Rapid #: -21904146

CROSS REF ID: **1545331**

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TYPE: Book

BOOK TITLE: Gregory Bateson on relational communication :from octopuses to nations

USER BOOK TITLE: Gregory Bateson on relational communication :from octopuses to nations

BOOK AUTHOR: Guddemi, Phillip.

EDITION:

VOLUME:

PUBLISHER:

YEAR: 2020

PAGES:

ISBN: 9783030521004

LCCN:

OCLC #:

Processed by RapidX: 1/24/2024 2:17:40 PM

Phillip Guddemi

Gregory Bateson on Relational Communication: From Octopuses to Nations

Springer

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Prologue: Cybernetics, Bateson, and the Missile Crisis

During the height of the Cuban Missile Crisis, Gregory Bateson wrote a letter to his cybernetic mentor, Warren McCulloch. In this letter Bateson asked McCulloch to bring to the attention of the Kennedy Administration certain parallels between the unfolding crisis and the communication system of octopus, which Bateson had been studying. I don't think it is an exaggeration to say that this is a stunning juxtaposition, one that few if any scientists or thinkers other than Gregory Bateson would have attempted. Even fewer would have been able to ground their argument in an unconventional perspective on animal communication and behavior, one which spurns the usual adaptationist emphasis on the function of such behavior, in favor of a semiotic approach which is also an interactional one emphasizing context.

The date of Bateson's letter to McCulloch, October 25, 1962, in which Bateson linked his research on animal communication (including octopus) to the Cuban Missile Crisis, was during the last and culminating (and scariest) weekend of the crisis. Here is the first portion of the introductory paragraph of this remarkable letter:

> Dear Warren:
>
> I am coming to Cambridge this Sunday night and want to talk to you Monday or Tuesday. I will phone when I arrive. I am writing now to get some ideas across in advance of our talk.
>
> I want to ask your opinion and, if you think I have something, I would ask you to pass the material on to Jerry Wiesner or to somebody at a similar policy-making level. It seems to me that this brainstorm, which starts from the questions which I have been asking of mammals and octopuses, may have some relevance to current international problems. (Letter to Warren McCulloch, MC 1039-10a, October 25, 1962)

Warren McCulloch, Jerry Wiesner, and Gregory Bateson himself had all met as part of the Macy Conferences, held in New York in the late 1940s and early 1950s. The Macy Conferences were instrumental in pioneering the way of thought to which they would give the name "cybernetics." Although today we tend to think of the word cybernetics as associated with machines such as computers (and the world which these machines have helped bring about), the original conception of cybernetics had much more to do with developing a new way of thinking about how living things behave—one which emphasized process and self-corrective systems. About

a third of the original participants in the Macy Conferences were from either the biological, medical, or social sciences, for example, neurophysiology, psychology, psychiatry, economics, and, in the case of Bateson and his then-wife and collaborator Margaret Mead, anthropology. This cross disciplinary group was brought together by the hope of pioneering a new way of thinking about systems, particularly living systems. Their collaboration resulted in the new emerging field of cybernetics. (The term "cybernetics" was popularized by the mathematical and theoretical genius Norbert Weiner, in his book of that title in 1948.) This original cybernetics as developed in the Macy Conferences set its task as examining the processes in time in which feedback dynamics operate either to conserve or to change aspects of systems in ways which enable either their perpetuation or their failure to perpetuate.

This new perspective or field of cybernetics had roots in mathematics, even for the less mathematically inclined founders such as Mead, and for those like Bateson who were not always inclined to quantification. (However Bateson's mathematical literacy should not be underestimated, as we will see.)

Warren McCulloch, the recipient of Bateson's letter, was a transdisciplinary thinker with a breadth of philosophical and topical interests, as described in the recent biography by Tara Abraham (2016). Born in 1898, McCulloch by the 1960s was something of an elder statesman of the idea that a rigorous mathematics, combined with experimental and laboratory work on the brain, could shed new light on ancient philosophical questions about the nature and workings of the mind. McCulloch's own wide ranging and incisive mind and his philosophic and scientific rigor impressed and inspired Bateson, and their friendship continued until McCulloch's death in 1969.

The scope of cybernetics as envisioned by the Macy Conferences was perhaps best exemplified by their organizer and president, Lawrence Frank, in a letter which he wrote to McCulloch in October 1946 regarding the themes he wanted to explore in the upcoming Second Meeting. Lawrence Frank's proposed themes for cybernetics included:

1. Biological feedbacks in order to foster the conceptual clarification that is needed and to avoid the taking over of a formula from the field of mechanics or electronics without recognizing what the biological feedback involves
2. A clarification of the concepts of signals, signs, and symbols, not merely in semantic or semiotic terminology but in terms of the biological and cultural *processes* which are involved
3. The requirement of a mathematics for handling biological data as distinguished from the kind of mathematics that has been developed for classical physics, chemistry, and astronomy… (Frank [unpublished letter] 1946, quoted in Abraham 2016:135)[1]

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[1] Unpublished letter, Lawrence Frank to Warren McCulloch, October 7, 1946, quoted by Tara Abraham, 2016, *Rebel Genius: Warren S. McCulloch's Transdisciplinary Life in Science*, p. 135. Folder "Conference: Josiah Macy Meeing II," Seires II, WSM Papers, APS.

Note that, fascinatingly, Theme 2 proposed by Lawrence Frank for cybernetics in 1946 anticipates, in a way, the need for what we would today call biosemiotics, by calling attention, in a manner faintly anticipating Jesper Hoffmeyer, to the existence in biology of a discourse of "signals, signs, and symbols," which furthermore was not yet fully assimilated into the biological theorizing of the day. So we see that the idea of a cybernetic system, even from its very beginnings, unified pattern, feedback, and semiotics. Gregory Bateson's letter to Warren McCulloch was predicated on their common understanding of this new way of thinking forged in the Macy Conferences.

And of course Bateson's hope that Jerry Wiesner would carry this message to the Kennedy Administration was based on Wiesner's participation in this selfsame intellectual movement. Jerome Wiesner was an electrical engineer by training and had participated in several of the Macy Conferences. He became head of the Research Library of Electronics at the Massachusetts Institute of Technology and before taking up the position ensured the hiring of Warren McCulloch in 1951 to join him at that institution (under the pretext of McCulloch studying synaptic transmission in neurons). (Abraham 2016: 153)

A decade later, in 1961, Wiesner was chosen by John F. Kennedy to chair the President's Science Advisory Committee, a position he retained during and after the Cuban Missile Crisis. In 1962, Wiesner was to recommend the phasing out of toxic pesticides in the wake of Rachel Carson's *Silent Spring*; he was evidently instrumental in the achievement of the 1963 Partial Nuclear Test Ban Treaty and the establishment of an Arms Control and Disarmament Agency. He was somewhat skeptical of the need for a manned Space Program. Ultimately he was replaced as Science Advisory Chair shortly before President Kennedy's assassination in November 1963.[2]

Due to the timing of the Bateson–McCulloch letter, which as mentioned was just a few days prior to the resolution of the Cuban Missile Crisis, it is doubtful whether Jerry Wiesner would have had time to hear of Bateson's ideas or had the time to bring them to the attention of the Administration. Indeed, there is no evidence that Warren McCulloch acted on the letter, or that any note was subsequently taken of it, until I discovered it in 2015 in the Gregory Bateson archives at the University of California, Santa Cruz.

Gregory Bateson and Octopus

In his letter to Warren McCulloch, Bateson had referred to the research he was doing at that time on octopus communication. The fact he was doing octopus research is not generally known, since he did not publish anything formally about it, either at the time or later. Nonetheless, over a period of half a decade or longer,

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[2] Wikipedia, *Jerome Weisner*. Accessed on January 12, 2019.

Gregory Bateson, on his own (with help from his immediate family), collected and studied octopus to observe their interactions. He began working on octopus while he was working in California on schizophrenia, using tanks located at the Veteran's Hospital (in the morgue!) and then at his home, beginning around 1958 or 1959. Later he continued his octopus work while working on dolphin communication with John Lilly in 1963–64. He never made octopus his main focus of research, and he never researched them in affiliation with any university or other research organization. He did make several grant applications, to the NSF (and other organizations), in 1962 to continue his research, but none of these were funded. As he wrote to one psychologist who he hoped might help with his funding issues, "I suspect, however, that my difficulty in getting money is related to the fact that I myself am neither fish, flesh nor fowl – but only good red herring." (Letter to Thomas Milburn, MC 1039–16, June 13, 1963)

As the son of the famed British biologist William Bateson (who invented the word genetics), Gregory Bateson, though he is known as an anthropologist, never abandoned a concern with biological topics and perspectives. His youth and young adulthood, before he turned to anthropology at age 21, had been a collaborative one which involved the co-authorship of one paper (on partridge feathers) with his father (W. Bateson and G. Bateson 1925), and an expedition on his own in the spirit of Darwin to the Galapagos Islands (Lipset 1982). Later in life, he pursued his interest in the patterns of information in living things by pursuing seamlessly interwoven studies of human beings and animals.

Gregory Bateson began his work specifically on animal communication with observations on otters in the San Francisco Zoo, leading up to his "Theory of Play and Fantasy," in 1954. He did not separate animal and human communication, but instead he looked at the ways human communication is continuous with the modalities of animal communication, especially as regards what he would eventually term "communication about relationship." By the time of his octopus research, in the early 1960s, Bateson had been studying for several years the patterns of interaction in families with a schizophrenic member. This research was focused on how their communication entangled itself in what he called double binds. But as part of this, and prior to it, Bateson's research emphasized those aspects of communication, whether animal or human, which defied what he was later to call "the logician's dream that men should communicate only by unambiguous digital [or, as we might say today, symbolic] signals." (Bateson 2000: 418)[3] These were the aspects of communication he would later term as "analogue," as opposed to "digital," and that he would identify as a universal mode of "communication about relationship." In one unpublished study he would term this form of communication the "carrier wave" (Bateson CAF 319, March 30, 1961)—underlining its necessary ubiquity as a foundation and substrate for any other possible communication.

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[3] "Redundancy and Coding," in Gregory Bateson, *Steps to an Ecology of Mind*, Chicago, University of Chicago Press, 2000 (1972), p. 418. First published as Chapter 22 in Thomas Sebeok, ed., 1968, *Animal Communication: Techniques of Study and Results of Research*, Indiana University Press.

But why study octopus? Bateson indicated, in one of his unfunded grant applications, a number of reasons (CAF 231-E-5). Octopuses are intelligent species that are far away from humans and other mammals on the phylogenetic tree of life of Animalia. They can be studied in home aquaria with relatively little expense, and Bateson took advantage of that since he was never actually funded to study them. Much of what he felt he learned about them is to be found in his unsuccessful grant applications for further research; but in those applications he set out what he had already learned in two or three years of unfunded study. But the larger issue is no doubt that if you can find commonalities in social behavior among species which are as far apart phylogenetically as octopuses and vertebrates, you might be on to something in terms of a general theory of animal social behavior. To take an example that was studied more recently than Bateson's work, naked mole rats are a mammalian species that in their social life is extremely reminiscent of "eusocial" insect species such as bees or termites, as we learn from the work of E.O. Wilson. The fact that hierarchical castes of a social insect type can evolve separately among mammals is an example of what is called "convergence" in ecology, and it is theoretically significant but not that well understood.

Gregory Bateson's own words on the subject, from the aforementioned unsuccessful grant proposal:

> About two years ago, preliminary work was begin on the inter-individual communication of octopus, with the idea that it should be possible to demonstrate similar limitations in any organism with sufficiently complex central nervous system and inter-individual behavior. Octopus was deliberately chosen as being both neurally complex and maximally different from the human species both in a phylogenetic sense and in the degree to which its normal environment contrasts with that of man. (CAF 231-E-6)

Today we think of octopus in ways that have been emphasized since Bateson's own studies. Not only are they unusually intelligent and adaptable, they seem to be "alien" in their DNA and its expression, and unusual in the way their neural matter and its connectivity seems less centralized than that of other creatures. These "wow factors" of today's cephalopod research would seem to have little to do with what Bateson observed. Those of us who have read about octopus recently are also aware of the exquisite communication, using patterns of color on the skin, characteristic of some octopus species, and we also find ourselves wishing that Bateson had had a lot more to say about this fascinating topic of research (though he did mention color communication in passing, relating it to moods). But actually he was more interested in commonalities with vertebrate or mammal communication, including that of humans and human organizations—for example, nations pursuing the Cold War.

Brief Outline of the Book

In the next chapter of the book I simply reprint the letter itself, for readers to see in its entirety. After this, I will follow the letter, paragraph by paragraph, setting forth Bateson's ideas which informed his line of argument. Some paragraphs will need

more than one chapter. For example, the first paragraph of the letter will, indeed, be discussed in several chapters to set out Bateson's concept of "communication about relationship," which he once termed the "carrier wave."

Topics explored in ensuing chapters include concepts of analog and digital communication, the strange problem of negation in analog communication, Bateson's own version of the evolutionary history of the sign (and of the place of "play" in this evolution), and the Batesonian contrast between what he called symmetry and complementarity which he (and I) utilized as a way of analyzing interactive dynamics.

Leading up to the discussion of the Cuban Missile Crisis will be an exploration of peacemaking among primates and in a human ritual, and a detailed summary of Bateson's work among octopus based on his grant applications. Then the background and the chronology of the Cuban Missile Crisis itself will be discussed in some detail in order to understand better how Bateson was able to apply his ideas to it in the letter to McCulloch. This will enable me to explore how Bateson saw matters of war and peace. I will again look at his ideas of symmetry and complementarity, and how his application of these to international affairs owed much to a Quaker mathematician who developed a mathematics of armaments races in the years between the twentieth century wars. I will also look at a letter he wrote on the very eve of the Second World War to one of his mentors, Frederick Bartlett. And I will apply some of his ideas to our current concerns.

Letter from Gregory Bateson to Warren McCulloch, MC 1039-10a, October 25, 1962

Dear Warren:

I am coming to Cambridge this Sunday night and want to talk to you Monday or Tuesday. I will phone when I arrive. I am writing now to get some ideas across in advance of our talk.

I want to ask your opinion and, if you think I have something, I would ask you to pass the material on to Jerry Wiesner or to somebody at a similar policy-making level. It seems to me that this brainstorm, which starts from the questions which I have been asking of mammals and octopuses, may have some relevance to current international problems.

It seems to me that nations having almost total distrust for each other's words in fact operate with non-verbal cues and therefore face problems which must closely resemble those which confront octopuses and pre-verbal mammals.

1. It appears to me that the discourse of these creatures (mammals, octopuses, and nations) focusses almost totally upon matters of a rather high order of abstraction, viz., what shall be the rules and the styles of relationship between the two communicating individuals. When the cat says "mew", she is asserting a dependency between herself and me. I may be able to deduce from this high-level abstraction that I should give her milk, but she does not in general mention milk and her "mew" is approximately what we anthropologists would call a kinship term, i.e., an assertion of a body of rules for a relationship.

2. These mammalian communications about relationship are in large measure analogic. In verbal communication, which is largely digital, it is possible to have words which will signify <u>negatives</u>. In non-verbal communication, very peculiar steps have to be gone through in order to get across a negative message to the other individual.

3. This is especially true where the negative message concerns the rules and styles of relationship. In particular, the message "I shall not hurt you" or "I trust you not to hurt me" can obviously only be communicated in one of two ways:

a. The individual may expose his vulnerable parts to possible attack – as do the dogs and the octopuses, <u>after</u> there has been some fighting. But this method, though dreamed of by many of our pacifists, is obviously very dangerous unless the

message which it seeks to transmit has already been transmitted, acknowledged, and believe[d] in by the other individual It follows that the message cannot safely be gotten across in this positive form.

The other alternative is (b) in which the transmitter of the message must in some sense mention violence in some analogic code (e.g. by a hostile intention movement) and must somehow introduce a <u>negative</u> into this analogic statement about violence. But, as mentioned above, analogic codes characteristically do not contain any signal for the word "not".

4. Now, the phrase "intention movement" is a phony. It is true that when I clench my fist I am thereby mentioning the notion of violence between myself and my vis a vis. But whether I am saying "I shall hit you" or "I shall not hit you" is unclear until we know more about the total interchange. Remember that peace-making ceremonies among primitive peoples usually consist in an exchange of violence and that courtship in many species contains elements of conflict.

5. In fact, the negatives can only be communicated by total sequences of interchange in which these negatives are exemplified. The Octopuses, starting from mutual hostility, pass through a sequence of minor battles in which nobody gets hurt much. After this the slightly stronger octopus very slowly and gently embraces the weaker, i.e. states, "I can hurt you but I am not doing so." Following this, the weaker comes over and attacks the stronger with his vulnerable backside, in response to which the stronger retreats. I.e., the weaker has now said, "Yes, I know you are not going to attack me" and the stronger has said, "That's right."

6. I was this morning asked to join in signing a telegram to the White House which was worded as follows: "We regret the action of placing an embargo on Cuba, because this action involves too much trust in Krushchev's good judgment." Considering this wording, I suddenly realized that my own theoretical position is precisely the reverse, that I rejoice in the action which Kennedy has taken precisely because it places trust in Krushchev's good judgement. It provides Krushchev with a <u>casus belli</u> and permits him to decline it.

7. But the essence of the matter is that all the messages which negate war must be gotten across and must be gotten across in an interlinked form. The great danger at the moment is that Krushchev's willingness to negotiate may be taken by us as fear. Correspondingly there was always in the past the danger that our unwillingness to go to war over Berlin, etc., could be taken by the Russians as an expression of fear. Still more dangerous, we could accuse ourselves of cowardice in declining these fights. What seems to me important is that at this stage our own past wisdom and the Russians' wisdom in not challenging the blockade should be linked together to give the mutual understanding that we have each challenged the other and have each shown enough sense to not pick up the challenge.

7a. There is, as I see it, a chance at this moment to get out of a lot of the "Prisoner's Dilemma" situation in which both sides have been caught. The great danger is that the American public (and still worse, the Russians) may decide that the events of the last few days prove the desirability of deterrence. The whole point is not deterrence but that use of violence which in fact breeds trust.

8. As far as I can see, the games theorists and others who have tried to formalize these problems have consistently thought at a level of logical typing which was one step too low – in fact, one level below what the octopuses and pre-human mammals normally achieve. Somebody should be doing a lot of research, both mathematical and observational, at the level which I have tried to define in this letter, in which the analogic mention of violence becomes in the overall interchange a peace-making move, not through deterrence but through the discovery of trust. We do not know anything, for example, about the conditions and parameters of relationship in which two opposed individuals get stuck in a steady state of continued mutual hostility.

I look forward to seeing you the beginning of the coming week.

Yours sincerely,
Gregory Bateson, M.A.
Ethnology Section

Acknowledgments

To begin with I would like to acknowledge Gregory Bateson with whom I had four classes as an undergraduate at the University of California, Santa Cruz. One of them was an independent study (in 1976) in which I purported to observe sea otters and elephant seals. I was allowed to observe the elephant seals at Año Nuevo State Park, in California, before the official tours began, and got chased by one, but did not make any significant or pathbreaking observations.

I would like to thank Kalevi Kull for inviting me to write this book after the presentation I gave at the 18th Annual Biosemiotics Gathering, the University of California, Berkeley, in June 2018, and for his ongoing supportiveness to the project of writing it.

I want to acknowledge Nora Bateson for her ongoing friendship and encouragement, and for providing such a shining example of how someone can be in this world, when provided in childhood with a firm foundation in her father Gregory Bateson's way of thinking, along with the empathy inherent in it.

I thank my wife Gail Kara for being a close reader of the manuscript (and for her discussion with me on the concepts of the book throughout its composition). I especially am grateful for her insistence on making my writing as accessible and readable as possible, in a way which enhances rather than detracts from precision and clarity.

I will now turn to acknowledgments for specific items used in the book.

The extensive quotes from Gregory Bateson's unpublished (and where applicable, published) writing, as well as the transcriptions from his audio recordings, are by permission of the Bateson Idea Group. I am President of the Bateson Idea Group, which is composed of lifelong scholars of Gregory Bateson and which holds and administers the rights to Gregory Bateson's intellectual property that are held by his estate. Nora Bateson was the prime mover for the establishment of the organization and is one of its Directors. The Bateson Idea Group is a registered nonprofit organization in the USA and is the successor organization, with respect to Gregory Bateson's rights, to the Institute for Intercultural Studies.

I would like to thank Frans de Waal, who holds the copyright to his book *Peacemaking Among Primates*, for his statement that my extended citations from

Contents

Chapter 1
Bateson, Cybernetics, and Nonverbal Communication

> It seems to me that nations having almost total distrust for each other's words in fact operate with non-verbal cues and therefore face problems which must closely resemble those which confront octopuses and pre-verbal mammals. (Letter to Warren McCulloch, MC 1039-10a, October 25, 1962)

Gregory Bateson's view was that inherent in any instance of communication, among humans as with other animals, is communication about the relationship of the parties who are communicating. This relational communication is over and above the "content" of any communication – it is "metacommunicational" to overt content, or to use a Batesonian phrase which will be explored further, it is of a "higher logical type." Bateson's concept of communication about relationship forms the larger subject of this book. In humans it is exemplified *par excellence*, though not exclusively, by non-verbal, so-called analogue, forms of communication. These, as Bateson often pointed out, have not died out in spite of the existence in humans of linguistic, so-called digital, communication.

1.1 History of Bateson's Interest

Gregory Bateson's approach to this relational aspect of communication among animals in particular, as well as in how it emerged in humans from deep roots in animal communication, began to take shape fairly soon after he left anthropology, Margaret Mead, and the United States East Coast, in 1948. His theoretical interest in these matters had several roots. One taproot began with the Macy Conferences, the unique interdisciplinary movement which gave birth to the field of cybernetics. A second one was his proximity to the field of psychiatry, which began with his appointment at the University of California Medical School to study human communication in psychotherapy, along with the Swiss scholar Jurgen Ruesch. And a third, in some ways the most important of all, was his deep knowledge of natural history, which began with his boyhood as the son of the famous evolutionist and pioneering geneticist, William Bateson. Gregory Bateson often said, and increasingly so nearer the end of his life, that all his work in what looked like disparate fields – anthropology, psychiatry, animal behavior, epistemology of perception – was actually devoted to a small set of questions in a single field, that of evolutionary theory writ large. In the end he was his father's son.

The word cybernetics in the popular mind has developed connotations inspired by the computer era. Computer technology of course does have many of its foundations in cybernetics, and yet the range of interests of the original cyberneticists was much wider, in perhaps surprising directions. Specifically, the interdisciplinary group at the Macy Conferences, which was instrumental in the founding and development of that field, had a very diverse membership. These conferences included not only mathematicians, engineers, and physical scientists, as one would expect based on what our day imagines cybernetics to be, but also neurophysiologists (interested in modeling the brain), psychologists and psychiatrists (interested in malfunctions of the mind), other sorts of biologists, and of course the anthropologists, Gregory Bateson and Margaret Mead. And the topics this multifarious group explored included all possible types of communication, ranging from machine communication to animal communication to the proper way of learning an anthropological field language (a paper Margaret Mead contributed in 1950, which would have still been good advice forty years later).

The transcripts of the Macy Conferences might be expected, then, to provide the basis for a new way of understanding animal communication or human nonverbal communication. I had some hope for this upon seeing that the Eighth Conference on Cybernetics, dated 1951, included a talk on "Communication Between Animals" by Herbert G. Birch. (Pias ed. 2016: 446–474) However, Gregory Bateson was absent from that year's talks, even though most of them dealt with the potentially Batesonian topic of "communication" in several dimensions. The format of the published Macy Conferences includes a substantial amount of the discussion among the participants. It was clear that these participants were prepared and interested. They shared a common fund of knowledge about examples of animal communication ranging from von Frisch's description of the waggle dance of bees, to the behaviors of apes in zoos, to the schooling behavior of fish and the courting behavior of birds. Nevertheless, the prevailing paradigm for non-human animal behavior was still a kind of behavioristic mechanical model, based on the formal theorizing of the ethologists Nikolas Tinbergen and Konrad Lorenz (rather than on the examples in their books, which might indeed point to a different and more sophisticated theorizing than they themselves made). Behaviors were seen as being "released" in the automaton fashion proposed by the dominant schools of thought of the time, and to my eyes it seems that the examples given were stretched and tortured in a Procrustean way to confirm the reductionistic paradigms of the era. One partial exception to mechanistic reductionism was the contribution of the Freudian analyst Lawrence Kubie, who, in his turn, may not always have been innocent of stretching examples to fit a very different set of theories.

1.2   Humor and Humans – A Non-Digression into the Carrier Wave

Gregory Bateson's own Macy Conference presentation in the following year was on "The Position of Humor in Human Communication." This provides us with a different world of ideas. Already one sees Bateson's way of thinking in the choice of topic. Scientists are usually encouraged to look for easy subjects to conquer, and the phrase for this is often that they should pluck the low-hanging fruit. Bateson always gravitated to the *high*-hanging fruit. He would rather think in an exploratory way about a difficult topic than rack up easy victories against a simple phenomenon. All Bateson's preferred topics were refractory ones which common sense would tell us are out of the reach of science. The focus of his anthropological study of a New Guinea people, *Naven*, was not, as with his contemporaries, overt social structure or ritual symbolism, but the subtleties of gendered social dynamics as an interactive system. (Bateson 1958 (1936)) When he was subsequently inspired by cybernetics and systems theory, he chose to use these to tackle, not economics and formal game theory, but humor and play. In the company of therapists and theorists of mental illness, Bateson did not emphasize clinical descriptions of schizophrenias or theories of their cure, but (again) their complex social dynamics and metaphorical speech. And as a theorist of animal communication, he bypassed the functionalist interpretation of animal communication in terms of the survival of genes, but rather attempted to understand it in terms of its *sui generis* processes.

In 1953, the influences on Bateson's thought about a topic such as humor were a complex mixture of psychoanalytic ideas and his own interpretations of the paradoxes of logic. Already in this article much of Bateson's theory of communication has been born fully formed out of the brow, so to speak, of cybernetic Zeus. Above all, the priority of relationship is the starting point, as it would remain throughout Bateson's theoretical career.

In fact Bateson's Macy Conference presentation begins by discussing "the position of humor in *the equilibration of human relationship* (Bateson 2016 (1953): 541, emphasis added). Messages, even verbal messages, are not so much representations of reality as they are means of bringing people into the same context:

> People are not necessarily in clear agreement about what their messages mean. The senders have their rules or habits in constructing messages; the recipients have their rules and habits in interpreting them; and there is not always agreement between the rules of the sender and the rules of the recipient. One of the most important uses of messages, and especially of their interchange – the single message doesn't mean much or do much in this respect – is to bring the two persons or the many persons together into an implicit agreement as to what the words are to mean… If we discover that we are not communicating in the same way, we become anxious, unhappy, angry; we find ourselves at cross-purposes. (Bateson 2016 (1953): 541)

Though he does not yet use the word meta-message, Bateson in this article is already emphasizing that every message has several meanings at different levels of what he sometimes calls abstraction – different levels of generality of context. This can

include the habits of perception of an individual who, for example feels that the world is hostile, is against her, and who interprets every communication in a way that confirms that habit or premise of interpretation.

We encounter here one of the very first examples of what Bateson would later, in unpublished and unofficial contexts, call the "carrier wave" of communication.

> There is another set of implicit contents in such a message as: "The cat is on the mat," namely, implicit statements about relationship. We are trying to tell each other that we love each other, that we hate each other, that we are in communication, that we are not in communication, and so on. The implicit statements about the conventions of communication are messages about the 'how' of communication, but these (about relationship) are messages about the fact of communication. "We are communicating" is a statement by two persons. (Pias 2016: 542)

This realm of meta-message is intrinsic to the act of communicating itself – any act of communication, articulate or inarticulate, witty or awkward, felicitous or unfortunate, "successful" or "unsucccessful." From the beginning, as early as this article from 1953, Bateson's ideas about communication were rooted in what is *necessarily* true about the natural history of interactions between humans — or animals — or both. And the fact that all communication exists on multiple levels is a *necessary* truth about it.

That is to say, the fact that two (or more) organisms are communicating means that some relationship between them exists, if only the relationship brought into being by that act of communication. And the communication will therefore by necessity be, in addition to everything else it intends or purports to be, also a communication about that relationship. It cannot be otherwise.

It is this communication about relationship that Bateson would later, in an unpublished talk, refer to as the "carrier wave" that exists in all interchange. However, there are, perhaps, imperfections to that metaphor (which never saw the light of formal publication). Such communication about relationship can, perhaps, be abstracted (or as the Peirceans say, prescinded), by intellectual analysis, from the other aspects of communication, including its purported subject matter. But it would never be possible to create, experimentally as it were, a communication without relational meta-implications of any sort. That would have to be a communication from no one, to no one: a conceptual contradiction.

Gregory Bateson's participation in the Macy Conferences took place when, as mentioned, he was working with Jurgen Ruesch, a psychiatrist and academic, at the University of California Medical School in San Francisco, on a project of understanding human communication in psychiatry. One of the results of that work was a joint book by Ruesch and Bateson published in 1951 and entitled *Communication: The Social Matrix of Psychiatry*. Bateson did not train or take coursework in psychiatry for this project, but what he did do, was interview and observe psychiatrists in the manner of the cultural anthropologist he was – in other words he practiced what is known as "participant observation" among the psychiatrists. His chapter on psychiatric theory relies heavily on casual, non-formal talk by psychiatrists of that era and place, and does his informants the favor of keeping them anonymous.

But he did not limit himself to ethnography. He had to preface his observations on the world view of the psychiatrists of his day with his own perspective as it had been influenced by the cybernetics movement, and we find this in the Ruesch and Bateson book's Chap. 7 entitled "Information and Codification." (In general the first half of the book is by Ruesch, there is a middle joint chapter, and everything from Chap. 7 on is solely Bateson's.) In this chapter Bateson brought to bear several ideas from his cybernetic work, made observations based on Tinbergen's study of ethology, and discussed Aristotle's concept of substance. He also in this chapter introduces two of the key ideas of his thought about communication. This may be the first place where he describes the contrast, in communication, between "analog and digital," which I will discuss in detail in a subsequent chapter. And this is where he first uses the concept of "metacommunication," a concept which may, as he notes in his later book *Mind and Nature*, have been originated by the anthropologist Benjamin Whorf, but which Bateson made his own from a theoretical perspective. (See Bateson 1979:116).

Importantly for his forthcoming studies of animal communication, he at this point conditioned metacommunication on what he called "mutual awareness of perception."

> We shall describe as 'metacommunication' all exchanged cues and propositions about (a) codification and (b) relationship between the communicators. We shall assume that a majority of propositions about codification are also implicit or explicit propositions about relationship and vice versa, so that no sharp line can be drawn between these two sorts of metacommunication. Moreover, we shall expect to find that the qualities and characteristics of metacommunication between persons will depend upon the qualities and degree of their mutual awareness of each other's perception. (Ruesch and Bateson 1968: 209–210)

But, we should not assume that this "mutual awareness" is itself part of conscious reflection, or that metacommunicative messages are themselves consciously sent or received. Initially, the question of whether animals know that their messages are messages, a question related to issues of intention and consciousness, was always mentioned by Bateson as part of the thought process which inspired his early inquiry into play. However this issue recedes as a concern after the middle 1950s. By the 1970s he had dismissed the question of animal consciousness as being non-central to his concerns. I think this was for very good reasons. Bateson found that much of the communication he was interested in even among human beings is "exchanged" below the threshold of conscious intention or reception. Particularly this is so for the realm of communication about relationship. Regarding the study of animal communication there is a second concern, which is that the disciplined and naturalistic observation of communication, signaling, sign behavior and the like must not be held hostage to speculations about animal capabilities or lack of capabilities which then lead to *a priori* discounting of what is observed. Bateson was always first and foremost the naturalist he was brought up to be. For all these reasons the issue of whether messages are conscious is generally not given great importance in Bateson's work.

1.3 Nonverbal Nations

I have saved until now any comment on the bombshell of a premise which Gregory Bateson drops in his letter to McCulloch, quoted as an epigraph for this chapter: "It seems to me that nations having almost total distrust for each other's words in fact operate with non-verbal cues and therefore face problems which must closely resemble those which confront octopuses and pre-verbal mammals." (MC 1039-10a, October 25, 1962).

The mention of verbal language here is a bow to a conventional concept of communication which we might call "folk rationalism." We tell our children to "use their words," to use the purported conscious rationality of language to solve or prevent disputes. But the problems inherent in conflict and in coexistence seem often to be intractable to logical discussion, even among human beings who believe that their ability to discourse in symbolic language ought to provide them with tools to transcend the sort of problems which bedevil the nonspeaking animals.

The inclusion of nations as a part of the category which includes octopuses and nonverbal mammals is provocative on two fronts. On one front it evokes perennial controversies about whether or in what way nations (or other human organizations) can be analogized to organisms. Clearly this was not a problem for Bateson, whose view of living systems was hardly limited to individual animals or plants. Bateson's systems approach notoriously extended itself from living things themselves, to systems composed of the interactions between living things. Indeed, for him, the boundaries between one living system and another were ontologically somewhat fluid, relativized according to the perspectives of the observer or analyst. So what is true of individual organisms, in terms of their abilities or lack of same to communicate, can also be true of organizations such as a nation. He would have envisioned a nation of course not as a bunch or pile of individual citizens, but rather as a system composed of their relations and interactions.

On the other front of course it is provocative to consider a nation as relegated to nonverbal forms of communication because of "distrust." This evocation of distrust is a move which already brings to bear a realm of communication which subverts the ideal of resolving all conflicts using discursive verbal means. Whatever the content of a stream of language, the question of whether it can be trusted or not exists at a different level, as we say, to the denotative meaning of the particular words and sentences as they combine in a statement. Sometimes, borrowing and possibly stretching an idea of Bertrand Russell's for the purpose, Bateson would refer to the difference of levels observable here as a difference of "logical type." To use another favorite Bateson phrase, it is a matter of the "natural history" of communication. The question of trust and distrust exists at a so-called "meta level" to the verbal material which is trusted or distrusted. It is "about" that material rather than an extension of it.

The construction of meta level as a form of "logical type" does imply that this meta-ness must somehow emerge from the need to deal with a logical paradox. The one relevant here might be constructed from the existence of "rhetoric" itself, that

is, the fact that we know that people (and especially nations) use language to persuade rather than to articulate true things about the world (bracketing in every possible way the thousands of years of philosophical discussion about what might be meant by truth here). If it is accepted that language as rhetoric is an instrument of conflict with the purpose of prevailing, then the question of trust cannot be established from within that system of language, since everything said within that system of language has to be evaluated not in terms of truth but in terms of the purposes of the conflicting parties, for whom the articulation of true things about the world may be a secondary priority if that. Truth, whatever it may be, becomes subordinate to the instrumentalities of linguistic warfare, and thus trust, when this is wanted, has to come from elsewhere, from outside or "above" the system of language.

But ironically that "aboveness" can only come, in a Batesonian system, from "below," i.e. from communicational systems shared with the supposedly "lower" animals (a phrase, and an evaluation, he would of course have emphatically rejected). Not all metacommunication is necessarily nonverbal; but when the verbal becomes unreliable, the nonverbal can become the only recourse.

Perhaps ironically, for Bateson this becomes one key to why the nonverbal modes of communication have survived and ramified in human beings. To evoke another context in which human communication can sometimes be subject to distrust, Bateson notes: "When boy says to girl, 'I love you,' he is using words to convey that which is more convincingly conveyed by his tone of voice and his movements; and the girl, if she has any sense, will pay more attention to those accompanying signs than to the words." (Bateson 2000: 418).

In the later discussion of the Cuban Missile Crisis, we will see that the Soviets and Americans behaved something like that courting couple in trusting properly patterned actions rather than words. Today the phrase that all is fair in love and war is deservedly no longer popular. But Bateson showed that the same kind of attention to communicative patterns of action, rather than potentially empty language, can serve the establishment of peace among parties in conflict. We will be seeing what kind of "signs" are exchanged in animal conflict in particular, as well as in an example of animal courtship, and how these can promote at minimum a *modus vivendi*.[1] It would be harder to prove that they produce friendship or love as well, as Bateson clearly believed. But such a thing is harder to prove scientifically, even in the case of octopuses who, solitary as they are reputed to be, were seen by Bateson in his aquaria, and by a recent researcher in the ocean, occasionally, if rarely, to share a common dwelling under a rock.

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[1] The best definition of this term for my purpose is actually Wikipedia's, "an arrangement or agreement that allows conflicting parties to coexist in peace." I prefer this to the Oxford English Dictionary definition of a "working agreement between contending parties, pending the settlement of matters in debate." In animal conflict matters, the meaning of the concept of "settlement" would be somewhat obscure. I would argue it is *modi vivendi* "all the way down."

Chapter 2
Bateson, Relationship, and the Biologists

1. It appears to me that the discourse of these creatures (mammals, octopuses, and nations) focusses almost totally upon matters of a rather high order of abstraction, viz., what shall be the rules and the styles of relationship between the two communicating individuals. When the cat says "mew", she is asserting a dependency between herself and me. I may be able to deduce from this high-level abstraction that I should give her milk, but she does not in general mention milk and her "mew" is approximately what we anthropologists would call a kinship term, i.e., an assertion of a body of rules for a relationship. (Letter to Warren McCulloch, MC 1039-10a, October 25, 1962)

2.1 The Relational Abstract

What Bateson calls in his letter to McCulloch the "rules and the styles" of relationship, he often elsewhere referred to as the "contingencies" of relationship. The term "contingencies of relationship" was based on a concept from behaviorist psychology, but with a Batesonian spin. Bateson's longest treatment of this concept was in a paper he prepared for the Symposium on the Expression of the Emotions in Man.[1]

In this paper, entitled "A Social Scientist Views the Emotions," his formal treatment is somewhat behaviorist in language – though not in spirit.[2] (Bateson 1991: 127–131) Behaviorism's concept was that of contingency of reinforcement, not contingency of relationship. With an eye to the former concept, which he wished to use to generate the latter, Bateson noted that the reinforcement within a learning sequence could be "variously contingent upon time, probability, the subject's

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[1] Held in 1960 at the meeting of the American Association for the Advancement of Science, December 29–30, New York.

[2] Reprinted in Gregory Bateson, Rodney Donaldson, ed., *A Sacred Unity: Further Steps to an Ecology of Mind*, New York, HarperCollins, 1991, pp. 127–131.

behavior, peculiar combinations and characteristics of the stimulus, and so on."
(Bateson 1991: 128) But his next move was to model the system of two interacting
organisms in his typical reciprocal way, in which each of them played the role, as it
were, of experimenter and subject for each other. This he represented in a simple
model as …*ababababa*… in which every letter represents "behaviors or signals
emitted by" the respective two organisms. (Note the opening towards semiotic lan-
guage here.) Each letter functions as part of a possible triad of stimulus, response,
and reinforcement – every letter of course playing every part since there is in this
sequence no determinate punctuation except according to the arbitrary choice of the
analyst. In a footnote he further complicates this model by noting that:

> any item in the sequence of interchange may be a "response" or "reinforcement" for any
> earlier item and it may be "stimulus" for any later item. It is also possible for any group of
> items to function as a unit of this sort. The problem of describing each series becomes
> methodologically similar to the problem of describing orders of redundancy in such sto-
> chastic series as codes or ciphers. (Bateson 1991: 128 fn 1)

Having thus used behaviorism to transcend behaviorism, without overt critique, in
order to set up a semiotic model, Bateson proceeds to note that each organism has
expectations (or predictions) which can be violated or confirmed by the other party.
This confirmation or disconfirmation is separate from the question of punishment or
reward, or "positive or negative reinforcement." An expected punishment, for exam-
ple, or an unexpected reward, are both violations of the expectations that each
organism has developed about the "contingencies of relationship," to use the term
Bateson introduces here.

The development of these systems of expectation is the result of what Bateson
referred to as higher-level learning (in his terminology, Learning II or deutero-
learning). Learning II is not the learning of specific sequences of behavior, which
would be in his terminology Learning I. Rather, Learning II is about the patterns
which the organism learns to expect across multiple contexts of behavior. The con-
tingencies of relationship are therefore "meta" to the mere contingencies of rein-
forcement discussed by behaviorism. Bateson describes this meta-level as being
more "abstract," which is an idiosyncratic, and undoubtedly provocative on his part,
way of conceiving abstraction. In fact higher-order learning, deutero-learning, or
Learning II, can also be described as the development of *habits* of learning. These
habits of learning, in their turn, serve as modes of perception and action for any
subsequent experience and learning – something which Bateson referred to as *clas-
sification* of such subsequent experience and learning. As always with Bateson, we
are dealing with dynamic self-reinforcing patterns. One is reminded of the Peircean
concept of the *taking of habits* which is key to Peirce's view of the emergence even
of laws of nature.

Thus at the individual organism level we are dealing with organisms who develop
habits of learning from interactions and who bring those habits of learning to those
interactions. At the interaction level we are dealing with the interactive "grooves"
which inevitably develop when such organisms become each other's significant
environment (or *umwelt*) to which each other must adapt in time.

The behavior of each organism with respect to the others involved in such a system of mutual interaction, provides these other organisms with what was in this article termed by Bateson "signals of state" (Bateson 1991: 128) – presumably referring to the (psychological) state of the first organism relevant to its relationship with the others. But this term with its behaviorist antecedents was too static, as it were, for Bateson. In fact, what each organism's behavior provides is information about the contingencies of relationship that the other organism(s) have learned to expect. These are assimilated to the patterns of contingencies of relationship that each organism has learned from its own experiences.

These patterns exhibit what Peirce would have called abduction, what Bateson would have called metaphor, and what psychoanalysis would have called transference. That is, patterns of expectation regarding the contingencies of relationship can transfer from one context to another. In the case of the mewing cat and its "owner," which Bateson mentions in the letter to McCulloch, the domesticated cat is transferring to its relationship with Gregory a set of contingencies of relationship from its past experience as a kitten vis-à-vis its mother cat. The kitten's mew is a sign of relationship originating in the dependency experience of mammalian "childhood," but its extension to the relationship with a human "master" is an expression of the similar dependency which is established in the latter context. These sorts of abductive transfers of relationship are not only found in domesticated animals, but are also found in the wild among mammals and birds, and they will be illustrated in a number of examples later in the book.

(However, the octopus has no such childhood dependency from which to create metaphors for adult life. Prospects for truly domesticating octopuses would seem to be doomed to failure. Nonetheless, their communication seems very sophisticated in other ways, including as we will see matters of conflict and of developing non-conflictual relationships.)

Bateson, as mentioned above, considers the communication about contingencies of relationship to be "abstract." This is because, unlike the concept of contingency of reinforcement which is specific to an individual event sequence (such as an experiment), the contingency of *relationship* is about the meta level of expectation which animals learn to apply to the *commonalities* which they learn to perceive as their actions and perceptions are reinforced – or not. However, this communication of contingencies of relationship need not be consciously emitted nor consciously received – indeed it is quite possibly a more *honest* signal when it is not. It is not always nonverbal, but nonverbal and analogic modes of communication have their advantages with respect to carrying this kind of message.

2.2   Critique of Conventional Biological and Scientific Ideas

At this point it will be useful to backtrack and, to mix metaphors, to go "meta" and to explore the contrasts between Bateson's thinking on these lines and more conventional discourses within biology.

Bateson defined his ideas as involving the subject matter of "communication about relationship." Relationship, particularly (though not necessarily only) with members of their own species (conspecifics), is an important part of the environment of organisms, whether they are completely social or intermittently so (such as solitary species that come together only to mate). We can see relationship as intrinsic to any interaction between organisms, possibly excluding interactions that directly involve killing or eating. Perhaps the material mechanics of reproduction could also be excluded, though the "mating rituals" leading to reproduction would emphatically be included.

For a biosemiotician, the realm of relationship is the realm of the semiotic, broadly conceived. But for conventional, functionalist biology, relationship is constructed according to the implicit goals of living things according to the neo-Darwinian universe: territoriality, reproduction, dominance, status. Bateson eschewed this kind of functionalism, which in the theory of biological evolution is also termed adaptationalism. Functionalism can perhaps be defined as explanation of a behavior in terms of what things are for, and Bateson was more interested in questions of how things happen. Thus we can see that conventional approaches did not address the questions in which he was interested, neither in biology nor in anthropology where similar tendencies existed within the works of Malinowski or Radcliffe-Brown. It may also be relevant that relationship in Bateson is not static or reified, a point to which I will have cause to return. The relationship which Bateson found among animals and human beings is ever-present but always in flux. This leads to a view of communication about relationship as a "carrier wave" which accompanies all other forms of communication.

To return to mid-century (and even contemporary) neo-Darwinian biology, its functionalist understanding of animal social behavior is often subsumed under the individualist concept of "instinct" – and Bateson worked hard to destabilize the assumptions behind the way that concept was used, most notably in his famous "Metalogue: What is an Instinct?" first published, as I noted earlier, in Sebeok's edited volume of 1969, *Approaches to Animal Communication*, and reprinted, of course, in 1972 in *Steps to an Ecology of Mind*.

Bateson's Metalogues are imagined dialogues between a father and a daughter. In principle the structure of the dialogue is supposed to have a relationship to its subject. In practice the metalogue takes the reader on a subversive and unexpected journey of thought, beginning with first principles of epistemology and philosophy of science, extending to the mechanisms of genetics and development (and how they are not fully understood), and of learning theory (and the taking of habits). The foundations are laid for a rejection of positivism and a critique of objectivity, and especially, as relevant to our current discussion, for a principled form of what might

be termed anti-anti-anthropomorphism. (Which is to say, Bateson rejected, sometimes playfully, the then-conventional premises of human uniqueness underlying the accusation of anthropomorphism, an accusation which is fortunately far less in fashion in 2020 than it was in 1969.)

The metalogue continues by making and defending a parallel between animal communication and dreams, focusing not on the Freudian analysis of dreams but on a semiotic one. Bateson then shows how both dreams and animal communication about relationship are necessarily related to metaphor. And all of this is accomplished in dialogue form which is both more entertaining and more profound than the summary which I have just given.

Bateson was of course very familiar with conventional accounts of animal behavior and communication, just as he was familiar with the Darwinian versions of natural selection which privileged competition. But, as the son of the heretical geneticist William Bateson, whose reputation was in eclipse among conventional biologists for much of the twentieth century in which his son worked, Gregory Bateson felt free to pathbreak his own trails rather than following the road more travelled by the biology of his day. In particular, his work on animal communication superficially appeared to contradict three scientific taboos – those against teleology, against anthropomorphism, and against anecdotal evidence (or small sample sizes). But he only broke these taboos in an informed fashion. He considered himself as a scientist committed to advancing scientific truth, and preached an intellectual and rigorous gospel in unlikely places, even in the New Age mecca of Esalen Institute where he spent his last years.

Let us consider his arguments against these scientific taboos. Teleology is the explanation of the behavior of living things with respect to the purpose or goal that behavior seems to serve. It violates the unidirectional concept of cause, which is considered fundamental to science, and it makes the future causative to the present, which also contradicts the canons of how science has been practiced. In some of its airier philosophical guises, teleology has been known to cast evolution itself as an agent similar to a monotheistic God, and sometimes it is used to give a spurious inevitability to contingent and historical phenomena. Yet, as regards living organisms, it seems so intuitive to our everyday observations that J.B.S. Haldane, a towering figure of the establishment if anyone ever was, famously made the remark that "Teleology is like a mistress to the biologist; he dare not be seen with her in public but cannot live without her." (Alexander 2011: 7).

A major reason for the Macy Conferences which established cybernetics was to study precisely how systems, operating in a way completely concordant with established mechanistic science, nevertheless demonstrate either the appearance, or the reality, depending on one's taste, of goal-seeking in a teleological way. The second and third Macy Conferences, in 1946 and 1947, were entitled "Teleological Mechanisms and Circular Causal Systems." (Pias 2016 (2003)).

Gregory Bateson, in the early section of *Mind and Nature* entitled "Every Schoolboy Knows," sets forth some of the basic presuppositions and items of knowledge that are needed to apprehend his ideas, but that are not as widely understood as they should be. In that section (1979: 60) he makes a point of noting, and

agreeing with, the standard criticisms of teleology. But the version that he criticizes is the "lineal thinking" version, the version of Aristotelian final cause which implies "that the pattern generated at the end of a sequence of events could be regarded as in some way causal of the pathway followed by that sequence." Most moderns (except for some popular historians) do of course understand that as a fallacy. His task was to demonstrate that the goal-direction, which people intuitively see in the behavior of animals and plants, does not actually partake of that fallacy.

What for Bateson licensed the ability to work with the apparent teleology of living things is the discovery in cybernetics of circular systems engaged in feedback cycles. Such circular systems can modify their behavior towards what can fairly be described as system goals, whether these are externally pre-programmed in the case of mechanical systems, or they are part of increasingly complex processes of self-organization as we see in living systems. Bateson remarked, in *Mind and Nature*, that the discovery of cybernetic systems of this kind allowed "the problem of purpose," which he took to be central to philosophy since the days of the ancient Greeks, to come "within range of rigorous analysis." (1979:106).

Note that the intricate processes of self-correction and self-regulation we see in living things take place for the most part in the absence of consciousness (even in human beings). Yet Bateson included these processes in his expanded concept of mind. Thus his expanded cybernetic concept of mind enabled Bateson to avoid worrying whether an intelligent or adaptive behavior in an animal required an attribute of consciousness. The question of consciousness was one he by-passed as a rule. But this brings us to the second taboo – that against anthropomorphism.

It is in the already mentioned metalogue "Daddy, what is an instinct?" that Gregory Bateson deals most with the concept of anthropomorphism – by teasing it and treating it lightly. Noting that botanists are not supposed to use the concept of "instinct," he writes an exchange between Daughter and Father, beginning by Daughter asking:

> D. Do plants have instincts?
> F. No. If a botanist used the word "instinct," when talking about plants, he would be accused of zoomorphism.
> D. Is that bad?
> F. Yes. Very bad for botanists. For a botanist to be guilty of zoomorphism is as bad as for a zoologist to be guilty of anthropomorphism. Very bad, indeed.
> D. Oh, I see. (2000: 40)

Later in the metalogue he writes that attributing a "self-preservative instinct" to an animal would be a "halfway house on the road to anthropomorphism," because if the animal knew it had a self to preserve, its "wiggling" in the course of apparent self-preservation would be "rational, not instinctive." (2000: 41).

His other uses of the term anthropomorphism in the metalogue are ironical. With behaviorism in his cross hairs, he accuses the scientists of his day of both anthropomorphism and inhumanity at the same time, in their choice of "objective" aspects of animal behavior to study. But how, he asks, does one know that one's choice of behavior is objective? By choosing among the "things which they choose to look at," and "looking very hard at them," and finding out by experience. "Daughter"

points out that because it is experience, it is subjective and "Father" responds, "Oh, yes. All experience is subjective." (2000: 47).

Father subsequently notes, in a later section that "It's easy to be objective about sex but not about love." (2000: 50) And in that vein Daughter further notes, "It looks like we are going to be anthropocentric in one way or another whatever we do. And it is obviously wrong to build our anthropocentrism on that side of man's nature in which he is most unlike the animals." (2000: 50) In other words, the attempt to study animals objectively, as in behaviorist experimental psychology, necessarily leads to an impoverished and incomplete idea not only of animals but of human beings as well. The avoidance of anthropomorphism, as it has been practiced in the sciences, tends to throw the baby out with the bath water, the baby being those aspects of being both animal and human which are not captured in "objective" study methods – methods artificially developed precisely so as not to deal with the presence or absence of these aspects.

Gregory Bateson told a number of stories in this vein, stories which were meant in the context of the mid-twentieth century hegemony of behaviorism to poke at its edges and demonstrate its limitations. He often told a "tale out of school" about B.F. Skinner's own laboratory, in which pigeons were the experimental subject of choice. The best version of this story that actually met publication can be found in the transcript of the introductory remarks to a conversation Bateson had in public with Carl Rogers.

> …there is a lot of stuff which is true within its very narrow limits. It's called behavioral modification, it's called behaviorism, it's called Skinner, it's called by other opprobrious terms. And these matters of study that they've worked on, you know, are worth studying. Trouble begins, though, when you find, of the pigeons being put into the Skinner boxes, that first of all there is a rule in the lab that nobody but a particular lady is allowed to handle the pigeons, and secondly that the graduate students and Ph.D.s emphatically are not allowed to handle their pigeons: they just write the schedules. And then you find that the pigeons adore the lady who puts them in the boxes, that they swoon with pleasure in her hands. And this part of the story is not in general recorded in the research results. Because love, you see, is not what it is supposed to be all about. It just happens to be one of the things that it is all about. Right. There is, therefore, obviously not only a learning to peck prime numbers on discs or whatever it is, there is also a learning to peck prime numbers in a context whose shape is related to love. Stone walls do not a prison make, yes, nor iron bars a cage, but love will find a way somehow.[3] (Kirschenbaum and Henderson, eds., 1989: 183)

Gregory Bateson did sometimes use the word "love" for shock value. But consider how his observation of the necessity for "proper experimental subject handling" – which is probably how what he is describing would have to be phrased in a National

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[3] H. Kirschenbaum and V. Land Henderson (eds.), 1989, *Carl Rogers: Dialogues*. New York, Houghton-Mifflin, Chapter 7, p. 183.

In other tellings of this story, on unpublished tapes, it turns out that its basis was film footage shown to him by one of the trainers of dolphins whom he worked with, who visited the Skinner labs. (The trainer in question was probably Karen Pryor.) His point is not, of course, to claim that Skinner training does not "work"; the point is that it (and all laboratory behavior) exists in the animal's context, and that key features of the context for that animal tend to be elided in the way we think of describing behavior, for example for publication.

Science Foundation grant – is only made possible by allowing a certain amount of anthropomorphism, yet at the same time, once it is taken at its own face value, it validates the limited anthropomorphism which it also presupposes. And it is consistent with Bateson's rich sense of what it means to be human, as well as enriching the sense of what it might mean to be nonhuman.

For Bateson, the anthropologist, it was always clear that the experimental apparatus of the scientist must always and emphatically include the whole person of the investigator. Or as he put it, "the point of the probe is always in the heart of the explorer." (1979: 88) The adoption of the stance of non-anthropocentric objectivity blunts the sensitivity of the investigator to processes which are otherwise observable and highly important. The counter argument to this of course is from the semiotician Sebeok, who cautioned (especially in his work on the "clever horse Hans," which will be mentioned in a later chapter) that anthropomorphism, of a naïve variety, often leads to sloppiness and sentimentality. Clearly what is demanded of the investigator of animal behavior is a complex balancing act. It is not different in principle from other exercises of cognitive empathy. One must learn to look from the other's point of view (for which von Uexküll's concept of *umwelt* is helpful) and try to limit the tendency to take oneself as the central metaphor for the other (though as Mary Catherine Bateson noted (1991: 285), we are always and unavoidably our own central metaphor.)

Indeed the hope is that we will transcend both anthropomorphism and anti-anthropomorphism, and eliminate the opposition or binary involved. I think Bateson was well on his way to doing this. What enables progress in this matter is to view the organism, in the first instance, in terms of context rather than capacity. (This involves a similar transition to how early twentieth century anthropology evolved away from explaining group differences using the idea of race and toward explaining them via the idea of culture.)

To be seduced by the question of capacity (e.g. "animal intelligence") is to have as one's primary concern how much animals are able to communicate, more particularly to human beings though also to each other. Much of contemporary animal studies seems focused largely on this question, and this is understandable since so much of the argument for human uniqueness has been founded on imputing various sorts of incapacity to animals and other living things. If the human is to be defined against the animal, if there is a value to maintaining that border, then a bias is established which will tend to obscure commonalities and make them unobservable. Today this border is starting to crumble at various points. But to understand Bateson we have to see that he, presciently perhaps, did not treat that border as being there to begin with. The question of capacity was never a focus of his research. If he observed something (such as animal play), then *ipso facto* the capacity for what he observed was seen to exist. The next question was to define the circumstances in which the phenomenon is in fact observed. This will inexorably lead to showing how the phenomenon fits its context. At this point, the question of capacity becomes one of *how* this contextual fitting can arise – a problem of what mechanism might underlie communication, as it were, rather than one of how identity or nature might be compatible with whether that communication could possibly exist. The whole

issue of whether what is observed fits the preconceived nature of what an animal is thought to be, by contrast with the human, is bypassed and never arises.

Another shibboleth of social science to which Gregory Bateson refused to do homage is the concern for sample size and the possibility of statistical analysis. He would joke about this too. There was a psychology graduate student, according to his story, whose thesis research was not approved because his sample size was only four, and nothing could be proved on the basis of only four instances. The number of examining professors who rejected his study? Four – with one dissenting vote. (Letter to Gerrit M. Keator, MC 709-1b, April 5, 1967) This probably seems normal and not funny at all.

Bateson considered himself a natural historian. It is also relevant that he had been a cultural anthropologist – I was about to call him a trained cultural anthropologist, but in truth, for that field, he sculpted the mold rather than being cast by it. (His work predated most of what would later be thought of as method in that field, and for that matter his practice anticipated, especially regarding field ethics, most of the refinements of training that were not to become standard for another five decades.) But cultural anthropology shares with the natural history method a focus on the description of particular and unique contexts, or behaviors in context, which are not in principle repeatable enough to generate enough similarity to allow statistical treatment.

His classic illustration of why this is not a problem comes from an early article of his, dated 1946, which is entitled "Sex and Culture," although its real topic is arguably the methodology of cultural anthropology. It is reprinted in the book *A Sacred Unity* edited by Rodney Donaldson. The example he gives is however from paleontology not from a human social science. It is of a nearly unique fossil, *Archaeopteryx*, (which is today no longer so unique) illustrating the transition between dinosaurs and birds.

> The fact that our data are not suitable for statistical analysis means that they must be handled in other ways. This can be done, just because the unit datum is so complex. It is not necessary to discover hundreds of specimens of *Archaeopteryx lithographica*, in order to satisfy the scientific world that this creature existed and had a number of phylogenetically significant features. The existing samples, consisting of one nearly perfect skeleton, one imperfect skeleton, and one single feather, are more than sufficient, simply because an *Archaeopteryx* skeleton is a complex object. In the same way, the data of the cultural anthropologist, if they are a valid base for theory, are so because they are complex. "This given complex pattern of events occurred"; and this unique occurrence is one of the bricks which must form the material for our theoretical constructions. (1991: 40)

And what is true for cultural anthropologists, and paleontologists, is arguably true for field ethologists as well, not to mention field biologists who may be describing a unique species. Relevant to our concerns here, a well attested example of animal communication or behavior, from a trustworthy observer, even in principle one only observed once, can be incorporated into the foundations of theory.

This is Bateson's argument within his own scientific framework for his practice of describing his theoretical insights using a key instance. The use of a story, or illustrative example, which illustrates a key theoretical point is of course Bateson's

mechanism for communicating that point to a wider audience. But it is not only that. It is also a grounding mechanism for his own thinking process. He always insisted on the need for "some data flowing through the system." (Brand ed. 1976: 38) In a mutual interview conducted by Stewart Brand with Gregory Bateson and his former wife Margaret Mead, he expanded on what that idea meant in teaching:

> Yes. I set my classes an assignment. If they can, they will handle it purely abstractly. And they then get off into an awful mess of ill-drawn abstractions which act upon other ill-drawn abstractions. But if you can make them fool around with data of any sort, while they're playing with the abstractions, then you get something. I keep a fish tank going there, because a fish tank is a nice thing, really, to have in the back of your mind while you're thinking about what ever it might be. (Brand ed. 1976: 38)

Hence Bateson's thought process operated dialectically, between the very concrete and the very abstract. We will see examples of this dialectic in the ensuing chapters when single examples will often carry the weight of complex interpretations. Yet the interpretations do not stand alone. In Bateson's case, they are always integrated into an evolving epistemology and ontology which formed its own sort of unique integrated whole, even as it metamorphosed over time.

2.3   The Question of Instinct

It is impossible to write a book about animal communication and Gregory Bateson without bringing in the question of instinct, a concept which his approach mostly transcended and which he found to be "doubly difficult to translate… into modern terms and ideas." (2000: 41) But if instinct were a concept that moderns never used, I would maybe have tried to avoid discussing it, because it would be better in some ways to develop Bateson's ideas about communication in terms of what he did believe, rather than in terms of a paradigm which he treated in general as being obsolete. In some ways the characterization of obsolete paradigms is a difficult task. The more our thought has transcended them, the harder it becomes to recover the intellectual (and social) context in which they made sense in and for their time. Bateson himself said, in a 1977 partly autobiographical piece, that due to his own work, he had driven himself to a "place" where "the conventional dualisms of Darwinism, psychoanalysis, and theology" had become "absolutely unintelligible" to him. (1977a: 236).

Intuitively I believe that what is at stake in the concept of instinct is the need to transition from a central metaphor that is becoming obsolete in science – the mechanistic metaphor. But, Bateson did not – and we need not – eliminate all mechanistic theory from the study of the mind. One of the points of the cybernetic revolution, to him as to his mentor McCulloch and to others such as Ross Ashby and Norbert Weiner, was to establish a new metaphor for mechanism, one which allows for the possibility that even a robot (such as a self-driving car) might be able to relate and

adapt to its surrounds in a manner impossible for the Swiss clockwork machines that underlay the views of Descartes.

Our outdated implicit concept of instinct, maybe even more than other possibly outdated concepts of consciousness and the mind, carries with it, I would argue, an implicit Cartesianism, an implicit metaphor not merely of mechanism but of a mechanism of an earlier era. At least until very recently, we have not changed our concept of instinct, because we have not been asking the questions that would make us change it. We prefer to ask ourselves adaptationist questions in the functionalist mode, thinking about what enables structures and behaviors to persist due to natural selection, and it is interesting what questions that emphasis helps us to avoid. By deferring explanation into the deep past we deprive the present of its explanatory power, the present in which organisms live and act in reference to an environment.

Increasingly, however, we live in a world of robotics, of which the self-driving car is maybe the most contemporary avatar. The world of artificial intelligence and smart machines into which we are emerging, is not one of unvarying clockwork automata, like dancers who move after being wound up with a key (cf. Riskin 2016). Instead we live in a brave new world where even our machines begin to perceive and learn and act in environments, in ways we first saw as philosophically possible when cybernetics was developed in the Macy Conferences in the 1940s and 1950s. There are important reasons why Gregory Bateson would probably have remained a skeptic of Artificial Intelligence and would have insisted that the living world is structured in ways which the so-called smart machines we have constructed do not imitate. But that does not detract from how our machines (as opposed to the machines of the past) have now become some of our central metaphors. In our world of more "cybernetic" machines, the older concepts of instinct, in the sense of fixed pre-programmed action, increasingly do not fit the world in which we are coming to live.

I would argue that it is something like the clockwork dancer which provides the implicit image for the "fixed action pattern" that was Konrad Lorenz' definition of at least one sort of instinct. Such a fixed action pattern would involve a pre-programmed set of instructions which is triggered by a specific stimulus and not significantly modified or changed by the environment (or subject to learning). Although Gregory Bateson and Konrad Lorenz were friends and had a stimulating and interesting correspondence over many years, Bateson found himself skeptical of many of Lorenz' theoretical ideas.

This is beautifully exemplified by a question and answer in Bateson's correspondence. It involves, in fact, the octopus, an animal which, as I think readers will be aware by now, tends to scramble our preconceptions and defeat our easy explanations. George M. Hunt, who asked the question, was employed by the Batesons to work with marine animals and filming, and he had significant commercial fishery experience. He asked in a letter, on November 21, 1967, about an octopus he had observed in an aquarium.

This octopus had drilled and opened a bivalve mollusk (a classification which includes, e.g., clams and mussels) prior to eating it. But the octopus had used its

beak to bore twice into the shell. In its first attempt to drill into the shell, the octopus missed the edible muscle. The octopus then turned around the shell and bored a second hole in the other side, and this second attempt was successful in getting to the meat. Hunt's question was whether this was "normal" for an "instinctive reaction to a situation"? Could instinct allow for the correction of mistakes, or should the octopus' behavior be attributed to learning? (Letter from George M. Hunt to Gregory Bateson, MC 685-9a, November 21, 1967).

Gregory Bateson responded by a discussion of the natural history of an insect:

> The question you ask about instinctive behavior is a very awkward one, and applies to almost all instances of such behavior. The wasp who catches spiders, stinging them neatly in the central nervous system and dragging the paralysed carcass to its hole in the ground, etc., must, of course, deal all the time with small variations in the task. The spider will not always present itself in the same way and the landmarks by which the wasp finds its own hole will be different for each hole. The obstacles over which it must drag a carcass will be different every time and if the wasp fails to get the spider to its hole, she must go off and get another spider. And so on. In other words, the patterns which are inherited must be more or less abstract and must allow for a lot of trial and error, or possibly systematic search behavior in practice. The old Darwinian picture of instinctive behavior precisely defined just won't do.
>
> Excessive precision in any sort of instructions for action is always fatal, and the "obedience strike" is the demonstration of this truth. (Letter from Gregory Bateson to George M. Hunt, MC 685-10a, November 28, 1967)

An interesting book which makes a similar line of argumentation is by the philosopher Mark Okrent and is entitled, *Rational Animals: The Teleological Roots of Intentionality*. Okrent discusses two ethological examples which are famous in the philosophical literature, the Sphex wasp which is discussed by Daniel Dennett and Douglas Hofstadter, and the female plover which acts as if it is injured in the presence of a predator which might hurt its offspring.

To repeat a quote I have used earlier in the chapter, the biologist J.B.S. Haldane is said to have remarked that teleology "is like a mistress to a biologist: he may not be able to live without her but he's unwilling to be seen with her in public." (Alexander 2011: 7) The point of Mark Okrent's book is to emphasize this exact inevitability of our seeing animal actions as serving a function or purpose. In the case of the female plover, miming a broken wing to fool a predator, Okrent notes that based on both ethological observation and on experimental manipulation, the plover's activity meets basic criteria of rationality. On the other hand, the Sphex wasp's activities seemed, according to a famous quote, to evince a kind of inflexibility which bring to mind more traditional concepts of instinct:

> When the time comes for egg laying, the wasp *Sphex* builds a burrow for the purpose and seeks out a cricket which she stings in such a way as to paralyze but not kill it. She drags the cricket into the burrow, lays her eggs alongside, closes the burrow, then flies away, never to return. In due course, the eggs hatch and the wasp grubs feed off the paralyzed cricket, which has not decayed, having been kept in the wasp equivalent of deep freeze. To the human mind, such an elaborately organized and seemingly purposeful routine conveys a convincing flavor of logic and thoughtfulness – until more details are examined. For example, the wasp's routine is to bring the paralyzed cricket to the burrow, leave it on the threshold, go inside to see that all is well, emerge, and then drag the cricket in. If the cricket is

moved a few inches away while the wasp is inside making her preliminary inspection, the wasp, on emerging from the burrow, will bring the cricket back to the threshold, but not inside, and then will repeat the preparatory procedure of entering the burrow to see that everything is all right. (Dean Wooldridge, quoted in Okrent 2007: 7, also quoted in Dennett 1984 and Hofstadter 1985)

This description, which is famous because of its uses by Daniel Dennett (1984: 11) and Daniel Hofstadter (1985: 529), is written so as to influence us back in the direction of viewing wasp behavior as that of an automaton. Mark Okrent uses it as a kind of zero example to contrast with animal behavior which, like that of the plover, more clearly shows intentionality and even rationality.

But a Sherlock Holmesian tracking down of the backstory behind this well-cited quote, by a Dutch philosopher named Fred Keijzer writing in 2013, finds that it has a peculiar lineage. The quote is from a book entitled *The Machinery of the Brain* whose author, Dean Wooldridge, was a former aerospace electronics engineer, who developed an electronic fire-control system for fighter aircraft and helped develop an air-to-air missile, then became one of the founders of a major aerospace company. Wooldridge, trained in physics, turned to neuroscience in retirement, authoring several books. He did not himself perform the experiments with the *Sphex* moth. These experiments, from all the evidence collected by Fred Keijzer, were originally done by Henri Fabre and published in 1915. But not all the wasps Fabre studied in 1915 showed behavior that was so rigid or mechanically predictable! The experimenter, Fabre, indeed, reported that some communities of wasps (the more automata-like ones) seemed less intelligent than others. (To describe the "stupider" wasps Fabre resurrected an obscure ancient Athenian slur against a "hillbilly" neighboring city-state.) Woolridge himself, for his book *The Machinery of the Brain*, did not seem to have taken his example directly from Fabre himself, as the book he cited was a popular book, *The Science of Life*, written by H.G. Wells, Julian Huxley, and G.P. Wells, and published in 1931. However, even this source reported that the same experiment was tried with a slightly different species and with less automaton-like results. (Keijzer 2013).

Woolridge's version of the wasp as automaton was taken up by Hofstadter in particular as a specific analogy to certain types of computer programming subroutines (along with a logical type confusion of these with habits or "ruts"). It is interesting that the computer, the child of cybernetics, can provide almost the same metaphor to our interpretive minds as did the antique clockwork dancer of an earlier era. But the spirit of the cybernetics of the Macy conferences and of Bateson is very different indeed. It requires us to replace the image of the automaton with the idea of a cybernetic machine, capable of acting and modifying a basic action within an environment by using feedback, but within limits. Even a self-driving automobile would perhaps do thus – if it is a mechanical metaphor that one needs. (Putting myself in the position of the wasp, I am not at all sure that burrow situations are stable enough to rely on even a fairly recent memory to provide a green light. Burrows can change in a split second, so even if as an experimentalist I observed repetition, I would probably interpret it using the metaphor of a pilot's checklist, one which the wasp would hardly be wrong to start over again.)

Instinct theory would seem to provide us with the image of a player piano whose holes have been punched by the remote hands of natural selection. But we are left unclear as to whether the piano has strings or what kind of hammer actually strikes them. In other words, what is left unexplained by such theory are precisely the close-in mechanisms by which an appearance of rational behavior could be simulated in "instinctual" situations. Such hypothetical automatic mechanisms are harder to imagine in a modern cybernetic world than learning, memory, and rationality themselves, which have become less recalcitrant to explanation since the "cognitive revolution" beginning in the late twentieth century. I believe this means that instinct theory is ripe for a paradigm shift.

It is now time to return again to Gregory Bateson's most justly famous work on instinct – his metalogue, or fictive father-daughter conversation, "Metalogue: What is an Instinct," which as mentioned earlier was first prepared for the 1969 book *Approaches to Animal Communication* edited by Thomas Sebeok, and reprinted in the 1972 book *Steps to an Ecology of Mind*. The beginning of this metalogue is inimitable, though it makes us little the wiser about instinct – but much the wiser about philosophy of science!

> Daughter: Daddy, what is an instinct?
> Father: An instinct, my dear, is an explanatory principle.
> D: But what does it explain?
> F: Anything – almost anything at all. Anything you want it to explain.
> D: Don't be silly. It doesn't explain gravity.
> F: No. But that is because nobody wants "instinct" to explain gravity. If they did, it would explain it. We could simply say that the moon has an instinct whose strength varies inversely as the square of the distance…
> D: But that's nonsense, Daddy.
> F: Yes, surely. But it was you who mentioned "instinct," not I.
> D: All right, but then what does explain gravity?
> F: Nothing, my dear, because gravity is an explanatory principle.
> D: Oh. (Bateson 2000: 38)

An obligatory research trip to the Oxford English Dictionary informs us that indeed, in 1726, a man named Leoni in a book called *Alberti's Architecture* actually noted, "There is a natural instinct in all heavy bodies to lean and press upon the lowest parts." So, in the first half of the eighteenth century, someone *did* want instinct to explain gravity. (Or perhaps it was in the sixteenth century when Alberti originally wrote about his architecture in Italian. The earlier date would make the phrasing pre-Newtonian, i.e. prior, in fact, to the modern conception of gravity.)

The remainder of the metalogue is also inimitable and demonstrates numerous problems and inconsistencies in the concept of instinct, not only by what is said by the two interlocutors, but also by how it is said. (The concept of a metalogue is, of course, that of a dialogue in which how things are said, and in what order, are as informative about the topic at hand as the overt words of the discussion.)

One of the many points made by the discussion of instinct along with gravity as an explanatory principle is that such explanatory principles are agreements among scientists not to explain things after a certain point. They are "black boxes," in the jargon of cybernetics, and the actual mechanisms by which they work remain in the darkness of the interior of the box.

In fact, the actual workings of the DNA molecule, the ways in which it determines or influences the spectrum (loosely so-called) that includes behavior, development, and learning, are also contained in a similar black box. We have learned this by years of research into how single genes supposedly relate to complex behavioral traits, research which has for the most part turned out to be a blind alley. Nowadays it is believed that most behavioral traits are "caused" by a number of genes, and it is still obscure how this causation happens in detail.

Gregory Bateson may have foretold this in his statement that "instincts were invented before anybody knew anything about genetics, and most of modern genetics was discovered before anybody knew anything about communication theory." (2000: 41). Much of the early part of the metalogue on instinct is in fact composed of speculation about what might or might not be the way genes work. Is the behavior of chromosomes *about* the behavior the chromosomes are said to control? Is the growth and development of an embryo mirrored by changes in genetic material? (2000: 42) Gregory Bateson was dubious about these ideas, no doubt correctly. He was, in accord with the biology of his day, opposed to Lamarckian ideas of the inheritance of acquired characteristics, even though he had something of a soft spot for Lamarck himself. But he did not and could not foresee the extent to which epigenesis has, in the decades since his death, vindicated a kind of Lamarckianism of gene expression. (He did, however, have "Daughter" ask the question, "Do chromosomes learn?" But he said he did not know. "If chromosomes and genes can learn, then they are much more complicated black boxes than anyone at present believes. Scientists are always assuming or hoping that things are simple, and then discovering that they are not." (2000: 43) Recent movements away from the "central dogma of DNA," including those having to do with epigenesis, certainly count as a discovery that a hoped for simplicity in the realm of genetics was indeed all too simple.)

The metalogue on instinct is devastating with respect to what might be called the functionalist categorization of instincts. This is my term for the classification of instincts by what they are supposed to accomplish in the lives of individuals or species. Thus, as Bateson notes in the metalogue, the idea that a dog would have a self-preservation instinct is contradictory, because the idea of self-preservation implies that the dog has a self, and knows that it has one, and this is contradictory to the implications of the concept of instinct. If the dog knows it has a self then its self-preservation is *rational*.

Since instinct is an explanatory principle, which means that it does not explain its own workings, the question becomes, as Daughter asks, when do scientists evoke it? Bateson addresses this question in the following section of the Metalogue:

> F: Yes, that's a better way of asking the question. They do it when they see a creature do something, and they are sure: first, that the creature did not learn how to do that and, second, that the creature is too stupid to understand why it should do that.
> D: Any other time?
> F: Yes, When they see that all members of the species do the same things under the same circumstances: and when they see the animal repeating the same action even when the circumstances are changed so that the action fails.
> D: So there are four ways of knowing that it's instinctive.

F: No. Four conditions under which scientists talk about instinct.
D: But what if one condition isn't there? An instinct sounds rather like a habit or a custom.
F: But habits are learned.
D: Yes. (2000: 44)

(It must be noted that elsewhere in Bateson, of course, for example in his book *Mind and Nature*, there are profound analogies made between learning and evolution.)

How indeed should instincts be classified, if we are to rule out classification by function ("territory, sex, food" 2000: 53)? Or, "Daughter" asks, if for example a bird practices its songs, is the instinct to *practice* a separate instinct? Is it possible that there are big instincts and "little instincts," the latter being such things as reflexes, fixed action patterns, innate releasing mechanisms, and the like? Bateson suggests that the explanation only in terms of "little instincts" of that type is characteristic of what Bateson calls "S-R" (i.e. stimulus/response) psychology and what we would probably call behaviorism (2000: 50).

The upshot of Bateson's various discussions about instinct is that the idea, being as he says an agreement among scientists to stop explanation at a certain point, is not really informative even though it may seem to be so at first glance. It does not after all help us understand animal behavior or communication very profoundly, and its various uses and classifications exemplify the kinds of stratagems scientists use when a subject is very imperfectly understood. In his analysis of animal communication, the concept of instinct is barely used, and he is deeply skeptical of the theories which do use it.

2.4   The Carrier Wave

In an unpublished manuscript dating from the early 1960s, approximately the time of his Cuban Missile Crisis letter to McCulloch, Bateson describes relational communication as a kind of "carrier wave" which is always present in any sort of exchange, including that among humans.

"E.g., I might think I'm talking scientific sense to you, but in addition to the concrete material, the wave upon which this is necessarily carried is a wave of a statement of my relationship to you and your relationship to me. My geographic relationship, that I'm from California, all sorts of status relationships, all sorts of complex material, what Dr. McLaughlin said in the introduction – all of this – whatever the scientific content of the message may be, if I do sufficient violence to the carrier wave, the statement of relationship, you will either walk out of the room, hate my guts, say I was a brute, say I was schizophrenic, or something. You will, as the psychiatrists say, defend yourself, if I behave not according to the carrier wave." (CAF 319: 4, dated March 30, 1961)[4]

[4] MS., "The Syntax of Mammalian Communication," Box 54, Gregory Bateson Archives, University of California, Santa Cruz. Dated March 30, 1961, page 4.

Bateson never used the phrase "carrier wave" in any formal publication, probably because of his dislike of using metaphors from physics to describe matters in the living world. But I like how the phrase emphasizes that this dimension of communication, which humans share with animals (and even elaborate beyond animals), is never absent from any communication, no matter how digital or symbolic. Another metaphor which is of interest is Jesper Hoffmeyer's (2015) concept of "semiotic scaffolding." The often analog dimension of communication about relationship might be seen as scaffolding upon which the more content-level, digital and symbolic use of words and mathematics is built. But the problem with the scaffolding metaphor is that scaffolding is usually torn down. Communication about the contingencies of relationship, on the other hand, always co-exists with the digital and symbolic types. Hence the carrier wave.

The psychotherapist Digby Tantam, who works with persons with autism, has taken the phrase "carrier wave" to refer to something he thinks is lacking in people who have been diagnosed with that syndrome. (Tantam 2009: 104) Tantam does not directly cite Bateson for the phrase, and may have derived it differently. With all due respect, though, it cannot be true that the carrier wave as Bateson used the concept can possibly refer to something which is lacking in any human being (or even mammal, and probably extending to birds and octopuses). This is so even given Tantam's analysis that persons with autism have difficulties with fluently producing or understanding many of the "messages" (usually nonverbal ones) which for most people communicate about relational matters. It is a matter of what Bateson calls logical type. To read some theories of autism it would be as if persons with autism are *ipso facto* not concerned with the relationships they have with others. However, as is clear from numerous accounts by and about persons with autism, the syndrome does not make people into non-relational beings. It is often argued that it may make some avenues of immediate or intuitive apprehension of relational information more difficult. But when or if that is the case, there is every evidence that other channels of perception and implication are pressed into service in the vital interest, shared by all mammals and many other animals, of finding one's way in a world which is composed, for better and sometimes for worse, of relationship.

Bateson's concept of "carrier wave," therefore, should not be confused with the specific communicational, perceptual, or even interactional means by which, as it were, the wave is carried. It does not refer exclusively to the nonverbal or the analog, even though these modes of communication are perhaps best suited for it in some ways. The carrier wave is relationship, and it is the sea in which we necessarily swim.

Chapter 3
Relationship and Metaphor: A Bird Courtship Interlude

In his analysis of nonverbal/ nonhuman communication, particularly among mammals and birds, Gregory Bateson emphasized the way that the experiences of early life are echoed in metaphor in the communication of adult life. The cat who mews at Gregory to express the dependence that will get him to bring it milk, is using cries which are in the wild used by kittens to their mother. Thus Bateson would often say that what the cat was really saying with its mew was "Mama! Mama!" In his letter to McCulloch he referred to this as the cat using a kinship term.

(To make an aside: as an anthropologist I recognize an allusion to the often dry but voluminous study of kinship terminology that characterized much of twentieth century anthropology. It is a study that has sadly become less central to the discipline, partly because there has sometimes been a tendency to misunderstand its topic as dealing with the actual or potential sharing of "blood," or as we would put it today, DNA, rather than with the broader question of relationship.)

This kind of metaphor in the lives of animals was most typically illustrated by Gregory Bateson by using examples, of which the cat's mewing was only one. In the metalogue, "What is an Instinct," which I have already discussed in some length, he notes:

> You see, when a grown-up bird makes like a baby bird in approaching a member of the opposite sex, he's using a metaphor taken from the relationship between child and parent. But he doesn't have to peg down whose relationship he is talking *about*. It's obviously the relationship between himself and the other bird. They're both of them present. (2000: 57)

In this chapter I will examine the biology behind this example by analyzing a classic article about the topic. In the next chapter I will publish, with the permission of the Bateson Idea Group, an extract from a talk Gregory Bateson gave at the Esalen Institute a few months before his death. In this talk, he discusses an example from the lives of dogs and wolves.

3.1 Courtship Feeding as Abductive Metaphor

With his own upbringing steeped in what was then the everyday natural history just out of doors of semi-rural Southern England, Gregory Bateson probably assumed that this example would be common experience. However, my own urban Los Angeles upbringing did not extend to understanding the common behavior of birds to that extent. Neither a deep commitment to the environment nor hiking the state and national parks substituted for a basic education in the common behaviors of what may still remain common species.

There is a conventional biological term for the phenomenon Bateson was referring to in birds. In 1940, for the ornithological journal *The Auk*, the well-known Darwinian evolutionary biologist David Lack wrote about the phenomenon of "Courtship Feeding in Birds." He notes:

> In most cases of courtship feeding, the female adopts an attitude and calls almost identical with those of a young bird begging food from its parents, and the male puts food into the female's mouth. (1940: 169)…

In some cases (e.g. the Button Quail, *Turnix*), the sexes are reversed, and the females feed the males, but evidently button quails are like hyenas in having many of the usual sex roles reversed. In the waxwing (*Bombycilla*), males and females "exchange the food backward and forward" but the male behavior goes first (1940: 170).

David Lack notes that the food is not the "primary object" of the behavior. Among herring gulls (*Larus argentatus*), well-fed females who have just fed along the shore, sometimes beg their hungrier mates for food even though these males have stayed near the nest. A captive British Robin female was mentioned as having begged her mate for food even though she was standing on a food tray surrounded by mealworms and he was sitting in a less provisioned location (1940: 171).

In five species, Lack notes "courtship feeding seems closely associated with copulation," by which he means, the male holds (for example) an insect either during or before copulation, and the female eats it during or after the act. But among the British Robin, Galapagos finches, and presumably other species, copulation only exists during a short period, yet courtship feeding occurs "throughout the breeding cycle except when the birds are feeding the young. (1940: 172). That is to say, sometimes courtship feeding happens in association with immediate copulation, and sometimes it does not. Similarly, sometimes courtship feeding happens when the female is sitting on the egg, but among several bird genera it happens at other times as well. Thus David Lack concludes that the courtship feeding ritual is attributed to maintaining pair bonding in a wider sense.

Lack's survey of this behavior seems to be guided and interpreted by an implicit canon of instrumental rationality, albeit reframed in adaptational terms. This contrasts, as I will show, with the use that Bateson makes of this example. However Lack's approach fits well with our common sense anthropomorphic (and functionalist) intuitions of why behaviors make sense. For example, in the case where the feeding forms part of copulation, the provision of food seems like an instrumentally rational bribe or payment. In the case where the female is sitting on the eggs, it

would seem to us like a healthy and wise provision of nourishment for a partner unable to feed herself (but this kind of attempted explanation would not explain why it occurs where it occurs, in the ways it occurs, rather than universally in the same way in every species). Only in the case where courtship feeding does not "rationally" accompany either copulation proper or incubation, does the Darwinian biologist begin to talk about the "symbolic nature of the habit" -- Lack's exact phrase, and one which I believe should point us in the direction of semiotics and Batesonian perspectives (1940: 173).

Gregory Bateson in his own work nearly always eschews this form of functionalism, for reasons he describes well in the very metalogue in which he eventually mentions this "habit" of birds. The imputation of rationality to animals where one is not actually arguing that they are using rationality, leads to paradox. Can one speak of a self-preservation instinct in an animal who may or may not experience itself as a self? This paradox is resolved in contemporary so-called evolutionary psychology, and similar types of sociobiology, by making natural selection into the agent of the rationality which is being denied to the animals themselves.

These Darwinist approaches usually take the form of answering a *why* question, but what Bateson preferred to ask might be called *how* questions. In the decades after Bateson's death, just as during his life, evolutionary explanations have focused on the adaptiveness of living forms and behaviors over evolutionary time. But such an ingrained focus on a certain type of *why* occludes a whole realm of explanation having to do with a more proximate sense of *how*. What are the modes of operation, even of *mechanism*, by which so-called symbolic behaviors, such as courtship feeding, operate? How do they work in their own proximate contexts as what we would now call semiotic phenomena?

It is within the larger system of interaction between the courting birds that courtship feeding becomes evident as a semiotic phenomenon. Courtship feeding both represents and, along with other behaviors, constitutes an immediate or an ongoing relationship for which it is a component.

Jesper Hoffmeyer has often said that biosemiotics is only a way of taking seriously, from a theoretical point of view, statements about coding or sign behavior which are made un-selfconsciously and so to speak untheoretically throughout the "traditional" biological literature (see especially Hoffmeyer 2011). David Lack writes, for example, as if to prove Hoffmeyer's point, about the "symbolic nature of the habit" (1940: 173) In so doing he also proves Gregory Bateson's point about the nature of the "habit" as metaphor. Lack writes:

> Since the main function of courtship feeding is not food, it might be classified as a type of 'symbolic' display, i.e., *in which an act normally playing some other part in bird behavior is introduced into display*. Habit preening, and the manipulation of nest material are other examples. (1940: 173, emphasis added.)

Such "transfer" of one kind of behavior into a different arena of "display" is almost literally the definition of abductive metaphor. (Of course in Peircean terms it is not "symbolic." I would argue that it is perhaps "iconic.") Like the evocation of weaning in the wolf behavior in the following chapter, a relationship between two

animals is evoked in terms which are familiar from life history, yet in a new and different context which has both similarities and differences from an earlier one. This abductive metaphor obviates the differences between the feeding of a hungry chick and of a potential or actual mate. By evoking and proposing an otherwise not necessarily obvious similarity between the two cases, abductive metaphor helps constitute and lay the foundations for new relationship, partly on the model of dispositions, learned associations or habits formed by earlier experiences.

Chapter 4
Among Wolves and Logicians,
by Gregory Bateson

In this chapter I (Phillip Guddemi) introduce Gregory Bateson's own "voice" by printing for the first time an extended section of a talk he gave just a few months before he died. After a two paragraph introduction by me, this chapter consists entirely of an excerpt from a workshop on "Ecology of Mind," which Gregory Bateson gave at the Esalen Institute where he lived and taught, in May 1980. It is reprinted by permission of the Bateson Idea Group, which retains the copyright.

The talk, which I have given the title "Among Wolves and Logicians," masterfully interweaves two subjects of discussion, one specifically semiotic, one more generally epistemological.[1] As with other transcriptions of excerpts of Bateson's talks or workshops in this book, the choice to use an informal talk is because of the specific eloquence of Gregory Bateson's spoken words and because I want to convey something of Bateson's teaching style. In this case, as well as in others, the basic narrative or story – and a discussion of its theoretical import – can also be found in Bateson's published corpus. But as often in Bateson, his spontaneous words in a teaching or lecture session can sparkle and convey the meaning of sometimes elusive ideas more effectively than the sometimes compressed versions found in his published books and articles.

Esalen Institute, May 1980, Gregory Bateson speaking (inclusive to end of chapter): Now I wrote a book called *Mind and Nature* (1979) in which I pointed out that there were formal resemblances between processes which we vaguely call thinking – which wasn't a very good category, I pointed out, but still, there it was – and processes which we call biological evolution. And I proposed the word "mind"

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[1] The story of Benson Ginsburg's wolves is told, not in as great detail, in the paper "Problems in Cetacean and Other Mammalian Communication," republished in *Steps to an Ecology of Mind*, Bateson 2000: 365–366. Another discussion of Nicholas Humphrey and the "syllogism in grass" can be found in the paper "Man are Grass: Metaphor and the World of Mental Process," derived from a talk given a month before he died in June 1980, reprinted in *A Sacred Unity*, Bateson 1991: 235–242.

as a general term for all systems which exhibit phenomena of this type which is exhibited by these two systems already mentioned: thinking, and the evolutionary process.

I was then attacked by a young zoologist, who said, "Bateson, you are being very naughty.[2] What you are doing is called 'affirming the consequent'," this being an, I suppose, seventeenth century logician's term for a particular type of syllogism, which is disallowed by logic. And I took a look at that, and I've got quite a bit of mileage out of this syllogism, and out of accepting the fact that indeed, I was using this type of syllogism. And that this type of syllogism seemed to me to be, whether or not it is acceptable in a strange world called logic, it did seem to me to be acceptable in a much wider and more real world, of evolutionary process, biological communication, animal behavior, and such things. I want you therefore to look at two syllogisms.

Firstly, orthodoxly accepted [according to] an ancient paradigm, for a class of syllogisms, [there is one] called the syllogism in Barbara. I am not quite sure what the word Barbara means. It has something to do with the internal structure of the syllogism. And there are about twenty words of that kind, that these late medieval and early sort of up to seventeenth century people recognized. That they recognized as good.

Secondly, there is the one called "affirming the consequent." Grass dies; men die; men are grass. Of course, the [more traditional syllogism in Barbara] being: men die; Socrates is a man; Socrates will die. I want you to look at the structure of those two things. What my little friend-enemy accused me of is thinking that way, which is the way that poets have been thinking for a very many years, amongst other things. And he pointed out that it isn't always sound. You could equally say that turnips die, men die, and men are turnips. Well I wrote him a letter finally, as one turnip to another. Because if you can lift it, you see, out of the realm of prose, into the realm of either humor or poetry or something or other, then it begins to have a certain validity.

What justification have I, as a scientist – scientists are people who deal above all in prose, preferably in mathematical symbols, but at least in prose – what would be the justification for admitting the grass syllogism into my works? And there can be only one such justification. The justification would be, that the organisms about which I talk, in fact operate that way. Now I don't think, you see, that atoms operate that way, or inorganic things, pebbles. But it does seem perhaps as if organisms do. Let me give you a story:

I was visiting ... Dr. [Benson] Ginsburg in the Chicago Zoo, where he had a pack of wolves.[3] This is a pack of eleven wolves. And they have a nice big runway of

[2] Nicholas Humphrey, "New Ideas, Old Ideas," review of *Mind and Nature: A Necessary Unity*. 6 December 1979, *London Review of Books* 1:4;

Gregory Bateson, 24 January 1980. Letter responding to Nicholas Humphrey. *London Review of Books* 2:1;

Nicholas Humphrey. Letter, responding to Gregory Bateson. *London Review of Books* 2:2, 7 February 1980

[3] https://en.m.wikipedia.org/wiki/Benson_Ginsburg accessed May 23, 2019

rough ground with sort of thin bushes on it, of I guess two or three acres at least. And they've dug a hole in the middle, in which they have their babies, and they have an alpha animal, a boss animal, who is their leader. And altogether they are really a very successful little piece of the natural world, enclosed in a fence. It's typical to enclose pieces of the natural world in a fence. But in this case it seems to have worked. Now, before we went out to see the wolves, we had lunch, and I said to Ginsburg over lunch (I forget what preceded it), that of course animals communicate by the use of metaphors derived from their childhood. ... they don't do much else. This is their main mode of communication. So that when you come home from the market, and start unpacking the big brown bags, the cat comes up, and rubs against your leg, and says certain things which no adult cat ever said to another adult cat. But which baby cats do say to adult cats. And what the cat is saying is, Mama, Mama. And the meaning of what the cat says (because meaning is a very subtle thing) is set by the context in which the thing is said, notice that one. And the context in which that is said, of you having come home with these brown bags, means that the noise which the cat is making is to be interpreted as "milk, milk, milk." In other words be, and do, what Mama should do.

Ginsburg said, "Prove it." And I said, you can't prove that. It's not the sort of thing you could prove. If you don't see it as obviously true, we can go somewhere else or something. But, you know, these are truths of communication, they're not truths of physics. Indeed it's doubtful we can prove too much with physics.

So we were still friends and we went on to the zoo to watch the wolves. We watched the wolves for half an hour – they're perfectly fascinating, it's a lovely thing to watch. And there is this alpha animal, who is the only active person in the enclosure. The others are sort of sitting around, and once in a while a wolf will get up and walk over, and nose another wolf, and walk back again, lie down again and go to sleep. But the alpha animal patrols. And you can see this patch of land all covered with his running tracks. He looks out this way and he looks out that way and he looks out that way. To see if the keeper's coming, to see this, and see that. He's busy. He's also very beautiful, and very strong and healthy. And I think there's some connection between beauty and alphaness, leadership, perhaps.

Anyhow, there they are. Now I should say, that the wolves, like all ... in all the dogs, all the *canidae*, wolf, the coyotes, the hunting dogs of Africa, the... most of your domestic dogs, they are of course terribly messed up, but our little Keeshund, who is a very good sample of dog apparently, did [the weaning typical of wild *canidae*]. When the time comes to wean the pups, crush the pup down with an open mouth behind its head, here. Mama's open mouth squashes the pup down, and lets him up again. If he again goes for tit, she squashes him down again. If he again goes for tit, she squashes him down. And in, you know, in psych lab terms, this is nice, simple, negative reinforcement, isn't that what they call it? It's actually isn't the end of the story, was not with our Keeshund, because what happened was that the next thing that happened was that the pup attacked mother's mouth, and they got into a mutual mouthing game, which resolved the whole problem of the frustration of course. And the whole negative reinforcement paradigm was a little too simple to describe what was really happening. As is sometimes the case with those paradigms.

Anyhow, this also is how the wolves wean their babies, except that in the case of wolves, the babies graduate without weaning, from mother's milk to communal food. And what indeed happens is that the whole pack goes, fills its belly with food, and comes home. And with food in the belly it doesn't leave a scent track wherever it goes, of course. It comes home, regurgitates the food it's got, and everybody shares a nice hot meal. At a later stage, the pack, somehow, God knows how, decide its time these puppies learn to come with us. And it's time we refused to regurgitate. At this point, when the puppies ask for regurgitation, they get their heads squashed down, and that ritual applies. Right.

Now we were watching these wolves, and discussing the sexual system. There was this one very conspicuous outstanding male, two or three junior males, and several young females, who no doubt from time to time came in heat. And Ginsburg said, well, he thinks he ought to have rights on all females who come in heat, but he's a busy man. He's an executive. And he doesn't insist much.

All right so we watched wolves for half an hour, then we went to see the films, which he had from last year. And in the films, exactly and precisely answering the argument we had at lunch, was an instance in which a younger female had come in heat, a junior male had got into her, when somehow the boss wasn't looking. He was locked in, because this is so in all dogs, that the penis expands in such a way that it can't be gotten out again, until after ejaculation. And there is this male, absolutely helpless, tied by the penis. And up rushes the boss, to teach him what's what. What happens? And this is in the film, it's very impressive.

The boss comes up, opens his mouth, crushes the head of the [young wolf] down, once, twice, three times, four times. Then he walks away, deeply satisfied, because he's done what his pride and position demanded. In other words, the action of weaning is then is metaphorically used as a way of stating something like prestige, I guess. Or negative prestige of the down animal.

So I wasn't so much worried about the zoologist accusing me of, what's it called? affirming the consequent.

Then we've been pushing, I've been pushing this around, in the about six months since I had it, his attack, in the review. And of course this is the sort of next thing that happens. You see that the syllogism in Barbara, is contrived upon asserting class membership, identifying Socrates as the member of the class. Whereas the syllogism in grass consists in identifying the predicates, not the subjects. And by the identification of predicates extending class membership. This is different. It becomes rather evident that you couldn't really have syllogisms in Barbara, unless you have a separated subject and predicate. You've got to have the notion of subject, the notion of class, in your language code, in your communicational code, in order to have that thing at all. Now that means that the syllogism which the logicians approve of, is perhaps only, you know, ten to a hundred thousand years old. It is, it cannot really be older than language. We don't know how old language is, call it a million years old if you like, but it's still a Johnny come lately. And the rest of the communication of the world, from amoebae upwards, perhaps from bacteria upwards I don't know how they work, necessarily is of the other kind or somehow related to the other kind. And if it's illogical and if the schoolmen don't like it, the hell with

'em. We got a long way on biological evolution before ever we discovered a watertight syllogism.

And that's a hell of a thing to say, you know. Because they thought they were ruling the roost, for two hundred years anyway. And what I just told you, is an enormous sort of opener.

Somehow, you see, by some sort of communication in some wide sense of that word, you have all I think, managed to produce two eyes one on each side of a nose. It's quite a remarkable feat, of communication within an embryo, you know, to get that right. There are a few individuals who fail. There are cyclopean embryos, and there are I suppose three eyed embryos. Because always, communication, the organization of things by communication, is liable to various sorts of disruption, owing to the second law of thermodynamics, which is precisely that which confuses the pattern arrangements, that is what the second law of thermodynamics says. If you've got a nice arrangement, a randomization will confuse it. A bit truistical, but that's how it is.

Now we can go on to any direction you want to...

Chapter 5
Human-Animal Interactions and the "Carrier Wave"

I will briefly here take a very slight and glancing look at the topic of human-animal interactions, which is not one to which it is possible to do justice in the format of this book, and which is not the book's main theme. But a few examples of such interactions may help us underscore intuitively a sense of how communication about relationship in Bateson's sense can transcend even the species boundary. They will also illustrate how difficult it is to itemize exactly what is communicated and when, or to put it differently, how impossible it may be to translate the communication exactly.

The first such example is that of the horse "Clever Hans," which Bateson never mentions. It is the modern zoosemiotician Dario Martinelli who tells the story of Clever Hans with the proper moral, otherwise there would be no reason to tell it here. (Martinelli 2009: 39–40) That is to say, the real point of the story of Clever Hans should not be to warn against anthropomorphism, which is one interpretation of the moral that Sebeok (e.g. 1989) famously found to that story. The real point should be, rather, to underscore a certain type of communication that can exist between horse and human.

Clever Hans was a performing horse whose owner was Wilhelm van Osten, a German mathematics teacher at the *gymnasium* level at the beginning of the twentieth century. Van Osten would use Clever Hans to demonstrate the ability of a horse to perform all sorts of mathematical computations. The human would ask the horse more and more difficult mathematical questions, or sometimes questions about the calendar, musical tones, or spelling in the German language. The horse would always answer by tapping his hoof the number of times that corresponded to the answer. Van Osten did not charge for these performances.

The public was amazed by these demonstrations, and a commission was appointed by the German board of education to investigate the phenomenon. Ultimately the psychologist Oskar Pfungst determined that the horse did not need to be asked questions by von Osten himself, but did need to be able to see the questioner – and the questioner had to know what the right answer would be. Ultimately

it was concluded that the horse had of course no ability to calculate the answer (nor to understand the German language at a sophisticated level).

What the horse was doing was to interpret the "posture – gesture language" (to use one of Bateson's terms for it) of the questioner, whether that questioner was van Osten himself or someone else. Clever Hans knew to tap with his hoof as a response to being questioned. As the correct answer would be approached, the questioner would give a subtle cue which Clever Hans had learned to associate with ending the tapping procedure. The questioners' cues were never consciously known to the questioners themselves. And it is possible that Clever Hans was neither conscious of the cue that meant to begin tapping his hoof, or the cue that meant to stop doing so.

The Clever Hans phenomenon has been used – indeed, as it seems today, over-used — for decades as a cautionary tale not to "anthropomorphically" overestimate the intelligence or abilities of animals. It has inspired complicated experimental designs in psychology and animal biology for anything to do with these topics. Today, investigators seem to be more willing to acknowledge animal capacities which had been doubted previously, but these do not include the kind of *savant* abilities van Osten claimed to demonstrate in Clever Hans. The true significance of Clever Hans, however, and the reason he is mentioned here, has meanwhile been hidden in plain sight in a manner worthy of Edgar Allen Poe. It is of course the subtle analog communication between horse and human. As Dario Martinelli has so pointedly if amusingly written, "What matters [to conventional biologists] is that Hans is not an Einstein. To be a Freud is not enough. Why?" (2009:40).

So that is the first example of analog communication between human beings and animals to hang on the wall as a trophy. The second one, by an odd coincidence, also involves a mathematics teacher at the high school level who also worked training horses. This teacher made a presentation of her findings at a conference where Gregory Bateson presided in 1968.

In 1937 Gertrude Hendrix was putting a horse through a retraining regimen to get him to stop galloping in a runaway fashion on a show course. She was trying to get him to canter in a more controlled fashion. (M.C. Bateson 1991 (1972): 106). She first established his ability to do this in a small ring. But when she took him out on country roads she had a partial failure. She tried to establish a particular rhythm, alternating, according to the terrain, commands to walk and trot with commands to canter. But when permitted to canter, the horse would not do this in a controlled way, and seemed likely to return to a habit of runaway galloping. Upon rethinking her training regimen, she decided that the horse on these roads had made an *inductive* generalization by thinking that a particular terrain (a level stretch with a hill visible beyond) meant "canter" – or even, given the horse's own history of association, "run" – even when, using her usual signals, she was trying to make him walk first. Hendrix decided to rethink her behaviorist training protocol and to act according to the hypothesis that the horse was indeed making inductive generalizations. She then changed her training style so as to encourage the horse to relate a particular "if set of events" to a "then set of events" (1991: 108). What is interesting to us from the standpoint of communication is how, at that point, when the horse had made what she considered an inductive leap, the horse would make what she called a

"half-hesitant, questioning motion," and that when she in turn showed her approval, the horse would show "a ripple of something like satisfaction, or even elation." (1991: 108).

She was ultimately to take a lesson from this and apply it to her mathematical teaching in the classroom. Based on her teaching experience, she felt that providing children with a rule first, before working through examples of its application, was, as Gregory Bateson would put it in an unpublished tape describing her work, "on the whole a strategic error." (Bateson August 1976 Workshop A, U.C. Santa Cruz). Thus instead of starting with the rule, she would provide her students with a number of examples and they would infer the rule. But this would be an unconscious inference — until (and unless) they were subsequently told the rule explicitly that they now understood implicitly. Clearly Gertrude Hendrix thought that this kind of implicit, unconscious inference was a phenomenon of a similar order among both her mathematics students and among the horses she was training. (Given the times when she was doing the work, this was heretical both in the fields of animal and human learning.) In experiments she performed in the classroom in 1946–1947, she tested her human students' abilities to apply the rule after being taught either by providing the rule first or by the unconscious inference method. She also varied experimentally whether they were afterwards taught the rule explicitly. Unconscious inference learning was twice as effective, in transferring the learning to new examples, as learning the rule first by authority. Between the two types of inference learning, one where the rule was subsequently given, and one where the rule was never given, there was surprisingly a slight but statistically significant advantage to the case where the rule remained only implicit. (M. C. Bateson 1991: 111) However, this method was not ultimately advisable, because only if a rule is explicitly stated can it be, if necessary, *unlearned*. Rules need to be unlearned if they turn out to be fallacious, and also if they are, as can often happen with implicit learnings, over-applied (1991: 113).

Gertrude Hendrix was deeply respected by Gregory Bateson. He had remarked to his daughter Mary Catherine Bateson, that "of all the people he invited to the conference, Gertrude was the one he was most certain of, the one whose work seemed to dovetail most precisely with his own concerns." (1991: 110) Hendrix was able to communicate with her horse, and vice versa, using gesture – posture language with a great deal of virtuosity. So far, so ordinary, perhaps, since most horse trainers and even horse riders could probably testify to just this sort of communication. But in addition she was able to predict the horse's probable reactions by giving the horse credit for being able to use inductive reasoning. (Note that the specific muscular motions both of horse questioning and human approval are not specified. We know what they mean, but we are not necessarily conscious of how we know.)

A third story comes from an article detailing Gregory Bateson's work with cetaceans, specifically dolphins. Bateson began work with dolphins at John Lilly's laboratory in the Virgin Islands, where he was based for slightly more than one year from 1963 to 1964. He was subsequently based at the Oceanic Institute in Hawaii for seven years, where he continued to have cetaceans as a research focus to a

greater or lesser extent. The latter research center was attached to Sea Life Park which gave shows for the public.

George Hunt, who has already been mentioned in reference to a query about octopus and instinct, was Gregory Bateson's assistant in both places. In the article, "Observations of a Cetacean Community," which was published in the book, *Mind in the Waters: A Book to Celebrate the Consciousness of Whales and Dolphins*, Bateson tells the following story on Hunt:

> One story of dolphin ethics is George Hunt's story about Sissy, a porpoise in the West Indies. John Lilly wanted to make a film of a porpoise rescuing a human being in the water. So George gets in the water and pretends to be in distress. Sissy comes over and rescues him by pushing him to the side. Lilly is filming this, but when he looks at the camera he finds that the cap is still on the lens. So he takes the cap off the lens and sends George back into the water. When George pretends to be in distress again, Sissy beats him up. (Bateson 1974a:159)

This anecdote speaks to a considerable ability on the part of the porpoise to "classify contexts," to use the Batesonian philosophical term. The porpoise not only classifies distress but also, not to be fooled twice, correctly identifies (a second example of) falsity in distress.

One story of a psychology experiment gone wrong is too good to omit, even though this is not a book of psychology and we are not interested here in psychological questions as they are usually understood. It is also possibly not an instance of analog communication. I should mention that this was an experiment in which Bateson was decidedly *not* involved.

> The question was whether the animal could learn to learn. There was a straight pipe and an L-shaped pipe, and one pipe meant "do this," and the other pipe meant "do that." If you did the right thing you got rewarded, if you didn't, you didn't. Then when the porpoise knew clearly what it was supposed to do – to differentiate between the straight pipe and the L-shaped pipe – the trainer reversed the signals, so that the L-shaped pipe now meant this, and the straight pipe meant that. In such an experiment, you've got to have a criterion of how many times the porpoise has to be right – to do the right thing – in order to permit you to say, "He now knows." Obviously, it's not enough to get it right once. The criterion was set, I think, at fifteen times. This was much too long and the porpoise got bored. The psychologist had gone off to New York and left an assistant to do the experiment and take notes. But she as never able to get the porpoise to go to fifteen times, because somewhere along the line it would do it wrong. And she said to me, "You know, it makes a funny noise when it does it wrong." And I said, "Have you recorded the noise?" And she said, "No, he (the psychologist) didn't ask for that." So, to this day we don't know the porpoise for "go to hell." (Bateson 1974a:160-1)

In classroom retellings of this story Bateson used even saltier language for what the bored porpoise may have been saying. The semiotics of cursing are of course very interesting and perhaps not as well understood as they could be even among humans. The semiotics of cursing using vocalizations among dolphins is potentially even more interesting, noting of course that we have no real evidence that dolphins have a referential language in the human sense – or need one.

5.1   Cetaceans, Communication, and Music

This is a good place in which to discuss a theoretical article which was republished in *Steps to an Ecology of Mind* (2000: 364–378). This article, entitled "Problems in Cetacean and Other Mammalian Communication," restates Bateson's main premises about communication about relationship.

He founds his analysis of communication on his hierarchical concept of learning. Learning II is the key level to understand. Seen one way, Learning II, or deutero-learning as Bateson also calls it, is a matter of learning habits of learning by which new items of learning will be understood. In this article, it is defined as "the acquiring of information about the contingency patterns of the contexts in which proto-learning occurs." (2000:364).

A person's or animal's habits of perceiving and reacting to aspects of experience, necessarily involve a learning and classifying of the contexts by which that experience presents itself to that person or animal, and in terms of which that person or animal learns to act. Learning II, which we might call habit-learning (my term), is largely unconscious, and defines the character of a person or other animal as the aggregate of the learned contexts of its experience. In a less Batesonian idiom, one might say that one's character is the habit of having one's habits.

Bateson at this point develops an account of the "meaningfulness" of behavior. Behavior is meaningful, he first notes, if it affects the behavior of another. At this point we seem to be dealing with something like a corollary to the Peircean pragmatic maxim — the idea that our conceptions need to conceivably have practical bearings or effects in order to deserve to be called conceptions at all. But Bateson then makes his own complication or caveat. My behavior's *failure* to affect you will, according to him, affect both of us because of its very ineffectiveness! (But only if that ineffectiveness is *perceptible*.) This too is the meaningfulness of behavior – especially, Bateson hastens to add, in the case of dolphins. (He was once to write in a letter to his cousin, Patrick Bateson, that "Dolphins are the devil." (MC 127–2, April 28, 1964) As is evident from the other stories I have quoted Bateson as telling about them, dolphins do not much tolerate fools.)

Bateson then gives several examples of mammalian communication about relationship, and discusses the difficulties of the rather behavioristic methodological options open to him in the 1960s. Nonetheless he fearlessly begins to speculate about the form that communication about relationship might take in dolphins and, by implication, whales.

He begins with a useful review of his general stance on communication about relationship:

> As mammals, we are familiar with, though largely unconscious of, the habit of communicating about our relationships. Like other terrestrial mammals, we do most of our communicating on this subject by means of kinesic and paralinguistic signals, such as bodily movements, involuntary tensions of voluntary muscles, changes of facial expression, hesitations, shifts in tempo of speech and movement, overtones of the voice, and irregularities of respiration. If you want to know what the bark of a dog "means," you look at his lips, the hair on the back of his neck, his tail, and so on. These "expressive" parts of his body tell you

at what object of the environment he is barking, and what patterns of relationship to that object he is likely to follow in the next few seconds. Above all, you look at his sense organs: his eyes, his ears, and his nose.

> In all mammals, the organs of sense become also organs for the transmission of messages about relationship. A blind man makes us uncomfortable, not because he cannot see – that is his problem and we are only dimly aware of it – but because he does not transmit to us through the movement of his eyes the messages we expect and need so that we may know and be sure of the state of our relationship to him. We shall not know much about dolphin communication until we know what one dolphin can read in another's use, direction, volume, and pitch of echolocation. (2000: 370)

But dolphins in the ocean do not possess the mobility of face and body of terrestrial mammals, even the four legged beasts who were their remote ancestors. They communicate a lot with sounds, but dolphin vocalizations did not strike Bateson as easily understandable, in comparison with the emotive noises made by other mammals. For mammal vocalizations in general, but not for dolphins, he noted that humans could readily make non-random guesses at "greeting, pathos, rage, persuasion, and territoriality" (2000: 371).

> I personally do not believe that the dolphins have anything that a human linguist would call a "language." I do not think that any animal without hands would be stupid enough to arrive at so outlandish a mode of communication. To use a syntax and category system appropriate for the discussion of things that can be handled, while really discussing the patterns and contingencies of relationship, is fantastic. [In 1966 "fantastic" could mean "outlandish."] (371-2)

Nonetheless, every utterance by human beings, no matter how much it purports to be about things, is also and inseparably a message about relationship. Every human sentence contains a "carrier wave" of pragmatic and rhetorical desire, of respect given and taken, of challenge or dominance or submission, of affection or contempt – even when said sentence is uttered in a conference about whales. Even the most "digital" or "symbolic" human communication has its μ-function (pronounced "mew-function) — Bateson's coinage for this kind of communication, inspired by a cat's mew.

Bateson speculated however that the communication system of dolphins could include somehow a "digital" exchange of μ-function messages. This would not be the only modality of communication, of course. He notes that dolphin behaviors such as various behaviors of touching one another, but also holding oneself apart from a group and remaining stationary, can in fact be interpreted using our intuitive understanding of mammalian "signals." But he proposes a detailed study of dolphin ethology in order to determine whether their postural language might be supplemented by some kind of discrete set of non-analog signs which are nevertheless primarily about relationship. He makes one very evocative speculation. "We do not even know what a primitive digital system for the discussion of patterns of relationship might look like, but we can guess that it would not look like a "thing" language. (It might, more probably, resemble music.)" (2000: 375).

In the light of the more recent research by Dario Martinelli, set forth in his book *Of Birds, Whales, and Other Musicians,* it seems possible that the language Bateson

was searching for might indeed *be* music. (And what would it mean to resemble music and not be music?) Certainly the message of music is not easy to replicate in language. Once, in a published comment on an article by Harvey Sarles entitled "The Study of Language and Communication Across Species," Bateson made the gnomic remark that "the nature of music remains completely obscure." (Gregory Bateson comment in Sarles 1969: 215).

A more nuanced, and possibly more easily defended, hypothesis might be that music of all species, like human language, necessarily includes a "carrier wave" or μ-function *along with* whatever else it does. In other words, what carries relational meaning is not, or not merely, that an animal makes musical sounds. But what carries relational meaning is how these sounds are made, when they are made, to whom they are made, the manner in which they are made, and so on.

We have now come to the kind of difficult to summarize point that Gregory Bateson found he had to make using an entire metalogue – another imagined dialogue between himself and a daughter. The metalogue appropriate now is entitled "Why do Frenchmen?" from 1951, and it was originally published in a magazine of dance – though also in a Review of General Semantics. (Bateson 2000: 9–20) It begins with Daughter asking, "Daddy, why do Frenchmen wave their arms about?" To the ethnocentric Daughter, accompanying speech with what seems to her like flamboyant gesturing seems silly. But Father asks, what if the Frenchman stopped waving his arms about and just talked? Daughter remarks that the Frenchman might be hurt or angry, and Father confirms that she might be right. Thus, by waving his arms, the Frenchman might be confirming that he is not angry. But, daughter asks, why do all this work to wave one's arms about, just to be able to indicate anger by stopping the waving? She says she doesn't smile just to indicate that she is angry by not smiling – but Father confirms that perhaps she smiles just for that reason.

And what is human communication about anyway? Baseball and gardens and ice cream and what they got for Christmas? But who is listening? In such conversations people "are busy telling each other that they are friendly – which is sometimes a lie." (2000:12) So why not just tell this in words? But the messages of the "carrier wave" are not quite translatable in that sense. And in any case, as Daughter hastens to point out, all verbal language also carries tone. Even in the case of written language, Father notes, "written words still have some sort of rhythm and they still have overtones. The point is that *no* mere words exist. There are *only* words with either gesture or tone of voice or something of the sort. But, of course, gestures without words are common enough." (2000:13).

Perhaps in this sense no "mere" music exists as well. Rhythm and overtones are intrinsic to music, as are the other qualitative modulations, and periodic silences, which accompany human communication, and perhaps all animal interaction as well. Though music is not unique in being suited to carry the carrier wave, of relational messages between its performers and receivers, it certainly does so with its own *panache*.

Chapter 6
Analog and Digital Communication, and Similar Contrasts

> 2. These mammalian communications about relationship are in large measure analogic. In verbal communication, which is largely digital, it is possible to have words which will signify <u>negatives</u>. In non-verbal communication, very peculiar steps have to be gone through in order to get across a negative message to the other individual. (Letter to Warren McCulloch, MC 1039-10a, October 25, 1962)

Throughout Gregory Bateson's thinking about communication, a set of distinctions recurs in various forms or approximations (Table 6.1). In discussions about his work, by himself and others, these distinctions are usually subsumed by the difference between so-called analog and digital. This contrast was originally inspired by a contrast between types of "computers" during the dawn (or pre-dawn) of the computer age in the middle and late twentieth century.

We should not, however, see Bateson's ideas about the difference between types of communication as captive to the exact contrasts itemized in the table. In what might be called a fallibilist way, these parallel contrasts point to ways in which he was groping to understand certain aspects of communication which have been difficult to describe precisely. Bateson never felt that he had achieved a complete system of philosophy, in the sense that we teach the systems of the great philosophers before our time (but in recent decades it would be hard to find a philosopher who had the *hubris* to propose a system in that sense). He was never convinced that his words were some final statement, but was always *reaching* toward an understanding that he sometimes felt he fully in the end *grasped*. Hence he used to jokingly invoke a variation of a poem of Browning: "A man's reach should exceed his grasp/ or what's a meta for?"

The cybernetic tradition enables us to think about contrasts or oppositions, such as the ones in the table above, in a way which does not replicate how these are treated in much of Western philosophy. In his "star cybernetics," Francisco Varela (1976) shows us how with these distinctions we need not be looking at *oppositions* in a Hegelian or, what would be worse, a Cartesian way. Rather, we should see the categories on the right as *encompassing* those on the left, and those on the left as emerging from the right by specific processes related to acts of attention (or

Table 6.1 Distinctions of mental processing and communication relevant to Gregory Bateson's thinking

Distinctions of mental processing and communication relevant to Gregory Bateson's thinking	
Digital	Analog
Verbal (not always)	Nonverbal (not always)
"Literal"	Metaphoric
Secondary process	Primary process
Left hemisphere, or forebrain	Right hemisphere, or back brain
Translatable	Untranslatable
"Coded"	"Non-coded"
Number (integers)	Quantity
Syllogism in Barbara	Syllogism in grass

possibly including prescission in a Peircean sense). A well marked-up copy of Varela's manuscript on star cybernetics, which was a position paper for a Bateson-chaired conference on the mind-body problem, exists in the Gregory Bateson archives.

6.1   Analog and Digital

With this caveat in mind, let's look at these Batesonian distinctions in turn. The analog/ digital contrast is probably the earliest in his thought, as he adopted it from cybernetic thinkers in the Macy Conferences. The most succinct definition of this contrast is probably the one in the Glossary of Bateson's book *Mind and Nature*:

> *Digital*: A signal is *digital* if there is discontinuity between it and alternative signals from which it must be distinguished. *Yes* and *no* are examples of digital signals. In contrast, when a magnitude or quantity in the signal is used to represent a continuously variable quantity in the referent, the signal is said to be *analogic*. (1979: 227-8)

As twenty-first century biosemioticians we would probably query what work the term "representation" is doing particularly in the definition of the analogic signal. We can explore this using Peircean sign categories of index and icon. If we look for the intersection of analog with indexical coding or communication, for example, we might see continuously variable quantities in one animal's communication *link* with continuously variable quantities in another's. This might be seen, for example, in play sessions between animals which improvise reactions upon the other party's reactions. (Perhaps also in "serious" interactions between animals which do the same.)

In the human-created or artificial world, we see the analogical yet iconic relation in what are termed analog computers. This is a term which incorporates a number of machines which in the twenty-first century it might be odd to consider computers – for example, the long-forgotten logarithmic slide rule. One favorite example of Gregory Bateson's was the range finder of a traditional camera.

> This device is fed with an angle that has real magnitude and is, in fact, the angle that the base of the range finder subtends at some point on the object to be photographed. This angle controls a cam that in turn moves the lens of the camera forward or back. The secret of the device lies in the shape of the cam, which is an analogic representation (i.e., a picture, a Cartesian graph) of the functional relationship between distance of object and distance of image. (Bateson 2000: 373)

Bateson demonstrates a Peircean iconism here by using the terms picture and graph (i.e. diagram), both of which are categorized as icons in Peirce, and yet there is an element of indexicality in the direct causal link between the range finder and the relations in the physical world with which the camera is interacting. The traditional phonograph is a similar analogical-iconic machine. In it, continuously varying magnitudes of sound are "represented" by continuously varying grooves which are then electrically or otherwise amplified in a way which preserves their continuous variation, which is also maintained in the sound waves and in the internal motion of the hearing ear. The grooves are causally related by physical principle to the sounds they record and play back, which involves an indexical relation; but nonetheless the playback is an auditory icon, or image, in a particular Peircean sense. Specifically, for Peirce, an icon, or image, has the characteristic of being something which enables the perceiver to learn new and accurate things about an object of perception, simply from re-inspecting the image. This is well-known to be true of analog auditory recordings (and some maintain it is less so for digital recordings).

The analogical relation or code can also intersect with the iconic sign in cases where an act of mirroring re-creates the analogic pattern in an image, model, or map. It is somewhat of an open question whether this is done via analogical processes in the brain itself. Certainly we are familiar enough with the ability of digital computers to simulate analogic phenomena. But also, this is done through metaphor.[1] The production of a sign which refers nonverbally (for example through gesture, posture, action, or even tone) to a previously known phenomenon, and which is apprehended through its similarity in part or whole to that phenomenon, is one of the key forms of analogic communication with which Bateson is particularly concerned. Specifically this kind of iconism is treated in the earlier chapter on courtship feeding in birds, and in the extended discussion by Bateson himself on the mating hierarchy communication among wolves (Chap. 4). As Bateson there points out, what may be strange to our usual thinking about iconism or the sign, is that the metaphorical relation (or iconic relation) which is at issue in this kind of communication among animals, is an identity or similarity of predicates rather than of subjects. This is part of what makes it communication about relationship.

The intersection of the digital and symbolic, in its turn, is usually taken to have human verbal language as its privileged example. This is because, and insofar as, the "discontinuity," the distinction, between letters or words, is not in most respects or most of the time *connected* with a difference in meaning. "The word *big* is not bigger than the word *little*." (Bateson 2000: 373) Human verbal language, as a

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[1] There is some evidence that what Bateson meant by "metaphor" would have been considered by Peirce more strictly "analogy" (Anderson 1984)

system built out of contrasts at both the phonemic and lexical levels, is thus generally considered the type example of discontinuous, or digital, code and communication. However, verbal language is not an entirely unmixed system. Is there a language in which the word for *bigger* is smaller than the word for *big*? There might be, but in English this example shows that at least there are occasionally features of language itself which can enter into the analogic, and/or the indexical or iconic.

But Gregory Bateson was not primarily interested in those aspects of human communication which are most often studied by linguists and logicians. Throughout his lifetime, and in several fields of study, he focused instead on aspects of communication which were not primarily those of the sunny kingdoms of the literal, the digital, the lucidly translatable, or even (depending on interpretation) the Peircean symbolic. Any question of the type, "How did we get to be kings of the hill?," was of almost no interest to him whatsoever – and not only because it never seemed to him that the kingdom of that hill was truly secure.

6.2 Primary Process

The analog as Bateson saw it was often likened to the concept, originating in Freudian theory, of "primary process." But Bateson gave primary process much more respect, and structure, than did many Freudians. In Freudian writings it is not difficult to see primary process, which governs the operations of the Freudian unconscious, referred to as unorganized, for example, or as simple infantile wish fulfillment, or as involving the discharge of the kind of psychological energy that Bateson never believed in. By contrast, Bateson had his own take on primary process, which built on the Freudian concept but changed its context.

Primary process is opposed, both by the Freudians and by Bateson, to *secondary process*, which Bateson notes is the medium of expression of "the thoughts of consciousness (especially verbalized thoughts)" (2000: 139). My assertion above about Bateson's lack of interest in certain types of human communication is supported by Bateson's explicitly ironic statement which followed that definition:

> Nobody, to my knowledge, knows anything about secondary process. But it is ordinarily assumed that everybody knows all about it, so I shall not attempt to describe secondary process in any detail, assuming that you know as much about it as I. (2000: 139)

After this, Bateson returns to characterizing primary process. The specific passage about secondary and primary process is part of an article on the interpretation of art, in this case Balinese art, and it is clear to Bateson that art must be a different kind of communication than "the cat is on the mat." And even the kind of Freudianism that sees primary process as primarily infantile and related to the id, would no doubt still find a link of it to creativity plausible. (After all, primary process is considered to be the "language" of dreaming.) However, Bateson separates out these derisory parts of the definition and defines primary process largely in terms of the semiotics of those aspects of secondary process which it *lacks*. "Primary process is

characterized (e.g. by Fenichel) as lacking negatives, lacking tense, lacking in any identification of linguistic mood (i.e., no identification of indicative, subjunctive, optative, etc.) and metaphoric." (2000: 139) One might say that primary process lacks a certain dimension of *distinction* and does not label context.

The only positive dimension listed in Bateson's definition above is that of metaphor. Primary process leaves the relata or subjects unidentified and places focus solely on the predicates or *relationships*. Let us use some quasi-mathematical symbols to elucidate this concept of metaphor. Metaphor can be seen to involve a relatum, *r1*, a relationship, *p*, and a second relatum, *r2*, and an assertion that *p* remains the same or identical when *r1* is changed to *r2*. This enables *r1* and *r2* to become icons of each other with respect to (and only with respect to) *p*, which is their index of resemblance.

Bateson indeed characterizes this kind of communication as specifically iconic. Of course he is not necessarily using that term as it would be used in a rigorously Peircean theoretical framework. Be that as it may,

> for our present purposes it is important to note that the characteristics of primary process as described above are the inevitable characteristics of any communicational system between organisms which must use only iconic communication. This same limitation is characteristic of the artist and of the dreamer and of the prehuman mammal or bird. (The communication of insects is, perhaps, another matter.)

> In iconic communication, there is no tense, no simple negative, no modal marker. (2000: 140)

Returning again to his oft-repeated example of the mewing of his cat, let us see how it can illuminate this analysis. Gregory comes back from the grocery store, and his cat slinks up to his leg and mews. This mewing, Bateson notes as a matter of natural history, is a communication type which in wild felines is limited to kittens or cubs. Hence he translates the mew as "dependency, dependency" or more precisely, as "Mama, Mama." It is a metaphorical communication which only mentions the relationship itself, but which asks so to speak that the cat's master should act as "mama" should (and feed it). Mama substitute, is proposed as an icon, in this Batesonian sense, of mama, via the relationship that involves dependency (and feeding).

To return again to the courtship feeding of birds (Chap. 3), we have seen that the courting male (or less often, female) also makes himself (or herself) into an icon of a nurturing parent by the act of feeding his (or in some cases her) would-be mate. And of course in Bateson's example of the alpha wolf and his hapless subordinate (Chap. 4), the younger wolf is given a pointed reminder that the alpha wolf is the weaning parent and the subordinate male should consider himself as remaining a cub.

These examples have all had at their basis a certain form of caring for the young. But there are "metaphors" which perhaps extend even further down the phylogenetic ladder. One simple metaphor is that between physical closeness and psychological attachment (be this friendship or a mating pair bond). The cat accompanies its mew with touch in this way. Bateson claims to have found physical closeness of

this kind among octopus, which would be a particularly interesting finding because octopus do not have the parental caring period that is found among the advanced vertebrates. The double meaning of closeness is so primordial that it may be hard for us to see it as metaphoric, but not all animals possess meaningful bonds, and only those which do possess such bonds can be expected to reinforce these through some version of physical touch or propinquity.

A relationship in which touch reinforces a bond, or feeding reinforces one, is one in which a physical and behavioral act or event refers to a kind of abstraction, but one which is felt to belong to that act *necessarily*. Anecdotally, captive octopuses are said to "spit" quantities of water at a human being with whom they are displeased, or who they dislike (Montgomery 2015: 51–2). In a Macy Conference on the topic of play, one on Group Processes which took place after the more well-known Macy Conferences, there was a lengthy discussion of tortoises who may have been harassing or taunting one another through physical actions (Bateson 1956: 209–211).

6.3   Digital Number and Analog Quantity

The difference between analog and digital coding is related to a difference in the branch of mathematics called number theory. The aspect of number theory to which it is related is listed in Section II of Gregory Bateson's book, *Mind and Nature*, which was given by him the ironic title "Every Schoolboy Knows…" because in it he sets forth a number of ideas which are not well taught in the schools but which he felt ought to be. Presupposition number 9 in that Section is "Number is different from quantity" (1979: 49–52). Numbers, in this sense, are discrete integers, which can be counted: 1, 2, 3, 4, etc. In the system of numbers there are no intermediates between each discrete integer. A shepherd never counts 5 ½ sheep. The statistical definition of the average family in the United States as being comprised of 2.52 persons is fodder for comedians who joke about that fraction of a person. A calculating machine or computer that is based on discrete numbers is called a *digital* machine – the word digital coming from the Latin for finger, as there are no fractional fingers.

Quantity, on the other hand, is a continuous scale which is never exact in the same sense as number. In cooking we deal with cups or liters of water or flour. These are always more or less, as we say. Quantity is the basis of the device called the "analog computer," although the devices in question are not usually thought of as computers today. According to the communications scholar Anthony Wilden's 1972 book *System and Structure*:

> …real quantities may be the distance between points on a scale, the angular displacement, the velocity, or the acceleration of a rotating shaft, a quantity of some liquid, or the electrical current in a conductor. Examples of the analog computer thus include a number of common devices: the flyball governor (which first led Clerk Maxwell to found the theory of goalseeking or cybernetic devices), the map, the clock (water or mechanical), the ruler, the

thermometer, the volume control, the accelerator pedal, the extant, the protractor. Specialized computing devices employing analog representation include the slide rule, the planimeter, the harmonic analyzer and synthesizer (e.g. Kelvin's tide predictor), the mechanical or electrical differential analyzer. (Wilden 1980: 156)

In theorizing based on Bateson's work, human symbolic language often is taken as representing a *digital* form of communication, based on exact contrasts and denotations. Actually, Bateson clearly states that calling symbolic language digital in this sense is a loose form of thinking, as it is more exact to say that language incorporates aspects of both the digital and the analog. (See Bateson 2000: 373) But in the repertoire of human communication, it is only symbolic language which incorporates the digital. That is to say, symbolic language may not always involve precise denotation, but it has the *potentiality* of doing so, in ways which are not possible for other forms of "analog" communication.

The realm of *analog* communication is often placed in contrast to the largely digital realm of symbolic language. Analog communication includes kinesic and paralinguistic forms of body language, gesture, and tonality, as well as the interpretation of action sequences. In this form of communication, precise denotation is often elusive. Yet this type of communication is highly elaborated among human beings, as well as among other mammals. Bateson attempts in the following passage to derive why this form of communication is in the analog realm:

> On the other hand, in kinesic and paralinguistic communication, the magnitude of the gesture, the loudness of the voice, the length of the pause, the tension of the muscle, and so forth – these magnitudes commonly correspond (directly or inversely) to magnitudes in the relationship that is the subject of discourse. (Bateson 2000: 373-4)

Bateson mentions that this kind of communication is often unconscious and involuntary, and that humans often prefer it to be so. As I noted earlier, unconscious communication is by its very lack of intentional manipulation suited to be used as *honest* information about relationship. It is communication which is suited by its distinctive characteristics to express the "carrier wave."

Had these types of analog communication been replaceable by symbolic language, evolution would have seen to it that the two would not coexist in humans as they do. Bateson theorized such analog communication as particularly well suited to be "communication about relationship," though one wonders whether it should be seen as separate enough from relationship as to be "about" it – perhaps it is truer to phrase it as an enaction of relationship .[2]

The perception of pattern or *gestalt* is generally in Bateson's analysis not referred to the digital side of things, but to what is elsewhere the analog aspect or type of communication. Strangely, though, in Bateson's number theory meditations, *gestalt* is included on the side of discrete number, generally associated with digital computation, and not of quantity, associated with analog. But the brain does not

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[2] See particularly "Metalogue: What is an Instinct?" in Gregory Bateson, *Steps to an Ecology of Mind*, Chicago, University of Chicago Press, 2000 (1972), pp. 38–58, reprinted from Thomas Sebeok, ed., *Approaches to Animal Communication*.

evidently perceive *gestalten* by *counting*. Significantly, in his very first exploration of the analog-digital contrast in Bateson's *corpus*, in 1951, Bateson mentions codification in terms of *gestalt* as a separate and discrete, third category (Bateson 1968 (1951): 171–3). This was noted by Carol Wilder (1998) as part of a wise and intelligent exploration of the implications of "being analog" in a digital era. In contemporary explorations of analog and digital computing by the physicist Freeman Dyson, *gestalt* perception is mostly treated as part of the analog side of things, as it is in the later works of Bateson.

In theorizing based on Bateson's work, human symbolic language often is taken as representing a *digital* form of communication, based on exact contrasts and denotations. Actually, Bateson clearly states that calling symbolic language digital in this sense is a loose form of thinking, as it is more exact to say that language incorporates aspects of both the digital and the analog. (See Bateson 2000: 373) But in the repertoire of human communication, it is only symbolic language which incorporates the digital. That is to say, symbolic language may not always involve precise denotation, but it has the *potentiality* of doing so, in ways which are not possible for other forms of "analog" communication.

Extending Bateson, Anthony Wilden analyzed a number of consequences of the analog, as machine and as communication, and of quantity as opposed to number:

> It is impossible to represent the truth functions of symbolic logic in an analog computer, because the analog computer cannot say "not-A."… There is no "either-or" for the analog computer because everything in it is only "more or less," that is to say: everything in it is "both-and"…
>
> The analog computer cannot represent nothing (no-thing) because it is directly or indirectly related to "things," whereas the "language" of the digital computer is essentially autonomous and arbitrary in relation to "things" (except in so far as all information requires matter-energy in the form of markers for its transmission).
>
> The analog computer is an icon or an image of something "real," whereas the digital computer's relationship to "reality" is rudimentarily similar to language itself. In fact, we can say that … analog or iconic communication [is that] in which the signal or sign has a necessary relation to what it 're-presents," whereas all denotative, linguistic communication is arbitrary and digital…
>
> (Wilden 1980: 162-163)

In human beings, analog communication is said to be characteristic of gesture, posture, and facial expression ("body language"), rhythm, cadence, sequence, and inflection ("paralinguistics"), and other ways of apprehending the context of communication (Wilden 1980: 163). The analog is also said to include the instantaneous recognition of pattern or *gestalt*, although how this is so is possibly more obscure.[3])

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[3] The physicist Freeman Dyson has been exploring for at least a decade the question of whether brains are analog or digital. He has the interesting opinion that the human brain is mostly analog. He also incorporates *gestalt* among analog functions, however he claims that even as of his online writing in 2018 it is not clear exactly how the brain represents *gestalt* patterns. See https://www.edge.org/conversation/freeman_dyson-the-brain-is-full-of-maps and also http://physicsdatabase.com/2014/06/03/freeman-dyson-are-brains-analogue-or-digital/ In the 2014 speech he gave at the

Perhaps indeed the concept of iconic communication, in some hybrid version of Bateson's and Peirce's usage of that term, might better reflect the character of the non-linguistic communication that we think of as analog.

Near the end of his life, Bateson expressed a distrust of the (similar) concept of "non-verbal communication" which he had accepted as a rough term for a subject of interest during the 1950s. In an interview published in 1979 in a newsletter *The Kinesis Report: News and Views of Nonverbal Communication*, Bateson opined that

> The verbal-nonverbal distinction is in some ways a great mistake. We all believed in it in the fifties, but I don't think it was useful. Of course, each mode of communication has its own characteristics. Auditory input differs from visual input, and kinesic input is different again. Each code is different and has its own implications; we don't swap codes very well, in the sense that nonverbal people don't "hear" verbal messages and verbal people don't really "hear" kinesic messages, and so on. (Beels 1979: 2)

Bateson's apparent transition here from what might, with an analogy to taxonomy, be called a conceptual "lumper" to a conceptual "splitter" is typical for the moment when he is beginning to question an overarching term or framework. He did the same for "instinct" in his famous metalogue about it (2000: 38–58), and also for "power" in a position paper for a conference on the subject (1974b). It appears to be a way in which he would deconstruct, for himself, a metanarrative which he felt should be reconfigured in some new paradigm which was not yet in sight.

6.4 The Mu-Function

In the Bateson archives one can find a number of diagrams and handwritten papers in which he was exploring these issues. One term with which he experimented was that of the μ-function, inspired by the already described mewing of his cat as if to say "mama, mama." In one diagram he identified this μ-function as being characterized by "identity of signal and referent."

This is a peculiar thing to say. But we can approach it by thinking about the concept of metaphor. We usually see metaphor as involving two concrete items, two "things," which are shown or asserted to be the same in some way. In that sense it is hard to see the mewing of the cat as metaphoric. What the mewing references, so to speak, is a relationship in the cat's present or current experience, which is made to equate with a relationship in the cat's memory or past experience.

What is thus at issue in many of Bateson's examples of non-human (or human non-verbal) communication is a structure similar to metaphor but one in which what is being equated are examples of a relationship. What is being equated is of the

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University College, Dublin, he addresses the question of how the brain encodes visual mappings, and comes to the conclusion that although in theory this could be done either digitally or via analog means, the evidence (including how instantaneously this is done by the brain) better supports analog processing. This is the same as saying that, at least in the natural history of human brains, *gestalt* perception should be seen as part of the analog realm rather than the digital one.

nature of a predicate rather than a subject. The mewing of the cat is "identical" to the relationship not to the things related. Perhaps it is a kind of symbolic relationship in Peirce's terms, since we are not concerned with some inherent quality of the particular mewing sound that has evolved to symbolize the dependence of an offspring on a mother.

Bateson often remarked that animal or human "non-verbal" communication was more "abstract" than concrete communication of "the cat is on the mat" type. Consider the relationship p' between a relationship p and its relata $r1$ and $r2$. Bateson tended to say that p' is more abstract than either p or its relata, or just as often he would describe p' as being of a "higher logical type," following an idiosyncratic reading of Bertrand Russell. So in this sense, the subject matter of the cat's mew, of the μ-function, is paradoxically of a higher abstraction or logical type than is what we think of as subject matter communication. (Specifically, we are dealing with a meta-metaphor, in which $p1' = p2'$.) What is symbolized is a generality or *type* of relationality, while the specifics of behavior that are wanted by the cat are left unspecified. Thus we see that for Bateson the evolutionary progression is *from* abstraction and generality *to* concreteness and specificity, since the latter depends upon the former.

Perhaps the more properly analog types of relational communication can be seen as versions of p itself, its variations in both quality and intensity. But p is itself a product, in a nearly mathematical sense, of the specific actions of interaction among the animals themselves: hostile, friendly, competitive, cooperative, even territorial or sexual. The "summation" or "configuration" of these interactions into a relationship would imply a logical type relationship in which p itself is "meta," not indeed to concrete relata, but to episodic predicates which are themselves actions or interactions, $a1, a2, a3$ and so on. These can only be described after the fact in terms of narrative or story. Bateson in one of his unpublished diagrams notes that when digital "units" become put together in a narrative, they become "analog." The "digital" items of story are almost like pixels which, strung together in time, form an analog picture.

6.5   The "Ballading" of the Jackdaws

Throughout Bateson's unpublished and published corpus there is reference to the work of Konrad Lorenz. Their relationship was friendly and they kept up a considerable correspondence. However, Bateson paid little attention to Lorenz' theoretical ideas (particularly those invoking the concept of instinct). Instead, Bateson would look at specific anecdotes in such semi-popular works as *King Solomon's Ring* (Lorenz 1962) with an anthropologist's eye for significance. Then he would interpret these anecdotes in line with his *own* developing theoretical perspectives.

In an unpublished draft of a talk from March 1961, entitled "Meaning in Mammalian Communication," Bateson discussed an anecdote in *King Solomon's Ring* about jackdaws, a kind of crow. (A minor irony, of course, since a crow is not

a mammal.) Bateson is intrigued by a contradiction in Lorenz' account of what animal behaviorists would normally describe as an alarm call. Based on a theory of instinct, this should yield a near-automatic response of "danger coming, fly now." But this does not happen, at least not always. Instead, it happens that a jackdaw can be sitting on a roof and making this call, but the other jackdaws make no response, neither flying nor fighting. The jackdaw is "ballading," to use a word Bateson attributes back to Lorenz, and "it is quite as if they were telling detective stories to one another. No murder has been committed, they were only talking about it." (Bateson CAF 168-A-6).

While this interpretation seems foreign to much of the instinct theory that bears Konrad Lorenz' name, it is in fact not far off from several long passages in Lorenz' own *King Solomon's Ring*. Lorenz notes that the jackdaw song, sung by both sexes, in which "each and all of the different cries peculiar to the species are constantly reiterated" (1962: 192). The call notes for defense, as well as those which are used to get the flock to fly together away or homeward, are all reprised in the "reciting" of singing jackdaws. Yet, in a true emergency context, an alarm cry brings about a "blind, reflex-like" reaction (1962: 193).

When the whole flock had flown away except, poignantly, for the single female Redgold, she constantly sang the call for flying homeward. Sitting on the roof she would sing it "in all tones and cadences, from the gentlest piano to the most desperate fortissimo." (1962: 194) Sometimes she would fly down to the meadow to search for the others, calling "this time in earnest, not in song – a subtle difference." (1962: 194) Eventually, through a startling and novelistic set of plot turns, the flock did become reunited.

This will not be the only time when my turning to primary sources yields a more Batesonian result than even Bateson's own recounting of them. Jackdaws, it emerges, classify communications by using contextual cues. Furthermore, they not only possess memory but evoke it during song. Clearly, Lorenz' participation as a participant observer in the life of birds had led him to "more than was dreamt of in his own philosophy."

The calls which are components in these songs do not refer to substantives. In their non-recollected incarnation they relate to actions – fly away, be alarmed, fly homeward – while as song, they relate to the actions they would relate to, if the context did not otherwise indicate. The ballading of jackdaws is in this sense relevant to play. Just as in a play fight the nip does not mean what a nip would normally mean (Bateson 2000:180), so in the ballading of jackdaws, an alarm call does not mean what an alarm call would normally mean. Just as with play, the meaning of the message is transformed, when the context markers (apparent to birds but not necessarily to their ethologists) so indicate.

6.6   The Absence of a "Not" in Analog Communication

One of the most significant features of analog communication to Gregory Bateson was its absence of the ability to say "not" – the "simple negation" which he felt might be possible in verbal or digital language. This correlates, as Anthony Wilden pointed out, with the absence of zero in the quantitative aspect of number, as opposed to the digital or integral aspect in which zero is a key concept (1980: 163).

In analog communication it is explicitly possible to reject a proposed action, to say "don't," and Bateson notes this repeatedly, notably in his metalogue about instinct (2000:56). However, it is according to Bateson impossible to say in analog language that "I am not going to fight you." Two dogs who meet and wish to make that statement, as it were, will have to show their fangs, and take the risk that this showing of fangs will lead to the fight that they do not want to have – or do they? During the fight they discover that "neither ultimately intends to kill the other" (2000: 141) and may afterwards become friends.

According to Bateson's argument, it is not possible to specify that it is fighting that one does not intend to do, unless fighting is somehow mentioned – and in "action language" (2000:56) this is only possible by an iconic use of fangs, or by play-fighting, or via other actions which have the possibility of devolving, as it were, into an allegedly non-intended fight.

Later examples in this book, such as the discussion of the surgeon by George Spencer Brown, and indeed the Cuban Missile Crisis, will indicate that the supposed "digital" explicitness of verbal language does not much help the situation. It is possible that a statement of non-intention to fight is not truthful, and even if it is, the meta-level of "what does he mean by that" is automatically evoked by the mere mention of fighting in the first place. So it is also possible that humans, and nations, find themselves in the situation where they feel they need to act out the possibility of a fight before knowing whether or not it will take place.

6.7   Left and Right Hemispheres

As we have seen, Gregory Bateson was concerned with the distinction in communication styles between "primary process" and a more proselike "secondary process." This is for him primarily a distinction of types of thinking and communication, not a distinction between functions of the brain. But he was open to the idea that these contrasting ways of thinking, which co-exist in human functioning, also reflect a division in the brain. At first he described this contrast as between the back and the front parts of the brain. Only later did he accede to the fashion of the time and describe it as between the right and left hemispheres. The actual contrast he was describing remained the same whether he was describing it as front-back in the brain or left-right in the brain.

For example he would often make this contrast, in human history, between the Catholic and Protestant view of transubstantiation in the mass. For him, the Protestant view was the view of conscious, prosaic "secondary purpose," in which the bread *stands for* the Body and the wine *stands for* the blood. This is simile because it is linguistically labeled. The Catholic view, in his interpretation, in which the bread *is* the body and the wine *is* the blood, is metaphor — precisely because it is not labeled as being metaphor! In Bateson's emerging system of thought, he felt that this Catholic view reflects primary process, that is to say, the communication system of dreams, most human nonverbal communication, and much animal communication. Such primary process does not have the ability to negate a proposition that it asserts, in the clear manner that we believe human language to be able to do. Furthermore, such primary process works via metaphor, but never by labeling metaphor as metaphor (which, after all, changes metaphor to simile).

In a 1974 lecture to the Naropa Institute, a Buddhist college in Boulder, Colorado where he taught for two summers, Gregory Bateson, in the course of describing his contrast between Protestant and Catholic views of the mass, at first described the Protestant, "prosaic" view as front-brain and the Catholic "metaphorical" view as back-brain. Then in mid-talk he changed his brain metaphor to the then-fashionable left-brain versus right-brain division. But the substance of his contrast remained the same in spite of being incarnated in different paradigms of the brain. The switch is only in the taped, unpublished version of the talk. By the time he had the talk published, as "Ecology of Mind: The Sacred," in the house journal of Naropa Institute, *Loka* (Issue 1, 1975), the mention of the front brain - back brain distinction had been revised out of the edited version, which only speaks of the contrast between left and right hemispheres. Bateson used that left brain -right brain contrast frequently in the years he had left, though he was never entirely comfortable with it.

He was very concerned that this brain contrast would be conflated with the Cartesian mind–body split. He was explicit about this in a position paper for a conference on mind/body dualism.

> It is today fashionably (and I guess correctly) believed that at the level of the hemispheres there is a division of function such that it would be true perhaps to say that the R-hemisphere has typically a different epistemology from that of the L-hemisphere...This matter of hemispheric difference is, in many ways, relevant to our conference, but I hope we can avoid the fallacy which could equate R/L contrast with the dualisms of mind and body. (Bateson 1976a p. 57).

More recently, Iain McGilchrist has described the contrast between right and left hemispheres with meticulousness and subtlety. In a very long and closely argued book, he makes the case that animal research, in both birds and mammals, yields a picture of a left hemisphere dealing with narrow and focused attention, dealing with getting and feeding in the moment; while the right hemisphere is in charge of a kind of watchful and wide-ranging attention, scoping out a wider environment to determine potential threats or opportunities. The right hemisphere sees wholes in context, while the left abstracts from context and then reconstructs a whole from parts. Social bond-forming capacities also, for McGilchrist, locate themselves primarily in the right hemisphere. (McGilchrist 2009: 27–28).

Interestingly, although the left hemisphere has the reputation of being the hemisphere of human language, this is an oversimplification. Both hemispheres have their part in the production of speech, interweaving and collaborating at every point. However, it is also the case that both primary and secondary process both have a part in the production of every thought. When one dives into the specifics of the characteristic processes of each hemisphere, as McGilchrist has done in great detail, it tends to support a Batesonian interpretation of the functional specialization of the hemispheres. Specifically, with respect to the right hemisphere, I have in a review of McGilchrist's book summarized right hemisphere cognition, as both McGilchrist and Bateson see it, as "analog, contextual, implicit, pattern recognizing, not necessarily verbal, holistic, and connected to emotions (though I suspect not necessarily connected with the verbal labeling of emotions)." These are "the abductive and metaphorical sorts of cognition." (Guddemi 2012:631).

By contrast, for McGilchrist the left hemisphere specializes in focused attention, "abstracted" (in the usual sense) from context and analyzed into parts, which must then undergo an artificial resynthesis into a whole. In the healthy individual, these divergent hemispheres (or in any case, cognitive styles) form part of what Jesper Hoffmeyer (2008c) called a *code-duality*. The bringing to bear of divergent and even contrasting perspectives on an object enables us to see it, so to speak, in the round. It is one example of the phenomenon Bateson has referred to in *Mind and Nature* (1979) as *multiple description*.

Both Bateson and McGilchrist have explicitly made the point that this multiple description, involving the synthesis of contrasting types of perception and communication, exists whether or not specific locations in the brain have been located for different types of mental processing. As McGilchrist put it in the conclusion to his book, "If it could eventually be shown definitively that the two major ways, not just of thinking, but of being in the world, are *not* related to the two cerebral hemispheres, I would be surprised, but not unhappy." (McGilchrist 2009:461) The brain in this case is, even if a particular theory of the brain happens to be true, a metaphor for the mind. The contrasts discussed in this chapter remain, whether they are assigned to two different parts of the brain, or to the brain and the heart, or merely to two different types of "software" running on the same wetware within the skull.

Chapter 7
G. Spencer Brown on the Paradoxes of "Not" – And Gregory Bateson on the Richness of Analog Communication

One of the books that was perennially on the list of readings, which was posted on Gregory Bateson's office wall when he taught at the University of California, Santa Cruz, was the unconventional book of philosophical mathematics, or mathematical philosophy, *Laws of Form*, by George Spencer Brown, usually known as G. Spencer Brown. Spencer Brown was a polymath who was influenced personally by R.D. Laing and by Bertrand Russell, and who died only recently in 2016. His *Laws of Form* is a topological calculus based on a unique notation in which distinction is the foundation and which relies on two symbols, a mark indicating distinction, and a blank space.

Two reasons why this mathematical innovation intrigued Bateson were that Bateson himself had famously defined information as "a difference that makes a difference," and that both Bateson and Spencer Brown discussed as key aspects of their theorizing the logical paradoxes (such as the Theory of Types) first described by Bertrand Russell. Bateson had great hopes that the formalizations pioneered by Spencer Brown were an extension of cybernetic ideas such as his own, such that they might provide a clear language in which to express some of the conceptions with which Bateson himself had been struggling for many years.

On March 19 and 20, 1973, a conference was held at the Esalen Institute in which a number of thinkers of the day grappled with Spencer Brown's ideas. These figures included Gregory Bateson, Alan Watts, John Lilly, Heinz von Foerster, Ram Dass, and many others, as well as Spencer Brown himself, at least for the first two days. The conference was known as the AUM Conference. The transcripts of the discussion have existed and still do exist on the World Wide Web, though only in its so-called Archive, but they have also as of 2019 been reprinted as a whole in the journal *Cybernetics and Human Knowing.* I will be concerned with the discussion

mostly between Bateson and Spencer Brown in Session Three of the conference, on March 20, 1973.[1]

Near the beginning of the session, Bateson got right to the point about his own interest in animal communication and his hopes that the *Laws of Form* might be helpful in clarifying them.

> … what goes on between animals is evidently characterized by, amongst other things, the absence of 'not' – the absence of a simple negative. While they can forbid each other – say 'don't' – they can in general not deny a message which they themselves have emitted. They cannot negate.
>
> Now, the messages which they emit tend to go in the form of intentional groups, or something which is part action, and part stands as a name for the whole, in some sense. So their showing of a fang is a mentioning of battle. Not necessarily the beginning of a battle; possibly a challenge, possibly a mentioning with a question mark – I mean, 'Are we there to fight each other?'
>
> It's sort of in the hope, that I am here, that your *Laws of Form* calculus might be the sense on which to map this sort of sound. We have a two-legged language which is very unsuitable for mapping what goes on between animals. Indeed, it is unsuitable for mapping what goes on between people. (Bateson, in Barney and von Meier 2019 (1973): 56)

Ultimately, because the discussion at the conference can be characterized as non-sequential, Spencer Brown's response to this hope of Bateson's was a polite "no." *Laws of Form* could not be a calculus of animal or nonverbal communication. Spencer Brown elaborates:

> As soon as we have *not*, we have a kind of world that no animal without *not* ever sees. And since, in *Laws of Form*, the *Laws of Form* can be described as coming from a license to *not*, it is, therefore, this universe of the *not*-speaking animal that this particular form is about. (Spencer-Brown, in Barney and von Meier 2019 (1973): 60)

And earlier in the discussion:

> *Laws of Form* comes effectively from the licensing of the *not* operator in logic. What is of interest in Gregory Bateson's account of the animals is that they don't so much communicate as commune with us and with each other. And I would like to make this distinction … (Spencer-Brown, in Barney and von Meier 2019 (1973): 56)

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[1] https://web.archive.org/web/20060821204906/http://lawsofform.org:80/aum/session3.html. Accessed on January 17, 2019.

The extended quotations here are with the permission of Cliff Barney, who is the rights-holder and who worked to prepare the transcripts both shortly after the conference and also in 2019 for the journal *Cybernetics and Human Knowing*. My citations are to the 2019 version.

7.1   Further Spencer Brown on the Peculiarities of the "Not" Message

It is worth attending to what Spencer Brown has to say about this "not" message, which he terms an operator in logic – and about how poorly human beings actually assimilate it. His words are difficult to paraphrase and his examples are intriguing.

> The one thing that a human being has in his language, which other animals, if they have a similar language, don't yet have, is a word or an expression having the effect of "not." Now just as human flesh can accommodate cuts and bruises better than burns –it doesn't seem to know that so well – so the human mind can accommodate to positive sentences much better than to the same sentence-with "not" stuck on there somewhere. "Not" appears to be a recent acquisition in language … Indeed, it is well known in business when one has to get something done, that you have to be very careful to put what you want doing in positive terms. Don't put it–like I'm putting it.

> My professor of anatomy, J. D. Boyd, didn't appear to understand this. Because he was a very good lecturer. He had if anything one fault. When he was describing some part of the human anatomy, he would make a list always of the common mistakes that students made as to where a nerve went, of whatever it may be, you see. It doesn't go there, he would always write, and it doesn't go there, and this doesn't happen and that doesn't happen like that. And then he would – this would come out in his lectures and he would say "I cannot understand this," he would say, "I told my students exactly the mistakes they should avoid, and these are the very mistakes they always make."

> **LILLY:** They were following directions.

> **SPENCER BROWN:** They were following directions. And whether the directions have "not" tanked on somewhere or not, is something which they forget. And indeed, this is so obvious that there are ways of maligning people – for example, a picture of somebody in the paper and the caption underneath –"Denies Cuddling Policewoman."…

> We are least adapted to "not." "Not" is the worst order to give anybody, the most confusing order, and the most unlikely to be carried out properly. (Spencer-Brown, in Barney and von Meier 2019 (1973): 58–9)

Spencer Brown also mentions the famous injunction "Don't think of an elephant" (or in his case it was a hippopotamus; in the case of the social psychologist Daniel Wegner (1989) it is a white bear). In the case of any these imagined animals, it is impossible to obey an injunction not to think of them. They have been brought to mind. Or think of the sign prohibiting swimming in a lake. It will show a picture of a swimmer, and then a circle and a bar which is a cultural convention for "don't." But swimming has been brought to mind. (Though it makes little difference; the teenager you are trying to keep from swimming has already seen the lake, which has already brought swimming to mind.)

In mathematics the idea of number involves the concept of zero which is similar, or related, to this "not" function. Zero, as historians know, was not invented until late in the history of mathematics, except perhaps by the Mayans. There is no Roman numeral for zero. When thinking in terms of quantity, zero makes no sense.

This is the reason for the joke in the early twentieth century song, "Yes, we have no bananas." (But there are bananas in the mind of the person who hears the song.)

There are, it would seem, two ways of thinking, coexisting within human action and within language itself. One of these is evolutionarily late and accommodates the "not" function. The other is evolutionarily deep and does not accommodate "not." The latter might be said to operate via metaphor, or in Peircean terms abduction; in Bateson's day it used to be thought to be characteristic of the right hemisphere of the brain, a hypothesis that may not yet be disproven (McGilchrist 2009). I will return to this contrast.

7.2   Spencer Brownian Communion and the "Restricted Code"

While it appears Spencer Brown agrees with Bateson that animal communication does not have the logical operator of "not," Spencer Brown does not think semiotically in what I might call the true sense of the word, and does not form a theory of how animal signification works. He does not discuss abduction or metaphor, for example, in the way Bateson does. His point is rather different and points to the *precondition* for communication, which he calls "communion." Why he does this can be illustrated in Spencer-Brown's version of the example which Bateson so often gives, the communication between a cat and its owner:

> Now when one is communicating, for example, with one's cat, that doesn't have the sort of language we have, or if it does, we don't know it, then it is done in this kind of way. It is done because you know each other. And when my cat says "Meouw," I sometimes say, "What do you mean, 'meouw'" But this is a game, because if I consider it, there is never a time when my cat says "Meouw" that I don't know exactly what he means. Why I sometimes say, "What do you mean, 'meouw'?" is because I can't be bothered to get up and give it the fish or open the door or pet it. If I am honest with myself, there is never any doubt whatever. Although it says "Meouw" it makes it quite plain to me, by the context in which it says it, exactly what it means. And if I pretend that I don't understand, it knows perfectly well that I am being awkward. (Spencer-Brown, in Barney and von Meier 2019 (1973): 57)

For Bateson this is an example of "communication about relationship," and the important point is the cat's invocation of relationship which then entails the owner's living up to what the cat feels are the terms of that relationship. For Spencer Brown, on the other hand, the point is that these terms are developed through a mutual process which he calls "communion." Such "communion" is a basis and foundation for communication – but paradoxically, the more the communion, the less communication is necessary.

> Now it is my thesis that communication is superficial to communion, and without communion there is no communication, really, at all. That is to say, if there were no communion, which I will now define as a fitting on another level between the communicants – if there is no communion as indeed there sometimes is not, then what is communicated, when it reaches the other end, it is not understood.

> The more perfect the fit on the communion level, the less needs to be communicated, the more that can be crossed from one being to another in fewer actual communicated acts. In *Laws of Form*, this is expressed in these two laws–or at least there are pictures of it in the two laws early on, in the canon of contraction of reference [1], whereby, as people get to know each other better–a gang of kids go about and one word or even half a word is used to express a whole community between them. Whereas when people do not know each other, this has to be expressed in a whole book. But between people who do know one another, however, there is no need for a book, it can all go in half a syllable. (Spencer-Brown, in Barney and von Meier 2019 (1973): 57)

This phenomenon of "Spencer Brownian communion," which arises from, as he says, "getting to know each other better," is built on a foundation of mutual learning, or what might be called co-conditioning. In Peircean terms we could speak of a "mutual taking of habits." In Batesonian terms we are dealing with second-order learning or deutero-learning. The habits of *a* learn to adapt to the habits of *b* and the habits of *b* learn to adapt to the habits of *a*, in a self-reinforcing and iterative process that is unconscious most of the time, and becomes more unconscious as the process proceeds in time (due to what Bateson terms the "economics of flexibility", see Bateson 2000: 346–363).[2]

It is this sort of "communion" which is the basis for what some anthropologists term a "restricted code" of communication (Mary Douglas 1973). A so-called restricted code emerges when people (or organisms) find themselves in such close alignment that they require little overt communication to feel they understand each other. (But their intercommunication can by this very token sometimes be opaque to others.) Such restricted codes can develop a sense of close mutual understanding not limited to the denotative aspects of conversation. It is perhaps "Spencer-Brownian communion," based on co-learning, that is the basis for so much of the communicational richness of understanding that takes place between people. This communicational richness was explored by Bateson and his colleagues in the unpublished manuscript known as *The Natural History of an Interview*. (McQuown ed. 1971).

7.2.1   The Communicational Richness of (Human) Interaction: A Partial Digression

A significant portion of Gregory Bateson's theorizing about communication was researched specifically using human interactions, and yet might (or might not) have relevance to the nonhuman world as well. This theorizing was catalyzed in some ways by the fact that he had worked for more than a decade (1948–62) in a specific milieu, involving the State hospitals where psychotics were warehoused and in which some attempts at therapy were being made along with the warehousing. Gregory Bateson held the title of "Ethnologist" at the Veteran's Administration

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[2] i.e. the article "The Role of Somatic Change in Evolution," first published in *Evolution*, vol. 17, 1963.

hospital in Palo Alto, and prior to this worked with Jurgen Ruesch at the Langley Porter Clinic at the University of California, San Francisco. Eventually his work with others in the "Bateson Group" was instrumental in founding the Mental Research Institute or M.R.I., and their work was catalytic in founding and influencing the nascent movement of family therapy. However, Gregory Bateson was not interested in creating a theory of deviant or deficient communication. He was interested in a comprehensive theory of communication, but realized that the healthy state is hard to study on its own, and sometimes can be illuminated by circumstances where it seems to go wrong. I am not interested here in exploring Batesonian theories of mental illness, and will not comment on whether there is such a thing. I am interested in the general theoretical ideas which Bateson developed, ideas which ultimately stand or fall as contributions to our understanding of human, and (as I will show) animal communication.

In human communication, we see a mixture of the digital with the analog, of the symbolic with the indexical and iconic. We also see the development of cybernetic systems with relatively tight integration. Theorists in cybernetics, most notably Gordon Pask and Klaus Krippendorff, have spent much of their careers developing theories of conversation.

7.3   The Cybernetics of Human Talk: Interaction Analysis, 2008

As part of the celebration of the centennial of Gregory Bateson's birth, a conference was held in Copenhagen to discuss aspects of his legacy relating to biosemiotics. This resulted in the book, edited by Jesper Hoffmeyer, *A Legacy for Living Systems: Gregory Bateson as Precursor to Biosemiotics* (Hoffmeyer 2008b). In his article for that book, Donald Favareau describes the relevance, for Batesonians and cyberneticians, of a mode of research called Interaction Analysis.

Using video and audio tapes for its source materials, Interaction Analysis concentrates on "naturally occurring, everyday talk-in-interaction." (Favareau 2008: 169) This talk turns out to have characteristics which belie our usual models of conversation. Each participating speaker is improvising their participation in talk without being able to predict beforehand what they are going to say. Turn-taking, to take one aspect of conversation, is shown to exist in an empirically discoverable way, but one which encompasses dynamics which prior to study may appear chaotic or non-ordered – a fallacy which is corrected by the cybernetic perspective implicit in Interaction Analysis.

Favareau summarizes part of the perspective of Interaction Analysis as follows. The mutual "active co-participation" in a conversational dynamic creates that very dynamic by "creating contexts of relevancy, constraint, and possibility" for each participant's ongoing "re-shaping of the cybernetic surround." This reshaping occurs in what Favareau calls the "immediate next," which is a concept based on

what complexity theory calls the "adjacent possible" – the set of all possibilities that emerge from a certain state of the situation at any given "time grain," to use a term from Gregory Bateson and Warren Brody (MC 207-19i, May 3, 1971).[3] This is a reframing of the concept of conversational talk that fully embodies what Bateson referred to, in a 1967 article reprinted in *Steps to an Ecology of Mind*, as "Cybernetic Explanation." Specifically, instead of taking the causal, billiard ball, perspective, of one thing after another in lineal sequence, one sees the "course of events" as subject to constraints (or, in 1967, "restraints"), which are in Bateson's terms "factors which determine inequality of probability." (2000: 405–6) These constraints exist in a space created by the previous state of the system which itself was shaped by constraints, so that the current shape of any system can be seen as what might be called, to paraphrase Favareau slightly, the "immediate previous," or the "adjacent prior possible."

Favareau's version of talk, of course, encompasses more than the strictly verbal or "symbolic" mode. In fact, it is not possible only in that mode. Favareau writes:

> … the meaning-making that the agents here are constructing together is visible, hearable, and in a real sense "out there" in the world between them. For it is also out there in this embodied interface that the participants themselves constitute that they must be actively aligning their own breathing, body torque, facial expressions and motor rhythms in order to bring off the kind of fine-grained reflexivity of temporal and motor coordination that allow them to *collectively accomplish* the built order of apparently "seamless" transitioning and structural stigmergy that is the hallmark of everyday talk. (Favareau 2008: 193)

The term "stigmergy" comes from the study of insects and refers, according to the Oxford English Dictionary, to "the process by which the results of … activity act as a stimulus to further activity." More specifically, each activity builds upon the situation of the environment that was previously built up by other activities. In terms of talk, this means that each incident of talk builds into what Favareau calls the "adjacent next" built by all the previous incidents of talk. This constitutes a microanalysis of how we construct what we might call our talk-niche.

7.4   The Cybernetics of Human Talk: The Natural History of an Interview, 1955–1971

Favareau's approach, seeing human conversation as a rich interactive multi-channel dynamic, was anticipated in some ways by several decades – by a project in which Gregory Bateson, and many other pioneers of the study of communication, were involved beginning in 1955. This project was called *The Natural History of an Interview*. Decades earlier than Interaction Analysis, *The Natural History of an Interview* would similarly be based on a fine-grained analysis of a filmed record.

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[3] Gregory Bateson Archive 207-19b through 19u, handwritten date May 3, 1971, handwritten title "The Treaty of Kealakokua Bay"; specific quote page 8 (207-19i).

But while the Interaction Analysis discussed in Favareau's article was based on hundreds of hours of footage from various researchers, *The Natural History of an Interview* was an exercise in minimalism. Its core involved seven researchers analyzing a film sequence a mere 10 mins long. (Though this minimalist description is misleading, because the analysis of any such snippet of film necessarily involves context – and some of that context in this case was provided by other filmed records of the same participants.)

The Natural History of an Interview has remained unpublished, at least in English, because of the sensitivity of the 10 min film sequence which is at its center. It involves Gregory Bateson meeting with a woman, pseudonymously called "Doris," discussing her child "Billy." As Wendy Leeds-Hurwitz has written, in her very comprehensive study of "The Social History of *The Natural History of an Interview,*" Bateson made the film in question "as part of a series of interaction in several families where at least one of the members had undergone psychotherapy." (Leeds-Hurwitz 1987: 7.) Bateson was not her therapist, but Doris was in therapy at the time. A series of stringent releases were obtained in order to make these films, and their viewing or wide dissemination has not been encouraged. (See Bateson 1957, reprinted in Bateson 1991, pp. 246–251).

The 10 min discussion between Doris and Gregory was therefore not an example of therapeutic practice or technique, and had not been filmed for the purposes of any kind of reanalysis. Nonetheless, beginning in 1956, a multi-disciplinary group of researchers from various disciplines took this short snippet of film as the overt topic of a project which in various forms continued until September of 1968, when it was ready for publication in the form of a book. However, the transcription of the data turned out to be too expensive to reproduce in that era, and the authors had to content themselves with publication in microfilm form by the University of Chicago in 1971. The total length of the document can be calculated in a number of ways, but including the transcription of the data, as well as detailed explanations of the assumptions, methodologies, and techniques used in the study, the microfilm document extends to well over 1000 pages – all centered on a 10 min snippet of film.

The authors of the project in this form included Norman McQuown, an anthropological linguist (who had previously specialized in Mesoamerican languages); Henry W. Brosin, a psychiatrist; Charles F. Hockett, another linguist; Ray Birdwhistell, who pioneered the study of body movement as nonverbal communication, which he termed *kinesics*; and of course Gregory Bateson himself, who provided the films to the group and wrote the theoretical introduction to the book. The famous psychiatrist Frieda Fromm-Reichmann participated in the study until her death in 1957, though she is not listed as an author. The analysis of what is called "paralanguage," a term which includes tone of voice and other accompaniments of speech, was also made, by George L. Trager in one of the Appendices.

This unwieldy 12 year project can be taken to illustrate a simple yet profound point. The amount of data in an ordinary human conversation, including all its nonverbal accompaniments, is astronomical. The family therapist Jay Haley mentioned, at a conference about "Beyond the Double Bind," that Ray Birdwhistell had estimated 100,000 bits of information in a two person conversation per minute (Berger

ed. 1978: 193). In the electronic age, 100,000 bits translates to 12.3 kilobytes, a number which was considered impressive in 1977, when that conference took place. (Today, we are tempted to contrast this number with the 10 – 33 megabytes that can be used to store a single minute of music without compression – but this is undoubtedly an apples to oranges type of comparison.)

The translation of analog data to digital measurement can never, in the nature of things, be exact. It might be more to the point simply to note that the analysis of even the smallest recorded conversation can be drawn out to the point of being nearly interminable. But also what emerged from this early study was a sense of conversation as a naturalistic self-organized system. It must never be emphasized enough that, for Bateson, the moment one sees two or more self-organized systems in interaction, one refocuses attention on the larger self-organized system which they compose *by* that interaction. (Said differently, the moment that two people (or animals) converse or interact, a larger system comes into being, and it is that larger system which becomes Bateson's preferred focus of attention and study.)

I would also contrast the kind of conversation theory that was developed in *The Natural History of the Interview*, and from the more recent work in Interaction Analysis which Favareau described, with other attempts at describing conversation in the cybernetic works of Gordon Pask (1975) and Klaus Krippendorff. (2011). These conversation theories by Pask and Krippendorff are idealized and provide a vision of what conversation might potentially be. They provide ways in which feedback and self-organization might profitably be built into conversation in ways which enhance the goals or purposes of such conversation, or in the case of Krippendorff, in ways which provide for accountability. On the other hand, the basic approach found in Bateson and Favareau is that of naturalistic observation. Pieces of data, which were selected (to the degree possible) so as to be typical of what occurs in non-laboratory settings, are used as the muse for developing theory about what happens "in the field."

7.5   Transmutation of Freudian Concepts into Communication Theory

The first, theoretical, chapter of *The Natural History of an Interview* was by Bateson himself and in it, he reframes a number of psychoanalytic and even Freudian concepts into ones which made sense to him from an emerging cybernetic framework. We can remember that a number of the participants in the Macy Conferences which originated cybernetics were in fact psychiatrically trained and even practicing therapists. Most notoriously, Ross Ashby, the writer of the highly mathematical *Introduction to Cybernetics* and *Design for a Brain*, was for many years director of research at the mental institution, Barnwood House in Gloucester (see Pickering 2010: 92) Another Macy Conference participant, Lawrence Kubie, was a Freudian

practitioner, based at Yale, who critiqued the Freudian hydraulic theory of motivation and libido based on drives.

Bateson agreed with Kubie's criticism that Freud, in a misguided attempt to make psychiatry scientific, had adopted an inappropriate metaphor from the physical sciences as his model for motivation and action in animals and humans. Specifically, Freud's explicit model was based on quantity and not pattern. Subsequently, Konrad Lorenz was to develop a similar model of animal aggression based on the movements of metaphorical fluids or substances, a model which Bateson would critique as well.

Gregory Bateson saw as an important part of his task the reframing of these models to suit what he considered a more soundly based form of science, that of cybernetics based on information. Indeed, those aspects of Freudian thinking which depended on the idea of a code (hidden or overt) which can be interpreted, were far more suited to what today would be called a semiotic interpretation, than they were to a theory based on the movement of postulated fluids thought of as drives.

Fluids cannot explain meanings. In our common parlance, we say that angry people "let off steam." But the movements or the liberation of that steam do not explain the relational roots of the anger or the ideas in which it expresses itself. Even the non-verbal kinesics of anger arrange themselves according to a semiotic code which contains information that at the very least supplements the quantitative metrics of their intensity.

There is no more explicit source in Bateson's work for how he reappropriated and reframed concepts from Freud and from psychiatric practice, than Bateson's theoretical first chapter in *The Natural History of an Interview*. He enumerated six contributions of the Freudian approach to his study of communication.

The first is recognition of the existence of unconscious mind. The Batesonian unconscious is significantly different from the Freudian unconscious, which it includes. For Bateson, the reason for unconscious mind is that no organism can be conscious of all that it potentially perceives. Attention is selection, and the criteria for selecting what is attended to, are themselves unconscious. Repression is only part of the story of selection. But signals are emitted and received outside of consciousness as well. Bateson likened unconscious perception of this kind to peripheral vision.

The second contribution of the Freudian perspective is the idea that everything that happens in an interchange is meaningful. For Bateson, this was not only a psychological meaning for the individual, but it was also an aspect of the "interpersonal determinism" between the participants (1971: 9). Everything that happens determines and refers to their ongoing relationship.

The third contribution is the idea of "primary process" which I have discussed in the previous chapter. In Batesonian terms we can see this as a system of implicit (or sometimes explicit) metaphors. Freudianism has been caricatured as claiming that every statement refers to both itself and sex. Batesonian "primary process" includes that kind of so-called "symbolism" (e.g. a woman's "unconscious fingering of the dress"), but also expands to consider parental and rivalrous relationships, for example, as motivations for all sorts of unconscious metaphor which co-exist with the

overt subject of a conversation or interchange. These unconscious metaphors, which may appear to an analyst retrospectively in a videotape, or to a participant in recollection, form part of the ways in which the interchange enacts relationship at the time in which it occurs.

The fourth contribution of Freudianism is transference, and the fifth is projection. Bateson's reframing of these is based on his theory of learning, which in its detailed form is not part of the subject of this book. But it is easy to translate this theory of learning into the language of habit, which is correct for Bateson and also evokes Peirce.

Transference, for Bateson, is the assumption that a conversational or interactional partner will behave or react or understand things in the same way that others in one's life have done. Or we might say that transference is the habit of expecting others to confirm one's own habits of relating. Projection is closely related to transference but in projection it is the self that is the model. We might say that projection is the habit of expecting others to exemplify one's own habits of relating. Instead of expecting others to behave like one's parents or peers, which is transference, projection expects others to behave like oneself.

Identification, Freudian contribution number six, involves imitation. "A is said to identify with B when he starts to mold his own meaningful action in terms of what he thinks are B's principles of codification." (1971: 11). This involves a possibly less passive form of habit formation, a habit of making models of others and then living by those models. These models may of course not be accurate.

Bateson goes on to make one of those points that only he would make. That is, that not only are these habits of relating unconscious, but that they are also to some extent "coercive" of one's partner. "Any errors which A may make in his assumptions about B are likely to cause A to act in such a way that B is put *under pressure* to validate those errors by acting as if A's assumptions were true." (1971: 11) This is a way in which the conversation or interchange becomes a system which is not the linear expression of the psychologies of either party, and yet it also becomes one which reinforces these psychologies even in terms of their errors.

This is the extent to which Bateson describes a debt specifically to Freud or Freudian approaches in this Introduction. It would be a mistake to consider him a Freudian, as he rejected many of the substantive theories which Freud proposed. Bateson never took upon himself the responsibility of being a therapist, nor the task of evaluating techniques of therapy according to whatever criteria of effectiveness might have been fashionable in his era. In the middle of the twentieth century, Freudianism was, in the immortal words of the poet W.H. Auden, "a whole climate of opinion," one which was inescapable to communications researchers. Notably, in a paper given as early as 1940, and published the next year, about the alternations of strict and loose thinking in science, Bateson expressed the hope that "most of the old [Freudian] fabric of analysis will be left standing after the new underpinning has been inserted" (Bateson 2000: 87). That phrase is a good summary of what Bateson felt he and his fellow researchers were able to do, in order to retool psychoanalytic ideas to serve the purposes of communications researchers in the 1950s and 1960s.

In the end, what survived were ideas about relationship and habit which do not need the help of Freud's "climate of opinion" to continue to stand up on their own feet.

Bateson went on to discuss the contributions of other psychological theories to the analysis of communication in *The Natural History of an Interview*. First among these is gestalt theory (not to be confused with gestalt therapy). From gestalt theory we get the idea of *figure and ground*. Of course this idea is related to that of conscious versus unconscious perception. But Bateson also relates it to another of his own favored concepts, that of the *punctuation of experience*. Each participant punctuates experience according to prior habit and history that informs the perception of the moment. Each participant breaks up the flow of events in ways which that participant has learned to be meaningful, in that participant's history.

The flow of events is also interpreted according to the principle that *nothing never happens* (1971: 12). The absence of an expected or predicted signal is also meaningful. "In human relations, no silence is insignificant and the absence of tears may speak volumes." (1971: 12).

Interaction recorded on tape (or by a similar device) can be punctuated for purposes of study, but part of what one would be trying to determine through that study is exactly the way that the participants themselves punctuate their interaction. Furthermore, the participants are not entirely unitary subjects according to this analysis. "A particular message may be simultaneously interpreted in different ways by different levels of the mind; we face problems of *multiple coding*." (1971: 14).

These problems of multiple coding might be partly addressed by looking at the multiplicity of contexts to which a "message" may relate. In Peircean jargon we may be looking at a multiplicity of interpretants. But the message in part determines the contexts which are necessary to interpret it. (And does that mean that the sign determines its interpretant, in a similarly co-dependent fashion?) By analogy with linguistics, Bateson wants to see meaning ("as this word is vulgarly used") as emerging "only at a very high level in this hierarchy [of contexts]." (1971: 16).

Inspired by cybernetics, Bateson interprets meaning as a function of the restriction of possible meanings (1971: 17), and it can never be definitive. With an increase in the data provided, the probability of an interpretation can be improved, but the process of "the approach to non-ambiguity" (1971: 17) is asymptotic and endless. The method of inquiry is therefore one which "postpones" (1971: 18) the question of meaning, in favor of asking about how a change in the sequence of events or their contexts might produce a *change* in meaning. So meaning is understood at the first derivative level before it is understood in "itself."

7.6   Kinesic Speculations

Those people too young to remember what it was like to live under the Freudian "climate of opinion" may or may not have had the adolescent experience of joking about how everything and anything was either a phallic symbol or a female sexual

symbol or a symbol of the act of sex itself. With the eclipse of Freud, this juvenile game may have lost its link to any intellectually reputable body of theory.

Nonetheless, such games and interpretations may have freed a process of interpretation such that therapists and others became able to discern the metaphorical "symbolism" of unconscious body gestures and other aspects of implicit and usually nonverbal communication.

Bateson rarely published these interpretations, as they weren't always germane to his larger points. But they can help us understand just how he felt that nonverbal communication signified, among humans and by implication among other animals.

In a letter to Ray Birdwhistell, on May 22, 1957, Gregory Bateson addressed this question more explicitly than he ever did in print. From this letter we have one example of an analog communication in the field of kinesics (awkard body posture) and one from the field of paralanguage (raspy vocal laughter). Obviously this form of communication does not yield a denotational exact meaning. These examples are only meant to point towards a realm of significance rather than providing a finished theory of it:

> We have been groping towards saying that kinesic communication is analogic rather than digital; and this is simple enough for such kinesic events as an impact between right and left fists used to describe a collision between two opinions. In such an example, it is clear that the kinesic event is an analogue of what is being talked about. It is however, less clear, in regard to much kinesic material, of what this material is an analogue. A man walks in a certain way, and we say that this walk is an analogic communication. All right, but we must ask "His walk is analogous to what?"

> Now, if what I said in Pittsburgh is right, then we observe that there is a possible analogy between the interaction among the processes of learning (in the widest sense of this term) and the interaction among parts of the body in movement, poise, balance, etc. Wherever a possible analogy exists, it is possible for this analogy to be used as a basis for analogic communication. I therefore ask you, is it conceivable that this is precisely what happens – that by awkwardness of gait, a man might communicate about psychological incongruity, or awkwardnesses in the human situation surrounding him as he perceives it …

> There is also the question whether the vocal segregates and other para-linguistic phenomena are in some degree analogue messages. We know that sporadically within the language proper there is use of analogic devices (onomatopoeia, etc.) In general, I would guess that something of the sort would be much commoner on the para-linguistic level. That, for example, the convulsive oscillations of laughter may well be a comment analogous to circular paradox, and that the addition of rasp to the laughter would be a comment upon a circular paradox of which one component arouses distaste – or perhaps, upon a paradox such that its juxtaposition of components is distasteful. And so on. What seems to be important is to stress that in such a system of analogue interpretation we always look to the relationships. We must avoid the idea that the rasp might stand for the unacceptable component, and stress the idea that the total laugh is an analogue of the total paradox as felt by the subject.

> And always of course we must emphasize the creative nature of the individual perception.
> (Letter to Ray Birdwhistell, MC 173-4a, b, May 22, 1957)

7.7   Lack of Translatability

Much later in his life, in 1975, Gregory Bateson would tell a class at Naropa Institute about his experience being analyzed as part of the study for *The Natural History of an Interview*.[4] But of course his purpose in that discussion was not merely biographical, or venting about his mixed feelings about being placed metaphorically on the table for dissection. He had a larger point, which is that, for him, the analog aspects of communication are radically nontranslatable into ordinary or verbal language. This is from a question and answer period at the end of the class. The class title is "The Real and Abstract" – that is to say, the "abstract," or metacommunication, which is real …

> Audience member: And don't you think it's possible, moreover, to fill in the gap, the high point, between speaker and audience, parent and children, what have you, by verbal means, even though the original statements are kinesic?

> Gregory Bateson: Yeah … You asked me a question, I go into thought, and I turn towards the audience. Now … all that; if Ray Birdwhistell were here, he would take, dissect, and tell you, "Look, Gregory did so and so, he's using that audience as an escape from that question, etc. " All of which is true. But the fact that it is in one sense true, the actual operation took two seconds, three seconds, maybe. And now a kinesicist analyzes it out, and, this point this point that point … that's what he was, quote, "doing." By the time you have spread it out at that length, and turned it into words, you've made it into something which is not a translation of that which you started from. I mean, I've sat, you know, down in the audience, while Ray has analyzed films in which I was contained in the film, there on that screen, and there's Gregory. This is very unpleasant, I may say. [laughter] But what makes it unpleasant is that, that the dance is being turned into words, and when it's turned into words, it isn't a dance anymore, you know, and it isn't what it was. However insightful Ray's seeing, it still is a distortion. And the same of course is true of, say, the interpretation of dreams, you see. Your dreams belong way down in unconscious levels, I don't know, right hemispheres, what have you. Tell 'em to your shrink, and by various processes and collaborations you get a sort of interpretation so called of the dream, matching it up against free associations and with whatever good, careful methods he may use, it's fine. But the interpretation is not the dream. There will …

> Audience member: But in the context of "shrinkdom," there is no dream until it is told. It remains unconscious.

> Gregory Bateson: Let me say there is no therapy until the dream has been maltreated …

> Gregory Bateson: I think the beginning of the story – this is related to the interpretation of the dream too – is that … I have an esthetic feeling, for lack of a better word, related to [some] work of musical composition. But the musical composition is not a representation of that feeling as felt by the composer …

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[4] Naropa Institute, in Boulder, Colorado, USA, was founded by a school of Tibetan Buddhism. In the 1970s it sponsored numerous courses in several fields, most notably poetry (Alan Ginsberg and John Cage taught there), but also psychology, in addition to Buddhist studies. Gregory Bateson taught there for two summers, 1974 and 1975, giving public lectures as well as more advanced classes.

> You see, the unconscious is unconscious. A thing that you forget. [laughter] But it really IS unconscious.[5] (Phillip Guddemi transcription.)

Gregory Bateson seems rather lucky in his interlocutors here. They provide him with a kind of metalogue, only, instead of a dialogue between a knowing father and an astutely naïve daughter, we see a dialogue between a knowing, certain youth and a wise man exemplifying a productive and exploratory kind of uncertainty and doubt.

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[5] Bateson class, Naropa Institute, "The Real and Abstract", part 1 tape 2, recorded December 1, 1977. Transcribed by Phillip Guddemi. Tape accessed online February 24, 2020, at https://cdm16621.contentdm.oclc.org/digital/collection/p16621coll1/id/1785/rec/14

Chapter 8
The Slash Mark: Gregory Bateson's Cybernetic Semiotic

3. This is especially true where the negative message concerns the rules and styles of relationship. In particular, the message "I shall not hurt you" or "I trust you not to hurt me" can obviously only be communicated in one of two ways:

(a) The individual may expose his vulnerable parts to possible attack – as do the dogs and the octopuses, <u>after</u> there has been some fighting. But this method, though dreamed of by many of our pacifists, is obviously very dangerous unless the message which it seeks to transmit has already been transmitted, acknowledged, and believe[d] in by the other individual It follows that the message cannot safely be gotten across in this positive form.

The other alternative is (b) in which the transmitter of the message must in some sense mention violence in some analogic code (e.g. by a hostile intention movement) and must somehow introduce a <u>negative</u> into this analogic statement about violence. But, as mentioned above, analogic codes characteristically do not contain any signal for the word "not". (Letter to Warren McCulloch, MC 1039-10a to 10b, October 25, 1962)

8.1   The Slash Mark of Information

As we have seen, Bateson considered analog body communication as having the characteristic that using it alone, it is impossible to point to an action and then indicate that said action is what one does *not* propose to do. This characteristic prompted Bateson to observe, using his studies of octopus and other animals, that what looks like an intention movement, i.e. an expression of an intention to fight, often, in a seeming paradox, forms part of a larger interactive sequence which eventuates in peaceful, rather than hostile, relations. (Note also Harries-Jones' discussion of this (2016: 200–01.))

There is a subtlety which I have only recently understood about the analogic inability to say the word "not." That is, the inability to "say" a negative analogically is not a problem from the point of view of the recipient of a message – the responder to an action. Bateson felt that there are indeed analogic ways of saying "don't." (Though whether such no's are taken for an answer is always another matter.) The

inability to say "no" analogically is a problem for the party trying to establish trust, not for a party trying to express distrust.

This question of trust can be illuminated by looking at matters from the point of view of the potential loser of a "scrap," to use a word Bateson was fond of using. It is a vital question for the possible loser of such an encounter whether the winner is going for some sort of coexistence or for total annihilation. How can this vital prediction be made in the absence of some interactive baseline? I will revisit these two opposing outcomes in a subsequent chapter.

8.1.1   Gregory Bateson's Cybernetic Semiotic

This may be a place where it is appropriate to discuss the semiotic (as I would call it) which Bateson developed from first principles of cybernetics, a semiotic which he primarily develops in three articles which were reprinted in *Steps to an Ecology of Mind* (Bateson 2000). The most important of them is an article entitled *Redundancy and Coding*, which has the very biosemiotic history of having been written for Thomas Sebeok's edited book *Animal Communication*. Preceding the argument in that one, however, is the article *Cybernetic Explanation* which was originally published in the *American Behavioral Scientist* in 1967. This article begins at a point closer to the fundamentals of information theory as well as cybernetics. The third article which I would bring to bear is one on aesthetics which also founds itself on cybernetic ideas, entitled *Style, Grace, and Information in Primitive Art*. This was first published, also in 1967, in an anthropological anthology.

So let's begin with the information theory basics of Batesonian *meaning*, as he defines it in *Style, Grace, and Information in Primitive Art*. Let's begin with the *slash mark*. That is to say, let's begin with the idea of anything (any "aggregate of events or objects", p. 130), which can be divided by a slash mark such that it is possible to guess, with better than random success, from one side of the slash mark, what exists on the other. Any such anything, is thereby characterized by "redundancy, meaning, pattern, predictability, information, and/or the reduction of the random by 'restraint' [or 'constraint']." (2000: 131–2).

This is information theory, more or less raw, and applied to psychology by F. Attneave (1959). It is a transform specifically of the work of Shannon, who was largely concerned with such issues as signal/noise ratios and the like. From its original god's eye view this set of ideas would seem to have great generality and limited application.

What Bateson was able to do with this theory, explicitly in some places and implicitly in others, was to ask what cyberneticians call the second order question. How does this look from the point of view of an "observer"? Specifically, *who* (or what) is doing the guessing across the slash mark?

In some cases the guesser would be a human being. In some cases it would be a nonhuman organism. In some cases, perhaps, it could be some part of a cell or organ within an organism.

At a first approximation, the slash mark would appear to appear at the boundary between what we might designate "system" and "environment." But we must step aside for a moment to note that system/environment boundaries always come with caveats for Bateson. Any such boundary is always itself defined by a further observer and "according to taste." To use a different terminology, any such boundary is always nebulous (and shifting). But leaving these matters aside for the moment, we can consider the paradigmatic case in which the guesser is an organism, coping or surviving by making guesses about its environment.

It will occur to those steeped in Peirce that "guessing" in this paradigm should probably be glossed as abduction (as Bateson himself does in some of his later articles from the 1970s). I also think that in Hoffmeyer's (2008c) biosemiotics, the "guesser" in this model might sometimes be glossed as the "interpretant" in a way that does not always limit that concept to an organism with agency.

It will help us though to think of this "slash mark" model primarily in terms of organism and environment. It is now fashionable to talk about the "predictive brain" (Clark 2016). In a similar vein Robert Rosen spoke of organisms as "anticipatory systems" (1985) which is probably the better term. For Rosen, the opposite of anticipatory is reactive; a reactive system will only act in accordance with the linear cause which precedes its response. But an anticipatory system will act in accordance with what Rosen calls a "model" that allows it to predict, not necessarily with perfect accuracy, but with significantly better than random success, what might happen in its environmental relations (Rosen 1985). This model is defined mathematically by Rosen. I take Bateson to have included, if with less precision, a similar type of anticipation as implicit in the cybernetic self-regulation of living beings.

However, cybernetic living systems which are anticipatory must in the first instance be homeostatic in order to maintain themselves to be anticipatory. Bateson described the ongoing homeostasis of organisms which allow them to survive, as being based on the ongoing truth of descriptive statements which can be made about those organisms. The most basic such statement is of course along the lines of "I am alive." Among the statements which need to remain true for an organism to maintain its aliveness are statements about its structural integrity and also about the maintenance of key measurable values within a certain range. Examples of these values which maintain homeostasis include body temperature, glucose levels, blood pressure, blood pH, calcium levels, and numerous others.

In a letter to his old friend and Cambridge fellow student Conrad Waddington, Bateson describes the resulting viability of an organism, using the jargon of dynamical systems physics, as the *phase space* of the ranges of these values. Or put differently, as the *phase space* of the constraints of the organism's viability. (Letter to C.H. Waddington, MC 465–3, March 27, 1962).[1] In an obscure untranscribed

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[1] Letter to C.H. Waddington, March 27, 1962. Bateson Archive 465–3 File "Evolution Paper – Wad": "The basic premise of this economics is that any population of organisms of a given species, though genetically heterogeneous, can, over finite time, only place its members within a finite region of a phase space whose dimensions are the multiple variables defining the possible states of the organisms concerned." The context is a controversy between Bateson and Waddington about

workshop tape, Bateson elaborated on this paradigm. The moment by moment state of the organism can be seen as a moving point within this multidimensional phase space.[2] Each dimension represents one of "thousands or millions" of descriptive propositions which describe the limits or constraints of "what can go on" – "and if you go beyond what can go on, you're dead." Going beyond the phase space of viability, within any of its millions of dimensions, is fatal.

Stress, in this model, is a *fractionation* of the phase space of viability. A stress in one dimension, e.g. a history of smoking which reduces the function of the lungs, combines with the common cold to reduce the dimensions of the phase space. Move to a higher altitude and that further fractionates the phase space.

In the functioning organism or system, feedback processes and systems of feedback are what homeostatically maintain viability by maintaining the above mentioned values within limits. Mathematically, the multidimensionality of the phase space means that any *subtraction* of the range of a specific value will have *multiplicative* or *fractionating* consequences for the viability of the organism or system as a whole. Looked at from a different vantage point, this means that feedback processes have to be such as to "predict" or "anticipate" the continued requisites for the viability of the organism or system. Should this not be so, the organism would move out of the phase space of its continued existence.

The nature of organisms as anticipatory systems allows them to model those aspects of its "environment" in which their phase spaces of homeostasis can be allowed greater probabilities of viability. But in a typically Batesonian move, the boundaries of the organism can be analytically expanded at all times to include these aspects of the environment within the system of the organism, or the system of organism + environment. The aspects of the organism which can be consequential to its viability thus incorporate both its internal and its "external" relations, the latter defining what von Uexküll called the organism's *umwelt*.

What we call communication therefore thus involves the organism's viability both when it is the biosemiotics within the organism itself, as Hoffmeyer writes about (2008c), and also when it is the semiotics of communication with other organisms in its environment or *umwelt*. In both cases the processes of life involve anticipation and prediction. How this is so, Gregory Bateson describes in the second article I am discussing in this section, entitled "Cybernetic Explanation," which as mentioned was first published in the *American Behavioral Scientist* in 1967.

The part of this article which is relevant to the discussion here begins with an example of messaging that may derive from Shannon's work on information and cryptography. Bateson imagines an A who is sending a message on a pad to B such that the goal is to create the identical "sequence of letters" on B's pad that had existed on A's pad. But then, in a second order cybernetics move, he includes an observer who is neither A nor B. For such an observer, what A and B have just

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Bateson's paper, "The Role of Somatic Change in Evolution," ultimately reprinted in *Steps to an Ecology of Mind*.

[2] Gregory Bateson Workshop, UC Santa Cruz, February 28, 1976 no. 1, approx. 34 min from the start.

accomplished is a "creation of redundancy" in the larger system that includes both A and B. That is to say, an observer cannot get more information from looking at both A's pad and B's pad, than by looking only at A's pad.

> But in a wider universe, *i.e.* that defined by the point of view of the observer, this no longer appears as a "transmission" of information but rather as a spreading of redundancy. The activities of A and B have combined to make the universe more predictable, more ordered, and more redundant. (2000, p. 413)

In the case of such a perfect redundant, two-pad universe, A would be able to guess with perfect predictability, i.e. 100% probability, what is on B's pad. What can this model tell us about the much more common case in which guesswork of one organism will not yield perfect predictable information? It can bring us Bateson's conceptual clarity, which might be considered his own cybernetic biosemiotics:

> We might regard patterning or predictability as the very essence and *raison d'etre* of communication … (2000: 412)

> To guess, in essence, is to face a cut or slash in the sequence of items and to predict across that slash what items might be on the other side. The slash may be spatial or temporal (or both) and the guessing may be either predictive or retrospective. A pattern, in fact, is definable as an aggregate of events or objects which will permit in some degree such guesses when the entire aggregate is not available for inspection …

> If then we say that a message has "meaning" or is "about" some referent, what we mean is that there is a larger universe of relevance consisting of message-plus-referent, and that redundancy or pattern or predictability is introduced into this universe by the message. (2000: 413)

But such redundancy or pattern, in the form of an organism's ability to predict its environment, necessarily expands the phase space of its viability. It introduces order, from the organism's perspective, which aids its ability to adapt and survive. In this sense the realm of the semiotic and that of sense perception blend into one another.

At this point it becomes apparent that the distinction between *behavior* and *information* depends on where one sits with respect to the "slash mark." Consider an organism A and an organism B, each in each other's *umwelt* (each other's environment of interaction). An observer who is interacting directly with neither of them (who does not have "skin in the game") will see both of them as engaging in various sorts of *behaviors*. But for each of them, the behavior of the other is something which needs to be predicted or anticipated. The prediction or anticipation of B's behavior is necessarily for A a translation or interpretation of "signs," a "decoding," a biosemiotic phenomenon – often with vital stakes.

It is in the article written for Sebeok, "Redundancy and Coding," that Gregory Bateson develops a fuller theory of semiotic from the slash mark – and the organism's need to predict the not yet known. I will now commence to summarize Bateson's specific arguments in that article. I hope not to sacrifice too much of his almost mathematical precision as I try to walk the reader through his thinking.

Bateson uses the slash mark concept to define something he calls "part for whole coding." But this is a theory about coding in general not a specific type of coding. So let us begin again with the organism who has a sphere of perception or knowledge and a part of its environment which is as yet unperceived and unknown. The perceived, "known" information on the one side of the slash mark enables the observer to guess at the unperceived information on the other side. But this means that for that observer, the known parts carry, to use Bateson's verb, a *meaning* "which refers to the missing parts and is information about those parts" (2000: 414).

On the other hand, if that observer finds itself to be the recipient of messages specifically about what is on the other side of the slash mark, the observer's ability to predict is improved. This is particularly illustrated by the use of language. An observer can look out the window and see rain, or can hear me say "it's raining." From the point of view of predicting the current state of the weather, either will help the observer guess at current conditions with more accuracy. (But the observer will probably look out the window anyway, given the chance, because the observer will probably still want to calibrate *me* – to evaluate *my* reliability as an emitter of messages!)

So any message, verbal or otherwise, is a *part* of a larger universe, i.e. the recipient organism's *umwelt.* It is a part which is informative from the point of view of that recipient, and enables it to predict with better than random accuracy some part of its *umwelt* that it doesn't immediately perceive.

Bateson at this point uses a style of reasoning, unique to him, which I like to call "widening the system," in which he constantly expands the system under consideration by bringing into consideration a larger system, composed of the original system *plus* a something which would usually have been thought of as not within the system but "about" it. Thus, Bateson says a signal is "about" an organism's *environment* when it "contributes redundancy to," – or to put it differently, is informative about – the larger system *environment plus signal*. That is to say, signals from, for example, an animal, are necessarily part of the environment, or *umwelt,* of that animal. And in a system where all the animals are producing signals, we have an *umwelt* which is itself substantially composed of such signals. Recursively, these signals can often be *about* the very interactions of which they are "component parts." Signals about signals, and further recursions thereof, are still within the *umwelt*. (This has the implication that the *umwelt* is not simply material in nature. It is composed of actions, and interactions, and probabilities of actions and interactions – it is, though this is my word, *animate*.)

This would be complex enough in a world composed of hard-wired organisms which operated genetic programs automatically without learning. Actually I don't know if any signaling of this kind *would* be possible with such organisms, because I am not sure such organisms exist, or can exist. Some rudimentary sorts of *learning* seem to be characteristic of all living organisms. Bateson defines learning here, though not elsewhere, as "the repetition of sequences … becoming effective as patterns." (2000: 415) The events which, repetitively and thus to some extent predictively, accompany a perception, become associated with it. This has the consequence

that, to the perceiving organism, such a perception, and its accompanying events, begin to "mean" each other.

The kind of learning studied by behaviorists follows this pattern as well. Only, instead of an animal associating a perception with events that tend to accompany it, the animal associates an *action* of its own with such accompanying events. (Though in a cybernetic epistemology there is no hard and fast distinction, really, between perception and action in this context. All perceptions may be forms of action, and all actions are at least partially perceptual in nature and function.)

The abilities of any organism to learn are of course limited, and these limits define its adaptation and "social organization." (2000: 416) What is learned, and under what circumstances, differs for every species. No species is a blank slate, not even the human species. Gregory Bateson acknowledges the genetic, or as he puts it the "phylogenetic," component in the adaptations of every organism. There is a complementarity, which is of course well known, between the structure and behavior of organisms and their environments of adaptation. If a fossil of a shark is unearthed it can be deduced by the structure of the long-dead animal that it came from a watery environment, and this is especially true because we understand hydrodynamics and we know what kinds of streamlining of a skeleton are likely to arise to deal with (over deep time) the physics of deep water.

Is this streamlining a signal? Not to the shark, and not to the water. But to the observing paleontologist, who is able to infer a kind of whole (the ecological adaptation of an extinct shark) from a part of that whole (the shark skeleton).

The slash mark and the predictive organism guessing at what is behind it, generate a theory of what signalling means for Bateson, or in any case meant in 1968 for Bateson, working from first principles based on Weiner, Shannon, and McCulloch.

Bateson's work began by itemizing various forms of coding by which a "part" of a system could stand for or indicate wider aspects of that system, if not the "whole" system. (To be consistent to Bateson's thought, I believe we have to take the word "whole" as itself relative, since any whole we can consider always can be considered as part of a wider whole – for example that whole plus our thoughts about it.)

In this article, part for whole coding develops according to a progression of four or so steps (2000: 423). These have to do with ontological judgments made by an observer. Or perhaps one might say, they might have to do with how tightly or intrinsically connected the part, which is acting as a signal, is connected with its wider system including the aspects of that system which are hidden.

1. Examples of the first case, of tight connection. The standing trunk of a tree indicates the tree's invisible roots. A raincloud indicates a coming storm. "The bared fang of a dog may be part of a real attack."
2. Examples of the second case, of conditional connection. "The cloud may indicate that we shall get wet if we don't go indoors; the bared fang may be the beginning of an attack which will be completed unless certain conditions are met." But I would note that what is different here from the first examples involves the (possible) agency of the (reacting) organism, rather than the objective qualities of the external environment.

3. The third case is exemplified by a dog which bares its fang to *mention* an attack which might happen, but if it does, the fang will be bared anew, as it were "for real." Only at this point does Bateson consider there to be a "true iconic signal." The part is now "split" from the whole which is the referent.

A parallel analysis is made by Maxine Sheets-Johnstone who cites "an olive baboon's open-mouth canine display" as symbolizing ("symbolizing" is here her term) a threat. The nature of a threat of this kind, is to "distance" original function in ways which maintain "iconicity." (Sheets-Johnstone 2009: 230). This "distancing" is precisely the same as Bateson's "splitting." But both Bateson and Sheets-Johnstone use "iconicity" for the semiosis which is produced thereby, in which Sheets-Johnstone as well as Bateson see the "roots of symbolization."

It is as though the signal before the act of "splitting" forms an integral part of some whole or *gestalt* – as in, canine teeth being an integral part of an attack. The part in this case is indexical to the whole. But an act of separation, termed *splitting* in Bateson's terminology or *distancing* in Sheets-Johnstone's, enables the canine teeth to be displayed in such a way that it references an attack that *might not* happen, should the message of the teeth be properly received by its intended recipient(s) who alter their action accordingly.

(4a) Such a "split away" signal is then "digitalized." Bateson's language here is somewhat obscure but I believe he is evoking a situation in which a signal of low intensity can refer to a possible "whole" of higher intensity or valence. A soft spoken warning call which quietly indicates that there is a predator to flee?

(4b) The "split" signal is applied to other wholes by ritualization, metaphor, or (the term is not yet used) abduction. The classic examples of this have been given in more detail in earlier chapters. They involve an extension of situations of upbringing or kinship to other situations between birds and mammals. For example, the parental actions of a bird feeding a chick become repurposed, so to speak, as actions of courtship.

Bateson makes the point that the animal signaling he is describing makes use of actions of the animals themselves, or parts of said actions. (I'm not sure this applies to alarm calls which verge on the symbolic.) It typically makes use specifically of animal reactions or responses. His example comes from Konrad Lorenz' work with jackdaws, a bird related to crows. When they wish to signal that Lorenz is a dangerous "jackdaw-eater," which they do when he is holding something black (Lorenz 1962: 159), the birds do so by reacting aggressively as they always would in response to such a dangerous creature. What they do not do is simulate (as one would do in a human game of "charades") the act of eating jackdaws themselves. (Notice, by the way, how in this passage Bateson concentrates on the semiotic aspects of messaging or signaling without addressing the issue of intent or consciousness. At other times he does ask whether animals know that they are sending messages, and how that changes the messaging which results. But at the foundational level which he is exploring in this article, he is addressing a basic semiotic

of living process, one which does not require or presume awareness or intentionality.)

Bateson makes the rather strong assertion that animal communication does not address features of the external environment (or, as Bateson thinks of it in his rigorous way, the universe constituted as *message plus external environment*, Bateson 2000: 418). If it uses aspects of the external environment, such as bits of potential nest material, or the kinds of miscellaneous objects hoarded by magpies or kangaroo rats, these otherwise insignificant bits of matter – most spectacularly the found objects of such courting animals as bowerbirds – are transformed into meaningfulness when they are brought to bear in addressing what is really vital to animals, their relationship with each other. (Or, as Bateson again rigorously chooses to put it, they "contribute redundancy to the universe *message plus the relationship between the organisms.*") What we may be dealing with here, of course, is partly a consequence of an implicit concept of communication itself as dealing with social phenomena between or among animals. Had Bateson been working with a more Peircean biosemiotics of the sign, especially of the kind that has developed in the decades since his death in 1980, he might have included in his semiotics more aspects of animal intelligence involving food-finding and other aspects of what we would consider interactions with an animal's non-social environment.

It is interesting to look at Bateson's sequence of the development of animal "signaling" from the point of view of Peircean sign theory. What stands out is that in Bateson's sequence of the evolution or development of the sign, it is the index which is basic. The Peircean concept of the index, or indexical sign, refers to signification which arises from connections which can be spatial, logical, or causal. But these connections exist in the realm called Secondness, that is, the world which impinges on the maintenance of the organism within its phase space of viability. The priority of the index, then, in the sequence of the development of the sign, reflects the priority of animal experience in a world where the maintenance and continuance of the organism is always at some degree of risk. In that world, of *umwelt*, it is always important for the animal to be able to guess correctly about what is unknown to it – across the slash mark – on the basis of what has already been learned. It is important to be able to "deduce" more of the whole, from the part which is perceived. For the coding which enables this to whatever degree, via a perception of connection, Bateson also uses the phrase "part for whole" coding.

In animal communication in particular, Bateson describes a progression from indexical to what Bateson (and, independently, Sheets-Johnstone) call iconic, that is, from structures and behaviors which are intrinsically connected (the dog's fang to a fight in which that fang is used), to the iconic use of part of such a behavior to indicate something like what it could be connected to (the dog's fang as a warning of a possible fight, rather than as forming a part of an imminent fight). The iconism of the dog's warning, though, always would seem to have the potential of "degenerating" right back into the indexical fight. A bird making like a baby bird as part of a courtship of a mate is more clearly iconic (and a sterling example of abduction, of course).

The jackdaws who are reactive to a black object in Konrad Lorenz' hand, and consider him "a jackdaw-eater," are in their way responding to the basic indexicality of connection, perhaps in an inborn fashion.

Bateson mentions the question of iconic messages (he uses the term, but possibly more loosely than Peirce would) that would seem to be due to genotypic, i.e. genetic and evolutionary, determinism rather than learning. Why would these sorts of messages be privileged in natural selection, particularly as against symbolic messages? He speculates about the kinds of "naturally related" messages we have been discussing, as well as about mimicry.

He also discusses the evolution of fish who mimic cleaner fish. Cleaner fish live off parasites of bigger fish and are therefore tolerated and not eaten by the bigger fish. But there are fish who have evolved to mimic cleaner fish. These latter fish are mildly predatory and take bites out of the fish they "should" be mutualistically "helping." This creates interesting adaptive pressures, to use a non-Batesonian but conventional biological phrase. The cleaner fish need to be distinctive, though they need not mimic any other fish in particular, but they are involved in a kind of reverse mimicry arms race, in which their own mimics have to be statistically rare enough so that the cleaner fish themselves do not become avoided. These fish who so to speak need to preserve their own copyright, are not easily assimilated into typologies of coding, and provide a digression for Bateson.

Summarizing his ideas on the development of forms of coding, which might also be called the development of the sign, Bateson originates this from the redundancy always present in the external universe, extending even beyond biology. The origin of the sign, at an ultimate level, comes about due to the basic fact of the universe's connectedness. An unpredictable universe which did not exhibit regularities (or what Peirce might have called "habits") would be incommunicable. Or in Peircean terms we can also say that a universe which does not take habits would be one in which no form of coding would be possible. It is the fact that regularities exist in the universe as a whole, which allow an observer to guess what is beyond the slash mark dividing what that observer "knows" from what it does not yet know. This primordial, so to speak, slash mark, bears witness to the connectedness of the universe that enables in particular the existence of indexical coding, in which the part stands for the whole to which it is joined in some real (e.g. causal or structural) sense.

The forms of coding which Bateson calls iconic develop from indexical forms by some version of what he calls "splitting." Bateson's example here interestingly straddles both forms of coding – "a showing of the fangs can denote a possible but as yet nonexistent fight." (2000: 420) The showing of the fangs can be either continuous from a fight which is about to happen, i.e. indexical, or discontinuous in the form of a warning, i.e. iconic in Bateson's sense. It may be an example, in this ambiguity, of communication by means of "intention movements" within body language.

I am aware here that the use of the term icon by Bateson may not completely parallel how Peirceans use the term. There is still something indexical about how a

fang relates to a fight which it signifies as a potentiality. But to Bateson, the moment of "splitting" is a key moment when what had been a necessary connection becomes conditional. A fang which is a warning and which is not necessarily connected to a fight, signifies more iconically than a fang which always co-occurs with a fight. Arguably it signifies by creating a model of the fight that might happen, in the other animal, who is then possibly "motivated," using that term loosely, to avoid the fight that was "mentioned" by the fang. Therefore it does come to some extent under the category of iconic signification, signification by means of a picture or model – though this may not be completely an iconic model, because even the picture of a fang also signifies because of what it might be connected to. I will argue in the following chapter that the development of *play* represents a *second* "splitting" process and possibly a further turn of the wheel towards a more fully Peircean iconic form of the sign.

To return to the "fang" kind of iconic coding, Bateson in the article "Redundancy and Coding" mentions that such coding can become fixed genotypically. However his turn of phrase that this is "partly understandable" (2000: 426) is something of a "reveal," showing that for him the mechanisms remain somewhat obscure by which gene expression and embryonic development can yield signs which we believe can be read socially by animals without learning them. His hope, expressed elsewhere, is that such signs can be read because of what might be called a *necessary* relation between the sign and what is symbolized – and this evocation of necessity may bring us back to the original indexicality of connection across the slash mark between what the organism knows and what the organism does not yet know.

Finally this brings us to the phrase, "intention movements," which will be discussed in detail later, as it plays a part in the letter to McCulloch which frames this book. In the discussion above, the baring of the fang is an "intention movement" which "can denote a possible but as yet nonexistent fight." (2000: 426) Any such "intention movement" in the direction of fighting can serve as either in the indexical mode, as an indication of a fight which is ineluctably starting to happen, or in the subtly different iconic mode, as an indication of a fight which can possibly be averted with the proper response.

8.1.2   *Implications for the Sparring Octopuses or Nations*

Bateson's "slash mark" semiotic is clearly a semiotic of an organism which, if not always under imminent threat of survival, nonetheless always lives with vulnerability in its ability to maintain the homeostases in its "phase space" such that it remains viable. There is an implicit urgency underlying the development of the kind of indexical communication which he describes.

Organisms are, of course, not always at ultimate risk. Bateson observed in some of his classes that when he visited the African savanna, in the course of shepherding a group of fortunate students around the world for a unique one-year course of

study, he noted the rarity of events of any kind.[3] Casual watchers of nature documentaries, like most students of Darwin, can come away with the impression that any tourist to the savanna would be able to witness "nature red in tooth and claw" on a daily basis. In fact, Bateson observed, most of the time most animals leave each other alone.

Sometimes they even play with each other, even across species boundaries or with animals they would otherwise fear or prey upon. The question of play is very important to Bateson and key to his ideas about semiotics, though it does not much enter into the letter to McCulloch which frames this book. After all, we don't really know whether, or how much, octopuses play (there is increasing evidence that they do, but little in Bateson's time). And the Cuban Missile Crisis was a very serious moment. However, I will next be discussing Bateson's ideas of play, because they are key to his further development of semiotic ideas. The animal who has de-linked its "intention movements" for fighting from inevitability, so as to make them indicate mere threat, is on its way to developing an interpersonal capacity to play, if indeed it has not already done so.

[3] Bateson Archive UCSC, CAF Box 16, Transcript of Westerbeke Ranch workshop with Werner Erhard, September 5, 1976, Tape 6 of 8, pages 20–21

Chapter 9
Metacommunication and Its Contents

9.1   Mood Signs, Signals, and Play

Early on in Gregory Bateson's investigation of animal and non-verbal communication, he developed a radically new analysis of play. Gregory Bateson's gift was to take a phenomenon in animals and humans that is familiar and exists in plain sight, and re-analyze it in a novel and unique fashion that nevertheless shows us new aspects even for such an old and well-known category of behavior.

Gregory Bateson often described the moment at which he first glimpsed the larger communicational relevance of the phenomenon of play. The Damascus moment happened, in the company of a poet named Weldon Kees, at the Fleishhacker Zoo in San Francisco, in January of 1952. It was a revelation which was primed by a series of key questions in what would later be called zoosemiotics. The larger question was whether animals possess an awareness that their messages are in fact messages.

> He had prepared a list of criteria which might indicate that nonhuman animals possessed the sort of awareness he was looking for. Could, for example, an animal send a message about a message? Could an animal correct or falsify a message? Were there messages made to insure message exchange? Observing some monkeys at play gave him pause. Play seemed so close to combat, yet the animals were able to discriminate between the two classes of message. Bateson believed that this distinction could only occur if the participant organisms were capable of some degree of metacommunication, i.e., of exchanging signals which would carry the message, "this is play." (Lipset 1982: 191–2)

But it wouldn't appear that the phenomenon of play actually answers the question about animal awareness of message-sending, if the word "awareness" is taken to mean consciousness in the usual way we think of it. Rather, it would appear that what Bateson found when he encountered animal play had less to do with consciousness and more to do with an interesting and paradoxical layering of messaging that takes place "below the radar" of conscious understanding and purpose. Nonetheless, the phenomenon of play marks a deeply consequential horizon which is perhaps, if not an example of conscious messaging in the usual sense, something

like a sub-foundation without which what we think of as conscious messaging would never come into being.

So let us look at Bateson's theorizing about play in this light, understanding that it will eventually help us understand what is at stake in octopus sparring that may or may not yet have crossed the threshold of play behavior. Bateson's theory of play is probably one of his most serious potential contributions to zoosemiotics.

Even Bateson's early investigations of play, for example that of his classic 1954 article "A Theory of Play and Fantasy" (reprinted in *Steps to an Ecology of Mind*), were an outgrowth of an incipient speculation about the evolution of signs and communication among animals. In this early Batesonian view of evolution, the "primitive condition" was something that he called mood-signs. These are signs which are responded to "automatically" and which reflect or express the mood of an organism in a non-manipulated way. Like other concepts which serve as a foil for the development of more sophisticated ones, the concept of "mood-sign" is rather undeveloped at first, unfortunately so because as a simple concept and in isolation it appears somewhat contradictory to the thrust of his overall theoretical emphasis. (One thinks of *pleroma* in Bateson's contrast of *pleroma* with *creatura*.) It seems at first to be an *expressivist* concept, similar to at least the title of Darwin's book *The Expression of Emotions in Man and Animals*. But Bateson was never really happy with the somewhat anti-communicational and anti-interactive implications of the concept of expression of emotion. As he was to write in 1967 to the author of a paper he was refereeing, "… the very title [of Darwin's book] was nonsense. There are not something called emotions which are "expressed," like paste out of a tube." (Letter to Harvey B. Sarles, MC 1192-13a, August 25, 1967).

Bateson's more mature view on the subject can be seen in a short piece from 1960, entitled "A Social Scientist Views the Emotions," reprinted in the collection *Sacred Unity: Further Steps to an Ecology of Mind* edited by Rodney Donaldson (Bateson 1991: 127–131). This was in fact prepared for a Symposium on Expression of Emotions in Man, and printed in a book entitled *Expression of the Emotions in Man*, clearly a tribute to Darwin's classic work. But Bateson begins by noting a term used by the eminent psychologist Karl Pribram, "signals of state." Bateson called this a perfectly good term for individual psychology, but went on to say that the psychology of the individual is something that a *social* scientist (emphasis mine), as Bateson clearly considered himself, should not emphasize. Instead, Bateson set out in a concise way an interactive concept of communication as dealing with *contingencies of relationship*. This concept's relational emphasis meant that the expressive (and even unconscious) nature of "signals of state," which would seem to be the same kind of concept as "mood-sign," no longer was sufficient in Bateson's thinking. By 1960 any thought about this kind of sign was placed in the context of Bateson's mature thinking about social process. This necessitated taking the apparently individualist and expressivist concept of mood-sign away from the role of conceptual primitive that it seems possibly to have had in 1954.

Bateson did remain fascinated with the concept of mood-sign in a peculiar way. In 1968 he sent a memorandum to the marine biologist John R. Hendrickson meditating on the jumping of mullet fish. It is clearly a response to a letter or previous

discussion on the topic that may have been lost. Do mullet jump because they have been made irritable (for example, by the chemical formalin, a diluted formaldehyde sometimes used to treat parasite infestations in aquaria)? Or, is it the case that "the better they feel, the more they jump," as the other researcher seems to have suggested, partly in jest? And is there infectious jumping, like infectious yawning, or my scratching in unconscious imitation of yours?

> Or is this an example of the "mood-sign" we have been discussing?

> Communication "to whom it may concern" but nobody is concerned. (By the way, this sort of "expression of mood," not addressed to anybody and continuing when the individual is alone, is of great theoretical interest. It is certainly characteristic of all mammals and birds. Inter-individual signals can be (are sometimes?) derived from this when animals begin to 'read' each other's mood.) (Letter to John R. Hendrickson, MC 706-27, dated March 6, 1968)

But things cannot be left at the level of this mystery of mood. Bateson continues by placing the mullet into a kind of relational algebra. First he says that "the mullet feel X" – and, typically for him but unusually for anyone else, he translates that feeling statement as synonymous with the mullets having "an *opinion* (emphasis added) about their relationship (emphasis in original) to their world." He continues, "they then put a better-worse value on this 'feeling.' Call this value: V. They then jump because of V."

We can see here that Bateson is far from being a fuzzy romanticist. Not even the exuberance of "animal spirits" is safe from what appears at first (maybe mostly to "Anglo-Saxons") to be an utterly pervasive intellectualism. But he has elsewhere addressed this misunderstanding:

> "The heart has its reasons which the reason does not at all perceive." Among Anglo-Saxons, it is rather usual to think of the "reasons" of the heart or of the unconscious as inchoate forces or pushes or heavings – what Freud called *Trieben*. To Pascal, a Frenchman, the matter was rather different, and he no doubt thought of the reasons of the heart as a body of logic or computation as precise and complex as the reasons of consciousness. (Bateson 2000: 138–139)

Clearly Bateson approves of what he is calling the "French" position here (in the next paragraph he praises Claude Levi-Strauss for it as well). Thus in the "mood-sign memorandum" we are looking at, the mullet fish are not provided with any immunity to logic or computation, or algebra.

> But from the investigator's point of view, V has now covered and concealed the nature of "X" – and it is the nature of X that must be identified. What is the contextual structure of X? Only when we know that jumping goes with a variety of "feelings," X, Y, and Z, can we say that these all have a "jump value." (MC 706-27)

The exuberance of the fish, to review, is claimed to be the fish's "opinion," to use Bateson's own idiosyncratic word (a message to self? an example of so-called endo-semiotics?), about the relationship self + environment. One which, I cannot resist adding, it is somehow safe to disclose – it does not put the animal in immediate danger, harmfully deplete its fund of metabolic energy, or disclose its mood in a way

which other animals will take advantage of. Or at least it does not do these things to an extent that would lead to an extinction of the species. The memorandum also mentions porpoise belly-flopping as a similar phenomenon.

This discussion is rather isolated in Bateson's letters and clearly was never developed to his full satisfaction. It would seem on the face of it to be highly relevant to the question of play in the sense of object play or solitary play among animals. But when Bateson was first exploring the concept of play, to return to his 1954 work "A Theory of Play and Fantasy," his theorizing addressed social play above all.

In that work he identifies a key point in the evolution of communication as the point at which animals no longer respond "automatically" to mood-signs but instead "recognize the sign as a signal." A "signal," furthermore, is a sign which can be "trusted, distrusted, falsified, denied, amplified, corrected, and so forth." (2000; 178) We are perhaps here looking at what more recent biosemioticians have described as an increase in *semiotic freedom*, a milestone in the development of *intentionality* (though I am somewhat afraid to invoke that slippery concept), or even a step up in *semiotic scaffolding* (cf. Hoffmeyer (2015).)

But many human phenomena too, Bateson noted, do not rise to the level of what he is calling signal rather than sign. He gives a further example to illustrate this. "Sexual odors," which today would be called pheromones, exist as "mood-signs" which are to some extent responded to automatically, perhaps even among humans too. Though, he continues, when human beings mask these scents with cleanliness and deodorants and replace them with perfumes, these latter are signals, which are only advertised as if they were involuntary mood-signs prompting an "automatic" response.

In 1954 during the height of the prestige of the ethological school of Tinbergen and Lorenz, I suspect that Bateson was less reflexively skeptical of the concept of instinct than he would become. Bateson was influenced by Konrad Lorenz, but did not subscribe to the theories Lorenz was developing at the time insofar as they involved a drive or hydraulic model based on budgets and/or flows analogous to energy. Bateson rejected on principle all drive, hydraulic, or "energy" theories in animal and human behavior including but not limited to the Freudian libido theory. But in spite of his rejection of those aspects of Lorenz' work, Bateson engaged closely with Lorenz' corpus as a whole.

In a later (1956) discussion about "The Message: 'This is Play'" which Bateson had at a Macy "Group Processes" conference that grew out of the original Macy Conferences, and which had many of the same participants, Bateson discusses the idea of mood-signs with a specific reference to Lorenz. Bateson's example, which has also been thought about by Jesper Hoffmeyer, is "that animal and bird communication is like communicating by means of a blush." (1956: 157) Specifically the mood-sign is described by Bateson here as an outward perceptible event which comes from an inner physiological process, which can set off automatic mood changes in another organism. A newborn baby's cry sets off an automatic response in the mother, though soon enough the baby learns to *use* its cries to make the mother come, changing the cry from what Bateson was calling a sign to what he was calling a signal.

In the transcripts for an undergraduate course on his ideas that he was to give at the University of California, Santa Cruz, in 1976, Bateson clarified and elaborated the difference he was evoking here. Specifically he noted to his class that it was not "consciousness" that he was talking about. You cannot "get inside" animals to "look from the inside out and not from the outside in."[1] (XII, 9) What is at issue, rather, is what level of information is available to the animal to modify that animal's actions. If an animal "knows that his message is a message," then he knows "that the other fellow is receiving it" and therefore "that it will affect the other fellow's behavior in certain ways" (Fig. 9.1).

We see animal A and animal B sharing an environment encompassing both of them. Or, as Bateson puts it, "a part/whole circuit A and B and a whole." If A can do something which affects what B does, and therefore which affects the whole relationship between A and B, this is a different level of information available to A and it changes the dynamics of the larger relationship. "Can he talk about his message," so to speak; "can he say 'hear ye, hear ye', can he call for attention to give the message?"

Even though – or because – it brackets the question of consciousness, this matter of what Bateson called sign and signal evokes a provocative set of questions to ask of animal communication, and I am not sure these questions are fully resolved even today. And questions such as these were what Bateson had in mind when he made a visit to the Fleishhacker Zoo in San Francisco in January, 1952, in the company of his assistant Weldon Kees, a polymathic poet and artist. There they witnessed the very common and unremarkable phenomenon of two young monkeys playing.

Bateson notes that he had wanted to differentiate between sign and signal according to the presence of metacommunicative signs or signals in the stream of interaction. The presence of metacommunication was supposed to be characteristic of signals rather than "mere" signs. The mood-sign primitive communication would perhaps then be perceived as unlayered communication, something which could be conceived of analytically without specifying any associated metacommunication. (Please note that I am not sure this view is compatible with his later work, or even coherent within it. In "classic Batesonianism" all communication necessarily involves and includes, and is only somewhat separable from, metacommunication which is associated with it. This is as much to say that metacommunication is a way of talking about *context*.) In any case Bateson's 1952 train of thought seemed at the time to lead to a search for how metacommunication would be accomplished via specific identifiable signals (or signs), and it was possibly this idea, which Bateson

Fig. 9.1 Animal A and animal B sharing an environment encompassing both of them, which in Batesonian language is described, "a part/whole circuit A and B and a whole"
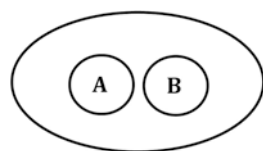
[1] Gregory Bateson Archive UCSC. Unedited transcript of GB's Fall, 1976, "Ecology of Mind" lecture course at UCSC, transcribed by Ronald Stebbins

would later only partially endorse, which brought him out to the zoo in hopes of observing metacommunication in action.

He did observe metacommunication, but not in the way he claimed he expected. What he observed in the phenomenon of play, is that the "message" of play inevitably and inextricably mixes the "layers" of communication and metacommunication, and does so in the manner of classic paradoxes of logic. The monkeys were involved in play combat, that is to say, they were engaged in actions which were similar to combat – but even a human observer would know that the monkeys knew it was not combat. This commonplace event was seen by Bateson in a new light. The statement, "this is play," seemed to mean, "these actions in which we now engage do not denote what those actions *for which they stand* would denote." (2000: 180) Expanded, "These actions, in which we now engage, do not denote what would be denoted by those actions which these actions denote." Specifically, "the playful nip denotes the bite, but it does not denote what would be denoted by the bite." (Bateson 2000: 180).

This was flagged by Bateson as a violation of Bertrand Russell's theory of logical types, in which a class cannot be seen as a member of itself. The two different levels of abstraction in the word "denote" are treated as synonymous in a way which violates logic – but logic is not, to use a favorite phrase of Bateson's, natural history.

Bateson in 1954 felt that this layered phenomenon, communication which is accompanied by (partly contradictory) metacommunication, marks a milestone in the evolution from sign (or mood-sign) to signal. Also marking a similar milestone is the phenomenon of *threat*, the clenched fist which is different from the punch, the nip which is meant which is still different from the bite. Perhaps it might be translated as the nip which does not *yet* denote what would be denoted by the bite?

And he added "histrionics" and deceit, which had even then been observed in monkeys, to the mix. All of these, which are behaviorally intermixed at least in mammals, and which may be *necessarily* intermixed in any animals which possess them, are argued to "contribute to the evolution of the discrimination between map and territory." (2000: 181) Presumably the map that may not fit the territory here is primarily a map of the behavior of one's conspecifics, and we are seeing here in the social world the beginnings of a semiotic freedom scaffolding itself into being by the development of ways in which signs no longer merely denote what they might otherwise appear to denote.

Leaving aside for the moment how ritual fits in to this paradigm, or how certain types of hazing are not organized around the implicit assertion that "this is play" but around that of "is this play?" (2000: 182), we will note the idea that the phenomenon of play is also shown by Bateson to demonstrate the existence of "psychological frames." A picture frame is a device which instructs a viewer to attend to what is inside that frame and disregard or de-emphasize what is outside of it. It is an attentional directive (2000: 187). Metacommunication, therefore, is at least partially an attentional phenomenon, or a protocol for what is attended to and what is not. Such frames are not necessarily paradoxes, though.

But there is one question which I want to return to because for me it is key to understanding what might be meant by metacommunication. This is the question of

whether metacommunication enframes the communication upon which it comments via a discrete and identifiable signal or sign, or whether sometimes metacommunication is a quality of a whole *gestalt* from which specific signs or signals cannot always be separated out. (In Peircean terms the question is whether "primary communication" and metacommunication are distinguished by an operation of discrimination, i.e. finding which sign is associated with which, or of prescission, in which what is a unity in the phenomenon we are observing is only distinguishable by an action of the mind of the observer.)

In an article originally published in 1964, and reprinted in *Steps to an Ecology of Mind*, entitled "The Logical Categories of Learning and Communication," Bateson finds that both these possibilities can be the case. He proposes the term "context marker" for a specific sign or signal, in the environment (or possibly in the animal itself?), which is associated with particular contexts or behaviors and indicates in which frame the animal is to place its actions. These are often learned. Dogs can be placed in harnesses by experimenters and learn that this harness is associated with the experimental experience, as it were. Or in more homely examples, the leash associated with taking a dog for a walk, or even the word "walk," can be context markers in this sense. (Bateson 2000: 290) Context markers are defined as "signals whose major function is to *classify* contexts" (Bateson 2000: 289). On the other hand, the condition without specific context markers also occurs.

> In many instances, there may be no specific *signal* or label which will classify and differentiate the … contexts, and the organism will be forced to get his information from the actual congeries of events that make up the context in each case. (2000: 289)

We can see this in the example of the "play bow" that the animal researcher Marc Bekoff has identified in dogs (1975, 1998). This posture which dogs often display before and during a play session can be seen in Bateson's terms precisely as a metacommunicative context marker. (This posture was also identified, but as an expressive mood sign, in Darwin (1872: 51–53); Fig. 9.2).[2] But as Bekoff also indicates, there are also play sessions in which the play bow never occurs. He mentions one in which the play session began with a type of growl, one which it would take a familiarity with the particular dog to understand that it always occurred at the beginning of a play session.

The complexity of play sessions in dogs is well illustrated in this extended passage from a more recent book by Bekoff:

> Detailed analyses of film show that in canids there are subtle and fleeting movements and rapid exchanges of eye contact that suggest that players are exchanging information on the run, from moment to moment, to make sure that everything is still all right, that this is still play. Dogs and their wild relatives communicate with each other (and with us) using their face, eyes, ears, tail, body, and various gaits and vocalizations. They combine facial expressions and tail positions with different types of barks to produce a large number of detailed messages about what they want or how they feel. (Bekoff 2006: 126)

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[2] Fig. 6. The Same in a humble and affectionate frame of mind. By Mr. Riviere. Page 53, online version of original is http://darwin-online.org.uk/content/frameset?pageseq=1&itemID=F1142&viewtype=text
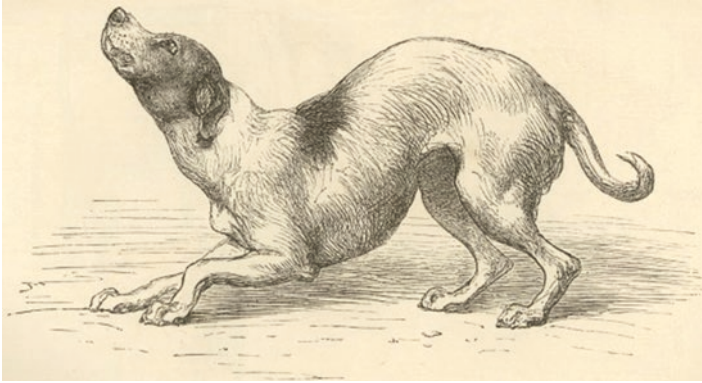
Fig. 9.2 Reprinted from Charles Darwin, *The Expression of the Emotions in Man and Animals*, 1872, Figure 6. "The Same in a humble and affectionate frame of mind. By Mr. Riviere." Identified with Bekoff's "play-bow" by Bekoff 1972: 426

In the case where the organism gets its information about context from "the actual congeries of events," rather than from some easily identifiable context marker, we might have to speak of metacommunication as inhering not in some specific gesture or action, but in a whole *gestalt* – making this aspect of zoosemiotics something which is recalcitrant to a behaviorist or "objective" analysis, at least a simple one. I suspect, indeed, that we should train ourselves to see this as the rule rather than the exception for animal play as well as for human behavior. The classification of behavior as play or threat, or other related categories, cannot be held hostage to an identifiable signal or marker.

Bateson, in the Macy Foundation Conference discussion already mentioned, "The Message: This Is Play," makes a definitive statement in human terms that also applies to animal communication. "We operate with a metalanguage and language combined into one – a single ongoing process." (1956: 199).

The point at which play or similar categories of behavior can begin to exist, then, probably marks an inflection point of what Hoffmeyer would call *semiotic scaffolding*. It increases the "semiotic freedom" of the organism by introducing a kind of, to use a Peircean term, *prescission* of categories of behavior, in which the organism can differentiate (in the moment and without reflection) the bite that is meant to mean something, from the bite which is not meant to mean anything, but which is "just playing."

In terms of the discussion in the previous chapter, I would also argue that play marks the further turning of the wheel of the sign from indexical to partly iconic (in the form of the threat) to fully iconic (in the sense that play is an image of the "seriousness" that it keys off of, but is not identical to it). The play fight is an image, for example, of the real fight. My argument would be that play marks a second *splitting*, to use Bateson's phrase in "Redundancy and Coding." However I am going beyond his own analysis in saying this.

Bateson in fact describes the play situation (as well as others mentioned) as involving the animals having an ability to "classify the components of their messages" (Bateson 1977b: 8).

Returning to the "Group Processes" discussion, Bateson there builds a terminology which can encapsulate a lot of what has been discussed here. This terminology expresses a hierarchical set of levels of nonhuman signs and signals. L-I or Lorenz I, is the "mood sign," described as "a blush or a smile or a hunch of the shoulder, at an involuntary or automatic level." (1956: 167) L-II is the use of a "simulation" of that sign to be used as a message, like the child crying in order to make the mother come. This is voluntary (or in any case exists at a greater level of intentionality than the mood sign L-I). But the signal or context marker which "discriminates between this L-I and that L-II" – the context marker which indicates play, or otherwise categorizes the message – is L-III and is usually involuntary. Which is to say that the metamessage level is involuntary – even "unconscious." (It is not necessarily, as will be discussed, a simple signal either, but a quality of a *gestalt* apperceived as part of a context) (Fig. 9.3).

(One example which Bateson elsewhere describes as at the level of mood sign or L-I deserves perhaps some critical thought. Dogs who knew that their barks were messages, at an L-II level, might be expected to bark louder to dogs who are far away (so they could hear it). But in fact, dogs on the whole bark louder to dogs who are closer. (1977b: 8) I do not find this argument conclusive; if the message of the bark is some version of "get away," the loudness of the bark ought to track the dog's sense of urgency, which would of course be less when the other dog is further away. However, to the extent that the bark is an honest signal of the dog's urgency, perhaps it is still a mood-sign.)

Gregory Bateson and Weldon Kees made a film, "The Nature of Play, River Otters: part I," which involved their observing two otters at the Fleishhacker Zoo over almost a year and a half. These were probably the least playful otters ever observed. Since we have been discussing almost exclusively social play, it is of

Fig. 9.3 Gregory Bateson's so-called "Lorenz Categories." Reprinted from "The Message 'This is Play'" by Gregory Bateson for the Conference on Group Processes, Second Conference, 1956, Fig. 21, p. 167
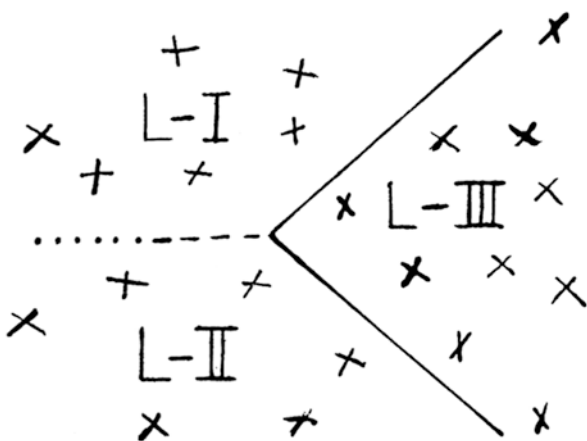
interest that part of what was filmed involved the lowering of a piece of paper as a toy into the animals' display. This toy catalyzed a period of social play among the previously surprisingly unplayful otters, who had been exhibiting symptoms not unlike boredom or depression. Bateson was later to say that in the film the possibility was broached, but not definitively established, that "the presentation of a toy which was *not* food created a context for interaction which was *not* combat" (1956: 176). This brings the analysis of non-social or object play theoretically into alignment with what I have been calling the layered concept of play. That is, in object play, this object is *not* what my non-play behavior with respect to it would otherwise have indicated it to be.

To think away from Bateson's own thoughts for a minute: when we think about behavior which we consider to be instinctive, particularly for animals "low" on the phylogenetic scale, it is odd to reflect that we consider it instinctive precisely because we do not believe the animal to be capable of goal directed or instrumental action. And yet the action of just such animals tends to be clearly focused, however mechanistically, on what appears to us as a goal or purpose (even if we hesitate to say that the animal has the mental capacity for that to be *its* purpose). "All work and no play," one can paraphrase the nursery rhyme, makes purportedly "instinctual" creatures (spiders, insects, snails, jellyfish?) into dull boys. But when we observe animals which engage in non-goal-directed behavior, that is, in what we might call playful behavior, this very fact makes us attribute to them (according to our anthropomorphic "instincts"?) a higher level of semiotic freedom than we do for these organisms "lower" on the phylogenetic scale whose actions seem to us only to relate to survival.

Gregory Bateson refers to the piece of paper used as a toy as being "metaphoric" to the otters playing with it, that is, it is probably food that the paper "stands for." (1956: 194)

> The correctness of that interpretation is not what I am concerned with, but rather the notion that the paper is somehow *skewed* against other parts of an otter's life which may be fish or crayfish or other otters or huntable objects or edible objects. The paper is *not* one of those objects, and that sets up some vaguely analogous skewing in the relationship of the otters. As a result, what they engage in, is something which is *not* combat, or something which is *not* courtship. [Incidentally the otters in question were both males] (1956: 194)

In the end, play as a category ends up, even for its analysts, as a peculiar category of behavior, with paradoxical characteristics. These characteristics are probably what enable the existence of play to bring into being the higher level of semiotic scaffolding which it appears to do.

> Recurrently, in this discussion, we are trying to put 'play' into a class of behaviors with positive characteristics like the class of chairs. The central point which I am really trying to get across is that 'play' is not a class of that sort, but is somewhere out here in the limbo. A 'play chair' is not only a chair; it is not even one of those things which are properly classified as 'not chairs.' Play is a class of behaviors defined by means of a negative without commonly identifying what that negative negates. (1956: 194)

9.1.1   Metacommunication and Its Misunderstandings in Play

We can now see that Bateson's understanding of how behavioral interchanges can be seen as exchanges of messages, that rest, in a way that might have been unexpected even to him, on the philosophical exploration of a phenomenon called play. Play helps us understand the phenomenon of social communication, and its paradoxes, among animals of a certain complexity. For Bateson, play became the foundation and type example of the kind of communication which involves a kind of layering, in which metacommunication, to use his own term of art, modifies and recontextualizes overt communication. Organisms which have surmounted the play horizon are able to *classify* the messages which they receive, and to respond accordingly.

Bateson never played small, and we should interpret his theory of play in terms of his questing after serious quarry. So let me begin by saying that he felt he had an insight into the *nature* of play itself, what it consists of as a phenomenon, both in nonhuman animals and in humans. His claims about play were *ontological* in that sense. He preferred to say his thought was about *epistemology* – how an animal would know it or another was playing, how we as observers might know that we are seeing or experiencing play.

Much of the criticism of his definition of play ends up from this perspective as begging the question. The opposition of play to seriousness is an example of this. Clearly if play did not exist, seriousness as its opposite would equally not exist. Seriousness would simply extend from horizon to horizon and never get a name. This is probably the case for animals below, so to speak, the threshold where play behavior is observed, though if we are to believe Sebeok, for example, (Tønnessen 2009), this threshold may extend down to fish or, among invertebrates, to various forms of insect. But once play exists in the behavior repertoire of an organism, seriousness then comes into being and the difference between the two also comes into being. Also, at another level of framing or abstraction, at that point the potential begins to exist of playing with whether something is play or not – the game of "is this play?" (Bateson 2000:182).

For my ensuing critique I am very indebted to the psychologist Robert Mitchell and his stimulating article, "Bateson's concept of 'metacommunication' in play." (Mitchell, 1991) I will begin with the ethologist D(onald) Symons. According to him, "That the playful nip denotes the bite to *Bateson* is not evidence that it denotes the bite to the *monkeys*." (1978:96 cited at Mitchell 1971: 77) Again this begs the question, using the richness of English vocabulary to do so. Since the dictionary definition and etymological history of the word *nip* denotes it as a kind of bite, we can substitute the word bite for nip. When we do so, it becomes more problematic to say of either Bateson or the monkeys that the playful bite does not denote the bite. The monkeys in that case would have to have an (implicit, nonverbal) classification system in which acts which undoubtedly resemble each other are nonetheless described separately and not associated with each other, and this violates the way that *Bateson* would use Occam's razor. (As I have mentioned elsewhere, Bateson

was not concerned with avoiding anthropomorphism, and if anything, he was more likely to sanction it on the grounds that what we observe in humans is probably evolutionarily conserved from animal antecedents.)

Another problem occurs with ethologists who wished to "operationalize" the communication, or metacommunication, by which animals know that social play is beginning or continuing. (Mitchell 1991: 76–77 et seq.) Marc Bekoff, one of our greatest ethologists of play, nevertheless found himself questioning Bateson's concept of metacommunication partly because the type example Bekoff uses for it is a simultaneously wonderful and misleading instance of that concept. The "play bow" which dogs exhibit, and which indicates either to other dogs or to humans their willingness or interest in a play session, has been noted, as mentioned above, at least as far back as Darwin (1873). It is an excellent example of a metacommunicative "context marker," to use a Batesonian phrase, a bodily communication which modifies how ensuing action will be understood. But what Mitchell calls Bekoff's early "operationalizing" of this metacommunication takes the play bow as a template. "Metacommunication will have occurred (sic) when it can be shown that the performance of a particular behavior(s) has served to alter the significance of a subsequent signal(s)." (Bekoff 1975: 232) With all due respect to the younger version of Bekoff, this is what happens when a Batesonian idea is placed on the rack so as to be conformable with the protocols of behaviorist thinking that were dominant in the academic study of ethology in the middle of the twentieth century.

It is as though animal observers were working with a clipboard and graph paper and ticking off examples of specific observed behaviors, and they wanted to tick off an example of "metacommunication" as a behavior in the same way as other observed behaviors. Bateson used to complain about the same sort of thing as regards people who wanted to watch a video tape or a therapy session and count the number of double binds in it. A similar problem arises when you want to count the number of jokes in a comedian's set. What comes about is a kind of flattening of phenomena that are actually layered and hierarchical.

Bekoff indeed, elsewhere in his writings, is very clear that the "play sign" among animals is not limited to discrete and easily observable signs such as the dog play bow or the monkey play face. He definitely understands, and has noted, that the message "this is play" can be carried by subtleties within the playful action itself, that is, by intuitively discernable qualities of the action within the play context. Later descriptions of the play bow emphasize the ways that it regulates communication within a play session and prevents it from departing from a play mood. (Bekoff 2006: 126).

But it is not really all that easy to approach what Bateson is doing in his analysis of play. Mitchell himself, unfortunately, falls into the ensuing trap of discussing metacommunication as a form of *referentiality*. Perhaps it is partly Bateson's trap, in his discussion of nips that both do and do not "denote" what a bite would denote – and indeed Bateson was no doubt tempted, in that discussion, by the specter of something that might shed light on the mystery of the origins of the kind of denotation that exists in human language. I think in time it may shed some light on that mystery, and yet we need to step back.

Let us begin by observing that in principle metacommunication does not need to take place via a specific, isolable act or individual sign. Often it takes place by virtue of subtle differences in quality or expression of acts which are otherwise not different from others. Play in dogs, for instance, is not always preceded by a play bow or accompanied by a play face (though the fact that these did evolve signifies that it can be advantageous to diminish ambiguity about whether something is or will be play). But ontologically and even epistemologically, discrete signals do not determine the existence or nonexistence of play.

It is also important to emphasize that metacommunication is not separated in *time* from that which it communicates about. In Bateson's world, metacommunication is *inextricable* from that which it is "about"; they form a whole, a unified *gestalt*. A dog's play bow which "precedes" a bout of play is not *prior* to it; in fact the dog is already at play.

Here is a Bateson quote on the epistemology of recognizing the presence of play. It is from a transcription of a talk entitled, simply, "Play," in the Gregory Bateson archives at the University of California, Santa Cruz. The talk critiques talks or articles presented or published by The Association for the Anthropological Study of Play some time in the late 1970s. The point of the quote is that the recognition of play is hard to operationalize even though, as the Supreme Court justice said about pornography, we know it when we see it:

> One of the most interesting things about play is that it is recognizable. We can point to two kittens and say, "They're playing." But they don't do anything, obviously, that a human child does or that a professional footballer does, supposing these two bipeds to also have something called "play." I go further and suggest to you that if I have a movie animation it would not be particularly difficult to make a film in which the, shall I say, the hero and the heroine, or the two babies, would be two black blocks on an otherwise clear screen, two small rectangles, and these rectangles would run about on that screen and contact each other and move towards each other and away from each other and around each other and whatnot; and I think there's absolutely no doubt that I could produce a sequence of frames on that screen that you would be willing to agree that those two rectangles are playing with each other, are playing, as we say, together. (Bateson CAF 238-A-3, entitled "Play")[3]

Metacommunication is said by Bateson to involve *classification of contexts*. In the case of play, an animal without the ability to play is, by that very lack, always engaged in only one class of activity. It looks to us that such "purely serious" activity of "lower" animals is a form of direct adaptation (in the sense of functional interaction) to its social and physical environment. We intuitively interpret this "seriousness" as a form of rationality or functionality, if only of the "rationality" of the evolutionary process which honed the animal's repertoire of "serious," i.e. functional, behaviors. But an animal with an ability to play has two settings so to speak. One is the setting of "serious" adaptive functionality, but the other, the play setting, is that of a kind of action which is both like and unlike the actions of direct functional behavior. In social play, this animal has the ability to discriminate which "setting" it is using itself and which its partner is using. We, and other animals, can

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[3] Transcription of talk given to the Association for the Anthropological Study of Play, late 1970s.

tell whether an animal is playing and we can respond in kind, or not. We do not usually do this by analyzing the presence or absence of a specific signal, especially not one which we are consciously aware of. We can respond to play or to non-play, and respond by play or by non-play. Our discrimination and understanding of play is *not infallible* (and therefore not "automatic" or instinctive by some definitions of instinct). And indeed it is possible to *play with* whether someone, or some other, is playing or not. This further, sometimes dangerous, game constitutes a recursive twist on the existence of play itself.

But in *social* play there is according to Bateson only one thing that it is *really* about – only one matter that it really references, if one wants to say it references something. When he discusses "the … set of levels of abstraction we will call metacommunicative" he explicitly says "the subject of discourse is the relationship between the speakers." (2000: 178).

Animal (and much human) communication as communication about relationship is of course one of the most common and thematically constant *leitmotif*s in Bateson's corpus. In human language, as we know, we can and do refer to all sorts of different objects in the course of a communicative interaction – and yet, the communication about relationship is always present as well. In animal "language" which does not have a verbal medium, Bateson's assumption is that most of its reference, as it were, is primarily to relationship.

Some exceptions that come to mind are the bee waggle dance, which is informative about an external object which is a source of food, and the famous alarm calls of vervet monkeys, birds, and others, which are informative about external objects which are threats.

But particularly in social play, it is *communication about relationship* which predominates. Of course, this is a category which Bateson uses, which encompasses a lot which conventional biology subsumes under status, dominance, territoriality, mating behavior and the like. Bateson avoids these conventional functional categories as answers to the question of why animals do what they do, because he is not ultimately concerned with the *evolutionary why* level of explanation. He is much more concerned with the *how* of communication as it takes place, and the *what* of the ontological and epistemological nature of the types of communication which can be observed. The functional evolutionary types of explanation are not denied, but are left to take care of themselves.

Let us therefore go back to the nip, or playful bite, which does not denote what a bite would otherwise denote. What, then, would that non-playful bite have denoted? Relationship, specifically, a relationship in the moment of hostility or antagonism. What does the nip denote? Specifically a relationship in the moment which is the opposite of hostility and antagonism.

The relationship of the "serious" bite to the relationship which it "denotes" is indexical. That is, a bite is a part of a wider pattern of behavior and interaction which constitutes hostility and antagonism during a period of time. The relationship of the nip to the relationship it does-and-does-not-denote, however, is paradoxical. It places hostility and antagonism under a contextual modification that has the

potential for "reversing the sign" of the otherwise inevitable indexical part-for-whole "meaning" of a bite.

To have the mental and behavioral flexibility to engage both in play fighting and non-playful true fighting, is to have the ability to do what Bateson calls *classification* – classification of interaction, of behavioral modality, and of context. The organism now has at least two behavioral modes – and the ability to communicate, mostly implicitly, which one it is operating in – but also possibly the ability to keep another organism guessing, to some extent, as to which mode it is engaging in.

Morten Tønnessen in a 2009 meditation on "Abstraction, cruelty, and other aspects of animal play," as exemplified by his cats, notes the existence of cruelty play, such as a cat somewhat sadistically playing with a mouse it will eventually eat. This sadistic play can include, in the middle of it, the self-handicapping or role reversal which scholars like Bekoff have noted as characteristic features of play. That is, in normal social play, a more dominant, stronger, more powerful animal will hold back in using all its strength or abilities in a play fight with a younger, weaker, or more inexperienced partner. This is a very important aspect of normal social play. But it is not always so pro-social.

Indeed, Robert Mitchell also notes that among animals as among humans, play can serve as a medium for the hostile actions it would appear to deny. Play fights which are recognizable as such from external observers and even by participants can still manifest aggression which is not a feigned aggression (1991: 83). Bateson considers this sort of thing part of the hazing game of "is this play?" and finds it characteristic of some institutions of initiation (2000: 182). It is certainly characteristic of many schoolyards. In some human cases the use of play in this way may serve as a kind of plausible deniability.

Do these examples militate against Bateson's account of play? I suggest that they complicate it but do not refute it. Mitchell spends much of his article, which purportedly deals with Bateson's idea of metacommunication in play, on questions of intention and how animals communicate it. Certainly the question of what an animal intends is always key to the calculations of that animal's potential play partner. Is it safe? Does he mean it? Would she hurt me anyway?

Nonetheless, the contrast between the play nip and the non-play bite is not necessarily based on the conscious intentions of the playing or biting creatures. This contrast partly emerges, of course, from what Sheets-Johnstone (2009) would call a corporeal reality. But given the capacities of bodies and the recursive aspects of their social interactions, we are dealing with intrinsic aspects of a difference that *necessarily* makes a difference. A play nip relates to a non-play bite by virtue of its *intrinsic* quality of resemblance/non-resemblance to that bite. Perhaps the emergence of this paradoxical form of communicative behavior subsequently, or consequently, enables animals to have more complex intentions. If so, it is intrinsic to the existence of play that they can do so.

Play would seem to mark a horizon in animal communication and behavior. It is a horizon in which both direct functional action, and its paradoxical negation via play, can occur. Above this horizon, communicative acts – and social behaviors generally – can signify both their necessary or intrinsic meaning, and the assertion

yet contradiction of that meaning. This is a semiotic scaffolding *par excellence*, to use Hoffmeyer's terminology. After play everything changes.

Play is the most key advance prior to human language in semiotic freedom, in the ability not to have to mean that which comes next. It is Bateson's analysis of play as paradox that enables us to understand the epochal significance of play's appearance in animal evolution. It is why a viewing of monkeys in the zoo took on the aspect of a road to Damascus.

9.2   "Going By Opposites" in Behavioral Encounters

We have seen that for Bateson, the phenomenon of play has to be understood as the enactment of paradox – of action that is both itself and not itself. Another kind of enactment of paradox in animal behavior is the phenomenon Bateson identified of the way violence and vulnerability can at times lead to a peaceful and stable *modus vivendi*. This is the core of the relationship discussed in the first chapter between the behavior of octopus and the Cuban Missile Crisis.

In the metalogue, "What is an instinct?" which is written as a fictive father-daughter dialogue, Bateson derives the emergence of peacemaking from sparring as arising from the characteristics of "primary process" communication, particularly its lack of the ability to negate which is purportedly part of verbal communication (Bateson 2000: 54–58). In the history of ideas, this paradoxical form of peacemaking finds its most immediate precedent in the work of Konrad Lorenz. In his book, *King Solomon's Ring*, Lorenz described the submissive posture of male wolves who had been defeated in fights, who would expose their throats to the dominant wolf. He claimed that the submissive wolf would not be further attacked by the more dominant wolf who had defeated him, because the dominant wolf would be inhibited by the defeated wolf's show of vulnerability. (Lorenz 1962: 206–210).

This analysis of the dynamics of fighting wolves was easy for Bateson to accept because it fit into a framework he had already developed in his anthropological study of the New Guinea ritual *naven*. This framework involved the interplay between symmetrical and complementary process, which is something that I will discuss in the following chapter.

What I want to concentrate on now is Bateson's evocation of communicational paradox as the key to animal conflict and resolution, considered as part of a unitary dynamic. Communicational paradox exists in play fighting, which is shown to have the paradoxical nature of being both fighting and not fighting at the same time. In that case play fighting is differentiated from true fighting by metacommunication of both overt and subtle kinds, and/or by context and framing. In the sparring-peacemaking cycle, we are dealing with real fighting, but real fighting which has the paradoxical *telos*, even if only a potential one, of establishing a peaceful resolution and the establishment of a *modus vivendi* among the two animals.

My use of the word *telos*, a word which is not licensed specifically as a Batesonian way of speaking or writing about the matter, points up one important reason why

Bateson's ideas on this were not taken up by conventional biology. The word is of course the root of teleology, which is the philosophical designation of the scientific original sin that Bateson imagined cybernetics to have solved (or provided the salvation for) via the mechanisms of circular causation, calibration and feedback.

In the case of sparring and peacemaking, Bateson either avoided teleology, or justified or enabled it, by the argument from semiotics, in the sense that "primary process"/analog/"right hemisphere" semiotics does not have a word for "not," in the sense of an animal being able to say "I will not bite you." In order to say that it is biting that an animal is not doing, it has to mention biting, and in what Bateson also calls "posture – gesture language," this mentioning can only be done either by the bite itself, or by some indexically linked part of the whole biting sequence, or by some icon of a part of the biting sequence – such as a threat grimace. But when two animals exchange either a part or a resemblance of biting, with each other, it is very easy for the exchange to devolve into the very fight that they might have been trying to avoid or prevent.

There is another game theory analysis of this situation which I think is salient. Let us say that the goal – or if one prefers, the optimum end state – of the animals' interaction is a peaceful *modus vivendi*. This depends on their mutual trust. If we are dealing with two animals who did not know each other prior to the encounter, on what basis can trust be established? Trust cannot exist without some basis of knowledge of the other. Trusting in a vacuum is a dangerous proposition. But, without prior acquaintanceship, how is knowledge of what the other can do to be obtained? Some sort of sparring is very helpful in establishing this knowledge. It can help each animal understand a sample of the potential range of behavior that can be expected from the other, and can help each animal develop, as it were, a model of how it might adapt to the presence of the other in its close *umwelt* or environment.

Without such a model, without a basis for trust, even a verbal assurance of "I will not bite you" would be rather meaningless. This puzzles me in Bateson's formulation. People lie. In the Cuban Missile Crisis letter, Bateson noted that nations are forced to rely on non-verbal cues because they have "almost total distrust for each other's words." But this is certainly the case for all human beings generally – unless they already know and trust each other, knowledge and trust which is rarely formed on the basis of verbal assurances. So, as for the vaunted verbal (so-called "digital") ability to make a negative statement of intention, while that statement may scan grammatically, how much does it really amount to pragmatically?

Sparring, then, gives the two previously unacquainted animals some basis for, as they say, mutual understanding. This mutual understanding in its turn provides a basis for avoiding fighting in the future.

But this understanding must be renewed. Here is Bateson on the sparring- peace-making cycle as greeting among animals, from a talk he gave. Greeting is a ritualization of the same cycle of trust-establishment which takes place upon meeting as acquaintances:

> What's the point of greeting? The greeting essentially is to affirm that you're not going to kill each other. This may be untrue but this is what is to be affirmed. Now how do you do that? You see, you can't do it by a gesture posture language, because gesture posture

languages don't have any "not" in them. Two dogs, to agree not to fight, have got to go through a process in which fight is somehow mentioned. M hm. Now the way to mention fight, is to show a part of it, a tooth, a curled lip, a stance of readiness to fight. But that is very easily mistaken for a threat. The difference indeed is zero. Therefore you have to work out the fight in order to find it isn't one. And this is what goes on. And two dogs who have known each other well, and meet often, will go through a sequence of fight exchanges, without hurting each other, which are essentially affirmations of friendship. And of course by affirmations of friendship they find, you know, their pleasure. And they like doing it. (From a workshop given at UC Santa Cruz, August 1976; Phillip Guddemi transcription)

The human custom of shaking hands has a similar origin. I worked as an anthropologist with a group in Papua New Guinea in the 1980s and 1990s which was still actively hunting with bows and arrows and which had only ceased traditional raiding practices in the 1960s. The older men of that culture also had the custom of shaking hands. It was a very gentle sort of handshake, completely without the American insistence on "firmness." In American terms one would almost call it a "limp" handshake, but the men who were doing it had extremely fierce reputations. As hunters, and in earlier times as raiders, they carried bows and arrows with them at all times. So, the handshake there represented an affirmation that they were not going to use the weapons which they carried. And this is also believed to be the origin of the handshake in European societies.

So in the case of an initial sparring, as in the case of ritual greeting which takes after its model, what happens is the generation of new relational information about the disposition of each of the parties. This can also be the case for play fighting, among the young. (Play fighting furthermore is less "expensive" or potentially damaging to the viability of either party than is "serious" fighting – a consideration which is commonly seen to be at the root of the "ritualization" of even those animal fights which have high stakes, such as those related to mating and territory.)

9.3 Epideictic, Epi-gamic, and Epi-eristic

In a letter to the biological theorist V.C. Wynne-Edwards, whom he had never met personally, Gregory Bateson reformulated his own theory of animal communication about relationship, in a way which bears upon much of the discussion here. Wynne-Edwards was at that time (May 1965) the Regius Professor of Natural History at the University of Aberdeen, in Scotland.

Wynne-Edwards had formulated an evolutionary theory involving "group selection," a concept which has been much misunderstood from the neo-Darwinian point of view. It is fair to say that for much of the late twentieth century a great deal of the biological literature involved almost a ritual denunciation of what was taken to be the Wynne-Edwards position, in his book *Animal Dispersion in Relation to Social Behaviour*. Wynne-Edwards was taken as arguing that animals were genetically programmed to self-sacrifice in order that populations should not grow so big as to outpace the resources on which they subsist. The refutation of this idea by Richard

Dawkins and others involved mathematical proofs purporting to establish that individual selection could explain evolution completely and that, to paraphrase Laplace's famous *bon mot* about God, insofar as group selection was concerned, there was no need of that hypothesis.

This is not how Gregory Bateson took the argument. He took it in two very different ways. The first was to think about the systems properties of ecosystems proper. How much do ecosystems behave as integrated systems which can be understood using the ideas of cybernetics? Taking it as given that ecosystems are systems, there must be ways in which they survive or do not. If they are indeed systems, then, Bateson argued, there is a "network of variables so interlinked that the slow-changing items determine the bias of the loops containing the fast-changing items." (Letter to V.C. Wynne-Edwards, MC 1399-1b, May 18, 1965) Such a network of variables would not, *pace* Dawkins, necessarily involve the hard-programming of systems phenomena into the DNA of individual organisms. The fallacy of neo-Darwinism, rather, was its inability to perceive the existence of a level of systems complexity overlying the level of individual selection. Similarly to Margaret Thatcher claiming at about the same time that there was no such thing as society, but only individuals and their families, the emerging neo-Darwinist orthodoxy would eschew any focus on systems composed of organisms *and* their interactions with their fellow-organisms and inorganic environments. The possibility that there might be systems phenomena such that these larger systems might survive or not, was not to be considered. How horrible that organisms could evolve to be totally optimal – adaptive – within systems that nonetheless, in their own turn, might be subject to collapse or self-destruction at the system level, making the hard-won adaptation of the organisms within them come to nothing. This level of *evolutionary double bind* was of course second nature to Bateson, the paradoxalist.

For Bateson, the Wynne-Edwards position was not one about individuals being changed by selection operating on their groups. Bateson immediately assumed that the focus was on the differential survival of the groups themselves, which would of course bear on the survival of the organisms composing them, but not necessarily in a way which would leave the kind of traces in individual genetics that would register for a neo-Darwinian. If there is any genetic programming, it would be one which produces groups which have the property of not self-destructing, but within such groups such phenomena as von Neumannian games (in which coalitions are an emergent feature) would still apply at the individual level – as well as the often neglected *interactional* level – preventing any need for specific genes for self-sacrifice.

Wynne-Edwards introduced the term *epideictic* for a certain category of animal display. The term comes from an ancient Greek analysis of rhetoric, which Wynne-Edwards simplified as indicating the "presentation of a sample." (1962: 16) However from his examples, I think it is fair to say that epideictic display is a kind of display in which the animal is so to speak saying, "Here I am." It is an extremely common type of animal display, probably mostly corresponding to what Dario Martinelli, in his book *Basics of Animal Communication*, considers the "self-promotion signal," which includes but is not limited to the "social status symbol." (Martinelli 2017: 27)

In terms of Martinelli's typology of the functions of communication, the function of epideictic displays would appear to be largely *phatic*, that is, concerned with the use of "establishing and/or keeping contact between sender(s) and receiver(s)." (Martinelli 2017: 44).

Wynne-Edwards analyzes this epideictic display in terms of group function and the perpetuation of viable animal communities. While this analysis may have been unjustly caricatured, Bateson does not continue with this focus. He returns to the individual, or rather, more properly, the *interactional* level of analysis, in which he makes a very succinct argument about his concept of relational communication.

Bateson begins by asking, "Why do epideictic displays so monotonously take the form of pseudo-combat?" (MC 1399-1c) He notes that combat which only functions epideictically would necessarily evolve into pseudo-combat, in which weapons become ornaments and so on. But he wonders why there is such a ubiquity of combat as a social building block. "In general, the whole spectrum of phenomena, greeting-play-agonistic-epideistics is quite mysterious. Epi-deictic, epi-gamic and epi-eristic.[4]"

He then remarks that he is not satisfied that these phenomena derive either from principles of dominance ("peck order") or territoriality. "Rather, these seem to me to be branches of the tree, not the trunk from which all derives."

> Suppose we say that peck order is one of the solutions of the problem of getting acquainted. And further that this solution is favored by the "law" that "black-and-white" is easier to operate than "shades of grey." The digital solution is always clearer than the analogic. There is therefore a tendency toward definiteness in the development of relationship between organisms.

> But another "law" of interaction also comes into relevance: The law that nothing never happens. A cannot not-reply to any signal emanating from B. This law, for good formal reasons, applies with special force to all signals about the contingency patterns of relationship (dependency, respect, spectatorship, etc., etc.) because to fail to answer such a signal is to offer a directly negating answer to the proposed pattern.

> The astonishing repetitiveness of mammalian discourse about patterns of relationship follows, I believe, from these two laws: The need for definiteness which is endlessly reactivated by any silence on the subject matter of relationship. So – it is never enough for two human beings to agree that they love, hate, respect, etc. each other. They must be forever re-affirming that fact.

> Now add to this another "law" viz. that in true analogic communication there can be no self-negation, i.e. no word for "not." In analogic interaction, it is of course easy to negate the other organism's proposals. But impossible to negate one's own.

> It follows that, if you and I are to agree not to fight and if we are restricted to intention movements in our discourse, then I must get you to deny my proposal of fight, and you must get me to deny your proposals of fight.

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[4] Eristic is a term of rhetoric meaning given to controversy as opposed to the finding of truth. In other words, Bateson is using Greek puns to link the spheres of display, sexual behavior, and agonistic behavior.

To mention "fight" at all we must offer the appropriate intention movements. In such cases, the proof of the pudding is always in the eating, and only by continual sparring can we continue to be sure of each other's peaceful intentions. (Letter to Wynne-Edwards 1399-1c to 1d)

Note that this remarkable analysis is from the point of view neither of group selection nor of individual selection. It is entirely from the interactive point of view, but not using the conventional game theory frame of won-loss. The same interactions which would conventionally be analyzed in terms of resource access or acquisition, are here reframed as maintenance of the continuity and reliability of relationship. Here of course it is important to emphasize that the perspective is entirely Batesonian and does not in any way reflect the ideas of Wynne-Edwards, whose star can rise or fall independently of this analysis.

Chapter 10
Complementary and Symmetrical Versions of Conflict

Bateson's evolutionary schema of the origins of what he calls "part for whole coding" is compatible with its originating in the context of conflict among animals. To see this, we need to look at the types of conflict that occur among animals – as well as among human beings and human groups, collectives, or nations – using Bateson's own typology of symmetrical and complementary interaction. This is a theory of dynamics not static relations.

10.1   Some Thinking About Contexts

For Bateson all communication necessarily takes place in context, but context to him was not an empty term. From his earliest anthropological thinking he was involved in theorizing the kinds of contexts in which signs, information, coding, messages, and similar phenomena are embedded. The recipient of information, or interpreter of signs or codes or messages, of course interprets the context as an integral part of interpreting any specific item or matter. So can there be such a thing as a theory of contexts as such?

Near the end of his life Bateson was taped giving a seminar on just this thing, although one would not know that was the subject from the title on the tape – "It takes two to know one."[1] But then, the intended subject of this Esalen seminar evidently being the future, Bateson's first wry remark was, "since it isn't, there is in a formal sense nothing to say." The future is not determinate and nothing true can yet be said about it until it happens. But all organisms need to predict, at least the immediate future, in order to act.

Or let's look at the question another way. Context, as we first approach thinking about it, appears to be more or less synonymous with environment, the setting or

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[1] Tape from Esalen Institute, May 15, 1980, distributed privately.

constraints or immediate influences within which perception and action, interpretation and communication, have their existence. Can there be a theory of context? Can we classify and describe kinds of contexts? Most theories of communication do not even try.

Bateson himself did not in this seminar say that this is what he was doing. And it would be misleading to think he was, if one thinks of context or environment as outside the organism within which it lives – or external to any "message" which is received. What Bateson did say he was doing, was making "a formal survey of the kinds of process which we might call change." The key word in this sentence is, I believe, "process." His classification of context is a classification of "change processes," that is to say, of interactive dynamics. These interactive dynamics are always to be taken to *include* the subject (taking that slippery word in all its senses – the subject of action, the subject which interprets the world, the subject of analysis).

(In fact, Bateson's position is that there are "conditions we regard as descriptive of individuals which are in fact descriptions of relations between individuals." Thus, words which purport to describe characteristics of individuals, even including such aspects as character and emotion, should be viewed with suspicion because they do not make any reference to the interactive patterns where those characteristics were learned and which tend over time to perpetuate them.)

So for Bateson, a classification of interaction dynamics is at the same time a classification of types of relationship over time. His premise, stated in systems theory terms, is that patterns of interaction are self-reinforcing. In cybernetic terms, they are feedback processes. Some such processes self-correct (i.e. they are characterized by so-called "negative feedback" or homeostasis). Many other such processes self-amplify, or "feed on themselves," and in Bateson's classification they do this in two ways, which he describes as "symmetrical" and "complementary."

10.2   Symmetrical and Complementary

The concepts of symmetry and complementarity were first developed by Gregory Bateson in *Naven*, an anthropological study of a New Guinea culture (Bateson 1958 (1936)). In that book, symmetry and complementarity referred to self-reinforcing dynamics of behavior, dynamics which when taken to their limit would result in the breakdown of a larger system. His pre-cybernetic term for these self-reinforcing dynamics was therefore *schismogenesis*, the "schism" part of which having to do with the ultimate unsustainability of what later would be called positive, or self-amplifying, feedback.

Symmetrical schismogenesis, thus, referred to a dynamic in which rivals compete to outdo each other in a way which is similar for the two of them. Symmetrical competition, for Bateson, always tends to produce similarity, because competition involves "agreeing on" a shared basis which the competition is about. However this is specific to the particular dynamic we might be observing.

(It can be noted in passing that Bateson was strikingly uninterested in the kinds of currencies of animal winning and losing which are conventional among

ethologists and evolutionists. He was skeptical of universal measures of fitness, which cannot be formulated in a context-free manner although this seems to be the intention of their developers; and he rarely spoke of such criteria of winning and losing as territory or mating privileges. In a letter (to Philip Wylie, MC 1519-8b, May 121,970) he actually referred to territory as itself a kind of context – rather than as a motivation or prize.)

Complementary schismogenesis refers to a dynamic in which the interactants are different to begin with, in some important dimension or feature, and then they interact in a way so as to intensify or widen that difference the more they interact. It is also, let us note, a form of *positive* or self-intensifying feedback. Complementary dynamics can range from nurturant to destructively hostile. The ultimate culmination of a complementary schismogenesis, whether or not this is intended or conscious on anyone's part, might be the ever-increasing subordination of one of the participants – or, as in the case of predation, it can also be one participant's complete destruction.

If both symmetrical and complementary schismogenesis lead when unchecked to the destruction of the interactive system formed by the relations between their parties, then any kind of stabilization of the system has to involve a balance between symmetry and complementarity.

Here is a 1958 definition and description of how symmetrical and complementary dynamics play themselves out. Note, by the way, that Bateson uses the terms both to describe dynamics involving rivalry and aggression, and also for dynamics which are less hostile.

> On the one hand, various sorts of symmetrical rivalry among individuals were observed and it was evident that such rivalrous sequences of interaction could be progressive [i.e. self-reinforcing] and therefore ultimately pathogenic. If A's rivalrous behavior provokes rivalry in B and vice versa, then unless some corrective phenomenon occurs, the system must go on to disruption. On the other hand, the second process observed involved complementary themes such as dominance-submission, exhibitionism-spectatorship, and succoring-dependence, where the behavior of B fit in with but was not the same as that of A.
>
>   It appeared, moreover, that these complementary themes of action were in some sense the psychological opposites of the symmetrical themes. In a symmetrical relationship, if A is ahead of B in some … direction, B will respond by trying to catch up, whereas in a complementary relationship, B, if he is already behind, will lag further behind. Or, we may put it this way: in a symmetrical relationship B's strength is a stimulus for A's aggression; whereas in a complementary relationship A's aggression will appear when he sees B's weakness. (Bateson 1991: 111–112)[2]

The pure forms of symmetrical and complementary schismogenesis tend, in Bateson's model, toward pathology and breakdown. Stability, however temporary or long-lasting, comes about when a self-reinforcing process of either the symmetrical or the complementary type is interrupted by an action of the other kind. A potentially runaway schismogenesis of either the symmetrical or complementary

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[2] Gregory Bateson, "Cultural Problems Posed by a Study of Schizophrenic Process," first published 1958, reprinted in Rodney Donaldson, ed., *A Sacred Unity: Further Steps to an Ecology of Mind*, New York, HarperCollins, 1991, pp. 111–112.

type can be mitigated by "a very small admixture (1991:112) of the other form of relationship.

Bateson was fond of two examples from human life to illustrate this. The first involves a symmetrical quarrel between a married couple, for example one between two anthropologists who might feel competitive about jobs and publications. (Note that he was at one time married to Margaret Mead.) Suddenly one of them twists an ankle, and the other moves to take care of the suffering one. This for the moment stabilizes the marriage; it's a complementary move that breaks for a moment the symmetrical dynamic.

The second involved a semi-feudal English country house and the peasants in the neighborhood. They could be involved in a complementary relationship of increased inequality and resentment. Although these problems might not exactly be solved by a game of cricket between the squires and the villagers once a year, such a game (if it's fair and either side is allowed to win) might do a lot to stabilize the feelings of the villagers about their situation. (Marxists would of course disagree about the desirability of this result, but they will probably not succeed in abolishing the cricket match so as to promote revolution.) The stabilizing effect of the cricket match, between otherwise complementary classes, arises from "a small admixture of symmetrical behavior in a complementary relationship." (Bateson 2000: 70)

In Peircean terms the ongoing nature of either complementary or symmetrical schismogenesis-type relations should be thought of as a "taking of habits" by the parties to such a dynamic. Or perhaps, as a taking of habits by the interactive dynamic itself, as it proceeds through time. In other words it is not really a question of our classifying, as external observers, single individuals, interactions, or relationships, as either symmetrical or complementary. Symmetry and complementarity do not even pertain to relations abstracted from their temporal or diachronic dimension. They pertain to "habits" of interactions – which is also to say, to the dynamics of interactions rather than to the static classification of relationship types.

Also in Peircean terms, these habitual dynamics are Secondnesses to the organisms which are embedded in them. The actions of one party require in a real way some countervailing actions by the other party, in ways which become increasingly "grooved" as the interactions proceed in time. These dynamics of interaction are thus concrete realities in which organisms are co-participant. They are not themselves symbols or signs, but symbols or signs can form part of them. Running under the surface of perceived events as they do, they are not usually the subject of direct conscious attention or verbal reference – for if they were, we would not be required to use such awkward and unfamiliar terminology to refer to them.

In many ways the "relationship," to which Bateson refers when he talks about "communication about relationship," is comprised of interactive dynamics such as these – interlocking feedback dynamics in which animals and people are intermeshed. Bateson also believed that some dynamics which exist between or among organisms exhibit what is termed *negative feedback*, or self-corrective feedback, similar to what is called *homeostasis* within organisms. This is controversial in biology because it is seen as creating superorganisms – which was not something that bothered Gregory Bateson. The world, at least the world which involves organisms,

in this view takes on a non-linear shape, one which is comprised of events running in circles which connect to other circles, of which our perception tends to be only of arcs and lines which we abstract from the complexity of the world's dynamics in order to pursue our purposes (cf. N. Bateson 2016).

In this more cybernetic context, it is fair to say that in Gregory Bateson's universe of thought, symmetrical and complementary dynamics are examples of what he termed a *metapattern*. In *Mind and Nature*, Bateson introduces the term *metapattern*, as a pattern of patterns, or a "pattern that connects" (1979: 11). Tyler Volk was later to adapt this concept to refer to a pattern "so wide-flung that it appears throughout the spectrum of reality." (Volk 1995: viii). Complementary and symmetry are types of universal dynamics and can be applied in disparate fields. Bateson was even able to see symmetrical dynamics in the shaking together of pebbles which can round off their edges and make them over time more similar to each other (2000: 233).

10.3   Symmetry and Complementarity in Animal and Human Conflict

The difference between a world understood according to dynamics and a world understood according to behavioral categories is well illustrated by the example of the concept of "aggression." It is only when Bateson distinguished symmetrical from complementary dynamics that he was able to distinguish the kind of aggression which responds to the strength of the other from the kind of aggression that responds to the other's weakness. It is worth looking at this dynamic using examples from modern biological analyses of animal conflict. It will become apparent that the Batesonian way of thinking about this issue has not lost its relevance.

Animal aggression, Bateson often noted, is of two kinds, which correspond in their way to this contrast between symmetrical and complementary. The (male) lion confronting another male lion makes himself look bigger than the other. This sort of dominance confrontation involves bluster and sometimes bluff and usually ends without injury to either party if they have the sense to avoid a fight. This is a symmetrical interaction, a rivalry based on perception of the strength of the other. On the other hand, the (female) lioness stalking a prey makes herself small in order to hide her intentions from the object of her hunt. These intentions of course are to kill the prey. This is complementary aggression, whose stimulus is the weakness of the possible victim.

As Bateson noted in a letter he wrote to his mentor Frederic Bartlett at the beginning of World War II (one which he possibly did not send),[3] a complementary *conflict* is one which is spurred on by the other's weakness, and which can have as its aim a total capitulation or even complete destruction of the weaker party. (This is different from a complementary *relationship* in which the differences between

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[3] Letter, Gregory Bateson to Fredric Bartlett 31/12/1939, Archives MC 107–1

parties lead to increased difference but not necessarily to the "weaker" party's destruction.) A symmetrical conflict, on the other hand, is spurred on by the other's relative strength, or should we say it is a relative test of strength. It tends to end when a hierarchy of strength has been established, proceeding toward the weaker party's withdrawal (but not annihilation) and the acknowledgement of the stronger party's possession of the resource fought over, e.g. rights to mate or to territory. Thus typically symmetrical conflict does not proceed toward the total destruction of the loser. It may result in an unequal relationship, with complementary dynamics accepted, to a greater or lesser extent, between the parties as a price of peace, but in which both parties refrain from destruction of the other.

> I now write because I think I have a new way of saying why the victorious dog cannot bite the losing dog when the latter shows signals of weakness…
>
> As you will see, I argue for two contrary states of the mammalian mind. In the symmetrical state the animal responds to aggression to the aggression of the other, whereas in the complementary state he responds with aggression to the weakness of the other. If we suppose that the battle has an effect upon the loser to make him switch from symmetrical state to complementary, this will account for his giving signals of weakness in response to aggression. There is no reason why the battle in which he is successful should change the state of the victorious. He therefore is left for the time being in the symmetrical state. In that state he cannot respond with aggression to the weakness of the other.
>
> In other words, our concept "aggression" has two meanings which must be quite distinct for a pre-verbal mammal. One meaning is aggression in response to aggression and the other meaning is aggression in response to weakness. (Letter to Konrad Lorenz, MC 876-16a – 16b, October 28, 1969)

These terms become less confusing when it is remembered that they should not be applied statically, as a classification of types of conflict or relationship. They are meant as a classification of *dynamics* of conflict or relationship (a higher "logical type" than conflict or relationship itself). Symmetrical relationships or conflicts involve a dynamic in which similar strength relates to similar strength, ensuring that one does not gain an inordinate advantage over the other. Complementary dynamics, on the other hand, involve the perception of the weakness of the other. However, the action which responds to this might be caretaking or nurturing, or it might be exploitative or destructive, even to the point of being in a literal sense predatory.

In symmetrical conflict, there may be real resources at stake, and certainly real status, but the parties to the conflict are usually approximately equal in strength or size. This means that the ability of one party to vanquish the other completely is limited. It means that even the victor could risk injury and end up, as the conventional biologists say, reducing the victor's own "fitness." (Bateson would put it that injury places the injured party in a riskier part of its phase space of survivability.)

In such conflicts there is a well-documented tendency to "ritualize" conflict. This means to demonstrate the likely outcome of a conflict without having to go through the entire conflict with its risks of injury. But note that the moment we start to talk about this type of conflict, we begin to want to use semiotic language. For example, in male-male conflicts among bears during mating season, one bear may rear higher than another bear. One bear may show his teeth, or growl. All of these are "signs" of why the other bear should back off.

To the extent that the fighting bears "read the signs" without injury to either party, we can see the beginnings of a "detachability" of threat from conflict proper. This is the beginning of a sign that can be used as a sign.

For what Bateson would call complementary conflict, on the other hand, an extreme (yet typical) case is that of predation. The lioness crouches down to ambush prey, hoping the prey does not see her. The parties are (in an "ideal" case) unequal in strength and size. The goal is the complete destruction of one of the parties (certainly when one of them intends to eat the other).

In the 1967 film *Cool Hand Luke* a catch phrase emerged that became famous in its day: "What we have here is a failure to communicate." But of course in the case of extreme complementary conflict the whole point is the failure to communicate. The success of such conflict comes about when the prey is sufficiently surprised so as not to be able to react or defend itself. Ambush is a kind of anti-sign.

10.4   A Human Conflict Example – "Ritualized" Symmetrical Conflict among the Dani of West Papua

Examples of symmetrical and complementary conflict occur not only in nonhuman animals, of course, but also, albeit differently, among humans of every time, place, and social organization. There is one striking example of symmetrical conflict which comes to mind for me, one which was famous some years ago among anthropologists, because a pathbreaking ethnographic film was made about it. This film, *Dead Birds*, made in 1961, is about the Dani people of the highlands of what was then Netherlands New Guinea, as they were prior to extensive colonial and neocolonial contact. (This region is now known as Papua to the Indonesians who administer it and as West Papua to those advocating for its independence.)

The film presents a world of warfare which is both endless and highly significant to its participants, and at the same time strangely (to us) restrained by custom. One of the film's creators, Robert Gardner, ironically noted in an online abstract, "there was no thought in the Dani world of wars ever ending, unless it rained or became dark."[4] In 2011, the anthropologist Paul Roscoe introduced his own somewhat skeptical restudy of this film, and the world of warfare it described, by agreeing that "the conduct of Dugum Dani battle was certainly highly stylized, theatrical, even playful." (2011:57) This has led to a sense that the battles they fought were "theatrical and largely innocuous." (2011:56) Fighting did not start until both sides are ready, but was "scheduled like a soccer match." (2011: 60) There were numerous breaks for rest, resupply, and recreation. Both sides might withdraw during the noonday heat, smoking, talking, and resting (2011: 60, quoting Gardner and Heider 1968:111). Sometimes instead of fighting warriors would sit on comfortable rocks

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[4] (https://www.imdb.com/title/tt0059091/plotsummary?ref_=tt_ov_pl accessed on November 22, 2019)

and trade insults at each other rather than fighting. A shower of rain would stop the action immediately, and gardeners would go about their business even a few hundred meters away (2011: 61). Fighters would express reluctance to disturb their hair styling or body ornaments.

However, Roscoe's reanalysis aimed to show the limits to ritualization both as a theory of Dani precontact warfare and in their practice of it. The idea of ritualization, he felt, was misleading and underestimated the stakes to Dani people of that era of their own conflicts. To this end, Roscoe's article went on to show the ways in which topography and other peculiarities of the social and military situation made it difficult for either side in any Dani conflict to pursue a decisive outcome. He noted that the terrain and military constraints of the region where the Dani fought made it difficult to "chase after and massacre a defeated side." (2011: 56) When these constraints were overcome, the Dani did not always conduct war in such a ritualized fashion. A striking exception to their ritualized style of warfare was "the great massacre of 1966," in which hundreds of men conducted a surprise raid on a neighboring people, killing 125 people and burning their homes within the space of an hour. Heider refers to this as "secular" war as opposed to the ritualized variety. (Gardner and Heider 1968: 104).

Indeed elsewhere in precontact cultures on the island of New Guinea, military and social asymmetries of all sorts could at times lead to outcomes ranging from lopsided trading relationships (Gewertz 1983) to local group extirpation (Morren 1986). The best way of avoiding such eventualities tended to be the strategic creation of roughly equal sides for any serious conflict. Tactics for achieving this parity could involve marriage alliances, gifts, feasting, and other forms of reciprocity.

Thus when one sees a ritualization of conflict, a "theatricality" such as was observed among most Dani conflicts, often accompanied by relative equality of strength among the combatants, then according to Bateson's analysis one is probably looking at a situation of what he calls symmetrical conflict. The ritualization of conflict in such symmetrical scenarios is also a kind of semiotization of conflict. We observe a process in which reasonably honest *indications* of how a potential fight might go, are enabled to displace the need for *instances* of serious combat in which both sides risk what conventional biologists call loss of fitness. In other words, the more "ritualized" conflict becomes, the better it is for both the winner, who escapes the risk of injury, and the loser, who lives to fight another day. This does not negate the serious stakes of battle. But it does contrast this kind of conflict from the more complementary versions, in which the dynamics of struggle permit and move towards a severe and irrevocable result for the losing side. When these go as the victor wants, we can note a "failure to communicate" until it is too late for the vanquished.

The conduct of conflict among the Dani people of the 1960s has long struck me as a dramatic illustration of symmetrical and complementary patterns of human warfare. But of course this contrast was first elaborated by Bateson in the shadow of the incipient conflicts that became World War II in Europe. Indeed, Bateson specifically notes, in the first (1936) epilogue to *Naven*, that his concept of symmetrical schismogenesis was significantly inspired by conversations about the fraught

European politics of the time with his family friend Alan Barlow. (Bateson 1958 (1936): 266).

10.5   Recent Research in Animal Conflict

Turning from humans again to the nonhuman world, we can now explore how Bateson's differentiation between symmetrical and complementary conflict relates to the development of animal communication. To do this, we can use examples from a review by the science journalist Susan Milius (in the journal *Science News*, a publication for general audiences) of recent research in animal conflict.[5] We shall also look at some of the source publications cited in that review.

Male fig wasps, which hatch in a fruit they are unable to leave, grow "big mouthparts like a pair of scissors" and "decapitate as many other males as they possibly can." This is according to Mark Briffa, one of the major animal conflict researchers quoted in Milius' article. The mass decapitation of all rivals results in the last remaining male wasp monopolizing all the females, who have also hatched in the same fig. Although it involves conspecifics (members of the same species), this is an example of *complementary* violence, and Bateson's theory would make the specific prediction that this decapitation may not be preceded by any overt display, but is likely to be done in a way that announces itself as little as possible beforehand.

Best not to be too Popperian about fights to the death, however. Although stealth is advantageous it is not always found. According to Charlotte Jander of Harvard University, female wasps of the *Pegoscapus* genus choose a fig-to-be which is comprised of a sac of flowers, and lay "one egg per flower in as many flowers as she can," forcing the wasp to enter tight spaces in which there is only really space for one. When two female wasps enter the same space, females "can lock on to each other's jaws for hours and push back and forth," not unusually resulting in death. (Milius 2018: 37–38) (This face to face fighting does seem odd in the absence of the ability of the loser to exit, and perhaps some can, although possibly the ones who exit would lose their ability to mate in their lifetime. The closeness of the fighting might be an accident of the tight space in which the fighting has to take place.)

Sea anemones are among the phylogenetically oldest and simplest animals in which conflict has been observed. They lack brains or more than a rudimentary nervous system. Nevertheless they engage in conflict over tide pool rocks to which they affix themselves. One species of sea anemones (*Actinia equina*) in which conflict has been studied possesses tentacles which catch its food. But beneath these tentacles can be found other specialized tentacles like "little blue beads," fighting tentacles called *acrorhagi*. These are inflated during combat and they shoot "harpoons" which inject toxins in the flesh of rivals for the same patch of rock. The loser

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[5] "Fight Like an Animal: Conflict Resolution is not what it seems." April 28, 2018 version. Online version   https://www.sciencenews.org/article/fighting-animal-doesnt-always-mean-duel-death accessed on November 22, 2019.

in the contest has the ability to "walk away" by contracting and expanding its simple musculature. Combat harms both winner and loser. Fragments of specialized fighting tentacles complete with tissue-killing toxins are left behind from each attack. The act of fighting also creates open wounds where the specialized tentacles had been deployed. Perhaps because of this tendency for mutual injury, when lab tests of conflict are performed involving placing anemones side by side, "about a third of the time" conflicts are prevented by the pre-emptive action of one of the parties moving away. (Milius 2018: 38).

In one of the academic publications that served as a source article for this account, a joint article written by Fabian Rudin and Mark Briffa, *Actinia equina* sea anemones are credited with making "assessments and decisions during contests." (Rudin and Briffa 2011) These anemones were moved by experimenters to the center of a tank so that they would be in tentacle contact with each other, often provoking agonistic behavior. Obvious factors such as the weight of the animal, or the length of its specialized fighting tentacles, often decided matches. Specifically, some fights happened without either animal using its fighting tentacles. In these matches, where size was the only factor, the bigger anemones won. But in those fights in which specialized fighting tentacles were deployed, the longer of these fighting tentacles won. The question which preoccupies the current animal conflict literature is what leads to the loser's retreat. Specifically, is this due to the loser's assessment of the difference between its size or weaponry and that of the winner – this is seen as "mutual assessment" – or does the loser retreat due to its own inherent lack of brute staying power in the fight (to the point of what we would probably call exhaustion)? This second case, i.e. the loser assessing its staying power, is known as "self-assessment," or sometimes as the achievement of the "maximum cost threshold," although it might be thought of as simply "running out of gas." In many species particularly of arthropods (i.e. species in the phylum including crabs, insects, and spiders), self-assessment seems to be the main limiting factor for conflict, according to the biologists P.W. Taylor and R.W. Elwood (2003). Mark Briffa seems to think that sea anemones are in the category of self-assessors.

The differentiation the current literature makes between mutual assessment and self-assessment is based on complex statistical arguments (Taylor and Elwood 2003). These may or may not bear on a countervailing contrast between symmetrical and complementary conflict situations. My own reading of the self-assessment versus mutual assessment literature is, however, that it may also implicitly stem from researchers' philosophical intuitions about the mental capacities of animals considered low on the phylogenetic scale. The self-assessment model entails that the losing animal only estimates its own remaining fighting capacity, instead of predicting the outcome of a fight based on an assessment of the other party's probable likelihood of winning. Researchers who created this model seem to have based it on the philosophical foundation of the self-other distinction, along with the further idea that predicting the behavior of the other is a mentally sophisticated operation – almost a form of "theory of mind." But the Batesonian point of view has a radically different set of basic assumptions. A Batesonian would postulate that for each of the contending animals what is being predicted, moment by moment, is not

a *state* of either one of them, but the *dynamics* of the conflict in which they are involved. This may be the key to why supposedly simple animals are able to make what look like complicated assessments: what is being assessed is the direction of the conflict itself. This may be the key to understanding how sea anemones sometimes are observed to, as Rudin and Briffa specifically note, exercise "strategic decision making" between types of fighting or even whether to avoid fighting altogether. (2011: 1284).

Thus Batesonian thinking enables us somewhat to ignore worries about the neural capacity of even "primitive" species. Once we do that, we can see that in some ways the two types of assessment roughly correspond to a difference between symmetrical and complementary conflicts. The so-called self-assessment model is game-theoretically rational in cases of complementary conflict – or conflicts which turn toward a complementary dynamic -- since in such cases the loser has no assurance of survival. In the most deeply complementary realm of "fighting to the death" there can be little or no payoff to stopping a fight short of depleting one's full capacity to struggle. By contrast, in symmetrical conflict, calculation of odds is beneficial because there is always the possibility of fighting another day; both parties risk injury and therefore have an interest in "limited war." This is compatible with the rationality (in what in principle might be a game theoretical sense) of "mutual assessment" in which the loser retreats when it assesses that it is the weaker competitor. Dynamics of this kind have been observed in arthropods such as mantis shrimp (Green and Patek 2018), weevils, and jumping spiders.

Unlike some early versions of game theory which relied on matrices of winning and losing represented by integral values such as 1 or 0, the Batesonian theory of symmetrical and complementary conflict involves self-reinforcing cybernetic dynamics. Analysis in terms of process and dynamics is inherently more fine-grained (though harder to observe externally) than conventional game theoretical analysis. It involves a processual and analog way of conceiving conflict, in which the direction of an encounter can change from one moment to another. Loss in a symmetrical conflict is qualitatively different from loss in a complementary conflict; as mentioned, it can be the difference between limited and total war.

In applying and supporting Batesonian ideas of symmetry and complementary in animal conflict, I have been emphasizing the risk of injury to both parties. This is particularly applicable, of course, to symmetrical struggles (taken to be "over resources" rather than over the life and death of one of the parties, or similar existential stakes). This aspect of conflict has evidently been undertheorized, according to an article written as recently as 2017 with Mark Briffa as a second author (Lane and Briffa 2017). In this article, "The price of attack: rethinking damage costs in animal contests," Sarah Lane and Mark Briffa note that current animal contest theory does not really take the risk of damage to an attacker into account, even in its mathematical analysis. The cumulative assessment model or CAM, in particular, only looks at the loser's decision to give up and retreat from a fight. However, "self-inflicted damage costs" should also factor into such a decision. It is these costs, indeed, which should factor into a game theoretical matrix such that the best outcome in a symmetrical struggle ought to be no overt contest at all – except through

the medium of "signaling." (Note the semiotic language, in the heartland of conventional biology.) Indeed, exactly to the extent that signaling will predict the outcome of a contest, it should prevent that contest – and thereby forestall the injury to either winner or loser that would result from that contest. Thus there is a clear evolutionary incentive for signaling. Furthermore, there is a clear incentive that the signaling be "honest," that is, that it avoids deception so that its predictiveness is not impaired.

The most classic examples of symmetrical struggles, which involve "signaling" and "ritualization" and which avoid injury to both parties, are of course among mammals. Among male caribou in Alaska, out of 1308 sparring matches only six resulted in bloody fights (Milius 2018: 40). Among male mammals, symmetrical fighting is famous for involving much bluster and bluff, "signaling" behavior which enables losers to appreciate when they would be outgunned in a fight, allowing them to back off. This "signaling" can involve the size of weapons such as antlers or grimacing teeth, or can involve rising to a greater height than the other animal as in bears.

10.6 Conflict and Communication Among Octopus – Recent Research

Such struggles mediated by "signaling" are also found among octopus. Scheel, Godfrey-Smith and Lawrence in a 2016 paper describe displays "produced during agonistic interactions" which "correlate with the outcome of these interactions." (2016: 377) This study was done in their natural environment off the coast of Australia. The species was *Octopus tetricus*. Although the authors of the paper worded things very cautiously, it appears that a set of conspicuous behaviors appeared together with aggression, all of which appear to increase the apparent size and formidability of an octopus: "stand tall, spread web, raised mantle, and seeking high ground." These are of course similar "signals" to those found among vertebrates and insects in similar situations – though they may be beyond the capacities of sea anemones.

These signals seem to be accompanied with a "darkening" of the color of the octopus. The correlation of color with aggressive mood seems common among cephalopods. Among the octopus, the darker color accompanied the other body signals of standing tall with web spread and elevated mantle (2016: 378). The authors report, "Interactions in which dark body color by an approaching octopus was matched by similar color in the reacting octopus were more likely to escalate to grappling. Darkness in an approaching octopus met by paler color in the reacting octopus accompanied retreat of the paler octopus" (2016: 377). This is similar to what is found among cuttlefish. For example, "in … *Sepia officinalis*, "dark face" is produced by males in agonistic interactions, paler males are more likely to withdraw from fights, and when both males maintain dark faces, fights ensue." (Adamo and Hanlon 1966) (Fig. 10.1).

Fig. 10.1 "Octopus Signals" – Color and body signals in the deep-sea "social" octopus *Octopus Tetricus*, drawn from a video frame. The octopus on the left is displaying dark colors and a raised mantle, associated with aggression. The octopus on the right is exhibiting a "deimatic" display and fleeing the octopus on the left. Illustration by Eliza Jewett reprinted in the book by Peter Godfrey-Smith, *Other Minds: The Octopus, The Sea, and the Deep Origins of Consciousness*, New York, Farrar, Straus and Giroux, 2016, page 186. Reprinted with the permission of Peter Godfrey-Smith (who holds the book copyright) and Eliza Jewett. The video frame can be seen in Scheel, Godfrey-Smith, and Lawrence, *Current Biology* (2016), Figure 1

The color changes in octopus and cuttlefish are intuitively more "semiotic" than the other signals of aggression which correlate more widely among animal phyla and which exhibit a kind of near-universal "body logic." The authors also mention what they call a "deimatic" display (from the Greek *deimos*, fear) which is high-contrast and which takes place on the side of the body of an octopus who may be reacting to an aggressive display or fleeing from an attacker. This display takes place upon returning to a den in the face of an aggressive display, or upon having been evicted from a den. Though the authors do not take the analysis this far, such a display would seem to indicate a lack of desire to escalate or challenge the more aggressive octopus, at least during the specific moments when the display is made. In a more popular book, one of the authors, Peter Godfrey-Smith, does interpret the deimatic display as being possibly one of "submission or nonaggression" (Godfrey-Smith 2016: 185).

The authors note that "grappling," which can be a form of escalation of aggression, was correlated with a similar level of darkness between the two animals, while *difference* in darkness correlated with the absence of escalation. One could see this as a sterling example of "mutual assessment." Difference in darkness, if it were correlated with something like fighting ability or size, should predict a clear winner or loser, giving the potential loser an incentive to retreat. Only when the outcome of a struggle is not obvious, does it make sense to engage in one.

On the other hand, as has been noted in the context of Bateson's idea of symmetrical struggle, being evenly matched can be correlated with the ritualization of fighting, avoiding possible injuries to either side. It seems that the use of color (or rather darkness/ lightness) in this species of octopus already acts as a sort of ritualization. And as it happens, the popular book by Godfrey-Smith mentions (as the

published article to which he contributes does not) that color in this sense does not always correlate to size or other obvious indications of likely victory in a conflict. What color does correlate with, anecdotally at least regarding one particularly fierce octopus, is actual victory in a conflict! (Godfrey-Smith 2016: 185) In such a case color appears as something of an indication of morale or fighting spirit.

(Note that Bateson (for example in an unpublished 1961 lecture transcript entitled "The Syntax of Mammalian Communication") describes the effect of territoriality among territorial animals as involving morale, which diminishes steadily as one leaves one's own territory. Specifically he said: "Messages about territory are interesting. They are messages that assert that within this area certain behavioral patterns shall hold, 'we will fight and your morale will not be as good as mine.'" (CAF 319 (1961) pp. 2–3))

Gregory Bateson's interest in conflict dynamics is compatible with what is observed by present day researchers. He was quite friendly to interpretations of biological data using game theory, at least as a starting point for observation and theorization. Indeed, in a taped record of a class Bateson co-taught in the late 1970s with molecular biologist Robert Edgar, when the contemporary discussion of "altruism" was brought up in a class presentation, Bateson anticipated modern thinking by attributing the evolution of cooperation not to group selection but to the game theory of von Neumann and others – with which he was quite familiar because of his own background in the beginnings of cybernetics.[6] Of course Bateson criticized the use of game theory because it rigidified the rules of whatever game it was studying, and thus did not show how it might be possible to change the game in mid-play. But it was precisely the naturalistic study of animals which he hoped would illuminate this matter.

An extended passage from one of the supporting documents for his rejected grant application on octopus is very clear about his position in 1962 which remains of interest today:

> In the present state of our knowledge we have, I believe, no basic theory of analogue communication – the basic contributions of Shannon and others having been concerned with digital and language-like systems. The Theory of Games, however, does deal with systems in which communicational move[s] may involve pragmatic changes in the relationship. But even this body of theory falls short of the problem with which I am struggling. The essence of the matter in analogue-empirical interchanges is that the organisms are engaged in trial-and-error sequences to determine the <u>future</u> rules of their game. Games Theory is in general concentrated upon the question of how rules will determine behavior. My problem is the converse – how behavior determines rules. The problem impinges awkwardly upon the Theory of Logical Types and is perhaps at present unassailable by mathematical means. For this reason it is important to use behavioral studies as a preliminary method. (Bateson, CAF 231–H–2, 1962)[7]

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[6] Evolution Seminar, Spring 1977, Gregory Bateson Archive UCSC

[7] Document entitled "Report on Preliminary Work on Relationships in Octopus: Conditions Determining Conflict and Coalition," CAF 231 – H – 2, Gregory Bateson Archive, UC Santa Cruz, MS 94 Box 64

In this passage Bateson says that game theory as a basis for understanding animal conflict is valid up to a point. But it should be applied only within a framework of qualitative ethological study of the animals themselves and how they work, and this ethological study should modify the ways in which game theory is applied. The Batesonian opposition between symmetrical and complementary conflict is one such possible ethological framework which might help us understand conflict in animals.

Chapter 11
Intention Movements and Peacemaking Ceremonies

4. Now, the phrase "intention movement" is a phony. It is true that when I clench my fist I am thereby mentioning the notion of violence between myself and my vis a vis. But whether I am saying "I shall hit you" or "I shall not hit you" is unclear until we know more about the total interchange. Remember that peace-making ceremonies among primitive peoples usually consist in an exchange of violence and that courtship in many species contains elements of conflict. (Letter to Warren McCulloch, MC 1039-10b, October 25, 1962)

11.1 Instinct and Intention Movements

The concept of intention movement is an ethological one that originated in German research in the 1940s but was adopted by both Niko Tinbergen and Konrad Lorenz. It appears to have been brought into the English language world by Niko Tinbergen in his book *The Study of Instinct*, originally published in 1951.

One way in which this concept could have seemed "a phony" to Gregory Bateson was that in Tinbergen the idea of intention movement formed part of a very mechanistic approach to instinct which concentrated on the animal's reaction patterns to stimuli, considered as releasers to action. Such an approach is very much concerned with the animal's abilities and in inferring specific pathways of sensitivity and reaction. Bateson implicitly repudiated such an approach which, he felt, did not take into account the cybernetic revolution. Cybernetics, for him, with its feedback mechanisms and its ideas about information, freed the observer of animals from needing to postulate the kind of clockwork mechanisms or drive theories characteristic of the early theorizing of Tinbergen or Lorenz. Instead we can characterize Bateson's approach as being, as Hoffmeyer (2008a) would have it, a precursor to the biosemiotic approach.

Tinbergen, in coining the phrase "intention movement" in the English language, cited a German researcher who published the term *Intentionsbewegungen* in 1911 (Heinroth 1911). Intention movements are consciously observable only by observers who have a great deal of experience with a particular animal. Even when animal

behavior is viewed as being comprised of "reactions" or "responses," these are not "all or none" phenomena (Tinbergen 1969: 79). The incipient part of the "response" when it is at its lowest "intensity" is what is termed the intention movement. No sharp distinction can be made between the intention movement and "more complete responses," which form a continuum.

These intention movements are, in Tinbergen's epistemology, "the first reactions to maximal adequate external stimulation" which "appear in incomplete form" and form "the initial part of the chain" of instinctual behavior (1969: 141). One sees in this phrasing a simple cause-effect logic and a determinist sequence of automatic instinctual behavior. Bateson, in his already discussed interesting letter to the biologist V. C. Wynne-Edwards, was to remark that "however elegant the observations and experiments of Tinbergen and Baerends, their attempts to build neurophysiological myths upon this data are a waste of time. They should be building interactional theories." (Letter to Wynne-Edwards, MC 1399-1c).

Indeed, Tinbergen's level of explanation was based on a theory, now dated, that can fairly be described as psychological. Tinbergen treated such concepts as motivation as having a physical incarnation in specific instinctual processes. This led him to create what Bateson called "neurophysiological myths," which are arguably the part of Tinbergen's work which gives off the greatest feeling of obsolescence today. But Bateson remarked, "I note that psychological studies of the individual are probably nonsense without accompanying neurophysiology but that *interactional* studies can stand on their own feet." (Letter to Wynne-Edwards, MC 1399-1c)

What Bateson is here calling "interactional" studies and theories might just as easily be termed biosemiotic ones. Bateson stood Tinbergen's mechanistic instinct theory on its head by seeing the semiotic potential of the intention movement, which indeed for Bateson existed as a potential semiotic phenomenon based on what he often called "part for whole coding." The intention movement formed the part, the sign, as it were, of a whole potential sequence of behavior. He viewed the intention movement, particularly in a social encounter between two animals, as a message, which could be interpreted by the other animal as a spur to counter-behavior of either a rivalrous ("symmetrical") kind or of a complementary kind such as submission – or, indeed, flight. The interpretation of the intention movement as a sign enables the other animal in a confrontation to predict appropriate behavior and to prevent possible injury by reacting appropriately prior to the phase in which conflict might eventuate "in complete form."

This different approach results in a redefinition of the intention movement, as a part of an action or a preparation for an action which can, however, sometimes occur in the absence of that action. One online dictionary defines it as "behavior that is preparatory to another behavior, as a crouch before a leap."[1] In a horse it might be a slight muscular contraction prior to movement. It is not always the focus of attention, or "conscious" in some senses of the word. But it is some portion of an action which, if that action were completed, would be an action of conflict, courtship, predation, feeding, nest building, or the like. (See Harries-Jones 2010)

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[1] https://www.dictionary.com/browse/intention-movement

As we have noted above, in dealing with Bateson's theory of sign origins, what is at issue is the possibility of *detaching* the intention movement from the subsequent action to which it was originally linked. The baring of the fang, to return to an earlier example, can be detached from the fight for which it *could* be the preparation – but if the recipient of the message of the fang pays attention, the actual fight might not have to ensue.

But for Bateson the phrase "intention movement" is also a "phony" in a second sense, even more profoundly appropriate to the letter he is writing to McCulloch and to his wider theorizing about animal communication. For Bateson, indeed, conflict, or more precisely, apparent preparation for conflict, is a tale of two contexts. There is the immediate context in which an intention movement toward conflict is clearly a prelude to a possible or likely immediate conflict. And then there is the longer term context which refers to an ultimate relationship which might be established by an initial move of conflict. Paradoxically as this may seem, this ultimate relationship is not necessarily a hostile relationship. And even more paradoxically, perhaps, it is not the *intention* of conflictual action to lead to a longer-term relationship characterized by hostility. Conflictual action is a move in a larger sequence of encounter. It has the potential, of course, to eventuate in a hostile relationship but it also, in many animals, has the potential to lead to a mutual *modus vivendi* characterized by a reduced level of conflict.

It seemed, indeed, that Bateson wondered if such a *modus vivendi* often required an initial intention movement of conflict in order to establish itself at all. This relates to his oft-repeated idea that it is impossible to say "I will not bite you" in a gesture-posture nonverbal language, an analog language without the concept of "not." But it is not really clear, at least to me, that putting such a message into verbal and/or digital language helps that much. The question is not whether language can explicitly and non-ambiguously indicate non-hostile intentions. The question is whether that expression of non-hostility can be *trusted*. And it is possible that intentions are never trusted in the absence of some experience of mutual interaction. But since in mutual interaction, conflict is always possible, a sample of interaction in which conflict is a component may be necessary in order for the potential of a wider interaction to be assessed.

11.2   Peacemaking in Non-Human Primates

Hence the appearance of conflict as an incident does not necessarily presage a conflictual relationship in the end. An example of an implicit peacemaking among rhesus monkeys (*Macaca mulatta*) in a zoo can be found in Frans de Waal's pioneering 1989 book *Peacemaking Among Primates*:

> The most common "excuse" is the so-called contact pass. One individual purposely moves from point A to point B n the cage, "finding" his or her former opponent on the path. Tip chases Kopje, the lowest-ranking female, along the cage ceiling. Kopje is in the final days of a pregnancy. After the pursuit she sits still for six minutes, panting heavily from her

strenuous escape. Tip moves to 1 meter above Kopje on the rock formation. Kopje glances over her shoulder at least twenty times a minute to check Tip's whereabouts. Then Tip descends, passing Kopje so closely that their hairs brush. This contact immediately relaxes Kopje. She descends too and feeds on the floor not far from Tip.

> Contact passes seem to carry a soothing message, not because of what happens but because of what does not happen. During the pass the dominant can easily grab the subordinate. Instead, the dominant peacefully continues on his way. The same message of "Look, I'm not going to hurt you!" is conveyed by sitting down in full view, very close to the subordinate for a brief moment before moving off again. Such interactions are perhaps more accurately described as tension breakers than as reconciliation. Rhesus monkeys, in my opinion, are not very good at reconciliation, but they do have many subtle ways of letting one another know when a conflict is over. (de Waal 1989: 115)

De Waal goes on to discuss similar implicit reconciliations among human beings who simply do not mention an earlier conflict but go on with life as if it never happened. He tells the story of a young woman scientist who felt humiliated by a remark an older woman scientist made to her. But the next evening in the town square the two women met and the older woman made a compliment about the younger woman's belt, and the younger woman relaxed as they chatted about restaurants and trivialities. (1989: 116)

However, de Waal does have a category of explicit reconciliation even among animals. "If two particular chimpanzees, who normally never kiss and embrace, do exactly that a short time after a major fight, it is hard not to see it as an explicit act of making up. They do not need to allude to what has happened between them; their behavior is so exceptional that it acts as an unequivocal reference to the past." (1989: 117)

Returning to the intention movement, we see an excellent example of its detachment and "ritualization" in de Waal's observation of stump-tailed monkeys (*Macaca arctoides*):

> For example, if Goldie [the alpha female] threatens Honey, a young adult female, Honey may bravely stand her ground, looking back at the alpha female. If Goldie threatens Dopey, one of the older females, Dopey may even threaten back. The result is a confrontation in which both rivals, faces close together, stare straight into each other's eyes with fierce expressions. Without breaking eye contact, Goldie may then grab Dopey's hand to give her a mock bite, pressing her open mouth on Dopey's wrist. This common gesture is unique for the species. It is not a real bite – although some investigators seem to record it as such – because it never results in even the slightest injury. Resistance to the symbolic punishment is rare. It happens regularly that a subordinate solves a tense standoff by *offering* her wrist for a ritual bite! (de Waal 1989: 157)

In this species of monkey, a symbol has evolved (the injury-free mock bite) which is precisely an intention movement that has been so to speak abstracted from its full expression of violence. But it is "a phony" in that the fight is not intended. What is intended is the relationship which otherwise would have needed to be enforced by the fight! Whether one calls that relationship "dominant – subordinate" or by some less hierarchical term, it is a *modus vivendi* which the two stump-tailed monkeys maintain by action which has taken a step into what Bateson calls "iconic" communication, action which is nonetheless of the nature of a sign because of its

detachment from the, not inevitable but precisely *evitable*, consequence of an intention movement (Fig. 11.1).

The offering of the wrist for a ritual bite is a similar action to the submission actions of wolves, or (in Bateson's analysis) of octopus. It is a sort of peace-keeping ceremony, or if one prefers, a kind of peace treaty which – albeit unequal – leaves both parties intact and unharmed.

This mock bite has an interesting relation to Bateson's famous analysis of play. In play one has the nip that is not a bite, but the mock bites de Waal describes in adult stump-tailed monkeys are not play. There is no real contradiction, but there is nuance. In play, "the playful nip denotes the bite, but it does not denote what would be denoted by the bite." (Bateson 2000: 180). But we see that among the adult stump-tailed monkeys, the nip precisely does denote what the bite would denote, if one had to proceed with it. It denotes the relationship that could be established by a real bite, but does so less stressfully and with less risk.

This implies of course that play fighting among juveniles is precisely not play to the extent that it establishes any real relationships of dominance among these juveniles. True play is possible between players of different power or rank precisely to the extent that these differences are suspended as part of the play. This is how adults can play with a juvenile, for example. So it is not only that in play the nip does not denote what the bite would usually denote. More specifically, in play the nip does not denote the *relationship* that would be established if the bite were "real" – even a ritualized version of "real."

Can a Peircean perspective be applied to the nip, the ritualized mock bite, or the play bite? If when we use a Peircean lens, we are looking for the "effects, which

Fig. 11.1 A juvenile stump-tailed macaque (*Macaca arctoides*) is here photographed by Frans de Waal accepting a mock bite from an adult female. De Waal adds, "These bites are highly ritualized; they are always preceded by a threat and aimed at a wrist or leg. Injuries never result. (Wisconsin Primate Center)" Reprinted from de Waal, *Peacemaking Among Primates*, Harvard University Press 1989, page 158, with the permission of Frans de Waal, who holds the copyright
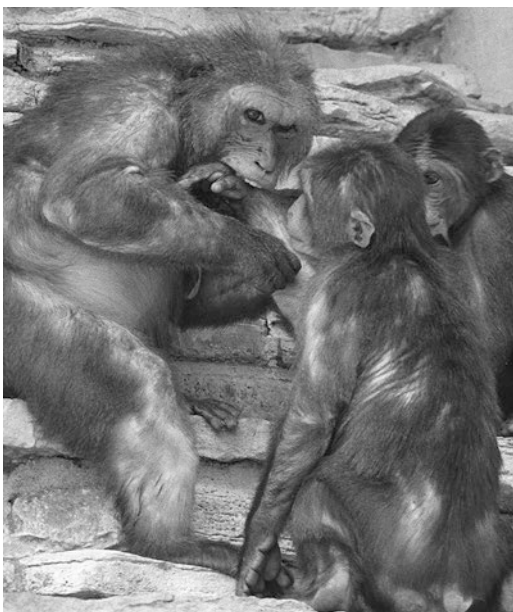
might conceivably have practical bearings, we conceive the object of our conception to have" (Houser and Kloesel eds. 1992: 132), then the relationship which is on offer by giving and receiving a ritualized mock bite comprises in a sense the "meaningfulness" of such a bite to a stump-tailed monkey. Play bites then can be distinguished by having different, and less consequential, practical bearings than such ritualized ones.

It can be mentioned in passing that Gregory Bateson described a similar mock bite, whether play or not, in a pet gibbon he owned in the middle 1960s. This gibbon may be the one immortalized on the cover of the DVD version of his daughter Nora Bateson's film *An Ecology of Mind*, (N. Bateson 2011) while Gregory Bateson describes a play sequence between the gibbon and his dog in a notable passage in *Mind and Nature* (1979: 137). However, in his 1965 letter to the biologist Wynne-Edwards, Bateson notes that "My gibbon presses her teeth against my skin to assure me that she is not going to bite – but sometimes she forgets." (MC 1399-1d, May 18, 1965)

11.3   The Peacemaking Ceremonies of the Andaman Islanders According to Radcliffe-Brown

The peacemaking ceremonies of the Andaman Islands are (or were) an elaborated and highly elegant enactment of the ways in which relationships are re-established according to Gregory Bateson's ideas. They are striking in that they not only provide what anthropologists would tend to call a "symbolic" enactment of peacemaking, but they also plausibly enact a psychological reconciliation involving nearly all of the participants, even taken individually.

These ceremonies were described in print by the eminent anthropologist A. R. Radcliffe-Brown, who was one of the most prominent British anthropologists during the early part of the twentieth century when Gregory Bateson was studying anthropology. Gregory Bateson studied with Radcliffe-Brown in depth. Some of the versions of Andaman peacemaking ceremonies which Bateson himself alludes to in his published and unpublished work may rely on unpublished materials by Radcliffe-Brown; but here I will present Radcliffe-Brown's published version and harvest it for its Batesonian implications.

The Andaman Islands are currently part of the nation of India, although they are situated in the Bay of Bengal south of Myanmar (Burma) and north of the Indonesian island of Sumatra. Their indigenous people are dark skinned and some of them are hunter-gatherers today as they were when Radcliffe-Brown studied them between 1906 and 1908. The original publication of the monograph *The Andaman Islanders* was shortly thereafter and it was published by the Cambridge University Press in 1922.

The anthropologist Raymond Kelly has restudied the Andaman case as part of his opus *Warless Societies and the Origin of War* (2000). Kelly has marshaled significant evidence that something which is appropriately called war does exist among

some, though not all, hunter-gatherer societies. This contrasts with the view that war originated with grain-agricultural societies or with something approximating the institutions of kingdoms or the State. Kelly defines war as armed conflict which is collectively carried out and which involves deadly weapons using deadly force (Kelly 2000: 3–4).

The Andaman Islander conflicts just barely qualified for his category of war. They took place between small local groups mostly based on kinship and marriage. These groups had territorial rights and could come into conflict over the uses of their respective lands. But the immediate spark of a conflict was a murder or "quarrel." The aim of war was vengeance on the perpetrator or perpetrators of an offense, but it often spread further than its target. Radcliffe-Brown continues the discussion of the type of raiding warfare that the Andamanese practiced:

> It does not seem that there was ever such a thing as a stand-up fight between two parties. The whole art of fighting was to come upon your enemies by surprise, kill one or two of them and then retreat. A local group that had some grievance against another would decide to make an attack. They might seek and obtain the aid of friends from other local groups. The men who were to take part in the expedition would paint themselves and put on various ornaments and join in a dance. They would then set out, either by land or by sea, in the direction of the encampment they meant to attack. Their weapons consisted of bows and arrows, and they carried no shields or other defensive weapons. They would not venture to attack the enemy's camp unless they were certain of taking it by surprise. For this reason such attacks were generally made either in the evening when the camp would be busy with the preparation of the evening meal, or at early dawn, when every one would be asleep. The attacking party would rush the camp and shoot as many men as they could. If they met with any serious resistance or lost one of their own number they would immediately retire. Those attacked, if they were really taken by surprise, were generally compelled to save themselves by flight. Though the aim of the attacking party was to kill the men, it often happened that women or children were killed. The whole fight would last only a few minutes, ending either with the retirement of the attackers before resistance, or the flight of those attacked into the jungle. A wounded enemy would be killed if found. (Radcliffe-Brown 1922: 85)

Raymond Kelly makes the point that the dances preparatory to a raid helped both organize and legitimate it. In these dances, the women clap to mark time as they dance, and thus they are co-participants in the group process leading to the raid, which is usually justified as some form of retribution. There are also supernatural precautions made against the spirits of enemy dead and of territory not one's own. (Kelly 2000: 107)

> Such attacks and counter-attacks might be continued for some years, thus establishing a feud between two neighboring local groups. More usually, however, after one or two such fights peace would be made. In the tribes of the north Andaman there was a special peace-making ceremony… All peace negotiations were conducted through the women. One or two of the women of the one group would be sent to interview the women of the other group to see if they were willing to forget the past and make friends. It seems that it was largely the rancor of the women over their slain relatives that kept the feud alive, the men of the two parties being willing to make friends much more readily than the women. (Radcliffe-Brown 1922: 85–86)

It is possible that what we are seeing with this claim about the women is an ideology from the Andamanese themselves, rather than from the anthropologist. Women in

such an ideology are cast as both reasons for war (because it is done on their behalf as well as that of the men) and barometers of the potentiality for peacemaking. (Kelly 2000: 107) Note, in the actual peacemaking ceremony, that women are fully involved as participants and that they, equally with the men, can sabotage the peacemaking process via a display of emotion or behavior.

The peacemaking ritual itself involves a prepared dance ground. The "forgiving party" comes to the village of the most recent perpetrators of a raid or other belligerent act. In the middle of the dance ground the "perpetrator side" erects a kind of wall (the *koro-čop*) of wooden posts and strong wicker limbo bars. (I call them limbo bars to help the description, but the men who passed under them may have ducked underneath them rather than passing backwards as in the Trinidadian limbo dance.) Hanging from the limbo bars are bundles of shredded palm leaf (*koro*). Kelly mentions that this cane is symbolic of the rainbow, which is a bridge to the spirit world of the dead. He also notes that "the *koro* fiber forms part of the women's pubic covering and connotes tabu, the regenerative birthing powers of the female genitals, and also a critical link to the spirit world" (Kelly 2000: 107).

When the visitors have come close to the perpetrator village,

> …the women sit down on one side of the dancing ground, and the men take up positions in front of the decorated cane. Each man stands with his back against the *koro-čop*, with his arms stretched out sideways on top of it. None of the [men of the host village] has any weapons.

> The visitors, who are, if we may so put it, the forgiving party, while the home party are those who have committed the last act of hostility, advance into the camp dancing… The women of the home party mark the time of the dance by clapping their hands on their thighs. I was told that the visitors carry their weapons with them, but when the dance was performed at my request the dancers were without weapons. The visitors dance forward in front of the men standing at the *koro-čop*, and then, still dancing all the time, pass backwards and forwards between the standing men, bending their heads as they pass through the suspended cane. The dancers make threatening gestures at the men standing at the *koro-čop*, and every now and then break into a shrill shout. The men at the *koro* stand silent and motionless, and are expected to show no sign of fear.

> After they have been dancing thus for a little time, the leader of the dancers approaches the man at one end of the *koro* and, taking him by the shoulders from the front, leaps vigorously up and down to the time of the dance, thus giving the man he holds a good shaking. The leader then passes to the next man in the row while another of the dancers goes through the same performance with the first man. This is continued until each of the dancers has "shaken" each of the standing men. The dancers then pass under the *koro* and shake their enemies in the same manner from the back. After a little more dancing the dancers retire, and the women of the visiting group come forward and dance in much the same way that the men have done, each woman giving each of the men of the other group a good shaking.

> When the women have been through their dance the two parties of men and women sit down and weep together.

> The two groups remain camped together for a few days, spending the time in hunting and dancing together. Presents are exchanged, as at the ordinary meetings of different groups.

> The men of the two groups exchange bows with each other. (Radcliffe-Brown 1922: 134–35).

In my own, I hope Batesonian, analysis of this ceremony, what is remarkable is not so much that fear is not shown, but that anger is not shown. As Raymond Kelly points out, "each individual man and woman of the forgiving party must enact a reconciliation with every man of the erstwhile enemy group so that peace is grounded on a consensus in which everyone participates." (2000: 108) (Fig. 11.2)

Remarkably, each of the members of the "forgiving party" enacts a threat or potential act of war at each of the men of the "perpetrator party." The ceremony begins with armed men yelling war cries as they pass between the "perpetrator men" at very close range. The "perpetrator men" stand impassively at the limbo bar without being provoked. Then the "forgiving party" men shake each of the standing men in turn, and then it is the turn of the "forgiving party" women to shake each of the standing men in turn. If the dance proceeds without a hitch, and no offence is taken, and no fight breaks out, it is not merely an official peace which results. The emotional temperature, so to speak, of the conflict has also been taken and demonstrated, not merely declared, to have cooled off.

To use the language which Bateson will use in the letter to McCulloch about the Cuban Missile Crisis, this remarkable ceremony involves the providing of numerous *casus belli* which are declined; it involves numerous challenges which are not picked up. At any point it could degenerate into open violence – at which point, it
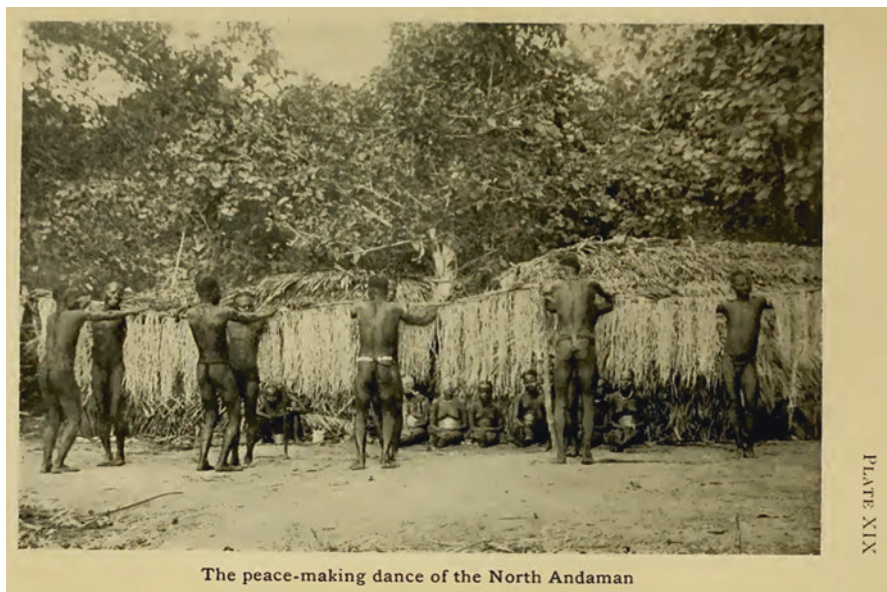

Fig. 11.2 Reprint of Plate XIX, A.R. Radcliffe-Brown, *The Andaman Islanders*. "The peacemaking dance of the North Andaman." By permission of Cambridge University Press

would be clear that peace was not established. But by that very token, by *not* becoming openly violent, it demonstrates that a state of peace *really* exists among the parties, who then weep together and exchange each other's weapons of war.

At this point it can be believed, by both sides, that the "forgiving party" will not "hit" the "perpetrator party" further and continue the back and forth of feuding. The pattern language is similar to that among the octopus and the other primates. Of course humans add to the mix a symbolic infrastructure which brings in yet other relational contexts, such as the gendered implications of the sacred/taboo *koro* fiber.

However this symbolic level is not the level of anthropological interpretation that ever interested Bateson. He was given to noting that his ethnographic interest was always in the interpersonal level of relationship, and its dynamics. And it is in this level that his gifts were most apparent.

In an exchange with Stewart Brand (which was part of a mutual interview the two of them were doing with the new Governor of California Jerry Brown), Bateson used a physical metaphor, as he occasionally did in spite of his own strictures against ever doing such a thing, to delineate an aspect of interpersonal dynamics. He mentioned that at Cambridge he had learned how to punt a canoe.

Bateson: The canoe is also interactive. And the way you balance it is by making it rock.
Brand: Continually going slightly wrong and having something to correct against?
Bateson: If you are making it rock, it will balance. If it rocks you, you fall in the water.
Brand: That means not only negative goals, but forcing the negative goals.
Bateson: You can't have a marriage and not quarrel with your wife.
Brand: Many do. What are they?
Bateson: Damn few. It gets in an awful mess. The information becomes very incomplete.
          (Brand, ed., 1975: 47)

We can usefully ask ourselves here what is the kind of "information" which becomes incomplete in a relationship without conflict? This is the kind of information which Bateson felt was established by the whole alternation of conflict and trust. A relationship in which conflict was never a potential would not be a living one, perhaps. The point is thus not to eliminate all conflict, nor to ensure that all relationships begin without it. However, if conflict "rocks you," if it goes beyond bounds, it can endanger the participants, even fatally. This was never more true than during the Cuban Missile Crisis.

Chapter 12
Relational Communication in Octopus

5. In fact, the negatives can only be communicated by total sequences of interchange in which these negatives are exemplified. The Octopuses, starting from mutual hostility, pass through a sequence of minor battles in which nobody gets hurt much. After this the slightly stronger octopus very slowly and gently embraces the weaker, i.e. states, "I can hurt you but I am not doing so." Following this, the weaker comes over and attacks the stronger with his vulnerable backside, in response to which the stronger retreats. I.e., the weaker has now said, "Yes, I know you are not going to attack me" and the stronger has said, "That's right." (Letter to Warren McCulloch, MC 1039-10b, October 25, 1962)

Bateson's favorite examples about communication regarding the contingencies of relationship come from birds and mammals, as we have noted in the last two chapters. But as we saw with the discussion of the mewing cat, so much of the tenor of relational communication among mammals (and birds) comes from the situation of parental care and being cared for. This is what allows for the evocation of what Bateson would typically call the succoring – dependency relationship (he insisted on mentioning both poles, or both roles, in defining any type of relationship).

But the natural history of octopus works against this. Octopuses do not have parental care in the same sense as mammals or birds do. Their females may tend and brood over multitudes of tiny eggs which are laid together in a protected spot, but this is often the last action of the octopus mother, whose sacrifice is not remembered by the planktonic young who, after hatching, are subjected to the not so tender mercies of the open ocean. Octopus sociality must therefore result from something else besides the social learning of the young, because the existence of their young is the opposite of social, and they may not interact socially until they are adult enough to search for territories or mates. Any commonalities in social communication between intelligent octopus and intelligent vertebrates, are likely to be *convergent evolution* and is likely to result from necessary and universal features of animal life – perhaps so necessary and universal that we could expect them from extraterrestrial animals when and if we find them.

The details of Gregory Bateson's research with octopus were not published by him. He felt that the research, which was entirely self-funded, only had preliminary results by 1962. The tanks he was using were either located at the morgue of the Veterans Hospital in Palo Alto, where he had been working with schizophrenics, or at his home. He hopefully submitted a research proposal to a number of possible funders. However this research was rejected by the National Science Foundation, the Air Force Office of Scientific Research, and NASA; and he may have submitted a version of his research proposal to Raytheon, the defense contractor which evidently acted as something of a think tank for general research as well. (The evidence for this is that one of the versions in the archive of his proposal is addressed to Raytheon, but it is not clear whether he submitted it there.)

A box of research notes on octopus can be found in the UC Santa Cruz archives, awaiting restudy by researchers. I do not consider myself qualified to re-evaluate his raw notes and I will rely on his summaries of his research as he made them for his grant applications.

Prior to 1962, Gregory Bateson's research on West Coast octopus dealt only with two related species which could easily be collected in southern California (specifically La Jolla), *Octopus bimaculatus* and *Octopus bimaculoides*. These species are difficult to distinguish and it is not always clear which species is being studied. In one draft of a grant application Bateson noted the following, with exemplary modesty:

> The phenomena which are here described are imperfectly verified and were observed under primitive conditions. The aquaria used were operated on the closed system and were relatively small (10–50 gallons). The animals had been transported over 500 miles from La Jolla to Menlo Park for purposes of study, and it is probable that at no stage were they in the best of health. The conditions were such that they did not survive more than four months. The animals were in all cases juveniles of from 4–12 inches armspan (normal adults are 24–36 inches). Temperature control could not be maintained and change of sea water was always a major project. (CAF 231-B-7)

Slightly better conditions of health and collection resulted from a collection trip in November 1962, which was of course the month following the Cuban Missile Crisis. The octopus were collected in low tide both at night and during the day, and at both times they were found hiding under stones. Night collecting was far less successful than during the day. While collecting during the day, two cases were observed of two octopus hiding under the same rock. This contradicted the idea, commonplace in studies of octopus, that most species including this one are solitary. Bateson's collecting crew (he, his wife Lois, and their two children John and Eric) were however unable to collect both co-resident members of any particular under-rock space. As an experienced naturalist, Gregory Bateson felt that the particular areas where he was collecting were highly populated with octopus of these species, with an estimated density of three to ten individuals per square yard.

Gregory Bateson generally "experimented" by placing two octopuses in the same tank. These tanks were provided with numerous hiding places or lairs, mimicking the natural environment in this respect. When three or more octopus were introduced into the same tank, usually at least one of them died. In cases of two

octopuses, one of them might cause the death of another, sometimes by "chivvying in which the smaller individual is successively driven out of all hiding places." (CAF 231-H-5). Of course in the wild this dynamic would probably have been mitigated by a strategy of mutual territorial avoidance, a strategy that Bateson felt was made impossible by the smallness of the tanks he was using (he referred to an early one as a "three foot" tank: CAF 231-B-10). (Of course one of the items he wanted to fund was a much larger tank size.) He felt that mutual avoidance could take place "where there is room to retreat to a distance of at least ten times the arm-span of the animals," which he felt was probably the rule in the natural environment. (CAF 231-E-7) Bateson did observe mutual avoidance among some pairs of octopus in which one was much larger than the other (16 inches to 6 inches). He speculated that this involved "protection of juveniles" (CAF 231-H-6 to 7).

But in some cases the two octopuses were able to live together and even spend time in close contact. This could only happen when the two octopuses were introduced at the same time. (If one was introduced before the other, the earlier one would act in a territorial way vis-à-vis the second. In one case where this was done and the earlier one was substantially smaller than the later one, this smaller octopus acted aggressively to its larger counterpart until the larger one responded to an attack by turning the tables and harassing the first octopus, who had to be taken out of the tank and remained in a state of "panic" for several hours afterward (CAF 231-H-7).)

It was this establishment of coexistence which was Bateson's particular interest. In at least two instances it resulted in two octopuses co-residing underneath a sand filter of about 8 inches by 7 inches in size. In the best documented of the cases, the slightly smaller of two male octopuses was exiled from this co-residence after getting food, and there was minimal contact. The larger octopus then began to steal food from under the "skirt" of the smaller one, accompanied by "mild combat."

> Finally on one occasion the larger very slowly and gently enclosed the smaller and retired carrying off the prawn which the smaller was eating. About an hour after this the smaller octopus came over to the larger, approached backwards with its abdomen first (the abdomen is the vulnerable part). With its abdomen, the smaller pushed the larger out of its lair. The larger did not resist this but went off and sat exposed on the glass. From this point on there seemed to be a mutual understanding between the two animals. No further combat was witnessed and the relationship between them included sitting together with arms interlocked or sitting one above the other in the corner of the tank with the head of one almost touching the posterior end of the abdomen of the other. Occasionally the smaller octopus would go over to where the larger was sitting in a corner and would touch him gently with an arm as if inviting him out. This type of relationship persisted until the octopuses died within two days of each other both from unknown causes. (CAF 231-E-8 to 9).

A second case observed from the animals collected in November 1962 also involved the larger male octopus stealing food from, and then slowly surrounding, a smaller one. This mimicked in some ways a form of combat in which one octopus surrounds the other and gets the weaker octopus to place its vulnerable abdomen toward the aggressor's mouth. However, in this case, after the larger octopus surrounded the smaller one very slowly, "a statement of total power without aggression," this was followed by an incident where the smaller octopus approached the larger but with

his vulnerable abdomen first, and the larger octopus then retreated. After this, the two octopuses "spent much time in close contact." In fact, when Bateson hammered some nails into the wooden base of the tank, this alarmed both of them and they huddled together, which Bateson termed an "indication" of "coalition vis-à-vis the outside world." (CAF 231-H-6).

Sexual relations involved a rather different pattern of conduct. The initial encounter involved a threat response. Lois Bateson (personal communication) noted that both octopuses had a "flushed and blushed" color pattern. In the one she described, the two octopuses suckered the side of the tank and almost touched, then the male sent out his arm in coitus and the two remained in that state for 40 min or so. In a case Gregory Bateson mentioned among his November 1962 cohort, the male dragged the female down in seconds after the initial threat encounter. However, coitus lasted about an hour. Then,

> the female shakes off the male's arm and follows the male, repeatedly stopping to present her defended mouth surface. He retreats from this but finally turns and the two animals come together mouth to mouth, remaining and even swimming in this position for a few seconds. After this, apart from recurrent coitus which occurs about every two days over a period of about a month, the animals remain apart. (CAF 231-H-6 to 7).

This so-called "kiss" position was also observed between two female octopuses which did not begin their relationship with any initial sparring.

The case of the "whistling octopus" involved a different species of octopus (*Octopus vulgaris*) which Gregory Bateson observed while in the Virgin Islands, where he mostly worked with cetaceans at John Lilly's lab. This species is far better known to science than the Pacific Coast species although Bateson was of the opinion that the California species was more intelligent, or at least easier to work with (Letter to J.Z. Young, MC 1524–1, April 1, 1964).

This incident took place on March 11, 1964, and in it a female octopus "was heard by five observers to emit three high pitched staccato whistles." In this case the two, a male and female, were placed together in an unfamiliar tank. Each dug out a hiding place or lair. After some time the male left his lair and went over to the female, who turned but did not move even when the male's arms touched her for about 20 s. The male moved back, then returned to the female with a more aggressive threat or display, "spreading wide the webbing between the arms." The female responded by "presenting only sucker surfaces," a defensive move after which the male returned to his lair. The third contact began similarly but the female actually moved in retreat away, then Bateson made some kind of startling move and the female changed direction and chased the male. In the fourth contact, described again in notes as "similar," the female developed a wound between the arms. Fifth contact was followed by the female exhaling in a "whistling" way never seen before, though no sound could be heard. Recording equipment was then brought and she was "stimulated with a white plastic paddle," upon which she squirted water violently at the paddle and made the whistling sound accompanied by a contracting siphon. It was this whistle that was heard by the researchers.

But sixth contact terminated in coitus, the male "placing his third right arm in [the female's] mantle cavity and retaining this position for some minutes." (MS 98 Box 56, Octopus and Cetacean Observations Box 1).[1]

12.1   Octopus Aggression and Peacemaking

However, in making analogies to relationships among nations, it was not the sexual relation which Gregory Bateson mostly used, but rather encounters between males which resulted in coexistence (or did not). As has been mentioned, Bateson was fascinated by how, in spite of the lack among octopuses of the juvenile experience of parenthood (or, often, play) from which mammals and birds develop their non-verbal "codes" about relationship, octopuses still can be observed to exhibit sophisticated forms of communication or enactment of relationship. This speaks to a kind of universality about the forms of interaction and relationship which develop in strikingly similar ways even across such a wide phylogenetic gap.

We can now turn to the specific aggression/ peacemaking action sequence described in Gregory Bateson's letter to McCulloch about the Cuban Missile Crisis. In Point 5 of his letter to McCulloch on the Cuban Missile Crisis, he writes: "The Octopuses, starting from mutual hostility, pass through a sequence of minor battles in which nobody gets hurt much." (MC 1039-10b) This initial sparring phase of the peacemaking sequence is characteristic of the symmetrical type of aggression. Usually, conventional biological thinking would subsume this type of aggression under the concept of a struggle for dominance, sometimes also involving territoriality. Not all dominance struggles are what Bateson would call symmetrical conflicts however. (The example of the domestic fowl where the pecking of subordinate birds can continue without respite, shows that what we see as dominance struggle is not necessarily self-limiting. When it becomes the kind of bullying which is stimulated by the weakness of the victim, it becomes what Bateson would call complementary aggression. The presence of a countervailing peacemaking sequence after aggression may therefore serve us as a clue that it was probably symmetrical aggression.)

After the end of the initial symmetrical sparring phase between the two octopuses, comes an act of "submission" by one of them. Conventional analysis would describe this point as the acceptance of a relative dominance hierarchy by the two octopuses. More important to note, according to a Batesonian analysis, is that this event is one in which a complementary action stabilizes the symmetrical schismogenesis. Unlike the story in which the fighting couple stabilizes via an act of nurturance – something which Bateson also called complementarity – the stabilizing moment here involves a presentation of vulnerability by the loser, which is then not

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[1] OCTOPUS OBSERVATIONS, MARCH 10. 1964: 1 GB handwritten draft entitled "Whistling Octopus", Mar. 11, '64 (5pp).

exploited by the winner. Complementary conflict is invoked, even risked – but the invitation to it is not accepted.

> After this the slightly stronger octopus very slowly and gently embraces the weaker, i.e. states, "I can hurt you but I am not doing so." Following this, the weaker comes over and attacks the stronger with his vulnerable backside, in response to which the stronger retreats. I.e., the weaker has now said, "Yes, I know you are not going to attack me" and the stronger has said, "That's right." (MC 1039-10b)

This failure to attack both ratifies the dominance – submission relationship between the two, and establishes a *modus vivendi* in which both octopus can live in peace with each other. The relationship switches from symmetrical struggle to complementary non-aggression by the interpolation of a complementary action. In fact, the complementary action which is interpolated in this case is precisely the providing of an opportunity for complementary aggression, which opportunity is refused. This is a pattern which we will see again in the dynamics of the Cuban Missile Crisis.

This is not an inevitable or automatic outcome. There was an incident which did not go nearly so well. It involved the introduction of a larger octopus into a tank which a smaller octopus considered his own secure territory. What is called territoriality in animal behavior of course involves a sense of "morale" as Gregory Bateson put it[2] – i.e., in a conflict, secure occupation of a territory seems to give some advantage, though not an invincible one, to the incumbent. A larger (14 inch, sex unknown) octopus was introduced into a tank which a smaller (10 inch, male) octopus had made his own. The larger octopus at first withdrew into a corner.

> The smaller approached, challenging; the larger threw out a couple of arms in threat; the smaller retreated. This sequence was repeated several times over about half an hour. Between contacts the smaller actively moved to and fro on the glass, putting on threat postures and threat coloration whenever he approached the larger. Finally the smaller seemingly judged that the larger was off guard and closed in with a vicious attack. In the resulting battle the larger surrounded the smaller, who finally escaped in a panic. Following this the larger started to chivvy the smaller around the tank. The smaller was then removed and remained on the edge of panic for several hours afterwards and would jet away whenever [G.B.] approached. He did not, however, die and perhaps had not been bitten. (CAF 231-H-7)[3]

In this case the attempt to leverage territoriality, to avoid a symmetrical sparring situation with an unequally sized counterpart, seemingly backfired. Both the resulting "vicious attack" by the smaller octopus, and the relentless "chivvying" (i.e. bullying) of the smaller by the larger one, can be subsumed under Bateson's category of complementary aggression – aggression which tends toward the elimination of one of the parties rather than toward a *modus vivendi*.

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[2] "Syntax of Mammalian Communication," unpublished lecture transcript, dated 1961. Gregory Bateson Archive, UC Santa Cruz, CAF 319-A-5 Box 54.

[3] Gregory Bateson, unpublished, "Report on Preliminary Work on Relationships in Octopus: Conditions Determining Conflict and Coalition." Gregory Bateson Archive, UC Santa Cruz, CAF 231-H-7 Box 64.

In human terms the two parties to this last octopus exchange would seem to exemplify distrust, in a way which would be hard to shift to trust. Whereas the incidents which begin with symmetrical sparring, for less than ultimate stakes, and then interpolate a complementary ritual of showing and not exploiting vulnerability, seem to develop a kind of mutually trusting relationship. (And of course I would suspect that Bateson, with his sense of unity between animal and human worlds, would not have shied away from the word "trust" in talking about this octopus relationship.)

In his grant application, Bateson summarizes what he saw as some specific observations from his octopus research. He felt that at least the first two of these had implications for conflict among any animals, including vertebrates and even human beings. The others are simply interesting observations of the octopuses themselves, notwithstanding what also appear to be wider relevances here and there in the animal kingdom.

> … the observations show considerable formal resemblance to the procedures which have been observed among vertebrates. These include:
>
> 1. The inhibition of attack by presentation of the vulnerable part;
> 2. Establishment of harmlessness by demonstration of overwhelming power without harming;
> 3. Mouth to mouth procedures following coitus, which mouth to mouth procedures have been observed in the establishment of female-female relationship;
> 4. Food stealing in the establishment of positive relations;
> 5. Sharing of territory, etc. (CAF 231-E-5)[4]

Bateson felt that investigation of such phenomena among animals ought to be more relevant to understanding the behavior of nations, than the conventional uses of the Theory of Games. As he said elsewhere in a passage already cited:

> The essence of the matter in analogue-empirical interchanges is that the organisms are engaged in trial-and-error sequences to determine the future rules of their game. Games Theory is in general concentrated upon the question of how rules will determine behavior. My problem is the converse – how behavior determines rules. (CAF 231–H–2)[5]

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[4] Gregory Bateson, unpublished, "Patterns of Relationship in Octopus," MS page 5. Gregory Bateson Archive, UC Santa Cruz, CAF 231-E-5, MS 94 Box 64.

[5] Document entitled "Report on Preliminary Work on Relationships in Octopus: Conditions Determining Conflict and Coalition," CAF 231 – H – 2, Gregory Bateson Archive, UC Santa Cruz, MS 94 Box 64.

Chapter 13
Cuban Missile Crisis

6. I was this morning asked to join in signing a telegram to the White House which was worded as follows: "We regret the action of placing an embargo on Cuba, because this action involves too much trust in Krushchev's good judgment." Considering this wording, I suddenly realized that my own theoretical position is precisely the reverse, that I rejoice in the action which Kennedy has taken precisely because it places trust in Krushchev's good judgement. It provides Krushchev with a <u>casus belli</u> and permits him to decline it. (Letter to Warren McCulloch, MC 1039-10b, October 25, 1962)

This chapter has at its center a narration of the events of the Cuban Missile Crisis. For a few frightening weeks in 1962, the two major nuclear powers, the United States and the Soviet Union, confronted each other in what has been considered the closest the world has ever come to nuclear war.

13.1 The Social Drama (and Some Backstory)

We should consider this event as something like what the anthropologist Victor Turner called a "social drama." Victor Turner was a British social anthropologist who was very prominent from the 1950s through 1970s for his processual approach, which he developed in fieldwork among the Ndembu in Africa. He found that certain "public episodes" in human collective life took on a particular significance. These episodes of conflict "bring fundamental aspects of society… into frightening prominence." (1974:35) In his anthropological method, Turner constituted these conflictual social dramas as "isolable and minutely describable" exemplifications of "social process." (1974:33)

Speaking as an anthropologist myself, I feel that Turner's description of social dramas as exemplifications of human interactional process was an extension of the implicit and explicit methods of anthropologists before him. Indeed, it is not taking anything away from Turner to note that the foregrounding and minute description of

exactly such "social dramas" has been a longstanding feature of history, literature, and tragic drama itself.

Gregory Bateson in his own *Naven*, originally published in 1936, was of course centrally concerned with social process. In that book about the Iatmul people of Papua New Guinea, when he recounted incidents of their lives, he concentrated primarily on very localized events which did not involve more than a few people or family groups at a time. Yet based on these, on ritual, and on myth, Bateson was able to formulate the concepts of complementary and symmetrical relationship that have been used throughout this book. And more importantly still, he described these in a processual way which he encapsulated in his term "*schismogenesis*." Schismogenesis is a term for a process which is either complementary or symmetrical. But as I have written before, complementary or symmetrical should not be used as static classifications of some observed behavior. They are also, or rather primarily, *directions* in which that behavior is going. If left to itself, symmetrical behavior will breed more of the same, and similarly, complementary behavior will continue to intensify difference. This was an anticipation, as Bateson explicitly noted in his 1958 Epilogue to *Naven*, of the concept of "positive feedback," also popularly known as the "feedback loop," as it would be developed by the later discipline of cybernetics.

Bateson shared with his compatriot and colleague Turner a fascination with the ancient Greek tragedies. The Bateson archives contain a number of pages on which Bateson wrote out in longhand some of his extensive studies of how these tragedies model a world in which his concept of schismogenesis plays out over generations. He was to use the example of the Greek tragedies in numerous talks and articles.

The upshot of the Cuban Missile Crisis was fortunately not tragic in that moment. No nuclear bombs were launched by either side. Bateson wrote about it when it was happening, in hopes of forestalling a tragic *denouement*, and indeed a tragic outcome was forestalled, for precisely the reasons which Bateson noted in his letter to McCulloch. We should be thankful that the American and Soviet nations found a way to behave like animals who, through the process of exploratory conflict, found a way to establish a *modus vivendi*. (We should indeed rethink the whole metaphor of "behaving like animals" as necessarily being a bad thing; there can be worse things, like behaving like programmed computers.)

The detailed exposition which follows is necessary to show exactly how that became possible. As anthropologists (and novelists) know, some of the most telling aspects of a story or myth or social drama can reside in details that may not seem obviously important at first glance. Anthropologists studying social dramas, in particular, need to maintain the integrity of the narrative as it was known to participants.

So let us set the stage for the social drama of the Cuban Missile Crisis. In 1962 the world was divided into two groups of nations, in a peculiar dualism which seemed ineradicable and dangerous at the same time. Each group of nations had an undisputed leader nation, a "superpower." Separated in Europe by an "Iron Curtain," the "Free World" led by the United States and the "Communist bloc" led by the Soviet Union engaged in ideological confrontation, limited communication, and an arms race both in "conventional" (non-nuclear) arms and in nuclear weapons.

According to ideological principles explicitly held by the ruling political, intellectual, and military leaders of each group, the only ultimate resolution of this conflict had to be the total ideological and political transformation of the other side. Totalistic ideological conflict should, in principle, be seen as ultimately a version of *complementary* conflict since the aim is the transformation of the other participant according to one's own vision. This is especially true if either or both parties consider their ideology to be universally valid. Competing ideological visions, whatever their virtues, make peace more difficult to achieve between people who hold them.

A generation previously, the Second World War had ended in 1945. (As with Greek tragedies, there is a thread of causation and context to untangle that extends backward in time.) World War II ended with unconditional surrender of the key Axis nations – Germany, Italy, and Japan – to the victorious Allied powers. These nations were subjected to an armed occupation meant to change their political and social systems irrevocably so they would not pursue war again. This was a *complementary* peace (which was mitigated in Western Europe and Japan by the Allies' role in restoring the economies of the losers, by instruments like the Marshall Plan – also a *complementary* relationship at first!). By contrast the Congress of Vienna in 1814–15, which had established the European order that followed the Napoleonic Wars, was in most respects a *symmetrical* peace that adjusted borders and made relatively minor changes to the status of less important parts of Europe, while keeping the major players in a rough "balance of power." The prewar government of defeated France was restored, making it an equal negotiator in that form.

The ideal of the Congress of Vienna was to return to the European of the early eighteenth century, in which the relationship between the nations of Europe was often more or less *symmetrical.* There were a number of kingdoms, with similar internal hierarchies, and relatively localized ambitions, which kept up something of a "balance of power" among at least the most powerful among them. (This was itself something of a reaction against the "total war" *complementary* ideological confrontations in previous centuries between rival religions, most recently Catholics against Protestants, with the salvation of souls at least theoretically at stake.) But during the periods when the relations among western European nations had become more symmetrical, the wars between them could be less than total. Such wars were often fought by mercenaries or small standing armies without mobilizing the population, and their results were a slight reconfiguration in dynasties or rulers, or small adjustments in borders. They rarely, except during the Wars of Religion, made deep changes in the societies in conflict. Before and after the religious wars, many of the constant conflicts described in the books of European history might almost be thought of as "ritual warfare" such as was described and filmed in the 1950s among the Dani of New Guinea (as mentioned in Chap. 10 of this book).

Gregory Bateson, in a lecture at Sacramento State University in 1966 reprinted in *Steps to an Ecology of Mind*, featured the Treaty of Versailles, which ended World War I, as a change in the *setting* of international relations. (Bateson 2000: 477–485). The causes of World War I are debated until this day. It was a war which started as a roughly symmetrical struggle between rival European empires which were not that far apart in ideology (i.e. colonialist/ imperialist constitutional monarchies or

republics with capitalist economic systems). But it became a total war nonetheless, mobilizing and strengthening ideas of nationalism and sacrificing a generation. It was less a result of complementary ideology than an incubator of it.

It is still controversial in some quarters to claim, as Bateson did, that the Treaty of Versailles, a treaty which set out the conditions for the peace after World War I, led, in the manner of Greek tragedy, to World War II. The economist Keynes, who attended the peace conference, famously wrote an account of it in 1920; Keynes' opinion was that the treaty was disastrous (in the ways Bateson was later to describe). This sense of the disastrousness of the treaty was shared at the time by many other observers including, evidently, both of Bateson's parents. According to the analysis Bateson was later to present at Sacramento and in *Steps to an Ecology of Mind*, the Fourteen Points, which were brought up and publicized as the terms according to which the Germans could surrender, proposed to treat the German nation as a co-equal or symmetrical partner in the peace.

But the actual Treaty of Versailles required Germany to pay punitive reparations and admit sole guilt for the conflict. It was negotiated without the participation of any German government – as opposed to the Congress of Vienna of the previous century in which the defeated nation of France was allowed to participate (provided that it changed its type of government, which of course it did). Thus the eventual result of the war was a complementary or totalistic submission of the German nation, unlike the peace which had been promised which had elements of a symmetrical relationship between equals.

Critics of this analysis of the Treaty of Versailles tend to be concerned that Keynes' book, in and of itself, reinforced or even inflamed German resentments. But it is unlikely that a book, even an influential one, had the ability to create sentiments where they did not already exist. The Germans had been offered a soft peace on the basis of Woodrow Wilson's Fourteen Points, and had accepted an armistice on that basis which ended the war. It was the contrast between the peace that was offered and the harsh terms of the ultimate Treaty of Versailles that was the "difference that made the difference." This was analyzed by Bateson as having to do with the "carrier wave" of relational communication among nations. To be put in the wrong about relational communication is extremely painful for any mammal, and also for nations composed of mammals.

Partly, thus, as a result of the after-effects of the Treaty of Versailles, particularly the enormous reparations which were still demanded of Germany even during the Great Depression that started in 1929, Hitler rose to power by masterfully exploiting German resentments. At the end of the resulting Second World War, the Allies insisted on an unconditional surrender by the Germans and their fellow Axis nations. There were to be no soft armistice terms this time. Indeed, the only nuclear bombs ever dropped in warfare were dropped by the United States on Germany's ally Japan, in order to end the war completely. Germany and Japan were militarily occupied by the victorious Allies, an occupation that was to last several years. Immediately upon the defeat of Germany and Japan, in 1945, there was a breakdown of trust between the Western allies (Britain, France, and the U.S.) and the Soviet Union,

partly based on their strong differences in ideology. The Soviets acquired nuclear weapons shortly afterwards, and the Cold War had begun.

In this Cold War the complementary "official" desire for ideological victory by both sides was counterbalanced in a strange way by the symmetry of the nuclear arms race, a symmetry of mutual destruction in which the capacity to destroy the cities of the other side was always maintained. There was of course the race in numbers of weapons and in the destructive capacity of each weapon, but psychologically at least, the ability for mutual assured destruction yielded a sense of equality in danger, at least to many.

There was always, though, another view, popular among people who would not let go of their habits of understanding warfare even in the face of the new destructive capabilities of nuclear weapons. This view of nuclear weapons as just another technology for pursuing the goals that warfare had always had, existed (and may still exist) in high places in the United States and Russia, and perhaps in other nuclear powers. These military and intellectual circles are devoted to, as the phrase goes, "thinking about the unthinkable," said unthinkable being the use of nuclear weapons as instruments of relative advantage while ignoring their absolute destructive capability. They are epitomized by the fictional character Dr. Strangelove, allegedly based on Henry Kissinger.

There have even been some unexpected voices in favor of using nuclear weapons as an instrument for ending conflict, in the spirit of the "war to end wars." It has been claimed, for example in William Poundstone's 1992 book *Prisoner's Dilemma*, that Bertrand Russell, lifelong pacifist as he felt himself to be, nevertheless advocated in 1947 that the United States should take advantage of the historical moment when it and not the Soviet Union had the bomb. The United States, Russell argued (for example at a lunchtime talk to the World Empire Society, and later in a letter to a British military man), should pre-emptively bomb targets in the Soviet Union, so as to gain the latter's subjection to a world government, the establishment of which was intended to prevent further world conflict. (Poundstone 1992: 78–79)

Given that the trauma of the Second World War had had such an effect on a peace-minded and liberal thinker such as Russell, one can easily imagine the climate of opinion among those who would have gladly pursued a conventional war against the Soviet Union for *casus belli* such as the establishment of a separate Communist government in Soviet-occupied East Germany. The aggressive stance taken by Stalin in the postwar years, particularly the imposition of Communist governments on the Soviet model throughout Eastern Europe, made many in the West either fearful or anticipatory (one hesitates to say eager) for a new war to come. Many people, indeed, felt that it should come sooner rather than later. Probably, in the absence of nuclear weapons, it very well may have.

The nuclear standoff between the U.S. and the Soviet Union during the Cold War was famously described by J. Robert Oppenheimer in 1953 in an article in *Foreign Affairs*. "We may be likened to two scorpions in a bottle, each capable of killing the other, but only at the risk of his own life." (Oppenheimer 1953: 529) I am not aware that any experiment of this kind involving scorpions has been literally run, but it is

now a favorite vivid image for a particular kind of conflictual situation. Even today, nuclear missiles under the control of the United States and of Russia stand poised to rain destruction on targets in the other nation. The main difference in this respect between the Cold War period and that of today is that there is no ideology on either side that the ultimate victory of any transcendent cause would be furthered by the military destruction of the other side.

13.2 High Noon

The Cuban Missile Crisis of 1962 has gone down in history as the most dangerous moment of the standoff between the United States and the Soviet Union when the world seemed to be dominated by these two nuclear powers and ideological adversaries. It has now become its own myth, evoked in the advocacy of contradictory policies. Its nature and its lessons were disputed while it was taking place, and have continued to be argued about for all the years since.

I will use as my main reference for the events of that time the book by Max Frankel, who was a reporter for the New York Times at the time, entitled *High Noon in the Cold War: Kennedy, Khrushchev, and the Cuban Missile Crisis*. This book was published in 2004 and it was not only based on reporting and information available during the crisis itself, but also on Soviet sources (including Krushchev's son) which became available after the end of the Soviet Union in 1992. For American decision making, it brings to bear transcribed recordings of White House meetings and troves of secret documents from both sides. What resulted was a confirmation of the centrality of John Kennedy and Nikita Krushchev – both of them interested in saving face and in maintaining status domestically, neither of them interested in open conflict.

Max Frankel writes that "it all began with a Russian ploy worthy of the horse at Troy." (2004: 7) In summer 1962 the Soviet Union assembled a fleet of civilian-appearing cargo ships and sent them "under false manifests" and filled with nuclear missiles to Cuba. In Cuba, forty thousand Soviet soldiers and technicians erected the missiles, trying to camouflage them under palm trees. They were not discovered by American spy planes and photo analysts until mid-October. This was, however, a month before the intended date when the completed missile emplacements were to be revealed as a *fait accompli* to the United States and the world.

Fidel Castro had become the leader of Cuba just three years previously. He had already faced down, as recently as 1961, an ill-planned and abortive invasion by Cubans, sponsored openly by the CIA, who had exiled themselves to the United States. (This invasion is known as the "Bay of Pigs" fiasco.) In spite of this he was initially reluctant to accept the Soviet missiles. He was persuaded by Soviet emissaries, and by Krushchev himself, over the course of the summer. The placement of

missiles in Cuba was, according to Max Frankel's account, originally Krushchev's idea rather than Castro's.

The biggest contentious issue between the Soviet Union and the Western alliance, led by the United States, was the "island" of West Berlin which was encircled by Communist East Germany. This "island" had come about because the four major powers divided Germany into sectors of administration but also divided Berlin into sectors of administration. So Germany was, immediately after World War II, divided into American, British, French, and Soviet sectors, but Berlin, as the capital of Germany, was also divided into these four sectors. In the case of Germany, the three Western sectors led to the establishment of a German Federal Republic in the West, also known as West Germany, with its capital in Bonn. The Soviet Sector of Germany became East Germany, with its capital in East Berlin. West Berlin remained and the Western powers refused to allow it to become part of East Germany. In 1948 Stalin had tried to blockade all ground traffic into West Berlin in an attempt to force it to become part of East Germany; but the United States broke the blockade by airlifting supplies to West Berlin "of an average six hundred flights a day, seven days a week" (2004: 22). West Berlin remained part of the "free world."

Meanwhile the United States had placed nuclear missiles in Turkey, just across the Black Sea from the Soviet Union (which then included the Ukraine). Turkey, then a secular state with an intermittently democratic constitution, was (and remains) a charter member of NATO, the American led military alliance. Krushchev is on record as feeling that the Soviet placement of missiles in Cuba was a "tit for tat" for the American placement of missiles in Turkey. In terms of the actual ability to fight a nuclear war, the need for ground based missiles to be based close to the target country was already either obsolete or nearly so. The ability of intercontinental missiles to target accurately across the globe, and the ability of submarines to be based close to target countries, had already made the issue of ground based missiles less salient than it might have appear to be to the publics of 1962.

In spite of Soviet attempts at concealing the nuclear missiles in Cuba, American spy planes, exercising their impunity to fly wherever they wished, found these missiles in mid-October on a flyover above Cuba. The Soviets had been keeping the missiles close to their vest, so to speak, in order to avoid having them become an issue in the American midterm elections – which Kennedy would have preferred as well. The Soviets intended to announce the missiles when they had been completely installed, and to keep them secret until the point when they wanted to reveal them. For the moment, until it had determined its own response, the U.S. government also kept them secret, from the American people.

What then were the stakes of the placement of missiles in Cuba, or of their removal? In terms of the war-fighting logic that might have been appropriate to a total "conventional" war such as World War II, these stakes should have been measured in terms of an assessment of their effect on something like war-fighting capability, and/or on the ultimate outcome of a total struggle. This, after all, is how most contemporary biology measures agonistic struggles among animals. Ironically, though, nuclear weapons themselves, because of their devastating effect on their users as well as their targets, tend to act as "great equalizers," so that two nuclear

powers in opposition act as though they are equal in fighting ability. Krushchev may have fretted that, in Frankel's words, the American imperialists "could outgun him ten times over" (2004: 9). On Kennedy's own part, he had run in 1960 against Nixon partly on fears that there was a "missile gap" with the advantage to the Soviet side. But nonetheless, during the cold war there was never, or almost never, any real effort at calling the bluff of any nuclear asymmetry, precisely because of the "symmetrizing" effect of the nuclear weapons themselves.

The moment that the missiles had been placed in Cuba, it was clear to Kennedy and to his advisors, both in his civilian Cabinet and in his military, that the United States had to use all means possible to get the missiles out of Cuba. To Bertrand Russell and other strong pacifists, as will be noted later, this was not necessarily an imperative. This particular act did not, after all, have that much bearing on the capability of either side to pursue mutual destruction in a real battle. Why not just let the Soviets put the missiles there?

As for Gregory Bateson, it seems that, whether or not he privately might have agreed with such a point of view, he also understood that Kennedy, and for that matter Krushchev, were constrained, in a cybernetic sense. If Kennedy were to act as an "unrealistic" pacifist and simply allow the Soviet *fait accompli*, he would be accused of appeasement and might even, as his brother later remarked, be impeached. Similar constraints existed on Krushchev.

Bateson was certainly able to make strong moral criticisms against the "game theory" of the nuclear standoff situation as a whole (and he did so forcefully both at the beginning of the nuclear age and until his death in 1980). But meanwhile within it, lives were at stake, and he felt it was his responsibility to act. Hence he wrote the letter which organizes this book, with the intention of actually affecting the course of events during the Cuban Missile Crisis itself.

He had naturalized as an American citizen, and he wrote to help the American leadership – by at least purporting to advise its science advisors to advise the President, to study animal behavior so as to understand the behavior of nations. Probably Bateson felt that the American political system taken as a whole had the better of the political and moral argument as against the totalitarianism that had installed itself in the implementation of the Russian Revolution. (However, Bateson also had a deep empathy for the experience of the Russian people. Years later, when he resided at Esalen Institute, which was engaging – much later but still during the Cold War – in an exchange program with Soviet scholars with the goal of promoting mutual understanding, Gregory Bateson mentioned to one of the Russians that they had had a war, in World War II, while the Americans had merely had an adventure. The statistics of the respective civilian losses in that war strongly bear Bateson out on this, of course.)

Bateson's whole approach in linking animal communication and that of nations, cannot be understood unless one is able to perceive conflict from a relational point of view rather than from a stance of moral absolutism. One has to apply a sort of empathy to both sides of the relational conflict. Specifically, one has to empathize with the *relational context* of both sides. One has to ask, given that each side is a

relational being, what are its "needs" in terms of the continuous negotiation of relationship which constitutes its ongoing life?

In that spirit let us return to empathizing with John F. Kennedy, and with the American nation, on Tuesday morning, October 16, 1962 when he was confronted with the knowledge, still being kept secret from the public, of the Soviet placement of missiles in Cuba. That day, the New York Times had the lead story, "Eisenhower Calls President Weak in Foreign Policy" (2004: 41). Kennedy spun the new knowledge of American "weakness" as presaging political defeats for his Democratic Party in the upcoming midterm and general elections.

Far from irrelevant to all of this is the brilliant exposition by the feminist philosopher Maxine Sheets-Johnstone on the animate and evolutionary roots of male-male competition. Her most comprehensive work on this is in *The Roots of Morality* which she published in 2008. Max Frankel, as an editorializing journalist, writes in a less lofty vein the following regarding this point of the flow of events:

> For the roots of crises, look to powerful men feeling vulnerable and underestimated. Their dread of weakness, even imagined frailty, begets belligerence. Kennedy and Krushchev led a cast of military millions and commanded horrific thermonuclear power in October 1962, yet they had to compete as lonely gladiators pulsing with fear – a fear of blundering into war, to be sure, but fear above all of being judged weak and wanting, in their own camp no less than in their adversary's. The Missile Crisis was also a Macho Crisis. (2004: 42)

But what weakness? Clearly not a substantive weakness, since the actual capacity of mutual destruction was not really at risk. Not *necessarily* a weakness of power taken as a "physical" entity (as Bateson always warned against doing, of course).

Calling the missile crisis a "macho crisis" is, if one rethinks it in a Batesonian manner, a way of calling it a relational crisis. The relationships at risk for Kennedy and Kruschchev were not limited to the confrontation with the other superpower. Each of them had both rivals and skeptics in their domestic scene, ready to weaken or supplant them in their own so-called "possession" of power. (This shows of course limitations to the concept of power, since the freedom of action of anyone in a leadership position tends to be limited in practice by the expected or feared consequences of acting in ways which might deprive that person of that very leadership position.)

From Kennedy's point of view, according to Max Frankel's informed account, what particularly rankled was the Homerically clever dissembling by which Krushchev had stealthily gotten the missiles to Cuba for a whole summer under the noses of the United States. Looking over messages from Krushchev and the Soviet government, it was clear that the US had been misled and had its attention diverted over that period of time. Krushchev had in fact flat out denied what he was doing at the same time he was doing it. Kennedy felt exposed for having been gullible, but he also felt that a level of trust between the leaders of the superpowers was necessary in order to prevent an accidental war arising out of lesser rivalries. The missiles in Cuba were, to use the words of McGeorge Bundy, Kennedy's national security advisor, "more an intolerable affront than an unacceptable attempt to change the nuclear balance of power." (2004: 76) Their "optics" were not good to the domestic U.S. audience, but they also felt like a direct challenge to Kennedy's character.

In fact, the Joint Chiefs of Staff, the top military officials of the United States, at this point advised Kennedy to mount a first strike attack against the missiles, to be followed by a full scale invasion of Cuba and overthrow of Castro. One general demurred that the invasion would result in getting bogged down in a guerilla war, but still favored attacks by air. (2004: 79) John Kennedy, supported by his brother and advisor (and, irrelevantly, Attorney General) Robert Kennedy, may have wished for some kind of limited military action if it were possible, but hesitated to pursue it. According to Max Frankel, John Kennedy even understood the Soviet position that its Cuba missiles might have had as much right to be there as American missiles in Turkey – missiles which American experts might have felt to be obsolete almost on installation, but which reassured the Turks.

Since the military would need a week to prepare fully for any action, Kennedy was able to take that week to consider his difficult choices. Military action should be done speedily for the advantage of surprise. Max Frankel was in the audience as a reporter when Kennedy read a poem to a meeting of hundreds of editors and reporters, likening himself to a bullfighter, and at the same time doubting in public (albeit not for the record) whether the human race would survive the twentieth century.

Indeed based on the debates in the first couple of days after the discovery of the missiles, most of Kennedy's advisors would have attacked the missile encampments, whether or not this would have been followed up by a full scale Cuba invasion. Frankel describes Kennedy as "the last skeptic standing" (2004: 89). He proposed a blockade. But the Joint Chiefs of Staff were to be ready for an air attack and invasion of Cuba, if the blockade was not resolved satisfactorily to the United States. (2004: 93)

The blockade was called a "quarantine," technically because it did not apply to all imports but only officially to weaponry. A true blockade is considered an act of war in international law. Kennedy consulted with the Congress and worked to get the nations of the Western Hemisphere to agree to the action. (Eventually the quarantine was approved by the required two-thirds vote of the Organization of American States.) US delegations met with the leaders of close European allies. Only after these steps did Kennedy address the people of the United States, at 7 p.m. on Monday, October 22, to announce that the United States had discovered the presence of Soviet missiles in Cuba.

He announced that any nuclear missile launched from Cuba to anywhere in the Western Hemisphere would be regarded as an attack requiring "a full retaliatory response upon the Soviet Union," invoking a tripwire of massive retaliation. In addition, the "quarantine" involved stopping all ships bound to Cuba, and turning back any which contained "offensive weapons," though not others. A distinction was made for public consumption between this limited action and the Berlin blockade of 1948 which the US considered a belligerent act because it would have involved "denying the necessities of life" if the United States had not intervened with a massive airlift.

Prior to this official announcement, newspapers in the United States were reporting a vague sense of tension in Washington. The Soviet leadership was on alert. Max

Frankel writes that Krushchev ordered a military response to any attack on Cuba – but one which did not use nuclear weapons. Nuclear weapons were not to be used unless there was direct authorization from the Kremlin.

Meanwhile the United States went on ostentatious alert and the Kennedy speech created a great sense of alarm. The armed forces went on major alert (short of war), sending sixty-six nuclear armed bombers instead of the usual twelve on flight paths toward the Soviet Union, sending 180 naval vessels into the Caribbean, and planning the possibility of 1000 attack sorties against Cuba on a single day. (2004: 117–18)

Kennedy's speech emphasized the "secret, swift, and extraordinary" buildup and claimed that it was in violation of Soviet assurances. The missiles were "a deliberately provocative and unjustified change in the status quo, which cannot be accepted by this country if our courage and our commitments are ever to be trusted again by friend or foe." (2004: 118) In other words, they were a relational challenge, first and foremost.

It was at this point that the public in the United States began to betray their alarm. Kennedy had told them that they might face months of sacrifice, with unpredictable "costs or casualties." He had also said straight out that "We will not prematurely or unnecessarily risk the costs of worldwide nuclear war in which even the fruits of victory would be ashes in our mouth – but neither will we shrink from that risk at any time it must be faced." (2004: 118).

I was a young child at that time going to a very small Episcopal elementary school. Tuesdays were "hot dog day," which in that era was considered a special treat, in which hot dogs were served to the children. I remember my mother coming back from the school and saying that the other mothers or workers at the school wondered whether there would ever again be a "hot dog day." My mother scoffed at this, and at the whole sense of doom (and she was not a fan of Kennedy).

The actual start of the quarantine waited for the approval of the Organization of American States, the next day. In the absence of the "hot line" telephone between the leader of the United States and that of the Soviet Union, messages of various sorts were exchanged implicitly and explicitly over the next few days, by and from high officials and diplomats as well as the leaders themselves. The line of quarantine was established in the Atlantic Ocean on early Wednesday, October 24, but it was a flexible line allowing both sides to avoid confrontation. However, when Kennedy was informed that morning that one Soviet submarine was escorting cargo ships an hour from the quarantine line, he had to decide not to allow the US navy to use depth charges to cripple the rudders of these merchant ships. Suddenly, the CIA director, McCone, "announced abruptly that six Soviet ships had stopped in mid-ocean or actually reversed course," and that, indeed, these ships had been carrying weapons. One major advisor to Kennedy noted to another, "we are eyeball to eyeball and I think the other fellow just blinked." (2004: 125) This is the specific event which Gregory Bateson referenced in his letter to McCulloch, when the Soviet Union had been offered a *casus belli* and denied it.

Verbally, however, Krushchev still took a strong line. He delivered a lecture to an American he took for a spy, saying that the missiles in Cuba were only defensive, and that America might feel them to be "a smelly goat in the house," but Russians

had to live with them and now Americans might have to do so as well. (2004: 126) He wrote a letter to Kennedy denouncing the quarantine as an ultimatum, based on election politics, and saying he would defend his ships. Indeed, on the 24th, Krushchev had the Soviet news agency broadcast very tough language calling the USA "despotic" and guilty of "outright piracy".

The United States, on its part, prepared to allow a tanker (the *Bucharest*) to pass the quarantine line, even though it had wanted to have it inspected. Kennedy would have allowed inspection to be done by the UN rather than the United States. But Kennedy had his hands full trying to keep the US Navy from acting on its own to intercept the tanker. Nonetheless, the tanker was allowed to proceed, early on Thursday, October 15 – after having been asked by a U.S. destroyer to identify itself and its cargo. This arguably fit Kennedy's flexible definition of complying with the quarantine. But later in that day, Kennedy "ordered hands off an East German ship carrying fifteen hundred soldier-passengers." (2004:131) It seems in fact, that the United States also denied at least one *casus belli*.

13.3   Missives to Power: Gregory Bateson's Letter and Bertrand Russell's Letters

The United States continued slow escalations, such as having fighter planes roar over the missile bases at less than a thousand feet in altitude. Castro, who had been holding back, deployed antiaircraft guns. Much dubious intelligence about the intentions of each side was being passed. And Gregory Bateson wrote the letter we have been discussing, setting forth that Thursday some ideas that he wished to pass on to Jerry Wiesner as one of Kennedy's science advisors.

This was a much more "using proper channels" approach than was being used by the philosopher Bertrand Russell during the crisis. Russell, who is not mentioned at all in the account by Max Frankel of the New York Times, was very public in his letters and telegrams. (Russell's activities have been chronicled by Al Seckel in an article specifically on Russell and the Cuban Missile Crisis, published in the journal *Russell* devoted to the study of his work.) As early as September 3, Russell had expressed deep concern at the tension between the United States and the Soviet Union, having to do with Cuba's revolutionary government aligning itself in the Soviet bloc. He also tried to address the United Nations as early as October 11. At the time of the announcement of the blockade, Russell telegraphed Kennedy and Krushchev.

To Kennedy he wrote: "Your action desperate. Threat to human survival. No conceivable justification. Civilized man condemns it. We will not have mass murder. Ultimatums mean war… End this madness." (Seckel 1985: 255) To Krushchev he wrote, "I appeal to you not to be provoked by the unjustifiable action of the United States in Cuba. The world will support caution. Urge condemnation to be

sought through the United Nations. Precipitous action could mean annihilation for mankind." (1985: 255)

On the 24th, Khrushchev wrote back, reassuring Russell that he would do everything to keep war from breaking out. Khrushchev suggested a "top level meeting." Arthur Schlesinger was to write about the night of the 24th:

> I received a call from Averill Harriman. Speaking with unusual urgency, he said that Khrushchev was desperately signaling a desire to cooperate in moving towards a peaceful solution… Harriman set forth the evidence: Khrushchev's suggestion of a summit meeting in his reply to Bertrand Russell … the indications that afternoon that the nearest Soviet ships were slowing down and changing course. "This was not the behavior of a man who wanted war," Harriman said, "it was the behavior of a man begging our help to get off the hook… we must give him an out… if we can do this shrewdly we can downgrade the tough group in the Soviet Union which persuaded him to do all this. But if we deny him an out, then we will escalate this business into a nuclear war. (Schlesinger 1965: 821)

The contrast in tone between Bertrand Russell's telegram to Kennedy and that to Krushchev is indicative. Although the substance of the telegram to Kennedy may have had echoes in Kennedy's own thought process, the telegram with its hectoring tone could not have been intended to be the kind of thing one says to someone whom one is really trying to affect. Russell's message to the leader of the self-described free world looks seemingly like what today would be called "virtue signaling," since it took no real account of the pressures that Russell knew Kennedy to be under, nor did it really appeal to any world view or model which Kennedy himself, or the American government, might be applying to the issues. It exemplified a context-free view from above, for public display rather than private persuasion.[1]

His message to Krushchev was more sympathetic to the latter's point of view (in spite of Russell's actual dislike of the Communist system, which he had expressed so strongly particularly in the early postwar years). This understanding of context brought about a genuine response from Krushchev, whereas one strains to imagine any possible coherent response from Kennedy to the telegram to him. This genuine response from Khrushchev, in its turn, was monitored by the American leadership and may have contributed, at a key point, to its understanding of the actual Soviet reluctance to escalate the situation.

The tension of the missile crisis did not abate after the 25th, the point at which Gregory Bateson wrote the letter. It had already abated by the following Monday the 29th, the earliest point at which Bateson proposed to discuss his ideas in person with McCulloch and pass on ideas to the administration's science staff. A number of incidents happened between the 25th and the 29th which ratcheted up the tension between the United States and the Soviet Union to dangerous levels. For example,

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[1] In his Autobiography Russell said regarding this telegram, "I will give my critics only one olive branch: I am sorry that I did not couch my telegram of October 23 to President Kennedy more gently. Its directness made it unlikely to cut much ice, I agree." (Russell 1969: 171) Kennedy responded on October 27, "I think your attention might well be directed to the burglars rather than to those who caught the burglars." (Seckel 1985: 54)

on Saturday the 27th, dangerous incidents included the shooting down of a US reconnaissance plane by the Cuban military, and the use of a depth charge on a Soviet submarine on the blockade line which was armed with a nuclear tipped torpedo, the firing of which was prevented by one of the officers on board named Vasili Arkhipov. Some people have paid tribute to Arkhipov as having saved the world in that moment – and I do not disagree. The US prepared for more serious military action, and Castro expressed, to Krushchev, Cuba's willingness to suffer severe casualties in a nuclear confrontation that resulted from its being invaded by the United States.

The end of the crisis was precipitated by Kennedy's agreement to remove the missiles in Turkey in exchange for the Soviet removal of the missiles in Cuba. This had to be accompanied by a United States commitment not to invade Cuba. The removal of the missiles in Turkey was not to be mentioned by Krushchev or the Soviet Union as being part of the agreement, but was to look like an unrelated decision. (Thus Krushchev had to agree to weaken his own position among his Communist rivals, and his looking weak to them resulted in his replacement by 1964.)

According to Max Frankel, the possibility of such a Turkey- Cuba swap was broached by the head of the CIA as early as the 17th, in the context of many other deliberations caught on White House tapes made by Kennedy himself (Frankel 2004: 91). This swap had also been proposed in two different United States newspapers on the 25th and the 26th. (2004: 143) The idea was "in the air" (and Bertrand Russell mentioned it also, though as it turns out he was not the first). Of course, to accomplish it, each side had to disregard the wishes of an ally who had felt protected by the presence of the missiles: the USSR had to betray Castro and the US had to betray Turkey. Castro indeed never forgave Krushchev – but was never invaded by the United States, who instead continued a trade embargo, begun on February 7, 1962, which has lasted for 57 years. (But *that* embargo responded to the expropriation of American owned oil refineries.)

In his letter to McCulloch, Gregory Bateson begins his discussion of the Cuban Missile Crisis with by mentioning that he had been asked to join a telegram worded as follows: "We regret the action of placing an embargo on Cuba, because this action involves too much trust in Krushchev's good judgment." Bateson chose to take this wording literally. He chose to advise Kennedy's administration from its own point of view, not indeed for ideological reasons, but because he felt one had to understand the natural history of potentially deadly conflict rather than simply to deplore it moralistically. Many years later he would tell Stewart Brand, commenting on the Biblical Book of Job, that "the correction for piety is natural history" (Brand 1974: 21). Bateson's unusual belief for that time, was that the study of animal communication, including octopus, can help us understand the kinds of messages which are exchanged in the course of the conflict even of nations.

For Bateson, then, the course of events of the Cuban Missile Crisis were an example of the kind of nonverbal communication in which an ultimately peaceful *modus vivendi* is established via a mention or signal of aggression which is not

allowed to escalate to an actual conflict. Of course this entire sequence was "unconscious" on the part of the two nations, and similarly on the part of the two leaders. Nonetheless Bateson invites us to learn from the similarity between the events of the Cuban Missile Crisis and that of competitive animals who manage to achieve peaceful relations.

The blockade functioned, not intentionally but as part of this implicit mode of communication, as a means by which communication of this kind could take place. It signaled a mention of the possibility of a greater conflict, without itself necessarily committing either side to such a conflict. When the Soviets turned back some of their ships, behaviorally complying with the blockade, that was an acknowledgement on their part that they were not going to escalate the conflict – Krushchev's verbal fulminations at approximately the same time notwithstanding. When, in response, the Americans made only a token examination of the tanker *Bucharest*, and let another East German ship through, that was the nonverbal countermove which corresponds to the phase in octopus conflict described in Bateson's letter to McCulloch, in which "the weaker has now said, 'Yes, I know you are not going to attack me,' and the stronger has said, 'That's right.'" (MC 1039-10b)

Indeed if one returns to earlier sections of the letter to McCulloch, one notes that Bateson explicitly rejects the pacifist position of exposing one's vulnerable parts to possible attack, before any sparring had taken place. Nuclear pacifists could justly reply to this that in this particular case of mutual assured destruction, either all parts are vulnerable or none of them are. There was probably not much greater vulnerability for the United States to a Soviet nuclear attack with the missiles in Cuba as without them. But how possible would it have been for a President in 1962 to argue such a thing before the American people or before the Joint Chiefs of Staff, or for that matter, vis-à-vis the Soviet Union? All of these *believed*, at the time, that nuclear weapons were potentially weapons of war, wieldable for purposes of national advantage (and for domination over other nations – such as West Germany, vulnerable over Berlin, or less powerful client state "allies" such as Cuba or Turkey).

It is abundantly clear from the record of the Cuban Missile Crisis that both Kennedy and Krushchev were, in practice, committed to avoiding nuclear war. Both of them were also, somewhat contradictorily, committed to pursuing a competitive foreign policy vis-à-vis the other.

However, in keeping with Bateson's letter and its implications, we can note that neither Kennedy nor Krushchev could have fully known or understood just how committed the other was to avoiding nuclear war. In a sense, that was true writ large for the nations of the United States and the Soviet Union as a whole. Both of them learned, through the experience of the Cuban Missile Crisis itself, that both of them would stop just short of war.

In the event, the United States and the Soviet Union may have achieved, at an elusively Batesonian high logical type, a rather intangible, but real, mutual trust, at what might have to be called a nonverbal level.

Certainly, in the immediate aftermath of the Cuban Missile Crisis, which was felt to be a personal win for Kennedy, a teletype "hot line" between the President and

the Soviet leader was established, an agreement was made to sell American wheat to the Soviet Union, and a treaty to end atmospheric nuclear testing was signed – one which to this day has almost eliminated the then-rising danger from fallout and other nuclear pollution in the atmosphere. Did this mutual trust survive in the longer term? Did it survive Krushchev being forced out of office and Kennedy's assassination?

In the next chapter I will explore some of the lessons that have been drawn, at the time and much later, from the missile crisis – including some which Bateson himself warned about later in the letter.

Chapter 14
False and True Lessons from the Cuban Missile Crisis

7. But the essence of the matter is that all the messages which negate war must be gotten across and must be gotten across in an interlinked form. The great danger at the moment is that Krushchev's willingness to negotiate may be taken by us as fear. Correspondingly there was always in the past the danger that our unwillingness to go to war over Berlin, etc., could be taken by the Russians as an expression of fear. Still more dangerous, we could accuse ourselves of cowardice in declining these fights. What seems to me important is that at this stage our own past wisdom and the Russians' wisdom in not challenging the blockade should be linked together to give the mutual understanding that we have each challenged the other and have each shown enough sense to not pick up the challenge.

7a. There is, as I see it, a chance at this moment to get out of a lot of the "Prisoner's Dilemma" situation in which both sides have been caught. The great danger is that the American public (and still worse, the Russians) may decide that the events of the last few days prove the desirability of deterrence. The whole point is not deterrence but that use of violence which in fact breeds trust. (Letter to Warren McCulloch, MC 1039-10b to 10c, October 25, 1962)

Bateson wrote the letter to McCulloch in the middle of the Cuban Missile Crisis itself, and his cautions were cautions meant for Kennedy's own eyes. We can assess that, on the whole, and during the event, Kennedy and Krushchev threaded the needle of possible false interpretation and acted in a way which heeded what would have been Bateson's warnings. On the other hand, over the longer term, the American and Soviet sides of conflict did fail to exit the "Prisoner's Dilemma" in which they found themselves caught. Their conventional epistemology of the event continued to reinforce the premises which made it inevitable.

I think it is fair to say that the United States ended up from the encounter the more dominant, in conventional sociobiological terms, of the two. But this did not give it "power" over the Soviet Union or Cuba, in any but a relative sense. Dominance does not in fact extend that far. One of Gregory Bateson's *bêtes noirs* was the idea of power that existed in his day and still does. Crudely, the more someone in a dominant position believes in the myth of power, the more they believe that they should be able to control events in the direction of their desires. Of course, one strain of

criticism of Kennedy in the Cuban Missile Crisis, perhaps one more characteristic of "conservative" thinking, especially prior to the end of the cold war, is that he could have leveraged the United States' dominant position more effectively. He could have gotten more concessions from the Soviet Union or, more to the point, somehow have forced Castro out of Cuba (Rodman 1982). This genre of criticism casts Kennedy as having been "weak" after all.

But this was a minority view. A more common reaction to the Cuban Missile Crisis, and one with serious dangers of its own of course, was that the United States had "won" and therefore the Cuban Missile Crisis could be used as a precedent for ways to "win" in the future. Perhaps the "play" of the Cuban Missile Crisis could be studied using game theory in order to replicate it, perhaps even to provoke similar situations which could be "won" for the sake of gaining a similar level of concessions from an international opponent.

In William Poundstone's popularization of the Prisoner's Dilemma, written just after the dissolution of the Soviet Union in 1992, the Cuban Missile Crisis is given as an exemplification of the game of "chicken." The archetypical game of chicken involves two teenage boys with cars. One version is that they drive the cars toward a collision, and the first one who swerves away loses. A slightly different version, from the 1955 movie *Rebel Without a Cause*, is that they drive them off a cliff, and the *second* one to jump out loses. It was Bertrand Russell who, in 1959, likened the policy of nuclear brinksmanship pursued in the Cold War to just such a game (Russell 1959). This was, of course, a few years prior to the Cuban Missile Crisis itself; his point, which has to be granted, was that the foreign policies of the great powers as a whole (transcending any specific incident) resembled that game.

Formal game theory for the game of chicken exists, complete with diagrammable matrices for "winning" and "losing", if such concepts are even remotely appropriate. It is a game where the more irrational player has an irremovable advantage, as Richard Nixon explained to his aide H.R. Haldeman when on a walk on the beach he coined the phrase the "Madman Theory" for the strategy he intended to use in Vietnam. But in the Cuban Missile Crisis, what actually won was not that kind of game-theoretical rationality.

Bateson's classic critique of game theory was always that the mathematical exploration of games, however elegant or complex or computerized, when applied to real-world situations tended to reify or reinforce the rules of the game as they exist. The point, to him, was not to win the game as it was defined, but rather to change the rules. This is a move which the mathematics of game theory does not contemplate.

Bertrand Russell's condemnation of nuclear brinksmanship as a whole exists at what followers of Bateson's usage would call a *higher logical type* than Bateson's own advice to Kennedy *within* a specific instance of nuclear brinksmanship. The concept of logical type is one which, appropriately perhaps, was originally developed by Bertrand Russell himself, to solve certain logical paradoxes. In the Russell version of logical type, a class is not to be considered as a member of itself. Bateson extended this concept in a number of ways, not, however, in his case so as to solve the paradoxes in which systems find themselves, but in order to explore such

paradoxes. In both Russell's and Bateson's versions of logical type, however, we can note the need to *distinguish* between phenomena which exist at different levels of inclusion in classes. Advice as to how to play *within* a game exists at a lower level of logical type than advice as to *which* game to play, or not to play.

At the level of logical type where one is advising someone who has been, in the Heideggerian sense, "thrown" into playing a particular game in spite of its wider advisability or lack of it, one has to develop enough empathy for that person's position so that one's advice is *relevant*. (I invoke Heidegger's concept of "thrownness" here to emphasize that many players of existential games do not really, in their particular context, feel that they have a choice whether or not to play them. It is an American individualist conceit to imagine that everyone has a choice.)

Not to play was not an option for Kennedy, or for any United States government in 1962. It would have been considered the equivalent of appeasement, of giving in to aggression. Robert Kennedy said to his brother that if he had not acted, he would have been impeached – and if impeached and replaced, he would have been replaced by someone who would have acted. But the point at which Bateson proposed to weigh in was much further along in the crisis. At that point, when both sides had clearly demonstrated by unconscious and nonverbal behavioral messaging that they did not intend to have a nuclear war, Bateson intended to transform the game by recognizing this very fact, and using it, though this is not directly stated, as a way of redefining what it might mean to win. For Bateson, it was the trust, which the intricate behavioral dance *just short of war* had shown to exist, which ought to be the lesson and *denouement* of the experience.

In non-nuclear male-male conflicts, which often serve as the implicit model for the conduct of war, conventional concerns include who shows fear, who is the weaker, who blinks. These are perhaps the corporeal or embodied underpinnings of what purports to be the abstract mathematics of von Neumannian game theory. They correspond to real concerns of organisms throughout the evolutionary history of animals, and they cannot thus be minimized. But Bateson's analysis, without negating that level, transcended it. To understand peace, he understood conflict. But for him, to prevail in conflict was a lesser goal than to find a means of living together, a *modus vivendi*. This living together would not involve suppressing or abolishing all conflict, but conflict would be handled in such a way that it does not pose an existential danger to the larger system in which all humans are now embedded. And for Bateson, the best way he knew to increase the chance of human beings to find a *modus vivendi*, was, as a researcher, to increase our knowledge about how relational communication works. Specifically, he proposed to do this in order to explore how, and under what conditions, conflict could, paradoxically as it may seem, give birth to trust.

14.1   Bateson and the Nuclear Arms Race – From the 1940s to the 1970s

After World War II and America's dropping of two nuclear weapons on Japan, Gregory Bateson was, like many others who called themselves "concerned citizens," very preoccupied with and worried about the nuclear arms race that had been brought into being by the United States deployment of nuclear weapons and their further deployment by the Soviet Union. But unlike many concerned citizens, he had theoretical ideas to bring to bear on analyzing this state of affairs.

There was a continuity in his thinking between 1946, when he wrote about "The pattern of an armaments race" for the second volume of the *Bulletin of the Atomic Scientists* (Bateson 1946a and 1946b), and 1979, when he wrote his fellow Regents of the University of California advocating the severance of that University from the Lawrence Livermore Laboratories, a nuclear weapons research institution, which is still affiliated with California's public university, though in a somewhat less transparent way than when Bateson was alive (Bateson 1980).

The 1946 article for the *Bulletin of the Atomic Scientists* was in two parts. The first was subtitled "An anthropological approach" but in fact it brought to bear primarily Richardson's post World War I analysis of arms races, and the concepts of symmetrical and complementary conflict. Bateson in this article does eloquently set out the symmetrization effect of nuclear weaponry:

> The atomic bomb is not only a saturation weapon in the sense that when it is used the entire defence machinery of the attacked spot is dislocated. It is also saturating in the sense that a given nation need only possess a limited number – a few thousands perhaps – of this weapon in order to achieve "complete" aggressive strength. The making of further thousands will not further increase its aggressive power … On the defence side, however, the picture is very different. Even adequacy of defensive preparation is probably impossible. (1946a: 11)

Therefore what nuclear weaponry has done is to increase the "fatigue coefficients" of each participant nation (1946a: 11), a term which Bateson used in the 1940s that seems to anticipate today's conventional biological understandings of animal conflict, as discussed in Chap. 10.

The second part of "The pattern of an armaments race" is subtitled "An analysis of nationalism." It does not deal specifically with World War I but does note that nations become the instruments for the (temporary and insufficient) satisfaction of culturally and socially implanted insatiable desires. Desires which are simply mammalian or "animal" are all satiable, like "oxygen, food, water, sleep, sexual satisfaction, etc." (1946b: 26) Desires for increases in power and prestige, in Bateson's 1946 view, date (for an individual) back to early childhood. They are not desires for a *state* of power or prestige but for a steady *increase* in these. It would be good to develop a culture in which this set of desires was less universal and in which people developed satisfaction from doing a job well for which they were fitted.

Nationalism enters this picture by allowing individuals who have such desires to pursue them without ethical qualms in the supposed interest of the nation:

> It is, however, worth noting that in those cultures which build up the group or the national unit to be a symbol of the disciplining parent – i.e. confer upon the national symbol some of the authority of conscience – the participating individual is *ipso facto* made free from almost all ethical limitations when he avails himself of the instrumentality of the group or nation in the pursuit of his own insatiable desires. And also we may note that the individuals feel that they themselves share in the authority and prestige which is imagined to be acquired by the national unit. (1946b: 26).

Such extreme versions of nationalism can, it seems, be ideologies in their own right. I have argued, on Batesonian grounds, that whenever ideologies rather than interests are present, conflict tends toward a complementary, or totalistic, version rather than a symmetrical type. Perhaps the reason for this is illustrated by Bateson's passage here. Symmetrical conflict would seem to correspond to *satiable* desire, so that a resolution (a *modus vivendi*) can be found in which some of the wants of both parties can be satisfied. (This resolution need not be totally *equal*.) But complementary conflict tends toward the zero-sum, precisely because what is fought for are not biological or even economic needs, which are self-limiting. Rather, in fully complementary or total conflict, what is being fought for is either the humiliation of the other, its transformation in the image of the victor, or its destruction. The pursuit of national interest in the absence of ideological nationalism does not provide the kind of fervor which animates total conflict. Yet nationalism alone seems to have been sufficient to prompt this level of ideological fervor in the First World War, for example, and today, in 2020, nationalism seems again to be in the forefront in our contemporary era, disillusioned as it seems to be with universalisms.

At the time of writing "The Pattern of an Armaments Race" Gregory Bateson was at a transition point in his life. His marriage to Margaret Mead was unraveling and he was yet to embark on the parts of his life connected with studying schizophrenics, octopus, and dolphins. Fast forward to the last several years of his life, beginning in 1972 when he began teaching at the University of California, Santa Cruz. At this stage of his life he was preoccupied with synthesizing and to some extent systematizing what he had learned in all the previous stages of his intellectual journey. He also captured the attention of some people influential in the countercultural movements of the day. Stewart Brand, the creator of the *Whole Earth Catalog*, was fascinated with Bateson's ideas. Brand was very tuned in to the social and culturally experimental mood of the era, and he was also connected with the young Governor of California, Jerry Brown. He brought Brown and Bateson together in conversation, which was published in the successor journal to the *Whole Earth Catalog*, the *Co-Evolution Quarterly*. (Brand ed., 1975) In his turn, Jerry Brown, as Governor, who had the power to nominate members of the Regents of the University of California, the governing board of the University, chose to nominate Gregory Bateson, who began serving as Regent in January 1977.

He found serving as Regent generally frustrating, feeling, as he said in one lecture, that as one climbs hierarchies one finds oneself unable to do much but support the status quo. The status quo of the university system was not one he much supported, as its focus on quantitative measurement and relevance to the job market did not much impress him as worthy of an educational institution. But the controversy

that is relevant here has to do with the connection between the University of California and Lawrence Livermore Laboratories. The latter institution (on contract with the United States Government) was and is responsible for matters concerning the reliability and improvement of nuclear weapons. Student activists were trying in the late 1970s to sever the relationship between this federally funded and owned nuclear weapons laboratory, and the University of California which oddly managed and operated it. Given his own history, as someone who had written critically of arms races a generation earlier, Bateson found himself sympathetic with this activist goal. The matter came before the Regents, and Bateson attempted to sway a few of them with letters which were later reprinted in the *Esalen Catalog*. (The effort to separate the Laboratory from the University failed, and to this day there is some role of the University in its management, though the University of California exercises this role in a consortium jointly with other universities and private corporations such as Bechtel.)

These letters to individual Regents, and to the Regents as a whole, turn out to be indispensible in our understanding of what Bateson meant by trust and by deterrence. It can even help us understand how he used these concepts in the letter, which forms the centerpiece of this book, that he wrote 16 years earlier during the Cuban Missile Crisis.

They can also help us clarify his usage of the word "violence" in the Cuban Missile Crisis letter, which should perhaps better have been expressed in that 1962 letter by "conflict" or "aggression." By 1979 in a memo to the collective Regents of the University of California, Bateson was to relegate the concept of "violence" to a *systemic* level. He wrote:

> We live in a world in which distrust and greed and violence masquerade as common sense, and in which the pathways of distrust and greed and violence are rapidly becoming self-validating. By following those pathways we create the social and international structures, the premises upon which we must live. By choosing the "common sense" of distrust, we choose also the progressive truth of distrust. We cause horror to become the only pathway to wisdom. (1980: 13)

Though "violence" was not a term Bateson used often, especially in an analytic or rigorous way, it is clear here, and in other letters he wrote during this period that he was relegating this term to a systemic usage. For example, he wrote to Assemblyman John Vasconcellos on February 20, 1980 (and cc'd the letter to both Governor Jerry Brown and to the Regents of the University of California):

> as I understand "violence" we live and eat and breed in a civilization which is chronically violent. We are open-eyed accomplices with any other civilization which will seriously compete with us – on our own terms, joining us in a philosophy of violence. (MC 1432-3a, February 20, 1980)

This Assemblyman, who has gone down in history as having promoted the concept of "self-esteem," was at that time proposing a Commission to research the reduction of violence. Bateson asked him, in that regard, whether if the Commission's researches were successful (and especially if they were thoroughgoing enough to affect "our way of life and birthing and childhood"), would it be possible for the

U.C. to continue to employ 13,000 persons "in the researching of the means and machinery of mass murder" (MC 1432-3a)?

The three page letter proceeded to provide the Assemblyman with a short course in the Batesonian framing of such issues. After describing in some detail the difference between complementary and symmetrical aggression, using the lion example that he had used years before with Konrad Lorenz, he turned the question back on the Assemblyman. "How will you <u>define</u> the violence which you would like to reduce by increasing parental wisdom – or improving the TV?" Bateson agreed with the legislator that violence could destroy our civilization, and that "the international violence and the domestic violence are probably connected – perhaps as both symptomatic of the same causes. (Could they be <u>alternative</u> symptoms?)." (MC 1432-3b).

But he proceeded to clarify the framing of what the word violence might be defined as meaning. Violence, crime, and exploration, are all words referring not so much to specific actions as to contexts of action. He illustrated this by critiquing behaviorist models of learning. For example, in the case of exploration, Bateson noted that one cannot teach a rat not to *explore* by putting electric shocks in boxes thereby "punishing" the rat for an individual *act* of exploration. In fact this supposed "punishment" rewards the rat for doing something in the category of exploration, or put differently, for retaining the habit of exploration. In general,

> ... if you set up a simple learning context to teach an animal to do something or other (or to <u>not</u> do something or other, or etc.), your animal (or human) will learn at least <u>two</u> things: (a) to do the something or other (or not to do it, etc.), and so far as this goes you will have succeeded.
>   But the animal or human will also (and always) learn something else. He/she will learn something about the <u>context</u> in which the first learning occurred. This second learning will be a change (big or small) in the creature's <u>character</u>. He/she will become the <u>sort</u> of person that expects (perhaps depends upon or perhaps fears or perhaps exploits) that sort of context. (MC 1432-3b-3c)

The word violence, like the word crime, thus is not the name of an action. Instead, such words are, Bateson suggests, "names of states of mind which are expectations or preconceptions about context." These are, of course, not necessarily conscious expectations or preconceptions. (At this deep level such matters are also hard to address by the use of legislation, which necessarily deals with acts but not with their contexts.)

In this systemic sense of violence, I would suggest that it is an category error, of perhaps the type which Bateson called an error of logical type, to see octopuses or mammals or other creatures, who are engaging in conflict which explores their relationship, as necessarily engaging in *violence*. They may be engaging in specific aggressive acts. But the context which results from this exploratory process may, as Bateson hastened to point out, be one of peacemaking or what I have been calling a *modus vivendi*. The proper use of the concept of violence is at a higher conceptual level than that of the individual act. In the letter to Vasconcellos Bateson interestingly notes that "a possible word for the character which must be changed is <u>cynical</u>." (MC 1432-3c) Thus not all aggression, but rather the cynical deployment of aggression, is what he questions. And the most cynical deployment of all is the invocation of fear, for example in propaganda:

> And in 1980 it becomes difficult sometimes to avoid cynicism. We are, after all, more complex than the lions whom I mentioned at the beginning of this letter. We are not content with a threatening stance in reply to the threats of the other lion, we forsooth must work to persuade ourselves that the other lion is stronger than we – etc. (MC 1432-3c)

The promotion of fear of this kind was something which Bateson incorporated into his own definition of "deterrence" as a policy in the nuclear arms race which he abhorred. By deterrence Bateson meant a specific policy which he claimed originated in fear and was perpetuated by fear. He was *not* referring to what I have been calling the "symmetrizing" effects of nuclear weapons, their inhibition of aggressive acts because they might lead inadvertently to Armageddon. In the end, in the Cuban Missile Crisis, both Kennedy and Krushchev were (or at least I believe they were based on evidence I have presented here) inhibited in aggression by a rational fear of the possible consequences of the use of nuclear weapons in war. Today this rational fear is often lumped in with the concept of "deterrence." But such fear was not what Bateson was warning against.

He was warning, in his criticisms of "deterrence," against a different kind of deployment of fear. The kind of deterrence which he criticized depends on A inducing fear in B about what A might do, and B inducing fear in A about what B might do. This does not actually propose stability, but rather proposes a self-reinforcing cycle or positive feedback loop. It is the logic of the arms race proper.

In an unpublished paper from about 1951 or 1952, "Changes in Human Relationships and Individual Psychology," Bateson delivered some interesting examples of this kind of recursive causal loop, in the course of criticizing the interpretation of international relations in "Neumannian" game theory terms. Bateson here goes beyond his usual criticism of this sort of game theory, which is that such theory does not deal with the possibility of any change in the rules of the game. In this paper, he discusses the self-reinforcing nature of how the rules of the game *remain* static. For example, if any large number of individuals turn against the "whole business of war," (CAF 37-A14) propaganda measures will be brought to bear to eliminate such thinking. The "game" of war is thus a self-perpetuating and self-reinforcing system, in which as Bateson says, "the experience of warfare is itself one of the most important factors in the maintenance of those psychological and social conditions which are necessary to its own recurrence" (CAF 37-A16). Only because the game is thus stabilized, by what Bateson would call cybernetic means, can it be analyzed by game theorists as a stable game.

Fear plays an extremely important part in this cycle:

> … it is of the essence of the game of war that neither side shall have opportunity to achieve sympathetic insight into the psychology of the other. If the system consists of nation X versus nation Y, the game is so set up that X can only judge of Y's aggressive tendencies by looking into his own heart and finding there his fears of Y. Y similarly can only judge X by his own introspective data which tell him of his fear of X. The opportunities for "reality testing" are reduced to a minimum. (CAF 37-A14-15)

Bateson considered the self-reinforcement of these premises of fear to have the structure of an *addiction* – addictive on both sides. But the sparring of the octopus

and of other animals is precisely a form of what he is here calling "reality testing" – on both sides. Ideally it is hoped that *action*, combined with an accurate interpretation (conscious or unconscious) of that action, can break the self-reinforcing addictive cycles of fear that perpetuate such phenomena as nuclear arms races.

We can now return to the question of the University's role in the Lawrence Livermore Laboratories involved in the production and testing of nuclear weapons. In a letter to fellow Regent Vilma Martinez, who was Catholic, intended to lobby her to vote to sever the University's ties to these Laboratories, Bateson made an interesting interpretation of Saint Thomas Aquinas. The Seven Deadly Sins described by Aquinas are, in this Batesonian interpretation, themselves of a higher logical type level than the actions that might be thought to be examples of them. Only instead of speaking of contexts, or of hierarchies of habit or learning, Bateson in this letter echoed the old Catholic theology by noting that in Aquinas, it is not action but generality of action which can be evil. A sin is deadly if it "gives rise to others especially in the manner of a final cause." (Bateson 1980: 15) The arms race itself as process is evil, then, or perhaps more analytically, *addictive*, to the extent that it promotes a mutual distrust which is what could lead to any specific incident turning disastrous.

Bateson had a hope that if the Cuban Missile Crisis were fully understood, it would not validate this kind of promotion of mutual distrust. But he knew that many would interpret it in just this way. Instead of being a dangerous moment which should frighten us away from similar moments, those people who were most invested in the addiction to the arms race would interpret the Cuban Missile Crisis as possibly even a template, a model for high-stakes gambles in which one side ("our own," of course) could somehow eke out a "win."

And neither Krushchev nor Kennedy was immune to the general sense that the nuclear arms race could be treated as just such a game. They were participants in the *zeitgeist*, and indeed, if they had not been, they would not have been in the positions that they were. Pacifists of the Bertrand Russell variety could never have attained the leadership positions in the contending countries.

Nonetheless Bateson felt that if one took a naturalist's eye to the actual events of conflict, one could actually notice a basis for trust that could emerge out of these. He nurtured a spark of hope that this trust could be the basis for countervailing the positive feedback loop of doom in which he felt the two world powers were enmeshed.

One could almost say that his hope was that the Cuban Missile Crisis might represent something analogous to the "hitting bottom" of an addict, in the framework of Alcoholics Anonymous. I am not sure that Bateson made this analogy at the time. His study applying his version of cybernetics to the dynamics of addiction according to Alcoholics Anonymous was not published until 1971, under the title "The Cybernetics of "Self": A Theory of Alcoholism." (This article was reprinted in *Steps to an Ecology of Mind*: Bateson 2000: 309–337.) But in the later 1970s, Bateson was to spell out how this specific framework of addiction fit the case of the nuclear arms race, in a letter to one Dan Hoppenfeld, a member of the public who had

written the Regents to oppose the continued ties of the University of California with the Lawrence Livermore Laboratory.

In Bateson's letter, dated November 30, 1977, he develops a capsule form of a theory of addiction. Like the letter to McCulloch during the Cuban Missile Crisis, this letter also is composed of numbered paragraphs. Number 11 is of some general interest as a theory of how the habit patterns of systems (including for example people, organisms, or nations) come to reinforce each other in an ecosystemic way:

> In a gross, unresearched way, it seems that the way into addiction is part of the very general phenomenon in organized systems that, given some "P" (a proposition describing any new part of a system), "Q", "R" and "S" describing other parts of the system, will shift to accommodate "P" – so that pretty soon "P" becomes embedded and cannot be changed without disturbing "Q", "R" and "S." And the addiction spreads because "T", "U" and "V" change to make room for the new values of "Q", "R" and "S." And so on. It's ecological. (Letter to Don Hoppenfeld, MC 1178-35b, November 30, 1977)

But to return to the problem at hand, the following paragraphs may retrospectively describe how Bateson felt about the continuation of the arms race on much the same premises as before, even following such an event as the Cuban Missile Crisis:

> 13. And the way out is more grievous than the way in. It seems from the experiences of Alcoholics Anonymous that even partial escape requires three components: a. Recognition of the fact of addiction; and b. Recognition of powerlessness; and c. an experience of extreme pain or shame or terror, resulting from the addiction. (In A.A. jargon, the addict must "hit bottom.")

> 14. There is a nasty gimmick. For alcoholics (and A-bomb addicts), it is rather easy to turn the "fear, shame, terror" around so that these phenomena seem to drive (rationalize) the addict towards the next drink or designing the next weapons system.

> 15. If this analysis is halfway correct, there is no possibility or likelihood of getting rid of the Livermore Labs or Los Alamos in the present state of the interlocking systems. a. There is no strong awareness of the fact of addiction; and b. there is no pain, shame, or terror; and c. no recognition of powerlessness.

> 16. I offer you no rose garden.

> 17. It is not possible to work up or fake the "pain, shame or terror." It is absolutely essential that the addict hit bottom as a clear result of his own nonsense. If friends or enemies or saboteurs do it to him, he can still use the disaster to rationalize his addiction.

> 18. But it is possible to work on the awareness of addiction and, in any case, this awareness is probably a necessary precondition if the disaster of hitting bottom is to have any lasting effect on the addict. (MC 1178-35 c and d, Nov. 30, 1977)

Addiction to an arms race involves, of course, addiction to a lack of trust. If trust can be established at any level, conscious or unconscious, it counteracts the "schismogenesis" or positive feedback loop in which both sides are caught. Gregory Bateson may have been uniquely suited to see the Cuban Missile Crisis, *while it was still at its height*, as an opportunity to develop trust between the United States and the Soviet Union. One might consider this a high-stakes version of making lemonade out of a lemon, that is to say, turning a frightening situation which one hopes will not be repeated into an opportunity out of which some good might come. But for Bateson it is exactly the knowledge that both sides gained about each other from

this harrowing experience, that provided the basis for a possible *modus vivendi*. This is how the nations could emulate the octopuses, by learning at a deep level, from specific incidents, that the other side was not going to kill you after all. And although neither I nor Bateson would have recommended being Pollyannas about such things, perhaps that lesson took, at some level. After all, the Soviet-American Cold War of the twentieth century is something that the world survived – or at least appeared to survive.

Chapter 15
A Level Too Low

8. As far as I can see, the games theorists and others who have tried to formalize these problems have consistently thought at a level of logical typing which was one step too low – in fact, one level below what the octopuses and pre-human mammals normally achieve. Somebody should be doing a lot of research, both mathematical and observational, at the level which I have tried to define in this letter, in which the analogic mention of violence becomes in the overall interchange a peace-making move, not through deterrence but through the discovery of trust. We do not know anything, for example, about the conditions and parameters of relationship in which two opposed individuals get stuck in a steady state of continued mutual hostility. (Letter to Warren McCulloch, MC 1039-10c, October 25, 1962)

The concept of "logical type" as Bateson uses it is unique to his thought. It was inspired by Bertrand Russell but it is not the same as Bertrand Russell's concept. It roughly corresponds in Bateson to our usage, sometimes a folk usage, of the concepts "about" or sometimes "meta." Bateson himself, in *Mind and Nature*, takes the recourse of defining it using examples:

1. The name is not the thing named but is of different logical type, higher than that of the thing named.
2. The class is of different logical type, higher than that of its members.
3. The injunctions issued by, or control emanating from, the bias of the house thermostat is of higher logical type than the control issued by the thermometer. (The *bias* is the device on the wall that can be set to determine the temperature around which the temperature of the house will vary.)
4. The word *tumbleweed* is of the same logical type as *bush* or *tree*. It is not the name of a species or genus of plants; rather, it is the name of a class of plants whose members share a particular style of growth and dissemination.
5. Acceleration is of higher logical type than *velocity*. (Bateson 1979: 229)

The original concept of logical type in Russell differentiates between a class and its members. It was a way of avoiding the paradox that occurs when a class is taken to be a member of itself. Bateson did not, of course, in general avoid paradox or try to do so, but instead he set out to observe its natural history. He was not troubled by

"violations" of logical type in animal or human behavior such as in play, humor, or art. But he did think that when one was doing rigorous thinking, one should know how the phenomena one was observing were related to each other in terms of logical level or, "logical type."

The level of logical type which Bateson attributes to game theorists is one in which the winning and losing of a game are paramount within the framework of the simplifying assumptions of von Neumann style games. When von Neumannian game theory becomes institutionalized (perhaps algorithmically by computer) into the military calculations of rival states, it may optimize the strategy of each party in terms of the game which it assumes they are playing. But by that very token what is reaffirmed, and even rigidified, are the *rules* of the game which are assumed by the calculations and decisions which are made. In current parlance we have given ourselves over to the "artificial intelligence" of our simplifying assumptions. We have algorithmically abdicated responsibility for our acts. (Bateson 2000: 484–5)

At a higher Batesonian logical type, the point is not to win by the current rules but to change the rules, or at least to have the potentiality of changing the rules. For a short time, possibly Kennedy and Khrushchev after their encounter in the Cuban Missile Crisis felt that there was some opening to make some changes. The Nuclear Test Ban Treaty, for example, followed shortly after the resolution of the crisis. A telegraphic "hot line" between the two leaders was instituted. But neither of them remained that long in office. Soon the more militaristic partisans on both sides began to use the example of the Cuban Missile Crisis to argue that a game of "chicken" could be won in some cases, which is not at all the lesson that Gregory Bateson would have had them draw.

Yet Gregory Bateson was not a "blank slate" idealist about human nature – this being something of a canard used against a school of anthropology which influenced him (Guddemi 2005). He was first and foremost a natural historian, which meant that his major efforts were always in the direction of understanding the world rather than urgently fixing it. And this is also the case for what we might think of as the problem of aggression. For him, indeed, as we have seen, not all aggression is the same. For octopus or vertebrate or human international conflict, he believed that a difference between symmetrical and complementary aggression can clearly be drawn.

In fact Gregory Bateson began to draw this difference in the case of international conflict all the way back to the very last day of 1939. This can be found in a letter in the archives addressed to an academic psychologist, Frederick Bartlett, who had been somewhat of a mentor to Bateson. (MC 107-1, December 31, 1939)[1] This letter to Bartlett (it is not clear whether it was actually sent) analyzed the World War II situation through the lens of some of the same ideas we are applying here. It was inspired by the mathematical analysis of armaments races done by a very interesting scholar, Lewis Fry Richardson. L.F. Richardson was a Quaker who served as an

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[1] Letter to Frederick Bartlett by Gregory Bateson, dated December 31, 1939. Inscribed "Own copy" with a note to Margaret Mead above the salutation.

ambulance driver during World War I as a conscientious objector – this actually disqualified him from taking an academic position after the war. He was a pioneer in the study of meteorology but also in the mathematical study of conflict. The copy of his 1939 work "Generalized Foreign Politics"[2] that found its way into the Bateson Archives at the University of California, Santa Cruz, contains extensive marginal notes of a great deal of mathematical sophistication, in Gregory Bateson's handwriting (Richardson 1939).

Gregory Bateson's relationship with his erstwhile mentor Bartlett did become rockier during and after the Second World War. In fact, in the interview published in 1976 by Stewart Brand with Bateson and his former wife Margaret Mead, Bateson says that Bartlett was responsible for introducing him to Richardson's work – by throwing it across the table to Bateson in contempt. "I went back to England in '39. Hitler had invaded Poland. Bartlett said, 'You might be interested in that,' throwing it across the room in contempt." (Brand ed. 1976: 34) (However tense their relationship during the war, Bateson did try to rekindle it, as a subsequent letter to Bartlett dated January 29, 1947 refers to a desire to explore "the passages in our material which evoked your disapproval." (MC 107-2, January 29, 1947)

A strange light is cast by this remembered history on Bateson's aforementioned letter to Bartlett dated on the last day of 1939, which may or may not have ever been sent. That letter is a fascinating and very long document complete with equations, some of which had been submitted to Richardson himself for his approval at the time. It prefigures a great deal of the analysis being made here. It purports to be a practical contribution to the type of propaganda which should be used by the Allied side. But in fact Bateson seems less concerned with how to gain a morale advantage during wartime, and more concerned with what sort of propaganda would be compatible with a "civilized peace."

For example the kind of wartime propaganda which stimulates one's own population to increase its warlikeness can be of two kinds. "To stimulate ourselves to [complementary] dominance we say, 'The enemy is weak – let's eat him', but to stimulate [symmetrical] emulation we say, 'the enemy is really very strong, we must buck up if we are to equal him.'" (Letter to Frederic Bartlett, MC 107-1d, December 31, 1939) On the other hand, propaganda about the enemy that imputes to him a complementary goal of total victory against our side, in general bodes less well for peacemaking after the war. "I very much believe," Bateson wrote, "that the symmetrical stimuli and tendencies are very much healthier than the complementary, and perhaps most unhealthy of all are the stimuli which would make out that the enemy is wholly oriented towards complementary dominance and not at all towards emulation." (Letter to Frederic Bartlett, MC 107-1d)

Bateson notes the survival, within the wider culture of Europe (as of that time), of taboos against the most severe complementary actions in wartime: "taboos on attack on civilians; shooting survivors of wrecks while swimming; use of poison

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[2] Richardson, L.F. (1939). "Generalized foreign politics". *The British Journal of Psychology*, monograph supplement No. 23.

gas; aggression versus weaker undefended states." (Letter to Frederic Bartlett, MC 107-1e)[3] These taboos may indicate a deep cultural preference in the long term for symmetrical relations of aggression, as being more stable and less volatile than complementary ones.

The World War II context was not ultimately kind to any possibilities of framing its struggle as symmetrical rather than complementary. Bateson's letter prefigures this by noting what he considered highly complementary aspects of German culture, involving a highly hierarchical society with strong social mobility. Bateson may have preferred to stress, even for propaganda purposes, the symmetrical aspect of competitive struggle. Indeed he mentions that British upper class society trained well for symmetrical struggle "on the playing fields of Eton" with its rules of fair play. But any such preference was more suited for fighting the previous war, or rather, the previous peace.

Many years later, in 1966, as I have mentioned earlier, Bateson would give a speech in Sacramento, California criticizing the Versailles Treaty that ended World War I, (Bateson 2000: 477–485)[4] following the analysis of his friend Maynard Keynes (1920). By that treaty, a German nation that had been promised (by Woodrow Wilson among others) an equitable and non-punitive peace, which would be expected if the conflict had been treated as a symmetrically competitive fight, was instead shocked by the imposition of severe reparations and other stringent measures. This was what the analysis we have been making would indicate as a complementary treatment of the new German republic, and it brought about not only real hardships to Germans but also severe resentment. It was very different from the symmetrical Treaty of Vienna that ended the Napoleonic Wars in 1815 by setting up a royalist France which was treated as an equal. The Treaty of Vienna established a peace that, however reactionary its premises, remained stable for a number of decades. In 1966 Bateson would consider the Treaty of Versailles to be the first incident in an international cascade of increasing distrust which he likened to the House of Atreus in Greek tragedy.

Some of the middle acts, as it were, of the international tragedy took place in the middle twentieth century, in a world polarized between the so-called free (or capitalist) world, led by the United States, and the Communist Party-ruled world led by the Soviet Union. The Cuban Missile Crisis was a climax moment in the Cold War between these two sides.

The Cuban Missile Crisis in a sense was an exercise in discovering the nature of the confrontation, precisely with regard to whether it was symmetrical or complementary in its main outline. This is, as I will discuss below, also the problem that the octopuses have to determine in their initial sparring. But octopuses do not have ideologies. The international system of the mid twentieth century was dominated by an expectation that its key conflicts, both the Second World War and the Cold War,

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[3] These taboos were not very well followed in colonial wars, it should be noted.

[4] "From Versailles to Cybernetics," a talk given at the "Two Worlds Symposium" at Sacramento State College, April 21, 1966.

were total wars in the sense that they could only end with the total defeat and trans-
formation of the other side, because in the cases of Naziism and Soviet Communism
in particular, the society and political structure of these societies was thought to be
officially dominated by ideologies which entailed a total conquest of the world,
whether by military means or, in the case of Communism, by political and social
struggle as well. It remains indeed difficult to imagine how one could have ever
framed the war against Naziism as a symmetrical struggle, in spite of Bateson's
great efforts to try to do this in 1939 – unless one looks for details rather than the
bigger picture, in the manner of war buffs who can admire the generalship of a
Rommel. No, World War II in Europe was felt at the time, and certainly later, to
have been total war justified by the totality of the war aims of the other side, and a
negotiated peace was not in the cards. There were many in the United States who
carried over this same attitude during the Cold War with the Soviet Union, assuming
that it was animated by the same sort of revolutionary fervor as were the Bolsheviks
of 1917 (a fervor that was certainly matched by Fidel Castro and his followers in the
1960s, to be sure). In the middle of the twentieth century, the vision of the conflict
of the major powers as a complementary ideological total war was thus prevalent.

But there was a countervailing reality, in that the nuclear arms race itself was a
symmetrical one, even if not exactly so benign a symmetry as was idealized in the
playing fields of Eton. It is probably the symmetry of mutual destruction itself that
changed the nature of the struggle in the Cuban Missile Crisis. But it was the wis-
dom of both John Kennedy and Nikita Krushchev that they were able to see the
other as a symmetrical opponent (rather than through the lens of the presumed ideo-
logical commitment of the other to destroy oneself). Bateson warned against the
logic of deterrence, and by deterrence he meant a kind of meta-symmetrical desper-
ate conflict based on the fear of the other's (presumed) complementary desire for
total victory. The resolution of the Cuban Missile Crisis came from setting this logic
behind, and instead, through the nonverbal series of actions described in Bateson's
letter (as understandable through animal behavior), establishing a form of trust –
one that arguably carried over to the end of the Cold War.

One of the most successful interventions in modern international affairs was of
course the Marshall Plan after the end of the Second World War. This and similar
acts of generosity which took place at that time were designed, perhaps, to avoid the
destabilization of the losing side that took place as a result of the Versailles treaty.
And indeed, aside from the half of Europe occupied by the Soviet Army, Europe
slowly climbed towards a peaceful prosperity for the next half century and more.
Unfortunately, the end of the Cold War in the late 1980s was not accompanied by
the same spirit of generosity. Russia after the collapse of Communism was allowed
to experience an economic and social free fall, into a brutal and unequal capitalism
and ultimately into strongman rule. The consequences of this callous relegation of a
former opponent to complementary misery may now be playing out in the current
act of the international tragedy, which has perhaps found its way home to become
part of an American tragedy as well.

Returning at long last to the octopuses, it can be seen why Gregory Bateson felt
their problem and that of the protagonists in the Cuban Missile Crisis to be the

same. As described above, the rather difficult to pinpoint, yet arguably semiotic, interpretation that each octopus needs to make when placed by Gregory Bateson in a tank with another octopus, is of course, whether the encounter will end up with the self's body intact or with bodily harm. Initial sparring which is not all-out may give an octopus some experiential informational basis on making this interpretation. As part of this determination, the octopus gains a feeling as to whether the interaction remains "in control" or will spiral "out of control."

The analysis the octopus needs to make is given some mathematical heft in a letter Gregory Bateson wrote to the physicist Fred Hoyle (famous for rejecting the Big Bang and for theories of the off-Earth origin of life). One of the most important scholars of Lewis Fry Richardson's work, Carl Lienau, had written to Bateson to tell him that Hoyle had made the following mathematical analysis of the Cuban Missile Crisis. From Bateson's letter:

> My friend, Carl Lienau, who edited L.F. Richardson's posthumous work on arms races and statistics of deadly quarrels, has called my attention to a very brief summary of your Trafalgar Day talk.
>
> You [Fred Hoyle] are described as saying, "he explained the resolution of the Cuban crisis by analogy with the model $dx/dt = Ax - B$, where $-B$ is a "control term" which prevents the solution $x = B/A + (x_0 - B/A)^{At}$ from exponential growth as long as the "perturbation" x_0 is small enough that $x_0 - B/A$ remains negative; but the inherent capability for exponential growth is present." (MC 678 1/2 -1, February 17, 1964)

In this context Gregory Bateson poses, for Fred Hoyle, the relevance of Bateson's octopus research. Bateson, in an intriguing four paragraphs, makes the startling suggestion that the question for the octopus engaged in an encounter with another octopus, is what is also key for the resolution of such crises as the Cuban Missile Crisis, i.e., the magnitude of this "control term" ($-B$). He goes so far as to say that

> The contesting entities discover through mutual sparring that relationship and even violent relationship with the vis-à-vis is safe because the control term has considerable magnitude. (MC 678½ -1, February 17, 1964)

The mathematics here is that of feedback cybernetic systems, rather than the mathematics usually used in game theory. In order for me to more fully understand this mathematics I consulted an engineer and systems thinker by the name of Barry Kort. Based on my understanding of his explanation to me, the "control term" is one which determines, within feedback based systems, whether the system will go "out of control" in an exponential, i.e. positive feedback, way. Or alternatively, the system may remain within "basin of attraction boundaries" which imply a relative, though certainly not an absolute, facsimile of stability.[5] The former is of course the

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[5] I would like to thank Barry Kort for an informative discussion illuminating the meaning and implications of these equations. From our Internet dialogue, Barry Kort writes:

> Imagine an ordinary curved bowl, like a soup bowl or a cereal bowl. The parameter A corresponds to the curvature of the sides of the bowl. The parameter B corresponds to the diameter of the bowl. Now imagine a marble sitting in the bottom of the bowl. If you move the marble a little ways up the side of the bowl, it will roll back to the bottom. But if you move the marble beyond the rim of the bowl, it won't roll back. So the parameter B, the

"complementary aggression" outcome, which could be lethal for an octopus, or a nation. Whether such an outcome is likely is, as we see, the exploratory question for which the initial sparring by the octopuses provides experimental information vital to each octopus' survival.

Whatever computations, if we wish to call them computations, take place in an octopus on the basis of its encounter with another, will be hard to specify in any particular case in either precise words or precise mathematics. These difficult inter-personal, or as it were inter-animal, matters are precisely those in which the analog and nonverbal "carrier wave" aspects of animal and human communication take pride of place. Such matters are becoming harder to talk about, given the eclipse of Freudianism and the triumph of what purports to be a rational construction of the world in the tech-dominated and STEM-dominated recent decades. But Gregory Bateson's work does give us a way of discussing such matters. His relational view of the world, when we make an effort to enter into it, can help us see both animal communication and our own human crises in a different and, it can be hoped, illuminating way.

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diameter of the bowl, determines how much of a perturbation the marble can take and still be able to roll back. Within those bounds, the system is able to recover to its steady state value. That's why B is called the Control Parameter. It defines the boundaries of the Basin of Attraction (the rim of the bowl). The curvature, A, determines the rate of acceleration of the marble. Now that's not quite a perfect analogy, but I think you get the idea of how it works in general. The greater the magnitude of B, the bigger the diameter of the bowl, and the more you can perturb the marble and still have it roll back to its resting position.

Appendix: Diagram of Symmetrical and Complementary Conflict or Aggression

I will conclude with a diagram setting out various examples of the contrast between symmetry and complementarity in conflict or aggression, especially reflecting and extrapolating from Gregory Bateson's 1939 letter to Frederick Bartlett (MC 107-1). (This is not, please note, meant to contrast symmetry and complementarity in general, in Gregory Bateson's thinking as a whole.)

Some of these examples have been dealt with adequately, I hope, in the book as a whole. It should be clear that conflict situations in which the aim is parity or emulation are of the symmetrical variety in which the goal is not to destroy the other side. The ambition of what I am calling preventive conflict is to "do unto others before they do unto you," which is an aim to capitalize upon weakness lest it turn to strength. Thus I am interpreting it as a form of complementary conflict. Symmetrical struggles tend towards limited war for limited interests; complementary struggles tend towards unlimited conflict which requires unconditional surrender.

In garden variety competitive social relationships, there can be teasing between equals that looks hostile, in the same way that sometimes play fighting dogs can look mean. This kind of teasing or even gentle hazing can exist among friends or friendly acquaintances. Then there is what I would call true bullying, which is aimed at the psychological annihilation of someone not considered as an equal. The ideology underpinning this sense of inequality may be one of masculinity, race, social class, or some other dimension of supposed superiority. "Outcast nerd" is chosen as one example of a bullying-provoking dimension of supposed lesser masculinity that is less recognized as an oppressed identity category than others that could be mentioned. True bullying can be one on one but is often many versus one (outnumbering the victim) and it does not have the self-limiting characteristics of play fighting as they exist in both animals and humans.

The concept of "bare life" comes from the Italian philosopher Giorgio Agamben. Persons engaged in symmetrical struggle may emerge unequal in some dimensions of status but they are still accorded the status of players who remain in the game. In the more extreme complementary forms of struggle, the losers, if they remain alive

at all, can be radically depersonalized. As in Hegel's parable of the master and the slave, the vanquished is treated as not having any rights worth mentioning. Agamben uses the term *zoê* or "bare life" for someone in a "state of exception" which can apply in such spaces as concentration camps, border zones, prisons (particularly Guantanamo) and the like. People in such situations are not given what might be called a basic recognition of their personhood, and to the extent that they are allowed to survive they do so entirely on the terms, minute by minute, of the winners. (Some traditional societies have been so radically non-Hegelian as to accept prisoners of war as adoptees who are then granted the status of fellow members of that society. This would be the exact "symmetrizing" opposite of the creation of a "status of no status" which is "bare life.")

In the discussion of the concept of deterrence I have contrasted a commonsense version of the nuclear standoff, in which symmetrical fear leads to détente or coexistence, with the complementary form of deterrence, in which each side ideologically assumes "the other" wishes to annihilate it. In complementary deterrence the idea is to exploit the other's weakness or to prevent the other from exploiting one's own.

I have used the term throughout this book of symmetrical struggle as leading to a *modus vivendi* because the result of such struggle should not be confused with what is sometimes called "equality of outcome." The *modus vivendi* may provide for a kind of peace, sometimes temporarily, but it is not the same as justice or deservingness. Such concepts are outside the purview of either symmetry or complementarity as I am exploring these things here. However, symmetrical conflict can be seen as *lawful* because it provides the basis for respecting some kind of status for either party. The loser octopus who has made a show of submission is not subsequently "chivvied" or chased around the aquarium.

An octopus who is in fact chivvied or chased without respite is in a complementary struggle with high stakes, and no peace, unless some accommodation is made. Total domination in such a situation can often mean annihilation. In the human case we can see the complementary situation of "bare life" as one in which no law actually applies (though law may "theoretically" apply, it is not actually followed by the "superior" party).

The application of this contrast to icon versus index is tenuous and speculative. The icon is the sign based on imitation and matching to the other, thus the other serves as icon. The index is the sign based on "real world" connectedness and, like tracks to a hunter, can become the basis for exploitation. People say they prefer to be treated like "a whole person" and not a "thing" – does this map out to being treated as an icon rather than as an index? (Table 1).

Table 1 Symmetrical and Complementary Forms of Conflict or Aggression, examples by Phillip Guddemi

Symmetrical and complementary forms of conflict or aggression – based on a letter of Bateson to Bartlett, possibly unsent, 1939, regarding Richardson's analysis of arms races	
Symmetrical	Complementary
Stimulated by strength of other	Stimulated by weakness of other
Lion inflates size to intimidate	Lioness crouches down to ambush/stalk
[the following are partly or wholly extrapolations by me, Phillip Guddemi]	
Emulation/Parity	Preventive or counter-preventive
Limited war	Total war (up to slavery or genocide)
National Interests Policy	Ideological victory policy
Jock – Jock teasing/fighting	Jock – (outcast) nerd bullying
Some rights for vanquished	"Bare life" (Agamben)
Détente/Coexistence	Classical deterrence (total war fear)
Icon?	Index?

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(I am using a citation style adapted from that used by Peter Harries-Jones (2016). Cited materials are of three types: unpublished articles, correspondence, and audiotapes of Gregory Bateson's teaching or lectures. Unpublished articles are numbered in the CAF or Complete Articles File. Unpublished correspondence is numbered according to the system at the Gregory Bateson Archives in which each item of correspondence has its own number. Small case letters following items of correspondence take the place of page numbers, thus, for MC 1519-8b the "b" refers to the second page of the indicated letter. Audiotapes of teaching or lectures are cited in such a way that they can be uniquely identified.)

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