ON THE DOMESTICATION OF MAGIC

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In one of those gracious old-world apartments that can still be found in New York City's Greenwich Village, a late afternoon happening was being nurtured. One of the guests had demonstrated the efficacy of a dowsing rod that had been used for generations by a New England farm family to locate hidden sources of well water. This forked stick came alive in the hands of any user even when it was brought close to the water taps in the kitchen. Since the day was hot, the door to the public hall was left open for ventilation. There was no air conditioning. Suddenly, a six-year-old boy from the apartment across the hall burst in upon the gathering. He was a familiar and always welcome visitor. He loved to share in the games his generous adult neighbors played. The hostess put the dowsing rod in his hand and told him to bring it near the water tap. The forked stick came properly alive in his hands too. "What do you think of that, Kenneth?" he was asked. He handed the instrument back to the hostess and reached for an apple on the kitchen table. "Oh, it's only magic," he said, and left the room munching on the fruit.

We are not at home, as children briefly are, in the presence of wonder and novelty. We need to know with certainty why things are as they are. We have an ever-decreasing tolerance for ambiguity, a reluctance to suspend disbelief for very long. Playfulness cannot be sustained, nor can we accept the notion that it possesses any cognitive value or virtue. We forget that to be serious one is not required to be solemn. And yet joyfulness is a proper condition for any quest or query and the results of these undertakings can make our worlds different and sometimes better than they were.

In the making of something new, be it a dance or a dam or a mathematical equation, we begin and are sustained in our efforts by play, play that can be elegant and serious but that helps us to surge over great difficulties through the sheer fun of the effort. And we should never

forget that the fun aspect of play is extra-rational. It cannot be explained through the fractional distillation of its elements. It is, so to speak, a psychic resource, available when needed, especially to the healthy mind. It has always been with us.

Johan Huizinga, in his marvelous and too long neglected book, *Homo Ludens,* observes that ". . . the incidence of play is not associated with any particular stage of civilization or view of the universe," that ". . . the very existence of play continually confirms the supralogical nature of the human situation," and that "the great archetypal activities of human society are all permeated with play from the start." [1] Here he is speaking of language, myth and ritual, especially as they are transmogrified on grand occasions, by individual or collective creative impulses.

Leo Frobenius is precisely to the point in this when he comments that " '. . . the creative faculty in a people as in the child or every creative person springs from this state of being seized. . . . Man is seized by the revelation of fate. . . . The reality of the natural rhythm of genesis and extinction has seized hold of his consciousness, and this, inevitably and by reflex action, leads him to represent his emotion in an act.' " [2]

This "seizure," however, is neither a divine madness nor a fecund frenzy but the commonplace response a human being makes when he suddenly sees familiar objects or events from a fresh point of view. He becomes intoxicated by possibilities. In this sense, then, everyone is "creative," or can be. And the product of such creativity can be a new commonplace or an old awareness suddenly filled with new meaning.

In itself the occasion or the product may be trivial or ephemeral, but anyone who has ever been a teacher knows the seductiveness of its implications. There is a brooding power in man to be unleashed. There is a productive potency that must be allowed to flourish. We know so much more than we used to know about how we learn and why we learn. We even know how to make a better world.

Consider Abraham H. Maslow: "We now know something about how to set up the conditions in which the needs of the individual become synergic with, not opposed to, the needs of society, and in which they both work to the same ends. . . . Apparently all people, or almost all people, have peak experiences or ecstasies. The question might be asked in terms of the single, most joyous, happiest, most blissful moment of your whole life. You might ask how did you feel different about yourself at that time? How did the world look different? What did you feel like? What were your impulses? How did you change if you did?" [3]

Such questions are pedagogically and therapeutically seductive. There

is an ineluctable eagerness to cherish and to extend the occasion. There is a tendency to make it carry some instructional or healing freight which can be submitted to only at considerable professional peril.

Bruno Bettelheim is a salutary corrective here: "Education . . . shows a parallel influence of psychoanalysis. We see it most typically in the tendency to applaud almost any disorganized thing that a child does because it reveals something. Or by viewing what he does as 'creative' even when it is just an instinctual expression—such as smearing with paint or an outpouring in words of some formless inner pressure." [4] Bettelheim says that there is nothing either wrong or destructive about these expressions as such—but, ". . . it becomes damaging if the educator who should know better fools himself and the child into believing that if something has meaning as *id* expression, it is therefore ego-correct (contains a meaningful message to others), which is not true." [5]

It is not true and it is demeaning to the adult hidden within the child to pretend that it is true. There is potential for creative activity in almost any child, and anyone who would teach that child anything must provide occasions for the employment of that potential. Gardner Murphy suggests that ". . . the creative teacher . . . can represent the mature evaluative judgment of the social order. He can help the creator to create if he can share in the creator's struggle." But, Murphy warns, ". . . if the energy is too great to pour itself into existing channels, there is, inevitably, a spilling over; and this spilling over will take a structural rather than a chaotic form insofar as the habit of looking for structure is ingrained and waiting for the task; insofar as one is *open* to structured reality." [6]

True creativeness, whether in an artist or a craftsman, entails at least three conditions: there must be a response to a novel or rare idea or occasion; that response, in thought and action, must in some way be unique; that response must in some way solve the problem inherent in the idea or occasion and do so in such a manner that the completed act becomes a validation of the entire process. There is a resolution of a problem. A goal is gained. A skill or a talent is raised to a higher level of performance. A part of the world is shattered and remolded "nearer to the heart's desire."

Donald W. MacKinnon, in his Yale lecture, "The Nature and Nurture of Creative Talent," speaks of creativity as ". . . a process extended in time and characterized by originality, adaptiveness, and realization. It may be brief, as in a musical improvisation, or it may involve a considerable span of years as was required for Darwin's creation of the theory of evolution." [7]

MacKinnon reports on his investigations of the life styles and personal characteristics of creative persons and found them to share certain characteristics both in the way they responded to the investigation itself and in the traits they exhibited in their creative endeavors, with the exception of their initial response to the invitation to reveal themselves.

MacKinnon reports that ". . . at the one extreme there have been those who replied in anger at what they perceived to be the audacity of psychologists in presuming to study so ineffable and mysterious a thing as the creative process and so sensitive a being as a creative person. At the other extreme were those who replied courteously and warmheartedly, welcoming the invitation to be studied, and manifesting even an eagerness to contribute to a better understanding of the creative person and the creative process." [8]

MacKinnon and his colleagues who studied scientists and artists, architects and musicians, found insofar as the relation between creativity and intelligence was concerned, ". . . save for mathematicians where there is a low positive correlation between intelligence and the level of creativeness, we have found within our creative samples essentially zero relationship between the two variables, and this is not due to a narrow restriction in range of intelligence." [9] Further, he reports that ". . . above a certain required minimum level of intelligence which varies from field to field and in some instances may be surprisingly low, being more intelligent does not guarantee a corresponding increase in creativeness. It just is not true that the more intelligent person is necessarily the more creative one." [10]

A demurrer must be immediately entered here. With two such semantically unstable terms as "intelligence" and "creativity," one must be wary. The poet's calipers are gentler than the gynecologist's forceps. So long as we, especially in the United States and Western Europe, insist on numerical scales for intelligence, so long as we feed our Thorndikean passion for measuring everything that moves, our universe will be limited by the bell curve of "normal" distribution and we will continue to be strangers to ambiguity.

So far as MacKinnon is concerned, "The evidence is clear: The more creative a person is the more he reveals an openness to his own feelings and emotions, a sensitive intellect and understanding self-awareness, and wide-ranging interests including many that in the American culture are thought of as feminine. In the realm of sexual identification and interests, our creative subjects appear to give more expression to the feminine side of their nature than do less creative persons." [11]

One characteristic shared by all the creative groups examined was a clear preference ". . . for the complex and the asymmetrical, and in

general the more creative a person is the stronger is this preference." [12] It is not so much that creative people like disorder as such, it is rather that they prefer the richness of the disordered to the stark barrenness of the simple. They are relatively disinterested in small details or in facts for the sake of facts. They are interested in shadings, in nuances, in subtleties. They tend to talk easily and effectively about their interests, no matter how restricted the vocabulary they use. They tend *not* to be very concerned with controlling their own impulses or those of others. Creative people have a capacity for tolerating the tensions that strong opposing values produce within themselves and are somehow able eventually to reconcile or recreate them. "For the truly creative person it is not sufficient that problems be solved; there is the further demand that the solutions be elegant. He seeks both truth and beauty." [13]

These findings appear to echo the wise observation of Frances G. Wickes: "The art of living is, in its essential meaning, a development and transformation of the power of inward choice. It is of all the creative arts the most difficult and the most distinguished. Its products are fashioned in the workshop of the soul whose windows open upon inner and outer worlds." [14]

Those "inner choices" are the products of fortunate early lives in families that were wisely tolerant of the often unknowingly talented child. MacKinnon and his colleagues studied the childhood experiences of a group of architects and found that the parents had "an extraordinary respect for the child and confidence in his ability to do what was appropriate." [15] "There were not strong emotional ties of either a positive or a negative sort between parent and child, but neither was there the type of relationship that fosters overdependency nor the type that results in severe rejection. Thus, if there was a certain distance in the relationship between child and parent, it had a liberating effect so far as the child was concerned." [16]

Perhaps even more important, in almost all instances it seemed that ". . . within the family there existed clear standards of conduct and ideas as to what was right and wrong but at the same time an expectation if not requirement of active exploration and internalization of a framework of personal conduct. Discipline was almost always consistent and predictable. In most cases there were rules, family standards, and parental injunctions which were known explicitly by the children and seldom infringed." [17]

From all of the foregoing it would seem inescapable that we have vastly overestimated, in our educational systems, the role of intelligence in creative achievement. For if we make it clear that a child below a

certain pedagogically certified "level of intelligence" is not expected to respond creatively to a task, we reduce the possibility that he will. Exempt the child from creative encounters and in a few years time we have trained his "incapacity." We will have created a dullard.

MacKinnon reports that his ". . . data suggest . . . that if a person has the minimum of intelligence required for mastery of a field of knowledge, whether he performs creatively or banally in that field will be crucially determined by nonintellective factors." [18] These include openness to experience both within and without, tolerance of ambiguity, of messiness, of confusion, a neutral curiosity about novelty, a capacity to pay attention, to take pains, and an ability to immerse oneself in the undertaking.

Gardner Murphy speaks of the four phases of creativeness which begin with the long immersion of a sensitive mind in something that gives delight and leads to fulfillment in some form; that leads to the more formal acquisition and consolidation of experience; that results in the sudden "click" of inspiration, of hunch, of insight and produces new combinations of perception; and that finally results in a commitment, a "hammering out" of a product, an effect, an act.[19] One composes with fury and corrects with phlegm. For creativity, however defined or undertaken, involves some kind of ordering and all ordering proceeds by some kind of rational or self-consistent process towards goals that are perceived with increasing clarity as the means for achieving them are refined.

Discipline and self-control are essential. They must be learned if ever one is to become truly creative—but they must not be *over-learned.* Once having learned how to control a skill, how to manage a medium, be it words or paint or granite, one must be flexible, relaxed, at ease before the undertaking. MacKinnon warns that ". . . the danger for one's creative potential is not the judging or evaluating of one's experience but that one prejudges, thus excluding from perception large areas of experience." And he adds, "The danger in all parental instruction, as in all academic instruction, is that new ideas and new possibilities of action are criticized too soon and too often."

The creative potential must be nurtured, but equal emphasis must be placed upon perceptiveness. The entertainment of " . . . the most fantastic ideas and possibilities" must be encouraged. "It is the duty of parents to communicate and of professors to profess what they judge to be true, but it is no less their duty by example to encourage in their children and in their students an openness to all ideas and especially to those which most challenge . . . their own judgments." [20]

Abraham Kaplan's comments are apposite here: "Esthetics does not

produce art; but it may free both artist and audience from constraints that stand in the way of its creation and appreciation. I believe that the most important contribution that methodology can make to (art and) science is, in Peirce's phrase, to help unblock the roads to inquiry." [21] Out of chaos, the imagination frames a thing of beauty. "Real pioneering," as Cyrus Gordon has pointed out, "is not at home in highly developed disciplines." [22]

It is of course uncomfortable for parents and teachers to have to tolerate the consequence of this welcomed openness. It encourages skepticism in children and students. They take nothing on faith, merely because it has the voice of authority behind it. They become rebellious, but if their education is one of openness and security, they do not run counter to standards out of sheer rebelliousness. They may not be easy to live with as they learn to deal with themselves, their talents and the world, but they are always the sovereign hope of our future.

Joseph Campbell says, "It is amazing, really, to think that in our present world, with all its sciences and machines, megalopolitan populations, penetrations of space and time, night life and revolutions, so different (it would seem) from the God-filled world of the Middle Ages, young people should still exist among us who are facing in their minds, seriously, the same adventures as thirteenth-century Gottfried; challenging hell." [23]

They are the great "thought divers" of Herman Melville who ". . . have been diving and coming up with blood-shot eyes since the world began," who see things more deeply, differently, who ask unanswerable questions, who challenge hell and tame the ugliness of everyday life.

Gertrude Stein, that strange American earth-mother who lived outside of time and who thought that heaven must be a place where one can sit down and laugh, was such a thought diver who challenged hell.

She wrote in her essay on Picasso:

> All ages are heroic, that is to say there are heroes in all ages who do things because they cannot do otherwise and neither they nor the others understand how and why these things happen. One does not even understand, before they are completely created, what is happening and one does not at all understand what one has done until the moment when it is all done. Picassso said once that he who created a thing is forced to make it ugly. In the effort to create this intensity and the struggle to create this intensity, the result always produces a certain ugliness, those who follow can make of this thing a beautiful thing because they know what they are doing, the thing having already been invented, but the inventor because he does not know what he is going to invent inevitably the thing he makes must have its ugliness." [24]

Ugly, can of course be another word for strange, for novel, for the

different. The ugly demands attention, demands belief, requires the ministrations of magic if it is to be tolerated long enough to be known, long enough to be recreated, housebroken, as it were, made easy to live with.

This is easier to see and understand in cultures other than our own. "In place of science, the Eskimo has only magic to bridge the gap between what he can understand and what is not known. Without magic, his life would be one long panic." "The Eskimo says, 'What do we believe? We don't believe. We only fear.' "

So, we begin with fear, the unknowable terrors of the night and strange places. We call up magic to explain the inexplicable, to give us a feeling that we are placating the implacable, and so we fashion an "understanding" that allows us to give shape to the ugliness of the unknown, that allows us to make, to control, to create beauty which is an orderly openness, a still center in the churning world. It is the universal law of man's right to work, freed from the primal curse of toilsome survival. It is free entrance into the gambling casino of uncertainties and possibilities where the eternal quest is hedged in by the twin hurdles of fear and belief.

As John Dewey says, "We believe in the absence of knowledge or complete assurance. Hence the quest for certainty has always been an effort to transcend belief." [25] Every creative act is a partially successful effort to transcend belief. It is playing with the primordial fire. "For man, in spite of the new perils in which the machinery of his new arts of production and transportation have involved him, has learned to play with sources of danger." [26] Fourteen years after that statement was written, we unloosed the ultimate danger of the atomic nucleus and must now live with it forever.

The creative act is daring and dangerous. It arouses the dragons of the mind. It unlatches the controls of caution. It presumes to make tomorrow different from what is written in the sands of time.

Loren Eiseley observes that "The evolutionary wound we bear has been the creation of a thing abstracted out of time yet trapped within it: the mind, by chance distorted, locked into a white-ribbed cage which effervesces into air the moment it approaches wisdom. 'What shall be gained in thee,' wrote Melville, 'must needs be plucked at from the skies, and dived for in the deep, and featured in the unbodied air.' " [27]

Eiseley has said that he has at times been labeled a mystic because he has been unable to shut out wonder occasionally when he has looked at the world. Yet this is the only way that creativity can be wooed and welcomed. This is the only defensible posture for one who would teach anyone anything.

"Moving among innovators of ideas as we do," he says, "sifting and judging them daily, something of the suspicion with which the mass of mankind still tends to regard its own cultural creators falls upon the teacher who plays a role . . . in . . . cultural definition." [28] For all teaching is a form of showing others how to learn to read the world in which we live, its signs and portents, its strange regularities, its commonplace surprises and the traces of yesterday in a fossil or a folio. The teacher of children has a primary task of unlocking doors, opening gateways, and allowing discovery to happen.

I suspect that sometimes we are blinded by the image of the book *writ large,* the book as the special repository of wisdom, and power, and we forget that with the dazzling exception of the poet's work, the book is merely a data storage and retrieval system. (And, please understand by "poet," I mean novelist, dramatist, story-teller, philosopher, whoever it is who refuses to allow mere facts to stand in the way of truth.) I think I can explain this point best with a comment from the Nobel laureate Albert Szent-Gyorgyi:

> There is a widely spread misconception about the nature of books which contain knowledge. It is thought that such books are something, the contents of which have to be crammed into our heads. I think the opposite is closer to the truth. Books are there to keep the knowledge *in* while we use our heads for something better. Books may also be a better *place* for such knowledge. In my own head any book-knowledge has a half-life of a very few weeks. So, I leave knowledge, for safekeeping, to books and libraries and go fishing, sometimes for fish, sometimes for new knowledge." [29]

That image of going fishing is what reading is all about too, for what is fishing if it is not a search for surprise? And what is reading if it is not a search for seeing things differently?

Alfred North Whitehead assures us that "from the very beginning of his education, the child should experience the joys of discovery. The discovery which he has to make is that general ideas give an understanding of that stream of events which pours through his life, which is his life." [30] The problem of the teacher is to show the student how to make the world fit to his perceptions and not his perceptions to the world. How else can one see things differently? How else can one recognize novelty?

Whitehead observes that every new situation ". . . includes a factor of activity which is the reason for the origin of that occasion of experience. This factor of activity is what I have called *creativity.* The initial situation with its creativity can be termed the initial phase of a new occasion. It can equally be termed the 'actual world' relative to that occasion. It has a certain unity of its own, expressive of its capacity for

providing the objects requisite for a new occasion, and also expressive of its conjoint activity whereby it is essentially the primary phase of a new occasion. . . . This basic situation, this actual world, this primary phase—however you characterize it—as a whole is active with its inherent creativity, but in its details it provides the passive objects which derive their activity from the creativity of the whole. The creativity is the actualization of potentiality, and the process of actualization is an occasion of experiencing." [31]

Elsewhere Whitehead uses the term *concrescence* to suggest that creativity is a steady-state concept, that it is an emergent quality of ordered experiencing. He suggests that we ". . . let the working hypothesis be that the ultimate realities are the events in their process of organization. Then each event, viewed in its separate individuality, is a passage between two ideal termini, namely, its components in their ideal disjunctive diversity passing into these same components in their concrete togetherness . . . (thus there is) a metaphysical principle belonging to the nature of things, that there is nothing in the universe other than instances of this passage and components of these instances. . . . (If this be granted) then the word creativity expresses the notion that each event is a process issuing in novelty. . . ." [32]

Every creative act must begin with an audacious notion that one can make "sense" out of a condition or event that is new to our personal history. And as we develop, as we "work out" this act, we cast our skills, our perceptions, our understanding into new combinations in new perspectives. We use hunch, intuition, insight or depend upon blind luck, that happy child of chance. Creativity involves the need to suppose that something is or can be made to appear or to function in some new manner. For example, quantum theory first made its appearance, according to P. A. M. Dirac, ". . . when (Max) Planck discovered the need to suppose that the energy of electro-magnetic waves can exist only in multiples of a certain unit, depending on the frequency of the waves, in order to explain the law of black-body radiation." [33] In short, Planck's imagination had to take a "quantum-leap" into the invisible. Dirac's comment suggests the nature of the potency of the creative act and the necessary courage of its instigator: "It seems that if one is working from the point of view of getting beauty in one's equations, and if one has really a sound insight, one is on a sure line of progress. If there is not complete agreement between the results of one's work and experiment, one should not allow oneself to be discouraged, because the discrepancy may well be due to minor features that are not properly taken into account and that will get cleared up with further developments of the theory." [34]

This is precisely where intelligence *is* wedded to creativity. One knows what one has to work with and what resources are available. One proceeds in exciting peril toward yet-to-be-disclosed goals. Dewey suggests that ". . . a man is intelligent *not* in virtue of having reason which grasps first and indemonstrable truths about fixed principles in order to reason deductively from them to the particulars which they govern, *but* in virtue of his capacity to estimate the possibilities of a situation and to act in accordance with his estimate. In the large sense of the term, intelligence is as practical as reason is theoretical." [35]

Thus a creative enterprise is moved forward by the use of one's interpretations of events and experiences within some logical framework, no matter how private or how bizarre. Abraham Kaplan, who is philosophically a lineal descendant of Dewey, comments on the personal signature of the observer, the worker or the artist, which is that elusive but ever-present "human equation" that makes a difference *different,* and fruitful. Kaplan notes that ". . . the logical significance of an observation is conditioned by psychological factors that played a part in determining the outcome of the process. Wishful thinking, for example, has its counterpart in wishful seeing . . . it is notorious that arithmetical mistakes on income-tax returns are almost invariably in favor of the taxpayer. Other studies have revealed the effect of social pressure not only on what we believe, but quite literally on what we see." [36]

In short, our culture teaches not only how to perceive, but what to perceive. The dominant view of the universe puts dragons in the air, "humors" in our bodies, or neuroses in our personalities. We hear the "music of the spheres," we feel the presence of the guiding and informing spirit, we know with certainty that the earth is flat or that the whole universe is in a state of continuous creation.

Such is the nature of experience which Kaplan suggests ". . . is a succession of continuities, and everything discriminated in the continuum has fuzzy edges. . . . Whatever we can discriminate in the facts, we can distinguish in our meanings; we can always call the fuzzy edge a definite fringe. The point is that facts are *indefinitely* indefinite; however fine the mesh we use, finer differences slip through the conceptual net. And the more discriminations we make, the more opportunities we create for borderline cases to arise. We must leave off our discriminations somewhere, but the facts never quit. They are never content to leave well enough alone; sub specie aeternitatis nothing human is ever enough." [37]

Thus the artist within each of us cries out, "You see things as they are and ask why; I dream things that never were, and ask, why not!"

We will make things that make differences. We will alter the flow of events. We do so in terror tinged with joy or out of sheer tough-minded confidence that we can learn how to master the intractable facts. And if we are mad it is only by North Northwest!

Lawrence S. Kubie notes that ". . . what men succeed in creating is in spite of their struggle to overcome their neuroses, and not in any sense the fruit of these struggles. . . . What is more, the residual creativity which survives this struggle is rendered culturally impotent because the product is an ineffectual compromise between two processes. Thus the full price for the ubiquity of the neurotic process is paid not by the creative artist or scientist alone. Nor is it limited to those whose personal lives touch his. It is paid by all of society and by that very art, literature, music or science through which the artist struggles to live his life and speak his piece in that life. The toll which neurosis exacts from man's creative potential is paid by all human culture." [38]

Creativity, however defined and whatever its consequence, is the most human of our human endeavors. It is neither God-directed nor daemon inspired. It is not a pearl-producing illness nor some resonance to trans-sensory vibrations. It is the process of man thinking and acting out of some urge or hurt, out of some confusion or enchantment, but eventually toward some definable purposes. Its crucial signal is metaphor which allows him to think "otherwise," which permits him to make things or events "stand for" those inchoate notions he hopes to give form to. In short, creativity is always some kind of symbol making and using.

Kubie suggests that ". . . flexibility of symbolic imagery is essential if the symbolic process is to have that creative potential which is our supreme human trait . . . this creative flexibility is made possible predominantly if not exclusively by the free, continuous, and concurrent action of the preconscious processes. As long as the preconscious processes function freely, no scientist and no artist need fear that to sacrifice the unhappy luxury of being neurotic will leave his creative powers paralyzed." [39]

The healthy, self-conscious artist knows what he is about in the process of creation. He knows that the ". . . facts won't quit." He knows that he is telling lies to himself, his friends or his colleagues when he talks about a "fine frenzy," a blinding light of revelation. He knows that he is masking some hoard of joy, some treasure of action that would be too complicated for him to explain in public terms. He sometimes pretends to be in league with children, claiming to do what they do.

Consider, for example, Joyce Cary's remarks: "Children's pleasure

in exploring their world, long before they can speak, is very obvious. They spend almost all their time at it. We don't speak of their intuition, but it is the same thing as the intuition of the artist. That is to say it is direct knowledge of the world as it is, direct acquaintance with things, with characters, with appearance, and this is the primary knowledge of the artist and writer. The joy of discovery is his starting point . . . the essential thing about a work of art is that it is work, and very hard work too. He has had his intuition, he has made his discovery, he is eager to explore it, to reveal it, to fix it down." [40] What Cary is saying here is that the artist's effort is to control, to manage, to manipulate, to domesticate those seemingly errant experiences that his putatively "special" way of knowing reveals to him and which he chooses to reveal to others.

But Kaplan insists that ". . . knowing is not one thing that we do among others, but a quality of any of our doings; its logical grammar is that of the adverb, not the verb. To say that we know is to say that we do rightly in the light of our purposes, and that our purposes are thereby fulfilled is not merely the sign of knowledge, but its very substance." [41] And this is precisely Dewey's point when he suggests that ". . . the criterion of knowledge lies in the method used to secure consequences and not in metaphysical conceptions of the nature of the real." [42]

An individual begins to engage in creative activity whenever he examines what he knows and what he does not know about some condition, substance, occasion or event and decides to do something with that knowledge. His behavior is characterized by openness to the new or recreated experience, by courage before the conceivable consequences of his anticipated acts, and by his capacity to commit himself to the effort and to pay the cost of living with the consequences. If he succeeds, he may be called lucky or wicked, but he will have the satisfaction of having changed the shape of his world to some noticeable degree, for his ideas will have been fruitful.

"I have argued," says Kaplan, "for a tolerance of ambiguity, a recognition of the openness characteristic of fruitful ideas. 'The hits in science,' James Bryant Conant has said, 'are usually made with a crooked ball.' It is not just serendipity which is involved here, the fortuitous discovery; it is that retrospectively scientists are so often seen as succeeding better than they have a right to—according to our more rigorous methodological principles. If the wicked seem to flourish, it is not always God's fault . . . they may not be so wicked after all." [43]

There is fun to be found in the act of creating, there is joy to be experienced even in the unequal struggle to wrest meaning from the

chaos of the universe. "A sweet disorder" is often attractive just because it defies explanation, just because the pleasure we find in it is not susceptible to analysis, to measurement, to naming and numbering. It is the lure of the horizon that beckons us, the taunt of the frontier, the challenge of the unknowable to which we respond whenever we attempt to make things different from what they are or to see the world's aspect from another vantage point. That, after all, is the heaven of invention, where Prometheus is.

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