

the tensions within a society do not develop creative thinking with a cutting edge, but rather generate a number of accommodations of one social group with another. The trouble with our contemporary political situation is that there are no issues which divide sharply the philosophies of the political parties, not even the race issue. There are only accommodations which individuals and groups within each party make, in order to secure political success.

I would therefore conclude that, in societies as in the individual, creativity

needs at its base a drive, a moral, aesthetic and intellectual energy which will not rest content with the forms of life, art or social order which presently exist. I would also conclude that in education, as in society and the individual, the way to evoke that energy is to give freedom, encouragement and help to the individual, to create in him a sense of self confidence, to trust him, to cherish him, and to give him that sense of expectancy for the excitement of the unforeseen which is the necessary condition of the creative act.

2. The Process of Creative Thinking

by GARDNER MURPHY

RESearch on the process of creative thinking gives a few clear principles. From the exquisite study of Coleridge's dream of Kubla Khan to Rossman's patient analysis of the files of the patent office, there is general agreement that acts of creativeness, great or small, arise in a context typically involving four phases.

First, there is the long immersion of the sensitive mind in some specific medium which gives delight and fulfillment, whether it be the world of color, tone, movement, space, time, the world of force and organization, the world of words, of images, of social relationships, or the world of contemplation or of mastery. Through the tentative gropings of the mind in its early formative stages, steeping itself in the sensory or the intellectual riches of this world, one falls in love, as did Newton, with space or with

force; or as did Blake, with line or color; or as did Mozart, with tone and rhythm. Minds, both great and small, are first marked out for the pathway of creativeness through the fact that they are sensitive to something in this challenging and fascinating world.

The first great problem therefore that confronts parent and teacher is to allow this first generous outpouring of mind and heart to have its way. We know relatively little about how to encourage, but all too much about how to impede. We find a thousand devices for regularizing, stabilizing, restraining, or even for poking fun at the earliest exploratory efforts of children who are overpowered with the charm or the challenge of this world. Whatever stray creativeness gets through the mesh of our adult system of approvals and disapprovals of children's behavior is likely to be knocked

down by classmates, who, through their own earlier subjection to restraints and ridicule have learned that to poetize, to daub, to speculate or to dream, is a waste of time.

The same fate would likewise attend the efforts of the young child in the direction of science, were it not for the fact that in our moment of technical mastery, Western society is willing to give a certain amount of freedom to boys, at least in the first scientific efforts, and in some environments permit sheer dabbling in the ham world of electronics, or the homemade laboratory of chemistry. Even here, however, where creative thought seems to be encouraged, it is unfortunately the acquisition of the standardized skills of the culture, rather than the encouragement of true freedom of inquiry, that gives security and status. Nothing whatever, of course, is to be gained by our simply bemoaning the situation; the practical thing is rather to note that the first huge responsibility of the teacher is to encourage, to give freedom, to swing wide the gates to whatever a child's or adolescent's mind wants to explore, to make contact, to know, to grasp, to assimilate the new to the self. The first principle then in the development of creativeness is the encouragement of the child's sheer sensitiveness to the charm, the challenge, the mystery, of this wonderful world.

The second phase in creativeness appears when this sensitivity, this demand upon the world for contact and assimilation, leads to the acquisition of storehouses of experience which consolidate themselves, just as all learning experiences do, into higher units or structured patterns or ordered experiences. To be sensitive to tones means that soon there are melodies and soon thereafter harmo-

nized patterns, experienced usually in the part-singing of the church choir, or the barbershop quartet, or the glee club. In the same way there are the color combinations and linear combinations of the world of pencil, crayon and brush. There are the organized patterns of temporal and spatial relationships that go into mechanics. There is the world of social relationships, privileges and obligations. Now since all these things cannot be kept in consciousness at a single moment, they are organized unconsciously, or, to speak more technically, preconsciously into vast systems upon which we may draw as we need them; storehouses of ready yet adaptable and flexible information and experience. It is, of course, from these vast storehouses, based upon years of accumulation and incubation that the sudden inspiration of the composer, the dramatist, the scientist, derives.

This third great stage, the stage of inspiration or illumination, is that in which Archimedes leaps from the bathtub down the hall, shouting, "I have it!"; the stage in which the chemist, Kekulé, sees the dancing components of the benzene ring ranging themselves in his fantasy, satisfying his long struggle to understand the problems of chemistry; the moment of sudden fulfillment in which Hamilton, standing on London Bridge, saw revealed before him the mathematical system which bears his name. All these acts of illumination or fulfillment, I would urge, are the necessary derivatives from the two preceding phases, the phases of sensitivity and of incubation. Insight, illuminations, large

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or small, come to all of us in all spheres of life. They depend for their very existence upon the parents' and the teachers' encouragement all along the way in the world through encouraging the child's sensitivities and through freedom to accumulate through incubation the storehouses of experience upon which most illuminations depend.

Actually, however, this is not enough to say about the social functions involved in illumination. There are two reasons why the teacher is of special importance here. In the first place, illuminations come when they are ready to come in terms of the readiness of the mind, and particularly of the *mood* of searching in which the imperfectly organized material leaps, if it can, into its own structure, a principle of integration that depends upon the inner logic of the material and the inner logic of the human personality in relation to the structure of material. (Seldom, if ever, can the orderly ways of a standardized group process provide a maximal opportunity for this individualistic construction.) On the contrary, it is typically the Archimedes of the bathtub, the distracted and absentminded Newton, the eccentric and angry Beethoven, to whom, often in the least appropriate moment, the sudden inspiration comes. A certain willingness to allow for chaos and irrelevance, a certain freedom from every type of social regimentation is likewise required.

At the same time there is a paradoxical counterpart of this principle of the solitary creator which may at first sight seem to be a veritable opposite of what has just been said. These illuminations come as a result of years or even decades of highly social experience. The great periods of human creativeness are notoriously circumscribed in time and place, and dependent upon the living example

of a series of heroic figures to whom each newcomer adapts himself. Whether one thinks of the dramatic poets of fifth century Athens, or the Italian and Dutch painters of the Renaissance, or the composers in early nineteenth century Vienna, one finds periods in which there is accomplished within a few years more than a thousand years could ordinarily produce, through the white heat of interstimulation of a likeminded and like-souled generation of men, each inspiring his comrades and followers to reach a still greater height.

This point has been recently developed vigorously in connection with the training of college students for leadership roles: special facilities for the recognition and encouragement of highly creative persons need to be provided within the very structure of our educational system, so that one may seek out and make the most of the inspiring leadership of others who have already begun to blaze a trail. When the world of economics, politics, religion, and social values is writhing in chaos as it is today, it is not enough to urge the student to think creatively; he must be encouraged to associate with freely creative peers in fellowship with daring and inspired teachers. If it is only great painters that can inspire those who are striving to paint, it is only with great thinkers that students can learn to think creatively. This may sound obvious, but do we not practice exactly the opposite, expecting our students to attempt individually to solve the herculean social problems of today? One learns such creativeness in any human field of endeavor only by sharing with others, in the company of those who have already known the struggle to think out the meaning of inspiration.

The fourth step which always emerges

in the process of creating is the "hammering-out," the sifting and testing, the critical evaluating and perfecting of the work done. After the "fine frenzy," the "quiet eye," after composing with fury, "correct with phlegm," and especially, correct with socially responsible judgment. Here again the creative teacher can represent the mature evaluative judgment of the social order. But woe be to him if he sinks to the level of sarcasm. He can help the creator to create only if he can share the creator's struggles.

Obviously we cannot speak of creativeness as an isolated function occurring in a single context isolated from the rest of life. There is, as a matter of fact, an ever broadening area of creativeness when a beginning is made, like the spread of circles in the pool when a pebble is dropped in. Or, to speak of this in terms of the psychology of learning, there is a tendency to transfer and generalization. The boy Mozart, the boy Newton seek ever wider realms to conquer and consolidate their gains as they move on. In the same way in every mind there are ever widening regions of creativeness, if once the spark has been allowed to generate the fire. We can speak therefore of the development of a habit of creating, the development of a personality disposition slanted in the first instance towards creativeness and always maintaining this slant, unless pushed violently back into some other slant through adverse circumstances. It is the task, then, of the teacher not only to encourage sporadic creative efforts, but to inculcate the habit of creating, the attitude of ever broadening readiness for the new, the refreshing, the distinctive.

Hence arises the inevitable question of how far such generalizations can be expected to move? Can it even leap from one field of endeavor to another? Can

training in literary creativeness generalize to creativeness in science? It is not sufficient to reply that there have been in all eras certain widely gifted persons who have contributed, as did Leonardo, to mechanics and anatomy, to painting and to the theory of knowledge. The massive materials gathered by the psychologist Terman and his collaborators indicate that the generalization goes much further, that in an era which is really generous and open towards a reconsideration of all fundamentals, as was the Periclean age in Athens, the Romantic era in early nineteenth century Germany, each area of inquiry may actually break down to some degree the barriers into other areas however unrelated, and there may literally be an era of inquiry.

Such an era, as a matter of fact, certainly existed early in the nineteenth century in many points, both in Europe and in America. Indeed, if we may accept the luminous pages of Van Wyck Brooks, as they open for us the story of early nineteenth century American life in the age of Jefferson and Irving, we may believe that American education was in fact beginning to open in just such a way to all the sunlight of the newer human wisdom that came as the age of enlightenment led on into the age of democracy. That the advent of industrial society and the defensive tactics of a new power system have at times interfered with such inquiry is hardly to be denied. But our task here is quite different from that of the Cassandras who tell us that the machine and the state are to throttle every creative effort. Rather it is our task to show that research in education, research in psychology, research in the social sciences can still move apace towards the definition of a kind of freedom of teaching.

freedom of learning, freedom of discussion, freedom of inquiry, which, however it is threatened, must be vigorously

defended. The right to inquire is at the very heart of the spirit from which all creativeness develops.

3. Creativity vs. Organization Life

by W. H. WHYTE, JR.

I WOULD like to address myself to the problem of how creativity can be fostered within organization life. For better or worse we live in an organization society and most of our talented youth will make their major contributions, if they are to make major contributions, through the vehicle of the huge collective enterprises of our time. There are other ways to be creative, and it may be that in the years to come great advances will be made by those outside of the organization environment. But it is not likely. Society does not usually condone double standards, and if the dominant institutions of our time—the corporation, the government, the academic laboratory, the foundation—do not encourage the creative spark, there will be precious few opportunities for it elsewhere.

I am talking, in short, about the conditions of creativity, and the first thesis, I submit, is this. The organization is basically hostile to creativity.

To make this statement is not to bespeak a sense of futility. Quite the opposite. In every era the obstacles to creativity have been immense, and we have quite enough problems today without muddying the issue with misplaced nostalgia. In realistically examining current organization pressures, then, no contrast is intended between paradise and paradise lost. We are not in the grip of hapless forces. Organizations have been made by men; they can be changed

by men, and with intelligence we may be able to make them as compatible with individual expression as institutions of the past.

That said, I am emboldened to state my second thesis; people should be taught to fight the organization. Not self-destructively or stupidly, no. The problem of the one who wishes to be creative in an organization is not the easy one of the brave man fighting black reaction; the brilliant inventor facing massed disbelief. The real issues are far more subtle. For it is not the evils found within organization life that puzzle one—but *its very beneficence*. This is the heart of the problem. The organization man by necessity works with and through others constantly, and he feels a strong moral obligation to the consensus of the group. He is, in a sense, imprisoned in brotherhood. For example, he has been working out a new idea. He believes in it, yes, but so also does he believe in the consensus that this idea will confound. If he goes off on his own tangent, he wonders, is he being courageous—or wilfully stubborn? Of such problems are born the neuroses of organization man. What he needs is intellectual armor; the ability to recognize what the pressures are so that he may judge when he is succumbing and when he is not.

Let us look briefly at the pressures. The first is the organization's antipathy to purposelessness, to idle curiosity. And nowhere is this antipathy stronger than

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