

THE FLOW OF THOUGHT

THE GOOD THINGS IN LIFE do not come only through the senses. Some of the most exhilarating experiences we undergo are generated inside the mind, triggered by information that challenges our ability to think, rather than from the use of sensory skills. As Sir Francis Bacon noted almost four hundred years ago, wonder—which is the seed of knowledge—is the reflection of the purest form of pleasure. Just as there are flow activities corresponding to every physical potential of the body, every mental operation is able to provide its own particular form of enjoyment.

Among the many intellectual pursuits available, reading is currently perhaps the most often mentioned flow activity around the world. Solving mental puzzles is one of the oldest forms of enjoyable activity, the precursor of philosophy and modern science. Some individuals have become so skilled at interpreting musical notation that they no longer need to listen to the actual notes to enjoy a piece of music, and prefer reading the score of a symphony to hearing it. The imaginary sounds dancing in their minds are more perfect than any actual performance could be. Similarly, people who spend much time with art come to appreciate increasingly the affective, historical, and cultural aspects of the work they are viewing, occasionally more than they enjoy its purely visual aspects. As one professional involved in the arts expressed it: “[Works of] art that I personally respond to . . . have behind them a

lot of conceptual, political, and intellectual activity. . . . The visual representations are really signposts to this beautiful machine that has been constructed, unique on the earth, and is not just a rehashing of visual elements, but is really a new thought machine that an artist, through visual means and combining his eyes with his perceptions, has created."

What this person sees in a painting is not just a picture, but a "thought machine" that includes the painter's emotions, hopes, and ideas—as well as the spirit of the culture and the historical period in which he lived. With careful attention, one can discern a similar mental dimension in physically enjoyable activities like athletics, food, or sex. We might say that making a distinction between flow activities that involve functions of the body and those that involve the mind is to some extent spurious, for all physical activities must involve a mental component if they are to be enjoyable. Athletes know well that to improve performance beyond a certain point they must learn to discipline their minds. And the intrinsic rewards they get include a lot more than just physical well-being: they experience a sense of personal accomplishment, and increased feelings of self-esteem. Conversely, most mental activities also rely on the physical dimension. Chess, for instance, is one of the most cerebral games there is; yet advanced chess players train by running and swimming because they are aware that if they are physically unfit they will not be able to sustain the long periods of mental concentration that chess tournaments require. In Yoga, the control of consciousness is prepared for by learning to control bodily processes, and the former blends seamlessly into the latter.

Thus, although flow always involves the use of muscle and nerve, on the one hand, and will, thought, and feelings on the other, it does make sense to differentiate a class of activities that are enjoyable because they order the mind directly, rather than through the mediation of bodily feelings. These activities are primarily *symbolic* in nature, in that they depend on natural languages, mathematics, or some other abstract notation system like a computer language to achieve their ordering effects in the mind. A symbolic system is like a game in that it provides a separate reality, a world of its own where one can perform actions that are permitted to occur in that world, but that would not make much sense anywhere else. In symbolic systems, the "action" is usually restricted to the mental manipulation of concepts.

To enjoy a mental activity, one must meet the same conditions that make physical activities enjoyable. There must be skill in a symbolic domain; there have to be rules, a goal, and a way of obtaining feedback.

One must be able to concentrate and interact with the opportunities at a level commensurate with one's skills.

In reality, to achieve such an ordered mental condition is not as easy as it sounds. Contrary to what we tend to assume, the normal state of the mind is chaos. Without training, and without an object in the external world that demands attention, people are unable to focus their thoughts for more than a few minutes at a time. It is relatively easy to concentrate when attention is structured by outside stimuli, such as when a movie is playing on the screen, or when while driving heavy traffic is encountered on the road. If one is reading an exciting book, the same thing occurs, but most readers still begin to lose concentration after a few pages, and their minds wander away from the plot. At that point, if they wish to continue reading, they must make an effort to force their attention back to the page.

We don't usually notice how little control we have over the mind, because habits channel psychic energy so well that thoughts seem to follow each other by themselves without a hitch. After sleeping we regain consciousness in the morning when the alarm rings, and then walk to the bathroom and brush our teeth. The social roles culture prescribes then take care of shaping our minds for us, and we generally place ourselves on automatic pilot till the end of the day, when it is time again to lose consciousness in sleep. But when we are left alone, with no demands on attention, the basic disorder of the mind reveals itself. With nothing to do, it begins to follow random patterns, usually stopping to consider something painful or disturbing. Unless a person knows how to give order to his or her thoughts, attention will be attracted to whatever is most problematic at the moment: it will focus on some real or imaginary pain, on recent grudges or long-term frustrations. Entropy is the normal state of consciousness—a condition that is neither useful nor enjoyable.

To avoid this condition, people are naturally eager to fill their minds with whatever information is readily available, as long as it distracts attention from turning inward and dwelling on negative feelings. This explains why such a huge proportion of time is invested in watching television, despite the fact that it is very rarely enjoyed. Compared to other sources of stimulation—like reading, talking to other people, or working on a hobby—TV can provide continuous and easily accessible information that will structure the viewer's attention, at a very low cost in terms of the psychic energy that needs to be invested. While people watch television, they need not fear that their drifting minds will force them to face disturbing personal problems. It is understandable

that, once one develops this strategy for overcoming psychic entropy, to give up the habit becomes almost impossible.

The better route for avoiding chaos in consciousness, of course, is through habits that give control over mental processes to the individual, rather than to some external source of stimulation, such as the programs of network TV. To acquire such habits requires practice, however, and the kind of goals and rules that are inherent in flow activities. For instance, one of the simplest ways to use the mind is daydreaming: playing out some sequence of events as mental images. But even this apparently easy way to order thought is beyond the range of many people. Jerome Singer, the Yale psychologist who has studied daydreaming and mental imagery more than perhaps any other scientist, has shown that daydreaming is a skill that many children never learn to use. Yet daydreaming not only helps create emotional order by compensating in imagination for unpleasant reality—as when a person can reduce frustration and aggression against someone who has caused injury by visualizing a situation in which the aggressor is punished—but it also allows children (and adults) to rehearse imaginary situations so that the best strategy for confronting them may be adopted, alternative options considered, unanticipated consequences discovered—all results that help increase the complexity of consciousness. And, of course, when used with skill, daydreaming can be very enjoyable.

In reviewing the conditions that help establish order in the mind, we shall first look at the extremely important role of memory, then at how words can be used to produce flow experiences. Next we shall consider three symbolic systems that are very enjoyable if one comes to know their rules: history, science, and philosophy. Many more fields of study could have been mentioned, but these three can serve as examples for the others. Each one of these mental “games” is accessible to anyone who wants to play them.

THE MOTHER OF SCIENCE

The Greeks personified memory as lady Mnemosyne. Mother of the nine Muses, she was believed to have given birth to all the arts and sciences. It is valid to consider memory the oldest mental skill, from which all others derive, for, if we weren't able to remember, we couldn't follow the rules that make other mental operations possible. Neither logic nor poetry could exist, and the rudiments of science would have to be rediscovered with each new generation. The primacy of memory is true first of all in terms of the history of the species. Before written

notation systems were developed, all learned information had to be transmitted from the memory of one person to that of another. And it is true also in terms of the history of each individual human being. A person who cannot remember is cut off from the knowledge of prior experiences, unable to build patterns of consciousness that bring order to the mind. As Buñuel has said, “Life without memory is no life at all. . . . our memory is our coherence, our reason, our feeling, even our action. Without it, we are nothing.”

All forms of mental flow depend on memory, either directly or indirectly. History suggests that the oldest way of organizing information involved recalling one's ancestors, the line of descent that gave each person his or her identity as member of a tribe or a family. It is not by chance that the Old Testament, especially in the early books, contains so much genealogical information (e.g., Genesis 10: 26–29: “The descendants of Joktan were the people of Almodad, Sheleph, Hazarmaveth, Jerah, Hadoram, Uzal, Diklah, Obal, Abimael, Sheba, Ophir, Havilah, and Jobab. . .”). Knowing one's origins, and to whom one was related, was an indispensable method for creating social order when no other basis for order existed. In preliterate cultures reciting lists of ancestors' names is a very important activity even today, and it is one in which the people who can do it take a great delight. Remembering is enjoyable because it entails fulfilling a goal and so brings order to consciousness. We all know the little spark of satisfaction that comes when we remember where we put the car keys, or any other object that has been temporarily misplaced. To remember a long list of elders, going back a dozen generations, is particularly enjoyable in that it satisfies the need to find a place in the ongoing stream of life. To recall one's ancestors places the recaller as a link in a chain that starts in the mythical past and extends into the unfathomable future. Even though in our culture lineage histories have lost all practical significance, people still enjoy thinking and talking about their roots.

It was not only their origins that our ancestors had to commit to memory, but all other facts bearing on their ability to control the environment. Lists of edible herbs and fruits, health tips, rules of behavior, patterns of inheritance, laws, geographical knowledge, rudiments of technology, and pearls of wisdom were all bundled into easily remembered sayings or verse. Before printing became readily available in the last few hundred years, much of human knowledge was condensed in forms similar to the “Alphabet Song” which puppets now sing on children's television shows such as “Sesame Street.”

According to Johann Huizinga, the great Dutch cultural historian,

among the most important precursors of systematic knowledge were riddling games. In the most ancient cultures, the elders of the tribe would challenge each other to contests in which one person sang a text filled with hidden references, and the other person had to interpret the meaning encoded in the song. A competition between expert riddlers was often the most stimulating intellectual event the local community could witness. The forms of the riddle anticipated the rules of logic, and its content was used to transmit factual knowledge our ancestors needed to preserve. Some of the riddles were fairly simple and easy, like the following rhyme sung by ancient Welsh minstrels and translated by Lady Charlotte Guest:

Discover what it is:
 The strong creature from before the Flood
 Without flesh, without bone,
 Without vein, without blood,
 Without head, without feet . . .
 In field, in forest . . .
 Without hand, without foot.
 It is also as wide
 As the surface of the earth,
 And it was not born,
 Nor was it seen . . .

The answer in this case is "the wind."

Other riddles that the druids and minstrels committed to memory were much longer and more complex, and contained important bits of secret lore disguised in cunning verses. Robert Graves, for instance, thought that the early wise men of Ireland and Wales stored their knowledge in poems that were easy to remember. Often they used elaborate secret codes, as when the names of trees stood for letters, and a list of trees spelled out words. Lines 67-70 of the *Battle of the Trees*, a strange, long poem sung by ancient Welsh minstrels:

The alders in the front line
 Began the affray.
 Willow and rowan-tree
 were tardy in array.

encoded the letters F (which in the secret druidic alphabet was represented by the alder tree), S (willow), and L (rowan). In this fashion, the

few druids who knew how to use letters could sing a song ostensibly referring to a battle among the trees of the forest, which actually spelled out a message only initiates could interpret. Of course, the solution of riddles does not depend exclusively on memory; specialized knowledge and a great deal of imagination and problem-solving ability are also required. But without a good memory one could not be a good riddle master, nor could one become proficient at any other mental skill.

As far back as there are records of human intelligence, the most prized mental gift has been a well-cultivated memory. My grandfather at seventy could still recall passages from the three thousand lines of the *Iliad* he had to learn by heart in Greek to graduate from high school. Whenever he did so, a look of pride settled on his features, as his unfocused eyes ranged over the horizon. With each unfolding cadence, his mind returned to the years of his youth. The words evoked experiences he had had when he first learned them; remembering poetry was for him a form of time travel. For people in his generation, knowledge was still synonymous with memorization. Only in the past century, as written records have become less expensive and more easily available, has the importance of remembering dramatically declined. Nowadays a good memory is considered useless except for performing on some game shows or for playing Trivial Pursuit.

But for a person who has nothing to remember, life can become severely impoverished. This possibility was completely overlooked by educational reformers early in this century, who, armed with research results, proved that "rote learning" was not an efficient way to store and acquire information. As a result of their efforts, rote learning was phased out of the schools. The reformers would have had justification, if the point of remembering was simply to solve practical problems. But if control of consciousness is judged to be at least as important as the ability to get things done, then learning complex patterns of information by heart is by no means a waste of effort. A mind with some stable content to it is much richer than one without. It is a mistake to assume that creativity and rote learning are incompatible. Some of the most original scientists, for instance, have been known to have memorized music, poetry, or historical information extensively.

A person who can remember stories, poems, lyrics of songs, baseball statistics, chemical formulas, mathematical operations, historical dates, biblical passages, and wise quotations has many advantages over one who has not cultivated such a skill. The consciousness of such a person is independent of the order that may or may not be provided by the environment. She can always amuse herself, and find meaning in the

contents of her mind. While others need external stimulation—television, reading, conversation, or drugs—to keep their minds from drifting into chaos, the person whose memory is stocked with patterns of information is autonomous and self-contained. Additionally, such a person is also a much more cherished companion, because she can share the information in her mind, and thus help bring order into the consciousness of those with whom she interacts.

How can one find more value in memory? The most natural way to begin is to decide what subject one is really interested in—poetry, fine cuisine, the history of the Civil War, or baseball—and then start paying attention to key facts and figures in that chosen area. With a good grasp of the subject will come the knowledge of what is worth remembering and what is not. The important thing to recognize here is that you should not feel that you *have to* absorb a string of facts, that there is a right list you must memorize. If you decide what *you* would like to have in memory, the information will be under your control, and the whole process of learning by heart will become a pleasant task, instead of a chore imposed from outside. A Civil War buff need not feel compelled to know the sequence of dates of all major engagements; if, for instance, he is interested in the role of the artillery, then only those battles where cannons played an important part need concern him. Some people carry with them the texts of choice poems or quotations written on pieces of paper, to glance over whenever they feel bored or dispirited. It is amazing what a sense of control it gives to know that favorite facts or lyrics are always at hand. Once they are stored in memory, however, this feeling of ownership—or better, of *connectedness* with the content recalled—becomes even more intense.

Of course there is always a danger that the person who has mastered a domain of information will use it to become an overbearing bore. We all know people who cannot resist flaunting their memory. But this usually occurs when someone memorizes only in order to impress others. It is less likely that one will become a bore when one is intrinsically motivated—with a genuine interest in the material, and a desire to control consciousness, rather than in controlling the environment.

THE RULES OF THE GAMES OF THE MIND

Memory is not the only tool needed to give shape to what takes place in the mind. It is useless to remember facts unless they fit into patterns, unless one finds likenesses and regularities among them. The simplest ordering system is to give names to things; the words we invent trans-

form discrete events into universal categories. The power of the word is immense. In Genesis 1, God names day, night, sky, earth, sea, and all the living things immediately after He creates them, thereby completing the process of creation. The Gospel of John begins with: "Before the World was created, the Word already existed . . ."; and Heraclitus starts his now almost completely lost volume: "This Word (*Logos*) is from everlasting, yet men understand it as little after the first hearing of it as before. . . ." All these references suggest the importance of words in controlling experience. The building blocks of most symbol systems, words make abstract thinking possible and increase the mind's capacity to store the stimuli it has attended to. Without systems for ordering information, even the clearest memory will find consciousness in a state of chaos.

After names came numbers and concepts, and then the primary rules for combining them in predictable ways. By the sixth century B.C. Pythagoras and his students had embarked on the immense ordering task that attempted to find common numerical laws binding together astronomy, geometry, music, and arithmetic. Not surprisingly, their work was difficult to distinguish from religion, since it tried to accomplish similar goals: to find a way of expressing the structure of the universe. Two thousand years later, Kepler and then Newton were still on the same quest.

Theoretical thinking has never completely lost the imagistic, puzzlelike qualities of the earliest riddles. For example Archytas, the fourth-century-B.C. philosopher and commander-in-chief of the city-state of Tarentum (now in southern Italy), proved that the universe had no limits by asking himself: "Supposing that I came to the outer limits of the universe. If I now thrust out a stick, what would I find?" Archytas thought that the stick must have projected out into space. But in that case there was space beyond the limits of the universe, which meant that the universe had no bounds. If Archytas's reasoning appears primitive, it is useful to recall that the intellectual experiments Einstein used to clarify to himself how relativity worked, concerning clocks seen from trains moving at different speeds, were not that different.

Besides stories and riddles all civilizations gradually developed more systematic rules for combining information, in the form of geometric representations and formal proofs. With the help of such formulas it became possible to describe the movement of the stars, predict precisely seasonal cycles, and accurately map the earth. Abstract knowledge, and finally what we know as experimental science, grew out of these rules.

It is important to stress here a fact that is all too often lost sight of: philosophy and science were invented and flourished because thinking is pleasurable. If thinkers did not enjoy the sense of order that the use of syllogisms and numbers creates in consciousness, it is very unlikely that now we would have the disciplines of mathematics and physics.

This claim, however, flies in the face of most current theories of cultural development. Historians imbued with variants of the precepts of material determinism hold that thought is shaped by what people must do to make a living. The evolution of arithmetic and geometry, for instance, is explained almost exclusively in terms of the need for accurate astronomical knowledge and for the irrigational technology that was indispensable in maintaining the great "hydraulic civilizations" located along the course of large rivers like the Tigris, the Euphrates, the Indus, the Chang Jiang (Yangtze), and the Nile. For these historians, every creative step is interpreted as the product of extrinsic forces, whether they be wars, demographic pressures, territorial ambitions, market conditions, technological necessity, or the struggle for class supremacy.

External forces are very important in determining which ideas will be selected from among the many available; but they cannot explain their production. It is perfectly true, for instance, that the development and application of the knowledge of atomic energy were expedited enormously by the life-and-death struggle over the bomb between Germany on the one hand, and England and the United States on the other. But the science that formed the basis of nuclear fission owed very little to the war; it was made possible through knowledge laid down in more peaceful circumstances—for example, in the friendly exchange of ideas European physicists had over the years in the beer garden turned over to Niels Bohr and his scientific colleagues by a brewery in Copenhagen.

Great thinkers have always been motivated by the enjoyment of thinking rather than by the material rewards that could be gained by it. Democritus, one of the most original minds of antiquity, was highly respected by his countrymen, the Abderites. However, they had no idea what Democritus was about. Watching him sit for days immersed in thought, they assumed he was acting unnaturally, and must be ill. So they sent for Hippocrates, the great doctor, to see what ailed their sage. After Hippocrates, who was not only a good medical man but also wise, discussed with Democritus the absurdities of life, he reassured the townspeople that their philosopher was, if anything, only too sane. He was not losing his mind; he was lost in the flow of thought.

The surviving fragments of Democritus's writing illustrate how

rewarding he found the practice of thinking to be: "It is godlike ever to think on something beautiful and on something new"; "Happiness does not reside in strength or money; it lies in rightness and many-sidedness"; "I would rather discover one true cause than gain the kingdom of Persia." Not surprisingly, some of his more enlightened contemporaries concluded that Democritus had a cheerful disposition, and said that he "called Cheerfulness, and often Confidence, that is a mind devoid of fear, the highest good." In other words, he enjoyed life because he had learned to control his consciousness.

Democritus was neither the first nor the last thinker to be lost in the flow of the mind. Philosophers have frequently been regarded as being "absentminded," which of course means not that their minds were lost, but that they had temporarily tuned out of everyday reality to dwell among the symbolic forms of their favorite domain of knowledge. When Kant supposedly placed his watch in a pot of boiling water while holding an egg in his hand to time its cooking, all his psychic energy was probably invested in bringing abstract thoughts into harmony, leaving no attention free to meet the incidental demands of the concrete world.

The point is that playing with ideas is extremely exhilarating. Not only philosophy but the emergence of new scientific ideas is fueled by the enjoyment one obtains from creating a new way to describe reality. The tools that make the flow of thought possible are common property, and consist of the knowledge recorded in books available in schools and libraries. A person who becomes familiar with the conventions of poetry, or the rules of calculus, can subsequently grow independent of external stimulation. She can generate ordered trains of thought regardless of what is happening in external reality. When a person has learned a symbolic system well enough to use it, she has established a portable, self-contained world within the mind.

Sometimes having control over such an internalized symbol system can save one's life. It has been claimed, for instance, that the reason there are more poets per capita in Iceland than in any other country of the world is that reciting the sagas became a way for the Icelanders to keep their consciousness ordered in an environment exceedingly hostile to human existence. For centuries the Icelanders have not only preserved in memory but also added new verses to the epics chronicling the deeds of their ancestors. Isolated in the freezing night, they used to chant their poems huddled around fires in precarious huts, while outside the winds of the interminable arctic winters howled. If the Icelanders had spent all those nights in silence listening to the mocking wind, their

minds would have soon filled with dread and despair. By mastering the orderly cadence of meter and rhyme, and encasing the events of their own lives in verbal images, they succeeded instead in taking control of their experiences. In the face of chaotic snowstorms they created songs with form and meaning. To what extent did the sagas help the Icelanders endure? Would they have survived without them? There is no way to answer these questions with certainty. But who would dare to try the experiment?

Similar conditions hold true when individuals are suddenly wrenched from civilization, and find themselves in those extreme situations we described earlier, such as concentration camps or polar expeditions. Whenever the outside world offers no mercy, an internal symbolic system can become a salvation. Anyone in possession of portable rules for the mind has a great advantage. In conditions of extreme deprivation poets, mathematicians, musicians, historians, and biblical experts have stood out as islands of sanity surrounded by the waves of chaos. To a certain extent, farmers who know the life of the fields or lumbermen who understand the forest have a similar support system, but because their knowledge is less abstractly coded, they have more need to interact with the actual environment to be in control.

Let us hope none of us will be forced to call upon symbolic skills to survive concentration camps or arctic ordeals. But having a portable set of rules that the mind can work with is of great benefit even in normal life. People without an internalized symbolic system can all too easily become captives of the media. They are easily manipulated by demagogues, pacified by entertainers, and exploited by anyone who has something to sell. If we have become dependent on television, on drugs, and on facile calls to political or religious salvation, it is because we have so little to fall back on, so few internal rules to keep our mind from being taken over by those who claim to have the answers. Without the capacity to provide its own information, the mind drifts into randomness. It is within each person's power to decide whether its order will be restored from the outside, in ways over which we have no control, or whether the order will be the result of an internal pattern that grows organically from our skills and knowledge.

THE PLAY OF WORDS

How does one start mastering a symbolic system? It depends, of course, on what domain of thought one is interested in exploring. We have seen that the most ancient and perhaps basic set of rules governs the usage

of words. And today words still offer many opportunities to enter flow, at various levels of complexity. A somewhat trivial but nevertheless illuminating example concerns working crossword puzzles. There is much to be said in favor of this popular pastime, which in its best form resembles the ancient riddle contests. It is inexpensive and portable, its challenges can be finely graduated so that both novices and experts can enjoy it, and its solution produces a sense of pleasing order that gives one a satisfying feeling of accomplishment. It provides opportunities to experience a mild state of flow to many people who are stranded in airport lounges, who travel on commuter trains, or who are simply whiling away Sunday mornings. But if one is confined to simply solving crosswords, one remains dependent on an external stimulus: the challenge provided by an expert in the Sunday supplement or puzzle magazine. To be really autonomous in this domain, a better alternative is to make up one's own crosswords. Then there is no longer need for a pattern to be imposed from the outside; one is completely free. And the enjoyment is more profound. It is not very difficult to learn to write crossword puzzles; I know a child of eight who, after trying his hand at a few Sunday puzzles in the *New York Times*, began writing his own quite creditable crosswords. Of course, as with any skill worth developing, this one, too, requires that one invest psychic energy in it at the beginning.

A more substantive potential use of words to enhance our lives is the lost art of conversation. Utilitarian ideologies in the past two centuries or so have convinced us that the main purpose of talking is to convey useful information. Thus we now value terse communication that conveys practical knowledge, and consider anything else a frivolous waste of time. As a result, people have become almost unable to talk to each other outside of narrow topics of immediate interest and specialization. Few of us can understand any longer the enthusiasm of Caliph Ali Ben Ali, who wrote: "A subtle conversation, that is the Garden of Eden." This is a pity, because it could be argued that the main function of conversation is not to get things accomplished, but to improve the quality of experience.

Peter Berger and Thomas Luckmann, the influential phenomenological sociologists, have written that our sense of the universe in which we live is held together by conversation. When I say to an acquaintance whom I meet in the morning, "Nice day," I do not convey primarily meteorological information—which would be redundant anyway, since he has the same data as I do—but achieve a great variety of other unvoiced goals. For instance, by addressing him I recognize his existence, and express my willingness to be friendly. Second, I reaffirm one

of the basic rules for interaction in our culture, which holds that talking about the weather is a safe way to establish contact between people. Finally, by emphasizing that the weather is "nice" I imply the shared value that "niceness" is a desirable attribute. So the offhand remark becomes a message that helps keep the content of my acquaintance's mind in its accustomed order. His answer "Yeah, it's great, isn't it?" will help to keep order in mine. Without such constant restatements of the obvious, Berger and Luckmann claim, people would soon begin to have doubts about the reality of the world in which they live. The obvious phrases we exchange with each other, the trivial talk dribbling from radios and TV sets, reassure us that everything is all right, that the usual conditions of existence prevail.

The pity is that so many conversations end right there. Yet when words are well chosen, well arranged, they generate gratifying experiences for the listener. It is not for utilitarian reasons alone that breadth of vocabulary and verbal fluency are among the most important qualifications for success as a business executive. Talking well enriches every interaction, and it is a skill that can be learned by everyone.

One way to teach children the potential of words is by starting to expose them to wordplay quite early. Puns and double meanings may be the lowest form of humor for sophisticated adults, but they provide children with a good training ground in the control of language. All one has to do is pay attention during a conversation with a child, and as soon as the opportunity presents itself—that is, whenever an innocent word or expression can be interpreted in an alternative way—one switches frames, and pretends to understand the word in that different sense.

The first time children realize that the expression "having Grandma for dinner" could mean either as a guest or as a dish, it will be somewhat puzzling, as will a phrase like "a frog in the throat." In fact, breaking the ordered expectations about the meaning of words can be mildly traumatic at first, but in no time at all children catch on and give as good as they are getting, learning to twist conversation into pretzels. By doing so they learn how to enjoy controlling words; as adults, they might help revive the lost art of conversation.

The major creative use of language, already mentioned several times in earlier contexts, is poetry. Because verse enables the mind to preserve experiences in condensed and transformed form, it is ideal for giving shape to consciousness. Reading from a book of poems each night is to the mind as working out on a Nautilus is to the body—a way for staying in shape. It doesn't have to be "great" poetry, at least not at first. And it is not necessary to read an entire poem. What's important is to

find at least a line, or a verse, that starts to sing. Sometimes even one word is enough to open a window on a new view of the world, to start the mind on an inner journey.

And again, there is no reason to stop at being a passive consumer. Everyone can learn, with a little discipline and perseverance, to order personal experience in verse. As Kenneth Koch, the New York poet and social reformer, has shown, even ghetto children and semiliterate elderly women in retirement homes are able to write beautifully moving poetry if they are given a minimum of training. There is no question that mastering this skill improves the quality of their lives. Not only do they enjoy the experience, but in the process they considerably increase their self-esteem as well.

Writing prose provides similar benefits, and although it lacks the obvious order imposed by meter and rhyme, it is a more easily accessible skill. (To write *great* prose, however, is probably just as difficult as writing great poetry.)

In today's world we have come to neglect the habit of writing because so many other media of communication have taken its place. Telephones and tape recorders, computers and fax machines are more efficient in conveying news. If the only point to writing were to *transmit* information, then it would deserve to become obsolete. But the point of writing is to *create* information, not simply to pass it along. In the past, educated persons used journals and personal correspondence to put their experiences into words, which allowed them to reflect on what had happened during the day. The prodigiously detailed letters so many Victorians wrote are an example of how people created patterns of order out of the mainly random events impinging on their consciousness. The kind of material we write in diaries and letters does not exist before it is written down. It is the slow, organically growing process of thought involved in writing that lets the ideas emerge in the first place.

Not so long ago, it was acceptable to be an amateur poet or essayist. Nowadays if one does not make some money (however pitifully little) out of writing, it's considered to be a waste of time. It is taken as downright shameful for a man past twenty to indulge in versification unless he receives a check to show for it. And unless one has great talent, it is indeed useless to write hoping to achieve great profit or fame. But it is never a waste to write for intrinsic reasons. First of all, writing gives the mind a disciplined means of expression. It allows one to record events and experiences so that they can be easily recalled, and relived in the future. It is a way to analyze and understand experiences, a self-communication that brings order to them.

Many have commented lately about the fact that poets and playwrights as a group show unusually severe symptoms of depression and other affective disorders. Perhaps one reason they become full-time writers is that their consciousness is beset by entropy to an unusual degree; writing becomes a therapy for shaping some order among the confusion of feelings. It is possible that the only way writers can experience flow is by creating worlds of words in which they can act with abandon, erasing from the mind the existence of a troubling reality. Like any other flow activity, however, writing that becomes addictive becomes dangerous: it forces the writer to commit himself to a limited range of experiences, and forecloses other options for dealing with events. But when writing is used to control experience, without letting it control the mind, it is a tool of infinite subtlety and rich rewards.

BEFRIENDING CLIO

As Memory was the mother of culture, Clio, "The Proclaimer," was her eldest daughter. In Greek mythology she was the patroness of history, responsible for keeping orderly accounts of past events. Although history lacks the clear rules that make other mental activities like logic, poetry, or mathematics so enjoyable, it has its own unambiguous structure established by the irreversible sequence of events in time. Observing, recording, and preserving the memory of both the large and small events of life is one of the oldest and most satisfying ways to bring order to consciousness.

In a sense, every individual is a historian of his or her own personal existence. Because of their emotional power, memories of childhood become crucial elements in determining the kind of adults we grow up to be, and how our minds will function. Psychoanalysis is to a large extent an attempt to bring order to people's garbled histories of their childhood. This task of making sense of the past again becomes important in old age. Erik Erikson has held that the last stage of the human life cycle involves the task of achieving "integrity," or bringing together what one has accomplished and what one has failed to accomplish in the course of one's life into a meaningful story that can be claimed as one's own. "History," wrote Thomas Carlyle, "is the essence of innumerable biographies."

Remembering the past is not only instrumental in the creation and preservation of a personal identity, but it can also be a very enjoyable process. People keep diaries, save snapshots, make slides and home movies, and collect souvenirs and mementos to store in their houses to

build what is in effect a museum of the life of the family, even though a chance visitor might be unaware of most of the historical references. He might not know that the painting on the living-room wall is important because it was bought by the owners during their honeymoon in Mexico, that the rug in the hall is valuable because it was the gift of a favorite grandmother, and that the scruffy sofa in the den is kept because it was where the children were fed when they were babies.

Having a record of the past can make a great contribution to the quality of life. It frees us from the tyranny of the present, and makes it possible for consciousness to revisit former times. It makes it possible to select and preserve in memory events that are especially pleasant and meaningful, and so to "create" a past that will help us deal with the future. Of course such a past might not be literally true. But then the past can never be literally true in memory: it must be continuously edited, and the question is only whether we take creative control of the editing or not.

Most of us don't think of ourselves as having been amateur historians all along. But once we become aware that ordering events in time is a necessary part of being a conscious being, and moreover, that it is an enjoyable task, then we can do a much better job of it. There are several levels at which history as a flow activity can be practiced. The most personal involves simply keeping a journal. The next is to write a family chronicle, going as far into the past as possible. But there is no reason to stop there. Some people expand their interest to the ethnic group to which they belong, and start collecting relevant books and memorabilia. With an extra effort, they can begin to record their own impressions of the past, thus becoming "real" amateur historians.

Others develop an interest in the history of the community in which they live, whether it is the neighborhood or the state, by reading books, visiting museums, and joining historical associations. Or they may focus on a particular aspect of that past: for instance, a friend who lives in the wilder reaches of western Canada has been fascinated by "early industrial architecture" in that part of the world, and has gradually learned enough about it to enjoy trips to out-of-the-way sawmills, foundries, and decaying railway depots, where his knowledge enables him to evaluate and appreciate the fine points of what anyone else would dismiss as piles of weedy junk.

All too often we are inclined to view history as a dreary list of dates to memorize, a chronicle established by ancient scholars for their own amusement. It is a field we might tolerate, but not love; it is a subject we learn about so as to be considered educated, but it will be learned

unwillingly. If this is the case, history can do little to improve the quality of life. Knowledge that is seen to be controlled from the outside is acquired with reluctance, and it brings no joy. But as soon as a person decides which aspects of the past are compelling, and decides to pursue them, focusing on the sources and the details that are personally meaningful, and recording findings in a personal style, then learning history can become a full-fledged flow experience.

THE DELIGHTS OF SCIENCE

After reading the preceding section, you may find it just barely plausible that anyone could become an amateur historian. But if we take the argument to another field, can we really conceive of a layperson's becoming an amateur scientist? After all, we have been told many times that in this century science has become a highly institutionalized activity, with the main action confined to the big leagues. It takes extravagantly equipped laboratories, huge budgets, and large teams of investigators to survive on the frontiers of biology, chemistry, or physics. It is true that, if the goal of science is to win Nobel prizes, or to attract the recognition of professional colleagues in the highly competitive arena of a given discipline, then the extremely specialized and expensive ways of doing science may be the only alternatives.

In fact, this highly capital-intensive scenario, based on the model of the assembly line, happens to be an inaccurate description of what leads to success in "professional" science. It is not true, despite what the advocates of technocracy would like us to believe, that breakthroughs in science arise exclusively from teams in which each researcher is trained in a very narrow field, and where the most sophisticated state-of-the-art equipment is available to test out new ideas. Neither is it true that great discoveries are made only by centers with the highest levels of funding. These conditions may help in testing novel theories, but they are largely irrelevant to whether creative ideas will flourish. New discoveries still come to people as they did to Democritus, sitting lost in thought in the market square of his city. They come to people who so enjoy playing with ideas that eventually they stray beyond the limits of what is known, and find themselves exploring an uncharted territory.

Even the pursuit of "normal" (as opposed to "revolutionary" or creative) science would be next to impossible if it did not provide enjoyment to the scientist. In his book *The Structure of Scientific Revolutions*, Thomas Kuhn suggests several reasons why science is "fascinating." First, "By focusing attention upon a small range of relatively

esoteric problems, the paradigm [or theoretical approach] forces scientists to investigate some part of nature in a detail and depth that would otherwise be unimaginable." This concentration is made possible by "rules that limit both the nature of acceptable solutions and the steps by which they are obtained." And, Kuhn claims, a scientist engaged in "normal" science is not motivated by the hope of transforming knowledge, or finding truth, or improving the conditions of life. Instead, "what then challenges him is the conviction that, if only he is skillful enough, he will succeed in solving a puzzle that no one before has solved or solved so well." He also states, "The fascination of the normal research paradigm . . . [is that] though its outcome can be anticipated . . . the way to achieve that outcome remains very much in doubt. . . . The man who succeeds proves himself an expert puzzle-solver, and the challenge of the puzzle is an important part of what usually drives him on." It is no wonder that scientists often feel like P. A. M. Dirac, the physicist who described the development of quantum mechanics in the 1920s by saying, "It was a game, a very interesting game one could play." Kuhn's description of the appeal of science clearly resembles reports describing why riddling, or rock climbing, or sailing, or chess, or any other flow activity is rewarding.

If "normal" scientists are motivated in their work by the challenging intellectual puzzles they confront in their work, "revolutionary" scientists—the ones who break away from existing theoretical paradigms to forge new ones—are even more driven by enjoyment. A lovely example concerns Subrahmanyan Chandrasekhar, the astrophysicist whose life has already acquired mythical dimensions. When he left India as a young man in 1933, on a slow boat from Calcutta to England, he wrote out a model of stellar evolution that with time became the basis of the theory of black holes. But his ideas were so strange that for a long time they were not accepted by the scientific community. He eventually was hired by the University of Chicago, where he continued his studies in relative obscurity. There is one anecdote told about him that best typifies his commitment to his work. In the 1950s Chandrasekhar was staying in Williams Bay, Wisconsin, where the main astronomical observatory of the university is located, about eighty miles away from the main campus. That winter he was scheduled to teach one advanced seminar in astrophysics. Only two students signed up for it, and Chandrasekhar was expected to cancel the seminar, rather than go through the inconvenience of commuting. But he did not, and instead drove back to Chicago twice a week, along back-country roads, to teach the class. A few years later first one, then the other of those two former students

won the Nobel prize for physics. Whenever this story used to be told, the narrator concluded with sympathetic regrets that it was a shame the professor himself never won the prize. That regret is no longer necessary, because in 1983 Chandrasekhar himself was awarded the Nobel for physics.

It is often under such unassuming circumstances, with people dedicated to playing with ideas, that breakthroughs in the way we think occur. One of the most glamorous discoveries of the last few years involves the theory of superconductivity. Two of the protagonists, K. Alex Muller and J. Georg Bednorz, worked out the principles and the first experiments in the IBM laboratory in Zurich, Switzerland, not exactly a scientific backwater, but not one of its hot spots, either. For several years the researchers did not let anyone else in on their work, not because they were afraid it would be stolen, but because they were afraid that their colleagues would laugh at their seemingly crazy ideas. They received their Nobel prizes for physics in 1987. Susumu Tonegawa, who that same year received the Nobel prize for biology, was described by his wife as a "going-his-own-way kind of a person" who likes sumo wrestling because it takes individual effort and not team performance to win in that sport, just as in his own work. Clearly the necessity of sophisticated laboratories and enormous research teams has been somewhat exaggerated. Breakthroughs in science still depend primarily on the resources of a single mind.

But we should not be concerned primarily with what happens in the professional world of scientists. "Big Science" can take care of itself, or at least it should, given all the support it has been given since the experiments with splitting the atomic nucleus turned out to be such a hit. What concerns us here is amateur science, the delight that ordinary people can take in observing and recording laws of natural phenomena. It is important to realize that for centuries great scientists did their work as a hobby, because they were fascinated with the methods they had invented, rather than because they had jobs to do and fat government grants to spend.

Nicolaus Copernicus perfected his epochal description of planetary motions while he was a canon at the cathedral of Frauenburg, in Poland. Astronomical work certainly didn't help his career in the Church, and for much of his life the main rewards he had were aesthetic, derived from the simple beauty of his system compared to the more cumbersome Ptolemaic model. Galileo had been trained in medicine, and what drove him into increasingly dangerous experimentation was the delight he took in figuring out such things as the location of the center of gravity of various solid objects. Isaac Newton formulated his

major discoveries soon after he received his B.A. at Cambridge, in 1665, when the university was closed because of the plague. Newton had to spend two years in the safety and boredom of a country retreat, and he filled the time playing with his ideas about a universal theory of gravitation. Antoine Laurent Lavoisier, held to be the founder of modern chemistry, was a public servant working for the Ferme Generale, the equivalent of the IRS in prerevolutionary France. He was also involved in agricultural reform and social planning, but his elegant and classic experiments are what he enjoyed doing most. Luigi Galvani, who did the basic research on how muscles and nerves conduct electricity, which in turn led to the invention of the electric battery, was a practicing physician until the end of his life. Gregor Mendel was another clergyman, and his experiments that set the foundations of genetics were the results of a gardening hobby. When Albert A. Michelson, the first person in the United States to win a Nobel prize in science, was asked at the end of his life why he had devoted so much of his time to measuring the velocity of light, he is said to have replied, "It was so much fun." And, lest we forget, Einstein wrote his most influential papers while working as a clerk in the Swiss Patent Office. These and the many other great scientists one could easily mention were not handicapped in their thinking because they were not "professionals" in their field, recognized figures with sources of legitimate support. They simply did what they enjoyed doing.

Is the situation really that different these days? Is it really true that a person without a Ph.D., who is not working at one of the major research centers, no longer has any chance of contributing to the advancement of science? Or is this just one of those largely unconscious efforts at mystification to which all successful institutions inevitably succumb? It is difficult to answer these questions, partly because what constitutes "science" is of course defined by those very institutions that are in line to benefit from their monopoly.

There is no doubt that a layman cannot contribute, as a hobby, to the kind of research that depends on multibillion-dollar supercolliders, or on nuclear magnetic resonance spectroscopy. But then, such fields do not represent the only science there is. The mental framework that makes science enjoyable is accessible to everyone. It involves curiosity, careful observation, a disciplined way of recording events, and finding ways to tease out the underlying regularities in what one learns. It also requires the humility to be willing to learn from the results of past investigators, coupled with enough skepticism and openness of mind to reject beliefs that are not supported by facts.

Defined in this broad sense, there are more practicing amateur

scientists than one would think. Some focus their interest on health, and try to find out everything they can about a disease that threatens them or their families. Following in Mendel's footsteps, some learn whatever they can about breeding domestic animals, or creating new hybrid flowers. Others diligently replicate the observations of early astronomers with their backyard telescopes. There are closet geologists who roam the wilderness in search of minerals, cactus collectors who scour the desert mesas for new specimens, and probably hundreds of thousands of individuals who have pushed their mechanical skills to the point that they are verging on true scientific understanding.

What keeps many of these people from developing their skills further is the belief that they will never be able to become genuine, "professional" scientists, and therefore that their hobby should not be taken seriously. But there is no better reason for doing science than the sense of order it brings to the mind of the seeker. If flow, rather than success and recognition, is the measure by which to judge its value, science can contribute immensely to the quality of life.

LOVING WISDOM

"Philosophy" used to mean "love of wisdom," and people devoted their lives to it for that reason. Nowadays professional philosophers would be embarrassed to acknowledge so naive a conception of their craft. Today a philosopher may be a specialist in deconstructionism or logical positivism, an expert in early Kant or late Hegel, an epistemologist or an existentialist, but don't bother him with wisdom. It is a common fate of many human institutions to begin as a response to some universal problem until, after many generations, the problems peculiar to the institutions themselves will take precedence over the original goal. For example, modern nations create armed forces as a defense against enemies. Soon, however, an army develops its own needs, its own politics, to the point that the most successful soldier is not necessarily the one who defends the country best, but the one who obtains the most money for the army.

Amateur philosophers, unlike their professional counterparts at universities, need not worry about historical struggles for prominence among competing schools, the politics of journals, and the personal jealousies of scholars. They can keep their minds on the basic questions. What these are is the first task for the amateur philosopher to decide. Is he interested in what the best thinkers of the past have believed about what it means to "be"? Or is he more interested in what constitutes the "good" or the "beautiful"?

As in all other branches of learning, the first step after deciding what area one wants to pursue is to learn what others have thought about the matter. By reading, talking, and listening selectively one can form an idea of what the "state of the art" in the field is. Again, the importance of personally taking control of the direction of learning from the very first steps cannot be stressed enough. If a person feels coerced to read a certain book, to follow a given course because that is supposed to be the way to do it, learning will go against the grain. But if the decision is to take that same route because of an inner feeling of rightness, the learning will be relatively effortless and enjoyable.

When his predilections in philosophy become clear, even the amateur may feel compelled to specialize. Someone interested in the basic characteristics of reality may drift toward ontology and read Wolff, Kant, Husserl, and Heidegger. Another person more puzzled by questions of right and wrong would take up ethics and learn about the moral philosophy of Aristotle, Aquinas, Spinoza, and Nietzsche. An interest in what is beautiful may lead to reviewing the ideas of aesthetic philosophers like Baumgarten, Croce, Santayana, and Collingwood. While specialization is necessary to develop the complexity of any pattern of thought, the goals-ends relationship must always be kept clear: specialization is for the sake of thinking better, and not an end in itself. Unfortunately many serious thinkers devote all their mental effort to becoming well-known scholars, but in the meantime they forget their initial purpose in scholarship.

In philosophy as in other disciplines there comes a point where a person is ready to pass from the status of passive consumer to that of active producer. To write down one's insights expecting that someday they will be read with awe by posterity would be in most cases an act of hubris, that "overweening presumption" that has caused so much mischief in human affairs. But if one records ideas in response to an inner challenge to express clearly the major questions by which one feels confronted, and tries to sketch out answers that will help make sense of one's experiences, then the amateur philosopher will have learned to derive enjoyment from one of the most difficult and rewarding tasks of life.

AMATEURS AND PROFESSIONALS

Some individuals prefer to specialize and devote all their energy to one activity, aiming to reach almost professional levels of performance in it. They tend to look down on anyone who is not as skillful and devoted to their specialty as they themselves are. Others prefer to dabble in a

variety of activities, taking as much enjoyment as possible from each without necessarily becoming an expert in any one.

There are two words whose meanings reflect our somewhat warped attitudes toward levels of commitment to physical or mental activities. These are the terms *amateur* and *dilettante*. Nowadays these labels are slightly derogatory. An amateur or a dilettante is someone not quite up to par, a person not to be taken very seriously, one whose performance falls short of professional standards. But originally, "amateur," from the Latin verb *amare*, "to love," referred to a person who loved what he was doing. Similarly a "dilettante," from the Latin *delectare*, "to find delight in," was someone who enjoyed a given activity. The earliest meanings of these words therefore drew attention to experiences rather than accomplishments; they described the subjective rewards individuals gained from doing things, instead of focusing on how well they were achieving. Nothing illustrates as clearly our changing attitudes toward the value of experience as the fate of these two words. There was a time when it was admirable to be an amateur poet or a dilettante scientist, because it meant that the quality of life could be improved by engaging in such activities. But increasingly the emphasis has been to value behavior over subjective states; what is admired is success, achievement, the quality of performance rather than the quality of experience. Consequently it has become embarrassing to be called a dilettante, even though to be a dilettante is to achieve what counts most—the enjoyment one's actions provide.

It is true that the sort of dilettantish learning encouraged here can be undermined even more readily than professional scholarship, if the learners lose sight of the goal that motivates them. Laypersons with an ax to grind sometimes turn to pseudoscience to advance their interests, and often their efforts are almost indistinguishable from those of intrinsically motivated amateurs.

An interest in the history of ethnic origins, for instance, can become easily perverted into a search for proofs of one's own superiority over members of other groups. The Nazi movement in Germany turned to anthropology, history, anatomy, language, biology, and philosophy and concocted from them its theory of Aryan racial supremacy. Professional scholars were also caught up in this dubious enterprise, but it was inspired by amateurs, and the rules by which it was played belonged to politics, not science.

Soviet biology was set back a generation when the authorities decided to apply the rules of communist ideology to growing corn, instead of following experimental evidence. Lysenko's ideas about how

grains planted in a cold climate would grow more hardy, and produce even harder progeny, sounded good to the layperson, especially within the context of Leninist dogma. Unfortunately the ways of politics and the ways of corn are not always the same, and Lysenko's efforts culminated in decades of hunger.

The bad connotations that the terms *amateur* and *dilettante* have earned for themselves over the years are due largely to the blurring of the distinction between intrinsic and extrinsic goals. An amateur who pretends to know as much as a professional is probably wrong, and up to some mischief. The point of becoming an amateur scientist is not to compete with professionals on their own turf, but to use a symbolic discipline to extend mental skills, and to create order in consciousness. On that level, amateur scholarship can hold its own, and can be even more effective than its professional counterpart. But the moment that amateurs lose sight of this goal, and use knowledge mainly to bolster their egos or to achieve a material advantage, then they become caricatures of the scholar. Without training in the discipline of skepticism and reciprocal criticism that underlies the scientific method, laypersons who venture into the fields of knowledge with prejudiced goals can become more ruthless, more egregiously unconcerned with truth, than even the most corrupt scholar.

THE CHALLENGE OF LIFELONG LEARNING

The aim of this chapter has been to review the ways in which mental activity can produce enjoyment. We have seen that the mind offers at least as many and as intense opportunities for action as does the body. Just as the use of the limbs and of the senses is available to everyone without regard to sex, race, education, or social class, so too the uses of memory, of language, of logic, of the rules of causation are also accessible to anyone who desires to take control of the mind.

Many people give up on learning after they leave school because thirteen or twenty years of extrinsically motivated education is still a source of unpleasant memories. Their attention has been manipulated long enough from the outside by textbooks and teachers, and they have counted graduation as the first day of freedom.

But a person who forgoes the use of his symbolic skills is never really free. His thinking will be directed by the opinions of his neighbors, by the editorials in the papers, and by the appeals of television. He will be at the mercy of "experts." Ideally, the end of extrinsically applied education should be the start of an education that is motivated intrinsi-

cally. At that point the goal of studying is no longer to make the grade, earn a diploma, and find a good job. Rather, it is to understand what is happening around one, to develop a personally meaningful sense of what one's experience is all about. From that will come the profound joy of the thinker, like that experienced by the disciples of Socrates that Plato describes in *Philebus*: "The young man who has drunk for the first time from that spring is as happy as if he had found a treasure of wisdom; he is positively enraptured. He will pick up any discourse, draw all its ideas together to make them into one, then take them apart and pull them to pieces. He will puzzle first himself, then also others, badger whoever comes near him, young and old, sparing not even his parents, nor anyone who is willing to listen. . . ."

The quotation is about twenty-four centuries old, but a contemporary observer could not describe more vividly what happens when a person first discovers the flow of the mind.