restrictive and false." Jarvie, *Limits to Functionalism and Alternatives to It in Anthropology*, in F.T.S.S. 18, 27.

[58] Systems theorists respond by noting that somewhere "between the specific that has no meaning and the general that has no content there must be, for each purpose and at each level of abstraction, an optimum degree of generality." Boulding, *General Systems Theory — The Skeleton of Science*, 2 MANAGEMENT SCI. 197-98 (1956).

[59] *See* March, *Sociological Jurisprudence Revisited,* in JUDICIAL BEHAVIOR: A READER IN THEORY AND RESEARCH 132, 138 (G. Schubert ed. 1964) [hereinafter cited as JUDICIAL BEHAVIOR].

[60] von Bertalanffy, *supra* note 50, at 9. *See also id.* at 4; Lewis, *The High Court: Final . . . But Fallible*, 19 CASE W. RES. L. REV. 528 (1968).

[61] *See* Whitaker, *supra* note 50, at 143. Concerning Parson's theory, see D. MARTINDALE, THE NATURE AND TYPES OF SOCIOLOGICAL THEORY 421-25, 484-90 (1960); W. MITCHELL, SOCIOLOGICAL ANALYSIS AND POLITICS: THE THEORIES OF

prehended and thus helpful in eliminating specialized deafness.[62] The translation of traditional concepts into systems theory is not simply a formal exercise. Frick quotes Grossman's observation that using systems language we can say: "Instead of a *stimulus* causing a *reaction* when the *threshold* is exceeded, we now think rather in terms of a *signal* which may be obscured by *noise*, providing the *information* needed to *select* a response."[63] A valuable transmutation has occurred:

> [U]nlike a stimulus, a signal (which should be regarded as the output of a transmitter) . . . implies a set of alternatives and thus emphasizes the effect on behavior of what might have been as well as what is immediately present. Furthermore, a signal in this sense functions purely as the basis for response selection. It can, according to the theory, be coded into a variety of physical forms and embedded in a variety of signal sets, without effect on its selective function.[64]

The systems approach set forth in the following pages is obviously our own variation on the major theme. In arriving at this particular version we have drawn from the fascicle of disciplines that

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TALCOTT PARSONS (1967); J. STONE, SOCIAL DIMENSIONS OF LAW AND JUSTICE 20-28, 609-16 (1966).

[62] Caution is required, however, so that the richness and overtones of the argot of various specialties are not lost. *See* Probert, *Law Through the Looking Glass of Language and Communicative Behavior*, 20 J. LEGAL ED. 253 (1968).

[63] Grossman, *The Measure of Discriminability*, 7 QUARTERLY J. EXPERIMENTAL PSYCHOLOGY 176 (1955). This is not to say that noise is not itself desirable, for perhaps noise is "the only possible source of *new* patterns." Bateson, *Cybernetic Explanation*, 10 AM. BEHAVIORAL SCIENTIST, April 1967, at 29, 32.

[64] Frick, *Information Theory*, in 2 PSYCHOLOGY: A STUDY OF SCIENCE 611, 630 (S. Koch ed. 1959). The "respective dependence and invariance suggested by this reformulation of the basic psychophysical problem have stimulated a great deal of research in recent years." *Id.* at 630 (citations omitted). To the same effect: Weakland, *Communication and Behavior — An Introduction*, 10 AM. BEHAVIORAL SCIENTIST, April 1967, at 1. Walter Buckley's arguments for the value of the modern systems approach in sociological inquiry apply, *mutatis mutandis*, to psychological inquiry. Elsewhere he states: "Much the same might also be said for the human psychological system." Buckley, *Cybernetics: Purpose, Self-Regulation, and Self-Direction*, in MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 219, 220 (W. Buckley ed. 1968). He contends that the systems approach will provide:

> (1) a common vocabulary unifying the several "behavioral" disciplines; (2) a technique for treating large, complex organization; (3) a synthetic approach where piecemeal analysis is not possible due to the intricate interrelationships of parts that cannot be treated out of context of the whole; (4) a viewpoint that gets at the heart of sociology because it sees the sociocultural system in terms of information and communication nets; (5) the study of relations rather than "entities" with an emphasis on process and transition probabilities as the basis of a flexible structure with many degrees of freedom; [and] (6) an operationally definable, objective, non-anthropomorphic study of purposiveness, goal-seeking system behavior, symbolic cognitive processes, consciousness and self-awareness, and sociocultural emergence and dynamics in general. W. BUCKLEY, *supra* note 53, at 39.

are most clearly associated with the systems approach: cybernetics,[65] general systems theory,[66] communication models and information theory,[67] decision theory,[68] simulation studies or heuristic programming,[69] and formal models of operations research.[70] Several important common strands run through these disciplines: (1) The notion shared by conceptual pragmatists that models, including the particular one adopted, are merely suitable ways of looking at things;[71] (2) the necessity of taking the big picture into account;[72] and (3) the

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[65] Cybernetics, elaborated in the work of Arthur Rosenblueth and Norbert Wiener, refers to "the entire field of control and communication theory, whether in the machine or in the animal." N. WIENER, CYBERNETICS 19 (1948). The idea of control was implicit in the concept of homeostasis formulated earlier by Walter B. Cannon, a colleague of Rosenblueth. *See* W. CANNON, THE WISDOM OF THE BODY 22 (rev. ed. 1939). On cybernetics, see generally Gunderson, *Cybernetics*, in 2 THE ENCYCLOPEDIA OF PHILOSOPHY 280 (1967).

[66] Ludwig von Bertalanffy, the chief proponent of general system theory, states: "General system theory contends that there are principles of systems in general or in defined subclasses of systems irrespective of the nature of systems, of their components, or of the relations or 'forces' between them." von Bertalanffy, *General System Theory and Psychiatry*, in 3 AM. HANDBOOK OF PSYCHIATRY 705, 708 (S. Arieti ed. 1966). *See also* von Bertalanffy, *supra* note 50.

[67] *See generally* F. ATTNEAVE, APPLICATIONS OF INFORMATION THEORY TO PSYCHOLOGY: A SUMMARY OF BASIC CONCEPTS, METHODS AND RESULTS (1959); Deutsch, *Communication Models and Decision Systems*, in CONTEMPORARY POLITICAL ANALYSIS 273 (J. Charlesworth ed. 1967); Frick, *supra* note 64.

[68] *See generally* Edwards, *Decision Making*, in 4 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 34 (1968); Robinson & Majak, *The Theory of Decision-Making*, in CONTEMPORARY POLITICAL ANALYSIS 175 (J. Charlesworth ed. 1967).

[69] *See* Newell, Shaw & Simon, *Elements of a Theory of Human Problem Solving*, 65 PSYCHOLOGICAL REV. 151, 152 (1958). *See generally* G. EVANS, G. WALLACE & G. SUTHERLAND, SIMULATION USING DIGITAL COMPUTERS (1967) [hereinafter cited as G. EVANS].

[70] Operations research (OR) is defined as the "*use of the scientific method to provide criteria for decisions concerning man-machine systems involving repeatable operations.*" D. STOLLER, OPERATIONS RESEARCH: PROCESS AND STRATEGY 11 (1964). The primary phases involved in any OR program are: (1) Problem formulation; (2) construction of a mathematical model of the system involved; (3) product of problem solutions by derivation from the model; (4) testing or verification of the solutions (and thus an implicit evaluation of the solution); (5) control over the solution; and (6) implementation or actual performance of the solution. *See* C. CHURCHMAN, R. ACKOFF & L. ARNOFF, INTRODUCTION TO OPERATION RESEARCH, ch. 1 (1957). Robert Boguslaw suggests that the most popular formal models of operations researchers are the linear programming model and the game theory model. *See* R. BOGUSLAW, THE NEW UTOPIANS: A STUDY OF SYSTEM DESIGN AND SOCIAL CHANGE 47-70 (1965).

[71] *See* T. HILL, CONTEMPORARY THEORIES OF KNOWLEDGE 295-96 (1961); H. KANTOROWICZ, THE DEFINITION OF LAW 90 n.8 (A. Campbell ed. 1958).

[72] For examples of specific big picture approaches, see PERT: A NEW MANAGEMENT PLANNING AND CONTROL TECHNIQUE (J. Blood ed. 1962); Shapero & Bates, *A Method for Performing Human Engineering Analysis of Weapon Systems*, WADC TECHNICAL REPORT 59-784, Sept. 1959, at 5. *See generally* E. SUCHMAN, EVALUATIVE RESEARCH (1967).

A frequent criticism of legal education is that law students are not programmed to take into account the big picture: "A broad criticism, and one of substantial merit, of the

interdisciplinary approach.[73] Perhaps the most significant aspect of the systems approach is the mental stance it engenders as exemplified by C. West Churchman's conclusion: "What is in the nature of systems is a contining [*sic*] perception and deception, a continuing reviewing of the world, of the whole system, and of its components. The essence of the systems approach, therefore, is confusion as well as enlightenment. The two are inseparable aspects of human living."[74]

Modern systems theory slices reality into areas of relative organization or nonrandomness.[75] Organization or constrained variety[76] is the cornerstone of the theory.[77] For example, the systems theorist might characterize the Brownian movement as the relatively random *chaotic complexity* of particle mechanics, a machine as *organized simplicity*, and the personality system as *organized complexity*.[78] These areas of nonrandomness are systems — "*a set of objects together with relationships between the objects and between their at-*

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law schools is that their programs of instruction are lacking in breadth and perspective, and that they are not keyed to the problems lawyers must solve in the practice." A. HARNO, LEGAL EDUCATION IN THE UNITED STATES 140 (1953). *See also* K. DAVIS, DISCRETIONARY JUSTICE: A PRELIMINARY INQUIRY vi-vii (1969); Casner, *What Makes a Law School Great?*, 1956 U. ILL. L.F. 270, 271. This is undoubtedly what led Thorstein Veblen to remonstrate that the law school belongs in the modern university no more than a school of fencing or dancing." T. VEBLEN, THE HIGHER LEARNING IN AMERICA 211 (1918).

[73] We have already noted that the law-trained are finding it increasingly difficult to avoid interdisciplinary considerations. *See* text accompanying notes 3-16 *supra*. The difficulty encountered in forming a cross-discipline is graphically exemplified by the history of cybernetics. One recalls that originally, cyberneticians planned to develop an interdisciplinary language. Instead, cybernetics itself developed a highly esoteric sub-discipline argot. *See* Mead, *Cybernetics of Cybernetics*, in PURPOSIVE SYSTEMS: PROCEEDINGS OF THE FIRST ANNUAL SYMPOSIUM OF THE AMERICAN SOCIETY FOR CYBERNETICS 1, 2 (H. von Foerster, J. White, L. Peterson & J. Russell eds. 1968).

[74] C. CHURCHMAN, THE SYSTEMS APPROACH 230-31 (1968).

[75] *See* Ackerman & Parsons, *The Concept of "Social System" as a Theoretical Device*, in CONCEPTS, THEORY AND EXPLANATION IN THE BEHAVIORAL SCIENCES 24, 28 (G. Direnzo ed. 1966).

[76] We might agree with W. Ross Ashby that the core meaning of "organization" revolves around the notion of "conditionality." "As soon as the relation between two entities *A* and *B* becomes conditional on *C*'s value or state then a necessary component of 'organization' is present." Ashby, *Principles of the Self-Organizing System*, in PRINCIPLES OF SELF-ORGANIZATION 255, 256 (H. von Foerster & G. Zopf eds. 1962).

[77] *See* Buckley, *General Introduction* to MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 37 (W. Buckley ed. 1968) (wherein the author states that "[t]he dethronement of material substance as the only reality, the bedrock, has shifted the focus to the fact of *organization* per se as the more fundamental problem for study"); Khailov, *The Problem of Systemic Organization in Theoretical Biology*, 9 GENERAL SYSTEMS 151 (1964).

[78] *See* Rapoport & Horvath, *Thoughts on Organization Theory and a Review of Two Conferences*, 4 GENERAL SYSTEMS 89 (1959).

tributes."[79] Alternatively, it is possible to describe a system as "a group of events [set of objects] that have a higher interchange of energy or a higher rate of communication [relationships] among themselves than with other events [the environment]."[80] Rapoport would limit these definitions by adding the requirement that a system is considered as such only if it permits conceptual elaboration.[81] In any event, the definitions are sufficiently general to consider almost everything under the sun as a system,[82] keeping in mind constantly, however, the distinction between empirical "natural" systems as opposed to the theoretical or conceptual systems invented by man.[83] Within these definitions society is a system,[84] as is a community,[85] a collectivity,[86] a group,[87] an individual,[88] an organ,[89] a

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[79] Hall & Fagen, *Definition of Systems*, 1 GENERAL SYSTEMS 18 (1956). For purposes of this definition "objects" are the components or parts of the system; "attributes" are properties of the "objects"; and "relationships" are the conditional aspect of the organizational facet of the system discussed in note 76 *supra*. The environment for a given system is "*the set of all objects a change in whose attributes affect [sic] the system and also those objects whose attributes are changed by the behavior of the system.*" *Id.* at 20.

[80] Scott, *Cognitive Structure and Social Structure: Some Concepts and Relationships*, in 1 DECISIONS, VALUES AND GROUPS 86, 97 (D. Willner ed. 1962). For a similar definition, see Kaplan, *Systems Theory*, in CONTEMPORARY POLITICAL ANALYSIS 150 (J. Charlesworth ed. 1967).

[81] A mere aggregation of entities, such as a pile of bricks, might not qualify. Definitions of system abound. *See* note 66 *supra*. Rapoport, Parsons, Mitchell, Kaplan & Gochman, *Systems Analysis*, in 15 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 452 (1968).

[82] Thus "society," for example, can be viewed as either a conceptual system or its referent. *See* C. COOLEY, HUMAN NATURE AND THE SOCIAL ORDER 84 (1902). As Peter Caws has observed: "Each theoretical system confronts the physical system of which it is the theory, and this confrontation is not a bad image of the human activity we call science." Caws, *Science and System: On the Unity and Diversity of Scientific Theory*, 13 GENERAL SYSTEMS 3 (1968).

[83] Rapoport, *supra* note 48, at 452. The definition does make quite apparent the system nature of a scientific theory: "[A]n explicit formulation of determinate relations between a set of variables in terms of which a fairly extensive class of empirically ascertainable regularities can be explained." Nagel & Hempel, *Symposium: Problems of Concept and Theory Formulation in the Social Sciences*, in 1 SCIENCE, LANGUAGE AND HUMAN RIGHTS 159-60 (1960). *See also* R. HILLS, THE CONCEPT OF SYSTEM 2 (1967).

[84] Wilson defines "society" as "an ordered or organized set of relationships [a system] maintained by common adherence to the culturally specified rules, and roles, of the game." E. WILSON, SOCIOLOGY: RULES, ROLES, AND RELATIONSHIPS 48 (1966). *See also* W. GOLDSCHMIDT, *supra* note 52, at 59; T. PARSONS, THE SOCIAL SYSTEM ch. 1 (1951); Parsons, *An Outline of the Social System*, in 1 THEORIES OF SOCIETY 30, 44 (T. Parsons, E. Shils, K. Naegale & S. Pitts eds. 1961).

[85] *See* R. WARREN, THE COMMUNITY IN AMERICA 9 (1963), where the author states: "[C]ommunity is *that combination of social units and systems which perform the major social functions having locality relevance.*" *See also* T. PARSONS, STRUCTURE AND PROCESS IN MODERN SOCIETIES 250 (1960).

[86] "The system of such interaction of a plurality of role-performers is, so far as it is

cell,[90] and a molecule.[91]

It is apparent that each of these systems have outer and inner boundaries,[92] and exhibit varying degrees of differentiation,[93] interdependence,[94] and openness.[95] The chaotic complexity of the relatively random action of molecules manifested in the Brownian movement reflects a system exhibiting a low degree of differentiation, interdependence, and selective openness to the environment. On the other hand, the organized complexity of a behaving adaptive system, such as that of a person, exhibits a high degree of differentiation, interdependence, and selective openness. It is important to bear in mind that throughout this discussion the reference to *a* system or *the* system does not necessarily signify a *thing*, rather merely *some kind of order*. The order may consist of that perceived among any of the abstracted variables selected for analysis. We may relate variables of a given system from one system state to a different system state at a different time; or the attributes of a given system to the attributes of another system, etc. When the components of a system remain relatively stable we may speak of a structural system

normatively regulated in terms of common values and of norms sanctioned by these common values, a collectivity." Parsons, *supra* note 84, at 42.

87 "A group is an intricately woven fabric of relationships, the elemental units being the roles taken by people vis-a-vis one another. . . . What is to be sustained . . . if the group . . . is to survive is this pattern of relationships." E. WILSON, *supra* note 84, at 437.

88 "The individual, whatever else he may be, is an internally consistent and unique organization of bodily and mental processes." G. ALLPORT, *supra* note 38, at 8.

89 *See* T. STORER, GENERAL ZOOLOGY ch. 4 (1943).

90 *See id.* at 45-48. *See also* C. MORGAN, PHYSIOLOGICAL PSYCHOLOGY 12 (1965).

91 *See* Toulmin, *Neuroscience and Human Understanding*, in THE NEUROSCIENCES 822, 828 (G. Quarton, T. Melnechuk & F. Schmitt eds. 1967) [hereinafter cited as THE NEUROSCIENCES], where the author states:

> A physical system, or mechanism, is now specified by a wave-equation that characterizes in one step both the material constitution of the system and its mode of operation — both its structure and its activity. There is no procedure for specifying the one independently of the other, and to speak of either in isolation is a mere abstraction.

92 As Gochman has observed: "Where one set of events demonstrates greater interchange within itself than with other events . . . a boundary is said to exist around it, and the set of events is considered a bounded region." Gochman, *Psychological Systems*, in 15 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 486, 487 (1968). *See also* Miller, *Toward a General Theory for the Behavioral Sciences*, 10 AM. PSYCHOLOGIST 513 (1955); Parsons, *An Approach to Psychological Theory in Terms of the Theory of Action*, in 3 PSYCHOLOGY: A STUDY OF SCIENCE 612, 645 (S. Koch ed. 1959); Parsons, *supra* note 84, at 36.

93 *See* Gochman, *supra* note 92, at 487.

94 Interdependence refers to "the extent to which boundaries permit interchange between regions of a system and between a system and its environment." *Id.*

95 Openness refers to "the degree of interchange across the outer boundary of the system itself." *Id.*

as contrasted to a process system. Structural systems thus necessarily involve some type of compensatory mechanism for maintaining stability over time.

It follows then that we can describe natural and man-made systems, and that these systems may be characterized on the basis of their boundaries, openness, interdependence, and differentiation. Although it is theoretically possible to describe an infinite number of systems (with each system embedded in another more comprehensive system) it is useful to make certain obvious distinctions, such as, whether a system is open or closed,[96] or whether it involves a steady state or equilibrium process.[97] It is also helpful for us to differentiate, for ease of manipulation of our conceptual systems, varying "levels" of systems.[98] For example, we recognize that the complex idiographic[99] system of a human being is an adaptive system that exhibits ultrastability[100] during interaction simultaneously with systems operating at different levels of organization.

There are many available arrays of levels,[101] but the sequence

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[96] *See* note 92 *supra*. Whether such a thing as a closed system in fact exists is highly unlikely. *See* note 116 *infra*.

[97] A system exhibiting equilibrium achieves balance when it maintains a fixed level or point. In a steady state, the balanced relationship of the component parts of the system is not dependent on any fixed equilibrium point or level.

[98] Edel has defined "level" in the following terms:

> The concept of levels . . . refers initially to the emergence of qualities in the process of historical development. In this familiar sense, the appearance of life in the world constituted a new integrative level, the appearance of consciousness another, and again, in human affairs, new steps (fire, farming, machine technology, etc.) brought in new stages by altering profoundly and pervasively the qualities of human life. Philosophically, the concept of levels involves the ideas of some continuity of the new with the old, a maturing causal process which constitutes the emerging, a field of novel or distinctive qualities with some order of its own (hence an element of discontinuity with the past), some degree of alteration in the total scene and its modes of operation because of the presence of the new. Methodologically, a new level requires new descriptive concepts and, many believe, new empirical laws, independent of those of the old level. Edel, *The Concept of Levels in Social Theory*, in SYMPOSIUM ON SOCIOLOGICAL THEORY 167 (L. Gross ed. 1959).

See also Gerard, *Units and Concepts of Biology*, 125 SCIENCE 429, 431 (1957).

[99] The terms "nomothetic" and "idiographic," originally invented by Wilhelm Windelband, are used to differentiate, respectively, the general or law-like from the individual or unique. *See* G. ALLPORT, *supra* note 38, at 8-9.

[100] "Ultrastability" constitutes the capacity to persist during throughput, even though there occurs a change of structure and behavior. *See* W. ROSS ASHBY, AN INTRODUCTION TO CYBERNETICS 82-85 (1956); Caldwallader, *The Cybernetic Analysis of Change in Complex Social Organizations*, 65 AM. J. OF SOCIOLOGY 154, 155 (1959).

[101] Kenneth Boulding proposes the following nine levels of theoretical systems arranged hierarchically on the basis of the complexity of the basic "individual" unit of behavior: (1) *Frameworks* or static structures; (2) *clockworks* or simple dynamic highly ordered and predictable interaction; (3) the *thermostat* involving a cybernetic process; (4) the *cell* or self-adaptive system exhibiting ultrastability; (5) the *plant* or genetic-

from molecular to social levels is especially useful for classifying and analyzing human behavior which involves simultaneous transactions at each level. Ralph Gerard has used such a sequence in fashioning a matrix like that illustrated in figure 1.[102]

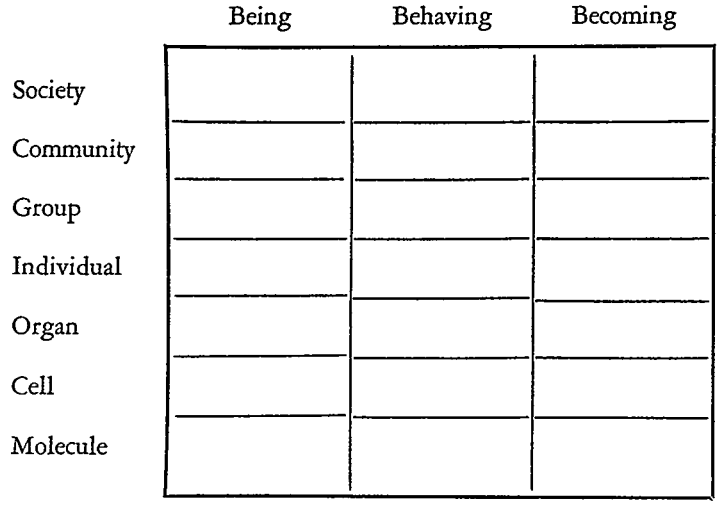

Figure 1.

This matrix provides a useful scheme in several ways. It is possible to classify many traditional disciplines by considering "being" as structure reflecting the interrelations produced by the ongoing processes of the system, "behaving" as short-term reversible changes, and "becoming" as long-term irreversible changes.[103] Although not

societal level where there obtains a division of labor or specialization and the phenomenon of equifinality [*see* note 111 *infra*]; (6) the *animal* level with increased mobility, self-awareness, and goal-directed behavior; (7) the level of *man*, who exhibits self-reflexive behavior, is able to produce, assimilate, manipulate, and interpret symbols, and is aware of his awareness; (8) the *social* level involving interaction of self-reflexive individuals where the role is perhaps the basic unit; and (9) the *transcendental* level, including the inescapable unknowables, sometimes perceived when one catches "an echo of the infinite, a glimpse of [the universe's] . . . unfathomable process, a hint of the universal law." Holmes, *The Path of the Law*, 10 HARV. L. REV. 457, 478 (1897). *See* Boulding, *supra* note 58, at 197. The concept of *emergent* levels minimally means that "the novel quality — or family of them — reappears with sufficient frequency so that it should be regarded as a regular inhabitant of the world, worthy of separate systematic study." Edel, *supra* note 98, at 168. For a summary of the "levels" problem of emergent evolutionists, see Goudge, *Emergent Evolutionism*, in 2 ENCYCLOPEDIA OF PHILOSOPHY 474, 475 (1967).

[102] The figure is taken, with modification, from Gerard, *Neurophysiology: An Integration (molecules, neurons, and behavior)*, in 3 HANDBOOK OF PHYSIOLOGY 1919, 1923 (J. Field ed. 1960). *See also* Gerard, *supra* note 98, at 430-31; Miller, *Information Input Overload and Psychopathology*, 116 AM. J. PSYCHIATRY 695 (1960).

[103] *See* Gerard, *supra* note 98, at 429.

plotted on the matrix, the transactional time variable roughly correlates directly with the listed levels. Chemical and micro-physical reactions occupy only fractions of a second; gross physiological processes — a few minutes, hours, or days; the ontogenetic changes in the individual — months to a century; phylogenetic alterations — decades to thousands of years. On the other hand, the sociocultural dimension has a far more flexible time range for alterations of a drastic nature which can occur with fulminating rapidity or seemingly infinite slowness (*e.g.*, elimination of racial prejudice) due to the timebinding nature of socialization.[104]

A careful consideration of the levels illustrates the importance of selecting the appropriate attribute space and conceptual structure for analysis of the subject matter involved. In resolving this locus problem we note that the lower levels generally exemplify chaotic complexity for which *simple equilibrium models* are appropriate,[105] whereas in the middle levels the greater organization that obtains requires homeostatic models. For personality systems, which exhibit increments in degrees of freedom and complexity, a *less restrictive model* is appropriate. This precludes explaining each level in terms of the events occurring at lower and presumably more basic levels — the avowed goal of the reductionists, who are vigorously opposed by the proponents of holism.[106] Paul Weiss' position appears eminently reasonable:

> [E]xclusive commitment to either [reductionism or holism] is unnatural. The molecular and the organismic are but two different vantage points from which to look at living systems, neither of them granting a monopoly to insight. They are complementary and co-equal. . . . [It appears] (1) that as our brain scans features of the universe we shift range and focus back and forth between telescopic and microscopic vision, as it were; (2) that as we move downward on this scale, we mostly gain precision and lose perspective; (3) that as we move upward, new and relevant features, formerly unrecognizable and unsuspected, come into view; (4) that this emerging novelty pertains to macrosamples of nature — that is, that it reflects properties of *collectives* — of groups, assemblies, systems, and populations, composed of microsamples; and (5) that the required additional terms to characterize such collectives must

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104 *See* Toulmin, *supra* note 91, at 829.

105 There are exceptions. Nonliving matter may exhibit "behavior" that is parallel to the goal seeking of organisms. *See* Gerard, *supra* note 98, at 433.

106 Reductionism takes on a broad spectrum of hues. There are the logical positivists who desire to reduce all concepts to either a sense-datum or physical thing language. Others suggest that all science can be reduced to physics. *See generally* Caws, *supra* note 82, at 5.

> come from rigorous scientific procedure rather than from anthropomorphic translocutions and allegorical allusions to mythology.[107]

His five points help to illuminate further the locus problem (selection of the appropriate subject matter, attribute space and conceptual structure). First, reality — out there — is a continuum. The delineations are in our conceptual systems, not nature. We are proceiving like the famous six blind Hindus, and can only comprehend reality from our specific perspective.[108] Our conceptual categories are *man-imposed*, for as Sergius Morgulis notes, there are no natural joints: "The biologist, unlike the layman, knows no line of demarcation separating plant life from animal life, nor for that matter living from nonliving material because such differentiations are purely conceptual and do not correspond to reality."[109]

There are those who have contended that living matter, and especially man, *is* at a *higher* and different emergent level,[110] not only in the manifestation of entelechy,[111] organized complexity,[112]

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[107] Weiss, 1 + 1 does not = 2 (*One Plus One Does Not Equal Two*), in THE NEUROSCIENCES, *supra* note 91, at 801, 802. Weiss has taken a view concerning the value of a systems approach which is virtually the same as that adopted by Buckley.

[108] As Churchman has noted, the tale of the six blind Hindus and the elephant that appeared so different to each of the six (a wall, snake, spear, tree, fan, and rope) is a grand piece of arrogance, for the teller assumes that it is possible for the sage to see the big picture. Churchman equates this kind of arrogance to "management science." *See* C. CHURCHMAN, *supra* note 74, at 28.

[109] Morgulis, *Introduction* to A. OPARIN, THE ORIGIN OF LIFE at v, viii (2d ed. 1953).

[110] Gerard writes:

> I have found the word *org* convenient for those material systems or entities which are individuals at a given level but are composed of subordinate units, lower level orgs, and which serve as units in superordinate individuals, higher level orgs. . . . The important levels are those whose orgs (entities) are relatively enduring and self contained. Gerard, *supra* note 98, at 430.

See also Kremyansky, *Certain Peculiarities of Organisms as a "System" From the Point of View of Physics, Cybernetics and Biology*, 5 GENERAL SYSTEMS 221, 224 (1960).

[111] Equifinality or entelechy is the "whole-making" factor that Hans Driesch offered to explain how, for example, in ontogenetic development an aggregation of "equipotentialities" grows into the "wholeness" of a mature organism. *See* Werkmeister, *Driesch, Hans Adolph Edward*, in 2 THE ENCYCLOPEDIA OF PHILOSOPHY 418, 419 (1967). *See also* Beckner, *Vitalism*, in 8 THE ENCYCLOPEDIA OF PHILOSOPHY 253 (1967).

[112] Chemical reactions occurring within an organism are often extremely complex. *See* H. SALLACH & R. MCGILVERY, INTERMEDIARY METABOLISM charts I, II (1967). For an interesting attempt to reconcile the natural law approach with the hard facts of evolution, see Fay, *Toward a Thomistic-Anthropoligical View of Evolution of Obligation*, 7 NATURAL L.F. 38 (1962). This approach must be contrasted with the developmental systems model which assures that there are discernible differences in states of a system, that the system is moving toward an end state or goal, and there are processes that may be discovered to explain the progression. *See* Chin, *The Utility of System Models and Developmental Models for Practitioners*, in THE PLANNING OF CHANGE 201, 208 (W. Bennis, K. Benne & R. Chin eds. 1961).

and teleology, but also in its apparent violation of the second law of thermodynamics.[113] "This gradual increase of inhomogeneity [in living matter] is a process against the second law of thermodynamics. In a few words, the second law of thermodynamics states that an isolated system spends with a great probability most of its time in high-probability states."[114]

The second law is frequently referred to as a principle of *energy degradation* that requires that the entropy (disorganization) of a closed system can never decrease, although it may increase.[115] There is in fact a tendency for it to increase, which means that "in the absence of outside interference, probability distributions tend to become flatter."[116] But, since there is a tendency for entropy to decrease in living organisms, which in the interim between "dust to dust" display an increasingly *organized* complexity, both ontogenetically and phylogenetically, how can we maintain the second law? A partial answer came not only with the discovery that living systems are open, but with the resolution of the sorting demon problem posed by Clark Maxwell in 1871,[117] and solved by Leo Szilard in 1929.[118] Szilard pointed out that information input into living organisms, both phylogenetically and ontogenetically, constitutes a negative contribution to entropy (ergo negentropy), thereby maintaining the organization of the organism.

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113 *See* E. SCHRÖDINGER, *supra* note 36, at 72-75.

114 Maruyama, *The Second Cybernetics: Deviation-Amplifying Mutual Causal Processes*, 51 AM. SCIENTIST 164, 167 (1963). Maruyama distinguishes a "first" cybernetics concerned with morphostasis and negative feedback from the "second" cybernetics which is concerned with morphogenesis and positive feedback. The term "morphogenesis" is sometimes used to refer to the idiographic. *See* Allport, *A Unique and Open System*, in 12 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 1, 2 (1968). The term is used here to refer to positive feedback or deviation-amplifying mutual causal relationships.

115 *See* Brillouin, *Life, Thermodynamics, and Cybernetics*, 37 AM. SCIENTIST 554, 557 (1949). *See generally* J. FAST, ENTROPY (1962).

116 P. LANDSBERG, ENTROPY AND THE UNITY OF KNOWLEDGE 16 (1961). Since an increase in entropy results in a decrease in the energy available for work in an isolated system, some have suggested that the universe will ultimately run down and expire in a "thermal death." There are numerous counter arguments including the logical argument of E. A. Milne, the statistical inference argument of Boltzmann, and the asymmetry of time argument of Nikolai Kozyrev. *See* N. KOZYREV, CAUSATIVE OR ASYMMETRICAL MECHANICS IN LINEAR APPROXIMATION (1958), discussed in BULLETIN OF THE INSTITUTE FOR THE STUDY OF THE U.S.S.R., Mar. 1960, at 39; Whitrow, *Entropy*, in 2 THE ENCYCLOPEDIA OF PHILOSOPHY 526-28 (1967). The most obvious is, of course, that the universe cannot be considered a closed system for purposes of application of the second law. *See generally* R. CALDER, MAN AND THE COSMOS 63-87 (1959); A. LOVELL, THE INDIVIDUAL AND THE UNIVERSE (1959).

117 *See* J. C. MAXWELL, THEORY OF HEAT 338-39 (10th ed. 1891).

118 *See* L. BRILLOUIN, SCIENCE AND INFORMATION THEORY ch. 13 (1956); Frick, *supra* note 64, at 614.

A moment's reflection indicates that organization, predictability (or uncertainty), and information are closely related. "A well-organized system is predictable — you know almost what it is going to do before it happens. When a well-organized system does something, you learn little that you didn't already know — you acquire little information. A perfectly organized system is completely predictable and its behavior provides no information at all."[119]

Thus, to the best of our knowledge it appears that although the cosmos may be an inseparable unity,[120] it does display regularities and patterns that are aptly described as systems, and that man's ability to understand, predict, and control his environment depends largely on his ability to identify and encode information. How is this information created, encoded, and utilized? It appears that in our interaction with our world, we proceive reality, form conceptual models, and sometimes are aware that our picturing is "as different from the world as a geographical map is from the surface of the earth."[121] But although man is capable of discerning regularities and patterns and ordering the world to suit his ends, he does not operate in violation of the second law. Rather, as illustrated by Szilard's resolution of Maxwell's sorting demon problem, man responds and interacts on the basis of information or negentropy, which offsets the decrease in the entropy of his "system."[122]

It bears emphasizing that information is only as useful as the perceiver's capability to assimilate and manipulate it. The more knowledgeable the "knower," the more information conveyed.[123] Thus, in dealing with complex adaptive systems that process information one must often deal with negentropy values that depend on

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119 Miller, *What is Information Measurement?*, 8 AM. PSYCHOLOGIST 3 (1953). *See also* Frick, *supra* note 64, at 614-15. The Shannon-Wiener measure of information has had a terrific heuristic and methodological impact, primarily because it offers a method for quantifying the optimally efficient encoding of information and relating this to relative entropy and redundancy. *See* F. ATTNEAVE, *supra* note 67, at 1-12.

120 *See* L. BRILLOUIN, SCIENTIFIC UNCERTAINTY AND INFORMATION 31 (1964). Čapek writes: "The only property of classical space which seemingly has not been affected by relativity theory is its continuity. However, under the impact of the quantum theory and wave mechanics, serious doubts about the applicability of spatial continuity on the microphysical level appeared." M. CAPEK, *supra* note 41, at 382-83.

121 L. BRILLOUIN, *supra* note 120, at 52.

122 Lehninger, *Molecular Biology: The Theme of Conformation*, in *Introduction* to THE NEUROSCIENCES, *supra* note 91, at 35-36.

123 Mortimer Ostow offers the example of the mixing of solutions of a given sugar — one containing synthetic and the other natural sugar — which results in an increase in entropy in the solution only to an individual with a knowledge of polarimetry. *See* Ostow, *The Entropy Concept and Psychic Function*, 39 AM. SCIENTIST 140, 141 (1951). What does the term *res judicata* mean to a layman?

the definition of the initial and final states of the system affected. When these variables are taken into account, the second law holds and the paradox is explained.

The conceptual models of external reality constructed by man — the information processor and negentropy creator *par excellence*[124] — are veridical only to the extent that the theoretical systems are isomorphic[125] with the existing empirical systems.[126] But just as the blind Hindus could not perceive all the elephant, no model constructed by man can ever reflect completely all of reality. An overlapping of complementary models can, however, add to perspective in the same sense that a discussion among the six blind Hindus would permit them to piece together a better picture of what it was they had touched. The necessity for developing overlapping models is probably best exemplified by the apparent conflict between the corpuscular theory and wave theory concerning properties of light. Certain experiments support one theory, other experiments the other. Niels Bohr suggests that neither is false, rather they are *complementary*, focusing on different aspects of reality for which no single conceptual system yet invented is isomorphic.[127]

Thus, we are precluded from ever ascertaining the "essence" of the universe, and instead must scan "features of the universe [as] we shift range and focus back and forth between telescopic and microscopic vision."[128] Our theoretical instruments are never entirely veridical, but they are useful insofar as they are isomorphic to the particular level at which we are focusing. This conclusion brings us to Weiss' remaining points, raising other crucial issues involved in resolving the locus problem. It is clear that as one moves down the scale he gains precision and loses perspective, and that as he moves up "new and relevant features, formerly unrecognizable and un-

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[124] We note that information is thus not subject to the physical laws of conservation. *See* Deutsch, *Some Notes on Research on the Role of Models in the Natural and Social Sciences*, 7 SYNTHESES 506, 518 (1948-49).

[125] Isomorphism between systems exists when there is a 1 to 1 correspondence between the elements of each system and "the relations among the elements are preserved by the same correspondence." Rapoport, *supra* note 48, at 455.

[126] *See* L. BRILLOUIN, *supra* note 120, at 59-60.

[127] *See* N. BOHR, ATOMIC PHYSICS AND HUMAN KNOWLEDGE (1958), discussed in L. BRILLOUIN, *supra* note 120, ch. v. H. L. A. Hart is actually adopting something of the complementarity approach when he suggests that the fusion of primary and secondary rules is "the most fruitful way of regarding a legal system." *See* H. L. A. HART, THE CONCEPT OF LAW 114 (1961). For a discussion of the undular or wave theory of light, the corpuscular theory, and complementarity, see E. BETH, SCIENCE: A ROAD TO WISDOM 3-5 (1968).

[128] On the relevance of the special theory of relativity to this issue, see L. WILLIAMS, RELATIVITY THEORY ITS ORIGINS AND IMPACT ON MODERN THOUGHT (1968).

suspected" appear. Further, it does appear that this "emerging novelty reflects properties of collectives," and their patterns of organization and communication.[129] His final point exhorts us to add the "required additional terms to characterize such collectives [on the basis of] . . . rigorous scientific procedure rather than from anthropomorphic translocutions and allegorical allusions to mythology."

That specific types of models are required for analysis at particular levels does not mean that we cannot discover useful homologies and analogies that cut across these levels, reflecting the unity that does exist. For example, consider the findings of Dr. James Miller, Director of the Mental Health Research Institute at the University of Michigan. He reports that when either information input overload or underload (sensory deprivation) occurs, the efficiency and output of the information processing system falls off sharply.[130] The equations reflecting the input-output relation for behaving systems ranging from cell to society are homologous — a finding of special interest in light of our contention that there is a pressing need for synthesis to eradicate specialized deafness by developing generalized hearing. Yet Miller notes that "[a]lthough more than a thousand related articles were reviewed in our literature survey, no references were ever found in them or in their bibliographies crossing from one level, say the neurophysiology of the cell, to another, such as group psychology." This, despite the fact that at all levels comparable performance curves have been discovered. Since such general systems characteristics are not sought, *the same phenomenon, with different names, different dimensions and units, is being discovered over and over again at different levels.*[131]

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[129] George Simmel, half a century ago, wrote extensively on the emergent qualities of groups as the number of individuals composing the group increased. Simmel, *The Number of Members as Determining the Sociological Form of the Group*, 8 THE AM. J. OF SOCIOLOGY 1 (1902). More recently it has been demonstrated that the very configuration of homes within a community will affect the "web of friendship" among the inhabitants. *See* W. WHYTE, JR., THE ORGANIZATION MAN 330-49 (1956). *See also* B. COLLINS & H. GUETZKOW, A SOCIAL PSYCHOLOGY OF GROUP PROCESSES FOR DECISION-MAKING 204-09 (1964); Bavelas, *Communication Patterns in Task-Oriented Groups*, 22 J. OF THE ACOUSTICAL SOCIETY OF AMERICA 725 (1950).

[130] *See* Miller, *supra* note 102. Others have pointed out that "the stability of man's spatial perception and spatially oriented behaviors depends upon habitual contact with the sense-stimulating environment. When such contact is reduced or otherwise altered for a considerable period, the human system for sensorimotor control reveals its plasticity." Held & Freedman, *Plasticity in Human Sensorimotor Control*, 142 SCIENCE 455 (1963. *See also* Heron, *The Pathology of Boredom*, 196 SCIENTIFIC AM., Jan. 1957, at 52.

[131] Miller, *supra* note 102, at 704.

However, while recognizing that parallels do exist,[132] we can not overlook the salient distinctions between levels of organization and diverse phenomena within each level that are adequately treated only by using different concepts and models. A valid and fruitful synthesis is attainable with the requisite sophistication and knowledge of each level of organization. Only then is it possible to shoot the rapids between the behavioral science Scylla and Charybdis of reification and reductionism. This once again makes us keenly aware of how perplexing and difficult it is to fashion a scientific theory of judicial behavior. If the properties of light require complementary and overlapping theories to explain partially its behavior, then will not the behavior of a judge, who participates in at least all the levels of Gerard's 7 by 3 matrix, also require complementary theories for a scientific explanation of his behavior, including perhaps "anthropomorphic translocutions and allegorical allusions to mythology"? Of course, the ultimate resolution of the locus problem will depend largely on value bias which in turn is heavily influenced by the cultural and technological matrix.

> [M]en have tended to order their thoughts in terms of pictorial models since the beginnings of organized thought. The model itself was usually drawn from something in their immediate experience, available from their technology, and acceptable to their society and culture. Once adopted it served, more or less efficiently, to order and correlate the experience which men had, and the habits they had learned, and perhaps to suggest a selection of new guesses and behavior patterns for new or unfamiliar situations.[133]

Whatever the nature of man, it is certain that he constitutes a system capable of adapting to his environment. We now turn to the characteristics of systems like man, which display the capacity for maintaining their integrity over time.

B. *Complex Adaptive Systems*

An adaptive system must effectively utilize information if it is

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[132] It is clear that the parallel organization of various entities is not mere feeble analogizing. Consider the patent implications of Mendeleyev's Periodic Table or *the eightfold way* theory of M. Gell-Mann and Y. Ne'eman. *See* S. BOROWITZ & L. BORNSTEIN, A CONTEMPORARY VIEW OF ELEMENTARY PHYSICS 825-29 (1968). A classic example of the stultifying effect of specialized deafness is manifested in the fact that the relevance of quantum theory [Max Planck 1900] to mutation theory [de Vries 1902] was not seen until a generation after the publication of the two theories. *See* E. SCHRÖDINGER, *supra* note 36, at 32-45.

[133] Deutsch, *supra* note 124, at 507. *See also* note 101 *supra*. The emphasis on cybernetics and systems is closely tied to the technological advances of our era. *See* Stanton & Sylva Cohn, *The Role of Cybernetics in Physiology*, 76 THE SCIENTIFIC MONTHLY 85, 87 (1953).

to achieve ultrastability in this dynamic and fluid universe. Unless the changing constrained variety of the environment is successfully mapped and effective adjustments accordingly made (in either the environment or the system), the system cannot in the long run survive. Given this Heraclitean assumption, certain characteristics of adaptive systems necessarily follow. The system must be open and capable of information processing. Thus, at a minimum it can detect the disparity between various states that are relevant to its functioning, and identify the cause or nature of a disparity that must be corrected. Of course, the system must then possess the ability to respond in such a way so as to attain the desirable state.[134] On a continuum, adaptive systems display a relatively wide range in degrees of openness, differentiation, and interdependence. For purposes of analysis, it is possible to identify four benchmarks along the continuum — low, moderately low, moderately high, and high integration index levels.[135] It is also helpful to distinguish between content and structural variables. The content variable refers to the substance (the manner of acquisition, magnitude, and direction) of information. The structural variable refers to the program or set of rules for dealing with that information. We must also keep in mind the distinction between complexity and order, a concept implicit in our earlier discussion. Order is equivalent to negentropy and may increase or decrease while complexity remains constant.[136]

At the low integration index level the adaptive system is minimally open to the environment and exhibits a low degree of differentiation and interdependence. At the same time, however, there is a high degree of order, a relatively low degree of freedom, and a

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[134] *See* Notterman & Trumbull, *Note on Self-Regulating Systems and Stress*, 4 BEHAVIORAL SCI. 324 (1959).

[135] These four levels are identified and discussed in H. SCHRODER, M. DRIVER & S. STREUFERT, HUMAN INFORMATION PROCESSING 15-23 (1967). The authors point out that these four levels are paralleled somewhat by Mead's four basic orientations of "I" (egocentrism), "me" (delineation of self), significant other (broader social perspective), and generalized other (alternate standards and generalization emerging from experience with various ranges of social perspectives) [see G. MEAD, MIND, SELF, AND SOCIETY (1934)], and the classification of games by Messrs. Moore and Anderson into four perspectives categories: (1) Perspective of agent where a puzzle is presented to be solved; (2) perspective of patient involving games of change in which the player is a recipient of action as well as agent; (3) reciprocal perspective involving games of strategy; and (4) perspective as umpire overseeing the rules. *See* Anderson & Moore, *Autotelic Folk Models*, 1 SOCIOLOGICAL Q. 203 1960). Although judges ought to act at perspectives (3) or (4), they often view cases as puzzles for which there is "one single right answer." K. LLEWELLYN, THE COMMON LAW TRADITION: DECIDING APPEALS 24 (1960).

[136] *See* Pringle, *On the Parallel Between Learning and Evolution*, 3 BEHAVIOR 174, 176-77 (1951).

concomitant predictability in the behavior of the system. The constrained variety of the environment is related in a static or fixed way, thus minimally affecting the system's information processing operations. Since the system is adaptive it must meet the minimal requirements of detection, identification, and control for self-regulation.[137] Lower order organisms operate at this level, as do brain-damaged humans most of the time, and the rest of us, hopefully, only some of the time.

The moderately low integration index level adds a structural variable that enables the system to utilize alternate perspectives or organizations of the constrained variety of the environment. There is no way, however, to relate the different content variables, other than by rough rules of integration based on conditionality. As Messrs. Schroder, Driver, and Streufert point out: "This does not involve the simultaneous use of schemata by superordinate rules other than conditional principles. In this sense, once a rule is engaged, moderately low integration index structure functions much like low integration index structure except that other schemata are available,"[138] although the alternate perspectives do "usher in the problem of choice and probability."[139]

The moderately high integration index level obtains with the emergence of a program with rules that permit comparison, combination, and other manipulations of the content variable perspectives. This means that the system can simultaneously take several points of view and, "observe the effects of [its] . . . behavior . . . and weigh the effects of taking different views."[140] The internal processes take on a more significant role at this level, and the system becomes more autonomous and less predictable with the increase in degrees of freedom.

The high integration index level is identified by the emergence of rules for generating complex conceptual relationships and thus facilitating the alteration of structural variables. At this level we have what Karl Deutsch has termed *goal-changing* feedback:

> [Goal-changing feedback] . . . includes feedback readjustments . . . of those internal arrangements which implied [the system's] . . . original goal, so that the net will change its goal, or set itself

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[137] *See* MacKay, *Towards an Information-Flow Model of Human Behaviour*, 47 BRITISH J. OF PSYCHOLOGY 30, 31-32 (1956).

[138] H. SCHRODER, *supra* note 135, at 18.

[139] *Id.* at 19.

[140] *Id.* at 21.

> new goals which it will now have to reach if its internal disequilibrium is to be lessened.[141]

At the high integration index level, there is found a complex adaptive system, such as the human personality, exhibiting a relatively high degree of interdependence, differentiation, openness, and freedom. Before discussing in more detail such a system it might be noted that "persons process information in different ways under different situational conditions and different persons use different ways of processing information under the same conditions."[142] We would find, for example, that Mr. Justice Black operates at different integration index levels in different contexts and at different times. All too little attention has been directed at the structural variables and their change over time. Given the same content variable, say attitude toward foreign immigration, in two judges, or the same judge at different times, the structural variables that determine how that attitude is integrated with other attitudes could alter drastically the way in which the content variable is used in the decisionmaking process. The integration index level schemes also offer an opportunity to demonstrate again the isomorphism that often exists but goes unnoticed because of specialized deafness.[143] Further, we might mention briefly the relevance of the levels to the studies dealing with dogmatism and concreteness-abstractness functioning.[144] An individual whose belief or cognitive system is operating at the low integration index level will display a "closed" mind and concrete functioning. His behavior pattern will exhibit tendencies to categorize events artificially and sharply into black or white dichotomies, to minimize and eliminate "cognitive dissonance," and to anchor his behavior in the environmental conditions. This means that he will overgeneralize, stereotype, and project to a relatively high degree.[145] At the moderately low integration index level we could expect a movement away from absolutism, with the advent of some internal causation, and a "pushing against or negativistic ori-

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[141] Deutsch, *supra* note 124, at 515.

[142] H. SCHRODER, *supra* note 135, at 5.

[143] For example, the four analytical integration index levels virtually parallel the four major evaluative criteria discussed by Braybrooke and Lindbloom: naive criteria, naive priorities, rational-deductive, and the strategy of disjointed incrementalism. D. BRAYBROOKE & C. LINDBLOOM, A STRATEGY OF DECISION: POLICY EVALUATION AS A SOCIAL PROCESS 6 (1963).

[144] *See* O. HARVEY, D. HUNT & H. SCHRODER, CONCEPTUAL SYSTEMS AND PERSONALITY ORGANIZATION (1961); M. ROKEACH, THE OPEN AND CLOSED MIND (1960).

[145] *See* H. SCHRODER, *supra* note 135, at 16-17.

entation."[146] At the moderately high integration index level we find greater internal causation or autonomy and a greater degree of freedom. At the high integration index level abstract functioning occurs and the "open" mind exhibits the ability to "receive, evaluate and act on relevant information received from the outside on its own intrinsic merits, unencumbered by irrelevant factors in the situation arising from within the person or from the outside."[147]

Our discussion up to this point indicates that a complex adaptive system operating at the high integration index level will exhibit both morphostatic and morphogenetic processes in interacting eufunctionally with its environment. Just like the law, such a system "cannot be stable, in any effective sense, *if* it stands still."[148] In other words, ultrastability of the adaptive system requires change in structure. This in turn means that in order for the system to produce response variations, it must have a source of variety, as well as a means of preserving and maintaining the selected variety. The organization constituting the control element of the complex adaptive system itself changes over time on the basis of transactions between it and the environment. Such a model suggests again that process is *the* thing, that interaction, not just reaction, is involved. More specifically, man's role within the array of levels in Gerard's matrix is "characterized by uncertainty, conflict, and other dissociative (as well as associative) processes underlying the structuring and restructuring of the larger psycho-social system."[149]

Man and appropriately programmed computers clearly qualify as complex adaptive systems[150] capable of performing at the high integration index level. The fact that the computer displays the facility to operate in a manner functionally parallel to man is of special significance to the behavioralist who realizes that when he simplifies for analysis he loses the organization and complexity that is the very essence of the system studied. The computer provides him with a tool whereby he can retain complexity during analysis. For this

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146 *Id.* at 20.

147 Gochman, *supra* note 92, at 488.

148 H. Jones, *The Creative Power and Function of Law in Historical Perspective*, 17 VAND. L. REV. 135, 139 (1963). The classic formulation was by Pound: "Law must be stable and yet it cannot stand still." R. POUND, INTERPRETATIONS OF LEGAL HISTORY 1 (1923).

149 Buckley, *supra* note 51, at 499. The role of morphogenetic, deviation-amplifying mutual causal processes sometimes termed "vicious cycles," is discussed at length in Maruyama, *supra* note 114.

150 Living orgs generally manifest attributes that meet the essential requirements of adaptive systems. *See* Gerard, *supra* note 98, at 433.

reason, more than any other, computers are the most recent in the progression of models of human behavior. Given their significance, it seems worthwhile to compare human and computer systems.

For some tasks computers appear as though they are more "intelligent" than man himself.[151] Indeed, they are almost human,[152] constituting systems "*capable of manipulating any sort of symbolic information whatever according to any rule of operation that can be clearly specified by a man.*"[153] The great evolutionary leap which carried computers to the higher integration index levels came with the programming of the machines to simulate the cognitive processes of the human mind, including those as primitive and powerful as "vicarious trials and errors" (VTEs).[154] Thus it is now a mutually beneficial exchange — humans as models for computers and vice versa. Up to now, however, simulation or heuristic programming has dealt only with relatively ordered tasks such as proving mathematical theorems, "playing" checkers or chess,[155] or performing various mathematical operations.[156]

The beauty of heuristic programming is that it not only provides us with an understanding of the essential operations (the processes for carrying out such operations clearly varying with the nature of

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[151] *See* Mowrer, *Ego Psychology, Cybernetics, and Learning Theory*, in LEARNING THEORY, PERSONALITY THEORY AND CLINICAL RESEARCH 81 (D. Adams *et al.*, eds. 1954). The first generation of computers was not in a class with the human brain that then embodied "a structure of rules of operation which is far more powerful than the structure of currently conceived artificial machines." E. NAGEL & J. NEWMAN, GODEL'S PROOF 100-01 (1960). *See generally* Burck, *The Boundless Age of the Computer*, 69 FORTUNE, April 1964, at 141; Burck, *The "Assault" on Fortress I.B.M.*, 69 FORTUNE, June 1964, at 112; Burck, *Management Will Never Be the Same Again*, 70 FORTUNE, Aug. 1964, at 124; Burck, *Will the Computer Outwit Man?*, 70 FORTUNE Oct. 1964, at 120; Pfeiffer, *Machines That Man Can Talk With*, 69 FORTUNE, May 1964, at 153.

[152] Computers are now programmed to "hold" beliefs and attitudes, and to "react" to emotional analogues of love, fear, and anger. *See* Loehlin, *Machines with Personality*, 4 SCI. J., Oct. 1968, at 97; N.Y. Times, Feb. 18, 1968, at 21, col. 1; N.Y. Times, Oct. 29, 1967, at 56, col. 1.

[153] G. EVANS, *supra* note 69, at 18.

[154] *See* Muenzinger, *Vicarious Trial and Error at a Point of Choice: I. A General Survey of its Relation to Learning Efficiency*, 53 J. GENETIC PSYCHOLOGY 75 (1938); Minsky, *Machines Are More Than They Seem*, 4 SCI. J., Oct. 1968, at 3; Beer, *Machines That Control Machines*, 4 SCI. J., Oct. 1968, at 89.

[155] *See* N.Y. Times, Nov. 26, 1967, at 146, col. 3; Mitchie, *Machines That Play and Plan*, 4 SCI. J., Oct. 1968, at 83.

[156] *See* Wang, *Toward Mechanical Mathematics*, IBM J. OF RESEARCH & DEVELOPMENT, Jan. 1960, at 2. A comprehensive account of the methods and history of these simulation experiments appears in H. KELLY & A. NEWELL, INFORMATION PROCESSING LANGUAGE — V MANUAL (2d ed. 1964). *See also* G. EVANS, *supra* note 69; Newell, Shaw & Simon, *supra* note 69. For bibliographies on simulation, see H. KELLY & A. NEWELL, *supra* at xxxi-xxxvi; 12 AM. BEHAVIORAL SCIENTIST, July-Aug., 1969, at 47.

the information processor, *e.g.*, machine as opposed to human) involved, but also permits the psychologist to carry on a dialogue with the machine that reveals the why and wherefore of the particular sequence of operations used to solve a problem.[157] Nevertheless, there are salient differences between computers and man, indicating that simulation programming has a long way to go to simulate accurately human behavior. Man and the computer are both under fewer phylogenetic constraints than lower level adaptive systems. However, whereas in man ontogenetic mapping is primarily determinative of his behavior,[158] in computers the program is *the* determinative variable. Man, unlike a computer, has two heritages — the genetic and sociocultural.[159] While it may soon be possible for us to alter the genetic constraints, we can determine changes that are desirable only within the context of our sociocultural constraints.[160] This is perhaps why Korzybski characterizes the accretive sociocultural processes as "time-binding."[161] The computer, on the other hand, is constrained only by its program, which can be erased and altered. Norbert Wiener comments on this important distinction noting that "the machine is intended for many successive runs, either with no reference to each other, or with a minimal limited reference; and that it can be cleared between such runs; while the brain in the course of nature, never even approximately clears out its past records."[162]

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[157] *See* Newell & Simon, *The Simulation of Human Thought*, in CURRENT TRENDS IN PSYCHOLOGICAL THEORY 153, 178 (1961); Newell, Shaw & Simon, *supra* note 69. Simulation programs produce "distinctive" behavior as idiosyncratic as that of a person. Such programming provides: (1) An opportunity to test theoretical notions concerning behavioral processes; (2) a better basis for prediction of behavior; and (3) perhaps a chance to transcend our time-bound nature.

[158] *See* Buckley, *Self-Regulation and Self-Direction in Psychological Systems*, in MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 315, 316 (W. Buckley ed. 1968); Sahlins, *The Origin of Society*, 203 SCIENTIFIC AM., Sept. 1960, at 76, 77.

[159] Konrad Lorenz argues that the sociocultural and genetic heritages of man are complementary. K. LORENZ, ON AGGRESSION 265 (1963).

[160] The superhuman prescience required to anticipate the ethical demands of the new culture produced by genetic manipulation are reflected in Churchman's definition: "A is what X would do if he knew the consequences of his acts, and if he knew what future men will want." C. WEST CHURCHMAN, PREDICTION AND OPTIMAL DECISION 22 (1961).

[161] *See* A. KORZYBSKI, MANHOOD OF HUMANITY 209 (1921).

[162] N. WIENER, *supra* note 65, at 143. There are other salient differences between computers and man, including the following: (1) The structural units (hardware) are quite different. Computers operate with basic go, no-go switches that are on or off. Although neurons manifest an all-or-none operation, there are analogue processes that happen at the synapses. (2) The inner-connections within the brain are far more complex than those of a computer's circuits, providing for "noise" and unconscious functioning often leading to new insights. (3) The time required to transmit information

The fact that man's past experience influences his present behavior would not itself preclude effective simulation programming. Man's rational ingenuity is surely equal to the task of programming into a computer his irrationality. The difficulty lies in the complexity of human behavior and the subtleness of its determinants,[163] exemplified by the Rosenthal effect[164] and other unconscious forces.[165]

While most individuals want to believe that their behavior is the product of rational deliberation and awareness of the motivation that prompts it, the fact is that "only to a minor extent is behavior

is considerably less for the binary element in a computer (10^{-7} second) than for a neuron (10^{-2} second) — the brain is, however, capable of performing millions of operations simultaneously whereas the computer operates serially. Still, the computer has a vast advantage in terms of sheer rapidity of information processing operations. (4) The computer can ultimately store far more information (currently storage capacity of 3×10^7 bits) than the brain (theoretical maximum of 10^9 bits), and as noted above, can erase completely or segregate various bits of information. In this sense the computer is not time-bound. (5) The computer has limited capacity for filtering out on its own stimuli from the outside world. It is estimated that 10^9 bits of information impinge upon each eye every second with 10-20 bits extracted each second as relevant to transacting with the environment. Whatever filtering ability the computer has to manage our blooming buzzing confusion must be installed by man. (6) A component failure in the computer system results in total breakdown of the machine's operations. Output is reduced to utter nonsense. The brain has evolved in such a way that total breakdowns are extremely rare. (7) The type of problem which a computer can solve is tightly delineated by its program. A general problem solving machine comparable to man in this respect has not yet been devised. (8) On the output side, computers are not yet actively manipulating the environment, including men and other computers. But, even given these existing differences, Sutherland advises that "[i]n 50 years time we may have ceased to argue about racial problems — we shall be too busy arguing about whether computers should be entitled to vote." Sutherland, *Machines Like Men*, 4 SCI. J., Oct. 1968, at 48. *See also* Skinner, *The Machine That is Man*, PSYCHOLOGY TODAY, April 1969, at 20.

[163] Many experts believe that the sheer complexity of the brain precludes a scientific understanding of its operation. *See* N.Y. Times, Jan. 13, 1967, at 11, col. 3.

[164] The "Rosenthal effect" refers to the phenomenon whereby individuals communicate unconsciously to others their desires. It is virtually impossible for trained observers to determine the cues by which their communication occurs. *See* Rosenthal, *Unintended Communication of Interpersonal Expectations*, 10 AM. BEHAVIORAL SCIENTIST, April 1967, at 24, 25. Rosenthal and Jacobson did, in fact, demonstrate that "children whose teachers expected them to gain in performance showed a significantly greater gain in I.Q. than did . . . control children . . . ." *Id.* at 26. *See* R. ROSENTHAL & L. JACOBSON, TEACHERS' EXPECTATION AND PUPILS' INTELLECTUAL DEVELOPMENT (1968).

[165] Subjects can acquire eufunctional behavior, such as thumb-twitching to eliminate adversive stimuli, or a change in heart rate, in operant conditioning situations without any conscious awareness of this behavior and its effect. This process is termed "subsception." *See* Hefferline, Keenan & Harford, *Escape and Avoidance Conditioning in Human Subjects Without Their Observation of the Response*, 130 SCIENCE 1338 (1959). The language of emotions and gestures is, of course, involved in the Rosenthal effect. *See* La Barre, *The Language of Emotions and Gestures*, 16 J. PERSONALITY 49 (1947). The dilation of the pupil correlates directly with pleasing perceptions and could constitute one of the subtle cues. *See* the discussion of pupillometrics in F. RUCH, PSYCHOLOGY AND LIFE 425-26 (7th ed. 1967). On subliminal communication, see Goldiamond, *Statement on Subliminal Advertising*, in CONTROL OF HUMAN BEHAVIOR 277 (R. Ulrich, T. Stachnik & J. Mabry eds. 1966).

the result of . . . conscious intellectual considerations."[166] We shall explore the problem of the subconscious later. It is sufficient now merely to note that the disparity in the actual *processes* by which information operations go forward in the computer and the human presents an enormously complex problem for resolution by the simulation programmer.

The nub of the simulation programmer's difficulty lies in the fact that man operates at each of the levels of Gerard's 7 by 3 matrix, and at each level a complex process occurs that is interrelated in extremely subtle ways with behavior at the other levels. Human information processing operations — reception, perception, cognition, apperception, mediation, and implementation[167] — are subject to parallel simulation programming in terms of the operations and not the processes involved. The latter do affect the operations in ways not yet fully understood, although it is clear that "the mechanisms of biological storage in the nervous system must be understood if an adequate explanation of information processing is to be developed."[168] The type of dynamic interactions that occur to form a Gestalt or closure phenomenon, for example, are understood only when the processes of the neural correlates of the phenomenon are unraveled.[169] But without more precise knowledge concerning the operation of the nervous system at the lower levels, it is generally sheer speculation to arrive at definitive conclusions concerning political and social behavior based on the nature of neural processes.[170] On the other hand, we cannot claim to understand behavior without a deep knowledge of the functioning of the lower levels, and the limitations and effects that functioning places on higher level behavior. In other words, to what extent are personality, group, and social systems constrained by lower level orgs? What limits are set on human behavior by the second law of thermodynamics, the nature of the cell, the demands of information processing operations, etc.?[171] But can any behavioralist attain more than a super-

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166 L. KOLB, NOYES' MODERN CLINICAL PSYCHIATRY 68 (7th ed. 1968).

167 *See* L. FOGEL, HUMAN INFORMATION PROCESSING 61 (1969).

168 Quarton & Melenchuk, *Preface* to THE NEUROSCIENCES, supra note 91, at xi.

169 *See* Weiss, *supra* note 107, at 810-11.

170 For an example of such speculation, see Brewer, *Political Effects of the Material Basis of Human Thought*, 9 AM. BEHAVIORAL SCIENTIST, June 1966, at 9-10.

171 Information theory in the narrow sense conceived of by Shannon and Wiener exemplifies limitations: "[W]e now know that it is possible to predict how accurately a man will perceive a stimulus . . . on the basis of a physical analysis of the properties of that stimulus alone. . . . This fact was not obvious to psychologists before we began to think in terms of information theory." G. MILLER, *supra* note 102, at 47.

ficial understanding of the complex conceptual space in which other experts encapsulate their specialties? Can a general systems approach add more substance than Lincoln's shadow of a starving pigeon to the task of ordering the pullulating comb of information capsules? Or will it only produce hazy analogies that add to the obfuscation?

As we turn now to the personality system — the level most significant for analyzing judicial behavior — these questions will continually recur. Whether or not they are answered satisfactorily at least we shall not intentionally engage in the equivalent of Mach's "unconscious metaphysics."[172]

C. *Personality Systems*

Our approach in this section adopts Gordon Allport's view that personality is "the dynamic organization within the individual of those psychophysical systems that determine his characteristic behavior and thought."[173] Using Allport's brand of behavioralism appears especially appropriate in view of his eclecticism,[174] together with his emphasis on purposive behavior and functional autonomy, conceptual pragmatism, and the person as a unique and open system.[175] Moreover, his flexible and open attitude seems particularly helpful for our purposes, given our relatively limited knowledge of judicial decisionmaking[176] and the complexity of human behavior.

In light of the dazzling diversity of methodology and approaches employed in studies of judicial behavioralism, eclecticism is the only way to achieve sufficient comprehensiveness without premature closure.[177] Further, the reflective and purposive element of judicial decisionmaking demands a theory that takes such factors into account. Allport's accent on purposive behavior and man's transaction with, rather than mere reaction to, his environment provides a theory

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[172] *See* Fuller, *The Place and Uses of Jurisprudence in the Law School Curriculum*, 1 J. LEGAL ED. 495, 507 (1949).

[173] Allport, *supra* note 114, at 3. *See* G. ALLPORT, *supra* note 38, at 28. *See also* G. ALLPORT, PERSONALITY: A PSYCHOLOGICAL INTERPRETATION 48 (1937). Some psychologists like Skinner, equate thought with behavior. *See* B. SKINNER, VERBAL BEHAVIOR 449 (1957).

[174] *See* G. Allport, *The Fruits of Eclecticism: Bitter or Sweet?*, in THE PERSON IN PSYCHOLOGY: SELECTED ESSAYS 3, 22 (1968).

[175] *See generally* G. ALLPORT, *supra* note 38; Allport, *supra* note 114; C. HALL & G. LINDZEY, THEORIES OF PERSONALITY 96, 257-95 (1957); G. LINDZEY & C. HALL, THEORIES OF PERSONALITY: PRIMARY SOURCES AND RESEARCH 231-72 (1965).

[176] *See* Lewis, *Phase Theory and the Judicial Process*, 1 CALIF. W.L. REV. 1 (1965).

[177] *See, e.g.*, studies cited notes 18-21 *supra*.

of personality more appropriate for analysis of judicial behavior than psychology generally — which, as the saying goes, first lost its soul, then its consciousness, and now is in danger of losing its mind altogether.

However, the most significant facet of Allport's personality theory for us is his stress on the person as a unique and open system. When a judicial behavioralist's goal is a scientific explanation of *a* judge's judicial behavior, he is necessarily confronted with the perplexing problem of whether a nomothetic discipline, such as science, can deal effectively with the individual case — the *idiographic*.[178]

> The individual, whatever else he may be, is an internally consistent and unique organization of bodily and mental processes. But since he is unique, science finds him an embarrassment. Science, it is said, deals only with broad, preferably universal, laws.[179]

In fact, some question whether science can cope with legal processes at all: "The scientist *generalizes*; the lawyer *individuates*. . . . *Litigation aims to individuate and the judicial process is most at home when it disposes of a unique conflict situation uniquely.*"[180]

Allport's acceptance of both idiographic and nomothetic methods in an attempt to understand human behavior thus makes his theory of the personality system especially appropriate for an analysis of the difficulties involved in arriving at a scientific explanation of judicial behavior. In the following pages we examine the significance of each element of his definition of personality.

Allport initially stresses the *organizational* element, especially mental organization, believing that the formation, maintenance and growth of content and structural variables for information processing "that *dynamically* direct activity"[181] poses *the* problem for contemporary psychology. We must determine not only the content and structural variables, but the interdependence between them. To what extent are content variables congruent or harmonious? How intensely are they held? How open is the system to various stimuli?

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[178] *See* note 99 *supra.*

[179] G. ALLPORT, *supra* note 38, at 8.

[180] Cowan, *Decision Theory in Law, Science and Technology*, 17 RUTGERS L. REV. 499, 500 (1963). To the same effect, see K. LLEWELLYN, *supra* note 135, at 15-16; Cahn, *The Lawyer as Scientist and Scoundrel: Reflections on Francis Bacon's Quadrecentennial*, 36 N.Y.U.L. REV. 1, 9-10 (1961). Professor Cowan has drawn attention to the opposition to a union of law and science by existentialism, which also stresses the "concrete existence of the individual life." Cowan, *Some Problems Common to Jurisprudence and Technology*, 33 GEO. WASH. L. REV. 3, 13 (1964). *See also* G. COHN, EXISTENTIALISM AND LEGAL SCIENCE 130, 144-48 (1967).

[181] G. ALLPORT, *supra* note 38, at 28 (emphasis added).

All these and other questions concerning mental organization are of central concern to Allport. Nevertheless, he is aware that to view personality from that perspective alone is inadequate since there are other systems operating simultaneously that impinge on cognitive processes. For example, it is not enough to say that Mr. Justice Black favors the working man, or freedom of speech. Rather, we must know how strongly he holds these views in relation to other views, at any given time. We must ascertain how his content variables interact with the structural component of how he processes information.[182] Consider the inconsistency between his early stand opposing entry of aliens into the United States,[183] and his later championing of the rights of aliens.[184] One resolution of this apparent paradox would suggest that his content variable which places a top priority on protecting the working man dictated his early stand since he viewed entry of aliens as a factor that would depress wages. Later, however, he came to see that the entry of aliens would not have such an effect, and thus with the potential conflict eliminated, he "became" *pro*-alien rights. That is to say, a marked change occurred in the structural and content variables interacting with his personality system. This reenforces our conclusion that when we are dealing with morphogenetic systems operating at a high integration index level, mechanical or static models of personality are not isomorphic with reality.

A second aspect of Allport's definition indicates that, from a *psychological* standpoint, he is keenly aware of the participation of the person in all the levels of Gerard's 7 by 3 matrix. Personality "entails the functioning of both 'mind' and 'body' in some inextricable unity."[185] Allport is not here suggesting a return to an outmoded Cartesian dualism, but only that one must take into account the intricate interrelationships among the various systems functioning within the person. In this respect he is building on the teaching

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[182] Through the remaining material Mr. Justice Black will serve as an example of the difficulty of attempting to explain scientifically the behavior of *a* judge.

[183] In his senatorial campaign Black often expressed his opposition to immigration. *See* Berman, *Hugo L. Black: The Early Years*, 8 CATH. U.L. REV. 103, 114 (1959). True to his word, Senator Black introduced a bill in 1929 that would have prohibited immigration for 5 years. *See* 70 CONG. REC. 664, 1903-04 (1929).

[184] *See, e.g.*, Galvan v. Press, 347 U.S. 522, 532 (1954) (Black, J., dissenting); Shaughnessy v. United States *ex rel.* Mezei, 345 U.S. 206, 216 (1953) (Black, J., dissenting); Takahashi v. Fish & Game Comm'n, 334 U.S. 410 (1948) (Black, J., for the Court). *See generally* Donnici, *Protector of the Minorities: Mr. Justice Hugo L. Black*, 32 U. MO. KAN. CITY L. REV. 266 (1964).

[185] G. ALLPORT, *supra* note 38, at 28.

of the Gestalt[186] and organismic[187] schools of psychology which stress:

> The organism always behaves as a unified whole and not as a series of differentiated parts. Mind and body are not separate entities, nor does the mind consist of independent faculties or elements and the body of independent organs and processes. The organism is a single unity. What happens in a part affects the whole. The psychologist studies the organism from one perspective, the physiologist from another. However, both disciplines need to operate within the framework of organismic theory because any event, be it psychological or physiological, always occurs within the context of the total organism. . . . The laws of the whole govern the functioning of the differentiated parts of the whole. Consequently, it is necessary to discover the laws by which the whole organism functions in order to understand the functioning of any member component.[188]

Allport's definition does not overlook the psychophysical constraints of our physical, biological, and sociocultural heritage.[189] We can survive only if the environmental conditions remain within certain circumscribed limits. There must be input, but not too much or too little,[190] and it must "remain organized if mental stability is to be preserved."[191] Man needs the company of other men,[192] but not too many,[193] and not too closely, as we have already learned from

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[186] *See* R. WOODWORTH & M. SHEEHAN, CONTEMPORARY SCHOOLS OF PSYCHOLOGY 214-50 (3d ed. 1964); Miles, *Gestalt Theory*, in 3 THE ENCYCLOPEDIA OF PHILOSOPHY 318 (1967).

[187] *See* C. HALL & G. LINDZEY, *supra* note 175, at ch. 8. Ludwig von Bertalanffy discusses the antecedent works leading to the organismic perspective in L. VON BERTALANFFY, ROBOTS, MEN AND MINDS 3-5, 60-61 (1966).

[188] C. HALL & G. LINDZEY, *supra* note 175, at 297-98. One is immediately struck by the compatibility of the modern systems approach and notions of complementarity with the organismic theory. The component subsystems are differentiated, and their interdependence, organization (complexity and order) studied without losing the integrity of the total system, with the functioning of each subsystem taken into account. The complex adaptive system model is thus incorporated into Allport's theory of the personality system, which he regards as a unique and open complex adaptive system.

[189] *See generally* Dubos, *Humanistic Biology*, THE AM. SCHOLAR 179, 186, 188-89 (1965).

[190] *See* note 130 *supra*; L. FOGEL, *supra* note 167, at 206-09; Riesen, *Sensory Deprivation*, in 1 PROGRESS IN PHYSIOLOGICAL PSYCHOLOGY 117 (E. Stellar & J. Sprague eds. 1966).

[191] L. FOGEL, *supra* note 167, at 208.

[192] The effects of solitary confinement are well known. Christopher Burney maintained his sanity during 18 months of solitary confinement by ordering his day through established routines. *See* C. BURNEY, SOLITARY CONFINEMENTS (1952). On the effects of loneliness, see Fromm-Reichman, *Loneliness*, 22 PSYCHIATRY 1 (1959).

[193] When animals are placed in a crowded state all manner of dysfunctional behavior patterns occur, ranging from cannibalism to convulsions. *See* F. DARLING, A HERD OF RED DEER (1937); S. ZUCKERMAN, THE SOCIAL LIFE OF MONKEYS AND APES (1932); Calhoun, *Population Density and Social Pathology*, 207 SCIENTIFIC AM.,

our limited experience in space exploration.[194] We now recognize the legal significance of our newly acquired understanding of the effects of these variables.[195] Let us now examine some of the givens of man's personality, *i.e.*, his physical nature and his drives. It appears that man is born active and that a *dynamic* organization of all levels of his psychophysical systems is dictated by his "nature."[196] "The nervous system is a source for activity as well as integration. The brain is not merely *reactive* to outside stimuli; it is itself spontaneously active."[197] Self-initiating behavior, termed *autogenous* by Dennis,[198] occurs at various stages of a child's "normal" maturation level as the requisite physiological and anatomical bases are established. Generally, functions essential to satisfying man's animal needs or creature comforts are autogenous. Here, however, as in all human behavior, there is an enormous variety of inputs from intersecting systems.[199] Without accretive inputs, such as his sociocultural heritage, man is little more than animal.[200] It is true, however, that our sensory-motor systems operate within ranges, varying somewhat from individual to individual, that are genetically limited

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Feb. 1962, at 139; Wynne-Edwards, *Self-Regulating Systems in Populations of Animals*, 147 SCIENCE 1543 (1965).

[194] The physical closeness, along with the tension and stress, might account for much of the apparently whimsical behavior of our astronauts in space. For commentary on the peculiar behavior, see Appel *Grissom Was Ill in Floating Capsule*, N.Y. Times, Mar. 25, 1965, at 22, col. 2; Clark, *Astronauts Find Sleep Difficult*, N.Y. Times, June 7, 1965, at 22, col. 4; *Banter in Space: A Textual Account*, N.Y. Times, June 4, 1965, at 1, col. 5; Clark, *Grissom Asks Study of Landing Error*, N.Y. Times, Mar. 25, 1965, at 1, col. 8; LIFE, June 18, 1965, at 39; TIME, June 11, 1965, at 27B.

[195] *See* T. Cowan & D. Strickland, The Legal Structure of a Confined Microsociety 309-10, Aug. 1965 (Internal Working Paper no. 34, Social Sciences Project, Space Sciences Laboratory, University of California, Berkeley); W. Weyrauch, "The Legal Structure of a Confined Microsociety" — A Tentative Evaluation of the Cowan-Strickland Penthouse Experiments 5-6, April 1966 (Internal Working Paper no. 42, Social Sciences Project, Space Sciences Laboratory, University of California, Berkeley). *See also* Weyrauch, The Law of a Small Group, Mar. 1967 (Internal Working Paper no. 54, Social Sciences Project, Space Sciences Laboratory, University of California, Berkeley).

[196] The various biological rhythms that affect behavior are also of increasing interest to those involved in space research, which "is at present creating a wave of interest in topics as earthy as the effects on man of the tides, the seasons and diurnal cycles." Dubos, *supra* note 189, at 189.

[197] Livingston, *Brain Circuitry Relating to Complex Behavior*, in THE NEUROSCIENCES, *supra* note 91, at 499, 501.

[198] *See* Dennis, *Infant Development Under Conditions of Restricted Practice and of Minimum Social Stimulation*, 23 GENETIC PSYCHOLOGY MONOGRAPHS 143 (1941).

[199] *See generally* Bruner, *Up From Helplessness*, PSYCHOLOGY TODAY, Jan. 1969, at 31.

[200] We can recall only too well the outcome of the experiment of Frederick the Great in which he had children raised in isolation to see if they would "naturally" speak Hebrew. The experiment failed when all the subjects died. *See* B. SKINNER, *supra* note 173, at 462. *See also* J. WHITTAKER, INTRODUCTION TO PSYCHOLOGY 61 (1965).

relatively beyond our control, although DNA manipulation,[201] and chemical[202] or electrical stimulation[203] can produce genetic and physiological alterations, including enhancement and blocking of the learning and memory processes.[204]

Our natural endowments on the input side consist of an array of receptors of limited range. The senses most mentioned are vision, audition, mechanical vibration, touch pressure, olfactory, gustatory, temperature, kinesthesis, angular acceleration, and linear acceleration.[205] Of equal importance, but less frequently discussed, are the senses of protensity (sensing of time),[206] probability,[207] and intensity.[208] As Aristotle realized thousands of years ago, these senses do not interact in a simple additive fashion,[209] rather they interact heirarchically, complicating the input pattern already fantastically confused by the Rosenthal effect and other subtleties.[210]

Although the memory component is limited genetically (the 7 ± 2 rule) in the number of items that can be consciously processed

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201 George Wald's queries to the eugeneticist are relevant here: "Are we now to begin to domesticate man, to make man a more highly standardized and more reliable, and hence a more useful product? And who is to decide the specifications? Useful to whom? And to what end?" Wald, *The Evolution of Life and the Law*, 19 CASE W. RES. L. REV. 17, 23 (1967). *See also* Lasagna, *Heredity Control: Dream or Nightmare?*, N.Y. Times, Aug. 5, 1962, § 6, (Magazine), at 7; LIFE, Mar. 8, 1963, at 92.

202 It has even been suggested that anti-aggression pills can change man's "nasty, mean and brutish" nature and thus eliminate war. *See* B. BARBER, *supra* note 10, at 161-65; N.Y. Times, May 10, 1967, at 27, col. 1.

203 *See* Heath, *Electrical Self-Stimulation of the Brain in Man*, 120 AM. J. OF PSYCHIATRY 571 (1963). This technological breakthrough means that it is now feasible to control people without going through the tedious task of brainwashing. *See* Schwitzgebel, *A Belt from Big Brother*, PSYCHOLOGY TODAY, April 1969, at 45; Note, *Anthropotelemetry: Dr. Schwitzgebel's Machine*, 80 HARV. L. REV. 403 (1966). *See generally* J. DELGADO, PHYSICAL CONTROL OF THE MIND (1969); P. LONDON, BEHAVIOR CONTROL (1969).

204 *See* Agranoff, *Agents that Block Memory*, in THE NEUROSCIENCES, *supra* note 91, at 756; Kety, *The Central Physiological and Pharmacological Effects of Biogenic Amines and Their Correlations with Behavior*, in THE NEUROSCIENCES 444; Nelson, *Brain Mechanisms and Memory*, in THE NEUROSCIENCES 772; Quarton, *The Enhancement of Learning by Drugs and Transfer of Learning by Macromolecules*, in THE NEUROSCIENCES 744.

205 *See generally* Mote, *Senses: Overview*, in 14 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 172 (1968).

206 *See* L. FOGEL, *supra* note 167, at 191-98; Mundle, *Consciousness of Time*, in 8 THE ENCYCLOPEDIA OF PHILOSOPHY 134 (1967).

207 *See* L. FOGEL, *supra* note 167, at 198-200. *See also* Cohen, *Subjective Probability*, 197 SCIENTIFIC AM., Nov. 1957, at 128.

208 L. FOGEL, *supra* note 167, at 200-03.

209 *See* G. BORING, A HISTORY OF EXPERIEMENTAL PSYCHOLOGY 157-58 (1929).

210 A further complication is added with the knowledge that the skin is a fairly sensitive receptor for spatio-temporal perception. *See* Geldard, *Body English*, PSYCHOLOGY TODAY, Dec. 1968, at 43, 47.

simultaneously,[211] by means of language and other "shortcode" devices a great deal of information is conveyed. Consider, for example, the information obtained by the educated reader when he processes a poem like John Donne's *Loves Alchymie*, or T. S. Eliot's *The Waste Land*.[212] A fantastic amount of information is "stored" in the 10 billion neurons, each connecting with about 400 other neurons contained in the human brain.[213] The potential associational patterns of content and structural variables involved in the registration, retention, and retrieval of memory traces is staggering. In any case it is clear that there is within the individual a system for making, in Penfield's words, "a permanent record of the stream of consciousness."[214]

These givens, our physical nature and our drives, establish the "can't helps" of our world. H. L. A. Hart, generally a rather strong opponent of natural law, finds that the underpinning of our physical nature is significant:

> [T]he whole of our social, moral, and legal life, as we understand it now, depends on the contingent fact that though our bodies do change in shape, size, and other physical properties they do not do this so drastically nor with such quicksilver rapidity and irregularity that we cannot identify each other as the same persistent individual over considerable spans of time. Though this is but a contingent fact which may one day be different, on it at present rest huge structures of our thought and principles of action and social life.[215]

Granted the minimal "can't helps" dictated by the demands of our biophysical systems which must maintain equilibrium and homeostasis, it is nonetheless clear that our concepts and categories, attitudes and habits are "the products not only of physiological and

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[211] Most persons can perceive only up to about 6 dots without counting and recall a random sequence of 7 ± 2 letters. *See* Miller, *Information and Memory*, 195 SCIENTIFIC AM., Aug. 1956, at 42.

[212] *Id.* at 45.

[213] It appears that there are probably three types of memory: A *short-term* memory for recent events; an *intermediate-phase* memory for holding information while the short-term memory trace is fading; and the *long-term* or *permanent* memory. Any number of brain injury cases support such a trichotomy. *See* C. MORGAN, *supra* note 90, at 547-55; Deutsch, *Neural Basis of Memory*, PSYCHOLOGY TODAY, May 1968, at 56; Halstead & Rucker, *Memory: A Molecular Maze*, PSYCHOLOGY TODAY, June 1968, at 39-41.

[214] L. FOGEL, *supra* note 167, at 348.

[215] H.L.A. Hart, *Positivism and the Separation of Law and Morals*, 71 HARV. L. REV. 593, 621-22 (1958). *See* F.S.C., NORTHROP, THE COMPLEXITY OF LEGAL AND ETHICAL EXPERIENCE 13 (1959); Goldschmidt, *Preface* to 4 KRITIK DES ENTWURFS EINES HANDELSGESETZBUCHS, KRIT, ZEITSCHR. F.D. GES. RECHT SWISSENSCHAFT, *cited in* K. LLEWELLYN, *supra* note 135, at 122.

psychological constraints but also, to a substantial degree of cultural and historical variables"[216] that produce behavior patterns and beliefs as diverse as those of the Dionysian Dobu and Appollonian Zuni. Unlike our lower order animal relatives, our biophysical systems set only minimal constraints, although it is true that we start with certain biological givens, *i.e.*, temperament, physique and intelligence potential.

Allport accepts the biological perspective of personality as partially valid since personality does reflect "the mode of survival that the individual has consciously worked out for himself."[217] However, notwithstanding the predictability of behavior in the young and brain-damaged, in later years, with ontogenetic movement toward the high integration index level, we must look to a different type of model. As Allport observes:

> My own view is that the *psychological* study of personality is considerably more advanced than is the *biological* study of personality. . . . We know that heredity is important but have little knowledge of the underlying mechanics of genetics. We know something about the laws of learning but little about the neurology of learning. We can study traits, attitudes, philosophies of life without knowing their neural and physiological equivalents. We have faith that sometime in the distant future well-proved facts concerning personality will be found to interlock with well-proved facts of human biology. Until that time we believe that the "psychological model" is on the whole the safest guide to follow in constructing the science of human personality.[218]

A third component in Allport's definition is the element of an *integumented personality* which affirms his belief that personality is not "merely a matter of external effect."[219] He would agree with Tennyson that "I am a part of all that I have met,"[220] believing that there is a dynamic interrelation of person and environment, and that it is impossible to segregate these systems completely. However, he would object to viewing personality as merely the intersection

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[216] Toulmin, *supra* note 91, at 829. There is some evidence, however, for a transcultural aesthetic sense. *See* Child, *And the Bridge of Judgment that Crosses Every Cultural Gap*, PSYCHOLOGY TODAY, Dec. 1968, at 25.

[217] G. ALLPORT, *supra* note 38, at 74.

[218] *Id.* at 73. Although the personality system is "a complex product of biological endowment, cultural grouping, cognitive style, and spiritual groping, . . . [psychology is] truly itself only when it can deal with individuality." *Id.* at 572-73.

[219] *Id.* at 30.

[220] A. TENNYSON, ULYSSES. "The individual as such does not stick out like a raw digit. He blends with nature, and he blends with society. It is only the merger that can be profitably studied." Allport, *The Open System in Personality*, in PERSONALITY AND SOCIAL ENCOUNTER 47 (1960).

of roles. The formula that "culture provides the rules that define the roles that make the relationships that constitute the group,"[221] is valid as far as it goes, which is not, Allport contends, far enough. His position is similar to that of Glendon Schubert who hypothesizes that understanding of a judge's acts is enhanced most by appreciation of the variables most relevant to those acts. In order of decreasing significance, these variables are decisional, attitudinal, attribute, and cultural.[222]

Further, Allport would contend that there is an interaction between culture and the individual, which is not a simple matter of cultural imprinting on the individual via socialization. As Goldschmidt observes:

> [Culture is not a static entity, but a] heritage that has been transmitted out of the past [time-binding] and modified in the course of events by individual acts and circumstances. [Thus] . . . the individual is molded by the reality of an ongoing symbol system which he unwittingly accepts, and which at one point in time is external to him, while at a later point in time he is reenforcing it, and perhaps reinterpreting it, for others.[223]

Allport stresses the distinction between the *real culture* and the *cultural construct* to explain his position on *cultural press*, *i.e.*, the impact of cultural forces on the person. The *cultural construct* reflects the modal practice in a society and is thus chiefly an abstraction, whereas the *real culture* offers factually a wide range of ac-

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221 E. WILSON, *supra* note 84, at 45.

222 Schubert's hypothesis relates more broadly to prediction. He hypothesizes that given decisional, attitudinal, attribute, and cultural variables, prediction is most accurate when its basis is a variable in a class contiguous to the variable to be predicted. Thus, attitudinal variables are the best basis for prediction of judical decisions or attributes, attribute variables are best for prediction of attitudinal or cultural variables, and cultural variables for attribute variables. Schubert, *Introduction* to JUDICIAL BEHAVIOR 1, 5 (G. Schubert ed. 1964); Schubert, *Introductory Note to Chapter V*, in JUDICIAL BEHAVIOR 443, 447 (G. Schubert ed. 1964). Schubert contends that the success of investigators who base their predictions of judicial decisions on content analysis of relevant opinion precedent [*see, e.g.*, Kort, *Content Analysis of Judicial Opinions and Rules of Law*, in JUDICIAL DECISION-MAKING 133 (G. Schubert ed. 1963); Kort, *Predicting Supreme Court Decisions Mathematically: A Quantitative Analysis of the "Right to Counsel" Cases*, 51 AM. POL. SCI. REV. 1 (1957)] is due to the fact that they were really working with the attitudinal variable since "an examination of their work makes it clear that the relationship they were investigating was judicial perceptions of fact." Schubert, *Introductory Note to Chapter V*, *supra* at 447. This suggests that the content analyst is working with an intervening variable more remote from the hypothetical construct attitude than the behavioralist using scaling techniques. *See* MacCorquodale & Meehl, *On a Distinction Between Hypothetical Constructs and Intervening Variables*, 55 PSYCHOLOGICAL REV. 95 (1948).

223 W. GOLDSCHMIDT, *supra* note 52, at 66. *See generally* Brodbeck, *Methodological Individualisms: Definition and Reduction*, in READINGS IN THE PHILOSOPHY OF THE SOCIAL SCIENCES 280 (M. Brodbeck ed. 1968).

ceptable conduct. A child is acculturated in the *real culture*, and even then accepts only those aspects that suit his unique personality system. The hippie may reject much of the *real culture* because of the disparity between the *culture construct* and the *real culture*, or because of the incongruity that exists between the ideal and desirable and the actual practices. Even among a group such as hippies we cannot speak of sharing of traits, only of a similarity or comparability of traits, since the personality of each hippie constitutes a *unique* and open system.

It is true that the role of an individual varies from situation to situation, that people, including judges, have *public* and *private* attitudes that are sometimes ostensibly contradictory. However, that does not mean that a person behaves merely as the situation or concomitant role dictates. The prescribed roles that reflect what "society" expects of a person in a particular position or status are effective only to the extent of the person's *role conception* and *role acceptance*, which in turn manifest his *role performance*. The role dimension is obviously highly relevant to the behavior of a judge.[224] Input and output are thus mediated by the personality system which, although time-bound, can alter the cultural system, which after all, exists only so long as there are men to recreate continually pattern variables.

Personality then is, as our systems approach indicates:

> [A] system within a matrix of sociocultural systems. It is an "inside structure" embedded within and interacting with "outside structures" . . . [which] could not exist at all if the constituent personality systems were destroyed. But neither could any given personality system be what it is, or endure for long, without the environing collective systems.[225]

Again the complementarity aspect of Allport's thinking is apparent. We cannot ignore culture.[226] There are general cultural traits — folkways, mores, themes or motifs, values, positive and critical morality — and cultural institutions. But the *real culture* exhibits a range of latitude that allows for individual differences, thus permitting both the personality and sociocultural systems to attain ultrastability.

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[224] *See, e.g.*, James, *Role Theory and the Supreme Court*, 30 J. POL. 160 (1968).

[225] G. ALLPORT, *supra* note 38, at 194.

[226] Even as to variables as "objective" as laughter, culture is crucial. For Africans laughter may express embarrassment and surprise, rather than amusement. *See* G. GORER, AFRICA DANCES 10 (1935). *See generally* Campbell, *The Mutual Methodological Relevance of Anthropology and Psychology*, in PSYCHOLOGICAL ANTHROPOLOGY 333 (F. Hsu ed. 1961).

Allport's definition states that psychophysical systems *determine* characteristic behavior and thought. This manifests his conviction that personality "*is* something and *does* something." Personality for Allport is more a hypothetical construct than an intervening variable that, though not readily visible, exists not just within a conceptual system but in the realm of the constrained variety of concrete reality.

A fifth element in Allport's definition indicates that for him the proper study of man is *man*, not *men*. The first law of the psychology of personality is that each person is unique. It seems, to paraphrase Goethe, that nature has staked everything on uniqueness.[227] The idiographic perspective, as noted above, is dominant in the law. *This* judge, *this* case, *this* defendant, *this* deceased, etc. Unless science either tailors the judicial process to fit its pattern, or ignores the subject altogether, it must come to grips with the idiographic, which is precisely what Allport does.

> About the individual, living or dead or imaginary, it is science that is inexact: its definitions are always partial (in both senses), and it fails in its own domain of prediction and control, because these apply only statistically to the mass — which is to say that science works with great accuracy by hit-and-miss. When it announces that the half-life of Radon 222 is 3.8 days, this tells us that half of any amount will have disintegrated in the time; *which* half cannot be foretold. No one cares. But if a law court jailed or hanged half the accused brought before it in any three or four days, without caring which half, there would be commotion even among scientists. The courts dare not work, much less predict, by number as science does work with and predict the emission of alpha particles. What one ought to say, therefore, is that the law is exact, but not precise; science is precise, but not exact. In this sense all the historical disciplines from poetry to law are exact: they grip tight the single particular of the moment and never by chance mean the one next to it.[228]

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[227] G. ALLPORT, *supra* note 38, at 7. One could respond: "We fancy men are individuals; so are pumpkins; but every pumpkin in the field goes through every point of pumpkin history." R. EMERSON, *Nominalist and Realist*, in II ESSAYS 198 (1876). Some contend that since we learn to be different, the less unique we are the more human we are. *See* Slater, *Some Social Consequences of Temporary Systems*, in THE TEMPORARY SOCIETY 19 (G. Bennis & P. Slater eds. 1968). This ignores the fact that learning to be unique may be one identifying mark of humanity.

[228] J. BARZUN, SCIENCE: THE GLORIOUS ENTERTAINMENT 197-98 (1964). At another point in the same text Barzun warns:

> The law today shares the general disrepute into which has fallen all that is intellect yet not science or not trying to turn into science. The law is in truth the most systematic and direct antithesis to science. As such it deserves more attention than it usually receives from educated people. Not only do the institutions we cherish depend on law and legal thought, but the ways of the law furnish an example that might strengthen the waning confidence in the reality of the unique, the concrete, and the nonstatistical. Public concern about the

No man is exactly like any other man at any of Gerard's levels. The genes do not even carry enough negentropy to impart the characteristics of an individual at birth,[229] which explains why homozygous twins are *not* identical. Roger Williams, who documents extensively the uniqueness of each of us at all levels,[230] is quite adamant about theories that intimate that people are filled with environmental influences like sausages with meat:

> If we are trying by education and training to make people uniform, we are failing dismally. Every person continues to carry with him, as long as life lasts, a host of desires, tendencies and attitudes that are an outgrowth of his own inborn, highly distinctive make-up and unique development. Millions have been ruined psychologically because of a failure to recognize this fact.[231]

Medical men, authentic artists and scientists, have long recognized that each patient has both common and unique characteristics when contrasted with his fellows, and that the latter as well as the former must be taken into account, since there is always the possibility of idiosyncratic reactions.[232]

Educators, and certainly law school admissions directors, are surely aware that differential psychology does not tell us enough about the individual. Law School Aptitude Test [LSAT] scores exhibit a notoriously poor correlation with academic achievement in law school.[233] This is consistent with the finding that there is only

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law is particularly needed today when the conquering spirit of behavioral science is beginning to see in the criminal law a fresh theater of activity. *Id.* at 218.

229 *See* Maruyama, *supra* note 114, at 171, 174; Weiss, *supra* note 107, at 806-09.

230 *See* R. WILLIAMS, YOU ARE EXTRAORDINARY (1967). *See also* his earlier, more technical, BIOCHEMICAL INDIVIDUALITY (1956).

231 R. WILLIAMS, YOU ARE EXTRAORDINARY 66 (1967).

232 *See, e.g.*, Beecher, *Experimentation in Man*, 169 J.A.M.A. 461, 473 (1959); Leonard, Clifford & Williams, *Tranylcypromine Sulfate Therapy*, 187 J.A.M.A. 957, 958 (1964); Modell, *Let Each New Patient Be a Complete Experience*, 174 J.A.M.A. 1717 (1960); Spillman, *Now — A Hormone that Melts Away Fat*, SCI. DIGEST, Jan. 1965, at 71, 72.

233 *See* Goolsby, *A Study of the Criteria for Legal Education and Admission to the Bar*, 20 J. LEGAL ED. 175, 177 (1967); Ramsey, *Law School Admissions: Science, Art, or Hunch?*, 12 J. LEGAL ED. 503, 513 (1960). *But see* Winterbottom, *Comments on "A Study of the Criteria for Legal Education and Admission to the Bar," An Article by Dr. Thomas M. Goolsby, Jr.*, 21 J. LEGAL ED. 75 (1968). The author's own studies have indicated correlations between LSAT scores and freshman academic averages ranging from .03-.12 on a correlation scale of 0-1. Probably student social security numbers would yield a higher negative correlation since older students tend to perform better. *See* Klein, Rock & Evans, *Predicting Success in Law School with Moderators*, 21 J. LEGAL ED. 304 (1969). The emphasis on LSAT scores will probably grow with the increase in applicants and the availability of computer techniques for channeling students into "appropriate" schools. *See* Cassidento, Hart & Marfuggi, *Can Computers Answer the Law School Admissions Challenge?*, 21 J. LEGAL ED. 100 (1968). Wig-

a moderate correlation between I.Q. and ability to solve problems.[234] Perhaps, higher correlations would result if differential tests were used that focused on problem solving ability rather than on the skills of recall and reading comprehension.[235] The LSAT, and all differential tests suffer from obvious defects:[236] (1) The Rosenthal effect is omnipresent; (2) the situation and criteria vary widely for which the tests, standardized under different conditions, are predictors;[237] and (3) the usual problems of reliability and validity are all there.[238] Allport would add that differential testing, while useful, omits the idiographic. As a result, constructs are dealt with rather than real people in whom there is "a *personalistic* patterning of intelligence, closely meshed with interests, traits and outlook on life."[239]

Allport is not denying that there are common characteristics from person to person at all levels, or that there are a limited number of alternatives available after the socialization and acculturation processes mold the individual. He is concerned, however, over the increased emphasis directed at the nomothetic and differential psychology, as opposed to the idiographic, especially since "comparison is only a secondary goal of the psychology of personality. The

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more, realist that he was, once suggested that "the way to find out whether a boy has the makings of a competent lawyer is to see what he can do in a first year of law studies." Wigmore, *Juristic Psychopoyemetrology — or How to Find Out Whether a Boy Has the Makings of a Lawyer*, 24 ILL. L. REV. 454, 463-64 (1929). The University of Georgia has adopted Wigmore's suggestion, on a limited scale. *See* Murray, *The Tryout System*, 21 J. LEGAL ED. 304 (1969).

234 *See* French, *Effects of Interaction of Achievement, Motivation, and Intelligence on Problem-Solving Success*, 12 AM. PSYCHOLOGIST 400 (1957); Gross & Gaier, *Techniques in Problem-Solving as a Predictor of Educational Achievement*, 46 J. EDUC. PSYCHOLOGY 193 (1955).

235 There is evidence that the Miller Analogies test would be a better predictor of law school success. *See* W. MILLER, MILLER ANALOGIES TEST MANUAL 13 (rev. ed. 1960). The author's own studies yield correlatives of .61 between the Miller scores and freshman grades.

236 We may validly ask why they are used. Practical reasons are most often given. Some suggest it is a matter of psychologists, impelled by fear and desire for power, seeking to maintain their professional stature. *See* McMahon, *Psychological Testing — A Smoke Screen Against Logic*, PSYCHOLOGY TODAY, Jan. 1969, at 54.

237 *See* Ramsey, *supra* note 233, at 516.

238 *See generally* A. ANASTASI, PSYCHOLOGICAL TESTING (2d ed. 1961); G. HELMSTADTER, PRINCIPLES OF PSYCHOLOGICAL MEASUREMENT (1964).

239 G. ALLPORT, *supra* note 38, at 66. The same is true regarding decisionmaking characteristics generally which "depend much more on individual differences in training, and on the effects of temperament or personality which regulate the use of various intellective factors, rather than on such factors themselves." O. BRIM, D. GLASS, D. LAVIN & N. GOODMAN, PERSONALITY DECISION PROCESS 49 (1962).

primary goal is the representation of the single life with maximum fidelity."[240]

Man as a system operating at the high integration index level not only adjusts to his environment but also reflects on, and transacts with it. This raises the perplexing question of what "motivates" man. What are man's drives? Is motivation merely tension directed toward a goal, the attainment of which reduces tension? Is motivation the anticipation of a satisfying object or event? Or is it the satisfying object or the tension directed toward the object or event? Does the term refer to aspiration? Is it a measurable quantity? Is regulated behavior, say that of a computer operating at one of the higher integration index levels, an example of motivated behavior? We could multiply questions ad infinitum, for there are an almost endless variety of definitions and approaches to human motivation and drive. However, there are some answers.

First, it is clear that the question for man is not "to do, or not to do?" It is "what to do?" One of our phylogenetically given traits dictates that we must be spontaneously active. Thus, it is not surprising to find man engaging in ludic behavior, *i.e.*, "seeking out particular kinds of external stimulation, imagery, and thought."[241] Second, it is also clear that man is less directed by his drives than other animals. There are biological needs which must be met.[242] But man, clearly does not merely react to his biological needs and the environment; he creates his life-space and purpose, generally operating as a complex adaptive system at the high integration index level. To emphasize this point Julian Huxley writes:

> Human life *is* a struggle — against frustration, ignorance, suffering, evil, the maddening inertia of things in general; but it is also a struggle *for* something. . . . And fulfillment seems to describe better than any other single word the positive side of human development and human evolution — the realization of inherent capacities by the individual and of new possibilities by the race; the satisfaction of needs, spiritual as well as material; the emergence of new qualities of experience to be employed; the building of personalities.[243]

Allport, too, contends that over and above satisfaction of biological needs each man seeks his own integrity and destiny. Again Allport is eclectic, opposing premature closure of our conceptual

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[240] G. ALLPORT, *supra* note 38, at 204. *See also* G. ALLPORT, *supra* note 173, at 22.

[241] D. BERLYNE, CONFLICT, AROUSAL, AND CURIOSITY 5 (1960).

[242] *See* G. ALLPORT, *supra* note 38, at 205.

[243] J. HUXLEY, EVOLUTION IN ACTION 162-63 (1953).

systems, contending for a complementarity of perspectives. He rejects unchanging motive theories whether they are those of the hedonists and tension-reductionists, or the instinct, need, or drive theorists. Nor does he accept the Freudian primacy of the unconscious view:

> Our conscious choices leave traces; they build up a self-image, they form a generic conscience, they construct new systems of interest. The ego, formed in this fashion, becomes relatively autonomous of the id.[244]

For purposes of analyzing the judicial process, in which the role of unconscious motivation is minimized by the emphasis our legal system places on conscious and rational decisions, Allport's view in this regard seems far more appropriate than classic psychoanalytic theory. Judges, immersed in legal doctrine and an education that stresses obedience to the "rule of law," work at deliberating consciously. Justice Traynor has remarked that: "[O]ur great creative judges have been men of outstanding skill, adept at discounting their own predilections and careful to discount them with conscientious severity."[245]

Allport then does not blindly accept any of the unchanging motive theories, seductively attractive as they may be. His own view is more that of the modern systems theorist who would see motivation not as a response to a stimulus,[246] or tension reducing, but as "something that is *constructed in a succession of self-correcting adjustments* to changing life conditions."[247]

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[244] G. ALLPORT, *supra* note 38, at 150. Earlier he had expressed a view that: "[M]otives are contemporary [and] . . . whatever drives must drive now . . . . [T]he 'go' of a motive is not bound functionally to its historical origins or to early goals, but to present goals only . . . ." Allport, *Motivation in Personality: Reply to Mr. Bertocci*, 47 PSYCHOLOGICAL REV. 533, 545 (1940).

[245] Traynor, *Comment on Breitel, The Courts and Lawmaking*, in LEGAL INSTITUTIONS TODAY AND TOMORROW 51, 52 (M. Paulsen ed. 1959).

[246] Allport is quite adamant about the S-R theorists. He spills considerable quantities of ink to refute the *re*action, *re*sponse, etc., way of thinking in favor of the *pro*spective, *pro*posing, etc., type of thinking. *See* G. ALLPORT, *supra* note 38, at 206-12; Allport, *supra* note 114. For a critique of the reflex arc concept, see Slack, *Feedback Theory and the Reflex Arc Concept*, 62 PSYCHOLOGICAL REV. 263 (1955). The S-R theorists are not as simple as Slack makes them appear. *See, e.g.*, Tolman, *Principles of Purposive Behavior*, in 2 PSYCHOLOGY: A STUDY OF SCIENCE 92 (S. Koch ed. 1959). Ludwig von Bertalanffy would point out, however, that "[h]ypothetical mechanisms, intervening variables, and auxiliary factors have been introduced — *without changing the basic concepts or general outlook.* But what we need . . . are not some hypothetical mechanisms better to explain peculiarities in the behavior of the laboratory rat; we need a new conception of man." L. VON BERTALANFFY, *supra* note 187, at 11.

[247] Shibutani, *A Cybernetic Approach to Motivation*, in MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 330, 331 (W. Buckley ed. 1968). This transactional view of man's behavior is required in light of the information processing opera-

The individual, over time, develops a constellation of mental sets which, like the program of a computer, steers behavior. Sets, for Allport, constitute "permanent possibilities for action"[248] which, although generally in the *tonic* aspect of latent readiness, when aroused guide, steer, and fashion "the *phasic* contractions that lead to the solving of [a] . . . problem or the performing of an act."[249] In this sense "sets are cortical and postural structures . . . have the capacity to 'gate' or guide specific phasic reactions."[250] Allport recognizes as significant for analysis and understanding of the personality system the following types of sets: traits, attitudes, habits, common traits, and personal dispositions.[251] The latter is the most important:

> While common traits are useful as coarse and approximate dimensions for convenient comparison of individuals, the ultimate units we seek are personal dispositions — the actual organized foci of the individual's life. While objective methods are preferable in determining these dispositions, subjective experience and self-report are not to be denied their place.
>
> I am inclined to believe that a relative few (perhaps six to ten) central dispositions can normally account for the congruence and stability found in personal conduct.[252]

The total universe of a person's sets and beliefs constitutes his belief system, which includes both his positive and critical morality, *i.e.*, his "values." But there are many types and variations of belief systems ranging through various permutations of the low to high integration index levels. Further the various cognitive permutations are interrelated with emotive processes to "become fused into an integral urge,"[253] with the result that complex constellations of sets are "more truly motivational than are drives."[254] Thus, our understanding of a person's behavior is incomplete unless we know his purpose, or plans and intentions. The more propriate[255] and

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tions of a complex adaptive system. *See* Buckley, *Information, Communication, and Meaning*, in MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST 119 (W. Buckley ed. 1968).

248 G. ALLPORT, *supra* note 38, at 261.

249 Allport, *supra* note 114, at 5.

250 G. ALLPORT, *supra* note 38, at 261.

251 A "personal disposition" (also termed by Allport "individual trait" and "morphogenic trait") is "a generalized neuropsychic structure (peculiar to the individual), with the capacity to render many stimuli functionally equivalent, and to initiate and guide consistent (equivalent) forms of adaptive and stylistic behavior." *Id.* at 373.

252 Allport, *supra* note 114, at 3.

253 G. ALLPORT, *supra* note 38, at 223.

254 *Id.* at 371.

255 "Proprium is defined as the self-as-known — that which is experienced as warm and central, as of importance." Allport, *supra* note 114, at 4.

central the plan, the more intense the personal disposition (p.d.) of the behaving person. Accepting the notion of the existence of integration index levels, Allport would not only contend that there is variation in the openness-closedness dimension from person to person, but that each person has a unique cognitive style, and that understanding a person requires seeing him "as a unique being-in-his-world."[256] This is, of course, equally true of a judge:

> Only by examining the Justices individually as whole human beings, by probing beneath the protective shell of principles expressed in opinions, to try to find what made or makes each Justice really tick, can past decisions be explained without constant contradiction and future decisions predicted with a surprising degree of accuracy.[257]

Thus, the key to understanding the behavior of an individual lies in the organization of his constellation of personal dispositions. In addition to ascertaining the intensity of the p.d.'s, we must determine their interdependence or integration,[258] as well as the extent of differentiation of the system itself. Finally, given the dynamic nature of the personality system, as learning occurs we must establish the extent to which the content and structural variables change over time. The task is immeasurable, complicated by the fact that think-

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256 G. ALLPORT, *supra* note 38, at 271.

257 Rodell, *For Every Justice, Judicial Deference is a Sometime Thing*, 50 GEO. L.J. 700, 701 (1962).

258 Studies on cognitive consistency, congruity, and cognitive dissonance all suggest that content and structural variables are interdependent. The theory of cognitive dissonance, for example, postulates:

(1) Cognitive dissonance is a noxious state.
(2) The individual will attempt to reduce cognitive dissonance or to eliminate it, and he will act to avoid events that increase it.
(3) In the case of consonance the individual will act to avoid dissonance-producing events.
(4) The severity or the intensity of cognitive dissonance varies with the importance of the cognitions involved and the relative number of cognitions standing in dissonant relation to one another.
(5) The strength of the tendencies enumerated in (2) and (3) is a direct function of the severity of dissonance.
(6) Cognitive dissonance can be reduced or eliminated only by adding new cognitions or by changing existing ones.
(7) The new cognitions may throw added weight to one side, decreasing the proportion of cognitions which are dissonant.
(8) The added cognitions may change the importance of the cognitive elements that are in dissonant relation with one another.
(9) Cognitions may change so and may become less important or less contradictory with others.
(10) These processes may recruit other behaviors which have cognitive consequences favoring consonance, such as seeking new information. Sajonc, *Cognitive Organization and Processes*, in 15 THE INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 615, 618-19 (1968).

See G. ALLPORT, *supra* note 38, at 97.

ing, learning, motivation, and perception — all cognitive, affect, and volitional processes — are inextricably integrated within that dynamic, complex, adaptive system — personality.

III. JUDICIAL BEHAVIORALISM

The goal set by judicial behavioralists is attainment of a *scientific* explanation of judicial behavior. Our systems discussion alerts us to the impossibility of fashioning *the* definition of science.[259] Instead

[259] A fair sampling of definitions of science might include the following: Science is (1) "The [explanation], prediction and control of events by organized symbol systems." L. VON BERTALANFFY, *supra* note 187, at 39. Explanation was apparently unintentionally omitted from the definition. *See id.* at 55. (2) "[L]ooking at things for yourself rather than trusting to the a priori or to authority of any kind." A. MASLOW, THE PSYCHOLOGY OF SCIENCE 135 (1966). (3) "[The] everlasting interrogation of Nature by Man." R. CALDER, *supra* note 116, at 3. Calder also characterizes science as "present verification without ultimate certainty" [*id.* at 3], and "proof without certainty." *Id.* at 19. Science is thus sharply delineated from faith, which is "certainty without proof." *Id.* (4) "[T]he body of rules, instruments, theorems, observations, and conceptions with aid of which man manipulates physical nature in order to grasp its workings." J. BARZUN, *supra* note 228, at 14. At another point Barzun defines science as "the study of objects, tangible or abstract, through analysis and measurement, for prediction, control, and other intellectual satisfactions." *Id.* at 192. (5) "[M]an's way of communicating with man in his cooperative attempt to control his environment;" C. CHURCHMAN, *supra* note 160, at 90. (6) "[A] collective work [that] . . . assembles all the information supplied by experimenters worthy of our trust. . . . [U]pon these fundamental data, carefully controlled, is built the work of theoreticians, looking for logical relations among facts, establishing laws, and attempting prediction." L. BRILLOUIN, *supra* note 120, at 49. Churchman agrees that science prescribes that facts are accepted if all "competent" observers agree on the occurrence of an event. *See* C. CHURCHMAN, *supra* note 160, at 15. (7) "[A] type of social activity," identified as science by the application of rational thought "to what we may call 'empirical' ends, that is, ends which are available to our several senses or to the refined development of those several senses in the form of scientific instruments." B. BARBER, SCIENCE AND THE SOCIAL ORDER 23, 33 (rev. ed. 1962). James Conant continues to believe that "the dynamic quality of science viewed as the continuous activity of an increasing number of men [is closest] . . . to the heart of the best definition." J. CONANT, SCIENTIFIC PRINCIPLES AND MORAL CONDUCT 8 (1967). *See* J. CONANT, ON UNDERSTANDING SCIENCE 24 (1947). (8) A label "either for an identifiable, continuing enterprise of inquiry or for its intellectual products, and they are often employed to signify traits that distinguish those products from other things." E. NAGEL, STRUCTURE OF SCIENCE 2 (1961). The portmanteau nature of the term is reflected in Ross's characterization of science as "empirical, rational, general, and cumulative; and it is all four at once." R. ROSS, SYMBOLS OF CIVILIZATION 1 (1962). The meaning of science is itself dynamic and changing. *See* R. ACKOFF, SCIENTIFIC METHOD 1 (1962). For an extensive treatment of the subject of what constitutes science, see A. KAPLAN, *supra* note 1; E. NAGEL, *supra.*

A similar sampling of definitions of the concept of law would reveal the same sort of variation. *See, e.g.*, H. CAIRNS, LEGAL PHILOSOPHY FROM PLATO TO HEGEL 556 (1949); P. DIESING, REASON IN SOCIETY 127-28 (1962). The difficulties inherent in defining "law" have often been noted. "We speak of ourselves practicing law, as teaching it, as deciding it; and not one of us can say what law means." B. CARDOZO, *Jurisprudence*, in SELECTED WRITINGS 7, 43 (M. Hall ed. 1947). "Those of us who have learned humility have given over the attempt to define law." Radin, *A Restatement of Hohfeld*, 51 HARV. L. REV. 1141, 1145 (1938). *See also* H.L.A. HART, *supra* note 127, at 1.

we shall consider what the concept entails, and the problems confronting the behavioralist attempting to do science, by viewing the enterprise of science from the perspective of seven significant parameters: goals, referent, decisionmaker, institutional context, product, language, and methods. We select these particular variables because they seem so central to the processes involved in the scientific endeavor. Conversion processes are accomplished by individuals (*decisionmakers*), operating within and transacting with social and institutional systems (*institutional context*), using a variety of means of communication (the most significant of which is *language*). Problems presented are resolved by using prescribed *methods*, with the *product* of the process evaluated and justified by reference to the institutional *goals* of the system, which in turn are dependent on the nature of the *referent* or system on which the scientific enterprise operates.

A. *Goals*

It is generally said that science aims at describing, understanding, and predicting the behavior of its referent. Normative disciplines, like law, on the other hand, are said to prescribe the appropriate behavior for their referent.[260] Of course, in both instances the disciplines serve man. Science, after arriving at an understanding of its referent as manifested by ability to predict, enables us to control our environment. Law seeks also to control and channel behavior, which in turn requires an understanding of the behavior of those to whom its prescriptions apply. Thus an intersection of law and behavioral science occurs due to their common desire to control their referents: Science needs norms for guidance in *how* it is to control and law requires scientific understanding of behavior *if* it is to control effectively. The idea of the law using behavioral techniques to control behavior completely is, however, abhorrent to most individuals, even though they are socialized and controlled in many subtle and potent ways from the cradle to the grave. It is one thing, they say, to tell a person that unless he behaves in a certain way he will be punished. It is something else to *make* him behave in a certain way by use of ESB, genetic manipulation or any other technique that leaves him no choice. The law sets norms which it anticipates most members of society will accept. Science discovers laws which physical systems must obey. The law shares

[260] *See* Langevin, *Communications Between the Legal and Scientific Professions*, in JURIMETRICS CONFERENCE 39, 40 (1965).

some of the distrust that behavioralists often express concerning discovery of behavioral laws for the purpose of imposing absolute control of behavior, leaving no range of choice or acceptance of the norm to the individual. As Maslow observes:

> [H]ow could it seriously be said that our efforts to know human beings are for the sake of prediction and control? The opposite is more often the case — that we would be horrified by this possibility of prediction and control. If humanistic science may be said to have any goals beyond sheer fascination with the human mystery and enjoyment of it, these would be to release the person from external controls and to make him *less* predictable to the observer (to make him freer, more creative, more inner determined) even though perhaps more predictable to himself.[261]

Many behavioralists emphasize the goal of understanding, rather than prediction and control. "More and more . . . [the behavioralists'] self-conscious ambition is the same as that of natural scientists, to create a set of highly determinate theories for the explanation of empirical . . . phenomena."[262] Yet, without demonstrable predictive power, with concomitant implications of ability to control, is an explanation scientific?[263] Dr. Bernard Diamond contends that it is not.

> [The] essence of science is prediction. Observation and description of what has happened is only history: history becomes science when man is able to utilize his observation of things past to predict what is going to happen. It is through this power of prediction, through his ability to interpolate the past into the future, that he acquires the ability to manipulate the present, and so manipulate the future.[264]

Diamond's statements, implying the Hempel-Oppenheim thesis

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[261] A. MASLOW, *supra* note 259, at 40. For a classic debate concerning behavior control, see Rogers & Skinner, *Some Issues Concerning the Control of Human Behavior: A Symposium*, 124 SCIENCE 1057 (1956). *See also* Krasner, *Behavior Control and Social Responsibility*, 17 AM. PSYCHOLOGIST 199 (1964).

[262] B. BARBER, *supra* note 259, at 318. *See also* text accompanying note 25 *supra*.

[263] *See* Eldersveld, *Theory and Method in Voting Behavior Research*, in POLITICAL BEHAVIOR: A READER IN THEORY AND RESEARCH 267, 273 (H. Euclau, S. Eldersveld & M. Janowitz eds. 1956), wherein the author inquires: "[H]ow can one be certain of understanding behavior, unless he is willing to make predictive judgments." *See also* Krislov, *Theoretical Attempts at Predicting Judicial Behavior*, 79 HARV. L. REV. 1573 (1966); Rapoport, *Foreword* to MODERN SYSTEMS RESEARCH FOR THE BEHAVIORAL SCIENTIST at xiii (W. Buckley ed. 1968); Schubert, *Introduction* to JUDICIAL BEHAVIOR 1, 4 (G. Schubert ed. 1964). *See generally* Morgenbesser, *Scientific Explanation*, in 14 THE INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 117 (1968). For a discussion of the difficulties involved in predicting judicial behavior, see Mermin, *Computers, Law, and Justice: An Introductory Lecture*, 1967 WIS. L. REV. 43, 72-87.

[264] Diamond, *The Scientific Method and the Law*, in PROCEEDINGS: THE THIRTEENTH NATIONAL CONFERENCE OF LAW REVIEWS 36, 38 (1967).

that explanation and prediction are symmetric, raise several important issues. First, we have noted that it is next to impossible to identify the essence of any concept, especially one as amorphous as science. For some behavioralists prediction does not constitute the essence of science; rather, it is considered merely the handmaiden of model building with a view to understanding the behavior in question.[265] Second, forecasts and predictions are not possible,[266] even in the physical sciences.[267] The "laws" of physics are at best approximations, with complementary theories required to comprehend the relevant behavior. Thus, in geology we may understand, in retrospect, by postdiction, how a particular rock formation was produced, although prediction was impossible.[268] In the behavioral sciences accurate prediction is not possible. There is no dearth of theory, but rather a lack of adequate rules of correspondence, rigorously relating theory to observable fact. *The behavioral sciences are correlational, not theoretical.*[269] This correlational nature of the behavioral sciences means that the predictions possible are stochastic, rather than deterministic.[270] This raises, however, the third, and perhaps most

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[265] *See* Feigl, *Philosophical Embarrassments of Psychology*, in 14 THE AM. PSYCHOLOGIST 115, 126 (1959), wherein the author states: "Prediction, vitally important in all practical applications of science, enters pure science primarily as a means of checking the adequacy of laws and theoretical assumptions." However, as Krislov notes: "Scientists value prediction for its ability to demonstrate and test the general utility of a theory, particularly to disprove the theory if a logically-necessary prediction does not result. . . . However, it is understanding in its broadest sense, not merely prediction, that is sought." Krislov, *supra* note 263, at 1574.

[266] The distinction between forecasts and predictions is often made. "A prediction states hypothetically that *if* such and such conditions exist, such and such an event will occur. A forecast states categorically that such and such an event *will* occur . . . and so assumes knowledge that the conditions do or will exist." R. ROSS, *supra* note 259, at 75. *See also* Krislov, *supra* 263, at 1574.

[267] This is not to say that general principles are not applicable, in conformity with Hutton's uniformity of process principle [*see* C. LONGSWELL & R. FLINT, INTRODUCTION TO PHYSICAL GEOLOGY 4 (1962)], so that in fact "the infinite number of scenic forms are really variants on a limited number of basic themes." J. SHIMMER, THIS SCULPTURED EARTH 4 (1959).

[268] We can, therefore, have understanding without prediction. In astronomy we find prediction and understanding possible, but not control. In the behavioral sciences, in the macro dimension, we may have prediction and control without understanding. It appears that understanding, prediction, and control are not necessarily concomitants.

[269] W. TORGERSON, THEORY AND METHODS OF SCALING 8 (1958). *See also* Homans, *A Life of Synthesis*, 12 AM. BEHAVIORAL SCIENTIST, Sept.-Oct. 1968, at 2, 5.

[270] Bartholomew states:

> If the effect of any change in the system can be predicted with certainty the system is said to be deterministic. In practice, especially in the social sciences, this is not the case. Either because the system is not fully specified or because of the unpredictable character of much human behavior there is usually an element of uncertainty in any prediction. This uncertainty can be accommodated if we introduce probability distributions into the model in place of math-

significant, point. If prediction in the behavioral sciences is possible only statistically, can we say that we "understand" the behavior of *the* person in question? Surely explanation implies more than prediction, including at the least an element involving cognitive satisfaction.[271] Given knowledge that some children subjected to certain circumstances will become drug addicts provides an interesting correlation, but not an explanation of why Joe Smith is an addict. This striking difference between explanation in the physical, as opposed to the behavioral sciences, is largely due to the nature of the referent involved, a matter to which we now turn.

B. *Referent*

Judicial behavioralists are surely aware that among the difficulties confronting them are those common to the behavioral sciences due to the nature of their subject matter or referent. Molecules and other systems operating at lower integration index levels are not capable of perceiving meaning and thus are not influenced by perceived norms. The behavioralist, however, unlike the physical scientist, must analyze systems for which signs and symbols are significant, and thus, must take into account "those processes in which symbols, or at any rate meanings, play an essential part."[272] Behavioral systems are operating at all levels of Gerard's matrix and are self-reflexive — transacting with rather than merely reacting to the environment. Since such systems transact on the basis of symbol systems it is incumbent on the behavioral scientist to deal with this variable. In this regard, Kaplan offers the helpful distinction between *act meaning* (the meaning of an act to the actor) and *action meaning* (the meaning of the act to the behavioral scientist studying the actor's behavior).[273] This double symbol process presents a host of problems for the behavioralist.[274]

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ematical variables. More precisely this means that the equations of the model will have to include random variables. Such a model is described as stochastic. D. BARTHOLOMEW, STOCHASTIC MODELS FOR SOCIAL PROCESSES 2 (1967). It should be emphasized that a stochastic "equation thus specifies a most probable value rather than a 'unique,' determinate value. What might appear here to be a loss in rigor is actually a gain in realism." Firey, *Mathematics and Social Theory*, 29 SOCIAL FORCES 20, 24 (1950).

271 Prediction encompasses more than a forecast, since it provides "us with understanding of past events and [suggests] ways in which future events might in principle be controlled." E. MEEHAN, EXPLANATION IN SOCIAL SCIENCE: A SYSTEM PARADIGM 21 (1968).

272 A. KAPLAN, *supra* note 1, at 32.

273 *Id.*

274 Most of the problems noted are discussed at length in E. NAGEL, *supra* note

Initially it would seem that the behavioralist has a methodological advantage over the physical scientist. He can ask his subjects what they are about and they will tell him.[275] But oral reports of an actor are not always reliable indicators of act meaning for a variety of reasons.[276] First, an individual may not know himself the true significance of an act he has performed. As Freud has so ably demonstrated, the analyst's action meaning may elucidate the act meaning for the actor who cannot for psychological reasons perceive the true import of his acts. Why the actor does what he does may in fact be the result of a variation of the "Rosenthal effect," and not capable of identification, let alone explanation, by the actor.[277] Second, the actor may intentionally distort his reports, perhaps because he knows he is being studied.[278] Third, there are mental states that are not directly expressible in words. As Wittgenstein once pointed out, everything that is understood cannot be said.[279] Allport would be quick to comment that the unique nature of each person's perception and experience produces a personal proception of each act. Whether or not atoms are fungible, it is clear that they do not exhibit anything comparable to act meaning. This has

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259, at 447-502. *See generally* Cohen, *Scientific Method*, in 10 ENCYCLOPEDIA OF THE SOCIAL SCIENCES 389 (1933).

[275] *See* Wald, *Determinacy, Individuality, and the Problem of Free Will*, in NEW VIEWS ON THE NATURE OF MAN 16, 41 (J. Platt ed. 1965). There are, however, in some situations, better ways. *See, e.g.*, Lindsley, *A Behavioral Measure of Television Viewing*, 2 J. OF ADVERTISING RESEARCH 2 (1962).

[276] *See generally* Azrin, Holz & Goldiamond, *Response Bias in Questionnaire Reports*, 25 J. OF CONSULTING PSYCHOLOGY 324 (1961).

[277] *See, e.g.*, Azrin, Holz, Ulrich & Goldiamond, *The Control of the Content of Conversation Through Reinforcement*, 4 J. OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 25 (1961).

[278] *See generally* Milgram, *Behavioral Study of Obedience*, 67 J. ABNORMAL & SOCIAL PSYCHOLOGY 371 (1963); Ulrich, Stachnik & Stainton, *Student Acceptance of Generalized Personality Interpretations*, 13 PSYCHOLOGICAL REPORTS 831 (1963).

[279] One writer has observed:

> We understand the elements of a sentence, and we see how they are combined. But we cannot say what this combination means. Yet we *grasp* its meaning. In some sense we know what it means, because the sentence *shows* its meaning. Anything that can be said can be said clearly, but not everything that is understood can be said. In a letter to Russell, Wittgenstein remarked that his "main contention" was this distinction between what can be said in propositions — i.e., in language — and what cannot be said but can only be shown. This, he said, was "the cardinal problem of philosophy." Malcolm, *Ludwig Josef Johann Wittgenstein*, in 8 THE ENCYCLOPEDIA OF PHILOSOPHY 327, 330 (1967).

Wittgenstein in his later works attempted to answer this problem he raises of a "private language." Susanne Langer writes that "the limits of language are not the last limits of experience, and things inaccessible to language may have their own forms of conception, that is to say, their own symbolic devices." S. LANGER, PHILOSOPHY IN A NEW KEY 224 (1942).

led to the contention that the double process of the behavioral sciences requires a special kind of understanding or *Verstehen* as distinguished from the knowing or *Wissen* of the physical sciences.[280] The behavioralist must attempt to discover the intentions of his subject and to empathize with him to attain an "understanding" of his act meaning.[281] The idiographic nature of each individual's personal constellation of attitudes, values, and perception precludes less than a rough approximation. To a significant extent it appears then that each person has his own private language, with each

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[280] Does the *Verstehen* argument, however, merely confuse the source of knowledge with its verification and understanding? Feigl observes:

> We recognize that, especially in the psychology of human motivation, and in psycho-dynamics generally empathy is an often helpful and important heuristic tool. But we realize also that empathetic judgments can go woefully wrong, no matter how strong their intuitive conviction. Empathy may be a *source* of knowledge in that it *suggests* hypotheses. But it is not self-authenticating. Objective tests alone can confirm the correctness of these "hunches." The philosophical embarrassment here arises out of a confusion between the origin and the justification of knowledge-claims. Once we distinguish between the psychological roots and the methodological validation of our judgments, there remains no fundamental difference in the type of justification legitimately applied in the natural and the social sciences. This may be recognized quickly if "understanding" is seen to rest on familiarization. Familiarity breeds intuition; but it is neither a necessary nor a sufficient condition for scientific explanation. In the more advanced physical sciences highly abstract theories possess great explanatory power, but the postulates of those theories are not in the least self-evident or intuitively convincing. They are effective premises for the sort of derivation which constitutes scientific explanations. We should not feel constrained to explain the new, the surprising, or the unfamiliar exclusively on the basis of old, customary, and familiar premises. To be sure, it is pleasant if it can be done this way, but, I repeat, this is neither necessary nor sufficient for a good scientific explanation. Feigl, *supra* note 265, at 118.

See also A. KAPLAN, *supra* note 1, at 142; E. NAGEL, *supra* note 259, at 484.

[281] [The effort to discover act meaning] pivots on our attempt to comprehend each other's *intentions*. As Heider points out, the unique feature of person perception is its preoccupation with "personal causality," and personal causality springs from intention. The intention of a person "brings order into the wide variety of possible action sequence by coordinating them to a final outcome." In short, the key to person perception lies in our attention to what the other is trying to do. His goals, his values — together with his abilities and available energy — are what fascinate us.

> Thus to know another person well is to know his intentions, i.e., what kind of future he is trying to bring about. It is true that we also perceive all manner of incidental features about him, but our main effort is directed toward grasping the directions of his striving, for these (above all other things) cement his personality (just as they cement our own).
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> To put the matter in another way: Our own personalities center subjectively around our own concept of self. The dynamic ingredient in this concept is our own propriate striving (our own intentions). It is natural then, indeed inevitable, that when we concern ourselves with others, we look primarily for this same unifying theme. G. ALLPORT, *supra* note 38, at 520.

See also B. BARBER, *supra* note 259, at 312.

word in our common vocabulary having a particular personal connotation.[282]

The dilemma presented by a *Verstehen* approach that assumes an idiographic private language is simply stated. If an individual possesses a private language then by definition he cannot communicate his understanding. To the extent that his act meaning is known to others by verstehen based on analogy, then we are back to the nomothetic, although it may not yet be explicated clearly. Unless we can communicate this verstehen understanding then perhaps we must suffer to know it silently, which might suggest that this type of knowing does not really involve language. Wittgenstein, in his later writings, would surely exhort us not to forget that words have meaning only in a behavioral setting and that convention is necessary for effective communication. It is possible, however, to consider the situation in a different light. The *Verstehen* approach may be telling us to explain an event by attending meticulously to its particular complex pattern. Understanding is attained by a type of non-logical inference that does not fit the traditional explanation by instantiation or higher order deductions. Even granting the contention that every possible description of external reality is contained in the set of all potential logical structures (and the relations of all terms in those structures may be shown by conjunction, disjunction, implication, and negation), we may still know more than we can describe, simply because our descriptions are never even logically complete.

Another difficulty for the behavioralist is presented by the high degree of autonomy and the degrees of freedom exhibited in the subjective and reflective nature of his referent. We have noted that persons do not merely react, but transact with the environment and can indeed alter their structural as well as content variables. This freedom poses a dilemma for the philosopher as well as the behavioralist. If an individual's acts are not strictly determined — if he has a "free will" to transact as he desires — does not the element of individual choice, no matter how minute it may be, preclude a general theory of individual behavior?[283] Would not every

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[282] *See generally* Castaneda, *Private Language Problem*, in 6 THE ENCYCLOPEDIA OF PHILOSOPHY 458 (1967). *See also* note 279 *supra.*

[283] Wald rhetorically inquires:

> How free is free will? It is rather curious that, for all the enthusiasms it arouses, it involves so narrow a segment of our experience and choice. . . . Yet, such as it is, it is important and precious to us and, I think, real — real

rule have to be qualified to read, "Given conditions $a_1, \ldots a_n$, X will do Y *unless he determines to do Z.*" [Or, "under highly controlled conditions, people do as they damn please."][284] Further, some contend that no individual can ever logically predict his own future decisions:

> It is claimed that if a person knows or thinks he knows what he will try to do tomorrow, then either he has already decided what he will try to do or he believes that what he will try to do is not up to him. In neither of these two cases can he decide what he will try to do, for in each case there is nothing for him to decide.[285]

The behavioralist is himself involved in predicting his own decisions concerning his subject's behavior. Thus, the dodge that one can predict another's decisions leads to an infinite regress problem. Herbert Feigl's analysis of the free-will vs. strict determinism dispute is helpfully clarifying:

> The perplexity of this ancient issue consists in the apparent logical incompatibility between two beliefs, each of which appears plausible on its own grounds: The assumption of free choice seems borne out by the testimony of introspection; also it seems indispensable as a presupposition for moral responsibility. On the other hand, a great deal of biological and psychological evidence points in the direction of a fairly strict determinism in regard to human behavior. . . . But, so it seems to many thinkers, if we are to be free, we cannot be enmeshed in a strict network of causal relations. Hence, the relief and jubilation in many quarters when the "good tydings" of indeterminacy in basic physics were proclaimed.
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> But a little critical reflection shows readily that this sort of "absolute chance," far from constituting free choice, would be experienced as a queer kind of compulsion, and thus not serve at all as a basis for moral responsibility (i.e., praisability or blamability). Only if, to a significant extent, we are the choosers of our choices, and the doers of our deeds, can we be held accountable. The entire bafflement is due to a confusion which can be easily dispelled. We must not confuse freedom with indeterminacy (i.e., the absence of causality), and we must not confuse causal determination with compulsion, coercion, or constraint. As already Spinoza essentially saw it, we are free to the degree that our choices and our conduct are determined by our character and personality . . . . To be free means that the chooser or agent is an essential link in the chain of causal events and that no extraneous compulsion — be it physical,

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in the sense that I have tried to define, its freedom residing in its unpredictability. Wald, *supra* note 275, at 37-40.

See also A. KAPLAN, *supra* note 1, at 256.

[284] Wald, *supra* note 275, at 40.

[285] Oldenquist, *Self-Prediction*, in 7 THE ENCYCLOPEDIA OF PHILOSOPHY 345, 346 (1967).

> biological, or psychological — forces him to act in a direction incompatible with his basic desires or intentions.[286]

There is also the complication engendered by that most subjective variable — the aesthetic. Simulation programmers have discovered that choices of strategy in chess are often made on aesthetic rather than purely "rational" bases. The simplest and most direct set of moves leading to a check-mate is not always selected, rather the sequence that satisfies the chess master's aesthetic sense.[287]

In the physical sciences we have seen that observation perturbs the environment, including the subject studied. This is especially true of behavioral systems (*e.g.*, the well known "Hawthorne effect"[288] and "Rosenthal effect"). There are various ways to deal with this problem, ranging from one-way mirrors to double-blind experiments.[289] There is an additional type of difficulty in the behavioral sciences. The substance or meaning of a scientific finding may itself produce behavior at variance with the finding (suicidal prediction), or even if invalid at the time made, the finding may produce "validating" behavior (self-fulfilling prophecy).[290] It is possible to construct servo-mechanisms that exhibit similar behavior, but only self-reflexive systems are able to transact on the basis of the proceived meaning of a scientific finding expressed symbolically. As Barber notes:

> It is a special condition of social life, that is, as against physical and biological phenomena, that predictions themselves become a part of the interacting set of social conditions which affect the development and consequences of scientific innovation.[291]

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[286] Feigl; *supra* note 265, at 116. Abraham Kaplan makes the same point: "A free choice is not uncaused but one whose causes include in significant measure the aspirations and knowledge of the man who is choosing. And I see no reason a priori why choices freely made should persistently refuse to exhibit any regularities whatever, even in a statistical sense." A. KAPLAN, *supra* note 1, at 121.

[287] *See* Miron & May, *A Note on Serendipity, Aesthetics, and Problem Solving*, 8 BEHAVIORAL SCIENTIST 242 (1963).

[288] *See* E. MAYO, THE HUMAN PROBLEMS OF AN INDUSTRIAL CIVILIZATION 56-57 (2d ed. 1946). *But see* Carey, *The Hawthorne Studies: A Radical Criticism*, 32 AM. SOCIOLOGY REV. 403 (1967).

[289] *See* A. KAPLAN, *supra* note 1, at 130; E. NAGEL, *supra* note 259, at 468; Campbell, *Factors Relevant to the Validity of Experiments in Social Settings*, 54 PSYCHOLOGICAL BULL. 297, 308-09 (1957).

[290] *See generally* Simon, *The Effect of Predictions*, in READINGS IN THE PHILOSOPHY OF THE SOCIAL SCIENCES 447 (M. Brodbeck ed. 1968).

[291] B. BARBER, *supra* note 259, at 291. As Herman Schmid points out:

> The social scientist, as opposed to the natural scientist, is part of the system he studies. Even if he can try to study human society "from the outside," as if he were not part of it himself, *he cannot manipulate it or have it manipulated from the outside.* Human society must be manipulated and controlled from

We see here a striking similarity between behavioralism and law. In both instances the "norms" influence individuals through perceived meaning.[292] However, the behavioralists conscientiously try to avoid prescriptions.[293] Moreover, unlike legal norms, the validity of their conclusions do not ostensibly rest on acceptance because the populace views them as the product of the exercise of legitimate power.[294] In fact, the behavioralist attempts to minimize behavioral changes based on publication of his "descriptive" norms. Clearly, the reverse is true of those who promulgate legal norms.[295]

The double symbol process creates yet another significant difficulty. When persons study persons there is present a very high likelihood of projection and concomitant increment in instrument decay. As Maslow points out:

> It is easy to take the laissez-faire attitude with oxygen or hydrogen and to have noninterfering curiosity, to be Taoistically receptive, to let things be themselves. . . .
>
> But what happens with this framework of ideas and attitudes when we move over into the human and social realm, when we try to be objective about people we love or hate, about our loyalties or values, about our very selves? We are then no longer laissez-faire, impersonal, uninvolved, unidentified, without stakes. Accordingly it becomes far more difficult to be "laissez-faire objective" or "not-caring objective." Now there are new hazards.[296]

The *behaviorists*, led by John B. Watson, proposed to avoid these "new hazards" by eliminating the subjective in scientific analysis of

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within. Schmid, *Science and the Control of Social Science*, 12 THE AM. BEHAVIORAL SCIENTIST, Nov.-Dec. 1968, at 59.

292 "[W]hat physical science predicts . . . comes true independent of our volition. What law predicts . . . comes true because we are resolved to do what we said we would do." Hayakawa, *Semantics, Law and "Priestly-Minded Men"*, 9 W. RES. L. REV. 176, 179 (1958). *See also* W. GOLDSCHMIDT, *supra* note 52, at 63; MATHEMATICAL METHODS IN SMALL GROUP PROCESSES 237 (J. Griswell, H. Solomon & P. Suppes eds. 1962); Cahn, *supra* note 180, at 9-10; Cowan, *supra* note 180, at 499-503.

293 *See* text accompanying note 25 *supra.*

294 *See* Lewis, *supra* note 60, at 531-63; Morris, *Justice and Scientific Method*, 60 COLUM. L. REV. 936 (1960). There is some evidence that the appeal to legitimacy is itself a myth. *See* Ladinsky & Silver, *Popular Democracy*, 1967 WIS. L. REV. 128, 167-68. *But see* Murphy & Tanenhaus, *Public Opinion and the United States Supreme Court: Mapping of Some Prerequisites for Court Legitimation of Regime Changes*, 2 L. & SOC'Y REV. 357 (1968); Selznick, *The Sociology of Law*, in 9 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 50, 53 (1968). *See also* Hart's discussion of the obligation-obligatory distinction in H.L.A. HART, *supra* note 127, at 80-81.

295 For a comparison of legal conflict resolution and behavioral science decision-making, see Cranberg, *Law—Scientific and Judicial*, 56 AM. SCIENTIST 244 (1968); Hazard, *Limitations on the Uses of Behavioral Science in the Law*, 19 CASE W. RES. L. REV. 71 (1967); Loevinger, *supra* note 17.

296 A. MASLOW, *supra* note 259, at 115.

behavior.[297] As Woodworth notes, however, Watson's behaviorism consisted primarily of "thou shalt nots": Ignore the mind, speak not of consciousness, cease introspecting, eliminate mentalistic concepts, forget act meaning.[298] But that's just the rub. Without attention to act meaning and its concomitants, the central variable is omitted — scarcely enhancing the comprehensiveness required of scientific theory. And so it is that the behaviorist's dodge is unacceptable to behavioralists, who generally "accept introspective *reports* by experimental subjects, not as statements *about* private psychic states of the subjects but as observable verbal responses the subjects make under given conditions."[299]

When consciousness is taken into account the operational prescriptions of classical science seem impossibly rigorous. How does one measure the referents of consciousness, whatever they are? Unlike physical entities, there is no public access to consciousness. How can an individual himself even know that he uses his mental language correctly? What evidence is there of consciousness? Is this last question like asking what evidence there is of evidence? In the court of science, facts are admissible only if subjected to the rigors of certain operational procedures. Consciousness, it seems, is not a scientific fact. Yet we cannot deny it. We can ignore it, but only at the cost of an omission that eliminates the comprehensiveness also prescribed by scientific norms. The logical positivists would dismiss as "meaningless nonsense" questions about consciousness and soul, unless subject to verification or at least to disconfirmation. Many physical scientists, however, have abandoned the foundering ship of logical positivism, perceiving how narrow the Homeric straits it too must negotiate — including the competing demands of phenomenalism and phenomenology. Ironically, to steer a better course requires a behavioralistic navigator as well as a classical scientist. We have seen that science has learned that it too must take the perturbation of the observer into account, a fact well known after the discovery of the *personal equation* in the early 19th century by the astronomer Bessel. We now know that man is spontaneously active, and needs an organized input. Yet we know that he can think of the nonexistent. It appears that a complementary approach

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297 *See, e.g.*, J. WATSON, BEHAVIOR 9 (1914).

298 R. WOODWORTH, CONTEMPORARY SCHOOLS OF PSYCHOLOGY 71 (rev. ed. 1948).

299 E. NAGEL, *supra* note 259, at 477. *See also* Fendrich, *A Study of the Association Among Verbal Attitudes, Commitment, and Overt Behavior in Different Experimental Situations*, 45 SOCIAL FORCES 347 (1967).

is required, recognizing validity in both phenomenalism and phenomenology, with special attention given to what Moore would term linguistic pathology lest we encapsulate ourselves in semantic boxes.

It is so crucial that we again here emphasize that what is ignored in the physical science will not affect its subject matter. But if we ignore consciousness, and soul, and all manner of other transcendent things not subject to disconfirmation, we shall indeed change, and not necessarily for the better. The behavioralist's theories may become isomorphic with reality, but at what cost!

C. *Decisionmaker*

Unfortunately there is all too little information about the characteristics of scientists, *i.e.*, those who do science.[300] If we are to appreciate the process by which scientific developments occur, then it behooves us to understand the relation of particular personal attributes to outstanding skill in doing science.[301] Many generalizations are profferred, such as those that younger scientists make the most significant breakthroughs,[302] and that Catholic scientists are less productive than Protestants.[303] It is difficult to be more specific. Maslow, who has studied the subject extensively observes that scientists do not all fit the usual conservative stereotype,[304] although he finds that most scientists are defensive and deficiency motivated.[305] Some scientists enjoy the pleasure of sloppiness, others neatness. They do generally feel that doing science is a worthwhile and virtuous sort of activity, thus justifying the scientific enterprise.[306]

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[300] *See* Hagstrom, *Scientists*, in 14 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL SCIENCES 107 (1968); Kuhn, *The History of Science*, in *id.* 74, 80-81.

[301] *See* A. MASLOW, *supra* note 259, at 7, 148. It has often been noted, however, that social conditions constitute a significant variable in engendering scientific discoveries. *See* E. BORING, A HISTORY OF EXPERIMENTAL PSYCHOLOGY 3-24 (2d ed. 1950).

[302] Newton was 24 when he postulated his theory of gravitation, Lavoisier near 30 when he demolished the theory of phlogiston, Maxwell 24 when he accomplished his greatest discoveries, Einstein 26 when he propounded the special theory of relativity, Bohr 28 when he offered his model of the atom, and Heisenberg 27 when he set forth the principle of uncertainty. Dalton was 40 when he propounded the Chemical Atomic Theory, but then he was only a neophyte in chemistry, his background being in meteorology. *See* R. CALDER, *supra* note 259, at 32.

[303] *See* B. BARBER, *supra* note 259, at 90, 186. *But see* Hagstrom, *supra* note 300, at 109.

[304] *See* J. BARZUN, *supra* note 228, at 61; A. MASLOW, *supra* note 259, at 2; Merton, *Behavior Patterns of Scientists*, 38 THE AM. SCHOLAR 197 (1969).

[305] A. MASLOW, *supra* note 259, at 22-23.

[306] *See id.* at 127.

Science, however, is a human creation, and persists, just as culture, only so long as it is recreated and applied by scientists — who are subject to the same type of proception problems that beset all of us.[307] Yet, the scientist who writes a report of his findings does not indicate his values, except obliquely, nor does he tell how he arrived at his conclusion.[308] Unfortunately, very little has been accomplished by behavioral scientists, including behavioralists, in their attempts to ascertain the extent to which the personal dispositions of a scientist influence the growth and elaboration of scientific theory.[309] As noted above, however, it is clear these variables do appreciably affect scientific behavior.[310]

Objectivity and the "empirical attitude" are chimeras for science as well as for the law. Scientists are influenced by their motives[311] and the purpose for which they conduct various investigations.[312] The behavioralist might well ask what type of individual is attracted to the scientific community and what the effect is of the input of such individuals.[313] Scientists, like judges, are only human, and subject to man's usual foibles and weaknesses. They are thus influenced by the existing scientific dogma and their more prestigious colleagues.[314] The bandwagon effect, fad and fashion, are not un-

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307 *See* Miller & Howell, *The Myth of Neutrality in Constitutional Adjudication*, 27 U. CHI. L. REV. 661, 666-67 (1960).

308 *See* Barber & Fox, *The Case of the Floppy-eared Rabbits: An Instance of Serendipity Gained and Serendipity Lost*, 64 AM. J. SOCIOLOGY 128 (1958).

309 *See* Merton, *Foreword* to B .BARBER, *supra* note 259, at 7, 9.

310 *See* R. DUBOS, LOUIS PASTEUR, FREE LANCE OF SCIENCE ch. XIII (1950); E. Nagel, *Naturalism Reconsidered*, in LOGIC WITHOUT METAPHYSICS 3, 5 (1956); Barber, *Resistance by Scientists to Scientific Discovery*, 134 SCIENCE 596 (1961); Barber & Fox, *supra* note 308, at 253.

311 What motivates any particular scientist is not easily determined. For some it may be the lust for knowing or *libido sciendi*. J. BARZUN, *supra* note 228, at 112; Barber, *supra* note 259, at 97-98. *See generally* Merton, *supra* note 304.

312 Alfred North Whitehead has remarked: "Scientists animated by the purpose of proving that they are purposeless constitute an interesting subject for study." A.N. WHITEHEAD, THE FUNCTION OF REASON 12 (1929). *See* J. BARZUN, *supra* note 228, at 99, 105. It is important to keep in mind that proception is involved in all phases of scientific decisionmaking, including description and observation. "Observation is purposive behavior, directed toward ends that lie beyond the act of observation itself: the aim is to secure materials that will play a part in other phases of inquiry, like the formation and validation of hypotheses." A. KAPLAN, *supra* note 1, at 127.

313 Donald E. Super has noted: "Research suggests that people differ in the kinds of problems they are good at solving . . . so perhaps they find roles in organization where the required decisions or decision phases are compatible with their skills." D. SUPER, THE PSYCHOLOGY OF CAREERS 19 (1957). A "good" scientist must be able to select good hunches and possess a keen sense of relevance for significant problems. *See* A. MASLOW, *supra* note 259, at 121-22.

314 Suggestions by individuals regarded as experts are given extra weight in most instances. *See* D. JOHNSON, THE PSYCHOLOGY OF THOUGHT AND JUDGMENT 295-96

known in scientific matters. When new and dramatic developments come to light, they are not always immediately accepted. For example, Max Planck, commenting on the cold reception given to his Quantum Theory, observed: "A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."[315]

When persons study persons it is even more difficult to maintain an "objective" attitude than in the physical sciences. This is necessarily so if teleological aspects of act meaning are understood only through some mental operation like verstehen. It is, of course, debatable whether action meaning can ever be equivalent to act meaning, given the unique nature of both the observer and the observed.[316] As Allport points out:

> Understanding another is often like understanding an unfamiliar metaphor. In Walt Whitman's phrase, "the wide unconscious scenery of my land," for every single word, of course, we have past associations — but not for this new combination. Never have we heard the phrase "unconscious scenery." But suddenly it conveys a feeling for the unplanned variety of the American landscape.
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> . . . .
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> Each person is much like a novel metaphor. Separate past experiences do indeed enter into our comprehension, but their impact is in no sense additive. It is not exclusively our habits that determine our comprehension; the outside pattern is also determinative.[317]

(1955); Suppes & Schlag-Rey, *Analysis of Social Conformity in Terms of Generalized Conditioning Models*, in MATHEMATICAL METHODS IN SMALL GROUP PROCESSES 334, 336 (J. Criswell, H. Solomon & P. Suppes eds. 1962).

[315] M. PLANCK, SCIENTIFIC AUTOBIOGRAPHY AND OTHER PAPERS 33-34 (1949). Von Bertalanffy found himself ridiculed when he first proposed the systems theory approach. *See* L. VON BERTALANFFY, *supra* note 187, at 87, 113. This is scarcely consistent with statements like "novel ideas in the exact sciences are taken seriously and have consequences when they have gained a hearing with a small group of leading specialists." E. BETH, *supra* note 127, at 7. For a case in point, see the discussion of Dr. Immanuel Velikovsky's work and its reception in 7 THE AM. BEHAVIORAL SCIENTIST, Sept. 1963. *See also* Barber, *supra* note 310.

[316] Michael Polanyi would generalize even more by contending that "all knowledge is based on a measure of personal participation." Polanyi, *Science and Man's Place in The Universe*, in SCIENCE AS A CULTURAL FORCE 54 (H. Woolf ed. 1964).

[317] G. ALLPORT, *supra* note 38, at 530-31. Polanyi illustrates the dialectic between the internal and external variables that constrain behavior and make it so difficult to separate act and action meaning by referring to a study by Lazarus and McCleary similar to the Hefferline, Keenan, and Harford study mentioned in note 165 *supra*. The Lazarus and McCleary study illustrated "subception" by presenting subjects with nonsense syllables in conjunction with a schedule of electric shocks. The subjects "learned" to anticipate the shocks, yet could not identify the syllables that acted as the signal for the shock. Polanyi dubs this phenomenon "tacit knowing." He goes on to state: "Such

Allport suggests that our approach to the understanding of a particular judge's personality

> [rest] on both inference and on configural immediacy. There are indeed sensory cues, empathic responses, coding instantiation — all as asserted by the inference theory. But these activities are normally subservient to the structuring process of the mind that takes place under the guidance of external pattern, sustained by the demand character of the human being. Thus, our understanding comes partly from within, but also partly from without. In any given instance of understanding it is not possible to separate the contribution of inference from the contribution of objective configural perception. Both are present.
>
> Personality is, verily, a work of art. Unless we view it in detail and in comparison with others, our impression remains naive. But unless we keep the objective pattern uppermost we start with analysis and end with irrelevancy. Along the way we sacrifice our chance to understand the living person. *Only by keeping objective pattern as the center of our interest and attention can we employ analytical or inferential knowledge appropriately.*[318]

This means that as a decisionmaker the successful behavioralist must know his field — the valid generalizations, empirical findings, and methods that constitute the accumulated store of knowledge at his disposal. But he must also be something of an artist if he is to fathom the workings of the individuals he studies. For Allport, the good judge of others manifests (1) experience, (2) resemblance to subject studied, (3) intelligence, (4) cognitive complexity, (5) self-insight, (6) social skills, (7) detachment, (8) esthetic attitude emphasizing a tendency to look for the intrinsic harmony of the subject studied, and (9) intraceptiveness.[319] Again, our difficulty relates back to our substantive Heisenberg analogue. How is one to determine who constitutes a competent observer? The predicament of regressive confidence in the physical sciences is mitigated by the check of disconfirmation, whereas in the behavioral sciences the competent or "regularized" observer, given his prestige, may decree an isomorphism that negates disconfirmation. It is, therefore, of crucial importance that we bear in mind the distinction between objectivity and value-free orientation. We certainly want behavioralists to manifest objectivity in the sense that they are free from bias in assessing observed facts. We cannot accept behavioralists, how-

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is the *functional relation* between the two terms of tacit knowing [shock syllables — first term; shock — second term]: *we know the first term only by relying on our awareness of it for attending to the second.*" Polanyi, *supra* note 316, at 57.

318 G. ALLPORT, *supra* note 38, at 547-48. *See also* A. MASLOW, *supra* note 259, at 10-11.

319 *See* G. ALLPORT, *supra* note 38, at 503-11.

ever, who have a value-free orientation. Such an individual would have no preference for selection of significant questions, no sensitivity to nuances of value in the proceived other, and thus might detract rather than add to our store of significant knowledge.

D. *Institutional Context*

It is often contended that action meaning is culturally determined to such a degree that the proception of act meaning is necessarily culturally bound, rendering impossible a transcultural science of behavior.[320] As an example, Professor Kaplan relates the story of the Viennese analyst whose patient reported that he dreamed of placing items in the pigeonholes in his desk. The analyst was at a loss to explain why birds were kept in the office.[321]

Although the behavior of the observed and observer varies with the institutional setting, this does not mean that specific patterns in particular cultures are not produced by higher order patterns invariant from culture to culture.[322] It appears that esthetic values, a culturally determined variable, are not entirely culture-bound since *experts* from divergent cultures manifest a high degree of agreement.

> There is . . . a tendency for expert agreement to occur cross-culturally. . . . [This] means . . . that we have to look again at the well-accepted view that esthetic judgment is *completely* . . . relative. . . . It suggests . . . that we might look fruitfully for different kinds of relativity: for one, a relativity that is rooted in the differences between expert and nonexpert response to works of art; for another, a relativity that is in some way connected to certain objective characteristics in the works of art being judged. Thirdly, . . . we might look for a relativity that is located in or connected with the perceptual sets or personal dynamics that lead some people to become experts in the esthetic field, whatever their cultures or their localized training. Research . . . suggests that there are in fact definite human *types* . . . who tend either to become experts or to display untutored judgments which agree significantly with those of experts.[323]

It is also true that in the physical sciences the cultural matrix is not an insignificant variable.[324] However, the difference is that the

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[320] *See* G. ALLPORT, *supra* note 38, at 265; A. KAPLAN, *supra* note 1, at 139.

[321] *See* A. KAPLAN, *supra* note 1, at 167.

[322] *See generally* E. NAGEL, *supra* note 259, at 459-66.

[323] Child, *And the Bridge of Judgment that Crosses Every Cultural Gap*, PSYCHOLOGY TODAY, Dec. 1968, at 25, 29. *See also* F.S.C. NORTHROP, THE COMPLEXITY OF LEGAL AND ETHICAL EXPERIENCE 13 (1959).

[324] *See* R. ROSS, *supra* note 259, at 72.

physical sciences have developed an institutional process for refining theories, models, and methods, which is at best only embryonic in the behavioral sciences.[325] Barber states:

> We invoke the canons of scientific method; we demand consistency and clarification and repeated tests by different observers; we require that the evidence from all sides be pooled and new evidence gathered. This process of criticism is not infallible; but if the statements of fact that are accepted as such after methodical criticism are actually still biased in some degree, it does not mean that the distinction between fact and distortion finally fails; it means simply that the process of criticism has not been carried far enough. So we resume it, whenever we are confronted with a plausible charge of bias.[326]

It appears, then, that the institutional context of both law and behavioral science is far more determinative of the norms established by each discipline than is true in the physical sciences. Again, this is seen as largely a result of the difference between the referents. In the physical sciences the institutional context has become more developed because objective agreement is more readily attained when the referent is not affected by that agreement. In the case of law and behavioral science the consensus itself transacts with the referent, setting up complex morphostatic and morphogenetic processes that render "objective" agreement virtually impossible.

E. *Product*

The basic output of the behavioral science endeavor is elaboration of theories about behavior that ostensibly explain the behavior in question. But these theories, in contrast to formulations in the physical sciences, are generally characterized as correlational rather than theoretical because the rules of correspondence are so weak.[327] In the physical sciences it is possible to move from the empirical system to the theoretical symbol system, and then, generally through mathematical operations, to a relatively distant region of the symbol system and on to a predicted aspect of the empirical system. In the behavioral sciences only rough correlations exist, for which

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325 The relevance to objectivity has been noted. "Objectivity is closely bound up with the social aspect of scientific method, with the fact that science and scientific objectivity do not and cannot result from attempts of an individual scientist to be 'objective,' but from the cooperation of many scientists." K. POPPER, 2 THE OPEN SOCIETY AND ITS ENEMIES 205 (1945).

326 B. BARBER, *supra* note 259, at 311. *See also* R. ROSS, *supra* note 259, at 72; Braybrooke, *The Relevance of Norms to Political Description*, 52 AM. POL. SCI. REV. 989, 990 (1958).

327 *See* H. MORGENAU, THE NATURE OF PHYSICAL REALITY 27-30 (1950).

highly divergent theories are equally effective. What is more, these theories are often characterized as only common sense codified,[328] elaborations of the obvious,[329] or trivia camouflaged by terminological pyrotechnics. The position that behavioral science findings are common sense hiding behind a facade of esoteric notation and technique, superficially impressive by virtue of its apparent scientific and mathematical authority is one of Jacques Barzun's favorite themes. He cites Lionel Trilling's parodying sentence concerning Romeo and Juliet who, "their libidinal impulses being reciprocal, they activated their individual erotic drives and integrated them within the same frame of reference."[330] The Golden Rule is "another codification of considerations which should govern our choice of actions lest we end by suboptimizing in terms of our interpersonal objectives."[331] Barzun and Graff observe:

> We did not need to be told, after Mr. Orson Wells's broadcast of 1938 which announced a landing of men from Mars in New Jersey: ". . . a highly consistent structuration of the external stimulus world may, at times, be experienced with sufficient intensity because of its personal implications to inhibit the operation of usually applicable internal structurations or standards of judgment. . . ." All this says is: "A carefully designed hoax can be so frightening that you lose your head." If all that the laws of social science can tell us is that aunts are females and bogey-men scary, we shall more than ever need observers and researchers with a grip on the real world.[332]

Sometimes the trivia is dressed in mathematical garb. For example, we are told that:

$$C = \frac{T + S}{R}$$

This formula expresses the behavioral tautology that: "A criminal act is the sum of a person's criminalistic tendencies plus his total situation divided by the amount of his resistance."[333]

There are several obvious answers to the charge that behavioral science theories merely elaborate the obvious. First, this is not always so. For example, Schmidhauser has demonstrated that United

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328 *See* J. CONANT, *supra* note 259, at 34.

329 *See* R. ROSS, *supra* note 259, at 69-70.

330 J. BARZUN, *supra* note 228, at 176.

331 *Id.*

332 J. BARZUN & H. GRAFF, THE MODERN RESEARCHER 226 (1957).

333 D. ABRAMSEN, THE PSYCHOLOGY OF CRIME 37 (1960). *See* J. BARZUN, *supra* note 228, at 222. It is clear that in the formula set forth all that has occurred is a translation into mathematical notation of what is adequately expressed in words.

States Supreme Court Justices who have prior judicial experience have a greater propensity to overrule than those without any prior judicial experience — a conclusion contrary to that which common sense would dictate.[334] Lazarsfeld sets forth an entire list of *obvious* "common sense" conclusions about American soldiers in World War II. In each case he points out that the obvious was disproved by contrary empirical findings.[335] Second, stating *precisely* the obvious may be a decisive gain, especially if it enhances understanding of the relationship between interacting variables.

> The obvious sometimes has to be stated as a basis for what comes next. To say that the rich have different attitudes from the poor may be just a preliminary to detailing the differences, some of which are by no means obvious. Some experiments in perception — challenged by other investigators — suggest the startling conclusion that coins actually look larger to poor children than to rich ones. And sometimes the full meaning of the obvious escapes us unless it is stated explicitly.[336]

Clyde Kluckholn and Henry Murray explain:

> It is important to note that it is not a tensionless state, as Freud supposed, which is generally most satisfying to a healthy organism, but the *process* of reducing tension, and, other factors being equal, the degree of satisfaction is roughly proportional to the amount of tension that is reduced per unit of time.[337]

The relationship might be expressed in the following formula:

$$S = -K \frac{dT}{dt}$$

For many, the mathematical notation graphically reflects the relations of the relevant variables and enhances understanding; for others the notation automatically produces only a mental block. The use of mathematical notation and methods presents still another difficulty, perhaps best discussed under the language rubric, immediately below.

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[334] *See* Schmidhauser, *Stare Decisis, Dissent, and the Background of the Justices of the Supreme Court of the United States*, 14 U. OF TORONTO L.J. 194 (1962). *See also* Grossman, *Social Backgrounds and Judicial Decision-Making*, 79 HARV. L. REV. 1551, 1558-59 (1966).

[335] Lazarsfeld, *The American Soldier — An Expository Review*, 13 PUB. OPINION Q. 380 (1949).

[336] R. ROSS, *supra* note 259, at 69.

[337] C. KLUCKHOLN & H. MURRAY, PERSONALITY IN NATURE, SOCIETY, AND CULTURE 15 (2d ed. 1953). There are, of course, limits to the range of applicability of this rule. The *ceteris paribus* assumption is virtually ubiquitous in behavioral science theory.

F. *Language*

The language of the physical sciences is primarily mathematical. It may be that sometimes the reason we find thoughts adequately expressed in words translated into mathematical notation is "the higher prestige which the mathematical forms of the physical sciences have for [behavioral] scientists."[338] Generally, however, the pressure to mathematize is produced by an awareness of the utility of mathematical methods.

> The gain from mathematical reasoning is a high degree of orderliness in the exercise of the imagination. . . . Secondly, mathematical reasoning is the quickest and most economical method of developing a large number of hypotheses for verification. . . . Thirdly, mathematical symbolization is the most accurate and economical form of symbolization. . . . Finally, mathematical reasoning gratifies the aesthetic sense, the love of proportion and symmetry.[339]

But, as Rapoport points out, there are certain conditions that must be met before classical mathematical methods are validly applicable:

> First there must be sharply defined, quantitative variables singled out for study. . . . In the behavioral sciences the problem of recognition becomes paramount. Since these sciences have only recently arisen from the humanities, their terms are derived largely from common sense and from intuitive notions at best, and from deeply rooted pre-scientific notions and prejudices at most. . . . Where there is no consensus on recognition, there can . . . be no question of quantification or measurement and so the first requirement of exact . . . science seems to be not fulfilled.
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> . . . .
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> The other condition usually assumed necessary for an exact science is this. Given a set of unambiguously measurable variables, one must be able to choose some assumptions about how they are related which reasonably reflect "reality." It is conceded, of course, that only an idealization of reality can be reflected in any finite set of assumptions, but it is maintained that the idealization should at least come close to reality.[340]

The behavioralist's difficulties in meeting these conditions are well known. First, it is suggested that the unique character of be-

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[338] B. BARBER, *supra* note 259, at 41.

[339] Paterson, *Can Law be Scientific?*, 25 ILL. L. REV. 121, 124-25 (1930). To the same effect: "Social scientists were certainly aware, well before the last ten years, that a science is not really a science until it can formulate a precise chain of propositions, and that mathematics is the best means of expression for achieving this result." Levi-Strauss, *The Mathematics of Man*, 6 INT'L SOCIAL SCI. BULL. 581, 583 (1954). *See generally* J. KEMENY & J. SNELL, MATHEMATICAL MODELS IN THE SOCIAL SCIENCES 3-8 (1962).

[340] Rapoport, *Various Meanings of Theory*, 52 AM. POL. SCI. REV. 972, 977-78 (1958).

havioral systems precludes capturing their essential attributes in the type of precise metrical terms employed in the physical sciences.[341] Although more discriminating classifications are possible, there may be a limiting point "fixed by the general character of the problems [behavioral scientists] . . . investigate and the level of analysis appropriate for dealing with those problems."[342] Second, act meaning and other nuances, *e.g.*, the variables relevant to the Rosenthal effect, are not yet quantifiable, and thus not subject to classical mathematical treatment.[343]

> The empirical experience on which one's understanding of the social world is based consists to a large extent of symbolic expressions of other individuals; one can apprehend these expressions directly because one is himself part of the social world he observes. Such apprehension must inevitably take place on a largely unconscious level unamenable to mathematical expression (which is surely the acme of consciousness).[344]

It is said that only if act meaning is ignored will the facts be amenable to mathematical methods. In this regard, one recalls the story told by a respondent of the Linsey investigation that no matter what he told the questioner, "he just looked me straight in the eye and asked, 'How many times?' "[345] The story illustrates the force of the "mystique of quantity."[346] Third, even if the problems noted were solved, any mathematical symbol system isomorphic with the behavioral system "would be too unwieldy to be useful — there are too many relevant variables and they are too intricately inter-

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341 Even the term "human nature" is highly ambiguous. *See* B. BARBER, *supra* note 259, at 39; A. KAPLAN, *supra* note 1, at 79.

342 E. NAGEL, *supra* note 259, at 507.

343 This follows from the fact that:

> The use of mathematical models is virtually synonymous with the construction of a quantitative theory of behavior. From a mathematical standpoint it is logically possible to have a theory of behavior that leads only to qualitative predictions. [There will be a tendency to make this response more often than that one.] However, it is difficult to find in the history of science, let alone in the history of psychology, theories of this sort that have had sustained empirical significance. From the systematic standpoint, a theory or model based only on qualitative distinctions leads to a small number of testable predictions. P. SUPPES & R. ATKINSON, MARKOV LEARNING MODELS FOR MULTIPERSON INTERACTIONS 283 (1960).

See also Barton & Lazarsfeld, *Methodology of Quantitative Social Research*, in A NEW SURVEY OF THE SOCIAL SCIENCES 151, 168 (B. Varma ed. 1962); Hurwicz, *Mathematics in Economics: Language and Instrument*, in MATHEMATICS AND THE SOCIAL SCIENCES 1, 2-3 (J. Charlesworth ed. 1963).

344 P. SUPPES & R. ATKINSON, *supra* note 343, at 283.

345 A. KAPLAN, *supra* note 1, at 171. *See* Etzioni & Lehman, *Some Dangers in "Valid" Social Measurement*, in 2 SOCIAL GOALS AND INDICATORS FOR AMERICAN SOCIETY 1, 2 (B. Gross ed. 1967); Paterson, *supra* note 339, at 126.

346 A. KAPLAN, *supra* note 1, at 172.

woven to permit treatment by existing mathematical techniques."[347] This is especially true where the unique nature of each individual is taken into account. Professor B. F. Skinner's critique of mathematical models in psychology reflects and amplifies all three criticisms:

> The properties which . . . make a paper doll more amenable than a living organism are crucial in a scientific account of behavior. No matter how many of the formulations derived from the study of a model eventually prove useful in describing reality (remember wave-mechanics!), the questions to which answers are most urgently needed concern the correspondence between the two realms. How can we be sure that a model is a model of *behavior*? What *is* behavior, and how is it to be analyzed and measured? What are the relevant features of the environment, and how are they to be measured and controlled? How are these two sets of variables related? The answers to these questions cannot be found by constructing models. (Nor is a model likely to be helpful in furthering the necessary empirical inquiry. It is often argued that some model, hypothesis, or theory is essential because the scientist cannot otherwise choose among the facts to be studied. But there are presumably as many models, hypotheses, or theories as facts. If the scientific methodologist will explain how he proposes to choose among them his answer will serve as well to explain how one may choose among empirical facts).[348]

There are any number of ways to respond to the contention that mathematical techniques are inapplicable to the behavioral sciences. To the charge of ambiguity and vagueness one would respond that ambiguity of reference is easily remedied by specifying the referent of the term and consistently adhering to that definition. Vagueness, while in many cases unavoidable, can be limited.[349] Further, it is not true that mathematics cannot deal with vague ideas. In fact, "[even] confused ideas have been put symbolically — in words and formulas — and this activity continues unabated in all fields of humor endeavor!"[350] Second, it is not true that mathematics cannot deal with the qualitative.[351]

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[347] Rapoport, *supra* note 340, at 978. *See also* Arrow, *Mathematical Models in the Social Sciences*, in THE POLICY SCIENCES 129, 151 (D. Lerner & H. Lasswell eds. 1951).

[348] Skinner, *The Flight from the Laboratory*, in CURRENT TRENDS IN PSYCHOLOGICAL THEORY 50, 61-62 (1961).

[349] Content analysis exemplifies one method for reducing the ambiguity of words. *See* P. STONE, D. DUNPHY, M. SMITH & D. OGILVIE, THE GENERAL INQUIRER: A COMPUTER APPROACH TO CONTENT ANALYSIS 4, 5 (1966). One method of reducing vagueness is to define meaning by weighting indicators. *See* A. KAPLAN, *supra* note 1, at 73-74.

[350] Morgenstern, *Limits to the Uses of Mathematics in Economics*, in MATHEMATICS AND THE SOCIAL SCIENCES 12, 25 (J. Charlesworth ed. 1963).

[351] It is suggested that mathematics is often used inappropriately because of a lack of

> Mathematics is *not* a science of quantities only; it does *not* require measurement; there is *no* fundamental difference between a simple addition with integers and that expressed by an integral. Mathematics does *not* necessarily need symbols other than words which, up to some degree of complication can adequately express mathematically ideas, state theorems, formulate proofs. Mathematics is *not* only a deductive science, it also uses induction — logical induction — for proof.[352]

This is not to say that one can start with precise terms, that in some situations a formula may serve only to obfuscate, that words may not be more appropriate for description, or that the metaphor or literary work may provide more understanding than mathematical methods.[353] Sophocles' *Oedipus Rex* is a case in point.

> If the Oedipus Rex is capable of moving a modern reader or playgoer no less powerfully than it moved the contemporary Greeks, the only possible explanation is that the effect of the Greek tragedy does not depend upon the conflict between fate and human will, but upon the peculiar nature of the material by which this conflict is revealed.[354]

Freud argued that *Oedipus Rex* reflects the conflict between a boy's sexual impulses toward his mother and aggressive impulses toward his father, whom he regards as a competitor for the mother's love. Thus *Oedipus Rex* is a literary "wish-fulfillment." Accepting Freud's premise, *Oedipus Rex* becomes more than an entertaining play. The embodiment of a basic conflict extant in human nature readily explains the contemporary vitality and appeal of the play. Perhaps the Freudian concept of the Oedipus Complex is best understood by reading *Oedipus Rex*, for the mind more readily grasps and retains material of a dramatic, concrete, and entertaining nature, rather than abstract.[355] Surely Freud was aware of the instructive

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understanding of mathematical concepts by behavioralists, and that if they would only ask, the mathematicians could develop new techniques adapted to the behavioralists' tasks. *See* MATHEMATICAL METHODS IN SMALL GROUP PROCESSES 1 (J. Griswell, H. Solomon & P. Suppes eds. 1962); Benson, *The Use of Mathematics in the Study of Political Science*, in MATHEMATICS AND THE SOCIAL SCIENCES 30, 51 (J. Charlesworth ed. 1963); Morgenstern, *supra* note 350, at 13, 15, 17.

[352] Morgenstern, *supra* note 350, at 14. *See also* Arrow, *supra* note 347, at 130.

[353] *See* R. ROSS, *supra* note 259, at 23; Langbaum, *The Mysteries of Identity*, 34 THE AM. SCHOLAR 569 (1965).

[354] S. FREUD, THE INTERPRETATION OF DREAMS, THE BASIC WRITINGS OF SIGMUND FREUD 308 (Modern Library ed. 1938).

[355] The validity of Freud's interpretation has been challenged most decisively by Malinowski who hypothesized that the child's reaction to the father was to an authority figure, not a competitor for a mate. *See* B. MALINOWSKI, SEX AND REPRESSION IN SAVAGE SOCIETY (1927); Lasswell, *A Hypothesis Rooted in the Preconceptions of a Single Civilization Tested by Bronislaw Malinowski*, in METHODS IN SOCIAL SCIENCES 480 (S. Rice

value of the myth. A modern psychiatric text describes the Oedipus Complex: "[T]here arises an attitude of sexual attraction on the part of the child toward the parent of the opposite sex, and one of rivalry and hostility toward the one of its own."[356] Such a definition falls far short of the richness and meaningfulness of the concept as developed in Sophocles' play. As a study in human nature, *Oedipus Rex* is as significant today as in 400 B.C. The character of Oedipus is presented in the context of the total man in a particular situation. He is portrayed as the self-confident man who through his own ability has raised himself to the supreme power in the state, finds himself checked and thwarted in his plan to relieve his people. His irascibility and determination to carry out his purpose are what would be expected of such a man. Oedipus in his refusal to be diverted from tracing out his lineage appears to be truly a person and not just a fascicle of traits.

Finally, mathematics has already proved its worth in the behavioral sciences.[357] George Miller identifies four modes of mathematics (discursive, normative, functional, and structural) that have proved useful to psychologists.[358] The discursive mode is employed where ordinary language is inadequate to express the complexity of a theory. No attempt is made to reason mathematically, rather the symbols are used to identify the variables, concepts, and interrelationships involved. Kurt Lewin's Field Theory is illustrative of the discursive mode.[359] The danger in the use of the discursive mode is that the behavioralist may forget that his data does not justify the numerical manipulations available where ordinal, interval or ratio scales are involved.[360] The normative mode is used where one seeks prescriptive guides to the best way to attain given goals. Game Theory is a good example of a normative use of mathematical meth-

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ed. 1931). The fit of both theories to the facts also illustrates again the problem of weak rules of correspondence that plagues the behavioral sciences.

356 A. NOYES, MODERN CLINICAL PSYCHIATRY 49 (4th ed. 1956). For an excellent discussion of the Oedipus Complex, see P. MULLAHY, OEDIPUS: MYTH AND COMPLEX (1948).

357 *See* MATHEMATICS AND PSYCHOLOGY (G. Miller ed. 1964). *See also* R. LUCE, R. BUSH & E. GALANTER, HANDBOOK OF MATHEMATICAL PSYCHOLOGY (1963) (2 volumes).

358 *See* MATHEMATICS AND PSYCHOLOGY, *supra* note 357, at 4-6.

359 *See* C. HALL & G. LINDZEY, *supra* note 175, at 201-15.

360 Where numbers merely serve to identify items, classes, or variables, only a nominal scale can be constructed, and bona fide mathematical reasoning is not appropriate. There are four scale types that measure either order, distance, or origin, or various combinations of these three characteristics: ordinal, ordinal with natural origin, interval, and ratio. *See* W. TORGERSON, *supra* note 269, at 16-17.

ods.[361] Behavioralists are, however, generally more concerned with describing than prescribing behavior.

The descriptive use of behavior involves the functional and structural modes. The functional mode is subdivided into determinate and stochastic applications. Examples of the determinate functional mode are provided by psychophysics and scaling techniques. The stochastic functional mode is illustrated in Shannon's statistical theory of communication.[362] The structural mode is illustrated by those theories that assume a "Markov chain" structure such that "there is a finite number of discrete and different states the system can get into, and events are generated as the system moves with given transitional probabilities over a highly structured network of paths between the various states."[363] Miller concludes that:

> [O]ne can argue that the complete literalness of computing machines and mathematical models is not a flaw, but is an essential source of their power and utility. The real trouble arises from the theorist's proclivity for confusing his model with the reality that his model represents; that affliction is not specific to mathematical theorists, but attacks us all equally. If, however, a theorist will refuse to overlook all the relevant phenomena he cannot explain and will agree to confess to any absurdities that his assumptions imply, then the literalness of mathematics provides him with a powerful way to test his own understanding.[364]

Mathematics, a highly specialized language, is, it appears, ideally suited for the scientific enterprise; and if its limits are appreciated, it is a useful tool for analysis of behavior. However, the precision and manipulative power of mathematics that enables us to derive logical relations and conclusions virtually without doing hard thinking, is possible only because the confusing ambiguity *and* meaningful richness of ordinary prose is eliminated. And yet, can we understand another without resort to a common symbol system capable of conveying the nuances of his concrete existence? We can in all seriousness contend that a sentence that is truly under-

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361 *See generally* R. LUCE & H. RAIFFA, GAMES AND DECISION (1957).

362 *See* Shannon, *A Mathematical Theory of Communication*, 27 BELL SYSTEMS TECHNICAL J. 623 (1948). Unfortunately, such theories are inapplicable to selection, choice, or decision where only one instance is involved. *See* Frick, *supra* note 64, at 617, 619. *But see* Ackoff, *Towards a Behavioral Theory of Communication*, 4 MANAGEMENT SCI. 218 (1957-58).

363 MATHEMATICS AND PSYCHOLOGY, *supra* note 357, at 222-23. Another noted application of the structural mode is provided by the factor analysis model of Thurstone, in which each factor was considered "a separate coordinate (axis, dimension) of a spatial framework in which the tests could be located." *Id.* at 235.

364 *Id.* at 291.

stood is more intimate than a kiss. Has anyone ever said that of an equation?

G. *Methods*

The life of a behavioralist is not easy. The foregoing discussion indicates how many difficulties immediately confront the judicial behavioralist in his attempt to arrive at a scientific explanation of a judge's behavior. The controlled experiment — s.o.p. for the physical scientist — is of no use to the behavioralist.[365] He cannot manipulate, prod, or poke at a judge, and if he did he certainly would not come to understand him.[366] Since persons are "so complex that every legitimate method must be employed"[367] to understand their behavior, it appears at the outset that the judicial behavioralist's task is immeasurably complicated in that he cannot use all the methods on a judge that he might on the ordinary layman.[368] Even then his problems would be considerable:

> [I]t is true that scientific observation and experiment often require some control of the subject matter and of the conditions of the in-

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365 Behavioralists generally find laboratory experiments of little value. As Kaplan notes: [I]n the laboratory . . . the motivations brought into play are relatively weak as compared with those which actually determine most of our behavior." A. KAPLAN, *supra* note 1, at 169. Rapoport observes:

> When it is proposed to simplify the situation by holding all but a few variables constant, it is pointed out (quite correctly) that, first, in many fields of investigation this is practically impossible . . . second, even where experimentation is possible, controlled conditions introduce distortions of such magnitude as to make extrapolations from controlled to natural situations worthless. Rapoport, *supra* note 340, at 978.

See also Allport & Postman, *The Basic Psychology of Rumor*, in 8 TRANSACTIONS OF THE N.Y. ACADEMY OF SCIENCES ser. II, at 61 (1945).

Barzun suggests that behavioralists find it "easier to use substitutes, such as rats and chimpanzees, and most recently cockroaches, which are said to show an amazing lust for learning." J. BARZUN, *supra* note 228, at 168. But even with animals it is dangerous to extrapolate from the laboratory to natural conditions. *See* H. KUMMER, SOCIAL ORGANIZATION OF HAMADRYAS BABOONS: A FIELD STUDY (1968).

366 *See* A. MASLOW, *supra* note 259, at 13, wherein the author observes: "If you [manipulate] . . . human beings you won't get to know them. They won't *want* you to know them. They won't *let* you know them."

367 G. ALLPORT, *supra* note 38, at 395. *See also* R. ROSS, *supra* note 259, at 73-74; Ashby, *The Effect of Experience on a Determinate Dynamic System*, 1 BEHAVIORAL SCIENTIST 35, 36 (1956). Sigmund Koch has recently contended that that complexity means that psychology cannot be a coherent science. *See* Koch, *Psychology Cannot be a Coherent Science*, PSYCHOLOGY TODAY, Sept. 1969, at 14.

368 Allport suggests that in understanding a person the behavioralist should employ: (1) Constitutional and physiological diagnoses; (2) studies of sociocultural membership; (3) personal documents and case studies; (4) self-appraisal reports; (5) conduct sampling; (6) ratings; (7) tests and scales; (8) projective techniques; (9) depth analysis; (10) analysis of expressive behavior; and (11) synaptic procedures. *See* G. ALLPORT, *supra* note 38, at 395-459.

> quiry. Such control is sometimes beyond the power of the social scientist. Observation is limited by the demand for privacy, and questions about private matters are not always answered truthfully. Experimentation is limited because it would often be inhumane, because failure might mean injury to life or personality, and because it might require too great a sacrifice on the part of the people experimented upon. How many mothers would give up their babies to psychological experiment for the sake of science? How can we dam the flow of war and crisis in order to have time and opportunity for research?[369]

There does exist, however, an array of techniques that can provide useful insights to the judicial behavioralist who seeks to peer past the purple curtain erected by the judiciary,[370] including questionnaires, content analysis of extra-judicial statements and judicial opinions, scaling techniques, and the promising simulation programs. The hard fact of the matter is that individuals, and judges in particular, are not nearly as amenable to study as molecules, although they are considerably more interesting and significant.

IV. THE BEHAVIORALIST AND JUSTICE HUGO BLACK: A CASE IN POINT

We have asked whether a scientific explanation of judicial behavior is possible. We have thus far examined the basic tenets and implications of the systems approach, giving special attention to personality — a complex adaptive system capable of operating at the high integration index level. The behavioral enterprise has been viewed from the perspective of seven significant parameters. In the process we have raised many perplexing problems confronting the judicial behavioralist who aspires to do science. In this section we get down to cases to illustrate concretely the many difficulties that *a* behavioralist would encounter in trying to explain scientifi-

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369 R. ROSS, *supra* note 259, at 71. For an excellent discussion of the problems of controlled inquiry facing the behavioralist, see E. NAGEL, *supra* note 259, at 452-58. Concerning the ethical problems involved, see Baumrind, *Some Thoughts on Ethics of Research: After Reading Milgram's "Behavioral Study of Obedience"*, 19 AM. PSYCHOLOGIST 421 (1964).

370 One who would study leadership on a collegial court faces, at the outset, what are clearly substantial obstacles. The "purple curtain" that hides much of the doings of courts of law is no accident. By design, great care is taken to safeguard deliberations leading to decision, and the conference room of the collegial court especially is considered inviolate. Such practices are neither arbitrary nor superfluous, since an important function of obscuring decisional processes is to sustain the myth of judicial objectivity which permeates the American judicial system. Ulmer, *Leadership in the Michigan Supreme Court*, in JUDICIAL DECISION MAKING 3, 14 (G. Schubert ed. 1963). *See also* Becker, *Surveys and Judiciaries, or Who's Afraid of the Purple Curtain?*, 1 LAW & SOC'Y REV. 133 (1966).

cally how *a* judge decides *a* case. We select for this sketch Mr. Justice Hugo Lafayette Black[371] and the case of *Griswold v. Connecticut*.[372] Our complete behavioralist, to whom we shall give the fanciful name of Dr. Jeremiah Pangloss, is entirely hypothetical. We shall assume that he is (1) sufficiently sophisticated to appreciate the systems and methodological problems involved; (2) a student of jurisprudence who will not make "insufficient use of jurisprudential insights";[373] and (3) a student of constitutional law capable of understanding the nuances of the judicial process.[374]

Dr. Pangloss, given our initial assumptions, is well aware of the complexity of the project. Within Justice Black all the psychophysical systems of the 7 by 3 matrix coalesce and are perpetuated and transformed during the dynamic process of systems transacting. The unique past of the Justice is absorbed and integrated into the unique and evanescent present, within the context of a dynamic cultural system continually recreated in act and artifact. Pangloss is naturally aware of the double-symbol process involved in the inquiry and that he too is an active participant, transacting with an equally complex set of systems. Imbued with the notions of sys-

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[371] The author is preparing an extensive analysis of Justice Black's judicial decisionmaking behavior. The material presented here is, of course, only illustrative.

[372] 381 U.S. 479 (1965).

[373] Jones, *A View from the Bridge*, LAW AND SOCIETY: A SUPPLEMENT TO THE SUMMER ISSUE OF SOCIAL PROBLEMS 39, 41 (1965). There are behavioralists who apparently feel traditional jurisprudential analysis can offer virtually no aid to the scientific study of judicial behavior. *See, e.g.*, Loevinger, *supra* note 17, at 488-89; Loevinger, *Some Reflections on the Jurimetrics Conference at Yale*, 1963, in JURIMETRICS CONFERENCE 11, 13 (L. Allen & M. Caldwell eds. 1965); Schubert, *Introductory Note to Chapter I*, in JUDICIAL BEHAVIOR: A READER IN THEORY AND RESEARCH 1, 9 (G. Schubert ed. 1964); Schubert, *Prediction from a Psychometric Model*, in JUDICIAL BEHAVIOR: A READER IN THEORY AND RESEARCH 548, 550 (G. Schubert ed. 1964).

[374] Given the training of most behavioralists, the last assumption is perhaps the most unrealistic, although the most crucial. For example, would most behavioralists appreciate the significance of Justice Black's dissent, without opinion, in Jones v. Louisiana, 392 U.S. 302 (1968)? The opinion of the majority of the Court is equally berift of lengthy explanation: "The motion to dismiss is granted and the appeal is dismissed for want of a substantial federal question." A dismissal in these terms, unlike a denial of certiorari, or a dismissal for lack of jurisdiction, is a decision on the merits. *See* C. WRIGHT, FEDERAL COURTS § 11, at 431 n.500 (1963). Since *Jones* appears after Duncan v. Louisiana, 391 U.S. 145 (1968) (holding the sixth amendment right to jury trial is applicable to the states), but before DeStefano v. Woods, 392 U.S. 631 (1968) (holding *Duncan* applicable prospectively only), it would seem that the Court is dealing with the scope of the right to jury trial in *Jones*, which involved a sentence of 1 year, rather than the prospective application of the *Duncan* rule. *But see* DeStefano v. Woods, *supra* at 633. Justice Black is therefore probably dissenting from a holding that the sixth amendment right to jury trial is not applicable to state trials where the sentence does not exceed 1 year. Federal precedents, based as they are on supervisory powers, are not applicable. *See, e.g.*, Cheff v. Schnackenberg, 384 U.S. 373, 380 (1966).

tems theory, he will constantly attempt to keep the "big picture" in mind, always looking for the significant systems within which a particular system transacts, be it Black, the Court, or the behavioralist enterprise.

There are a number of ways that Pangloss could proceed. Probably, rather than turn immediately to the decisional variables of *Griswold*, he would first try to understand Hugo Black — the whole man — and the systems with which he transacts. Only then can Pangloss appreciate the array of personal dispositions that will guide Black's proception and resolution of the *Griswold* situation.

A. *Individual Characteristics of Hugo Black*

Pangloss would certainly attempt to ascertain precisely the nature of the constellation of personal dispositions that Black brings with him to the bench. To understand the relevant content and structural variables, how they interrelate, and how constant and propriate they are requires a close examination of Black's past. Thus, Pangloss might commence his inquiry by searching the relevant biographical data.[375] He would discover that Hugo Lafayette Black officially commenced transacting with the world on February 27, 1886, in Harlan, Clay County, Alabama. He would follow Black, and his family, from Harlan to Ashland. He would try to reconstruct Black's experiences in medical and law schools, and as a practitioner, magistrate of the Birmingham police court, county solicitor, Captain of the 81st Field Artillery, United States Senator, and finally as Justice of the Supreme Court. Throughout this inquiry a host of difficulties confront Pangloss. First, there is the problem of obtaining reliable data.[376] Second, given reliable data, what does it mean? The significance of Black's past acts is discerned only by attending to the cultural context within which they occurred. For example, Pangloss can understand Black's membership in the KKK only if he knows the place of the Klan in the scheme of things in Birmingham when Black joined.[377] As he proceeds with the inquiry,

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375 Extensive biographical data is available. *See, e.g.*, J. FRANK, MR. JUSTICE BLACK: THE MAN AND HIS OPINIONS (1949); C. WILLIAMS, HUGO L. BLACK: A STUDY IN THE JUDICIAL PROCESS (1950); D. Berman, The Political Philosophy of Hugo L. Black, May 1957 (unpublished thesis in Rutgers University Library).

376 For example, Justice Black's sister-in-law, Mrs. Robert Lee Black, reports that he never did farm work. *See* H. DAVIS, UNCLE HUGO: AN INTIMATE PORTRAIT OF MR. JUSTICE BLACK 34 (1965). Berman reports, however, that he picked cotton. *See* D. Berman, *supra* note 375, at 3.

377 Black's membership in the Klan is understood, however, only in the context of Alabama politics. Other notable and prominent Americans, such as Harry S. Truman,

Pangloss is aware that his newly-acquired understanding of Hugo Black is changing his own proception — instrument decay, the Halo effect,[378] and other subtle variables are involved.

The collection and analysis of the available biographical data would begin to provide Pangloss with some understanding of Hugo Black's idiographic complex adaptive system. Indeed, Gordon Allport would note with some satisfaction that a differential psychology could not predict that a young lad from Harlan, Alabama, would develop into a liberal New Deal Senator who would champion the rights of minorities and the common man to live the good life without undue interference from concentrated power groups — government or otherwise.[379] Here was a former member of the Alabama

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had joined the Klan as an expedient political move. *See* D. LOWE, KU KLUX KLAN: THE INVISIBLE EMPIRE 18-19 (1967). Supreme Court Justice Edward White was also a member of the Klan. *See id.* at 15. In Birmingham, the Robert E. Lee Klavern, organized in 1916 and the second oldest in the country, was in 1922, some ten thousand strong. *See* K. JACKSON, THE KU KLUX KLAN IN THE CITY 1915-1930, at 82 (1967). Actually, Black resisted for some time pressure from friends to join the local klavern. Daniel Berman reports that Herman Beck, a Birmingham Jewish merchant, urged Hugo to join so as to counteract the influence of troublemakers in the Klan. Berman adds:

> His reluctance [to join] was due to the fact that he was already involved with more fraternal orders than he could do justice to. Ideolgical disagreement was an insignificant factor. The Klan, like later Fascist movements, affected a kind of pseudoradicalism on specific social issues: it was against the corporations, for the "common people," and against what was viewed as Catholic intolerance. In economically depressed areas it stressed the desirability of raising wages by cutting off the influx of cheap immigrant labor. These ideas had considerable appeal to a young progressive, and Black was too much a product of his region to be repelled by the racism that went with them. D. Berman, *supra* note 375, at 17.

Black joined the Robert E. Lee Klavern on September 11, 1923, and remained a member for about 2 years. During that time he attended several klan meetings and even gave some speeches. The tone of his talks is exemplified by the following statement made in a speech he gave at a Klan state convention in Birmingham on September 2, 1926, shortly after he resigned from the Klan: "The great thing I like about this organization is not the burning of crosses, it is not attempting to regulate anybody . . . ." *Quoted in* D. Berman, *supra* note 375, at 18. *See also* ONE MAN'S STAND FOR FREEDOM 11 (I. Dilliard ed. 1963).

[378] The Halo effect refers to a bias whereby a rater judges an individual as low or high on all items because of his initial experience rating the individual.

[379] Justice Black's background is clearly not typical of a Justice of the Supreme Court. *See* Schmidhauser, *The Justices of the Supreme Court: A Collective Portrait*, 3 MIDWEST J. OF POL. SCI. 1 (1959). *See also* Grossman, *Social Backgrounds and Judicial Decision-Making*, 79 HARV. L. REV. 1551 (1966); Ladinsky & Grossman, *Organizational Consequences of Professional Consensus: Lawyers and Selection of Judges*, 11 AD. SCI. Q. 79 (1966). For a study parallel to that of Schmidhauser concerning the social background of the judges of the Norwegian Supreme Court, see Torgersen, *The Role of the Supreme Court in the Norwegian Political System*, in JUDICIAL DECISION-MAKING 221 (G. Schubert ed. 1963). *See also* Schmidhauser, *Stare Decisis, Dissent, and the Background of the Justices of the Supreme Court of the United States*, 14 U. TORONTO L.J. 194 (1962).

KKK, who exhibited no longer any tinge of racial[380] or religious discrimination.[381] He had not always looked with favor on importation of aliens, but that was due to his concern for American workers, in conjunction with his conviction that permitting easy immigration would lower wage levels. When he sloughed off this provincial misinformation, he retained the same content variable, but the structural variable changed.

It is true that Pangloss' analysis at this point appears more like that of an historian than a "scientist," but complex adaptive systems have a past that explains why they behave as they do. Awareness

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380 It is true that Black had not always acted without some hint of racial prejudice. In 1928, he appeared incredulous at the idea of letting the Negro in the South vote:

> Am I to understand that the Senator [William C. Bruce, Maryland] wants to let the negroes vote down there? Is that what he is talking for? . . . The Senator seems gradually to be going over that way. 69 CONG. REC. 8815 (1928).

The context, however, was such that Black was perhaps being sarcastic. For Senator Bruce's reply, see *id.* At other times we find Senator Black using the rather invidious phrase, "nigger in the woodpile," [*see* 71 CONG. REC. 4200 (1929)], and telling jokes about "the old Alabama darkey who went stealing chickens." *See Inside a Senate Investigation*, 172 HARPERS, Feb. 1936, at 276. In a 1930 campaign speech in Montgomery, Alabama, he spoke as a sentimental Southerner:

> The spirit of the Old South was there [at the inauguration of Jefferson Davis as President of the Confederacy] . . . true to the sublime instincts of Anglo-Saxon courage and devotion. *Quoted in* D. Berman, *supra* note 375, at 214.

It has also been suggested that as a practitioner Black took advantage of the racial bias of Alabama jurors in a 1921 case involving a Protestant minister who had killed the priest that had married the minister's daughter to a Puerto Rican. The *Birmingham News* reported that Black, representing the minister at his murder trial, "had Pedro Gussman [the Puerto Rican] summoned into the Courtroom and had him stand before the jurymen so that they could see the man whose marriage to Ruth Stephensen [the minister's daughter] precipitated the killing. Lights were arranged in the courtroom so that the darkness of Gussman's complexion would be accentuated." D. Berman, *supra* note 375, at 215, *quoting* undated newspaper clipping in Mr. Justice Black's scrapbook. The incident drew unfavorable comments in a Catholic editorial attacking Black's appointment to the Supreme Court. *See Talent Rewarded: Mr. Justice Black*, 146 CATHOLIC WORLD, Nov. 1937, at 129. It is possible that this information could cause Pangloss to wonder if Black's official views concerning race are entirely congruent with his private attitudes.

381 When Hazel Davis wrote to Uncle Hugo in 1947 about her son Bob's intended marriage to a Catholic girl, he wrote back:

> It seems to me that you need not have too much concern about Bob's marrying the young Italian Catholic girl. Differences in religion can sometimes cause trouble between husband and wife but I have seen many such marriages work out well. And some of the most attractive women I have seen have been Italian. Certainly the fact that her people happen to have come from Europe a little later than ours did should make little difference. My sister's daughter married a Connecticut man who was a Catholic and of Italian extraction. So far as I have learned they have been very happy together. What you say about Rose Ann persuades me that she and your boy should be very happy also. I certainly wish them the best of luck. If I were you, I would not worry at all. Most parents usually have some reason why they think their children's marriages are likely to turn out badly, but the children themselves usually know best what to do. *Quoted in* H. DAVIS, *supra* note 376, at 52-53.

of process requires past data and postdiction before one can extrapolate and predict. An in depth analysis of Black's early life would provide invaluable insights into the inarticulate premises involved in many of the cases the Justice decides. And could Pangloss ever say that he "understood" Black without a look at the systems and institutions with which Black transacted in the past? The effect of family,[382] culture,[383] education,[384] and all Black's past experiences

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[382] Numerous examples come to mind. For example, Black's mother often related to Hugo how her ancestors had fled from a suppressed rebellion in Ireland. Justice Black was impressed by this fact. In 1962 he told Edmond Cahn, in a public interview: "Some of your ancestors came here to get away from persecution. Certainly, mine did." Cahn & Black, *Justice Black and First Amendment "Absolutes": A Public Interview*, 37 N.Y.U.L. REV. 549, 560 (1962). This surely helped to develop in Black a distrust for exercise of excessive power by anyone over others that is central in his thinking.

[383] Pangloss would find of interest the impact of Black on the Populist party which was quite popular in Clay County. The Populist movement sought protection of the rights of tenant farmers, revision of mortgage laws, and general betterment of the living standards for farm laborers. This program appealed strongly to the impoverished, among whom Hugo learned his politics. Indeed, we can assume that during these early years Hugo's political philosophy began to develop under the influence of the political speeches, discussions with family and friends, and the Sunday sermons that generally reenforced the views of the Populist politicians, stressing love, charity, and the Golden Rule. Thus the basic objectives of the Populists, liberal Democrats, and the poor white population of Clay County imbued young Hugo with the value of antitrust laws, opposition to intervention of courts in labor disputes, and regulation of wealth by income taxation. Perhaps most significantly, he identified with the poor citizens of Clay County he saw suffering around him.

An economic study of the South, initiated by President Roosevelt, revealed in 1939 that the per capita income of that region was lower than any other in the country; the illiteracy rate was high; industrial development was minimal, and what there was, was not controlled by Southerners; interest rates were high while bank deposits were low; emigration from the South was resulting in the loss of the most creative and talented citizens. *See* NATIONAL EMERGENCY COUNCIL, REPORT ON THE ECONOMIC CONDITIONS OF THE SOUTH (1938), *discussed in* Durr, *Hugo Black, Southerner: I. The Southern Background*, 10 AM. U.L. REV. 27 (1961). Durr suggests that the deplorable condition of the South explains

> a great deal about Black's liberal record, particularly in the Senate. These were facts he had lived with all of his life. He had not merely observed and studied them objectively but had felt them personally when they were even grimmer than in 1938. He had seen them bearing down on his family and his friends and the neighbors with whom he had grown up in Clay County. . . . They were facts that account for the economic radicalism of some of the most demagogic of the Southern Senators and Representatives of the past, as well as the economic liberalism of some of the best of the present. Durr, *supra* at 28.

Medelman writes:

> Black grew up in the psychology of the time. Men were to be courteous but unyielding; they were to act from principle, paying no more than polite attention to peer groups, interacting-others, or any of the yet-uninvented euphemisms for pressure. They were kind to women, horses, good darkies, children, and old friends. They were implacable to opponents — of whom they cultivated many. Of the occupations, law and politics had the most prestige. Medelman, *Do You Swear to Tell the Truth, the Whole Truth, and Nothing but the Truth, Justice Black: He Does*, ESQUIRE, June 1968, at 115.

are what make him what he is. The pre-Court Black is a man capable of an amazing level of activity and productivity, independent, frank and straightforward. He has great discipline, completing demanding programs for self-improvement. He is firm, yet gentle, with a gift for humor. Already his writing is succinct and cogent, with historical references and examples quite prominent. His value system includes a distrust in anyone having an inordinate power over others.[385] His life in Clay County developed a strong identification with the poor and the working man, who in some instances need society to regulate themselves for the common good. The realm of *thought* is not, however, a proper subject for governmental regulation.[386] In this regard Black appears to believe that if channels of communication are left open and the people are given the opportunity for education and access to relevant information, they will arrive at enlightened and intelligent decisions. Given these beliefs, Pang-

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[384] For a discussion by Justice Black concerning his legal education, see Black, *Reminiscences*, 18 ALA. L. REV. 3 (1965):

> Working with Walker's AMERICAN LAW and other textbooks, Judge Thorington and Judge Sommerville helped my classmates and me to learn the basic principles of the law as it then existed. They taught us, as I recall, that legislators not judges should make the laws. Neither of them used the modern case system of teaching law. Instead of it they used the "if-so, why-so," and "if-not, why-not" system. These two great instructors not merely taught me how to get a diploma but did their dead-level best to teach me how to think and to challenge. I cherish their memories. *Id.* at 10.

Black was apparently quite impressed by Walker's text. That conclusion rests on two different grounds. First, he specifically recalls the text 60 years later, and second, his views are sometimes strikingly similar to those expressed in the edition he read in law school. For example, Walker stated in his textbook:

> Our country claims the transcendent merit of having made the first grand experiment of limiting delegated power by written constitutions. T. WALKER, INTRODUCTION TO AMERICAN LAW 67 (11th ed., revised by C. Bates 1905).

Mr. Justice Black years later wrote:

> It is of paramount importance to me that our country has a written constitution. . . . And I am proud to say that since it was written and signed in 1787, our Constitution has been a model for other experiments around the globe where men have attempted to establish governments controlled by the people themselves. H. BLACK, A CONSTITUTIONAL FAITH 3 (1968).

For an informative study demonstrating the impact of education on a Justice, see Paschal, *The Education of a Justice*, 1 J. LEGAL ED. 333 (1949). Concerning what type of student goes to law school, see note 389 *infra*.

[385] During his term as a Senator, Black spoke of power:

> What difference does it make to whom you give too much power? Too much power is dangerous, whether it be vested in a government or a group of specially privileged plutocrats, in a religious group, or in any other group. The real liberty . . . has not stood for concentration of power in a centralized government or in the hands of any particular group. 75 CONG. REC. 3517 (1932).

[386] Senator Black's views about freedom of expression were manifested when the Smoot-Hawley Tariff Act was under consideration in 1929. One tariff provision authorized exclusion of "obscene" or "subversive" books. Senator Black's statement in opposition to this provision indicates not only his early free expression views, but his bent to historical justification of those views. *See* 71 CONG. REC. 4468-4469 (1929).

loss could predict a great deal of Justice Black's judicial behavior, without ever reading any of his judicial opinions.[387]

Pangloss, however, a complete behavioralist aware of the necessity of obtaining all the relevant data and of taking complementary approaches to understand his subject, knows that when Hugo Black ascends the bench he is involved in a new ball game. It is true that Hugo Black remains basically the same person but the role has changed, and a whole new set of transacting systems are involved.[388] Because he must attend to Black's intentions and role conceptions, Pangloss now must place himself in the position of a Justice to appreciate the context of his transacting. He must consider how the legal system differs from his own behavioral enterprise in regard to the seven parameters with which we earlier considered behavioralism. Given an entirely different type of training this is no mean feat, and yet the act meaning of his subject will forever elude him unless he can make the translation. Pangloss will ask himself what might be the effect of a self-selection process whereby different types of individuals enter the legal profession?[389] What is the ef-

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387 Pangloss would probably agree with Fred Rodell's assessment of Black:

> [T]he point is not that Black is sometimes inconsistent — which, like all Justices, he is — or intellectually dishonest, which he most assuredly is not. The point is rather that here the stark words of the Constitution, there an exegesis that puts words into the Constitution, here judicial deference, there judicial nondeference, are used as argumentative tools to make more juridically respectable and intellectually compelling the results that Black wants to reach for essentially quite different reasons. Among the more obvious of these reasons, or motives, are his passionate devotion to personal liberties, his greater concern for the poor than for the rich and for people than for business organizations, and his comparative indifference to the regulatory or tax burdens imposed on either personal or corporate wealth presumably for the general public good. These predilections and others, such as his strong sympathy for labor, were all readily predictable when he came to the Court — from his early background, his hard-won self-education, and particularly the nature of his pre-Court legal and political careers. And his votes on the Court, although always bolstered by an impressive display of legal learning, have been and remain predictable with far greater accuracy from his many-faceted evangelical yet practical humanitarianism, than from any complex of abstract jurisprudential principles. Rodell, *supra* note 257, at 703.

388 *See* Lewis, *supra* note 60, at 552, n.105. On the significance of the judge's view of his role see studies cited *id.* at 546, n.79.

389 *See, e.g.*, Watson, *The Quest for Professional Competence: Psychological Aspects of Legal Education*, 37 U. CIN. L. REV. 93, 94-96 (1968). Eron and Redmount report, on the basis of their findings:

> [F]reshmen law students, as a group, give test evidence of a significantly greater degree of anxiety and cynicism than freshmen medical students. They reflect a significantly greater degree of cynicism than freshmen nursing students but are not significantly different with respect to level of anxiety. The test scores suggest that the law students are, initially, significantly less humanitarian in outlook than the nursing students but do not differ substantially from the medical students on this factor. Freshmen law students, therefore, in com-

fect of the difference between his situation and that of Black by virtue of a divergence in goals,[390] institutional context,[391] problems

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parison with other freshmen student groups in this study are, initially more cynical and either more anxious or less humanitarian . . . . These results may lead to some serious questions. Do law schools singularly attract students who are somewhat more uncertain and uncomfortable in their personal adjustments and, in addition or instead, are more blightingly skeptical in their attitudes than students who apply to other professions? Eron & Redmount, *The Effect of Legal Education on Attitudes*, 9 J. LEGAL ED. 431, 438 (1957).

On the effect of legal education, the authors conclude:

> Medical students reflect significantly more cynicism at the completion than at the beginning of their training, while legal training appears to be associated with a significant lessening of blightingly skeptical attitudes. . . . The law students, at the end of their training, are significantly more humanitarian in outlook than before, the nursing students significantly less so, and the medical students essentially unchanged. *Id.* at 440.

See generally Little, *Pawns and Processes: A Quantitative Study of Unknowns in Legal Education*, 21 J. LEGAL ED. 145 (1968); Patton, *The Student, The Situation, and Performance During the First Year of Law School*, 21 J. LEGAL ED. 10 (1968). Unfortunately, but not surprisingly, some of the most able students drop out of law school. *See* Miller, *Personality Differences and Student Survival in Law School*, 19 J. LEGAL ED. 460, 465 (1967). For comparative studies, see Pal, *Personality Patterns of Engineering, Law, Medical, and Teacher-Training Students: A Comparative Study*, 74 J. OF SOCIAL PSYCHOLOGY 287 (1968); Pal, *Value Patterns of Engineering, Law, Medical and Teacher-Training Students in India*, 37 BRITISH J. OF EDUC. PSYCHOLOGY 371 (1967). There are many mansions in the profession, each attracting different types of individuals. *See* Selinger, *Functional Division of the American Legal Profession: An Historical Prologue*, 21 J. LEGAL ED. 523 (1969). There is today a movement by young lawyers away from entering the corporate law practice that is consonant with the visible alienation of our youth. *See* Nader, *Law School and Law Firms*, THE NEW REPUBLIC, Oct. 11, 1969, at 20.

390 In situations where the law is called upon to resolve conflicts there are some obvious differences between the legal and scientific decisionmaking processes: (1) For the disputing parties, who are not often in the most receptive frame of mind, there is an immediate significance which attaches to the disposition of the case that is absent from scientific decisions. (2) Unlike the scientific development that is accepted only by virtue of its intrinsic persuasiveness, a judicial determination must be accepted by the litigants as binding because it is arrived at by properly constituted authority. This leads to the conclusion that any method of decisionmaking will work for the law, so long at it is decisive and maintains the appearance of justice and rationality. (3) The type of empirical inquiry required for verification where a new development in contemporary scientific theory is involved, is not found in ordinary litigation. Practically speaking it could not be, for neither the litigants nor society could bear the cost, although where significant judicial legislation is anticipated, it seems that far more empirical input is desirable if the law is to be functional and fully meaningful. (4) The law, as already noted, is idiographic in contrast to the nomothetic nature of science. Some believe this distinction is at the root of the divergence in perspective of the lawyer and the scientist that impedes communication between the disciplines. *See generally* Hazard, *Limitations on the Uses of Behavioral Science in the Law*, 19 CASE W. RES. L. REV. 71 (1967).

391 Science requires a collective effort. Whether a finding is scientific is determined by whether it meets the rigorous demands of scientific method, which purports to be the *exclusive* determinant of admission policies to the corpus of science. Its goal is truth, enlightenment, knowledge, or just simply "science." It postulates a purity of science — that the propositions and methods of scientists are arrived at only by efficient, logicoempirical operations. Moreover, it requires that the "scientific method" be pursued in validating fact and proposition; it demands control, prefers quantification and honors prediction as marks of scientific work. The scientific method in its finest state

presented for solution,[392] and the methods employed?[393] Even the language is deceptively different.[394] There are now new sources of

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permits experimentation, allows publication of findings, opens the propositions of unbiased testing, permits debate by the propounder of the theory, then operates within the scientific reception system to accept or reject that which has been proposed; ideally so, at any rate. This dimension, however, is not the *sine qua non* for valid scientific work. And in that lies one of the crucial distinctions between the legal as opposed to scientific decisionmaking:

> Law . . . is inseparably linked to political processes and to public understanding and acceptance. Every legal scholar in the United States might agree that a certain projected ordering of affairs would be just and socially preferable to that provided by the existing law, but that new proposal would not be law — "legal truth," if you will — until some high court or, in farther-reaching matters, some legislative body has authoritatively declared that it is to be the law. Jones, *Legal Inquiry and the Methods of Science*, in LAW AND THE SOCIAL ROLE OF SCIENCE 120, 125 (H. Jones ed. 1967).

[392] *See* note 390, *supra.*

[393] Today many contend the law would do well to apply the methods of science to the legal process. This contention overlooks not only the differences between the scientific and legal enterprises, but the crucial fact that any method will do for science so long as it produces a valid theory. In the legal process, however, the decisionmaker must have jurisdiction over the subject matter and the parties to the suit, and decide the case in accord with the dictates of due process. The fact that Dollree Mapp actually had in her possession obscene material was insufficient to convict her where the relevant evidence was obtained by offensive police practices that violated the dictates of due process. *See* Mapp v. Ohio, 367 U.S. 643 (1961). Professor Harry Jones comments;

> Certainly there are characteristics of scientific procedure that can be borrowed for the disciplining of legal inquiry. We must give more thought than we have so far in law to quantitative measurements of the measurable and to the design of procedures to measure the presently unmeasurable. We have a great deal to learn from science about the importance of casting the results of legal inquiry into a form permitting verification by others and about the central significance, for social inquiry, of rules of correspondence that will relate theoretical notions to observable societal data. But it is wildly uncritical to suggest that the methods of science can be taken over lock, stock, and barrel for investigation of the problems of law in society. [A scientist] . . . and I may be workers in neighboring vineyards, but I cannot easily copy his methods of cultivation for my very different soil and vines. Nor can he too easily copy mine, assuming for the moment that he would ever want to. Jones, *supra* note 391, at 123.

See also Loevinger, *supra* note 17, at 72.

[394] The "language of the law is a convenient label for a speech pattern with a separate identity," the customary language used by lawyers in those common law jurisdictions where English is the official language, although "the language of the law is not officially English." D. MELLINKOFF, THE LANGUAGE OF THE LAW 3, 10 (1963). It is suggested that the language of the law involves a peculiar type of directive utterance, and is distinguished from ordinary English in that it is precise, hortatory, impressive, and durable. *See* S.I. HAYAKAWA, LANGUAGE IN THOUGHT AND ACTION 107-08 (2d ed. 1963). This is natural, given the normative nature of law. In the place of direct assertion, lawyers' language asserts an obligation to believe, reflecting the prescriptive nature of the legal system. Although in the past legal verbiage may have concealed the actual reasoning process involved, today it appears that "courts and lawyers are not stopping with the conceptual phases. They are digging under them to see what lies there — to see what results are produced." Schaefer, *Forward* to *The Language of Law: A Symposium*, 9 W. RES. L. REV. 117 (1958). This is consonant with the current emphasis on the functional approach. *See* Lewis, *supra* note 60, at 528-30, 541 & n.54.

data to which Pangloss will turn. He would discover all sorts of differential data contained in scaling studies, content analyses, and the like.[395] He would, of course, read carefully all of Black's judicial opinions[396] (with an awareness of the process by which opinion drafts are circulated and altered), study his voting behavior, acquire texts of his numerous speeches, his letters, and whenever possible, observe the Justice's behavior.[397] Pangloss would like to sit in on

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395 For a discussion of these studies, see Lewis, *supra* note 176, at 7-9; Lewis, *supra* note 60, at 551.

396 Pangloss would discover that there is no dearth of opinions by Justice Black. As of June 1968, Mr. Justice Black, during his tenure on the Court, had individually dissented or concurred, and authored the majority (495), concurring (65), or dissenting (273) opinion in 1,709 cases. At the end of the October 1970 term, he will have served on the Court for 34 years, a tenure exceeded only by Justice Field (34½ years) and Chief Justice Marshall (34¼ years). *See* J. FRANK, MARBLE PALACE: THE SUPREME COURT IN AMERICAN LIFE 119 (1961).

If he relied only on the language in the opinions, valid as that is, Pangloss would miss significant aspects of his subject's behavior. For example, the religious fervor of Hugo Black was especially evident during the reading of his opinion for the Court in the 1962 school prayer case [Engel v. Vitale, 370 U.S. 421 (1962)], when he delivered with considerable emotion this extemporaneous remark: "The prayer of each man from his soul must be his and his alone." N.Y. Times, June 26, 1962, at 16, col. 7. *See also* D. GREY, THE SUPREME COURT AND THE NEWS MEDIA 40 (1968). Mr. Justice Black's devotion to religion is illustrated in Hazel Davis' report that "for a number of years he taught the largest Sunday School class for men in the state of Alabama. Each Sunday morning he got up at five o'clock, studying in preparation for his lesson to the men in the First Baptist Church, Birmingham." H. DAVIS, *supra* note 376, at 45.

397 Only a personal exposure to Justice Black can convey his dynamism. Fred Rodell offers some insight:

> And though much of [his] . . . magical dual quality [of mind and heart] marks his work on the Court and seeps from between the lines of his opinions for all who can read to see, it can only be felt full-strength in the living presence of Hugo Black himself.
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> My own first meeting with Black came in the early summer of 1937. He was then a U.S. Senator; I was doing a piece for a magazine on a law, the Merchant Marine Act, which was largely the product of his probing and his pen. He had given me meticulous directions how to find his office, but he need scarcely have done so. For, shortly after supper, when I reached that big and ugly barn, the Senate Office Building, every office was dark save one; one Senator alone was still at work. He got up from his desk to greet me — a compact man with the bounce of a boxer, the courtliness of a Southern gentleman and that friendly yet strong-in-depth look in his steady eyes. Just what we talked of makes no matter; it went well beyond the Merchant Marine Act. My chief recollection is of coming away, very late that night, not merely informed but strangely warmed and inspired. Rodell, *A Sprig of Laurel for Hugo Black at 75*, 10 AM. U.L. REV. 1 (1961).

John Medelman adds to the charisma with the following description:

> Beneath [his] . . . facial impassivity Justice Black sits badly. His foot taps; one hand punches the other; he tilts forward and then folds back; his body seems eager to rise and move something with his muscles.
>
> Then, when he begins to speak, that bodily energy pours up into his face; its warmth melts off twenty of his years. His blue eyes — his whole visage — gleam with a tough good humor which suddenly and openly [transforms] . . . to a gleaming anger, or to scorn. His voice is studded with the idioms and elisions of the small-town South. Possessing no unusual volume or sharp-

the judicial conferences, give Black projective and psychometric tests, ask for an introspective report of his decisionmaking process, run numerous depth interviews, and question his colleagues and friends.[398] But obviously, no matter how cooperative a Justice,[399] this is out of the question. Time, privacy, the demands of the judicial decisionmaking process — all combine to render such a program sheer daydream.

Pangloss would find a high degree of consistency between Black's pre-Court values and his judicial behavior. The expressive behavior remains relatively constant, although even in this regard the dynamic nature of Black's personality system is evident.[400] A careful analysis of Black's opinions will reflect a high degree of

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ness, it is a voice that carries. He developed it giving campaign speeches — folk orations from the beds of wagons. He was a Southern politician — and Southern politics, wrote a historian, was "an arena wherein one great champion confronted another or a dozen, and sought to outdo them in rhetoric and splendid gesturing. It swept back the loneliness of the land, it brought men together under torches, it filled them with the contagious power of the crowd." Medelman, *supra* note 383, at 115.

[398] Pangloss would surely study the impact on Black's behavior of the death of his first wife on December 7, 1951, and his marriage 6 years later to his former secretary, Elizabeth Demeritte. *See* H. DAVIS, *supra* note 376, at 39-41, 57, 74.

[399] Mr. Justice Black's willingness to cooperate with anyone who wants to see him would delight Pangloss. One of his former law clerks, Daniel Meador writes of Black:

> He is concerned only with his work; indeed there is no Justice more committed to the business of the Court than he. At the same time he carries this responsibility without the slightest show of pompousness. His own office at the Court, unlike some others, is furnished with little more than the standard government-provided equipment. He often walks down to the public cafeteria in the basement of the building to stand in line and eat with his clerks. Subject to the press of work, he is willing to see almost anybody at any time.

Meador, *Justice Black and His Law Clerks*, 15 ALA. L. REV. 57, 61 (1962). Others including Daniel Berman and Stephen Strickland have acknowledged Justice Black's willingness to cooperate. Strickland tells us that:

> In the course of my research, questions developed to which answers could not readily be found in his opinions or anywhere else in print. When I first asked for an interview to seek needed facts, I was a stranger to him; he was not aware that some of the participants [in the symposium effort] were men he knew until late in the course of the project; and even as the effort came to a close, he had no guarantee that my intentions were objective. Nonetheless, from the time of my first request over a year ago down to a recent telephone inquiry about a minor point, he answered my questions without questioning me — an unusual and admirable attitude in my view. Strickland, *Acknowledgements*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM at xiii (S. Strickland ed. 1967).

[400] Mr. Justice Black no longer cites law review articles and secondary sources as in the past. Bernstein contends that "[Black's] shift from heavy reliance on secondary materials to their apparent rejection appears to be contemporaneous with a shift in Justice Black's judicial philosophy." Bernstein, *The Supreme Court and Secondary Source Material: 1965 Term*, 57 GEO. L.J. 55, 77 (1968).

consistency in his behavior,[401] if certain extra-opinion variables are taken into account. Pangloss would quickly discern that the Justice operates cognitively at various integration index levels, depending on the subject matter of the case. For example, if Black proceives the case as one where only pure speech is involved, we are at a lower level since his cognitive behavior pattern is highly predictable, undifferentiated, constant, and minimally effected by changes in the external environment.[402] Of course, if he proceives the case as one involving more than pure speech, say conduct, then we move to a higher level where prediction is much more difficult.[403] The area of Black's views concerning application of the federal Bill of Rights to the states provides a good example of an area of higher level cognitive functioning where greater differentiation, change in structural and content variables, and a concomitant decrement in predictability is manifest. Pangloss would discover that in *Palko v.*

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[401] In spite of a general consistency, there are some instances of just plain reversals. For example, Black wrote of himself:

> I do not deny that I have on occasion reversed myself. A clear example of this was my vote with the majority in *West Virginia State Board of Education v. Barnette*, 319 U.S. 624, which overruled *Minersville School District v. Gobitis*, 310 U.S. 586, and held that a state law requiring school children to salute the flag and recite the pledge of allegiance contrary to their religious faith violated the First and Fourteenth Amendments to the Constitution. I had voted with the Court in upholding such a law in the earlier *Gobitis* case. Reluctance to make the Federal Constitution a rigid bar against state regulation of conduct thought inimical to the public welfare was the controlling influence that caused me to consent to the *Gobitis* decision. Long reflection convinced me that although the principle was sound, its application in the particular case was wrong, and I clearly stated this change of view in a concurring opinion in *Barnette* which Justice Douglas joined. Life itself is change and one who fails to recognize this must indeed be narrow-minded; thus I make no apology for such changes as are illustrated by the *Barnette* case, where, I might add, I took pains to point out just what I was doing. But this type of change is one thing and a change in basic constitutional philosophy is another. I think that I can say categorically that I have not changed my basic constitutional philosophy — at least not in the last 40 years. H. BLACK, *supra* note 384, at XV.

[402] Black would give the first amendment the broadest scope possible, Bridges v. California, 314 U.S. 252, 263 (1941), since it has a "preferred position" in our constitutional system. Breard v. City of Alexandria, 341 U.S. 622, 650 (1951); Marsh v. Alabama, 326 U.S. 501, 509 (1946). Where *wartime* and national security are involved his absolute view becomes relative. *See, e.g.*, Korematsu v. United States, 323 U.S. 214 (1944) (Black J., writing for the Court).

[403] For example, consider his views on picketing and demonstrations reflected in Tinker v. Des Moines Independent School Dist., 393 U.S. 503, 515 (1969) (dissenting opinion); Food Employees, Local 590 v. Logan Valley Plaza, Inc., 391 U.S. 308, 327 (1968) (dissenting opinion); Brown v. Louisiana, 383 U.S. 131, 151 (1966) (dissenting opinion); Giboney v. Empire Storage & Ice Co., 336 U.S. 490 (1949). *Compare* Teamsters, Local 695 v. Vogt, Inc., 354 U.S. 284, 295 (1957) (Black & Douglas, J.J., dissenting), *with* Thornhill v. Alabama, 310 U.S. 88 (1940).

Connecticut,[404] Black concurred in Mr. Justice Cardozo's opinion espousing the fundamental fairness approach. In *Hague v. CIO*,[405] he joined in Justice Roberts' concurring opinion that suggests that first amendment rights are applicable to the states via the privileges and immunities clause of the 14th amendment. In *Bridges v. California*,[406] an alien's rights were involved, and thus the privileges and immunities clause of the 14th amendment was inapplicable, applying by its very terms only to citizens of the United States. In *Bridges*, Black, for the Court, merely cited the language of *Schneider v. Irvington*,[407] to the effect that the first amendment is applicable to the states by virtue of the 14th amendment.[408] Justice Black finally concluded that the entire Bill of Rights is applicable to the states, just as it is to the federal government, by means of the due process clause of the 14th amendment,[409] a view never accepted by a majority of the Court.[410]

Pangloss knows that opinions are for all judges not only a report of a decision, but a vehicle for justifying decisions.[411] As the realists so ably demonstrated, how a decision is arrived at does not always appear in the opinion. And given Black's succinctness and frequent dissents without opinion,[412] inarticulate premises abound. It is easy for Pangloss to spell out superficially Black's official view of the role of the Court.[413] Pangloss would find that for Black the

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404 302 U.S. 319 (1937).

405 307 U.S. 496, 500 (1939).

406 314 U.S. 252 (1941). Ranyard West proposes that Black forgot to robe prior to delivering the opinion in *Bridges v. California* because the logical inference of the holding of the case is that judges are in general to be treated as other men. *See* R. WEST, CONSCIENCE AND SOCIETY (1945). Perhaps Pangloss should psychoanalyze Justice Black. *See* Schroeder, *The Psychologic Study of Judicial Opinions*, 6 CALIF. L. REV. 89 (1918).

407 308 U.S. 147 (1939).

408 314 U.S. at 263 n.6.

409 *See* Adamson v. California, 332 U.S. 46, 68 (1947) (dissenting opinion); Betts v. Brady, 316 U.S. 455, 474 n.1 (1941) (dissenting opinion).

410 Black's view, however, has almost won. Except for the fifth amendment's grand jury indictment provision, the eighth amendment's excessive bail and fine provision, and the seventh amendment, the first eight amendments are now applicable to the states through the due process clause of the 14th amendment. It is doubtful, however, whether in each case they apply to the states just as they do to the federal branch of government. *See, e.g.*, Bloom v. Illinois, 391 U.S. 194, 214 (1968). (Fortas, J., concurring).

411 *See* Lewis, *supra* note 176, at 30-33.

412 *See* note 396 *supra*.

413 Attempts to encapsulate Mr. Justice Black's value scheme are numerous. Consider, for example, Stephen Strickland's conclusion that the key to Black's judicial behavior is that he is a Madisonian:

> Somehow, Black's being a Madisonian is so obvious that people forget what that

fact that ours is a written constitution is most significant. The Constitution provides a blueprint that spells out the relations between federal and state governments, the various branches of government and the people in the government. The Court is the guardian of the Constitution which it interprets with the literal language as its guide.[414] In cases involving issues of the validity of legislative acts it would appear that Justice Black respects legislative power perhaps more than any other Justice. He believes that where the Constitution grants the Congress, or the states, power to legislate, then such power should not be frustrated by the Court. Thus, he interprets as valid and to be read liberally the Sherman Antitrust Act,[415] the federal labor laws,[416] and federal tax laws.[417] On the other

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means. But as his numerous particular reliances on Madison for his speeches and opinions suggest, and as the comprehensive record of his judicial career clearly shows, Justice Black has not forgotten. For Madison's chief fame is not as the promoter of the Bill of Rights; he was, as Black has specifically acknowledged, the Father of the Constitution. He was, further, the chief explainer and defender of every part of that Constitution by virtue of being the author of the majority of the Federalist papers.

It would be ludicrous to suggest, in the face of that evidence — in the face of Madison's cogent arguments in support of every governmental arrangement proposed in the Constitution — that the Bill of Rights was so important to him that he placed on a secondary level such provisions as those relating to the separation of powers, the legislative authority of Congress, the role of the Supreme Court, or the delineation of authority between the federal and state governments. Quite obviously, he did not. And neither, according to the *whole* record, does his devoted follower, Justice Black.

Black may consider that the Bill of Rights lies at the heart of the Constitution, just as he considers that the First Amendment *is* the heart of the Bill of Rights. But even if this is so, he would also assert that there are other vital organs. Key words in his 1960 Madison lecture at New York University Law School were: "I believe that *our Constitution, with* its absolute guarantees of individual rights is the best hope for the aspirations of freedom which men share everywhere."

Thus Black can be an "absolutist," albeit "modified," in applying the Bill of Rights; a "states' righter" in supporting the regulatory powers of the states; a "liberal" as regards construction of the Congressional commerce power; and a "libertarian" in applying the law in defense of free speech, free exercise of religion, and free exercise of belief. Strickland, *Black on Balance*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 245, 272-73 (S. Strickland ed. 1967) (footnotes omitted).

[414] *See* Reich, *The Living Constitution and the Court's Role*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 133 (S. Strickland ed. 1967); Reich, *Mr. Justice Black and the Living Constitution*, 76 HARV. L. REV. 673 (1963). *See also* H. BLACK, *supra* note 384, at 3-22.

[415] *See* Kirkpatrick, *Justice Black and Antitrust*, 14 U.C.L.A.L. REV. 475 (1967); Kirkpatrick, *The Development of Antitrust*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 195 (S. Strickland ed. 1967).

[416] *See* Rutledge, *Justice Black and Labor Law*, 14 U.C.L.A.L. REV. 501 (1967).

[417] *See* Paul, *Federal Taxation: Questions of Power and Propriety*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 163 (S. Strickland ed. 1967).

hand, where no explicit power is given to the federal government, he would leave to the states the power to regulate local affairs.[418]

There are certain rights, however, which individuals retain that are not subject to control by the state, and others subject only to minimal control. Here the behavioralist should examine Black's views concerning the Bill of Rights,[419] due process,[420] and specifically the first amendment,[421] the rights of the accused,[422] the right to trial by jury,[423] and the right to equal protection under the law.[424] So that judges will not have too much arbitrary power, Black would insist on a literal interpretation and incorporation approach to the Bill of Rights.[425] Actually the complex pattern of decisionmaking involved in the cases Black has decided is completely explained only by taking into account the values that we have noted he brought with him to the bench.[426]

Pangloss must correct not only for changes over time in Black's content and structural variables,[427] such as occurred in the area of the rights of aliens, due process, etc., but also for changes in the other complex adaptive systems with which Black transacts, including society, the Court, and its personnel.[428] For example, the demands

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418 *See* Barnett, *Mr. Justice Black and the Supreme Court*, 8 U. CHI. L. REV. 20 (1940).

419 *See* Black, *Mr. Justice Black, The Supreme Court and the Bill of Rights*, HARPER'S MAGAZINE, Feb. 1961, at 63; Black, *The Bill of Rights*, 35 N.Y.U.L. REV. 865 (1960). *See also* Dilliard, *The Individual and the Bill of Absolute Rights*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 97 (S. Strickland ed. 1967).

420 *See* H. BLACK, *supra* note 384, at 23-42.

421 *See id.* at 43-66; Ash, *The Growth of Justice Black's Philosophy on Freedom of Speech: 1962-1966*, 1967 WIS. L. REV. 840; Cahn & Black, *supra* note 382; Gordon, *Justice Hugo Black: First Amendment Fundamentalist*, 20 L. GUILD REV. 1 (1960); Kalven, *Upon Rereading Mr. Justice Black on the First Amendment*, 14 U.C.L.A.L. REV. 428 (1967). On Black's attitude toward freedom of religion, see D. Berman, *supra* note 375, at 109-17.

422 *See* D. Berman, *supra* note 375, at 118-55; Sutherland, *Justice Black on Counsel and Non-Voluntary Confessions*, 14 U.C.L.A.L. REV. 536 (1967).

423 *See* Green, *Jury Trial and Mr. Justice Black*, 65 YALE L.J. 482 (1956).

424 *See* Berman, *The Persistent Race Issue*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 75 (S. Strickland ed. 1967); D. Berman, *supra* note 375, at 204-21.

425 *See, e.g.*, Griswold v. Connecticut, 381 U.S. 479, 507 (1965) (dissenting opinion).

426 *See* note 387 *supra.*

427 *See* discussion at pages 392, 400 *supra.*

428 Pangloss would examine closely the effect of transactions with colleagues. What was the effect of the Chief Justices on his behavior? *See, e.g.*, A. MASON, HARLAN FISKE STONE: PILLAR OF THE LAW (1956); M. PUSEY, CHARLES EVANS HUGHES 773-74 (1951). *See generally* Mason, *Chief Justice of the United States: Primus Inter Pares*, 17 J. PUB. L. 20 (1968). What was the impact of his feud with Justice Jackson? Without a Felix Frankfurter could Justice Black have behaved as he did? *See* W.

made on the Court today, in contrast to the 30's, are quite different.[429] Feedback processes enormously complicate the process. To the extent that judges view society from the perspective of an equilibrium model they will tend to reenforce morphostatic processes. Adoption of a process model, with a recognition of the demands of ultrastability in a complex adaptive system operating at high integration index levels, would result in judges being more willing to set morphogenetic processes in motion, as in cases like *Brown v. Board of Education*.[430] Thus, Black is not only a product of his culture, but one who has helped transform the entire social system, during his dynamic systems transactions. The behavioralists and scientists are, of course, not without their own impact.

B. *Griswold v. Connecticut*

After completing his analysis of Black and both the past and present systems with which Black transacts, Pangloss now focuses his attention on how the Justice would decide a case such as *Griswold*. He notes that during the process of deciding a case, Black is receiving input from a variety of sources. The problems and issues that come before him are not entirely of his own choosing.[431] The problematic situation is presented initially by opposing attorneys, operating within an adversary system which tends "powerfully both to focus and to limit discussion, thinking, and lines of deciding."[432]

MENDELSON, JUSTICES BLACK AND FRANKFURTER: CONFLICT IN THE COURT (1961). And what of his close association with Justices Rutledge and Murphy? *See* F. HARPER, JUSTICE RUTLEDGE AND THE BRIGHT CONSTELLATION (1965); F. MURPHY, MR. JUSTICE MURPHY AND THE BILL OF RIGHTS (1965). *See generally* W. MURPHY, ELEMENTS OF JUDICIAL STRATEGY 45, 54, 58 (1964).

[429] *See* Frank, *The New Court and the New Deal*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 39 (S. Strickland ed. 1967); C. LYTLE, THE WARREN COURT AND ITS CRITICS (1968); Swisher, *History's Panorama and Justice Black's Career*, in HUGO BLACK AND THE SUPREME COURT: A SYMPOSIUM 1 (S. Strickland ed. 1967); Frank, *Justice Black and the New Deal*, 9 ARIZ. L. REV. 26 (1967). *See also* A. BERLE & G. MEANS, *Preface* to THE MODERN CORPORATION AND PRIVATE PROPERTY at xxv (rev. ed. 1967); R. COLEMAN, PRESENT FRONTIERS IN CONSTITUTIONAL LAW 223, 226 (1967); A. COX, THE WARREN COURT 13-16 (1968); Schubert, *The Rhetoric of Constitutional Change*, 16 J. PUB. L. 16 (1967).

[430] 347 U.S. 483 (1954).

[431] Mr. Justice Brennan finds that the certiorari power, the "magnificent contribution of Chief Justice Taft's, which has given the Court discretionary power to select the cases it will hear and decide, functions very effectively to keep the workload within manageable proportions." HARVARD LAW SCHOOL, PROCEEDINGS IN HONOR OF MR. JUSTICE BRENNAN 9 (Occasional Pamphlet No. 9, 1967) [hereinafter cited as HARVARD LAW SCHOOL].

[432] K. LLEWELLYN, *supra* note 135, at 29. Llewellyn earlier noted: "[C]ourts are made and shaped more by the character of the bar before them than by any single factor. Courts, over the long haul, tend in their standards and in their performance to

In light of the impact of the Aufgabe (task attitude or problem set)[433] on all other phases of the decision process, hopefully, future intensive studies will delineate more precisely the function played by the adversary system in the decision process.[434] Is oral advocacy a hindrance or an aid to objective appraisal of a case?[435] Even a conscientiously independent judge frequently may take as his point of departure the written and oral arguments presented by counsel.[436]

Pangloss discovers that the briefs filed in *Griswold* raised questions concerning the applicability of the first amendment, equal protection, deprivation of the right to privacy and to pursue an occupation, and the standing of the appellants to raise these issues.[437] The brief for the appellants also emphasizes the effect of a favorable decision on society vis-a-vis population problems, public opinion, and the advancement of knowledge.[438]

At this point in the process, how can Pangloss know that Black will reject all the grounds offered by the appellants? After all, he joined in the Court's opinion in *Terminiello v. Chicago*,[439] and in other similar cases where statutes that appeared to proscribe protected speech were struck down even though the specific conduct

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fit the character of the bar with whom they deal." Llewellyn, *The Bar Specializes — With What Results?*, 167 ANNALS 179 (1933). *See also* Ladinsky, *The Impact of Social Backgrounds of Lawyers on Law Practice and the Law*, 16 J. LEGAL ED. 127, 142-43 (1963).

433 *See* G. ALLPORT, *supra* note 38, at 260.

434 This is especially so since studies have demonstrated that the instructions relating to problems succeed in changing the process of solution. Marks, *Problem Solving as a Function of the Situation*, 41 J. OF EXPERIMENTAL PSYCHOLOGY 74 (1951). And note that as the complexity of the problem situation increases the incorrect suggestions are more influential with the decisionmaker. Coffin, *Some Conditions of Suggestion and Suggestibility: A Study of Certain Attitudinal and Situational Factors Influencing the Process of Suggestion*, 53 PSYCHOLOGICAL MONOGRAPHS NO. 4 (1941).

435 Mr. Justice Brennan admits that "often my whole notion of what a case is about crystallizes at oral argument . . . . Often my idea of how a case shapes up is changed by oral argument." HARVARD LAW SCHOOL, *supra* note 431, at 22.

436 "If [a] . . . problem is stated verbally the meaning which the words convey is the starting point for the solution. Each word brings up its own trend of associations and the process of analysis and selection immediately starts. The interpretation of the language by the individual thus influences in a very significant and important way the individual's thinking." E. GLASER, AN EXPERIMENT IN THE DEVELOPMENT OF CRITICAL THINKING 26 (1941). And even though arguments of counsel are countered by the memoranda of the judge's law clerk (who generally has also done his initial research with the briefs before him), the order of presentation and correlative set is a variable of appreciable effect. *See* Bruner & Postman, *Perception, Cognition and Behavior*, 18 J. PERSONALITY 14 (1949); Hall, *Perceiving and Naming a Series of Figures*, 2 Q.J. OF EXPERIMENTAL PSYCHOLOGY 153 (1950).

437 *See, e.g.*, Brief for Appellants, Griswold v. Connecticut, 381 U.S. 479 (1965).

438 *See id.* at 17, 48, 72-74.

439 337 U.S. 1 (1949).

of the defendant might have been validly sanctioned. The aiding and abetting statute involved in *Griswold* presents a clearly analogous situation. Pangloss might express some surprise when he reads the Court's opinions and finds that none of the Justices used a ground already at hand,[440] but instead reached out for new approaches which badly divided the Court.

Pangloss, however, can reconstruct something of the process by which Black approached *Griswold* through reports made by his law clerks:[441]

> [First] he dives into reading the record and all briefs. He absolutely masters the facts and the arguments. Then he moves into the relevant literature — cases, statutes, treatises, and law reviews. The clerks often read along with him or dig out additional material and feed it to him. The issues will be discussed intermittently. After a while Black will feel that he is ready to do a first draft of the opinion, assuming he has not changed his mind and decided to vote the other way, and this occasionally happens. The draft is then turned over to the clerks, and, with all the confidence of youth, they work it over. Then the fun begins. The two clerks and Black gather around his large desk and start through the draft, word by word, line by line. This may go on for hours. When the Judge has an opinion in the mill he does not drop it for anything else. The discussion, often turning into lively debate, will sometimes be transferred to the study in his 18th century house in Alexandria and last until midnight. Often revisions result; sometimes a clerk can get a word or comma accepted, but the substance and decision are never anything but Black's alone.[442]

C. *The Behavioralist's Dilemma*

What a terribly complex situation confronts Pangloss. He must reconstruct the impact of arguments of counsel, clerks, colleagues, secondary sources, legal doctrine, and even indexing systems. At

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[440] Mr. Justice Douglas, joined by Mr. Justice Clark, develops a penumbral rights approach [381 U.S. 479]. Mr. Justice Goldberg, joined by Warren and Brennan, concurred in Douglas' opinion, but wrote a separate concurring opinion developing the notion that marital privacy is a fundamental personal right, supported by the ninth amendment. *See Id.* at 487. Mr. Justice Harlan wrote a separate concurring opinion based on his belief that the Connecticut law violated "basic values 'implicit in the concept of ordered liberty,' Palko v. Connecticut . . . ." *Id.* at 500. Mr. Justice White concurred because he found that the Connecticut law deprived married couples of their liberty without due process of law. *Id.* at 502. Justices Black and Stewart dissented. *Id.* at 507, 527.

[441] Mr. Justice Clark has expressed high regard for law clerks "to whom [judges] . . . are so indebted both for intellectual stimulus and practical collaboration." Clark, *"Practical" Legal Training an Illusion*, 3 J. LEGAL ED. 423, 424 (1951). For a general article describing the evolution of the law clerk species, see Newland, *Personal Assistants to Supreme Court Justices: The Law Clerks*, 40 ORE. L. REV. 299 (1961).

[442] Meador, *Justice Black and His Law Clerks*, 15 ALA. L. REV. 57, 59-60 (1962).

what point in the process is "noise" or creativity responsible for producing the outcome? Is the nature of the litigants significant? Did a colleague strike a responsive chord during a casual discussion of the case? Or, perhaps a recent text the Justice read suggested some new aspect of the case. Pangloss might even consider the effects of the aging process, especially in regard to short-term memory functioning.

Black seeks cognitive balance and here is a case where the law involved seems at odds with Black's first amendment views, his concern for the poor, distaste for control over the thoughts of men, and acceptance of the right of procreation as a fundamental right not subject to arbitrary control by the state.[443] But then Pangloss is aware that Black is highly autonomous and not easily swayed by others. He recalls his concern for a literal reading of the Constitution lest judges exercise too much power. If Black does not view the case as one covered by an explicit amendment or one involving procedural due process,[444] then he might refuse to undo the legislative enactment, not because the law is just or wise, but because the Court has no authority to do so under his view. In retrospect, we all know what Justice Black did. Pangloss can now easily postdict and "explain" why Black decided the case as he did. But could Pangloss predict what he would have done prior to publication of Black's opinion in *Griswold*?

When Pangloss evaluates his data and tentative hypotheses concerning Justice Black's behavior he will have a host of assumptions to work with. He must assume that the public and private faces of Black are relatively consistent, and that the action he reads is fairly congruent with Black's act meaning. To what extent is he imposing his own values on his explanatory scheme? Have the Hawthorne, Rosenthal, and substantive Heisenberg effects had a role? Is there a tacit knowing on the part of Black relevant to his judicial decisionmaking that he has not, and cannot communicate? Since opinions justify rather than explain how decisions are reached, it is likely that much has occurred in the decision process that has not been communicated to the public or to Pangloss.

Even given the knowledge of complementary approaches offering differential information about Justice Black's behavior, can Pangloss say he can attain a scientific explanation of his judicial be-

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443 *See* Skinner v. Oklahoma, 316 U.S. 535 (1942).

444 *See, e.g.*, Leland v. Oregon, 343 U.S. 790, 802 (dissenting opinion), *rehearing denied*, 344 U.S. 848 (1952).

havior? It is true that given certain types of cases he can predict Black's judicial response. But does he understand why Black decided *Griswold*, in the same sense that the *Verstehen* school contends that one understands persons as distinguished from things? Our behavioralist has never acted as a Justice of the Court, much less been that unique personality system identified as Hugo Lafayette Black. His study gives him a "feel" for the Justice; indeed, he can say he knows him like a brother. But that is a unique relation, and scarcely of the nomothetic type demanded by scientific prescriptions for scientific theories. He may have removed some of the perplexities that surround Black's behavior, changed unknowns to knowns, and offered some evidence of the causes of the judicial behavior of Justice Black. This constitutes explanation. If it is not scientific, then perhaps the behavior of a judge is not subject to scientific explanation — for greater generalizing to attain nomothetic principles (other than those by which we understand Black's idiographic ontogenetic development) must necessarily omit those very variables that lead to understanding.

Pangloss, imbued with systems notions, would display an interest in the impact and functioning of all the systems with which Justice Black transacts. Yet, when he seeks to understand them he finds that the tools of the behavioralist offer little beyond those developed by traditional techniques of analysis. Biographical, historical, and jurisprudential analysis afford Pangloss a rather good grasp of what Justice Black is about on the Court. Small group theory, scalograms, content analysis, and other behavioral and jurimetric techniques offer complementary views, but they are not sufficiently refined to capture the nuances revealed by traditional approaches. There are no known techniques that can deal precisely with the complex feedback processes which occur among transacting systems and which the systems approach dictates that Pangloss take into account. Since Justice Black's personality system is a subsystem embedded within and transacting with an array of other systems, it is necessary for Pangloss to determine the effect of Black's behavior on those systems in order to predict how they will in turn subsequently affect his behavior. This presents Pangloss with a host of polycentric problems to consider. For example, how much of an impact has Black's view had on his colleagues and the Court, and thereby on the sociocultural system? To what extent has Black's incorporation approach to the due process clause of the 14th amendment altered attitudes toward crime with a concomitant effect on

the input of cases presented for the Court to decide. Is there a morphogenetic process involved that is beyond control by the Court? Will the reaction to Black's approach lead to a change in the input of judges to the federal judiciary, thereby bringing about a long-term effect which is presently unpredictable? Has the course of decisions to date set an irreversible set of constraints on future decisionmaking process? Must we take into account the language in which those decisions were expressed, as well as the behavior patterns they engender? To the extent that systems studies indicate the protean nature of systems operating at the high integration index level, what effect will these findings have? Will they result in the adoption of evaluative criteria similar to the strategy of disjointed incrementalism rather than synoptic approaches such as are now in vogue among judicial decisionmakers? And if this is so, with what effect? Who can foresee the effect of the interaction of the human and computer races in the future? If a Pangloss does develop a computer program that simulates effectively what would be the behavior of nine justices, what role will a substantive Heisenberg effect play in altering man's future in response to the predicted course of events?

These, and the myriad of other problems raised by our sketch, are polycentric in nature and require development of new techniques before anything can be attained which even approaches the rigor of scientific explanation in the physical sciences. It is instructive to note, however, that our very sequence of analysis illustrates the polycentric nature of the behavioralists' problems. We started the analysis with the broadest possible orientation and moved by successive steps to the "narrowest" — that of an individual justice deciding a case. But the concrete individual's transacting required us to return to a consideration of all that had gone before in addition to his own peculiar ontogenetic development. And so we are back where we started, except that now we know that that is impossible — we are part of all that we have met and that for having proceived this analysis we too have changed in some degree, depending on our peculiar array of transacting systems.

V. Conclusion

The analysis of whether a scientific explanation of judicial behavior is possible began with the broadest possible orientation — the systems approach. It narrowed to a consideration of complex adaptive systems, personality, and finally to the specific inquiry of

a behavioralist attempting to commit science on a judge deciding a case. The systems approach appeared eminently appropriate given its capacity for dealing with morphogenetic and morphostatic processes, goal directed behavior, and the interaction and interrelation of complex systems. In addition, the systems approach held out the promise of reducing specialized deafness by establishing a more comprehensive perspective and interdisciplinary language while exposing theoretical lacunae.

The inquiry did illustrate the utility of the systems approach in that it virtually compelled attending to the nature of the systems studied, and their interrelations and transactions. The judicial behavioralists' difficulties became apparent with the explication of the nature of the array of systems involved in the analysis of a judge deciding a case. Many gaps in theory, methodology, and knowledge became apparent, not the least of which was the lack of a sophisticated behavioral technique with which to enhance understanding of the judicial process beyond that afforded by traditional jusisprudential methods.

If a judicial behavioralist, armed with the full panoply of existing systems techniques could explain and predict exactly the behavior of each judge, and thus the decisions of the courts on which they sit, he would find the world beating a path to his door. But clearly he has no technique that gives him an edge over lawyers armed with the more traditional analytical methods. Given the enormous expenditure of time and effort that has gone into traditional approaches in contrast to modern systems theory, the programmatical nature of the latter is scarcely surprising, although disheartening in light of the necessity of taking a systems approach to solve many of our contemporary problems. Probably only a radical reorientation of our entire educational system would enable us to escape the conceptual cocoons of the existing disciplines. That this will occur is so unlikely that the question of whether such a reorientation would result in throwing out the baby with the bathwater is solely of academic interest.

Our inquiry revealed that man exhibits an organized complexity not readily amenable to scientific analysis. Traditional scientific methods proceed with analysis by simplifying. Where lower level referents are involved, ignoring interactions between the part of the system studied and other parts of the system and other transacting systems does not produce appreciable distortions. But with man, transacting with other systems at all levels, to simplify in this way

is to ignore the complex and unique organization of these systems within the person that constitutes the hallmark of humanity. Values that relate to each person's capacity for uniqueness are uniquely human values. Science, however, values the nomothetic. And because man is malleable, operating as he does at the high integration index level, it is just possible that he can become less unique under the press of those who seek to fit him into a nomothetic system, much like a cog in a giant machine. Hopefully the systems approach will not add to that press, but instead provide a perspective that will enable those in positions of power, such as, judges, legislators, and scientists, to keep constantly in mind not only the big picture, but also each man's uniqueness.