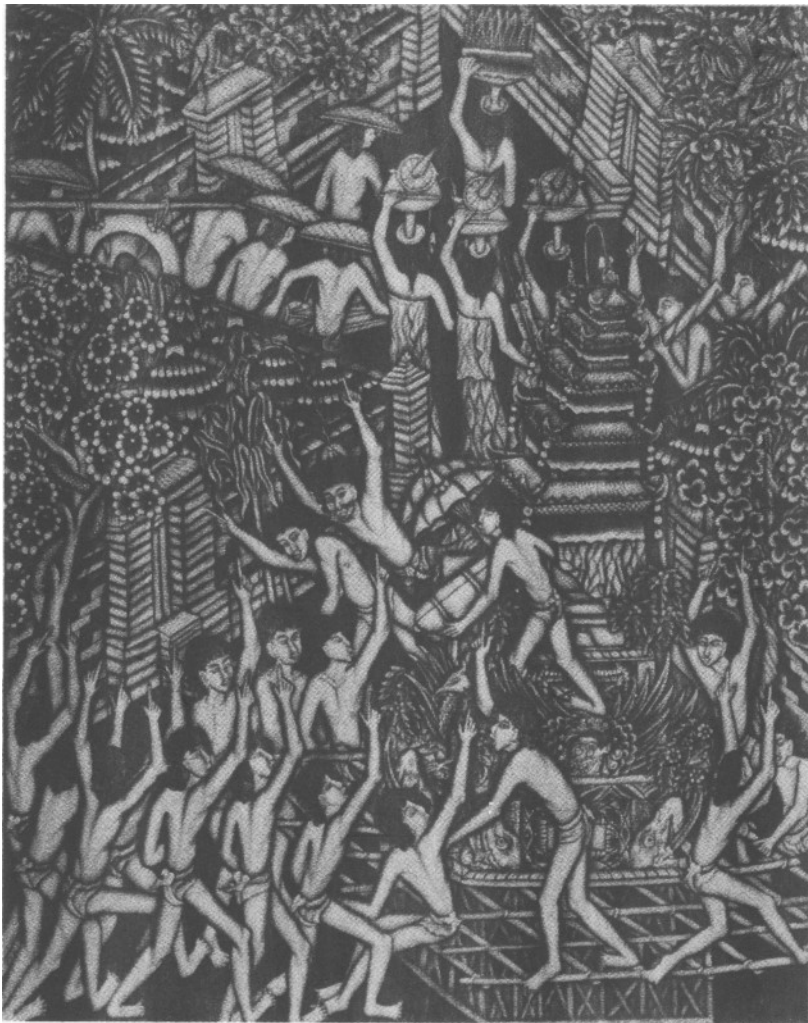


*STEPS TO AN
ECOLOGY OF MIND*

COLLECTED ESSAYS IN ANTHROPOLOGY,
PSYCHIATRY, EVOLUTION, AND
EPISTEMOLOGY

Gregory Bateson

Jason Aronson Inc.
Northvale, New Jersey
London



Balinese Painting (Ida Bagus Djati Sura; Batuan, 1937)
[Analysis, p. 147]

Copyright © 1972, 1987 by Jason Aronson Inc.
10 9 8 7 6 5 4 3 2 1

All rights reserved. Printed in the United States of America. No part of this book may be used or reproduced in any manner whatsoever without written permission from *Jason Aronson Inc.* except in the case of brief quotations in reviews for inclusion in a magazine, newspaper, or broadcast.

Library of Congress Cataloging-in-Publication Data

Bateson, Gregory.
Steps to an ecology of mind.

(Chandler publications for health sciences)
Reprint. Originally published: San Francisco :
Chandler Pub. Co., 1972. With new pref.
Collection of articles reprinted from various
periodicals.

"The published work of Gregory Bateson": p.
Includes index.

1. Anthropology, Cultural—Collected works.
2. Knowledge, Theory of—Collected works. 3. Psychiatry —
Collected works. 4. Evolution — Collected works.
I. Title. II. Series. [DNLM: 1. Anthropology, Cultural—
collected works. 2. Ecology — collected works.
Evolution — collected works. 4. Schizophrenic
Psychology—collected works. 5. Thinking—collected
works. GN 6 B329s 1972a]

GN6.B3 1987 306 87-24133

ISBN 0-87668-950-0

Effects of Conscious Purpose on Human Adaptation*

"Progress," "learning," "evolution," the similarities and differences between phylogenetic and cultural evolution, and so on, have been subjects for discussion for many years. These matters become newly investigable in the light of cybernetics and systems theory.

In this Wenner-Gren conference, a particular aspect of this wide subject matter will be examined, namely the role of consciousness in the ongoing process of human adaptation.

Three cybernetic or homeostatic systems will be considered: the individual human organism, the human society, and the larger ecosystem. Consciousness will be considered as an important component in the *coupling* of these systems.

A question of great scientific interest and perhaps grave importance is whether the information processed through consciousness is adequate and appropriate for the task of human adaptation. It may well be that consciousness contains systematic distortions of view which, when implemented by modern technology, become destructive of the balances between man, his society and his ecosystem.

To introduce this question the following considerations are offered:

(1) All biological and evolving systems (i.e., individual organisms, animal and human societies, ecosystems, and the like) consist of complex cybernetic networks, and all such systems share certain formal characteristics. Each system contains subsystems which are potentially regenerative, i.e., which would go into

* This essay was prepared as the author's position paper for Wenner-Gren Foundation Conference on "Effects of Conscious Purpose on Human Adaptation." The author was chairman of this conference, which was held in Burg Wartenstein, Austria, July 17-24, 1968. The proceedings of the conference as a whole are to be published by Knopf & Co. under the title *Our Own Metaphor*, edited by Mary Catherine Bateson.

exponential "runaway" if uncorrected. (Examples of such regenerative components are Malthusian characteristics of population, schismogenic changes of personal interaction, armaments races, etc.) The regenerative potentialities of such subsystems are typically kept in check by various sorts of governing loops to achieve "steady state." Such systems are "conservative" in the sense that they tend to conserve the truth of propositions about the values of their component variables—especially they conserve the values of those variables which otherwise would show exponential change. Such systems are homeostatic, i.e., the effects of small changes of input will be negated and the steady state maintained by *reversible* adjustment.

(2)But "*plus c'est la meme chose, plus ça change.*" This converse of the French aphorism seems to be the more exact description of biological and ecological systems. A constancy of some variable is maintained by changing other variables. This is characteristic of the engine with a governor: the constancy of rate of rotation is maintained by altering the fuel supply. *Mutatis mutandis*, the same logic underlies evolutionary progress: those mutational changes will be perpetuated which contribute to the constancy of that complex variable which we call "survival." The same logic also applies to learning, social change, etc. The ongoing truth of certain descriptive propositions is maintained by altering other propositions.

(3)In systems containing many interconnected homeostatic loops, the changes brought about by an external impact may slowly spread through the system. To maintain a given variable (V_1) at a given value, the values of V_2 , V_3 , etc., undergo change. But V_2 and V_3 may themselves be subject to homeostatic control or may be linked to variables (V_4 , V_5 , etc.) which are subject to control. This second-order homeostasis may lead to change in V_6 , V_7 , etc. And so on.

(4)This phenomenon of spreading change is in the widest sense a sort of *learning*. Acclimation and addiction are special cases of this process. Over time, the system becomes de-pendent upon the continued presence of that original external impact whose immediate effects were neutralized by the first order homeostasis.

Example: under the impact of Prohibition, the American social system reacted homeostatically to maintain the constancy of the supply of alcohol. A new profession, the bootlegger, was generated. To control this profession, changes occurred in the police system. When the question of repeal was raised, it was expectable that certainly the bootleggers and possibly the police would be in favor of maintaining Prohibition.

(5) In this ultimate sense, all biological change is conservative and all learning is aversive. The rat, who is "re-warded" with food, accepts that reward to neutralize the changes which hunger is beginning to induce; and the conventionally drawn distinction between "reward" and "punishment" depends upon a more or less arbitrary line which we draw to delimit that subsystem which we call the "individual." We call an external event "reward" if its occurrence corrects an "internal" change which would be punishing. And so on.

(6) Consciousness and the "self" are closely related ideas, but the ideas (possibly related to genotypically determined premises of territory) are crystallized by that more or less arbitrary line which delimits the individual and defines a logical difference between "reward" and "punishment." When we view the individual as a servosystem coupled with its environment, or as a part of the larger system which is individual + environment, the whole appearance of adaptation and purpose changes.

(7) In extreme cases, change will precipitate or permit some runaway or slippage along the potentially exponential curves of the underlying regenerative circuits. This may occur without total destruction of the system. The slippage along exponential curves will, of course, always be limited, in extreme cases, by breakdown of the system. Short of this disaster, other factors may limit the slippage. It is important, however, to note that there is a danger of reaching levels at which the limit is imposed by factors which are in them-selves deleterious. Wynne-Edwards has pointed out—what every farmer knows—that a population of healthy individuals cannot be directly limited by the available food supply. If starvation

is the method of getting rid of the excess population, then the survivors will suffer if not death at least severe dietary deficiency, while the food supply itself will be reduced, perhaps irreversibly, by overgrazing. In principle, the homeostatic controls of biological systems must be activated by variables which are not in themselves harmful. The re-flexes of respiration are activated not by oxygen deficiency but by relatively harmless CO₂ excess. The diver who learns to ignore the signals of CO₂ excess and continues his dive to approach oxygen deficiency runs serious risks.

(8) The problem of coupling self-corrective systems together is central in the adaptation of man to the societies and ecosystems in which he lives. Lewis Carroll long ago joked about the nature and order of *randomness* created by the inappropriate coupling of biological systems. The problem, we may say, was to create a "game" which should be random, not only in the restricted sense in which "matching pennies" is random, but meta-random. The randomness of the moves of the two players of "matching pennies" is restricted to a finite set of known alternatives, namely "heads" or "tails" in any given play of the game. There is no possibility of going out-side this set, no meta-random choice among a finite or infinite set of sets.

By imperfect coupling of biological systems in the famous game of croquet, however, Carroll creates a meta-random game. Alice is coupled with a flamingo, and the "ball" is a hedgehog.

The "purposes" (if we may use the term) of these contrasting biological systems are so discrepant that the randomness of play can no longer be delimited with finite sets of alternatives, known to the players.

Alice's difficulty arises from the fact that she does not "understand" the flamingo, i.e., she does not have systemic information about the "system" which confronts her. Similarly, the flamingo does not understand Alice. They are at "cross-purposes." The problem of coupling man through consciousness with his biological environment is comparable. If consciousness lacks information about the nature of man and the environment, or if the information is distorted and inappropriately selected, then the coupling is likely to generate meta-random sequence of events.

(9) We presume that consciousness is not entirely without effect—that it is not a mere collateral resonance without feedback into the system, an observer behind a one-way mirror, a TV monitor which does not itself affect the program. We believe that consciousness has feedback into the remainder of mind and so an effect upon action. But the effects of this feedback are almost unknown and urgently need investigation and validation.

(10) It is surely true that the content of consciousness is no random sample of reports on events occurring in the remainder of mind. Rather, the content of the screen of consciousness is systematically selected from the enormously great plethora of mental events. But of the rules and preferences of this selection, very little is known. The matter requires investigation. Similarly the limitations of verbal language require consideration.

(11) It appears, however, that the system of selection of information for the screen of consciousness is importantly related to "purpose," "attention," and similar phenomena which are also in need of definition, elucidation, etc.

(12) If consciousness has feedback upon the remainder of mind (9, above), and if consciousness deals only with a skewed sample of the events of the total mind, then there must exist a *systematic* (i.e., nonrandom) difference between the conscious views of self and the world, and the true nature of self and the world. Such a difference must distort the processes of adaptation.

(13) In this connection, there is a profound difference between the processes of cultural change and those of phylogenetic evolution. In the latter, the Weismannian barrier between soma and germ plasm is presumed to be totally opaque. There is no coupling from environment to genome. In cultural evolution and individual learning, the coupling through consciousness is present, incomplete and probably distortive.

(14) It is suggested that the specific nature of this distortion is such that *the cybernetic nature of self and the world tends to be imperceptible to consciousness*, insofar as the contents of the

"screen" of consciousness are determined by considerations of purpose. The argument of purpose tends to take the form "D is desirable; B leads to C; C leads to D; so D can be achieved by way of B and C." But, if the total mind and the outer world do not, in general, have this lineal structure, then by forcing this structure upon them, we become blind to the cybernetic circularities of the self and the external world. Our conscious sampling of data will not disclose whole circuits but only arcs of circuits, cut off from their matrix by our selective attention. Specifically, the attempt to achieve a change in a given variable, located either in self or environment, is likely to be undertaken without comprehension of the homeostatic network surrounding that variable. The considerations outlined in paragraphs 1 to 7 of this essay will then be ignored. It may be essential for *wisdom* that the narrow purposive view be somehow corrected.

(15)The function of consciousness in the coupling between man and the homeostatic systems around him is, of course, no new phenomenon. Three circumstances, however, make the investigation of this phenomenon an urgent matter.

(16)First, there is man's habit of changing his environment rather than changing himself. Faced with a changing variable (e.g., temperature) within itself which it should control, the organism may make changes *either* within itself *or* in the external environment. It may adapt to the environment or adapt the environment to itself. In evolutionary history, the great majority of steps have been changes within the organism itself; some steps have been of an intermediate kind in which the organisms achieved change of environment by- change of locale. In a few cases organisms other than man have achieved the creation of modified microenvironments around themselves, e.g., the nests of hymenoptera and birds, concentrated forests of conifers, fungal colonies, etc.

In all such cases, the logic of evolutionary progress is toward ecosystems which sustain *only* the dominant, environment-controlling species, and its symbionts and parasites.

Man, the outstanding modifier of environment, similarly achieves single-species ecosystems in his cities, but he goes one step further, establishing special environments for his symbionts. These, likewise, become single-species ecosystems: fields of corn, cultures of bacteria, batteries of fowls, colonies of laboratory rats, and the like.

(17)Secondly, the power ratio between purposive consciousness and the environment has changed rapidly in the last one hundred years, and the *rate* of change in this ratio is certainly rapidly increasing with technological advance. Conscious man, as a changer of his environment, is now fully able to wreck himself and that environment—with the very best of conscious intentions.

(18)Third, a peculiar sociological phenomenon has arisen in the last one hundred years which perhaps threatens to isolate conscious purpose from many corrective processes which might come out of less conscious parts of the mind. The social scene is nowadays characterized by the existence of a large number of self-maximizing entities which, in law, have something like the status of "persons"—trusts, companies, political parties, unions, commercial and financial agencies, nations, and the like. In biological fact, these entities are precisely *not* persons and are not even aggregates of whole persons. They are aggregates of *parts* of persons. When Mr. Smith enters the board room of his company, he is expected to limit his thinking narrowly to the specific purposes of the company or to those of that part of the company which he "represents." Mercifully it is not entirely possible for him to do this and some company decisions are influenced by considerations which spring from wider and wiser parts of the mind. But ideally, Mr. Smith is expected to act as a pure, uncorrected consciousness—a dehumanized creature.

(19)Finally, it is appropriate to mention some of the factors which may act as correctives—areas of human action which are not limited by the narrow distortions of coupling through conscious purpose and where wisdom can obtain.

(a) Of these, undoubtedly the most important is love. Martin Buber has classified interpersonal relationships in a relevant

manner. He differentiates "I-Thou" relations from "I-It" relations, defining the latter as the normal pattern of interaction between man and inanimate objects. The "I-It" relationship he also regards as characteristic of human relations wherever purpose is more important than love. But if the complex cybernetic structure of societies and ecosystems is in some degree analogous to animation, then it would follow that an "I-Thou" relationship is conceivable between man and his society or ecosystem. In this connection, the formation of "sensitivity groups" in many depersonalized organizations is of special interest.

(b) The arts, poetry, music, and the humanities similarly are areas in which more of the mind is active than mere consciousness would admit. *"Le coeur a ses raisons que la raison ne connaît point."*

(c) Contact between man and animals and between man and the natural world breeds, perhaps—sometimes—wisdom.

(d) There is religion.

(20) To conclude, let us remember that job's narrow piety, his purposiveness, his common sense, and his worldly success are finally stigmatized, in a marvelous totemic poem, by the Voice out of the Whirlwind:

*Who is this that darkeneth counsel by words
without understanding ...
Dost thou know when the wild goats of the rock
bring forth?
Or canst thou tell when the hinds do calve?*