STEPS TO AN ECOLOGY OF MIND

GREGORY BATESON

With a new Foreword by Mary Catherine Bateson

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Part I: Metalogues

DEFINITION: A *metalogue* is a conversation about some problematic subject. This conversation should be such that not only do the participants discuss the problem but the structure of the conversation as a whole is also relevant to the same subject. Only some of the conversations here presented achieve this double format.

Notably, the history of evolutionary theory is inevitably a metalogue between man and nature, in which the creation and interaction of ideas must necessarily exemplify evolutionary process.

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Metalogue: Why Do Things Get in a Muddle?*

Daughter: Daddy, why do things get in a muddle?

Father: What do you mean? Things? Muddle?

D: Well, people spend a lot of time tidying things, but they never seem to spend time muddling them. Things just seem to get in a muddle by themselves. And then people have to tidy them up again.

F: But do your things get in a muddle if you don't touch them?

D: No—not if *nobody* touches them. But if you touch them—or if anybody touches them—they get in a muddle and it's a worse muddle if it isn't me.

F: Yes—that's why I try to keep you from touching the things on my desk. Because my things get in a worse muddle if they are touched by somebody who isn't *me*.

D: But do people *always* muddle other people's things? Why do they, Daddy?

F: Now, wait a minute. It's not so simple. First of all, what do you mean by a muddle?

D: I mean—so I can't find things, and so it *looks* all muddled up. The way it is when nothing is straight—

F: Well, but are you sure you mean the same thing by muddle that anybody else would mean?

D: But, Daddy, I'm sure I do—because I'm not a very

*Written in 1948; not previously published.

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tidy person and if *I* say things are in a muddle, then I'm sure everybody else would agree with me.

F: All right—but do you think you mean the same thing by "tidy" that other people would? If your mummy makes your things tidy, do you know where to find them?

D: Hmm . . . *sometimes*—because, you see, I know where she puts things when she tidies up—

F: Yes, I try to keep her away from tidying my desk, too. I'm sure that she and I don't mean the same thing by "tidy."

D: Daddy, do you and I mean the same thing by "tidy?"

F: I doubt it, my dear—I doubt it.

D: But, Daddy, isn't that a funny thing—that everybody means the same when they say "muddled" but everybody means something different by "tidy." But "tidy" *is* the opposite of "muddled," isn't it?

F: Now we begin to get into more difficult questions. Let's start again from the beginning. You said "*Why do things always get in a muddle?*" Now we have made a step or two—and let's change the question to "Why do things get in a state which Cathy calls 'not tidy?' " Do you see why I want to make that change?

D: . . . Yes, I think so—because if I have a special meaning for "tidy" then some of other people's "tidies" will look like muddles to me—even if we do agree about most of what we call muddles—

F: That's right. Now—let's look at what *you* call tidy. When your paint box is put in a tidy place, where is it?

D: Here on the end of this shelf.

F: Okay—now if it were anywhere else?

D: No, that would not be tidy.

F: What about the other end of the shelf, here? Like this?

D: No, that's not where it belongs, and anyhow it would have to be *straight*, not all crooked the way you put it.

F: Oh—in the right place *and* straight.

D: Yes.

F: Well, that means that there are only very few places which are "tidy" for your paint box—

D: Only *one* place—

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F: No—very *few* places, because if I move it a little bit, like this, it is still tidy.

D: All right—but very, very few places.

F: All right, very, very few places. Now what about the teddy bear and your doll, and the Wizard of Oz and your sweater, and your shoes? It's the same for all the things, isn't it, that each thing has only a very, very few places which are "tidy" for that thing?

D: Yes, Daddy—but the Wizard of Oz could be anywhere on that shelf. And Daddy—do you know what? I hate, hate it when my books get all mixed up with your books and Mummy's books.

F: Yes, I know. (Pause)

D: Daddy, you didn't finish. Why do my things get the way I say isn't tidy?

F: But I *have* finished—it's just because there are more ways which you call "untidy" than there are ways which you call "tidy."

D: But that isn't a reason why—

F: But, yes, it is. And it is the real and only and very important reason.

D: Oh, Daddy! Stop it.

F: No, I'm not fooling. That is the reason, *and all of science is hooked up with that reason*. Let's take another example. If I put some sand in the bottom of this cup and put some sugar on the top of it, and now stir it with a teaspoon, the sand and the sugar will get mixed up, won't they?

D: Yes, but, Daddy, is it fair to shift over to talking about "mixed up" when we started with "muddled up?"

F: Hmm . . . I wonder . . . but I think so—Yes—because let's say we can find somebody who thinks it is more tidy to have all the sand underneath all the sugar. And if you like *I'll* say I want it that way—

D: Hmm . . .

F: All right—take another example. Sometimes in the movies you will see a lot of letters of the alphabet all scattered over the screen, all higgledy-piggledy and some even upside down. And then something shakes the table so that the letters start to move, and then as the shaking goes on, the letters all come together to spell the title of the film.

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D: Yes, I've seen that—they spelled DONALD.

F: It doesn't matter what they spelled. The point is that you saw something being shaken and stirred up and instead of getting more mixed up than before, the letters came together into an order, all right way up, and spelled a word—they made up something which a lot of people would agree is *sense*.

D: Yes, Daddy, but you know . . .

F: No, I don't know; what I am trying to say is that in the real world things never happen that way. It's only in the movies.

D: But, Daddy . . .

F: I tell you it's only in the movies that you can shake things and they seem to take on more order and sense than they had before . . .

D: But, Daddy . . .

F: Wait till I've finished this time . . . And they make it look like that in the movies by doing the whole thing backwards. They put the letters all in order to spell DONALD and then they start the camera and then they start shaking the table.

D: Oh, Daddy—I knew that and I did so want to tell *you* that—and then when they run the film, they run it backwards so that it looks as though things had happened forwards. But really the shaking happened backwards. And they have to photograph it upside down . . . *Why* do they, Daddy?

F: Oh God.

D: Why do they have to fix the camera upside down, Daddy?

F: No, I won't answer that question now because we're in the middle of the question about muddles.

D: Oh—all right, but don't forget, Daddy, you've got to answer that question about the camera another day. Don't forget! You won't forget, will you, Daddy? Because I may not remember. Please, Daddy.

F: Okay—but another day. Now, where were we? Yes, about things never happening backwards. And I was trying to tell you why it is a reason for things to happen in a certain way if we can show that that way has more ways of happening than some other way.

D: Daddy—don't begin talking nonsense.

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F: I'm not talking nonsense. Let's start again. There's only one way of spelling DONALD. Agreed?

D: Yes.

F: All right. And there are millions and millions and millions of ways of scattering six letters on the table. Agreed?

D: Yes. I suppose so. Can some of these be upside down?

F: Yes—just in the sort of higgledy-piggledy muddle they were in in the film. But there could be millions and millions and millions of muddles like that, couldn't there? And only one DONALD?

D: All right—yes. But, Daddy, the same letters might spell OLD DAN.

F: Never mind. The movie people don't want them to spell OLD DAN. They only want DONALD.

D: Why do they?

F: Damn the movie people.

D: But you mentioned them first, Daddy.

F: Yes—but that was to try to tell you why things happen that way in which there are most ways of their happening. And now it's your bedtime.

D: But, Daddy, you never did finish telling me why things happen that way—the way that has most ways.

F: All right. But don't start any more hares running—one is quite enough. Anyhow, I am tired of DONALD, let's take another example. Let's take tossing pennies.

D: Daddy? Are you still talking about the same question we started with? "Why do things get in a muddle?"

F: Yes.

D: Then, Daddy, is what you are trying to say true about pennies, and about DONALD, and about sugar and sand, and about my paint box, and about pennies?

F: Yes—that's right.

D: Oh—I was just wondering, that's all.

F: Now, let's see if I can get it said this time. Let's go back to the sand and the sugar, and let's suppose that somebody says that having the sand at the bottom is "tidy" or "orderly."

D: Daddy, does somebody have to *say* something like that before you can go on to talk about how things are going to get mixed up when you stir them?

F: Yes—that's just the point. They say what they hope will

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happen and then I tell them it won't happen because there are so *many* other things that might happen. And I know that it is more likely that one of the *many* things will happen and not one of the few.

D: Daddy, you're just an old bookmaker, backing *all* the other horses against the *one* horse that I want to bet on.

F: That's right, my dear. I get them to bet on what they call the "tidy" way—I know that there are infinitely many muddled ways—so things will always go toward muddle and mixedness.

D: But why didn't you say that at the beginning, Daddy? I could have understood *that* all right.

F: Yes, I suppose so. Anyhow, it's now bedtime.

D: Daddy, why do grownups have wars, instead of just fighting the way children do?

F: No—bedtime. Be off with you. We'll talk about wars another time.

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Metalogue: Why Do Frenchmen?*

Daughter: Daddy, why do Frenchmen wave their arms about?

Father: What do you mean?

D: I mean when they talk. Why do they wave their arms and all that?

F: Well—why do you smile? Or why do you stamp your foot sometimes?

D: But that's not the same thing, Daddy. I don't wave my arms about like a Frenchman does. I don't believe they can stop doing it, Daddy. Can they?

F: I don't know—they might find it hard to stop. . . . Can you stop smiling?

D: But Daddy, I don't smile all the time. It's hard to stop when I feel like smiling. But I don't feel like it *all* the time. And then I stop.

F: That's true—but then a Frenchman doesn't wave his arms in the same way all the time. Sometimes he waves them in one way and sometimes in another—and sometimes, I think, he stops waving them.

• • •

F: What do you think? I mean, what does it make you think when a Frenchman waves his arms?

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D: I think it looks silly, Daddy. But I don't suppose it looks like that to another Frenchman. They cannot all look silly to each other. Because if they did, they would stop it. Wouldn't they?

F: Perhaps—but that is not a very simple question. What else do they make you think?

D: Well—they look all excited . . .

F: All right—"silly" and "excited."

D: But are they really as excited as they look? If I were as excited as that, I would want to dance or sing or hit somebody on the nose . . . but they just go on waving their arms. They can't be really excited.

F: Well—are they really as silly as they look to you? And anyhow, why do you sometimes want to dance and sing and punch somebody on the nose?

D: Oh. Sometimes I just feel like that.

F: Perhaps a Frenchman just feels "like that" when he waves his arms about.

D: But he couldn't feel like that *all* the time, Daddy, he just couldn't.

F: You mean—the Frenchman surely does not feel when he waves his arms exactly as you would feel if you waved yours. And surely you are right.

D: But, then, how *does* he feel?

F: Well—let us suppose you are talking to a Frenchman and he is waving his arms about, and then in the middle of the conversation, after something that you have said, he suddenly stops waving his arms, and just talks. What would you think then? That he had just stopped being silly and excited?

D: No . . . I'd be frightened. I'd think I had said something that hurt his feelings and perhaps he might be really angry.

F: Yes—and you might be right.

• • •

D: All right—so they stop waving their arms when they start being angry.

F: Wait a minute. The question, after all, is what does one Frenchman tell another Frenchman by waving his arms? And we have part of an answer—he tells him something about how he feels about the other guy. He tells him

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he is not seriously angry—that he is willing and able to be what you call "silly."

D: But—no—that's not sensible. He cannot do all that work so that *later* he will be able to tell the other guy that he *is* angry by just keeping his own arms still. How does he know that he is going to be angry later on?

F: He doesn't know. But, just in case . . .

D: No, Daddy, it doesn't make sense. I don't smile so as to be able to tell you I am angry by not smiling later on.

F: Yes—I think that that *is* part of the reason for smiling. And there are lots of people who smile in order to tell you that they are *not* angry—when they really are.

D: But that's different, Daddy. That's a sort of telling lies with one's face. Like playing poker.

F: Yes.

• • •

F: Now where are we? You don't think it sensible for Frenchmen to work so hard to tell each other that they are not angry or hurt. But after all what is most conversation about? I mean, among Americans?

D: But, Daddy, it's about all sorts of things—baseball and ice cream and gardens and games. And people talk about other people and about themselves and about what they got for Christmas.

F: Yes, yes—but who listens? I mean—all right, so they talk about baseball and gardens. But are they exchanging information? And, if so, *what* information?

D: Sure—when you come in from fishing, and I ask you "did you catch anything?" and you say "nothing," I didn't *know* that you wouldn't catch anything till you told me.

F: Hmm.

• • •

F: All right—so you mention my fishing—a matter about which I am sensitive—and then there is a gap, a silence in the conversation—and that silence tells you that I don't like cracks about how many fish I didn't catch. It's just like the Frenchman who stops waving his arms about when he is hurt.

D: I'm sorry, Daddy, but you did say . . .

F: No—wait a minute—let's not get confused by being

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sorry—I shall go out fishing again tomorrow and I shall still know that I am unlikely to catch a fish . . .

D: But, Daddy, you said all conversation is only telling other people that you are not angry with them . . .

F: Did I? No—not *all* conversation, but much of it. Sometimes if both people are willing to listen carefully, it is possible to do more than exchange greetings and good wishes. Even to do more than exchange information. The two people may even find out something which neither of them knew before.

° ° °

F: Anyhow, most conversations are only about whether people are angry or something. They are busy telling each other that they are friendly—which is sometimes a lie. After all, what happens when they cannot think of anything to say? They all feel uncomfortable.

D: But wouldn't that be information, Daddy? I mean—information that they are not cross?

F: Surely, yes. But it's a different sort of information from "the cat is on the mat."

° ° °

D: Daddy, why cannot people just *say* "I am not cross at you" and let it go at that?

F: Ah, now we are getting to the real problem. The point is that the messages which we exchange in gestures are really not the same as any translation of those gestures into words.

D: I don't understand.

F: I mean—that no amount of telling somebody in mere words that one is or is not angry is the same as what one might tell them by gesture or tone of voice.

D: But, Daddy, you cannot have words without some tone of voice, can you? Even if somebody uses as little tone as he can, the other people will hear that he is holding himself back—and that will be a sort of tone, won't it?

F: Yes—I suppose so. After all that's what I said just now about gestures—that the Frenchman can say something special by *stopping* his gestures.

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F: But then, what do I mean by saying that "mere words"

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can never convey the same message as gestures—if there are no "mere words"?

D: Well, the words might be written.

F: No—that won't let me out of the difficulty. Because 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.

* * *

D: Daddy, when they teach us French at school, why don't they teach us to wave our hands?

F: I don't know. I'm sure I don't know. That is probably one of the reasons why people find learning languages so difficult.

* * *

F: Anyhow, it is all nonsense. I mean, the notion that language is made of words is all nonsense—and when I said that gestures could not be translated into "mere words," I was talking nonsense, because there is no such thing as "mere words." And all the syntax and grammar and all that stuff is nonsense. It's all based on the idea that "mere" words exist—and there are none.

D: But, Daddy . . .

F: I tell you—we have to start all over again from the beginning and assume that language is first and foremost a system of gestures. Animals after all have *only* gestures and tones of voice—and words were invented later. Much later. And after that they invented schoolmasters.

D: Daddy?

F: Yes.

D: Would it be a good thing if people gave up words and went back to only using gestures?

F: Hmm. I don't know. Of course we would not be able to have any conversations like this. We could only bark, or mew, and wave our arms about, and laugh and grunt and weep. But it might be fun—it would make life a sort of ballet—with dancers making their own music.

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Metalogue: About Games and Being Serious*

Daughter: Daddy, are these conversations serious?
Father: Certainly they are.
D: They're not a sort of game that you play with me?
F: God forbid . . . but they are a sort of game that we play together.
D: Then they're *not* serious!

• • •

F: Suppose you tell me what you would understand by the words "serious" and a "game."
D: Well . . . if you're . . . I don't know.
F: If I am what?
D: I mean . . . the conversations are serious for me, but if you are only playing a game . . .
F: Steady now. Let's look at what is good and what is bad about "playing" and "games." First of all, I don't mind —not much—about winning or losing. When your questions put me in a tight spot, sure, I try a little harder to think straight and to say clearly what I mean. But I don't bluff and I don't set traps. There is no temptation to cheat.
D: That's just it. It's not serious to you. It's a game. People who cheat just don't know how to *play*. They treat a game as though it were serious.
F: But it *is* serious.

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D: No, it isn't—not for you it isn't.
F: Because I don't even want to cheat?
D: Yes—partly that.
F: But do you want to cheat and bluff all the time?
D: No—of course not.
F: Well then?
D: Oh—Daddy—you'll *never* understand.
F: I guess I never will.
F: Look, I scored a sort of debating point just now by forcing you to admit that you don't want to cheat—and then I tied onto that admission the conclusion that therefore the conversations are not "serious" for you either. Was that a sort of cheating?
D: Yes—sort of.
F: I agree—I think it was. I'm sorry.
D: You see, Daddy—if I cheated or wanted to cheat, that would mean that I was not serious about the things we talk about. It would mean that I was only playing a game with you.
F: Yes, that makes sense.

* * *

D: But it doesn't make sense, Daddy. It's an awful muddle.
F: Yes—a muddle—but still a sort of sense.
D: How, Daddy?

* * *

F: Wait a minute. This is difficult to say. First of all—I think that we get somewhere with these conversations. I enjoy them very much and I think you do. But also, apart from that, I think that we get some ideas straight and I think that the muddles help. I mean—that if we both spoke logically all the time, we would never get anywhere. We would only parrot all the old clichés that everybody has repeated for hundreds of years.
D: What is a cliché, Daddy?
F: A cliché? It's a French word, and I think it was originally a printer's word. When they print a sentence they have to take the separate letters and put them one by one into a sort of grooved stick to spell out the sentence. But for words and sentences which people use often, the printer keeps little sticks of letters ready made up. And these ready-made sentences are called clichés.

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D: But I've forgotten now what you were saying about clichés, Daddy.

F: Yes—it was about the muddles that we get into in these talks and how getting into muddles makes a sort of sense. If we didn't get into muddles, our talks would be like playing rummy without first shuffling the cards.

D: Yes, Daddy—but what about those things—the ready-made sticks of letters?

F: The clichés? Yes—it's the same thing. We all have lots of ready-made phrases and ideas, and the printer has ready-made sticks of letters, all sorted out into phrases. But if the printer wants to print something new—say, something in a new language, he will have to break up all that old sorting of the letters. In the same way, in order to think new thoughts or to say new things, we have to break up all our ready-made ideas and shuffle the pieces.

D: But, Daddy, the printer would not shuffle all the letters? Would he? He wouldn't shake them all up in a bag. He would put them one by one in their places—all the *a*'s in one box and all the *b*'s in another, and all the commas in another, and so on.

F: Yes—that's right. Otherwise he would go mad trying to find an *a* when he wanted it.

• • •

F: What are you thinking?

D: No—it's only that there are so many questions.

F: For example?

D: Well, I see what you mean about our getting into muddles. That that makes us say new sorts of things. But I am thinking about the printer. He has to keep all his little letters sorted out even though he breaks up all the ready-made phrases. And I am wondering about our muddles. Do we have to keep the little pieces of our thought in some sort of order—to keep from going mad?

F: I think so—yes—but I don't know *what* sort of order. That would be a terribly hard question to answer. I don't think we could get an answer to that question today.

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F: You said there were "so many questions." Do you have another?

D: Yes—about games and being serious. That's what we started from, and I don't know how or why that led us to talk about our muddles. The way you confuse everything—it's a sort of cheating.

F: No, absolutely not.

• • •

F: You brought up two questions. And really there are a lot more . . . We started from the question about these conversations—are they serious? Or are they a sort of game? And you felt hurt that I might be playing a game, while you were serious. It looks as though a conversation is a game if a person takes part in it with one set of emotions or ideas—but not a "game" if his ideas or emotions are different.

D: Yes, it's if your ideas about the conversation are different from mine . . .

F: If we *both* had the game idea, it would be all right?

D: Yes—of course.

F: Then it seems to be up to me to make clear what I mean by the game idea. I know that I am serious—whatever that means—about the things that we talk about. We talk about ideas. And I know that I play with the ideas in order to understand them and fit them together. It's "play" in the same sense that a small child "plays" with blocks . . . And a child with building blocks is mostly very serious about his "play."

D: But is it a *game*, Daddy? Do you play *against* me?

F: No. I think of it as you and I playing together against the building blocks—the ideas. Sometimes competing a bit—but competing as to who can get the next idea into place. And sometimes we attack each other's bit of building, or I will try to defend my built-up ideas from your criticism. But always in the end we are working together to build the ideas up so that they will stand.

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D: Daddy, do our talks have *rules?* The difference between a game and just playing is that a game has rules.

F: Yes. Let me think about that. I think we do have a sort of rules . . . and I think a child playing with blocks

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has rules. The blocks themselves make a sort of rules. They will balance in certain positions and they will not balance in other positions. And it would be a sort of cheating if the child used glue to make the blocks stand up in a position from which they would otherwise fall.

D: But what rules do *we* have?

F: Well, the ideas that we play with bring in a sort of rules. There are rules about how ideas will stand up and support each other. And if they are wrongly put together the whole building falls down.

D: No glue, Daddy?

F: No—no glue. Only logic.

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D: But you said that if we always talked logically and did not get into muddles, we could never say anything new. We could only say ready-made things. What did you call those things?

F: Clichés. Yes. Glue is what clichés are stuck together with.

D: But you said "logic," Daddy.

F: Yes, I know. We're in a muddle again. Only I don't see a way out of this particular muddle.

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D: How did we get into it, Daddy?

F: All right, let's see if we can retrace our steps. We were talking about the "rules" of these conversations. And I said that the ideas that we play with have rules of logic . . .

D: Daddy! Wouldn't it be a good thing if we had a few more rules and obeyed them more carefully? Then we might not get into these dreadful muddles.

F: Yes. But wait. You mean that I get us into these muddles because I cheat against rules which we don't have. Or put it this way. That we might have rules which would stop us from getting into muddles—as long as we obeyed them.

D: Yes, Daddy, that's what the rules of a game are for.

F: Yes, but do you want to turn these conversations into *that* sort of a game? I'd rather play canasta—which is fun too.

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D: Yes, that's right. We can play canasta whenever we want to. But at the moment I would rather play this game. Only I don't know what sort of a game this is. Nor what sort of rules it has.

F: And yet we have been playing for some time.

D: Yes. And it's been fun.

F: Yes.

• • •

F: Let's go back to the question which you asked and which I said was too difficult to answer today. We were talking about the printer breaking up his clichés, and you said that he would still keep some sort of order among his letters—to keep from going mad. And then you asked "What sort of order should we cling to so that when we get into a muddle we do not go mad?" It seems to me that the "rules" of the game is only another name for that sort of order.

D: Yes—and cheating is what gets us into muddles.

F: In a sense, yes. That's right. Except that the whole point of the game is that we do get into muddles, and do come out on the other side, and if there were no muddles our "game" would be like canasta or chess—and that is not how we want it to be.

D: Is it *you* that make the rules, Daddy? Is that fair?

F: That, daughter, is a dirty crack. And probably an unfair one. But let me accept it at face value. Yes, it is I who make the rules—after all, I do not want us to go mad.

D: All right. But, Daddy, do you also change the rules? Sometimes?

F: Hmm, another dirty crack. Yes, daughter, I change them constantly. Not all of them, but some of them.

D: I wish you'd tell me when you're going to change them!

F: Hmm—yes—again. I wish I could. But it isn't like that. If it were like chess or canasta, I could tell you the rules, and we could, if we wanted to, stop playing and discuss the rules. And then we could start a new game with the new rules. But what rules would hold us between the two games? While we were discussing the rules?

D: I don't understand.

F: Yes. The point is that the purpose of these conversations is to discover the "rules." It's like life—a game

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whose purpose is to discover the rules, which rules are always changing and always undiscoverable.

D: But I don't call that a *game*, Daddy.

F: Perhaps not. I would call it a game, or at any rate "play." But it certainly is not like chess or canasta. It's more like what kittens and puppies do. Perhaps. I don't know.

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D: Daddy, why do kittens and puppies play?

F: I don't know—I don't know.

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Metalogue: How Much Do You Know?*

Daughter: Daddy, how much do you know?

Father: Me? Hmm—I have about a pound of knowledge.

D: Don't be silly. Is it a pound sterling or a pound weight? I mean *really* how much do you know?

F: Well, my brain weighs about two pounds and I suppose I use about a quarter of it—or use it at about a quarter efficiency. So let's say half a pound.

D: But do you know more than Johnny's daddy? Do you know more than I do?

F: Hmm—I once knew a little boy in England who asked his father, "Do fathers always know more than sons?" and the father said, "Yes." The next question was, "Daddy, who invented the steam engine?" and the father said, "James Watt." And then the son came back with "—but why didn't James Watt's father invent it?"

• • •

D: I know. I know more than that boy because I know why James Watt's father didn't. It was because somebody else had to think of something else before *anybody* could make a steam engine. I mean something like—I don't know—but there was somebody else who had to discover oil before anybody could make an engine.

F: Yes—that makes a difference. I mean, it means that knowledge is all sort of knitted together, or woven, like

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cloth, and each piece of knowledge is only meaningful or useful because of the other pieces—and . . .

D: Do you think we ought to measure it by the yard?

F: No. I don't.

D: But that's how we buy cloth.

F: Yes. But I didn't mean that it *is* cloth. Only it's like it—and certainly would not be flat like cloth—but in three dimensions—perhaps four dimensions.

D: What do you mean, Daddy?

F: I really don't know, my dear. I was just trying to think.

F: I don't think we are doing very well this morning. Suppose we start out on another tack. What we have to think about is how the pieces of knowledge are woven together. How they help each other.

D: How do they?

F: Well—it's as if sometimes two facts get added together and all you have is just two facts. But sometimes instead of just adding they multiply—and you get *four* facts.

D: You cannot multiply one by one and get four. You know you can't.

F: Oh.

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F: But yes I can, too. If the things to be multiplied are pieces of knowledge or facts or something like that. Because every one of them is a double something.

D: I don't understand.

F: Well—at least a double something.

D: Daddy!

F: Yes—take the game of Twenty Questions. You think of something. Say you think of "tomorrow." All right. Now I ask "Is it abstract?" and you say "Yes." Now from your "yes" I have got a double bit of information. I know that it *is* abstract and I know that it isn't concrete. Or say it this way—from your "yes" I can *halve* the number of possibilities of what the thing can be. And that's a multiplying by one over two.

D: Isn't it a division?

F: Yes—it's the same thing. I mean—all right—it's a multiplication by .5. The important thing is that it's not just a subtraction or an addition.

D: How do you *know* it isn't?

F: How do I know it?—Well, suppose I ask another ques-

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tion which will halve the possibilities among the abstractions. And then another. That will have brought down the total possibilities to an eighth of what they were at the beginning. And two times two times two is eight.

D: And two and two and two is only six.

F: That's right.

D: But, Daddy, I don't see—what happens with Twenty Questions?

F: The point is that if I pick my questions properly I can decide between two times two times two times two twenty times over things—2^{20} things. That's over a million things that you might have thought of. One question is enough to decide between two things; and two questions will decide between four things—and so on.

D: I don't like arithmetic, Daddy.

F: Yes, I know. The working it out is dull, but some of the ideas in it are amusing. Anyhow, you wanted to know how to measure knowledge, and if you start measuring things that always leads to arithmetic.

D: We haven't measured any knowledge yet.

F: No. I know. But we have made a step or two toward knowing how we would measure it if we wanted to. And that means we are a little nearer to knowing what knowledge is.

D: That would be a funny sort of knowledge, Daddy. I mean knowing *about* knowledge—would we measure that sort of knowing the same way?

F: Wait a minute—I don't know—that's really the $64 Question on this subject. Because—well, let's go back to the game of Twenty Questions. The point that we never mentioned is that those questions have to be in a certain order. First the wide general question and then the detailed question. And it's only from answers to the wide questions that I know which detailed questions to ask. But we counted them all alike. I don't know. But now you ask me if knowing about knowledge would be measured the same way as other knowledge. And the answer must surely be no. You see, if the early questions in the game tell me what questions to ask later, then they must be partly questions about knowing. They're exploring the business of knowing.

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D: Daddy—has anybody ever measured how much anybody knew.

F: Oh yes. Often. But I don't quite know what the answers meant. They do it with examinations and tests and quizzes, but it's like trying to find out how big a piece of paper is by throwing stones at it.

D: How do you mean?

F: I mean—if you throw stones at two pieces of paper from the same distance and you find that you hit one piece more often than the other, then probably the one that you hit most will be bigger than the other. In the same way, in an examination you throw a lot of questions at the students, and if you find that you hit more pieces of knowledge in one student than in the others, then you think that student must know more. That's the idea.

D: But could one measure a piece of paper that way?

F: Surely one could. It might even be quite a good way of doing it. We do measure a lot of things that way. For example, we judge how strong a cup of coffee is by looking to see how black it is—that is, we look to see how much light is stopped. We throw light waves at it instead of stones, it's the same idea.

D: Oh.

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D: But then—why shouldn't we measure knowledge that way?

F: How? By quizzes? No—God forbid. The trouble is that that sort of measuring leaves out your point—that there are different sorts of knowledge—and that there's knowing about knowledge. And ought one to give higher marks to the student who can answer the widest question? Or perhaps there should be a different *sort* of marks for each different sort of question.

D: Well, all right. Let's do that and then add the marks together and then . . .

F: No—we couldn't add them together. We might multiply or divide one sort of marks by another sort but we couldn't add them.

D: Why not, Daddy?

F: Because—because we couldn't. No wonder you don't like arithmetic if they don't tell you that sort of thing

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at school—What do they tell you? Golly—I wonder what the teachers think arithmetic is about.

D: What *is* it about, Daddy?

F: No. Let's stick to the question of how to measure knowledge—Arithmetic is a set of tricks for thinking clearly and the only fun in it is just its clarity. And the first thing about being clear is not to mix up ideas which are really different from each other. The idea of two oranges is really different from the idea of two miles. Because if you add them together you only get fog in your head.

D: But, Daddy, I can't keep ideas separate. Ought I to do that?

F: No— No— Of course not. Combine them. But don't add them. That's all. I mean—if the ideas are numbers and you want to combine two different sorts, the thing to do is to multiply them by each other. Or divide them by each other. And then you'll get some new sort of idea, a new sort of quantity. If you have miles in your head, and you have hours in your head, and you divide the miles by the hours, you get "miles per hour"—that's a speed.

D: Yes, Daddy. What would I get if I multiplied them?

F: Oh—er—I suppose you'd get mile-hours. Yes. I know what they are. I mean, what a mile-hour is. It's what you pay a taxi driver. His meter measures miles and he has a clock which measures hours, and the meter and the clock work together and multiply the hours by the miles and then it multiplies the mile-hours by something else which makes mile-hours into dollars.

D: I did an experiment once.

F: Yes?

D: I wanted to find out if I could think two thoughts at the same time. So I thought "It's summer" and I thought "It's winter." And then I tried to think the two thoughts together.

F: Yes?

D: But I found I wasn't having two thoughts. I was only having one thought *about* having two thoughts.

F: Sure, that's just it. You can't mix thoughts, you can only combine them. And in the end, that means you can't

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count them. Because counting is really only adding things together. And you mostly can't do that.

D: Then *really* do we only have one big thought which has lots of branches—lots and lots and lots of branches?

F: Yes. I think so. I don't know. Anyhow I think that is a clearer way of saying it. I mean it's clearer than talking about bits of knowledge and trying to count them.

• • •

D: Daddy, why don't you use the other three-quarters of your brain?

F: Oh, yes—that—you see the trouble is that I had schoolteachers too. And they filled up about a quarter of my brain with fog. And then I read newspapers and listened to what other people said, and that filled up another quarter with fog.

D: And the other quarter, Daddy?

F: Oh—that's fog that I made for myself when I was trying to think.

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Metalogue: Why Do Things Have Outlines?*

Daughter: Daddy, why do things have outlines?

Father: Do they? I don't know. What sort of things do you mean?

D: I mean when I draw things, why do they have outlines?

F: Well, what about other sorts of things—a flock of sheep? or a conversation? Do they have outlines?

D: Don't be silly. I can't draw a conversation. I mean *things*.

F: Yes—I was trying to find out just what you meant. Do you mean "Why do we give things outlines when we draw them?" or do you mean that the things *have* outlines whether we draw them or not?

D: I don't know, Daddy. You tell me. Which do I mean?

F: I don't know, my dear. There was a very angry artist once who scribbled all sorts of things down, and after he was dead they looked in his books and in one place they found he'd written "Wise men see outlines and therefore they draw them" but in another place he'd written "Mad men see outlines and therefore they draw them."

D: But which does he mean? I don't understand.

F: Well, William Blake—that was his name—was a great artist and a very angry man. And sometimes he rolled

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up his ideas into little spitballs so that he could throw them at people.

D: But what was he mad about, Daddy?

F: But what was he mad about? Oh, I see—you mean "angry." We have to keep those two meanings of "mad" clear if we are going to talk about Blake. Because a lot of people thought he was mad—really mad—crazy. And that was one of the things he was mad-angry about. And then he was mad-angry, too, about some artists who painted pictures as though things didn't have outlines. He called them "the slobbering school."

D: He wasn't very tolerant, was he, Daddy?

F: Tolerant? Oh, God. Yes, I know—that's what they drum into you at school. No, Blake was not very tolerant. He didn't even think tolerance was a good thing. It was just more slobbering. He thought it blurred all the outlines and muddled everything—that it made all cats gray. So that nobody would be able to see anything clearly and sharply.

D: Yes, Daddy.

F: No, that's not the answer. I mean "Yes, Daddy" is not the answer. All that says is that you don't know what your opinion is—and you don't give a damn what I say or what Blake says and that the school has so befuddled you with talk about tolerance that you cannot tell the difference between anything and anything else.

D: (Weeps.)

F: Oh, God. I'm sorry, but I was angry. But not really angry with you. Just angry at the general mushiness of how people act and think—and how they preach muddle and call it tolerance.

D: But, Daddy—

F: Yes?

D: I don't know. I don't seem able to think very well. It's all in a muddle.

F: I'm sorry. I suppose I muddled you by starting to let off steam.

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D: Daddy?

F: Yes?

D: Why is that something to get angry about?

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F: Is what something to get angry about?

D: I mean—about whether things have outlines. You said William Blake got angry about it. And then you get angry about it. Why is that, Daddy?

F: Yes, in a way I think it is. I think it matters. Perhaps in a way, is *the* thing that matters. And other things only matter because they are part of this.

D: What do you mean, Daddy?

F: I mean, well, let's talk about tolerance. When Gentiles want to bully Jews because they killed Christ, I get intolerant. I think the Gentiles are being muddle-headed and are blurring all the outlines. Because the Jews didn't kill Christ, the Italians did it.

D: Did they, Daddy?

F: Yes, only the ones who did are called Romans today, and we have another word for their descendants. We call them Italians. You see there are two muddles and I was making the second muddle on purpose so we could catch it. First there's the muddle of getting the history wrong and saying the Jews did it, and then there's the muddle of saying that the descendants should be responsible for what their ancestors didn't do. It's all slovenly.

D: Yes, Daddy.

F: All right, I'll try not to get angry again. All I'm trying to say is that muddle is something to get angry about.

D: Daddy?

F: Yes?

D: We were talking about muddle the other day. Are we really talking about the same thing now?

F: Yes. Of course we are. That's why it's important—what we said the other day.

D: And you said that getting things clear was what Science was about.

F: Yes, that's the same thing again.

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D: I don't seem to understand it all very well. Everything seems to be everything else, and I get lost in it.

F: Yes, I know it's difficult. The point is that our conversations do have an outline, somehow—if only one could see it clearly.

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F: Let's think about a real concrete out-and-out muddle, for a change, and see if that will help. Do you remember the game of croquet in *Alice in Wonderland?*

D: Yes—with flamingos?

F: That's right.

D: And porcupines for balls?

F: No, hedgehogs. They were hedgehogs. They don't have porcupines in England.

D: Oh. Was it in England, Daddy? I didn't know.

F: Of course it was in England. You don't have duchesses in America either.

D: But there's the Duchess of Windsor, Daddy.

F: Yes, but she doesn't have quills, not like a real porcupine.

D: Go on about Alice and don't be silly, Daddy.

F: Yes, we were talking about flamingos. The point is that the man who wrote Alice was thinking about the same things that we are. And he amused himself with little Alice by imagining a game of croquet that would be all muddle, just absolute muddle. So he said they should use flamingos as mallets because the flamingos would bend their necks so the player wouldn't know even whether his mallet would hit the ball or how it would hit the ball.

D: Anyhow the ball might walk away of its own accord because it was a hedgehog.

F: That's right. So that it's all so muddled that nobody can tell at all what's going to happen.

D: And the hoops walked around, too, because they were soldiers.

F: That's right—everything could move and nobody could tell how it would move.

D: Did everything have to be *alive* so as to make a complete muddle?

F: No—he could have made it a muddle by . . . no, I suppose you're right. That's interesting. Yes, it had to be that way. Wait a minute. It's curious but you're right. Because if he'd muddled things any other way, the players could have learned how to deal with the muddling details. I mean, suppose the croquet lawn was bumpy, or the balls were a funny shape, or the heads

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of the mallets just wobbly instead of being alive, then the people could still learn and the game would only be more difficult—it wouldn't be impossible. But once you bring live things into it, it becomes impossible. I wouldn't have expected that.

D: Wouldn't you, Daddy? I would have. That seems natural to me.

F: Natural? Sure—natural enough. But I would not have expected it to work that way.

D: Why not? That's what I would have expected.

F: Yes. But this is the thing that I would not have expected. That animals, which are themselves able to see things ahead and act on what they think is going to happen—a cat can catch a mouse by jumping to land where the mouse will probably be when she has completed her jump—but it's just the fact that animals are capable of seeing ahead and learning that makes them the only really unpredictable things in the world. To think that we try to make laws as though people were quite regular and predictable.

D: Or do they make the laws just because people are not predictable, and the people who make the laws wish the other people were predictable?

F: Yes, I suppose so.

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D: What were we talking about?

F: I don't quite know—not yet. But you started a new line by asking if the game of croquet could be made into a real muddle only by having all the things in it alive. And I went chasing after that question, and I don't think I've caught up with it yet. There is something funny about that point.

D: What?

F: I don't quite know—not yet. Something about living things and the difference between them and the things that are not alive—machines, stones, so on. Horses don't fit in a world of automobiles. And that's part of the same point. They're unpredictable, like flamingos in the game of croquet.

D: What about people, Daddy?

F: What about them?

D: Well, they're alive. Do they fit? I mean on the streets?

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F: No, I suppose they don't really fit—or only by working pretty hard to protect themselves and make themselves fit. Yes, they have to make themselves predictable, because otherwise the machines get angry and kill them.

D: Don't be silly. If the machines can get angry, then *they* would not be predictable. They'd be like you, Daddy. You can't predict when you're angry, can you?

F: No, I suppose not.

D: But, Daddy, I'd rather have you unpredictable—sometimes.

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D: What did you mean by a conversation having an outline? Has this conversation had an outline?

F: Oh, surely, yes. But we cannot see it yet because the conversation isn't finished. You cannot ever see it while you're in the middle of it. Because if you could see it, you would be predictable—like the machine. And I would be predictable—and the two of us together would be predictable—

D: But I don't understand. You say it is important to be clear about things. And you get angry about people who blur the outlines. And yet we think it's better to be unpredictable and not to be like a machine. And you say that we cannot see the outlines of our conversation till it's over. Then it doesn't matter whether we're clear or not. Because we cannot *do* anything about it then.

F: Yes, I know—and I don't understand it myself. . . . But anyway, who wants to *do* anything about it?

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Metalogue: Why a Swan?*

Daughter: Why a swan?
Father: Yes—and why a puppet in Petroushka?
D: No—that's different. After all a puppet is sort of human—and that particular puppet is very human.
F: More human than the people?
D: Yes.
F: But still only *sort of* human? And after all the swan is also sort of human.
D: Yes.

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D: But what about the dancer? Is she human? Of course she *really* is, but, on the stage, she seems inhuman or impersonal—perhaps superhuman. I don't know.
F: You mean—that while the swan is only a *sort of* swan and has no webbing between her toes, the dancer seems only *sort of* human.
D: I don't know—perhaps it's something like that.

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F: No—I get confused when I speak of the "swan" and the dancer as two different things. I would rather say that the thing I see on the stage—the swan figure—is both "sort of" human and "sort of" swan.
D: But then you would be using the word "sort of" in two senses.

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F: Yes, that's so. But anyhow, when I say that the swan figure is "sort of" human, I don't mean that it (or she) is a member of that species or sort which we call human.

D: No, of course not.

F: Rather that she (or it) is a member of another subdivision of a larger group which would include Petroushka puppets and ballet swans and people.

D: No, it's not like genera and species. Does your larger group include geese?

* * *

F: All right. Then I evidently do not know what the word "sort of" means. But I do know that the whole of fantasy, poetry, ballet, and art in general owes its meaning and importance to the relationship which I refer to when I say that the swan figure is a "sort of" swan—or a "pretend" swan.

D: Then we shall never know why the dancer is a swan or a puppet or whatever, and shall never be able to say what art or poetry is until someone says what is really meant by "sort of."

F: Yes.

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F: But we don't have to avoid puns. In French the phrase *espèce de* (literally "sort of") carries a special sort of punch. If one man calls another "a camel" the insult may be a friendly one. But if he calls him an *espèce de chameau*—a *sort of* camel—that's bad. It's still worse to call a man an *espèce d'espèce*—a sort of a sort.

D: A sort of a sort of what?

F: No—just a sort of a sort. On the other hand, if you say of a man that he is a *true* camel, the insult carries a flavor of grudging admiration.

D: But when a Frenchman calls a man a sort of camel, is he using the phrase *sort of* in anything like the same way as I, when I say the swan is *sort of* human?

* * *

F: It's like—there's a passage in Macbeth. Macbeth is talking to the murderers whom he is sending out to kill Banquo. They claim to be men, and he tells them they are sort of men.

Ay—in the catalogue ye go for men.

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as hounds and greyhounds, mongrels, spaniels, curs,
shoughs, water-rugs and demi-wolves are clept
all by the name of dogs.

(*Macbeth*, Act III, Scene 1)

D: No—that's what you said just now. What was it? "Another subdivision of a larger group?" I don't think that's it at all.

F: No, it's not only that. Macbeth, after all, uses dogs in his simile. And "dogs" means either noble hounds or scavengers. It would not be the same if he had used the domestic varieties of cats—or the subspecies of wild roses.

D: All right, all right. But what is the answer to my question? When a Frenchman calls a man a "sort of" camel, and I say that the swan is "sort of" human, do we both mean the same thing by "sort of"?

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F: All right, let's try to analyze what "sort of" means. Let's take a single sentence and examine it. If I say "the puppet Petroushka is *sort of* human," I state a relationship.

D: Between what and what?

F: Between ideas, I think.

D: Not between a puppet and people?

F: No. Between some ideas that I have about a puppet and some ideas that I have about people.

D: Oh.

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D: Well then, what sort of a relationship?

F: I don't know. A metaphoric relationship?

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F: And then there is that other relationship which is emphatically *not* "sort of." Many men have gone to the stake for the proposition that the bread and wine are *not* "sort of" the body and blood.

D: But is that the same thing? I mean—is the swan ballet a sacrament?

F: Yes—I think so—at least for some people. In Protestant language we might say that the swanlike costume and movements of the dancer are "outward and visible signs of some inward and spiritual grace" of woman.

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But in Catholic language that would make the ballet into a mere metaphor and not a sacrament.

D: But you said that for some people it is a sacrament. You mean for Protestants?

F: No, no. I mean that if for some people the bread and wine are only a metaphor, while for others—Catholics—the bread and wine are a sacrament; then, if there be some for whom the ballet is a metaphor, there may be others for whom it is emphatically more than a metaphor—but rather a sacrament.

D: In the Catholic sense?

F: Yes.

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F: I mean that if we could say clearly what is meant by the proposition "the bread and wine is *not* 'sort of' the body and blood"; then we should know more about what we mean when we say either that the swan is "sort of" human or that the ballet is a sacrament.

D: Well—how do you tell the difference?

F: Which difference?

D: Between a sacrament and a metaphor.

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F: Wait a minute. We are, after all, talking about the performer or the artist or the poet, or a given member of the audience. You ask me how I tell the difference between a sacrament and a metaphor. But my answer must deal with the person and not the message. You ask me how I would decide whether a certain dance on a certain day is or is not sacramental for the particular dancer.

D: All right—but get on with it.

F: Well—I think it's a sort of a secret.

D: You mean you won't tell me?

F: No—it's not that sort of secret. It's not something that one must not tell. It's something that one *cannot* tell.

D: What do you mean? Why not?

F: Let us suppose I asked the dancer, "Miss X, tell me, that dance which you perform—is it for you a sacrament or a mere metaphor?" And let us imagine that I can make this question intelligible. She will perhaps

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put me off by saying, "You saw it—it is for you to decide, if you want to, whether or not it is sacramental for you." Or she might say, "Sometimes it is and sometimes it isn't." Or "How was I, last night?" But in any case she can have no direct control over the matter.

* * *

D: Do you mean that anybody who knew this secret would have it in their power to be a great dancer or a great poet?

F: No, no, no. It isn't like that at all. I mean first that great art and religion and all the rest of it is about this secret; but knowing the secret in an ordinary conscious way would not give the knower control.

* * *

D: Daddy, what has happened? We were trying to find out what "sort of" means when we say that the swan is "sort of" human. I said that there must be two senses of "sort of." One in the phrase "the swan figure is a 'sort of' swan, and another in the phrase "the swan figure is 'sort of' human." And now you are talking about mysterious secrets and control.

F: All right. I'll start again. The swan figure is not a real swan but a pretend swan. It is also a pretend-not human being. It is also "really" a young lady wearing a white dress. And a real swan would resemble a young lady in certain ways.

D: But which of these is sacramental?

F: Oh Lord, here we go again. I can only say this: that it is not one of these statements but their combination which constitutes a sacrament. The "pretend" and the "pretend-not" and the "really" somehow get fused together into a single meaning.

D: But we ought to keep them separate.

F: Yes. That is what the logicians and the scientists try to do. But they do not create ballets that way—nor sacraments.

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Metalogue: What Is an Instinct?*

Daughter: Daddy, what is an instinct?
Father: An instinct, my dear, is a 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.

D: Do you mean that you cannot use one explanatory principle to explain another? Never?
F: Hmm . . . hardly ever. That is what Newton meant when he said, "*hypotheses non fingo.*"
D: And what does that mean? Please.
F: Well, you know what "hypotheses" are. Any statement

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linking together two descriptive statements is an hypothesis. If you say that there was a full moon on February 1st and another on March 1st; and then you link these two observations together in any way, the statement which links them is an hypothesis.

D: Yes—and I know what *non* means. But what's *fingo?*

F: Well—*fingo* is a late Latin word for "make." It forms a verbal noun *fictio* from which we get the word "fiction."

D: Daddy, do you mean that Sir Isaac Newton thought that all hypotheses were just *made up* like stories?

F: Yes—precisely that.

D: But didn't he discover gravity? With the apple?

F: No, dear. He invented it.

D: Oh. . . . Daddy, who invented instinct?

F: I don't know. Probably biblical.

D: But if the idea of gravity links together two descriptive statements, it must be an hypothesis.

F: That's right.

D: Then Newton did *fingo* an hypothesis after all.

F: Yes—indeed he did. He was a very great scientist.

D: Oh.

D: Daddy, is an explanatory principle the same thing as an hypothesis?

F: Nearly, but not quite. You see, an hypothesis tries to explain some particular something but an explanatory principle—like "gravity" or "instinct"—really explains nothing. It's a sort of conventional agreement between scientists to stop trying to explain things at a certain point.

D: Then is that what Newton meant? If "gravity" explains nothing but is only a sort of full stop at the end of a line of explanation, then inventing gravity was not the same as inventing an hypothesis, and he could say he did not *fingo* any hypotheses.

F: That's right. There's no explanation of an explanatory principle. It's like a black box.

D: Oh.

D: Daddy, what's a black box?

F: A "black box" is a conventional agreement between

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scientists to stop trying to explain things at a certain point. I guess it's usually a temporary agreement.

D: But that doesn't sound like a black box.

F: No—but that's what it's called. Things often don't sound like their names.

D: No.

F: It's a word that comes from the engineers. When they draw a diagram of a complicated machine, they use a sort of shorthand. Instead of drawing all the details, they put a box to stand for a whole bunch of parts and label the box with what that bunch of parts is supposed to *do*.

D: So a "black box" is a label for what a bunch of things are supposed to do. . . .

F: That's right. But it's not an explanation of *how* the bunch works.

D: And gravity?

F: Is a label for what gravity is supposed to do. It's not an explanation of how it does it.

D: Oh.

D: Daddy, what is an instinct?

F: It's a label for what a certain black box is supposed to do.

D: But what's it supposed to do?

F: Hm. That is a very difficult question . . .

D: Go on.

F: Well. It's supposed to control—partly control—what an organism does.

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.

D: What did you mean by "partly control"?

F: Well. If an animal falls down a cliff, its falling is controlled by gravity. But if it wiggles while falling, that might be due to instinct.

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D: Self-preservative instinct?

F: I suppose so.

D: What is a self, Daddy? Does a dog know it has a self?

F: I don't know. But if the dog does know it has a self, and it wiggles in order to preserve that self, then its wiggling is *rational*, not instinctive.

D: Oh. Then a "self-preservative instinct" is a contradiction.

F: Well, it's a sort of halfway house on the road to anthropomorphism.

D: Oh. That's bad.

F: But the dog might *know* it had a self and not know that that self should be preserved. It would then be rational to *not* wiggle. So if the dog still wiggles, this would be instinctive. But if it *learned* to wiggle, then it would not be instinctive.

D: Oh.

D: What would not be instinctive, Daddy? The learning or the wiggling?

F: No—just the wiggling.

D: And the *learning* would be instinctive?

F: Well . . . yes. Unless the dog had to *learn* to learn.

D: Oh.

D: But, Daddy, what is instinct supposed to explain?

F: I keep trying to avoid that question. You see, instincts were invented before anybody knew anything about genetics, and most of modern genetics was discovered before anybody knew anything about communication theory. So it is doubly difficult to translate "instinct" into modern terms and ideas.

D: Yes, go on.

F: Well, you know that in the chromosomes, there are genes; and that the genes are some sort of messages which have to do with how the organism develops and with how it behaves.

D: Is developing different from behaving, Daddy? What's the difference? And which is learning? Is it "developing" or "behaving?"

F: No! No! Not so fast. Let's avoid those questions by putting developing-learning-behavior all together in one basket. A single spectrum of phenomena. Now let's try

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to say how instinct contributes to explaining this spectrum.

D: But is it a spectrum?

F: No—that's only a loose way of talking.

D: Oh.

D: But isn't instinct all on the behavior end of that "spectrum"? And isn't learning all determined by environment and not chromosomes?

F: Let's get this clear—that there is no behavior and no anatomy and no learning in the chromosomes themselves.

D: Don't they have their own anatomy?

F: Yes, of course. And their own physiology. But the anatomy and physiology of the genes and chromosomes is *not* the anatomy and physiology of the whole animal.

D: Of course not.

F: But it is *about* the anatomy and physiology of the whole animal.

D: Anatomy *about* anatomy?

F: Yes, just as letters and words have their own forms and shapes and those shapes are parts of words or sentences and so on—which may be *about* anything.

D: Oh.

D: Daddy, is the anatomy of the genes and chromosomes about the anatomy of the whole animal? And the physiology of the genes and chromosomes about the physiology of the whole animal?

F: No, no. There is no reason to expect that. It's not like that. Anatomy and physiology are not separate in that way.

D: Daddy, are you going to put anatomy and physiology together in one basket, like you did developing-learning-behavior?

F: Yes. Certainly.

D: Oh.

D: The *same* basket?

F: Why not? I think *developing* is right in the middle of that basket. Right smack in the middle.

D: Oh.

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D: If chromosomes and genes have anatomy and physiology, they must have development.

F: Yes. That follows.

D: Do you think their development could be *about* the development of the whole organism?

F: I don't even know what that question would mean.

D: I do. It means that the chromosomes and genes would be changing or developing somehow while the baby is developing, and the changes in the chromosomes would be *about* the changes in the baby. Controlling them or *partly* controlling them.

F: No. I don't think so.

D: Oh.

D: Do chromosomes *learn?*

F: I don't know.

D: They do sound rather like black boxes.

F: Yes, but if chromosomes or genes can learn, then they are much more complicated black boxes than anybody at present believes. Scientists are always assuming or hoping that things are simple, and then discovering that they are not.

D: Yes, Daddy.

D: Daddy, is that an instinct?

F: Is what an instinct?

D: Assuming that things are simple.

F: No. Of course not. Scientists have to be taught to do that.

D: But I thought no organism could be taught to be wrong *every* time.

F: Young lady, you are being disrespectful and wrong. In the first place, scientists are not wrong every time they assume that things are simple. Quite often they are right or partly right and still more often, they think they are right and tell each other so. And that is enough reinforcement. And, anyhow you are wrong in saying that no organism can be taught to be wrong every time.

D: When people say that something is "instinctive," are they trying to make things simple?

F: Yes, indeed.

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D: And are they wrong?

F: I don't know. It depends on what they mean.

D: Oh.

D: *When* do they do it?

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 something 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.

D: Are habits always *twice* learned?

F: What do you mean?

D: I mean—when I learn a set of chords on the guitar, first I learn them or find them; and then later when I practice, I get the *habit* of playing them that way. And sometimes I get bad habits.

F: Learning to be wrong *every* time?

D: Oh—all right. But what about that twice-over business? Would *both* parts of learning be not there if guitar playing were instinctive?

F: Yes. If both parts of learning were clearly not there, scientists might say that guitar playing is instinctive.

D: But what if only one part of learning was missing?

F: Then, logically, the missing part could be explained by "instinct."

D: Could *either* part be missing?

F: I don't know. I don't think anybody knows.

D: Oh.

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D: Do birds *practice* their songs?
F: Yes. Some birds are said to practice.
D: I guess instinct gives them the first part of singing, but they have to work on the second part.
F: Perhaps.

D: Could *practicing* be instinctive?
F: I suppose it could be—but I am not sure what the word "instinct" is coming to mean in this conversation.
D: It's an explanatory principle, Daddy, just like you said. . . . There's one thing I don't understand.
F: Yes?
D: Is there a whole lot of instinct? Or are there lots of instincts?
F: Yes. That's a good question, and scientists have talked a great deal about it, making lists of separate instincts and then lumping them together again.
D: But what's the answer?
F: Well. It's not quite clear. But one thing is certain: That explanatory principles must be not multiplied beyond necessity.
D: And that means? Please?
F: It's the idea behind monotheism—that the idea of one big God is to be preferred to the idea of two little gods.
D: Is God an explanatory principle?
F: Oh, yes—a very big one. You shouldn't use two black boxes—or two instincts—to explain what one black box would explain . . .
D: If it were big enough.
F: No. It means . . .
D: Are there big instincts and little instincts?
F: Well—as a matter of fact, scientists do talk as if there were. But they call the little instincts by other names —"reflexes," "innate releasing mechanisms," "fixed action patterns," and so on.
D: I see—like having one big God to explain the universe and lots of little "imps" or "goblins" to explain the small things that happen.
F: Well, yes. Rather like that.

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D: But, Daddy, how do they lump things together to make the big instincts?

F: Well, for example, they don't say that the dog has one instinct which makes it wiggle when it falls down the cliff and another which makes it run away from fire.

D: You mean those would both be explained by a self-preservative instinct?

F: Something like that. Yes.

D: But if you put those different acts together under one instinct, then you cannot get away from saying that the dog has the use of the notion of "self."

F: No, perhaps not.

D: What would you do about the instinct for the song and the instinct for practicing the song?

F: Well—depending on what the song is used for. Both song and practice might be under a territorial instinct or a sexual instinct.

D: I wouldn't put them together.

F: No?

D: Because what if the bird also practiced picking up seed or something? You'd have to multiply the instincts —what is it?—beyond necessity.

F: What do you mean?

D: I mean a food-getting instinct to explain the practicing picking up seed, and a territory instinct for practicing song. Why not have a *practicing* instinct for both? That saves one black box.

F: But then you would throw away the idea of lumping together under the same instinct actions which have the same purpose.

D: Yes—because if the practicing is for a purpose—I mean, if the *bird* has a purpose—then the practicing is *rational* and not instinctive. Didn't you say something like that?

F: Yes, I did say something like that.

D: Could we do without the idea of "instinct"?

F: How would you explain things then?

D: Well. I'd just look at the little things: When something goes "pop," the dog jumps. When the ground is not under his feet, he wiggles. And so on.

F: You mean—all the imps but no gods?

D: Yes, something like that.

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F: Well. There are scientists who try to talk that way, and it's becoming quite fashionable. They say it is more *objective*.
D: And is it?
F: Oh, yes.

D: What does "objective" mean?
F: Well. It means that you look very hard at those things which you choose to look at.
D: That sounds right. But how do the objective people choose which things they will be objective about?

F: Well. They choose those things about which it is easy to be objective.
D: You mean easy for them?
F: Yes.
D: But how do they *know* that those are the easy things?
F: I suppose they try different things and find out by experience.
D: So it's a subjective choice?
F: Oh, yes. All experience is subjective.
D: But it's *human* and subjective. They decide which bits of animal behavior to be objective about by consulting human subjective experience. Didn't you say that anthropomorphism is a bad thing?
F: Yes—but they do try to be not human.

D: Which things do they leave out?
F: What do you mean?
D: I mean—subjective experience shows them which things it is easy to be objective about. So, they go and study those things. But which things does their experience show are difficult? So that they avoid those things. Which are the things they avoid?
F: Well, you mentioned earlier something called "practice." That's a difficult thing to be objective about. And there are other things that are difficult in the same sort of way. *Play*, for example. And *exploration*. It's difficult to be objective about whether a rat is *really* exploring or *really* playing. So they don't investigate those things. And then there's love. And, of course, hate.

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D: I see. Those are the sorts of things that I wanted to invent separate instincts for.

F: Yes—those things. And don't forget humor.

D: Daddy—are animals objective?

F: I don't know—probably not. I don't think they are subjective either. I don't think they are split that way.

D: Isn't it true that people have a special difficulty about being objective about the more animal parts of their nature?

F: I guess so. Anyhow Freud said so, and I think he was right. Why do you ask?

D: Because, oh dear, those poor people. They try to study animals. And they specialize in those things that they can study objectively. And they can only be objective about those things in which they themselves are least like animals. It must be difficult for them.

F: No—that does not necessarily follow. It is still possible for people to be objective about *some* things in their animal nature. You haven't shown that the whole of animal behavior is within the set of things that people cannot be objective about.

D: No?

D: What are the really big differences between people and animals?

F: Well—intellect, language, tools. Things like that.

D: And it is easy for people to be intellectually objective in language and about tools?

F: That's right.

D: But that must mean that in people there is a whole set of ideas or whatnot which are all tied together. A sort of second creature within the whole person, and that second creature must have a quite different way of thinking about everything. An objective way.

F: Yes. The royal road to consciousness and objectivity is through language and tools.

D: But what happens when this creature looks at all those parts of the person about which it is difficult for people to be objective? Does it just look? Or does it meddle?

F: It meddles.

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D: And what happens?
F: That's a very terrible question.
D: Go on. If we are going to study animals, we must face that question.
F: Well . . . The poets and artists know the answer better than the scientists. Let me read you a piece:

> *Thought* chang'd the infinite to a serpent, that which pitieth
> To a devouring flame; and man fled from its face and hid
> In forests of night: then all the eternal forests were divided
> Into earths rolling in circles of space, that like an ocean rush'd
> And overwhelmed all except this finite wall of flesh.
> Then was the serpent temple form'd, image of infinite
> Shut up in finite revolutions; and man became an Angel,
> Heaven a mighty circle turning, God a tyrant crown'd.*

D: I don't understand it. It sounds terrible, but what does it mean?
F: Well. It's not an objective statement, because it is talking about the *effect* of objectivity—what the poet calls here "thought" upon the whole person or the whole of life. "Thought" should remain a part of the whole but instead spreads itself and meddles with the rest.
D: Go on.
F: Well. It slices everything to bits.
D: I don't understand.
F: Well, the first slice is between the objective thing and the rest. And then *inside* the creature that's made in the model of intellect, language, and tools, it is natural that *purpose* will evolve. Tools are for purposes and anything which blocks purpose is a hindrance. The world of the objective creature gets split into "helpful" things and "hindering" things.
D: Yes. I see that.
F: All right. Then the creature applies that split to the world of the whole person, and "helpful" and "hinder-

*Blake, W., 1794, *Europe a Prophecy*, printed and published by the author. (Italics added.)

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ing" become Good and Evil, and the world is then split between God and the Serpent. And after that, more and more splits follow because the intellect is always classifying and dividing things up.

D: Multiplying explanatory principles beyond necessity?

F: That's right.

D: So, inevitably, when the objective creature looks at animals, it splits things up and makes the animals look like human beings *after* their intellects have invaded their souls.

F: Exactly. It's a sort of inhuman anthropomorphism.

D: And that is why the objective people study all the little imps instead of the larger things?

F: Yes. It's called S-R psychology. It's easy to be objective about sex but not about love.

D: Daddy, we've talked about two ways of studying animals—the big instinct way and the S-R way, and neither way seemed very sound. What do we do now?

F: I don't know.

D: Didn't you say that the royal road to objectivity and consciousness is language and tools? What's the royal road to the other half?

F: Freud said dreams.

D: Oh.

D: What are dreams? How are they put together?

F: Well—dreams are bits and pieces of the stuff of which we are made. The non-objective stuff.

D: But how are they put together?

F: Look. Aren't we getting rather far from the question of explaining animal behavior?

D: I don't know, but I don't think so. It looks as if we are going to be anthropomorphic in one way or another, whatever we do. And it is obviously wrong to build our anthropomorphism on that side of man's nature in which he is most unlike the animals. So let's try the other side. You say dreams are the royal road to the other side. So . . .

F: I didn't. Freud said it. Or something like it.

D: All right. But how are dreams put together?

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F: Do you mean how are two dreams related to each other?

D: No. Because, as you said, they are only bits and pieces. What I mean is: How is a dream put together inside itself? Could animal behavior be put together in the same sort of way?

F: I don't know where to begin.

D: Well. Do dreams go by opposites?

F: Oh Lord! The old folk idea. No. They don't predict the future. Dreams are sort of suspended in time. They don't have any tenses.

D: But if a person is afraid of something which he knows will happen tomorrow, he might dream about it tonight?

F: Certainly. Or about something in his past. Or about both past and present. But the dream contains no label to tell him what it is "about" in this sense. It just is.

D: Do you mean it's as if the dream had no title page?

F: Yes. It's like an old manuscript or a letter that has lost its beginning and end, and the historian has to guess what it's all about and who wrote it and when—from what's *inside* it.

D: Then we're going to have to be objective, too?

F: Yes indeed. But we know that we have to be careful about it. We have to watch that we don't force the concepts of the creature that deals in language and tools upon the dream material.

D: How do you mean?

F: Well. For example: if dreams somehow have not tenses and are somehow suspended in time, then it would be forcing the wrong sort of objectivity to say that a dream "predicts" something. And equally wrong to say it is a statement about the past. It's not history.

D: Only propaganda?

F: What do you mean?

D: I mean—is it like the sort of stories that propagandists write which they say are history but which are really only fables?

F: All right. Yes. Dreams are in many ways like myths and fables. But not consciously made up by a propagandist. Not planned.

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D: Does a dream always have a moral?

F: I don't know about *always*. But *often*, yes. But the moral is not stated in the dream. The psychoanalyst tries to get the patient to find the moral. Really the whole dream is the moral.

D: What does that mean?

F: I don't quite know.

D: Well. Do dreams go by opposites? Is the moral the opposite of what the dream seems to say?

F: Oh yes. Often. Dreams often have an ironic or sarcastic twist. A sort of *reductio ad absurdum*.

D: For example?

F: All right. A friend of mine was a fighter pilot in World War II. After the war he became a psychologist and had to sit for his Ph. D. oral exam. He began to be terrified of the oral, but, the night before the exam, he had a nightmare in which he experienced again being in a plane which had been shot down. Next day he went into the examination without fear.

D: Why?

F: Because it was silly for a fighter pilot to be afraid of a bunch of university professors who couldn't *really* shoot him down.

D: But how did he know that? The dream could have been telling him that the professors *would* shoot him down. How did he know it was ironic?

F: Hmm. The answer is he didn't know. The dream doesn't have a label on it to say it is ironic. And when people are being ironic in waking conversation, they often don't tell you they are being ironic.

D: No. That's true. I always think it's sort of cruel.

F: Yes. It often is.

D: Daddy, are animals ever ironic or sarcastic?

F: No. I guess not. But I am not sure that those are quite the words we should use. "Ironic" and "sarcastic" are words for the analysis of message material in language. And animals don't have language. It's perhaps part of the wrong sort of objectivity.

D: All right. Then do animals deal in opposites?

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F: Well, yes. As a matter of fact, they do. But I'm not sure it's the same thing . . .

D: Go on. *How* do they? And when?

F: Well. You know how a puppy lies on his back and presents his belly to a bigger dog. That's sort of inviting the bigger dog to attack. But it works in the opposite way. It stops the bigger dog from attacking.

D: Yes. I see. It is a sort of use of opposites. But do they *know* that?

F: You mean does the big dog know that the little dog is saying the opposite of what he means? And does the little dog know that that is the way to stop the big dog?

D: Yes.

F: I don't know. I sometimes think the little dog knows a little more about it than the big dog. Anyhow, the little dog does not give any signals to show that he knows. He obviously couldn't do that.

D: Then it's like the dreams. There's no label to say that the dream is dealing in opposites.

F: That's right.

D: I think we're getting somewhere. Dreams deal in opposites, and animals deal in opposites, and neither carries labels to say when they are dealing in opposites.

F: Hmm.

D: Why do animals fight?

F: Oh, for many reasons. Territory, sex, food . . .

D: Daddy, you're talking like instinct theory. I thought we agreed not to do that.

F: All right. But what sort of an answer do you want to the question, why animals fight?

D: Well. Do they deal in opposites?

F: Oh. Yes. A lot of fighting ends up in some sort of peace-making. And certainly playful fighting is partly a way of affirming friendship. Or discovering or rediscovering friendship.

D: I thought so. . . .

D: But why are the labels missing? Is it for the same reason in both animals and dreams?

F: I don't know. But, you know, dreams do not always deal in opposites.

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D: No—of course not—nor do animals.

F: All right then.

D: Let's go back to that dream. Its total effect on the man was the same as if somebody had said to him, " 'you in a fighter plane' is not equal to 'you in an oral exam.' "

F: Yes. But the dream didn't spell that out. It only says, "you in a fighter plane." It leaves out the "not," and it leaves out the instruction to compare the dream with something else and it doesn't say what he should compare it with.

D: All right. Let's take the "not" first. Is there any "not" in animal behavior?

F: How could there be?

D: I mean can an animal say by its actions, "I will not bite you"?

F: Well, to begin with. Communication by actions cannot possibly have tenses. They are only possible in language.

D: Didn't you say that dreams have no tenses?

F: Hmm. Yes, I did.

D: Okay. But what about "not". Can the animal say, "I am not biting you"?

F: That still has a tense in it. But never mind. If the animal *is* not biting the other, he's not biting it, and that's it.

D: But he might be not doing all sorts of other things, sleeping, eating, running, and so on. How can he say, "It's biting that I'm not doing"?

F: He can only do that if biting has somehow been mentioned.

D: Do you mean that he could say, "I am not biting you" by first showing his fangs and *then* not biting?

F: Yes. Something like that.

D: But what about *two* animals? They'd both have to show their fangs.

F: Yes.

D: And, it seems to me, they might misunderstand each other, and get into a fight.

F: Yes. There is always that danger when you deal in opposites and do not or cannot say what you are doing, especially when you do not *know* what you are doing.

D: But the animals would know that they bared their fangs in order to say, "I won't bite you."

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F: I doubt whether they would know. Certainly neither animal knows it about the other. The dreamer doesn't know at the beginning of the dream how the dream is going to end.

D: Then it's a sort of experiment. . . .

F: Yes.

D: So they might get into a fight in order to find out whether fighting was what they had to do.

F: Yes—but I'd rather put it less purposively—that the fight shows them what sort of relationship they have, after it. It's not planned.

D: Then "not" is really not there when the animals show their fangs?

F: I guess not. Or often not. Perhaps old friends might engage in playful fighting and know at the beginning what they are doing.

D: All right. Then the "not" is absent in animal behavior because "not" is part of verbal language, and there cannot be any action signal for "not." And because there is no "not," the only way to agree on a negative is to act out the whole *reductio ad absurdum*. You have to act out the battle to prove it isn't one, and then you have to act out the submission to prove that the other won't eat you.

F: Yes.

D: Did the animals have to think that out?

F: No. Because it's all *necessarily* true. And that which is necessarily true will govern what you do regardless of whether you know that it is necessarily true. If you put two apples with three apples you will get five apples—even though you cannot count. It's another way of "explaining" things.

D: Oh.

D: But, then, why does the dream leave out the "not"?

F: I think really for a rather similar reason. Dreams are mostly made of images and feelings, and if you are going to communicate in images and feelings and such, you again are governed by the fact that there is no image for "not."

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at it. If this be true of a culture seen in synchronic section, then it must also apply to the diachronic processes of culture contact and change; and we must expect that for the offering, acceptance or refusal of every trait that are simultaneous causes of an economic, structural, sexual, and religious nature.

(6) From this it follows that our categories "religious," "economic," etc., are not *real* subdivisions which are present in the cultures which we study, but are merely *abstractions* which we make for our own convenience when we set out to describe cultures in words. They are not phenomena present in culture, but are labels for various points of view which we adopt in our studies. In handling such abstractions we must be careful to avoid Whitehead's "fallacy of misplaced concreteness," a fallacy into which, for example, the Marxian historians fall when they maintain that economic "phenomena" are "primary."

With this preamble, we may now consider an alternative scheme for the study of contact phenomena.

(7) *Scope of the inquiry* I suggest that we should consider under the head of "culture contact" not only those cases in which the contact occurs between two communities with different cultures and results in profound disturbance of the culture of one or both groups; but also cases of contact within a single community. In these cases the contact is between differentiated groups of individuals, *e.g.*, between the sexes, between old and young, between aristocracy and plebs, between clans, etc., groups which live together in approximate equilibrium. I would even extend the idea of "contact" so widely as to include those processes whereby a child is molded and trained to fit the culture into which he was born,[3] but for the present we may confine ourselves to contacts between groups of individuals, with different cultural norms of behavior in each group.

(8) If we consider the possible end of the drastic distur-

[3] The present scheme is oriented toward the study of social rather than psychological processes, but a closely analogous scheme might be constructed for the study of psychopathology. Here the idea of "contact" would be studied, especially in the contexts of the molding of the individual, and the processes of schismogenesis would be seen to play an important part not only in accentuating the maladjustments of the deviant, but also in assimilating the normal individual to his group.

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Gregory Bateson (1904–1980) was the son of pioneer geneticist William Bateson and the husband of renowned anthropologist Margaret Mead. His work spanned many fields, from anthropology and communication theory to his studies of alcoholism and schizophrenia at the Veterans Administration Hospital in Palo Alto, California. His classic works include *Naven, Balinese Character,* coauthored with Margaret Mead, and *Mind and Nature*.

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