shot way up. According to the Magazine Publishers Association, approximately four new magazines have come into being for every one that died during the past decade. Every week sees a new small-circulation magazine on the stands or in the mails, magazines aimed at mini-markets of surfers, scuba-divers and senior citizens, at hot-rodders, credit-card holders, skiers and jet passengers. A varied crop of teenage magazines has sprung up, and most recently we have witnessed something no "mass society" pundit would have dared predict a few years ago: a rebirth of local monthlies. Today scores of American cities such as Phoenix, Philadelphia, San Diego and Atlanta, boast fat, slick, well-supported new magazines devoted entirely to local or regional matters. This is hardly a sign of the erosion of differences. Rather, we are getting a richer mix, a far greater choice of magazines than ever before. And, as the UNESCO survey showed, the same is true of books.

The number of different titles published each year has risen so sharply, and is now so large (more than 30,000 in the United States) that one suburban matron has complained, "It's getting hard to find someone who's read the same book as you. How can you even carry on a conversation about reading?" She may be overstating the case, but book clubs, for example, are finding it increasingly more difficult to choose monthly selections that appeal to large numbers of divergent readers.

Nor is the process of media differentiation confined to commercial publishing alone. Non-commercial literary magazines are proliferating. "Never in American history have there been as many such magazines as there are today," reports *The New York Times Book Review.* Similarly, "underground newspapers" have sprung up in dozens of American and European cities. There are at least 200 of these in the United States, many of them supported by advertising placed by leading record manufacturers. Appealing chiefly to hippies, campus radicals and the rock audience,

they have become a tangible force in the formation of opinion among the young. From London's *IT* and the *East Village Other* in New York, to the *Kudzu* in Jackson, Mississippi, they are heavily illustrated, often color-printed, and jammed with ads for "psychedelicatessens" and dating services. Underground papers are even published in high schools. To observe the growth of these grass-roots publications and to speak of "mass culture" or "standardization" is to blind oneself to the new realities.

Significantly, this thrust toward media diversity is based not on affluence alone, but, as we have seen before, on the new technology—the very machines that are supposedly going to homogenize us and crush all vestiges of variety. Advances in offset printing and xerography have radically lowered the costs of short-run publishing, to the point at which high school students can (and do) finance publication of their underground press with pocket money. Indeed, the office copying machine—some versions selling now for as little as thirty dollars—makes possible such extremely short production runs that, as McLuhan puts it, every man can now be his own publisher. In America, where the office copying machine is almost as universal as the adding machine, it would appear that every man *is*. The rocketing number of periodicals that land on one's desk is dramatic testimony to the ease of publication.

Meanwhile, hand-held cameras and new video-tape equipment are similarly revolutionizing the ground rules of cinema. New technology has put camera and film into the hands of thousands of students and amateurs, and the underground movie—crude, colorful, perverse, highly individualized and localized—is flourishing even more than the underground press.

These technological advances have their analog in audio commmunications, too, where the omnipresence of tape recorders permits every man to be his own "broadcaster." André Moosmann, chief Eastern European expert for Radio-Television Française, re-

ports the existence of widely known pop singers in Russia and Poland who have never appeared on radio or television, but whose songs and voices have been popularized through the medium of tape recordings alone. Tapings of Bulat Okudzava's songs, for example, pass from hand to hand, each listener making his own duplicate—a process that totalitarian governments find difficult to prevent or police. "It goes quickly," says Moosmann, "if a man makes one tape and a friend makes two, the rate of increase can be very fast."

Radicals have often complained that the means of communication are monopolized by a few. Sociologist C. Wright Mills went so far, if my memory is correct, as to urge cultural workers to take over the means of communication. This turns out to be hardly necessary. The advance of communications technology is quietly and rapidly de-monopolizing communications without a shot being fired. The result is a rich destandardization of cultural output.

Television, therefore, may still be homogenizing taste; but the other media have already passed beyond the technological state at which standardization is necessary. When technical breakthroughs alter the economics of television by providing more channels and lowering costs of production, we can anticipate that that medium, too, will begin to fragment its output and cater to, rather than counter, the increasing diversity of the consuming public. Such breakthroughs are, in fact, closer than the horizon. The invention of electronic video recording, the spread of cable television, the possibility of broadcasting direct from satellite to cable systems, all point to vast increases in program variety. For it should now be clear that tendencies toward uniformity represent only one stage in the development of any technology. A dialectical process is at work, and we are on the edge of a long leap toward unparalleled cultural diversity.

The day is already in sight when books, magazines,

newspapers, films and other media will, like the Mustang, be offered to the consumer on a design-it-yourself basis. Thus in the mid-sixties, Joseph Naughton, a mathematician and computer specialist at the University of Pittsburgh, suggested a system that would store a consumer's profile—data about his occupation and interests—in a central computer. Machines would then scan newspapers, magazines, video tapes, films and other material, match them against the individual's interest profile, and instantaneously notify him when something appears that concerns him. The system could be hitched to facsimile machines and TV transmitters that would actually display or print out the material in his own living room. By 1969 the Japanese daily *Asahi Shimbun* was publicly demonstrating a low cost "Telenews" system for printing newspapers in the home, and Matsushita Industries of Osaka was displaying a competitive system known as TV Fax (H). These are the first steps toward the newspaper of the future —a peculiar newspaper, indeed, offering no two viewer-readers the same content. Mass communication, under a system like this, is "de-massified." We move from homogeneity to heterogeneity.

It is obstinate nonsense to insist, in the face of all this, that the machines of tomorrow will turn us into robots, steal our individuality, eliminate cultural variety, etc., etc. Because primitive mass production imposed certain uniformities, does not mean that super-industrial machines will do the same. The fact is that the entire thrust of the future carries away from standardization—away from uniform goods, away from homogenized art, mass produced education and "mass" culture. We have reached a dialectical turning point in the technological development of society. And technology, far from restricting our individuality, will multiply our choices—and our freedom—exponentially.

Whether man is prepared to cope with the increased choice of material and cultural wares avail-

able to him is, however, a totally different question. For there comes a time when choice, rather than freeing the individual, becomes so complex, difficult and costly, that it turns into its opposite. There comes a time, in short, when choice turns into overchoice and freedom into un-freedom.

To understand why, we must go beyond this examination of our expanding material and cultural choice. We must look at what is happening to social choice as well.

Chapter 13

A SURFEIT OF SUBCULTS

Thirty miles north of New York City, within easy reach of its towers, its traffic and its urban temptations, lives a young taxicab driver, a former soldier, who boasts 700 surgical stitches in his body. These stitches are not the result of combat wounds, nor of an accident involving his taxi. Instead, they are the result of his chief recreation: rodeo riding.

On a cab driver's modest salary, this man spends more than $1200 a year to own a horse, stable it, and keep it in perfect trim. Periodically hitching a horse-trailer to his auto, he drives a little over one hundred miles to a place outside Philadelphia called "Cow Town." There, with others like himself, he participates in roping, steer wrestling, bronco busting, and other strenuous contests, the chief prize of which have been repeated visits to a hospital emergency ward.

Despite its proximity, New York holds no fascination for this fellow. When I met him he was twenty-three, and he had visited it only once or twice in his life. His entire interest is focused on the cow ring, and he is a member of a tiny group of rodeo fanatics who form a little-known underground in the United States. They are not professionals who earn a living from this atavistic sport. Nor are they simply people who affect Western-style boots, hats, denim jackets

and leather belts. They are a tiny, but authentic subcult lost within the vastness and complexity of the most highly technological civilization in the world.

This odd group not only engages the cab driver's passion, it consumes his time and money. It affects his family, his friends, his ideas. It provides a set of standards against which he measures himself. In short, it rewards him with something that many of us have difficulty finding: an identity.

The techno-societies, far from being drab and homogenized, are honeycombed with just such colorful groupings—hippies and hot rodders, theosophists and flying saucer fans, skin-divers and sky-divers, homosexuals, computerniks, vegetarians, body-builders and Black Muslims.

Today the hammerblows of the super-industrial revolution are literally splintering the society. We are multiplying these social enclaves, tribes and minicults among us almost as fast as we are multiplying automotive options. The same destandardizing forces that make for greater individual choice with respect to products and cultural wares, are also destandardizing our social structures. This is why, seemingly overnight, new subcults like the hippies burst into being. We are, in fact, living through a "subcult explosion."

The importance of this cannot be overstated. For we are all deeply influenced, our identities are shaped, by the subcults with which we choose, unconsciously or not, to identify ourselves. It is easy to ridicule a hippie or an uneducated young man who is willing to suffer 700 stitches in an effort to test and "find" himself. Yet we are all rodeo riders or hippies in one sense: we, too, search for identity by attaching ourselves to informal cults, tribes or groups of various kinds. And the more numerous the choices, the more difficult the quest.

SCIENTISTS AND STOCKBROKERS

The proliferation of subcults is most evident in the world of work. Many subcults spring up around occupational specialties. Thus, as the society moves toward greater specialization, it generates more and more subcultural variety.

The scientific community, for example, is splitting into finer and finer fragments. It is criss-crossed with formal organizations and associations whose specialized journals, conferences and meetings are rapidly multiplying in number. But these "open" distinctions according to subject matter are matched by "hidden" distinctions as well. It is not simply that cancer researchers and astronomers do different things; they talk different languages, tend to have different personality types; they think, dress and live differently. (So marked are these distinctions that they often interfere with interpersonal relationships. Says a woman scientist: "My husband is a microbiologist and I am a theoretical physicist, and sometimes I wonder if we mutually exist.")

Scientists within a specialty tend to hang together with their own kind, forming themselves into tight little subcultural cells, to which they turn for approval and prestige, as well as for guidance about such things as dress, political opinions, and life style.

As science expands and the scientific population grows, new specialties spring up, fostering more and still more diversity at this "hidden" or informal level. In short, specialization breeds subcults.

This process of cellular division within a profession is dramatically marked in finance. Wall Street was once a relatively homogeneous community. "It used to be," says one prominent sociological observer of the money men, "that you came down here from St. Paul's and you made a lot of money and belonged to the Racquet Club and you had an estate on the North

Shore, and your daughters were debutantes. You did it all by selling bonds to your ex-classmates." The remark is perhaps slightly exaggerated, but Wall Street was, in fact, one big White Anglo-Saxon Protestant subcult, and its members did tend to go to the same schools, join the same clubs, engage in the same sports (tennis, golf and squash), attend the same churches (Presbyterian and Episcopalian), and vote for the same party (Republican).

Anybody who still thinks of Wall Street in these terms, however, is getting his ideas from the novels of Auchincloss or Marquand rather than from the new, fast-changing reality. Today, Wall Street has splintered, and a young man entering the business has a choice of a whole clutch of competing subcultural affiliations. In investment banking the old conservative WASP grouping still lingers on. There are still some old-line "white shoe" firms of which it is said "They'll have a black partner before they hire a Jew." Yet in the mutual fund field, a relatively new specialized segment of the financial industry, Greek, Jewish and Chinese names abound, and some star salesmen are black. Here the entire style of life, the implicit values of the group, are quite different. Mutual fund people are a separate tribe.

"Not everyone even wants to be a WASP any more," says a leading financial writer. Indeed, many young, aggressive Wall Streeters, even when they do happen to be WASP in origin, reject the classical Wall Street subcult and identify themselves instead with one or more of the pluralistic social groupings that now swarm and sometimes collide in the canyons of Lower Manhattan.

As specialization continues, as research extends into new fields and probes more deeply into old ones, as the economy continues to create new technologies and services, subcults will continue to multiply. Those social critics who inveigh against "mass society" in one breath and denounce "over-specialization" in the

next are simply flapping their tongues. Specialization means a movement away from sameness.

Despite much loose talk about the need for "generalists," there is little evidence that the technology of tomorrow can be run without armies of highly trained specialists. We are rapidly changing the types of expertise needed. We are demanding more "multi-specialists" (men who know one field deeply, but who can cross over into another as well) rather than rigid, "mono-specialists." But we shall continue to need and breed ever more refined work specialties as the technical base of society increases in complexity. For this reason alone, we must expect the variety and number of subcults in the society to increase.

THE FUN SPECIALISTS

Even if technology were to free millions of people from the need to work in the future, we would find the same push toward diversity operating among those who are left free to play. For we are already producing large numbers of "fun specialists." We are rapidly multiplying not merely types of work, but types of play as well.

The number of acceptable pastimes, hobbies, games, sports and entertainments is climbing rapidly, and the growth of a distinct subcult built around surfing, for example, demonstrates that, at least for some, a leisure-time commitment can also serve as the basis for an entire life style. The surfing subcult is a signpost pointing to the future.

"Surfing has already developed a kind of symbolism that gives it the character of a secret fraternity or a religious order," writes Remi Nadeau. "The identifying sign is a shark's tooth, St. Christopher medal, or Maltese cross hung loosely about one's neck . . . For a long time, the most accepted form of transportation has been a wood-paneled Ford station wagon of ancient vintage." Surfers display sores and nodules

on their knees and feet as proud proof of their involvement. Suntan is *de rigeur*. Hair is styled in a distinctive way. Members of the tribe spend endless hours debating the prowess of such in-group heroes as J. J. Moon, and his followers buy J. J. Moon T-shirts, surfboards, and fan club memberships.

Surfers are only one of many such play-based subcults. Among skydivers, for example, the name J. J. Moon is virtually unknown, and so are the peculiar rituals and fashions of the wave-cresters. Skydivers talk, instead, about the feat of Rod Pack, who not long ago jumped from an airplane without a parachute, was handed one by a companion in mid-air, put it on, opened it, and landed safely. Skydivers have their own little world, as do glider enthusiasts, scuba-divers, hot rodders, drag racers and motorcyclists. Each of these represents a leisure-based subcult organized around a technological device. As the new technology makes new sports possible, we can anticipate the formation of highly varied new play cults.

Leisure-time pursuits will become an increasingly important basis for differences between people, as the society itself shifts from a work orientation toward greater involvement in leisure. In the United States, since the turn of the century alone, the society's measurable commitment to work has plummeted by nearly a third. This is a massive redeployment of the society's time and energy. As this commitment declines further, we shall advance into an era of breathtaking fun specialism—much of it based on sophisticated technology.

We can anticipate the formation of subcults built around space activity, holography, mind-control, deep-sea diving, submarining, computer gaming and the like. We can even see on the horizon the creation of certain anti-social leisure cults—tightly organized groups of people who will disrupt the workings of society not for material gain, but for the sheer sport of "beating the system"—a development foreshadowed in such films as *Duffy* and *The Thomas Crown Af-*

fair. Such groups may attempt to tamper with governmental or corporate computer programs, re-route mail, intercept and alter radio and television broadcasts, perform elaborately theatrical hoaxes, tinker with the stock market, corrupt the random samples upon which political or other polls are based, and even, perhaps, commit complexly plotted robberies and assassinations. Novelist Thomas Pynchon in *The Crying of Lot 49* describes a fictional underground group who have organized their own private postal system and maintained it for generations. Science fiction writer Robert Sheckley has gone so far as to propose, in a terrifying short story called *The Seventh Victim,* the possibility that society might legalize murder among certain specified "players" who hunt one another and are, in turn, hunted. This ultimate game would permit those who are dangerously violent to work off their aggressions within a managed framework.

Bizarre as some of this may sound, it would be well not to rule out the seemingly improbable, for the realm of leisure, unlike that of work, is little constrained by practical considerations. Here imagination has free play, and the mind of man can conjure up incredible varieties of "fun." Given enough time, money and, for some of these, technical skill, the men of tomorrow will be capable of playing in ways never dreamed of before. They will play strange sexual games. They will play games with the mind. They will play games with society. And in so doing, by choosing among the unimaginably broad options, they will form subcults and further set themselves off from one another.

THE YOUTH GHETTO

Subcults are multiplying—the society is cracking—along age lines, too. We are becoming "age specialists" as well as work and play specialists. There was

a time when people were divided roughly into children, "young persons," and adults. It wasn't until the forties that the loosely defined term "young persons" began to be replaced by the more restrictive term "teenager," referring specifically to the years thirteen to nineteen. (In fact, the word was virtually unknown in England until after World War II.)

Today this crude, three-way division is clearly inadequate, and we are busy inventing far more specific categories. We now have a classification called "pre-teens" or "sub-teens" that sits perched between childhood and adolescence. We are also beginning to hear of "post-teens" and, after that, "young marrieds." Each of these terms is a linguistic recognition of the fact that we can no longer usefully lump all "young persons" together. Increasingly deep cleavages separate one age group from another. So sharp are these differences that sociologist John Lofland of the University of Michigan predicts they will become the "conflict equivalent of southerner and northerner, capitalist and worker, immigrant and 'native stock,' suffragette and male, white and Negro."

Lofland supports this startling suggestion by documenting the rise of what he calls the "youth ghetto"—large communities occupied almost entirely by college students. Like the Negro ghetto, the youth ghetto is often characterized by poor housing, rent and price gouging, very high mobility, unrest and conflict with the police. Like the Negro ghetto, it, too, is quite heterogeneous, with many subcults competing for the attention and allegiance of the ghettoites.

Robbed of adult heroes or role models other than their own parents, children of streamlined, nuclear families are increasingly flung into the arms of the only other people available to them—other children. They spend more time with one another, and they become more responsive to the influence of peers than ever before. Rather than idolizing an uncle, they idolize Bob Dylan or Donovan or whomever else the peer group holds up for a life style model. Thus we

are beginning to form not only a college student ghetto, but even semi-ghettos of pre-teens and teenagers, each with its own peculiar tribal characteristics, its own fads, fashions, heroes and villains.

We are simultaneously segmenting the adult population along age lines, too. There are suburbs occupied largely by young married couples with small children, or by middle-aged couples with teenagers, or by older couples whose children have already left home. We have specially-designed "retirement communities" for retirees. "There may come a day," Professor Lofland warns, ". . . when some cities will find that their politics revolve around the voting strength of various age category ghettos, in the same way that Chicago politics has long revolved around ethnic and racial enclaves."

This emergence of age-based subcultures can now be seen as part of a stunning historical shift in the basis of social differentiation. Time is becoming more important as a source of differences among men; space is becoming less so.

Thus communications theorist James W. Carey of the University of Illinois, points out that "among primitive societies and in the earlier stages of western history, relatively small discontinuities in space led to vast differences in culture . . . Tribal societies separated by a hundred miles could have . . . grossly dissimilar systems of expressive symbolism, myth and ritual." Within these same societies, however, there was "great continuity . . . over generations . . . vast differences between societies but relatively little variation between generations within a given society."

Today, he continues, space "progressively disappears as a differentiating factor." But if there has been some reduction in regional variation, Carey takes pains to point out, "one must not assume that differences between groups are being obliterated . . . as some mass society theorists [suggest]." Rather, Carey points out, "the axis of diversity shifts from a spatial . . . to a temporal or generational dimension."

Thus we get jagged breaks between the generations —and Mario Savio summed it up with the revolutionary slogan, "Don't trust anyone over thirty!" In no previous society could such a slogan have caught on so quickly.

Carey explains this shift from spatial to temporal differentiation by calling attention to the advance of communications and transportation technology which spans great distances, and, in effect, conquers space. Yet there is another, easily overlooked factor at work: the acceleration of change. For as the pace of change in the external environment steps up, the inner differences between young and old become necessarily more marked. In fact, the pace of change is already so blinding that even a few years can make a great difference in the life experience of the individual. This is why some brothers and sisters, separated in age by a mere three or four years, subjectively feel themselves to be members of quite different "generations." It is why among those radicals who participated in the strike at Columbia University, seniors spoke of the "generation gap" that separated them from sophomores.

MARITAL TRIBES

Splintering along occupational, recreational and age lines, the society is also fragmenting along sexual-familial lines. Even now, however, we are already creating distinctive new subcults based on marital status. Once people might be loosely classified as either single, married or widowed. Today this three-way categorization is no longer adequate. Divorce rates are so high in most of the techno-societies today that a distinct new social grouping has emerged—those who are no longer married or who are between marriages. Thus Morton Hunt, an authority on the subject, describes what he terms "the world of the formerly married."

This group, says Hunt, is a "subculture . . . with its own mechanisms for bringing people together, its own patterns of adjustment to the separated or divorced life, its own opportunities for friendship, social life and love." As its members break away from their married friends, they become progressively isolated from those still in "married life" and "ex-marrieds," like "teen-agers" or "surfers," tend to form social enclaves of their own with their own favored meeting places, their own attitudes toward time, their own distinct sexual codes and conventions.

Strong trends make it likely that this particular social category will swell in the future. And when this happens, the world of the formerly married will, in turn, split into multiple worlds, more and still more sub-cultural groupings. For the bigger a subcult becomes, the more likely it is to fragment and give birth to new subcults.

If the first clue to the future of social organization lies, therefore, in the idea of proliferating subcults, the second lies in sheer size. This basic principle is largely overlooked by those who are most exercised over "mass society," and it helps explain the persistence of diversity even under extreme standardizing pressures. Because of in-built limitations in social communication, size itself acts as a force pushing toward diversity of organization. The larger the population of a modern city, for example, the more numerous—and diverse—the subcults within it. Similarly, the larger the subcult, the higher the odds that it will fragment and diversify. The hippies provide a perfect example.

HIPPIES, INCORPORATED

In the mid-fifties, a small group of writers, artists and assorted hangers-on coalesced in San Francisco and around Carmel and Big Sur on the California coast.

Quickly dubbed "beats" or "beatniks," they pieced together a distinctive way of life.

Its most conspicuous elements were the glorification of poverty—jeans, sandals, pads and hovels; a predilection for Negro jazz and jargon; an interest in Eastern mysticism and French existentialism; and a general antagonism to technologically based society.

Despite extensive press coverage, the beats remained a tiny sect until a technological innovation—lysergic acid, better known as LSD—appeared on the scene. Pushed by the messianic advertising of Timothy Leary, Allen Ginsberg and Ken Kesey, distributed free to thousands of young people by irresponsible enthusiasts, LSD soon began to claim a following on the American campus, and almost as quickly spread to Europe as well. The infatuation with LSD was accompanied by a new interest in marijuana, a drug with which the beats had long experimented. Out of these two sources, the beat subcult of the mid-fifties and the "acid" subcult of the early sixties, sprang a larger group—a new subcult that might be described as a corporate merger of the two: the hippie movement. Blending the blue jeans of the beats with the beads and bangles of the acid crowd, the hippies became the newest and most hotly publicized subcult on the American scene.

Soon, however, the pressures of growth proved too much for it. Thousands of teen-agers joined the ranks; millions of pre-teens watched their television sets, read magazine articles about the movement, and undulated in sympathy; some suburban adults even became "plastic" or weekend hippies. The result was predictable. The hippie subcult—exactly like General Motors or General Electric—was forced to divisionalize, to break down into subsidiaries. Thus out of the hippie subcult came a shower of progeny.

To the eye of the uninitiated, all young people with long hair seemed alike. Yet important sub-units emerged within the movement. According to David Andrew Seeley, an acute young observer, there were

at its height "perhaps a score of recognizable and distinct groups." These varied not only by certain subtleties of dress but by interest. Thus, Seeley reported, their activities ranged "from beer parties to poetry readings, from pot-smoking to modern dance—and often those who indulge in one wouldn't touch the other." Seeley then proceeded to explain the differences that set apart such groups as the teeny-boppers (now largely vanished from the scene), the political activist beatniks, the folk beatniks, and then, and only then, the original hippies *per se*.

Members of these subcultural subsidiaries wore identifying badges that held meaning for insiders. Teeny-boppers, for example, were beardless, many, in fact, being too young to shave. Sandals were "in" with the folk set, but not some of the others. The tightness of one's trousers varied according to subcult.

At the level of ideas, there were many common complaints about the dominant culture. But sharp differences emerged with respect to political and social action. Attitudes ranged from the conscious withdrawal of the acid hippie, through the ignorant unconcern of the teeny-bopper, to the intense involvement of the New Left activist and the politics-of-the-absurd activities of groupings like the Dutch provos, the Crazies, and the guerrilla theater crowd.

The hippie corporation, so to speak, grew too large to handle all its business in a standardized way. It had to diversify and it did. It spawned a flock of fledgling subcultural enterprises.

TRIBAL TURNOVER

Even as this happened, however, the movement began to die. The most passionate LSD advocates of yesterday began to admit that "acid was a bad scene" and various underground newspapers began warning followers against getting too involved with "tripsters." A mock funeral was held in San Francisco to "bury"

the hippie subcult, and its favored locations, Haight-Ashbury and the East Village turned into tourist meccas as the original movement writhed and disintegrated, forming new and odder, but smaller and weaker subcults and mini-tribes. Then, as though to start the process all over again, yet another subcult, the "skinheads," surfaced. Skinheads had their own characteristic outfits—suspenders, boots, short haircuts—and an unsettling predilection for violence.

The death of the hippie movement and the rise of the skinheads provide a crucial new insight into the subcultural structure of tomorrow's society. For we are not merely multiplying subcults. We are turning them over more rapidly. The principle of transience is at work here, too. As the rate of change accelerates in all other aspects of the society, subcults, too, grow more ephemeral.

Evidence pointing toward a decrease in the life span of subcults also lies in the disappearance of that violent subcult of the fifties, the fighting street gang. Throughout that decade certain streets in New York were regularly devastated by a peculiar form of urban warfare called the "rumble." During a rumble, scores, if not hundreds, of youths would attack one another with flailing chains, switchblade knives, broken bottles and zip-guns. Rumbles occurred in Chicago, Philadelphia, Los Angeles, and even as far away as London and Tokyo.

While there was no direct connection between these far-flung outbreaks, rumbles were by no means chance events. They were planned and carried out with military precision by highly organized "bopping gangs." In New York these gangs affected colorful names—Cobras, Corsair Lords, Apaches, Egyptian Kings and the like. They fought one another for dominance in their "turf"—the specific geographic area they staked out for themselves.

At their peak there were some 200 such gangs in New York alone, and in a single year, 1958, they accounted for no fewer than eleven homicides. Yet by

1966, according to police officials, the bopping gangs had virtually vanished. Only one gang was left in New York, and *The New York Times* reported: "No one knows on what garbage strewn street . . . the last rumble took place. But it happened four or five years ago [which would date the death of the rumble a mere two or three years after the 1958 peak]. Then, suddenly, after a decade of mounting violence the era of the fighting gangs of New York came to an end." The same appeared to be true in Washington, Newark, Philadelphia and elsewhere as well.

The disappearance of the violent street gangs has not, of course, led to an era of urban tranquility. The aggressive passions that led poor Puerto Rican and Negro youths in New York to wage war on rival gangs is now directed at the social system itself, and totally new kinds of social organizations, subcults and life style groupings are emerging in the ghetto.

What we sense, therefore, is a process by which subcults multiply at an ever accelerating rate, and in turn die off to make room for still more and newer subcults. A kind of metabolic process is taking place in the bloodstream of the society, and it is speeding up exactly as other aspects of social interaction are quickening.

For the individual, this raises the problems of choice to a totally new level of intensity. It is not simply that the number of tribes is expanding rapidly. It is not even that these tribes or subcults are bouncing off one another, shifting and changing their relationships to one another more and more rapidly. It is also that many of them will not hold still long enough to permit an individual to make a rational investigation of the presumed advantages or disadvantages of affiliation.

The individual searching for some sense of belonging, looking for the kind of social connection that confers some sense of identity, moves through a blurry environment in which the possible targets of affiliation are all in high-speed motion. He must

choose from among a growing number of moving targets. The problems of choice thus escalate not arithmetically, but geometrically.

At the very instant when his choices among material goods, education, culture consumption, recreation and entertainment are all multiplying, he is also given a bewildering array of social choices. And just as there is a limit to how much choice he may *wish* to exercise in buying a car—at a certain point the addition of options requires more decision-making than they are worth—so, too, we may soon approach the moment of social overchoice.

The level of personality disorder, neurosis, and just plain psychological distress in our society suggests that it is already difficult for many individuals to create a sensible, integrated, and reasonably stable personal style. Yet there is every evidence that the thrust toward social diversity, paralleling that at the level of goods and culture, is just beginning. We face a tempting and terrifying extension of freedom.

THE IGNOBLE SAVAGE

The more subcultural groupings in a society, the greater the potential freedom of the individual. This is why pre-industrial man, despite romantic myths to the contrary, suffered so bitterly from lack of choice.

While sentimentalists prattle about the supposedly unfettered freedom of the primitive, evidence collected by anthropologists and historians contradicts them. John Gardner puts the matter tersely: "The primitive tribe or pre-industrial community has usually demanded far more profound submission of the individual to the group than has any modern society." As an Australian social scientist was told by a Temne tribesman in Sierra Leone: "When Temne people choose a thing, we must all agree with the decision —this is what we call cooperation."

This is, of course, what *we* call conformity.

The reason for the crushing conformity required of pre-industrial man, the reason the Temne tribesman has to "go along" with his fellows, is precisely that he has nowhere else to go. His society is monolithic, not yet broken into a liberating multiplicity of components. It is what sociologists call "undifferentiated."

Like a bullet smashing into a pane of glass, industrialism shatters these societies, splitting them up into thousands of specialized agencies—schools, corporations, government bureaus, churches, armies—each subdivided into smaller and still more specialized subunits. The same fragmentation occurs at the informal level, and a host of subcults spring up: rodeo riders, Black Muslims, motorcyclists, skinheads and all the rest.

This split-up of the social order is precisely analogous to the process of growth in biology. Embryos differentiate as they develop, forming more and more specialized organs. The entire march of evolution, from the virus to man, displays a relentless advance toward higher and higher degrees of differentiation. There appears to be a seemingly irresistible movement of living beings and social groups from less to more differentiated forms.

Thus it is not accidental that we witness parallel trends toward diversity—in the economy, in art, in education and mass culture, in the social order itself. These trends all fit together forming part of an immensely larger historic process. The Super-industrial Revolution can now be seen for what, in large measure, it is—the advance of human society to its next higher stage of differentiation.

This is why it often seems to us that our society is cracking at the seams. It is. This is why everything grows increasingly complex. Where once there stood 1000 organizational entities, there now stand 10,000 —interconnected by increasingly transient links. Where once there were a few relatively permanent subcults with which a person might identify, there now are thousands of temporary subcults milling

about, colliding and multiplying. The powerful bonds that integrated industrial society—bonds of law, common values, centralized and standardized education and cultural production—are breaking down.

All this explains why cities suddenly seem to be "unmanageable" and universities "ungovernable." For the old ways of integrating a society, methods based on uniformity, simplicity, and permanence, are no longer effective. A new, more finely fragmented social order—a super-industrial order—is emerging. It is based on many more diverse and short-lived components than any previous social system—and we have not yet learned how to link them together, how to integrate the whole.

For the individual, this leap to a new level of differentiation holds awesome implications. But not the ones most people fear. We have been told so often that we are heading for faceless uniformity that we fail to appreciate the fantastic opportunities for individuality that the Super-industrial Revolution brings with it. And we have hardly begun to think about the dangers of over-individualization that are also implicit in it.

The "mass society" theorists are obsessed by a reality that has already begun to pass us by. The Cassandras who blindly hate technology and predict an ant-heap future are still responding in knee-jerk fashion to the conditions of industrialism. Yet this system is already being superseded.

To denounce the conditions that imprison the industrial worker today is admirable. To project these conditions into the future, and predict the death of individualism, diversity and choice, is to utter dangerous clichés.

The people of both past and present are still locked into relatively choiceless life ways. The people of the future, whose number increases daily, face not choice but overchoice. For them there comes an explosive extension of freedom.

And this freedom comes not in spite of the new

technology but very largely because of it. For if the early technology of industrialism required mindless, robot-like men to perform endlessly repetitive tasks, the technology of tomorrow takes over precisely these tasks, leaving for men only those functions that require judgment, interpersonal skills and imagination. Super-industrialism requires, and will create, not identical "mass men," but people richly different from one another, individuals, not robots.

The human race, far from being flattened into monotonous conformity, will become far more diverse socially than it ever was before. The new society, the super-industrial society now beginning to take form, will encourage a crazy-quilt pattern of evanescent life styles.

Chapter 14

A DIVERSITY OF LIFE STYLES

In San Francisco, executives lunch at restaurants where they are served by bare-breasted waitresses. In New York, however, a kooky girl cellist is arrested for performing avant garde music in a topless costume. In St. Louis, scientists hire prostitutes and others to copulate under a camera as part of a study of the physiology of the orgasm. But in Columbus, Ohio, civic controversy erupts over the sale of so-called "Little Brother" dolls that come from the factory equipped with male genitalia. In Kansas City, a conference of homosexual organizations announces a campaign to lift a Pentagon ban on homosexuals in the armed forces and, in fact, the Pentagon discreetly does so. Yet American jails are well populated with men arrested for the crime of homosexuality.

Seldom has a single nation evinced greater confusion over its sexual values. Yet the same might be said for other kinds of values as well. America is tortured by uncertainty with respect to money, property, law and order, race, religion, God, family and self. Nor is the United States alone in suffering from a kind of value vertigo. All the techno-societies are caught up in the same massive upheaval. This collapse of the values of the past has hardly gone unnoticed. Every priest, politician and parent is reduced

to head-shaking anxiety by it. Yet most discussions of value change are barren for they miss two essential points. The first of these is acceleration.

Value turnover is now faster than ever before in history. While in the past a man growing up in a society could expect that its public value system would remain largely unchanged in his lifetime, no such assumption is warranted today, except perhaps in the most isolated of pre-technological communities.

This implies temporariness in the structure of both public and personal value systems, and it suggests that *whatever* the content of values that arise to replace those of the industrial age, they will be shorter-lived, more ephemeral than the values of the past. There is no evidence whatsoever that the value systems of the techno-societies are likely to return to a "steady state" condition. For the foreseeable future, we must anticipate still more rapid value change.

Within this context, however, a second powerful trend is unfolding. For the fragmentation of societies brings with it a diversification of values. We are witnessing the crack-up of consensus.

Most previous societies have operated with a broad central core of commonly shared values. This core is now contracting, and there is little reason to anticipate the formation of a new broad consensus within the decades ahead. The pressures are outward toward diversity, not inward toward unity.

This accounts for the fantastically discordant propaganda that assails the mind in the techno-societies. Home, school, corporation, church, peer group, mass media—and myriad subcults—all advertise varying sets of values. The result for many is an "anything goes" attitude—which is, itself, still another value position. We are, declares *Newsweek* magazine, "a society that has lost its consensus . . . a society that cannot agree on standards of conduct, language and manners, on what can be seen and heard."

This picture of a cracked consensus is confirmed by

the findings of Walter Gruen, social science research coordinator at Rhode Island Hospital, who has conducted a series of statistical studies of what he terms "the American core culture." Rather than the monolithic system of beliefs attributed to the middle class by earlier investigators, Gruen found—to his own surprise—that "diversity in beliefs was more striking than the statistically supported uniformities. It is," he concluded, "perhaps already misleading to talk of an 'American' culture complex."

Gruen suggests that particularly among the affluent, educated group, consensus is giving way to what he calls "pockets" of values. We can expect that, as the number and variety of subcults continues to expand, these pockets will proliferate, too.

Faced with colliding value systems, confronted with a blinding array of new consumer goods, services, educational, occupational and recreational options, the people of the future are driven to make choices in a new way. They begin to "consume" life styles the way people of an earlier, less choice-choked time consumed ordinary products.

MOTORCYCLISTS AND INTELLECTUALS

During Elizabethan times, the term "gentleman" referred to a whole way of life, not simply an accident of birth. Appropriate lineage may have been a prerequisite, but to be a gentleman one had also to live in a certain style: to be better educated, have better manners, wear better clothes than the masses; to engage in certain recreations (and not others); to live in a large, well-furnished house; to maintain a certain aloofness with subordinates; in short, never to lose sight of his class "superiority."

The merchant class had its own preferred life style and the peasantry still another. These life styles, like that of the gentleman, were pieced together out of many different components, ranging from residence,

occupation and dress to jargon, gesture and religion.

Today we still create our life styles by forming a mosaic of components. But much has changed. Life style is no longer simply a manifestation of class position. Classes themselves are breaking up into smaller units. Economic factors are declining in importance. Thus today it is not so much one's class base as one's ties with a subcult that determine the individual's style of life. The working-class hippie and the hippie who dropped out of Exeter or Eton share a common style of life but no common class.

Since life style has become the way in which the individual expresses his identification with this or that subcult, the explosive multiplication of subcults in society has brought with it an equally explosive multiplication of life styles. Thus the stranger launched into American or English or Japanese or Swedish society today must choose not among four or five class-based styles of life, but among literally hundreds of diverse possibilities. Tomorrow, as subcults proliferate, this number will be even larger.

How we choose a life style, and what it means to us, therefore, looms as one of the central issues of the psychology of tomorrow. For the selection of a life style, whether consciously done or not, powerfully shapes the individual's future. It does this by imposing order, a set of principles or criteria on the choices he makes in his daily life.

This becomes clear if we examine how such choices are actually made. The young couple setting out to furnish their apartment may look at literally hundreds of different lamps—Scandinavian, Japanese, French Provincial, Tiffany lamps, hurricane lamps, American colonial lamps—dozens, scores of different sizes, models and styles before selecting, say, the Tiffany lamp. Having surveyed a "universe" of possibilities, they zero in on one. In the furniture department, they again scan an array of alternatives, then settle on a Victorian end table. This scan-and-select procedure is repeated with respect to rugs, sofa, drapes,

dining room chairs, etc. In fact, something like this same procedure is followed not merely in furnishing their home, but also in their adoption of ideas, friends, even the vocabulary they use and the values they espouse.

While the society bombards the individual with a swirling, seemingly patternless set of alternatives, the selections made are anything but random. The consumer (whether of end tables or ideas) comes armed with a pre-established set of tastes and preferences. Moreover, no choice is wholly independent. Each is conditioned by those made earlier. The couple's selection of an end table has been conditioned by their previous choice of a lamp. In short, there is a certain consistency, an attempt at personal style, in all our actions—whether consciously recognized or not.

The American male who wears a button-down collar and garter-length socks probably also wears wing-tip shoes and carries an attaché case. If we look closely, chances are we shall find a facial expression and brisk manner intended to approximate those of the stereotypical executive. The odds are astronomical that he will not let his hair grow wild in the manner of rock musician Jimi Hendrix. He knows, as we do, that certain clothes, manners, forms of speech, opinions and gestures hang together, while others do not. He may know this only by "feel," or "intuition," having picked it up by observing others in the society, but the knowledge shapes his actions.

The black-jacketed motorcyclist who wears steel-studded gauntlets and an obscene swastika dangling from his throat completes his costume with rugged boots, not loafers or wing-tips. He is likely to swagger as he walks and to grunt as he mouths his anti-authoritarian platitudes. For he, too, values consistency. He knows that any trace of gentility or articulateness would destroy the integrity of his style.

STYLE-SETTERS AND MINI-HEROES

Why do the motorcyclists wear black jackets? Why not brown or blue? Why do executives in America prefer attaché cases, rather than the traditional briefcase? It is as though they were following some model, trying to attain some ideal laid down from above.

We know little about the origin of life style models. We do know, however, that popular heroes and celebrities, including fictional characters (James Bond, for example), have something to do with it.

Marlon Brando, swaggering in a black jacket as a motorcyclist, perhaps originated, and certainly publicized a life style model. Timothy Leary, robed, beaded, and muttering mystic pseudo profundities about love and LSD, provided a model for thousands of youths. Such heroes, as the sociologist Orrin Klapp puts it, help to "crystallize a social type." He cites the late James Dean who depicted the alienated adolescent in the movie *Rebel Without a Cause* or Elvis Presley who initially fixed the image of the guitar-twanging rock-'n'-roller. Later came the Beatles with their (at that time) outrageous hair and exotic costumes. "One of the prime functions of popular favorites," says Klapp, "is to make types visible, which in turn make new life styles and new tastes visible."

Yet the style-setter need not be a mass media idol. He may be almost unknown outside a particular subcult. Thus for years Lionel Trilling, an English professor at Columbia, was the father figure for the West Side Intellectuals, a New York subcult well known in literary and academic circles in the United States. The mother figure was Mary McCarthy, long before she achieved popular fame.

An acute article by John Speicher in a youth magazine called *Cheetah* listed some of the better-known life style models to which young people were responding in the late sixties. They ranged from Ché

Guevara to William Buckley, from Bob Dylan and Joan Baez to Robert Kennedy. "The American youth bag," wrote Speicher, lapsing into hippie jargon, "is overcrowded with heroes." And, he adds, "where heroes are, there are followers, cultists."

To the subcult member, its heroes provide what Speicher calls the "crucial existential necessity of psychological identity." This is, of course, hardly new. Earlier generations identified with Charles Lindbergh or Theda Bara. What is new and highly significant, however, is the fabulous proliferation of such heroes and mini-heroes. As subcults multiply and values diversify, we find, in Speicher's words, "a national sense of identity hopelessly fragmented." For the individual, he says, this means greater choice: "There is a wide range of cults available, a wide range of heroes. You can do comparison shopping."

LIFE STYLE FACTORIES

While charismatic figures may become style-setters, styles are fleshed out and marketed to the public by the sub-societies or tribe-lets we have termed subcults. Taking in raw symbolic matter from the mass media, they somehow piece together odd bits of dress, opinion, and expression and form them into a coherent package: a life style model. Once they have assembled a particular model, they proceed, like any good corporation, to merchandise it. They find customers for it.

Anyone doubting this is advised to read the letters of Allen Ginsberg to Timothy Leary, the two men most responsible for creating the hippie life style, with its heavy accent on drug use.

Says poet Ginsberg: "Yesterday got on TV with N. Mailer and Ashley Montagu and gave big speech . . . recommending everybody get high . . . Got in touch with all the liberal pro-dope people I know to have [a certain pro-drug report] publicized and cir-

culated . . . I wrote a five-page summary of the situation to this friend Kenny Love on *The New York Times* and he said he'd perhaps do a story (newswise) . . . which could then be picked up by U.P. friend on national wire. Also gave copy to Al Aronowitz on New York *Post* and Rosalind Constable at *Time* and Bob Silvers on *Harper's* . . ."

No wonder LSD and the whole hippie phenomenon received the immense mass media publicity it did. This partial account of Ginsberg's energetic press agentry, complete with the Madison Avenue suffix "-wise" (as in newswise), reads precisely like an internal memo from Hill and Knowlton or any of the other giant public relations corporations whom hippies love to flagellate for manipulating public opinion. The successful "sale" of the hippie life style model to young people all over the techno-societies, is one of the classic merchandising stories of our time.

Not all subcults are so aggressive and talented at flackery, yet their cumulative power in the society is enormous. This power stems from our almost universal desperation to "belong." The primitive tribesman feels a strong attachment to his tribe. He knows that he "belongs" to it, and may even have difficulty imagining himself apart from it. The techno-societies are so large, however, and their complexities so far beyond the comprehension of any individual, that it is only by plugging in to one or more of their subcults, that we maintain some sense of identity and contact with the whole. Failure to identify with some such group or groups condemns us to feelings of loneliness, alienation and ineffectuality. We begin to wonder "who we are."

In contrast, the sense of belonging, of being part of a social cell larger than ourselves (yet small enough to be comprehensible) is often so rewarding that we feel deeply drawn, sometimes even against our own better judgment, to the values, attitudes and most-favored life style of the group.

However, we pay for the benefits we receive. For once we psychologically affiliate with a subcult, it

begins to exert pressures on us. We find that it pays to "go along" with the group. It rewards us with warmth, friendship and approval when we conform to its life style model. But it punishes us ruthlessly with ridicule, ostracism or other tactics when we deviate from it.

Hawking their preferred life style models, subcults clamor for our attention. In so doing, they act directly on our most vulnerable psychological property, our self-image. "Join us," they whisper, "and you become a bigger, better, more effective, more respected and less lonely person." In choosing among the fast-proliferating subcults we may only vaguely sense that our identity will be shaped by our decision, but we feel the hot urgency of their appeals and counter-appeals. We are buffeted back and forth by their psychological promises.

At the moment of choice among them, we resemble the tourist walking down Bourbon Street in New Orleans. As he strolls past the honky-tonks and clip joints, doormen grab him by the arm, spin him around, and open a door so he can catch a titillating glimpse of the naked flesh of the strippers on the platform behind the bar. Subcults reach out to capture us and appeal to our most private fantasies in ways far more powerful and subtle than any yet devised by Madison Avenue.

What they offer is not simply a skin show or a new soap or detergent. They offer not a product, but a super-product. It is true they hold out the promise of human warmth, companionship, respect, a sense of community. But so do the advertisers of deodorants and beer. The "miracle ingredient," the exclusive component, the one thing that subcults offer that other hawkers cannot, is a respite from the strain of overchoice. For they offer not a single product or idea, but a way of organizing all products and ideas, not a single commodity but a whole style, a set of guidelines that help the individual reduce the increasing complexity of choice to manageable proportions.

Most of us are desperately eager to find precisely such guidelines. In the welter of conflicting moralities, in the confusion occasioned by overchoice, the most powerful, most useful "super-product" of all is an organizing principle for one's life. This is what a life style offers.

THE POWER OF STYLE

Of course, not just any life style will do. We live in a Cairo bazaar of competing models. In this psychological phantasmagoria we search for a style, a way of ordering our existence, that will fit our particular temperament and circumstances. We look for heroes or mini-heroes to emulate. The style-seeker is like the lady who flips through the pages of a fashion magazine to find a suitable dress pattern. She studies one after another, settles on one that appeals to her, and decides to create a dress based on it. Next she begins to collect the necessary materials—cloth, thread, piping, buttons, etc. In precisely the same way, the life style creator acquires the necessary props. He lets his hair grow. He buys art nouveau posters and a paperback of Guevara's writings. He learns to discuss Marcuse and Frantz Fanon. He picks up a particular jargon, using words like "relevance" and "establishment."

None of this means that his political actions are insignificant, or that his opinions are unjust or foolish. He may (or may not) be accurate in his views of society. Yet the particular way in which he chooses to express them is inescapably part of his search for personal style.

The lady, in constructing her dress, alters it here and there, deviating from the pattern in minor ways to make it fit her more perfectly. The end product is truly custom-made; yet it bears a striking resemblance to others sewn from the same design. In quite the same way we individualize our style of living, yet it

usually winds up bearing a distinct resemblance to some life style model previously packaged and marketed by a subcult.

Often we are unaware of the moment when we commit ourselves to one life style model over all others. The decision to "be" an Executive or a Black Militant or a West Side Intellectual is seldom the result of purely logical analysis. Nor is the decision always made cleanly, all at once. The research scientist who switches from cigarettes to a pipe may do so for health reasons without recognizing that the pipe is part of a whole life style toward which he finds himself drawn. The couple who choose the Tiffany lamp think they are furnishing an apartment; they do not necessarily see their actions as an attempt to flesh out an overall style of life.

Most of us, in fact, do not think of our own lives in terms of life style, and we often have difficulty in talking about it objectively. We have even more trouble when we try to articulate the structure of values implicit in our style. The task is doubly hard because many of us do not adopt a single integrated style, but a composite of elements drawn from several different models. We may emulate both Hippie and Surfer. We may choose a cross between West Side Intellectual and Executive—a fusion that is, in fact, chosen by many publishing officials in New York. When one's personal style is a hybrid, it is frequently difficult to disentangle the multiple models on which it is based.

Once we commit ourselves to a particular model, however, we fight energetically to build it, and perhaps even more so to preserve it against challenge. For the style becomes extremely important to us. This is doubly true of the people of the future, among whom concern for style is downright passionate. This intense concern for style is not, however, what literary critics mean by formalism. It is not simply an interest in outward appearances. For style of life involves not merely the external forms of behavior, but the values implicit in that behavior, and one cannot change one's

life style without working some change in one's self-image. The people of the future are not "style conscious" but "life style conscious."

This is why little things often assume great significance for them. A single small detail of one's life may be charged with emotional power if it challenges a hard-won life style, if it threatens to break up the integrity of the style. Aunt Ethel gives us a wedding present. We are embarrassed by it, for it is in a style alien to our own. It irritates and upsets us, even though we know that "Aunt Ethel doesn't know any better." We banish it hastily to the top shelf of the closet.

Aunt Ethel's toaster or tablewear is not important, in and of itself. But it is a message from a different subcultural world, and unless we are weak in commitment to our own style, unless we happen to be in transition between styles, it represents a potent threat. The psychologist Leon Festinger coined the term "cognitive dissonance" to mean the tendency of a person to reject or deny information that challenges his preconceptions. We don't want to hear things that may upset our carefully worked out structure of beliefs. Similarly, Aunt Ethel's gift represents an element of "stylistic dissonance." It threatens to undermine our carefully worked out style of life.

Why does the life style have this power to preserve itself? What is the source of our commitment to it? A life style is a vehicle through which we express ourselves. It is a way of telling the world which particular subcult or subcults we belong to. Yet this hardly accounts for its enormous importance to us. The real reason why life styles are so significant—and increasingly so as the society diversifies—is that, above all else, the choice of a life style model to emulate is a crucial strategy in our private war against the crowding pressures of overchoice.

Deciding, whether consciously or not, to be "like" William Buckley or Joan Baez, Lionel Trilling or his surfer equivalent, J. J. Moon, rescues us from the

need to make millions of minute life-decisions. Once a commitment to a style is made, we are able to rule out many forms of dress and behavior, many ideas and attitudes, as inappropriate to our adopted style. The college boy who chooses the Student Protester Model wastes little energy agonizing over whether to vote for Wallace, carry an attaché case, or invest in mutual funds.

By zeroing in on a particular life style we exclude a vast number of alternatives from further consideration. The fellow who opts for the Motorcyclist Model need no longer concern himself with the hundreds of types of gloves available to him on the open market, but which violate the spirit of his style. He need only choose among the far smaller repertoire of glove types that fit within the limits set by his model. And what is said of gloves is equally applicable to his ideas and social relationships as well.

The commitment to one style of life over another is thus a super-decision. It is a decision of a higher order than the general run of everyday life-decisions. It is a decision to narrow the range of alternatives that will concern us in the future. So long as we operate within the confines of the style we have chosen, our choices are relatively simple. The guidelines are clear. The subcult to which we belong helps us answer any questions; it keeps the guidelines in place.

But when our style is suddenly challenged, when something forces us to reconsider it, we are driven to make another super-decision. We face the painful need to transform not only ourselves, but our self-image as well.

It is painful because, freed of our commitment to any given style, cut adrift from the subcult that gave rise to it, we no longer "belong." Worse yet, our basic principles are called into question and we must face each new life-decision afresh, alone, without the security of a definite, fixed policy. We are, in short, confronted with the full, crushing burden of overchoice again.

A SUPERABUNDANCE OF SELVES

To be "between styles" or "between subcults" is a life-crisis, and the people of the future spend more time in this condition, searching for styles, than do the people of the past or present. Altering his identity as he goes, super-industrial man traces a private trajectory through a world of colliding subcults. This is the social mobility of the future: not simply movement from one economic class to another, but from one tribal grouping to another. Restless movement from subcult to ephemeral subcult describes the arc of his life.

There are plenty of reasons for this restlessness. It is not merely that the individual's psychological needs change more often than in the past; the subcults also change. For these and other reasons, as subcult membership becomes ever more unstable, the search for a personal style will become increasingly intense, even frenetic in the decades to come. Again and again, we shall find ourselves bitter or bored, vaguely dissatisfied with "the way things are"—upset, in other words, with our present style. At that moment, we begin once more to search for a new principle around which to organize our choices. We arrive again at the moment of super-decision.

At this moment, if anyone studied our behavior closely, he would find a sharp increase in what might be called the Transience Index. The rate of turnover of things, places, people, organizational and informational relationships spurts upward. We get rid of that silk dress or tie, the old Tiffany lamp, that horror of a claw-footed Victorian end table—all those symbols of our links with the subcult of the past. We begin, bit by bit, to replace them with new items emblematic of our new identification. The same process occurs in our social lives—the through-put of people speeds up. We begin to reject ideas we have held (or to explain them

or rationalize them in new ways). We are suddenly free of all the constraints that our subcult or style imposed on us. A Transience Index would prove a sensitive indicator of those moments in our lives when we are most free—but, at the same time, most lost.

It is in this interval that we exhibit the wild oscillation engineers call "searching behavior." We are most vulnerable now to the messages of new subcults, to the claims and counterclaims that rend the air. We lean this way and that. A powerful new friend, a new fad or idea, a new political movement, some new hero rising from the depths of the mass media—all these strike us with particular force at such a moment. We are more "open," more uncertain, more ready for someone or some group to tell us what to do, how to behave.

Decisions—even little ones—come harder. This is not accidental. To cope with the press of daily life we need more information about far more trivial matters than when we were locked into a firm life style. And so we feel anxious, pressured, alone, and we move on. We choose or allow ourselves to be sucked into a new subcult. We put on a new style.

As we rush toward super-industrialism, therefore, we find people adopting and discarding life styles at a rate that would have staggered the members of any previous generation. For the life style itself has become a throw-away item.

This is no small or easy matter. It accounts for the much lamented "loss of commitment" that is so characteristic of our time. As people shift from subcult to subcult, from style to style, they are conditioned to guard themselves against the inevitable pain of disaffiliation. They learn to armor themselves against the sweet sorrow of parting. The extremely devout Catholic who throws over his religion and plunges into the life of a New Left activist, then throws himself into some other cause or movement or subcult, cannot go on doing so forever. He becomes, to adapt Graham Greene's term, a "burnt out case." He learns from past

disappointment never to lay too much of his old self on the line.

And so, even when he seemingly adopts a subcult or style, he withholds some part of himself. He conforms to the group's demands and revels in the belongingness that it gives him. But this belongingness is never the same as it once was, and secretly he remains ready to defect at a moment's notice. What this means is that even when he seems most firmly plugged in to his group or tribe, he listens, in the dark of night, to the short-wave signals of competing tribes.

In this sense, his membership in the group is shallow. He remains constantly in a posture of non-commitment, and without strong commitment to the values and styles of some group he lacks the explicit set of criteria that he needs to pick his way through the burgeoning jungle of overchoice.

The super-industrial revolution, consequently, forces the whole problem of overchoice to a qualitatively new level. It forces us now to make choices not merely among lamps and lampshades, but among lives, not among life style *components,* but among whole life *styles.*

This intensification of the problem of overchoice presses us toward orgies of self-examination, soul-searching and introversion. It confronts us with that most popular of contemporary illnesses, the "identity crisis." Never before have masses of men faced a more complex set of choices. The hunt for identity arises not out of the supposed choicelessness of "mass society," but precisely from the plenitude and complexity of our choices.

Each time we make a style choice, a super-decision, each time we link up with some particular subcultural group or groups, we make some change in our self-image. We become, in some sense, a different person, and we perceive ourselves as different. Our old friends, those who knew us in some previous incarnation, raise their eyebrows. They have a harder and harder time recognizing us, and, in fact, we experience in-

creasing difficulty in identifying with, or even sympathizing with, our own past selves.

The hippie becomes the straight-arrow executive, the executive becomes the skydiver without noting the exact steps of transition. In the process, he discards not only the externals of his style, but many of his underlying attitudes as well. And one day the question hits him like a splash of cold water in a sleep-sodden face: "What remains?" What is there of "self" or "personality" in the sense of a continuous, durable internal structure? For some, the answer is very little. For they are no longer dealing in "self" but in what might be called "serial selves."

The Super-industrial Revolution thus requires a basic change in man's conception of himself, a new theory of personality that takes into account the discontinuities in men's lives, as well as the continuities.

The Super-industrial Revolution also demands a new conception of freedom—a recognition that freedom, pressed to its ultimate, negates itself. Society's leap to a new level of differentiation necessarily brings with it new opportunities for individuation, and the new technology, the new temporary organizational forms, cry out for a new breed of man. This is why, despite "backlash" and temporary reversals, the line of social advance carries us toward a wider tolerance, a more easy acceptance of more and more diverse human types.

The sudden popularity of the slogan "do your thing" is a reflection of this historic movement. For the more fragmented or differentiated the society, the greater the number of varied life styles it promotes. And the more socially accepted life style models put forth by the society, the closer that society approaches a condition in which, in fact, each man does his own, unique thing.

Thus, despite all the anti-technological rhetoric of the Elluls and Fromms, the Mumfords and Marcuses, it is precisely the super-industrial society, the most advanced technological society ever, that extends the

range of freedom. The people of the future enjoy greater opportunities for self-realization than any previous group in history.

The new society offers few roots in the sense of truly enduring relationships. But it does offer more varied life niches, more freedom to move in and out of these niches, and more opportunity to create one's own niche, than all earlier societies put together. It also offers the supreme exhilaration of riding change, cresting it, changing and growing with it—a process infinitely more exciting than riding the surf, wrestling steers, playing "knock hubcaps" on an eight-lane speedway, or the pursuit of pharmaceutical kicks. It presents the individual with a contest that requires self-mastery and high intelligence. For the individual who comes armed with these, and who makes the necessary effort to understand the fast-emerging super-industrial social structure, for the person who finds the "right" life pace, the "right" sequence of subcults to join and life style models to emulate, the triumph is exquisite.

Undeniably, these grand words do not apply to the majority of men. Most people of the past and present remain imprisoned in life niches they have neither made nor have much hope, under present conditions, of ever escaping. For most human beings, the options remain excruciatingly few.

This imprisonment must—and will—be broken. Yet it will not be broken by tirades against technology. It will not be broken by calls for a return to passivity, mysticism and irrationality. It will not be broken by "feeling" or "intuiting" our way into the future while derogating empirical study, analysis, and rational effort. Rather than lashing out, Luddite-fashion, against the machine, those who genuinely wish to break the prison-hold of the past and present would do well to hasten the controlled—selective—arrival of tomorrow's technologies. To accomplish this, however, intuition and "mystical insights" are hardly enough. It will take

exact scientific knowledge, expertly applied to the crucial, most sensitive points of social control.

Nor does it help to offer the principle of the maximization of choice as the key to freedom. We must consider the possibility, suggested here, that choice may become overchoice, and freedom unfreedom.

THE FREE SOCIETY

Despite romantic rhetoric, freedom cannot be absolute. To argue for total choice (a meaningless concept) or total individuality is to argue against any form of community or society altogether. If each person, busily doing his thing, were to be wholly different from every other, no two humans would have any basis for communication. It is ironic that the people who complain most loudly that people cannot "relate" to one another, or cannot "communicate" with one another, are often the very same people who urge greater individuality. The sociologist Karl Mannheim recognized this contradiction when he wrote: "The more individualized people are, the more difficult it is to attain identification."

Unless we are literally prepared to plunge backward into pre-technological primitivism, and accept all the consequences—a shorter, more brutal life, more disease, pain, starvation, fear, superstition, xenophobia, bigotry and so on—we shall move forward to more and more differentiated societies. This raises severe problems of social integration. What bonds of education, politics, culture must we fashion to tie the super-industrial order together into a functioning whole? Can this be accomplished? "This integration," writes Bertram M. Gross of Wayne State University, "must be based upon certain commonly accepted values or some degree of perceived interdependence, if not mutually acceptable objectives."

A society fast fragmenting at the level of values and life styles challenges all the old integrative mech-

anisms and cries out for a totally new basis for reconstitution. We have by no means yet found this basis. Yet if we shall face disturbing problems of social integration, we shall confront even more agonizing problems of individual integration. For the multiplication of life styles challenges our ability to hold the very self together.

Which of many potential selves shall we choose to be? What sequence of serial selves will describe us? How, in short, must we deal with overchoice at this, the most intensely personal and emotion-laden level of all? In our headlong rush for variety, choice and freedom, we have not yet begun to examine the awesome implications of diversity.

When diversity, however, converges with transience and novelty, we rocket the society toward an historical crisis of adaptation. We create an environment so ephemeral, unfamiliar and complex as to threaten millions with adaptive breakdown. This breakdown is future shock.

Part Five:

THE LIMITS OF ADAPTABILITY

Chapter 15

FUTURE SHOCK: THE PHYSICAL DIMENSION

Eons ago the shrinking seas cast millions of unwilling aquatic creatures onto the newly created beaches. Deprived of their familiar environment, they died, gasping and clawing for each additional instant of eternity. Only a fortunate few, better suited to amphibian existence, survived the shock of change. Today, says sociologist Lawrence Suhm of the University of Wisconsin, "We are going through a period as traumatic as the evolution of man's predecessors from sea creatures to land creatures . . . Those who can adapt will; those who can't will either go on surviving somehow at a lower level of development or will perish—washed up on the shores."

To assert that man must adapt seems superfluous. He has already shown himself to be among the most adaptable of life forms. He has survived Equatorial summers and Antarctic winters. He has survived Dachau and Vorkuta. He has walked the lunar surface. Such accomplishments give rise to the glib notion that his adaptive capabilities are "infinite." Yet nothing could be further from the truth. For despite all his heroism and stamina, man remains a biological organism, a "biosystem," and all such systems operate within inexorable limits.

Temperature, pressure, caloric intake, oxygen and

carbon dioxide levels, all set absolute boundaries beyond which man, as presently constituted, cannot venture. Thus when we hurl a man into outer space, we surround him with an exquisitely designed microenvironment that maintains all these factors within livable limits. How strange, therefore, that when we hurl a man into the future, we take few pains to protect him from the shock of change. It is as though NASA had shot Armstrong and Aldrin naked into the cosmos.

It is the thesis of this book that there are discoverable limits to the amount of change that the human organism can absorb, and that by endlessly accelerating change without first determining these limits, we may submit masses of men to demands they simply cannot tolerate. We run the high risk of throwing them into that peculiar state that I have called future shock.

We may define future shock as the distress, both physical and psychological, that arises from an overload of the human organism's physical adaptive systems and its decision-making processes. Put more simply, future shock is the human response to overstimulation.

Different people react to future shock in different ways. Its symptoms also vary according to the stage and intensity of the disease. These symptoms range all the way from anxiety, hostility to helpful authority, and seemingly senseless violence, to physical illness, depression and apathy. Its victims often manifest erratic swings in interest and life style, followed by an effort to "crawl into their shells" through social, intellectual and emotional withdrawal. They feel continually "bugged" or harassed, and want desperately to reduce the number of decisions they must make.

To understand this syndrome, we must pull together from such scattered fields as psychology, neurology, communications theory and endocrinology, what science can tell us about human adaptation. There is,

as yet, no science of adaptation *per se*. Nor is there any systematic listing of the diseases of adaptation. Yet evidence now sluicing in from a variety of disciplines makes it possible to sketch the rough outlines of a theory of adaptation. For while researchers in these disciplines often work in ignorance of each other's efforts, their work is elegantly compatible. Forming a distinct and exciting pattern, it provides solid underpinning for the concept of future shock.

LIFE-CHANGE AND ILLNESS

What actually happens to people when they are asked to change again and again? To understand the answer, we must begin with the body, the physical organism, itself. Fortunately, a series of startling, but as yet unpublicized, experiments have recently cast revealing light on the relationship of change to physical health.

These experiments grow out of the work of the late Dr. Harold G. Wolff at the Cornell Medical Center in New York. Wolff repeatedly emphasized that the health of the individual is intimately bound up with the adaptive demands placed on him by the environment. One of Wolff's followers, Dr. Lawrence E. Hinkle, Jr., has termed this the "human ecology" approach to medicine, and has argued passionately that disease need not be the result of any single, specific agent, such as a germ or virus, but a consequence of many factors, including the general nature of the environment surrounding the body. Hinkle has worked for years to sensitize the medical profession to the importance of environmental factors in medicine.

Today, with spreading alarm over air pollution, water pollution, urban crowding and other such factors, more and more health authorities are coming around to the ecological notion that the individual needs to be seen as part of a total system, and that

his health is dependent upon many subtle external factors.

It was another of Wolff's colleagues, however, Dr. Thomas H. Holmes, who came up with the idea that change, itself—not this or that specific change but the general rate of change in a person's life—could be one of the most important environmental factors of all. Originally from Cornell, Holmes is now at the University of Washington School of Medicine, and it was there, with the help of a young psychiatrist named Richard Rahe, that he created an ingenious research tool named the Life-Change Units Scale. This was a device for measuring how much change an individual has experienced in a given span of time. Its development was an important methodological breakthrough, making it possible, for the first time, to qualify, at least crudely, the rate of change in individual life.

Reasoning that different kinds of life-changes strike us with different force, Holmes and Rahe began by listing as many such changes as they could. A divorce, a marriage, a move to a new home—such events affect each of us differently. Moreover, some carry greater impact than others. A vacation trip, for example, may represent a pleasant break in the routine. Yet it can hardly compare in impact with, say, the death of a parent.

Holmes and Rahe next took their list of life-changes to thousands of men and women in many walks of life in the United States and Japan. Each person was asked to rank order the specific items on the list according to how much impact each had. Which changes required a great deal of coping or adjustment? Which ones were relatively minor?

To Holmes' and Rahe's surprise, it turned out that there is widespread agreement among people as to which changes in their lives require major adaptations and which ones are comparatively unimportant. This agreement about the "impact-fullness" of various life events extends even across national and language bar-

riers.* People tend to *know* and to *agree* on which changes hit the hardest.

Given this information, Holmes and Rahe were able to assign a numerical weight to each type of life change. Thus each item on their list was ranked by its magnitude and given a score accordingly. For example, if the death of one's spouse is rated as one hundred points, then moving to a new home is rated by most people as worth only twenty points, a vacation thirteen. (The death of a spouse, incidentally, is almost universally regarded as the single most impactful change that can befall a person in the normal course of his life.)

Now Holmes and Rahe were ready for the next step. Armed with their Life-Change Units Scale, they began to question people about the actual pattern of change in their lives. The scale made it possible to compare the "changefulness" of one person's life with that of another. By studying the amount of change in a person's life, could we learn anything about the influence of change itself on health?

To find out, Holmes, Rahe and other researchers compiled the "life change scores" of literally thousands of individuals and began the laborious task of comparing these with the medical histories of these same individuals. Never before had there been a way to correlate change and health. Never before had there been such detailed data on patterns of change in individual lives. And seldom were the results of an experiment less ambiguous. In the United States and Japan, among servicemen and civilians, among pregnant women and the families of leukemia victims, among college athletes and retirees, the same striking pattern was present: those with high life change scores were more likely than their fellows to be ill in the following year. For the first time, it was possible to show in dramatic form that the rate of change in a person's

* The work in the United States and Japan is now being supplemented by studies in France, Belgium and the Netherlands.

life—his pace of life—is closely tied to the state of his health.

"The results were so spectacular," says Dr. Holmes, "that at first we hesitated to publish them. We didn't release our initial findings until 1967."

Since then, the Life-Change Units Scale and the Life Changes Questionnaire have been applied to a wide variety of groups from unemployed blacks in Watts to naval officers at sea. In every case, the correlation between change and illness has held. It has been established that "alterations in life style" that require a great deal of adjustment and coping, correlate with illness—whether or not these changes are under the individual's own direct control, whether or not he sees them as undesirable. Furthermore, the higher the degree of life change, the higher the risk that subsequent illness will be severe. So strong is this evidence, that it is becoming possible, by studying life change scores, actually to predict levels of illness in various populations.

Thus in August, 1967, Commander Ransom J. Arthur, head of the United States Navy Medical Neuropsychiatric Research Unit at San Diego, and Richard Rahe, now a Captain in Commander Arthur's group, set out to forecast sickness patterns in a group of 3000 Navy men. Drs. Arthur and Rahe began by distributing a Life Changes Questionnaire to the sailors on three cruisers in San Diego harbor. The ships were about to depart and would be at sea for approximately six months each. During this time it would be possible to maintain exact medical records on each crew member. Could information about a man's life change pattern tell us in advance the likelihood of his falling ill during the voyage?

Each crew member was asked to tell what changes had occurred in his life during the year preceding the voyage. The questionnaire covered an extremely broad spectrum of topics. Thus it asked whether the man had experienced either more or less trouble with superiors during the twelve-month period. It asked

about alterations in his eating and sleeping habits. It inquired about change in his circle of friends, his dress, his forms of recreation. It asked whether he had experienced any change in his social activities, in family get-togethers, in his financial condition. Had he been having more or less trouble with his in-laws? More or fewer arguments with his wife? Had he gained a child through birth or adoption? Had he suffered the death of his wife, a friend or relative?

The questionnaire went on to probe such issues as the number of times he had moved to a new home. Had he been in trouble with the law over traffic violations or other minor infractions? Had he spent a lot of time away from his wife as a result of job-related travel or marital difficulties? Had he changed jobs? Won awards or promotions? Had his living conditions changed as a consequence of home remodeling or the deterioration of his neighborhood? Had his wife started or stopped working? Had he taken out a loan or mortgage? How many times had he taken a vacation? Was there any major change in his relations with his parents as a result of death, divorce, remarriage, etc.?

In short, the questionnaire tried to get at the kind of life changes that are part of normal existence. It did not ask whether a change was regarded as "good" or "bad," simply whether or not it had occurred.

For six months, the three cruisers remained at sea. Just before they were scheduled to return, Arthur and Rahe flew new research teams out to join the ships. These teams proceeded to make a fine-tooth survey of the ships' medical records. Which men had been ill? What diseases had they reported? How many days had they been confined to sick bay?

When the last computer runs were completed, the linkage between changefulness and illness was nailed down more firmly than ever. Men in the upper ten percent of life change units—those who had had to adapt to the most change in the preceding year—turned out to suffer from one-and-a-half to two times

as much illness as those in the bottom ten percent. Moreover, once again, the higher the life change score, the more severe the illness was likely to be. The study of life change patterns—of change as an environmental factor—contributed significantly to success in predicting the amount and severity of illness in widely varied populations.

"For the first time," says Dr. Arthur, appraising life change research, "we have an index of change. If you've had many changes in your life within a short time, this places a great challenge on your body . . . An enormous number of changes within a short period might overwhelm its coping mechanisms.

"It is clear," he continues, "that there is a connection between the body's defenses and the demands for change that society imposes. We are in a continuous dynamic equilibrium . . . Various 'noxious' elements, both internal and external, are always present, always seeking to explode into disease. For example, certain viruses live in the body and cause disease only when the defenses of the body wear down. There may well be generalized body defense systems that prove inadequate to cope with the flood of demands for change that come pulsing through the nervous and endocrine systems."

The stakes in life-change research are high, indeed, for not only illness, but death itself, may be linked to the severity of adaptational demands placed on the body. Thus a report by Arthur, Rahe, and a colleague, Dr. Joseph D. McKean, Jr., begins with a quotation from Somerset Maugham's literary autobiography, *The Summing Up:*

> My father . . . went to Paris and became solicitor to the British Embassy. . . . After my mother's death, her maid became my nurse. . . . I think my father had a romantic mind. He took it into his head to build a house to live in during the summer. He bought a piece of land on the top of a hill at Suresnes. . . . It was to be like a villa on the Bosphorous and on

> the top floor it was surrounded by loggias. . . . It was a white house and the shutters were painted red. The garden was laid out. The rooms were furnished and then my father died.

"The death of Somerset Maugham's father," they write, "seems at first glance to have been an abrupt unheralded event. However, a critical evaluation of the events of a year or two prior to the father's demise reveals changes in his occupation, residence, personal habits, finances and family constellation." These changes, they suggest, may have been precipitating events.

This line of reasoning is consistent with reports that death rates among widows and widowers, during the first year after loss of a spouse, are higher than normal. A series of British studies have strongly suggested that the shock of widowhood weakens resistance to illness and tends to accelerate aging. The same is true for men. Scientists at the Institute of Community Studies in London, after reviewing the evidence and studying 4,486 widowers, declare that "the excess mortality in the first six months is almost certainly real . . . [Widowerhood] appears to bring in its wake a sudden increment in mortality-rates of something like 40 percent in the first six months."

Why should this be true? It is speculated that grief, itself, leads to pathology. Yet the answer may lie not in the state of grief at all, but in the very high impact that loss of a spouse carries, forcing the survivor to make a multitude of major life changes within a short period after the death takes place.

The work of Hinkle, Holmes, Rahe, Arthur, McKean and others now probing the relationship of change to illness is still in its early stages. Yet one lesson already seems vividly clear: change carries a physiological price tag with it. And the more radical the change, the steeper the price.

RESPONSE TO NOVELTY

"Life," says Dr. Hinkle, ". . . implies a constant interaction between organism and environment." When we speak of the change brought about by divorce or a death in the family or a job transfer or even a vacation, we are talking about a major life event. Yet, as everyone knows, life consists of tiny events as well, a constant stream of them flowing into and out of our experience. Any major life change *is* major only because it forces us to make many little changes as well, and these, in turn, consist of still smaller and smaller changes. To grapple with the meaning of life in the accelerative society, we need to see what happens at the level of these minute, "micro-changes" as well.

What happens when something in our environment is altered? All of us are constantly bathed in a shower of signals from our environment—visual, auditory, tactile, etc. Most of these come in routine, repetitive patterns. When something changes within the range of our senses, the pattern of signals pouring through our sensory channels into our nervous system is modified. The routine, repetitive patterns are interrupted —and to this interruption we respond in a particularly acute fashion.

Significantly, when some new set of stimuli hits us, both body and brain know almost instantly that they *are* new. The change may be no more than a flash of color seen out of the corner of an eye. It may be that a loved one brushing us tenderly with the fingertips momentarily hesitates. Whatever the change, an enormous amount of physical machinery comes into play.

When a dog hears a strange noise, his ears prick, his head turns. And we do much the same. The change in stimuli triggers what experimental psychologists call an "orientation response." The orientation response or OR is a complex, even massive bodily operation. The pupils of the eyes dilate. Photochemical changes

occur in the retina. Our hearing becomes momentarily more acute. We involuntarily use our muscles to direct our sense organs toward the incoming stimuli—we lean toward the sound, for example, or squint our eyes to see better. Our general muscle tone rises. There are changes in our pattern of brain waves. Our fingers and toes grow cold as the veins and arteries in them constrict. Our palms sweat. Blood rushes to the head. Our breathing and heart rate alter.

Under certain circumstances, we may do all of this—and more—in a very obvious fashion, exhibiting what has been called the "startle reaction." But even when we are unaware of what is going on, these changes take place every time we perceive novelty in our environment.

The reason for this is that we have, apparently built into our brains, a special novelty-detection apparatus that has only recently come to the attention of neurologists. The Soviet scientist E. N. Sokolov, who has put forward the most comprehensive explanation of how the orientation response works, suggests that neural cells in the brain store information about the intensity, duration, quality, and sequence of incoming stimuli. When new stimuli arrive, these are matched against the "neural models" in the cortex. If the stimuli are novel, they do not match any existing neural model, and the OR takes place. If, however, the matching process reveals their similarity to previously stored models, the cortex shoots signals to the reticular activating system, instructing it, in effect, to hold its fire.

In this way, the level of novelty in our environment has direct physical consequences. Moreover, it is vital to recognize that the OR is not an unusual affair. It takes place in most of us literally thousands of times in the course of a single day as various changes occur in the environment around us. Again and again the OR fires off, even during sleep.

"The OR is big!" says research psychologist Ardie Lubin, an expert on sleep mechanisms. "The whole body is involved. And when you increase novelty in

the environment—which is what a lot of change means—you get continual ORs with it. This is probably very stressful for the body. It's a helluva load to put on the body.

"If you overload an environment with novelty, you get the equivalent of anxiety neurotics—people who have their systems continually flooded with adrenalin, continual heart pumping, cold hands, increased muscle tone and tremors—all the usual OR characteristics."

The orientation response is no accident. It is nature's gift to man, one of his key adaptive mechanisms. The OR has the effect of sensitizing him to take in more information—to see or hear better, for instance. It readies his muscles for sudden exertion, if necessary. In short, it prepares him for fight or flight. Yet each OR, as Lubin underscores, takes its toll in wear and tear on the body, for it requires energy to sustain it.

Thus one result of the OR is to send a surge of anticipatory energy through the body. Stored energy exists in such sites as the muscles and the sweat glands. As the neural system pulses in response to novelty, its synaptic vesicles discharge small amounts of adrenalin and nor-adrenalin. These, in turn, trigger a partial release of the stored energy. In short, each OR draws not only upon the body's limited supply of quick energy, but on its even more limited supply of energy-releasers.

It needs to be emphasized, moreover, that the OR occurs not merely in response to simple sensory inputs. It happens when we come across novel ideas or information as well as novel sights or sounds. A fresh bit of office gossip, a unifying concept, even a new joke or an original turn of phrase can trigger it.

The OR is particularly stressing when a novel event or fact challenges one's whole preconceived world view. Given an elaborate ideology, Catholicism, Marxism or whatever, we quickly recognize (or think we recognize) familiar elements in otherwise novel stimuli, and this puts us at ease. Indeed, ideologies may be regarded as large mental filing cabinets with vacant

drawers or slots waiting to accept new data. For this reason, ideologies serve to reduce the intensity and frequency of the OR.

It is only when a new fact fails to fit, when it resists filing, that the OR occurs. A classical example is that of the religious person who is brought up to believe in the goodness of God and who is suddenly faced by what strikes him as a case of overwhelming, senseless evil. Until the new fact can be reconciled or his world view altered, he suffers acute agitation and anxiety.

The OR is so inherently stressing that we enjoy a vast sense of relief when it is over. At the level of ideas or cognition, this is the "a-hah!" reaction we experience at a moment of revelation, when we finally understand something that has been puzzling us. We may be aware of the "a-hah" reaction on rare occasions only, but OR's and "a-hah's" are continually occurring just below the level of consciousness.

Novelty, therefore—any perceptible novelty—touches off explosive activity within the body, and especially the nervous system. OR's fire off like flashbulbs within us, at a rate determined by what is happening outside us. Man and environment are in constant, quivering interplay.

THE ADAPTIVE REACTION

While novelty in the environment raises or lowers the rate at which OR's occur, some novel conditions call forth even more powerful responses. We are driving along a monotonous turnpike, listening to the radio and beginning to daydream. Suddenly, a car speeds by, forcing us to swerve out of our lane. We react automatically, almost instantaneously, and the OR is very pronounced. We can feel our heart pumping and our hands shaking. It takes a while before the tension subsides.

But what if it does not subside? What happens when

we are placed in a situation that demands a complex set of physical and psychological reactions and in which the pressure is sustained? What happens if, for example, the boss breathes hotly down our collar day after day? What happens when one of our children is seriously ill? Or when, on the other hand, we look forward eagerly to a "big date" or to closing an important business deal?

Such situations cannot be handled by the quick spurt of energy provided by the OR, and for these we have what might be termed the "adaptive reaction." This is closely related to the OR. Indeed, the two processes are so intertwined that the OR can be regarded as part of, or the initial phase of, the larger, more encompassing adaptive reaction. But while the OR is primarily based on the nervous system, the adaptive reaction is heavily dependent upon the endocrine glands and the hormones they shoot into the bloodstream. The first line of defense is neural; the second is hormonal.

When individuals are forced to make repeated adaptations to novelty, and especially when they are compelled to adapt to certain situations involving conflict and uncertainty, a pea-sized gland called the pituitary pumps out a number of substances. One of these, ACTH, goes to the adrenals. This causes them, in turn, to manufacture certain chemicals termed corticosteroids. When these are released, they speed up body metabolism. They raise blood pressure. They send anti-inflammatory substances through the blood to fight infection at wound sites, if any. And they begin turning fat and protein into dispersible energy, thus tapping into the body's reserve tank of energy. The adaptive reaction provides a much more potent and sustained flush of energy than the OR.

Like the orientation response, the adaptive reaction is no rarity. It takes longer to arouse and it lasts longer, but it happens countless times even within the course of a single day, responding to changes in our physical and social environment. The adaptive reac-

tion, sometimes known by the more dramatic term "stress," can be touched off by shifts and changes in the psychological climate around us. Worry, upset, conflict, uncertainty, even happy anticipation, hilarity and joy, all set the ACTH factory working. The very anticipation of change can trigger the adaptive reaction. The need to alter one's way of life, to trade an old job for a new one, social pressures, status shifts, life style modifications, in fact, anything that forces us to confront the unknown, can switch on the adaptive reaction.

Dr. Lennart Levi, director of the Clinical Stress Laboratory at the Karolinska Hospital in Stockholm, has shown, for example, that even quite small changes in the emotional climate or in interpersonal relationships can produce marked changes in body chemistry. Stress is frequently measured by the amount of corticosteroids and catecholamines (adrenalin and noradrenalin, for example) found in the blood and urine. In one series of experiments Levi used films to generate emotions and plotted the resultant chemical changes.

A group of Swedish male medical students were shown film clips depicting murders, fights, torture, execution and cruelty to animals. The adrenalin component of their urine rose an average 70 percent as measured before and after. Nor-adrenalin rose an average 35 percent. Next a group of young female office workers were shown four different films on successive nights. The first was a bland travelog. They reported feelings of calmness and equanimity, and their output of catecholamines fell. The second night they watched Stanley Kubrick's *Paths of Glory* and reported feeling intense excitement and anger. Adrenalin output shot upward. The third night they viewed *Charley's Aunt,* and roared with laughter at the comedy. Despite the pleasant feelings and the absence of any scenes of aggression or violence, their catecholamines rose significantly again. The fourth night they saw *The Devil's Mask,* a thriller during which they

actually screamed with fright. Not unexpectedly, catecholamine output soared. In short, emotional response, almost without regard for its character, is accompanied by (or, indeed, reflects) adrenal activity.

Similar findings have been demonstrated again and again in the case of men and women—not to speak of rats, dogs, deer and other experimental animals—involved in "real" as distinct from "vicarious" experiences. Sailors in underwater demolition training, men stationed in lonely outposts in Antarctica, astronauts, factory workers, executives have all shown similar chemical responsiveness to change in the external environment.

The implications of this have hardly begun to register, yet there is increasing evidence that repeated stimulation of the adaptive reaction can be seriously damaging, that excessive activation of the endocrine system leads to irreversible "wear and tear." Thus, we are warned by Dr. René Dubos, author of *Man Adapting*, that such changeful circumstances as "competitive situations, operation within a crowded environment, change in a very profound manner the secretion of hormones. One can type-read that in the blood or the urine. Just a mere contact with the complex human situation almost automatically brings this about, this stimulation of the whole endocrine system."

What of it?

"There is," Dubos declares, "absolutely no question that one can overshoot the stimulation of the endocrine system and that this has physiological consequences that last throughout the whole lifetime of the organs."

Years ago, Dr. Hans Selye, a pioneer investigator of the body's adaptive responses, reported that "animals in which intense and prolonged stress is produced by any means suffer from sexual derangements . . . Clinical studies have confirmed the fact that people exposed to stress react very much like experimental animals in all these respects. In women the monthly cycles become irregular or stop altogether, and during

lactation milk secretion may become insufficient for the baby. In men both the sexual urge and sperm-cell formation are diminished."

Since then population experts and ecologists have compiled impressive evidence that heavily stressed populations of rats, deer—and people—show lower fertility levels than less stressed control groups. Crowding, for example, a condition that involves a constant high level of interpersonal interaction and compels the individual to make extremely frequent adaptive reactions has been shown, at least in animals, to enlarge the adrenals and cause a noticeable drop in fertility.

The repeated firing of the OR and the adaptive reaction, by overloading the neural and endocrine systems, is linked to other diseases and physical problems as well. Rapid change in the environment makes repeated calls on the energy supply of the body. This leads to a speedup of fat metabolism. In turn, this creates grave difficulties for certain diabetics. Even the common cold has been shown to be affected by the rate of change in the environment. In studies reported by Dr. Hinkle it was found that the frequency of colds in a sample of New York working women correlated with "changes in the mood and pattern of activity of the woman, in response to changing relationships to the people around her and the events that she encountered."

In short, if we understand the chain of biological events touched off by our efforts to adapt to change and novelty, we can begin to understand why health and change seem to be inextricably linked to one another. The findings of Holmes, Rahe, Arthur and others now engaged in life change research are entirely compatible with on-going research in endocrinology and experimental psychology. It is quite clearly impossible to accelerate the rate of change in society, or to raise the novelty ratio in society, without triggering significant changes in the body chemistry of the population. By stepping up the pace of scientific,

technological and social change, we are tampering with the chemistry and biological stability of the human race.

This, one must immediately add, is not necessarily bad. "There are worse things than illness," Dr. Holmes wryly reminds us. "No one can live without experiencing some degree of stress all the time," Dr. Selye has written. To eliminate ORs and adaptive reactions would be to eliminate all change, including growth, self-development, maturation. It presupposes complete stasis. Change is not merely necessary to life; it *is* life. By the same token, life is adaptation.

There are, however, limits on adaptability. When we alter our life style, when we make and break relationships with things, places or people, when we move restlessly through the organizational geography of society, when we learn new information and ideas, we adapt; we live. Yet there are finite boundaries; we are not infinitely resilient. Each orientation response, each adaptive reaction exacts a price, wearing down the body's machinery bit by minute bit, until perceptible tissue damage results.

Thus man remains in the end what he started as in the beginning: a biosystem with a limited capacity for change. When this capacity is overwhelmed, the consequence is future shock.

Chapter 16

FUTURE SHOCK: THE PSYCHOLOGICAL DIMENSION

If future shock were a matter of physical illness alone, it might be easier to prevent and to treat. But future shock attacks the psyche as well. Just as the body cracks under the strain of environmental overstimulation, the "mind" and its decision processes behave erratically when overloaded. By indiscriminately racing the engines of change, we may be undermining not merely the health of those least able to adapt, but their very ability to act rationally on their own behalf.

The striking signs of confusional breakdown we see around us—the spreading use of drugs, the rise of mysticism, the recurrent outbreaks of vandalism and undirected violence, the politics of nihilism and nostalgia, the sick apathy of millions—can all be understood better by recognizing their relationship to future shock. These forms of social irrationality may well reflect the deterioration of individual decision-making under conditions of environmental overstimulation.

Psychophysiologists studying the impact of change on various organisms have shown that successful adaptation can occur only when the level of stimulation—the amount of change and novelty in the environment—is neither too low nor too high. "The central nervous system of a higher animal," says Professor D. E. Berlyne of the University of Toronto, "is designed to cope

with environments that produce a certain rate of . . . stimulation . . . It will naturally not perform at its best in an environment that overstresses or overloads it." He makes the same point about environments that understimulate it. Indeed, experiments with deer, dogs, mice and men all point unequivocally to the existence of what might be called an "adaptive range" below which and above which the individual's ability to cope simply falls apart.

Future shock is the response to overstimulation. It occurs when the individual is forced to operate above his adaptive range. Considerable research has been devoted to studying the impact of inadequate change and novelty on human performance. Studies of men in isolated Antarctic outposts, experiments in sensory deprivation, investigations into on-the-job performance in factories, all show a falling off of mental and physical abilities in response to understimulation. We have less direct data on the impact of overstimulation, but such evidence as does exist is dramatic and unsettling.

THE OVERSTIMULATED INDIVIDUAL

Soldiers in battle often find themselves trapped in environments that are rapidly changing, unfamiliar, and unpredictable. The soldier is torn this way and that. Shells burst on every side. Bullets whiz past erratically. Flares light the sky. Shouts, groans and explosions fill his ears. Circumstances change from instant to instant. To survive in such overstimulating environments, the soldier is driven to operate in the upper reaches of his adaptive range. Sometimes, he is pushed beyond his limits.

During World War II a bearded Chindit soldier, fighting with General Wingate's forces behind the Japanese lines in Burma, actually fell asleep while a storm of machine gun bullets splattered around him. Subsequent investigation revealed that this soldier was not merely reacting to physical fatigue or lack of

sleep, but surrendering to a sense of overpowering apathy.

Death-inviting lassitude was so common, in fact, among guerrilla troops who had penetrated behind enemy lines that British military physicians gave it a name. They termed it Long Range Penetration Strain. A soldier who suffered from it became, in their words, "incapable of doing the simplest thing for himself and seemed to have the mind of a child." This deadly lethargy, moreover, was not confined to guerrilla troops. One year after the Chindit incident, similar symptoms cropped up en masse among the allied troops who invaded Normandy, and British researchers, after studying 5000 American and English combat casualties, concluded that this strange apathy was merely the final stage in a complex process of psychological collapse.

Mental deterioration often began with fatigue. This was followed by confusion and nervous irritability. The man became hypersensitive to the slightest stimuli around him. He would "hit the dirt" at the least provocation. He showed signs of bewilderment. He seemed unable to distinguish the sound of enemy fire from other, less threatening sounds. He became tense, anxious, and heatedly irascible. His comrades never knew when he would flail out in anger, even violence, in response to minor inconvenience.

Then the final stage of emotional exhaustion set in. The soldier seemed to lose the very will to live. He gave up the struggle to save himself, to guide himself rationally through the battle. He became, in the words of R. L. Swank, who headed the British investigation, "dull and listless . . . mentally and physically retarded, preoccupied." Even his face became dull and apathetic. The fight to adapt had ended in defeat. The stage of total withdrawal was reached.

That men behave irrationally, acting against their own clear interest, when thrown into conditions of high change and novelty is also borne out by studies of human behavior in times of fire, flood, earthquake

and other crises. Even the most stable and "normal" people, unhurt physically, can be hurled into anti-adaptive states. Often reduced to total confusion and mindlessness, they seem incapable of the most elementary rational decision-making.

Thus in a study of the responses to tornadoes in Texas, H. E. Moore writes that "the first reaction . . . may be one of dazed bewilderment, sometimes one of disbelief, or at least of refusal to accept the fact. This, it seems to us, is the essential explanation of the behavior of persons and groups in Waco when it was devastated in 1953 . . . On the personal level, it explains why a girl climbed into a music store through a broken display window, calmly purchased a record, and walked out again, even though the plate glass front of the building had blown out and articles were flying through the air inside the building."

A study of a tornado in Udall, Kansas, quotes a housewife as saying: "After it was over, my husband and I just got up and jumped out the window and ran. I don't know where we were running to but . . . I didn't care. I just wanted to run." The classic disaster photograph shows a mother holding a dead or wounded baby in her arms, her face blank and numb as though she could no longer comprehend the reality around her. Sometimes she sits rocking gently on her porch with a doll, instead of a baby, in her arms.

In disaster, therefore, exactly as in certain combat situations, individuals can be psychologically overwhelmed. Once again the source may be traced to a high level of environmental stimulation. The disaster victim finds himself suddenly caught in a situation in which familiar objects and relationships are transformed. Where once his house stood, there may be nothing more than smoking rubble. He may encounter a cabin floating on the flood tide or a rowboat sailing through the air. The environment is filled with change and novelty. And once again the response is marked by confusion, anxiety, irritability and withdrawal into apathy.

Culture shock, the profound disorientation suffered by the traveler who has plunged without adequate preparation into an alien culture, provides a third example of adaptive breakdown. Here we find none of the obvious elements of war or disaster. The scene may be totally peaceful and riskless. Yet the situation demands repeated adaptation to novel conditions. Culture shock, according to psychologist Sven Lundstedt, is a "form of personality maladjustment which is a reaction to a temporarily unsuccessful attempt to adjust to new surroundings and people."

The culture shocked person, like the soldier and disaster victim, is forced to grapple with unfamiliar and unpredictable events, relationships and objects. His habitual ways of accomplishing things—even simple tasks like placing a telephone call—are no longer appropriate. The strange society may itself be changing only very slowly, yet for him it is all new. Signs, sounds and other psychological cues rush past him before he can grasp their meaning. The entire experience takes on a surrealistic air. Every word, every action is shot through with uncertainty.

In this setting, fatigue arrives more quickly than usual. Along with it, the cross-cultural traveler often experiences what Lundstedt describes as "a subjective feeling of loss, and a sense of isolation and loneliness."

The unpredictability arising from novelty undermines his sense of reality. Thus he longs, as Professor Lundstedt puts it, "for an environment in which the gratification of important psychological and physical needs is predictable and less uncertain." He becomes "anxious, confused and often appears apathetic." In fact, Lundstedt concludes, "culture shock can be viewed as a response to stress by emotional and intellectual withdrawal."

It is hard to read these (and many other) accounts of behavior breakdown under a variety of stresses without becoming acutely aware of their similarities. While there are differences, to be sure, between a

soldier in combat, a disaster victim, and a culturally dislocated traveler, all three face rapid change, high novelty, or both. All three are required to adapt rapidly and repeatedly to unpredictable stimuli. And there are striking parallels in the way all three respond to this overstimulation.

First, we find the same evidences of confusion, disorientation, or distortion of reality. Second, there are the same signs of fatigue, anxiety, tenseness, or extreme irritability. Third, in all cases there appears to be a point of no return—a point at which apathy and emotional withdrawal set in.

In short, the available evidence strongly suggests that overstimulation may lead to bizarre and anti-adaptive behavior.

BOMBARDMENT OF THE SENSES

We still know too little about this phenomenon to explain authoritatively why overstimulation seems to produce maladaptive behavior. Yet we pick up important clues if we recognize that overstimulation can occur on at least three different levels: the sensory, the cognitive and the decisional.*

The easiest to understand is the sensory level. Experiments in sensory deprivation, during which volunteers are cut off from normal stimulation of their senses, have shown that the absence of novel sensory stimuli can lead to bewilderment and impaired mental functioning. By the same token, the input of too much disorganized, patternless or chaotic sensory stimuli can have similar effects. It is for this reason that practitioners of political or religious brainwashing make use not only of sensory deprivation (solitary confine-

* The line between each of these is not completely clear, even to psychologists, but if we simply, in commonsense fashion, equate the sensory level with perceiving, the cognitive with thinking, and the decisional with deciding, we will not go too far astray.

ment, for example) but of sensory bombardment involving flashing lights, rapidly shifting patterns of color, chaotic sound effects—the whole arsenal of psychedelic kaleidoscopy.

The religious fervor and bizarre behavior of certain hippie cultists may arise not merely from drug abuse, but from group experimentation with both sensory deprivation and bombardment. The chanting of monotonous mantras, the attempt to focus the individual's attention on interior, bodily sensation to the exclusion of outside stimuli, are efforts to induce the weird and sometimes hallucinatory effects of understimulation.

At the other end of the scale, we note the glazed stares and numb, expressionless faces of youthful dancers at the great rock music auditoriums where light shows, split-screen movies, high decibel screams, shouts and moans, grotesque costumes and writhing, painted bodies create a sensory environment characterized by high input and extreme unpredictability and novelty.

An organism's ability to cope with sensory input is dependent upon its physiological structure. The nature of its sense organs and the speed with which impulses flow through its neural system set biological bounds on the quantity of sensory data it can accept. If we examine the speed of signal transmission within various organisms, we find that the lower the evolutionary level, the slower the movement. Thus, for example, in a sea urchin egg, lacking a nervous system as such, a signal moves along a membrane at a rate of about a centimeter an hour. Clearly, at such a rate, the organism can respond to only a very limited part of its environment. By the time we move up the ladder to a jellyfish, which already has a primitive nervous system, the signal travels 36,000 times faster: ten centimeters per second. In a worm, the rate leaps to 100 cps. Among insects and crustaceans, neural pulses race along at 1000 cps. Among anthropoids the rate reaches 10,000 cps. Crude as these figures no doubt

are, they help explain why man is unquestionably among the most adaptable of creatures.

Yet even in man, with a neural transmission rate of about 30,000 cps, the boundaries of the system are imposing. (Electrical signals in a computer, by contrast, travel billions of times faster.) The limitations of the sense organs and nervous system mean that many environmental events occur at rates too fast for us to follow, and we are reduced to sampling experience at best. When the signals reaching us are regular and repetitive, this sampling process can yield a fairly good mental representation of reality. But when it is highly disorganized, when it is novel and unpredictable, the accuracy of our imagery is necessarily reduced. Our image of reality is distorted. This may explain why, when we experience sensory overstimulation, we suffer confusion, a blurring of the line between illusion and reality.

INFORMATION OVERLOAD

If overstimulation at the sensory level increases the distortion with which we perceive reality, cognitive overstimulation interferes with our ability to "think." While some human responses to novelty are involuntary, others are preceded by conscious thought, and this depends upon our ability to absorb, manipulate, evaluate and retain information.

Rational behavior, in particular, depends upon a ceaseless flow of data from the environment. It depends upon the power of the individual to predict, with at least fair success, the outcome of his own actions. To do this, he must be able to predict how the environment will respond to his acts. Sanity, itself, thus hinges on man's ability to predict his immediate, personal future on the basis of information fed him by the environment.

When the individual is plunged into a fast and irregularly changing situation, or a novelty-loaded

context, however, his predictive accuracy plummets. He can no longer make the reasonably correct assessments on which rational behavior is dependent.

To compensate for this, to bring his accuracy up to the normal level again, he must scoop up and process far more information than before. And he must do this at extremely high rates of speed. In short, the more rapidly changing and novel the environment, the more information the individual needs to process in order to make effective, rational decisions.

Yet just as there are limits on how much sensory input we can accept, there are in-built constraints on our ability to process information. In the words of psychologist George A. Miller of Rockefeller University, there are "severe limitations on the amount of information that we are able to receive, process, and remember." By classifying information, by abstracting and "coding" it in various ways, we manage to stretch these limits, yet ample evidence demonstrates that our capabilities are finite.

To discover these outer limits, psychologists and communications theorists have set about testing what they call the "channel capacity" of the human organism. For the purpose of these experiments, they regard man as a "channel." Information enters from the outside. It is processed. It exits in the form of actions based on decisions. The speed and accuracy of human information processing can be measured by comparing the speed of information input with the speed and accuracy of output.

Information has been defined technically and measured in terms of units called "bits."* By now, experiments have established rates for the processing involved in a wide variety of tasks from reading, typing, and playing the piano to manipulating dials or doing mental arithmetic. And while researchers

* A bit is the amount of information needed to make a decision between two equally likely alternatives. The number of bits needed increases by one as the number of such alternatives doubles.

differ as to the exact figures, they strongly agree on two basic principles: first, that man has limited capacity; and second, that overloading the system leads to serious breakdown of performance.

Imagine, for example, an assembly line worker in a factory making childrens' blocks. His job is to press a button each time a red block passes in front of him on the conveyor belt. So long as the belt moves at a reasonable speed, he will have little difficulty. His performance will approach 100 percent accuracy. We know that if the pace is too slow, his mind will wander, and his performance will deteriorate. We also know that if the belt moves too fast, he will falter, miss, grow confused and uncoordinated. He is likely to become tense and irritable. He may even take a swat at the machine out of pure frustration. Ultimately, he will give up trying to keep pace.

Here the information demands are simple, but picture a more complex task. Now the blocks streaming down the line are of many different colors. His instructions are to press the button only when a certain color pattern appears—a yellow block, say, followed by two reds and a green. In this task, he must take in and process far more information before he can decide whether or not to hit the button. All other things being equal, he will have even greater difficulty keeping up as the pace of the line accelerates.

In a still more demanding task, we not only force the worker to process a lot of data before deciding *whether* to hit the button, but we then force him to decide *which* of several buttons to press. We can also vary the number of times each button must be pressed. Now his instructions might read: For color pattern yellow-red-red-green, hit button number two once; for pattern green-blue-yellow-green, hit button number six three times; and so forth. Such tasks require the worker to process a large amount of data in order to carry out his task. Speeding up the conveyor now will destroy his accuracy even more rapidly.

Experiments like these have been built up to dis-

maying degrees of complexity. Tests have involved flashing lights, musical tones, letters, symbols, spoken words, and a wide array of other stimuli. And subjects, asked to drum fingertips, speak phrases, solve puzzles, and perform an assortment of other tasks, have been reduced to blithering ineptitude.

The results unequivocally show that no matter what the task, there is a speed above which it cannot be performed—and not simply because of inadequate muscular dexterity. The top speed is often imposed by mental rather than muscular limitations. These experiments also reveal that the greater the number of alternative courses of action open to the subject, the longer it takes him to reach a decision and carry it out.

Clearly, these findings can help us understand certain forms of psychological upset. Managers plagued by demands for rapid, incessant and complex decisions; pupils deluged with facts and hit with repeated tests; housewives confronted with squalling children, jangling telephones, broken washing machines, the wail of rock and roll from the teenager's living room and the whine of the television set in the parlor—may well find their ability to think and act clearly impaired by the waves of information crashing into their senses. It is more than possible that some of the symptoms noted among battle-stressed soldiers, disaster victims, and culture shocked travelers are related to this kind of information overload.

One of the men who has pioneered in information studies, Dr. James G. Miller, director of the Mental Health Research Institute at the University of Michigan, states flatly that "Glutting a person with more information than he can process may . . . lead to disturbance." He suggests, in fact, that information overload may be related to various forms of mental illness.

One of the striking features of schizophrenia, for example, is "incorrect associative response." Ideas and words that ought to be linked in the subject's mind are not, and vice versa. The schizophrenic tends to

think in arbitrary or highly personalized categories. Confronted with a set of blocks of various kinds—triangles, cubes, cones, etc.—the normal person is likely to categorize them in terms of geometric shape. The schizophrenic asked to classify them is just as likely to say "They are all soldiers" or "They all make me feel sad."

In the volume *Disorders of Communication,* Miller describes experiments using word association tests to compare normals and schizophrenics. Normal subjects were divided into two groups, and asked to associate various words with other words or concepts. One group worked at its own pace. The other worked under time pressure—i.e., under conditions of rapid information input. The time-pressed subjects came up with responses more like those of schizophrenics than of self-paced normals.

Similar experiments conducted by psychologists G. Usdansky and L. J. Chapman made possible a more refined analysis of the types of errors made by subjects working under forced-pace, high information-input rates. They, too, concluded that increasing the speed of response brought out a pattern of errors among normals that is peculiarly characteristic of schizophrenics.

"One might speculate," Miller suggests, ". . . that schizophrenia (by some as-yet-unknown process, perhaps a metabolic fault which increases neural 'noise') lowers the capacities of channels involved in cognitive information processing. Schizophrenics consequently . . . have difficulties in coping with information inputs at standard rates like the difficulties experienced by normals at rapid rates. As a result, schizophrenics make errors at standard rates like those made by normals under fast, forced-input rates."

In short, Miller argues, the breakdown of human performance under heavy information loads may be related to psychopathology in ways we have not yet begun to explore. Yet, even without understanding its potential impact, we are accelerating the general-

ized rate of change in society. We are forcing people to adapt to a new life pace, to confront novel situations and master them in ever shorter intervals. We are forcing them to choose among fast-multiplying options. We are, in other words, forcing them to process information at a far more rapid pace than was necessary in slowly-evolving societies. There can be little doubt that we are subjecting at least some of them to cognitive overstimulation. What consequences this may have for mental health in the techno-societies has yet to be determined.

DECISION STRESS

Whether we are submitting masses of men to information overload or not, we are affecting their behavior negatively by imposing on them still a third form of overstimulation—decision stress. Many individuals trapped in dull or slowly changing environments yearn to break out into new jobs or roles that require them to make faster and more complex decisions. But among the people of the future, the problem is reversed. "Decisions, decisions . . ." they mutter as they race anxiously from task to task. The reason they feel harried and upset is that transience, novelty and diversity pose contradictory demands and thus place them in an excruciating double bind.

The accelerative thrust and its psychological counterpart, transience, force us to quicken the tempo of private and public decision-making. New needs, novel emergencies and crises demand rapid response.

Yet the very newness of the circumstances brings about a revolutionary change in the nature of the decisions they are called upon to make. The rapid injection of novelty into the environment upsets the delicate balance of "programmed" and "non-programmed" decisions in our organizations and our private lives.

A programmed decision is one that is routine, repetitive and easy to make. The commuter stands at

the edge of the platform as the 8:05 rattles to a stop. He climbs aboard, as he has done every day for months or years. Having long ago decided that the 8:05 is the most convenient run on the schedule, the actual decision to board the train is programmed. It seems more like a reflex than a decision at all. The immediate criteria on which the decision is based are relatively simple and clear-cut, and because all the circumstances are familiar, he scarcely has to think about it. He is not required to process very much information. In this sense, programmed decisions are low in psychic cost.

Contrast this with the kind of decisions that same commuter thinks about on his way to the city. Should he take the new job Corporation X has just offered him? Should he buy a new house? Should he have an affair with his secretary? How can he get the Management Committee to accept his proposals about the new ad campaign? Such questions demand non-routine answers. They force him to make one-time or first-time decisions that will establish new habits and behavioral procedures. Many factors must be studied and weighed. A vast amount of information must be processed. These decisions are non-programmed. They are high in psychic cost.

For each of us, life is a blend of the two. If this blend is too high in programmed decisions, we are not challenged; we find life boring and stultifying. We search for ways, even unconsciously, to introduce novelty into our lives, thereby altering the decision "mix." But if this mix is too high in non-programmed decisions, if we are hit by so many novel situations that programming becomes impossible, life becomes painfully disorganized, exhausting and anxiety-filled. Pushed to its extreme, the end-point is psychosis.

"Rational behavior . . . ," writes organization theorist Bertram M. Gross, "always includes an intricate combination of routinization and creativity. Routine is essential . . . [because it] frees creative energies for

dealing with the more baffling array of new problems for which routinization is an irrational approach."

When we are unable to program much of our lives, we suffer. "There is no more miserable person," wrote William James, "than one . . . for whom the lighting of every cigar, the drinking of every cup . . . the beginning of every bit of work, are subjects of deliberation." For unless we can extensively program our behavior, we waste tremendous amounts of information-processing capacity on trivia.

This is why we form habits. Watch a committee break for lunch and then return to the same room: almost invariably its members seek out the same seats they occupied earlier. Some anthropologists drag in the theory of "territoriality" to explain this behavior —the notion that man is forever trying to carve out for himself a sacrosanct "turf." A simpler explanation lies in the fact that programming conserves information-processing capacity. Choosing the same seat spares us the need to survey and evaluate other possibilities.

In a familiar context, we are able to handle many of our life problems with low-cost programmed decisions. Change and novelty boost the psychic price of decision-making. When we move to a new neighborhood, for example, we are forced to alter old relationships and establish new routines or habits. This cannot be done without first discarding thousands of formerly programmed decisions and making a whole series of costly new first-time, non-programmed decisions. In effect, we are asked to re-program ourselves.

Precisely the same is true of the unprepared visitor to an alien culture, and it is equally true of the man who, still in his own society, is rocketed into the future without advance warning. The arrival of the future in the form of novelty and change makes all his painfully pieced-together behavioral routines obsolete. He suddenly discovers to his horror that these old routines, rather than solving his problems, merely intensify them. New and as yet unprogrammable decisions are demanded. In short, novelty disturbs the

decision mix, tipping the balance toward the most difficult, most costly form of decision-making.

It is true that some people can tolerate more novelty than others. The optimum mix is different for each of us. Yet the number and type of decisions demanded of us are not under our autonomous control. It is the society that basically determines the mix of decisions we must make and the pace at which we must make them. Today there is a hidden conflict in our lives between the pressures of acceleration and those of novelty. One forces us to make faster decisions while the other compels us to make the hardest, most time-consuming type of decisions.

The anxiety generated by this head-on collision is sharply intensified by expanding diversity. Incontrovertible evidence shows that increasing the number of choices open to an individual also increases the amount of information he needs to process if he is to deal with them. Laboratory tests on men and animals alike prove that the more the choices, the slower the reaction time.

It is the frontal collision of these three incompatible demands that is now producing a decision-making crisis in the techno-societies. Taken together these pressures justify the term "decisional overstimulation," and they help explain why masses of men in these societies already feel themselves harried, futile, incapable of working out their private futures. The conviction that the rat-race is too tough, that things are out of control, is the inevitable consequence of these clashing forces. For the uncontrolled acceleration of scientific, technological and social change subverts the power of the individual to make sensible, competent decisions about his own destiny.

VICTIMS OF FUTURE SHOCK

When we combine the effects of decisional stress with sensory and cognitive overload, we produce several

common forms of individual maladaptation. For example, one widespread response to high-speed change is outright denial. The Denier's strategy is to "block out" unwelcome reality. When the demand for decisions reaches crescendo, he flatly refuses to take in new information. Like the disaster victim whose face registers total disbelief, The Denier, too, cannot accept the evidence of his senses. Thus he concludes that things really are the same, and that all evidences of change are merely superficial. He finds comfort in such cliches as "young people were always rebellious" or "there's nothing new on the face of the earth," or "the more things change, the more they stay the same."

An unknowing victim of future shock, The Denier sets himself up for personal catastrophe. His strategy for coping increases the likelihood that when he finally is forced to adapt, his encounter with change will come in the form of a single massive life crisis, rather than a sequence of manageable problems.

A second strategy of the future shock victim is specialism. The Specialist doesn't block out *all* novel ideas or information. Instead, he energetically attempts to keep pace with change—but only in a specific narrow sector of life. Thus we witness the spectacle of the physician or financier who makes use of all the latest innovations in his profession, but remains rigidly closed to any suggestion for social, political, or economic innovation. The more universities undergo paroxysms of protest, the more ghettos go up in flames, the less he wants to know about them, and the more closely he narrows the slit through which he sees the world.

Superficially, he copes well. But he, too, is running the odds against himself. He may awake one morning to find his specialty obsolete or else transformed beyond recognition by events exploding outside his field of vision.

A third common response to future shock is obsessive reversion to previously successful adaptive routines that are now irrelevant and inappropriate. The

Reversionist sticks to his previously programmed decisions and habits with dogmatic desperation. The more change threatens from without, the more meticulously he repeats past modes of action. His social outlook is regressive. Shocked by the arrival of the future, he offers hysterical support for the not-so-status quo, or he demands, in one masked form or another, a return to the glories of yesteryear.

The Barry Goldwaters and George Wallaces of the world appeal to his quivering gut through the politics of nostalgia. Police maintained order in the past; hence, to maintain order, we need only supply more police. Authoritarian treatment of children worked in the past; hence, the troubles of the present spring from permissiveness. The middle-aged, right-wing reversionist yearns for the simple, ordered society of the small town—the slow-paced social environment in which his old routines were appropriate. Instead of adapting to the new, he continues automatically to apply the old solutions, growing more and more divorced from reality as he does so.

If the older reversionist dreams of reinstating a small-town past, the youthful, left-wing reversionist dreams of reviving an even older social system. This accounts for some of the fascination with rural communes, the bucolic romanticism that fills the posters and poetry of the hippie and post-hippie subcultures, the deification of Ché Guevara (identified with mountains and jungles, not with urban or post-urban environments), the exaggerated veneration of pre-technological societies and the exaggerated contempt for science and technology. For all their fiery demands for change, at least some sectors of the left share with the Wallacites and Goldwaterites a secret passion for the past.

Just as their Indian headbands, their Edwardian capes, their Deerslayer boots and gold-rimmed glasses mimic various eras of the past, so, too, their ideas. Turn-of-the-century terrorism and quaint Black Flag anarchy are suddenly back in vogue. The Rousseauian

cult of the noble savage flourishes anew. Antique Marxist ideas, applicable at best to yesterday's industrialism, are hauled out as knee-jerk answers for the problems of tomorrow's super-industrialism. Reversionism masquerades as revolution.

Finally, we have the Super-Simplifier. With old heroes and institutions toppling, with strikes, riots, and demonstrations stabbing at his consciousness, he seeks a single neat equation that will explain all the complex novelties threatening to engulf him. Grasping erratically at this idea or that, he becomes a temporary true believer.

This helps account for the rampant intellectual faddism that already threatens to outpace the rate of turnover in fashion. McLuhan? Prophet of the electric age? Levi-Strauss? Wow! Marcuse? Now I see it all! The Maharishi of Whatchmacallit? Fantastic! Astrology? Insight of the ages!

The Super-Simplifier, groping desperately, invests every idea he comes across with universal relevance —often to the embarrassment of its author. Alas, no idea, not even mine or thine, is omni-insightful. But for the Super-Simplifier nothing less than total relevance suffices. Maximization of profits explains America. The Communist conspiracy explains race riots. Participatory democracy is the answer. Permissiveness (or Dr. Spock) are the root of all evil.

This search for a unitary solution at the intellectual level has its parallels in action. Thus the bewildered, anxious student, pressured by parents, uncertain of his draft status, nagged at by an educational system whose obsolescence is more strikingly revealed every day, forced to decide on a career, a set of values, and a worthwhile life style, searches wildly for a way to simplify his existence. By turning on to LSD, Methedrine or heroin, he performs an illegal act that has, at least, the virtue of consolidating his miseries. He trades a host of painful and seemingly insoluble troubles for one big problem, thus radically, if temporarily, simplifying existence.

The teen-age girl who cannot cope with the daily mounting tangle of stresses may choose another dramatic act of super-simplification: pregnancy. Like drug abuse, pregnancy may vastly complicate her life later, but it immediately plunges all her other problems into relative insignificance.

Violence, too, offers a "simple" way out of burgeoning complexity of choice and general overstimulation. For the older generation and the political establishment, police truncheons and military bayonets loom as attractive remedies, a way to end dissent once and for all. Black extremists and white vigilantes both employ violence to narrow their choices and clarify their lives. For those who lack an intelligent, comprehensive program, who cannot cope with the novelties and complexities of blinding change, terrorism substitutes for thought. Terrorism may not topple regimes, but it removes doubts.

Most of us can quickly spot these patterns of behavior in others—even in ourselves—without, at the same time, understanding their causes. Yet information scientists will instantly recognize denial, specialization, reversion and super-simplification as classical techniques for coping with overload.

All of them dangerously evade the rich complexity of reality. They generate distorted images of reality. The more the individual denies, the more he specializes at the expense of wider interests, the more mechanically he reverts to past habits and policies, the more desperately he super-simplifies, the more inept his responses to the novelty and choices flooding into his life. The more he relies on these strategies, the more his behavior exhibits wild and erratic swings and general instability.

Every information scientist recognizes that some of these strategies may, indeed, be necessary in overload situations. Yet, unless the individual begins with a clear grasp of relevant reality, and unless he begins with cleanly defined values and priorities, his reliance

on such techniques will only deepen his adaptive difficulties.

These preconditions, however, are increasingly difficult to meet. Thus the future shock victim who does employ these strategies experiences a deepening sense of confusion and uncertainty. Caught in the turbulent flow of change, called upon to make significant, rapid-fire life decisions, he feels not simply intellectual bewilderment, but disorientation at the level of personal values. As the pace of change quickens, this confusion is tinged with self-doubt, anxiety and fear. He grows tense, tires easily. He may fall ill. As the pressures relentlessly mount, tension shades into irritability, anger, and sometimes, senseless violence. Little events trigger enormous responses; large events bring inadequate responses.

Pavlov many years ago referred to this phenomenon as the "paradoxical phase" in the breakdown of the dogs on whom he conducted his conditioning experiments. Subsequent research has shown that humans, too, pass through this stage under the impact of overstimulation, and it may explain why riots sometimes occur even in the absence of serious provocation, why, as though for no reason, thousands of teenagers at a resort will suddenly go on the rampage, smashing windows, heaving rocks and bottles, wrecking cars. It may explain why pointless vandalism is a problem in all of the techno-societies, to the degree that an editorialist in the *Japan Times* reports in cracked, but passionate English: "We have never before seen anything like the extensive scope that these psychopathic acts are indulged in today."

And finally, the confusion and uncertainty wrought by transience, novelty and diversity may explain the profound apathy that de-socializes millions, old and young alike. This is not the studied, temporary withdrawal of the sensible person who needs to unwind or slow down before coping anew with his problems. It is total surrender before the strain of decision-making in conditions of uncertainty and overchoice.

Affluence makes it possible, for the first time in history, for large numbers of people to make their withdrawal a full-time proposition. The family man who retreats into his evening with the help of a few martinis and allows televised fantasy to narcotize him, at least works during the day, performing a social function upon which others are dependent. His is a part-time withdrawal. But for some (not all) hippie dropouts, for many of the surfers and lotus-eaters, withdrawal is full-time and total. A check from an indulgent parent may be the only remaining link with the larger society.

On the beach at Matala, a tiny sun-drenched village in Crete, are forty or fifty caves occupied by runaway American troglodytes, young men and women who, for the most part, have given up any further effort to cope with the exploding high-speed complexities of life. Here decisions are few and time plentiful. Here the choices are narrowed. No problem of overstimulation. No need to comprehend or even to feel. A reporter visiting them in 1968 brought them news of the assassination of Robert F. Kennedy. Their response: silence. "No shock, no rage, no tears. Is this the new phenomenon? Running away from America *and* running away from emotion? I understand uninvolvement, disenchantment, even noncommitment. But where has all the feeling gone?"

The reporter might understand where all the feeling has gone if he understood the impact of overstimulation, the apathy of the Chindit guerrilla, the blank face of the disaster victim, the intellectual and emotional withdrawal of the culture shock victim. For these young people, and millions of others—the confused, the violent, and the apathetic—already evince the symptoms of future shock. They are its earliest victims.

THE FUTURE-SHOCKED SOCIETY

It is impossible to produce future shock in large numbers of individuals without affecting the rationality of the society as a whole. Today, according to Daniel P. Moynihan, the chief White House advisor on urban affairs, the United States "exhibits the qualities of an individual going through a nervous breakdown." For the cumulative impact of sensory, cognitive or decisional overstimulation, not to mention the physical effects of neural or endocrine overload, creates sickness in our midst.

This sickness is increasingly mirrored in our culture, our philosophy, our attitude toward reality. It is no accident that so many ordinary people refer to the world as a "madhouse" or that the theme of insanity has recently become a staple in literature, art, drama and film. Peter Weiss in his play *Marat/Sade* portrays a turbulent world as seen through the eyes of the inmates of the Charenton asylum. In movies like *Morgan,* life within a mental institution is depicted as superior to that in the outside world. In *Blow-Up,* the climax comes when the hero joins in a tennis game in which players hit a non-existent ball back and forth over the net. It is his symbolic acceptance of the unreal and irrational—recognition that he can no longer distinguish between illusion and reality. Millions of viewers identified with the hero in that moment.

The assertion that the world has "gone crazy," the graffiti slogan that "reality is a crutch," the interest in hallucinogenic drugs, the enthusiasm for astrology and the occult, the search for truth in sensation, ecstasy and "peak experience," the swing toward extreme subjectivism, the attacks on science, the snowballing belief that reason has failed man, reflect the everyday experience of masses of ordinary people who find they can no longer cope rationally with change.

Millions sense the pathology that pervades the air, but fail to understand its roots. These roots lie not in this or that political doctrine, still less in some mystical core of despair or isolation presumed to inhere in the "human condition." Nor do they lie in science, technology, or legitimate demands for social change. They are traceable, instead, to the uncontrolled, non-selective nature of our lunge into the future. They lie in our failure to direct, consciously and imaginatively, the advance toward super-industrialism.

Thus, despite its extraordinary achievements in art, science, intellectual, moral and political life, the United States is a nation in which tens of thousands of young people flee reality by opting for drug-induced lassitude; a nation in which millions of their parents retreat into video-induced stupor or alcoholic haze; a nation in which legions of elderly folk vegetate and die in loneliness; in which the flight from family and occupational responsibility has become an exodus; in which masses tame their raging anxieties with Miltown, or Librium, or Equanil, or a score of other tranquilizers and psychic pacifiers. Such a nation, whether it knows it or not, is suffering from future shock.

"I'm not going back to America," says Ronald Bierl, a young expatriate in Turkey. "If you can establish your own sanity, you don't have to worry about other people's sanity. And so many Americans are going stone insane." Multitudes share this unflattering view of American reality. Lest Europeans or Japanese or Russians rest smugly on their presumed sanity, however, it is well to ask whether similar symptoms are not already present in their midst as well. Are Americans unique in this respect, or are they simply suffering the initial brunt of an assault on the psyche that soon will stagger other nations as well?

Social rationality presupposes individual rationality, and this, in turn, depends not only on certain biologi-

cal equipment, but on continuity, order and regularity in the environment. It is premised on some correlation between the pace and complexity of change and man's decisional capacities. By blindly stepping up the rate of change, the level of novelty, and the extent of choice, we are thoughtlessly tampering with these environmental preconditions of rationality. We are condemning countless millions to future shock.

Part Six:

STRATEGIES FOR SURVIVAL

Chapter 17

COPING WITH TOMORROW

In the blue vastness of the South Pacific just north of New Guinea lies the island of Manus, where, as every first-year anthropology student knows, a stone age population emerged into the twentieth century within a single generation. Margaret Mead, in *New Lives for Old,* tells the story of this seeming miracle of cultural adaptation and argues that it is far more difficult for a primitive people to accept a few fragmentary crumbs of Western technological culture than it is for them to adopt a whole new way of life at once.

"Each human culture, like each language, is a whole," she writes, and if "individuals or groups of people have to change . . . it is most important that they should change from one whole pattern to another."

There is sense in this, for it is clear that tensions arise from incongruities between cultural elements. To introduce cities without sewage, anti-malarial medicines without birth control, is to tear a culture apart, and to subject its members to excruciating, often insoluble problems.

Yet this is only part of the story, for there are definite limits to the amount of newness that any individual or group can absorb in a short span of time, re-

gardless of how well integrated the whole may be. Nobody, Manus or Muscovite, can be pushed above his adaptive range without suffering disturbance and disorientation. Moreover, it is dangerous to generalize from the experience of this small South Sea population.

The success story of the Manus, told and retold like a modern folk tale, is often cited as evidence that we, in the high-technology countries, will also be able to leap to a new stage of development without undue hardship. Yet our situation, as we speed into the super-industrial era, is radically different from that of the islanders.

We are not in a position, as they were, to import wholesale an integrated, well-formed culture, matured and tested in another part of the world. We must invent super-industrialism, not import it. During the next thirty or forty years we must anticipate not a single wave of change, but a series of terrible heaves and shudders. The parts of the new society, rather than being carefully fitted, one to the other, will be strikingly incongruous filled with missing linkages and glaring contradictions. There is no "whole pattern" for us to adopt.

More important, the transience level has risen so high, the pace is now so forced, that a historically unprecedented situation has been thrust upon us. We are not asked, as the Manus were, to adapt to a new culture, but to a blinding succession of new temporary cultures. This is why we may be approaching the upper limits of the adaptive range. No previous generation has ever faced this test.

It is only now, therefore, in our lifetime, and only in the techno-societies as yet, that the potential for mass future shock has crystallized.

To say this, however, is to court grave misunderstanding. First, any author who calls attention to a social problem runs the risk of deepening the already profound pessimism that envelops the techno-societies. Self-indulgent despair is a highly salable literary

commodity today. Yet despair is not merely a refuge for irresponsibility; it is unjustified. Most of the problems besieging us, including future shock, stem not from implacable natural forces but from man-made processes that are at least potentially subject to our control.

Second, there is danger that those who treasure the status quo may seize upon the concept of future shock as an excuse to argue for a moratorium on change. Not only would any such attempt to suppress change fail, triggering even bigger, bloodier and more unmanageable changes than any we have seen, it would be moral lunacy as well. By any set of human standards, certain radical social changes are already desperately overdue. The answer to future shock is not non-change, but a different kind of change.

The only way to maintain any semblance of equilibrium during the super-industrial revolution will be to meet invention with invention—to design new personal and social change-regulators. Thus we need neither blind acceptance nor blind resistance, but an array of creative strategies for shaping, deflecting, accelerating or decelerating change selectively. The individual needs new principles for pacing and planning his life along with a dramatically new kind of education. He may also need specific new technological aids to increase his adaptivity. The society, meanwhile, needs new institutions and organizational forms, new buffers and balance wheels.

All this implies still further change, to be sure—but of a type designed from the beginning to harness the accelerative thrust, to steer it and pace it. This will not be easy to do. Moving swiftly into uncharted social territory, we have no time-tried techniques, no blueprints. We must, therefore, experiment with a wide range of change-regulating measures, inventing and discarding them as we go along. It is in this tentative spirit that the following tactics and strategies are suggested—not as sure-fire panaceas, but as examples of new approaches that need to be tested

and evaluated. Some are personal, others technological and social. For the struggle to channel change must take place at all these levels simultaneously.

Given a clearer grasp of the problems and more intelligent control of certain key processes, we can turn crisis into opportunity, helping people not merely to survive, but to crest the waves of change, to grow, and to gain a new sense of mastery over their own destinies.

DIRECT COPING

We can begin our battle to prevent future shock at the most personal level. It is clear, whether we know it or not, that much of our daily behavior is, in fact, an attempt to ward off future shock. We employ a variety of tactics to lower the levels of stimulation when they threaten to drive us above our adaptive range. For the most part, however, these techniques are employed unconsciously. We can increase their effectiveness by raising them to consciousness.

We can, for example, introvert periodically to examine our own bodily and psychological reactions to change, briefly tuning out the external environment to evaluate our inner environment. This is not a matter of wallowing in subjectivity, but of coolly appraising our own performance. In the words of Hans Selye, whose work on stress opened new frontiers in biology and psychiatry, the individual can "consciously look for signs of being keyed up too much."

Heart palpitations, tremors, insomnia or unexplained fatigue may well signal overstimulation, just as confusion, unusual irritability, profound lassitude and a panicky sense that things are slipping out of control are psychological indications. By observing ourselves, looking back over the changes in our recent past, we can determine whether we are operating comfortably within our adaptive range or press-

ing its outer limits. We can, in short, consciously assess our own life pace.

Having done this, we can also begin consciously to influence it—speeding it up or slowing it down—first with respect to small things, the micro-environment, and then in terms of the larger, structural patterns of experience. We can learn how by scrutinizing our own unpremeditated responses to overstimulation.

We employ a de-stimulating tactic, for example, when we storm into the teen-ager's bedroom and turn off a stereo unit that has been battering our eardrums with unwanted and interruptive sounds. We virtually sigh with relief when the noise level drops. We act to reduce sensory bombardment in other ways, too—when we pull down the blinds to darken a room, or search for silence on a deserted strip of beach. We may flip on an air conditioner not so much to lower the temperature as to mask novel and unpredictable street sounds with a steady, predictable drone.

We close doors, wear sunglasses, avoid smelly places and shy away from touching strange surfaces when we want to decrease novel sensory input. Similarly, when we choose a familiar route home from the office, instead of turning a fresh corner, we opt for sensory non-novelty. In short, we employ "sensory shielding"—a thousand subtle behavioral tricks to "turn off" sensory stimuli when they approach our upper adaptive limit.

We use similar tactics to control the level of cognitive stimulation. Even the best of students periodically gazes out the window, blocking out the teacher, shutting off the flow of new data from that source. Even voracious readers sometimes go through periods when they cannot bear to pick up a book or magazine.

Why, during a gregarious evening at a friend's house, does one person in the group refuse to learn a new card game while others urge her on? Many factors play a part: the self-esteem of the individual,

the fear of seeming foolish, and so on. But one overlooked factor affecting willingness to learn may well be the general level of cognitive stimulation in the individual's life at the time. "Don't bother me with new facts!" is a phrase usually uttered in jest. But the joke often disguises a real wish to avoid being pressed too hard by new data.

This accounts in part for our specific choices of entertainment—of leisure-time reading, movies or television programs. Sometimes we seek a high novelty ratio, a rich flow of information. At other moments we actively resist cognitive stimulation and reach for "light" entertainment. The typical detective yarn, for example, provides a trace of unpredictability—whodunnit?—within a carefully structured ritual framework, a set of non-novel, hence easily predictable relationships. In this way, we employ entertainment as a device to raise or lower stimulation, adjusting our intake rates so as not to overload our capacities.

By making more conscious use of such tactics, we can "fine-tune" our micro-environment. We can also cut down on unwanted stimulation by acting to lighten our cognitive burdens. "Trying to remember too many things is certainly one of the major sources of psychologic stress," writes Selye. "I make a conscious effort to forget immediately all that is unimportant and to jot down data of possible value . . . This technique can help anyone to accomplish the greatest simplicity compatible with the degree of complexity of his intellectual life."

We also act to regulate the flow of decisioning. We postpone decisions or delegate them to others when we are suffering from decision overload. Sometimes we "freeze up" decisionally. I have seen a woman sociologist, just returned from a crowded, highly stimulating professional conference, sit down in a restaurant and absolutely refuse to make any decisions whatever about her meal. "What would you like?" her husband asked. "You decide for me," she replied. When pressed to choose between specific alternatives,

she still explicitly refused, insisting angrily that she lacked the "energy" to make the decision.

Through such methods we attempt, as best we can, to regulate the flow of sensory, cognitive and decisional stimulation, perhaps also attempting in some complicated and as yet unknown way to balance them with one another. But we have stronger ways of coping with the threat of overstimulation. These involve attempts to control the rates of transience, novelty and diversity in our milieu.

PERSONAL STABILITY ZONES

The rate of turnover in our lives, for example, can be influenced by conscious decisions. We can, for example, cut down on change and stimulation by consciously maintaining longer-term relationships with the various elements of our physical environment. Thus, we can refuse to purchase throw-away products. We can hang onto the old jacket for another season; we can stoutly refuse to follow the latest fashion trend; we can resist when the salesman tells us it's time to trade in our automobile. In this way, we reduce the need to make and break ties with the physical objects around us.

We can use the same tactic with respect to people and the other dimensions of experience. There are times when even the most gregarious person feels anti-social and refuses invitations to parties or other events that call for social interaction. We consciously disconnect. In the same way, we can minimize travel. We can resist pointless reorganizations in our company, church, fraternal or community groups. In making important decisions, we can consciously weigh the hidden costs of change against the benefits.

None of this is to suggest that change can or should be stopped. Nothing is less sensible than the advice of the Duke of Cambridge who is said to have ha-

rumphed: "Any change, at any time, for any reason is to be deplored." The theory of the adaptive range suggests that, despite its physical costs, some level of change is as vital to health as too much change is damaging.

Some people, for reasons still not clear, are pitched at a much higher level of stimulus hunger than others. They seem to crave change even when others are reeling from it. A new house, a new car, another trip, another crisis on the job, more house guests, visits, financial adventures and misadventures—they seem to accept all these and more without apparent ill effect.

Yet close analysis of such people often reveals the existence of what might be called "stability zones" in their lives—certain enduring relationships that are carefully maintained despite all kinds of other changes.

One man I know has run through a series of love affairs, a divorce and remarriage—all within a very short span of time. He thrives on change, enjoys travel, new foods, new ideas, new movies, plays and books. He has a high intellect and a low "boring point," is impatient with tradition and restlessly eager for novelty. Ostensibly, he is a walking exemplar of change.

When we look more closely, however, we find that he has stayed on the same job for ten years. He drives a battered, seven-year-old automobile. His clothes are several years out of style. His closest friends are long-time professional associates and even a few old college buddies.

Another case involves a man who has changed jobs at a mind-staggering rate, has moved his family thirteen times in eighteen years, travels extensively, rents cars, uses throw-away products, prides himself on leading the neighborhood in trying out new gadgets, and generally lives in a restless whirl of transience, newness and diversity. Once more, however, a second look reveals significant stability zones in his life: a

good, tightly woven relationship with his wife of nineteen years; continuing ties with his parents; old college friends interspersed with the new acquaintances.

A different form of stability zone is the habit pattern that goes with the person wherever he travels, no matter what other changes alter his life. A professor who has moved seven times in ten years, who travels constantly in the United States, South America, Europe and Africa, who has changed jobs repeatedly, pursues the same daily regimen wherever he is. He reads between eight and nine in the morning, takes forty-five minutes for exercise at lunch time, and then catches a half-hour cat-nap before plunging into work that keeps him busy until 10:00 P.M.

The problem is not, therefore, to suppress change, which cannot be done, but to manage it. If we opt for rapid change in certain sectors of life, we can consciously attempt to build stability zones elsewhere. A divorce, perhaps, should not be too closely followed by a job transfer. Since the birth of a child alters all the human ties within a family, it ought not, perhaps, be followed too closely by a relocation which causes tremendous turnover in human ties outside the family. The recent widow should not, perhaps, rush to sell her house.

To design workable stability zones, however, to alter the larger patterns of life, we need far more potent tools. We need, first of all, a radically new orientation toward the future.

Ultimately, to manage change we must anticipate it. However, the notion that one's personal future can be, to some extent, anticipated, flies in the face of persistent folk prejudice. Most people, deep down, believe that the future is a blank. Yet the truth is that we *can* assign probabilities to some of the changes that lie in store for us, especially certain large structural changes, and there are ways to use this knowledge in designing personal stability zones.

We can, for example, predict with certainty that

unless death intervenes, we shall grow older; that our children, our relatives and friends will also grow older; and that after a certain point our health will begin to deteriorate. Obvious as this may seem, we can, as a result of this simple statement, infer a great deal about our lives one, five or ten years hence, and about the amount of change we will have to absorb in the interim.

Few individuals or families plan ahead systematically. When they do, it is usually in terms of a budget. Yet we can forecast and influence our expenditure of time and emotion as well as money. Thus it is possible to gain revealing glimpses of one's own future, and to estimate the gross level of change lying ahead, by periodically preparing what might be called a Time and Emotion Forecast. This is an attempt to assess the percentage of time and emotional energy invested in various important aspects of life —and to see how this might change over the years.

One can, for example, list in a column those sectors of life that seem most important to us: Health, Occupation, Leisure, Marital Relations, Parental Relations, Filial Relations, etc. It is then possible to jot down next to each item a "guesstimate" of the amount of time we presently allocate to that sector. By way of illustration: given a nine-to-five job, a half-hour commute, and the usual vacations and holidays, a man employing this method would find that he devotes approximately 25 percent of his time to work. Although it is, of course, much more difficult, he can also make a subjective assessment of the percentage of his emotional energy invested in the job. If he is bored and secure, he may invest very little—there being no necessary correlation between time devoted and emotion invested.

If he performs this exercise for each of the important sectors of his life, forcing himself to write in a percentage even when it is no more than an extremely crude estimate, and toting up the figures to make sure they never exceed 100 percent, he will be rewarded

with some surprising insights. For the way he distributes his time and emotional energies is a direct clue to his value system and his personality.

The payoff for engaging in this process really begins, however, when he projects forward, asking himself honestly and in detail how his job, or his marriage, or his relationship with his children or his parents is likely to develop within the years ahead.

If, for example, he is a forty-year-old middle manager with two teen-age sons, two surviving parents or in-laws, and an incipient duodenal ulcer, he can assume that within half a decade his boys will be off to college or living away on their own. Time devoted to parental concerns will probably decline. Similarly, he can anticipate some decline in the emotional energies demanded by his parental role. On the other hand, as his own parents and in-laws grow older, his filial responsibility will probably loom larger. If they are sick, he may have to devote large amounts of time and emotion to their care. If they are statistically likely to die within the period under study, he needs to face this fact. It tells him that he can expect a major change in his commitments. His own health, in the meantime, will not be getting any better. In the same way, he can hazard some guesses about his job—his chances for promotion, the possibility of reorganization, relocation, retraining, etc.

All this is difficult, and it does not yield "knowledge of the future." Rather, it helps him make explicit some of his assumptions about the future. As he moves forward, filling in the forecast for the present year, the next year, the fifth or tenth year, patterns of change will begin to emerge. He will see that in certain years there are bigger shifts and redistributions to be expected than in others. Some years are choppier, more change-filled than others. And he can then, on the strength of these systematic assumptions, decide how to handle major decisions in the present.

Should the family move next year—or will there be

enough turmoil and change without that? Should he quit his job? Buy a new car? Take a costly vacation? Put his elderly father-in-law in a nursing home? Have an affair? Can he afford to rock his marriage or change his profession? Should he attempt to maintain certain levels of commitment unchanged?

These techniques are extremely crude tools for personal planning. Perhaps the psychologists and social psychologists can design sharper instruments, more sensitive to differences in probability, more refined and insight-yielding. Yet, if we search for clues rather than certainties, even these primitive devices can help us moderate or channel the flow of change in our lives. For, by helping us identify the zones of rapid change, they also help us identify—or invent—stability zones, patterns of relative constancy in the overwhelming flux. They improve the odds in the personal struggle to manage change.

Nor is this a purely negative process—a struggle to suppress or limit change. The issue for any individual attempting to cope with rapid change is how to maintain himself within the adaptive range, and, beyond that, how to find the exquisite optimum point at which he lives at peak effectiveness. Dr. John L. Fuller, a senior scientist at the Jackson Laboratory, a bio-medical research center in Bar Harbor, Maine, has conducted experiments in the impact of experiential deprivation and overload. "Some people," he says, "achieve a certain sense of serenity, even in the midst of turmoil, not because they are immune to emotion, but because they have found ways to get just the 'right' amount of change in their lives." The search for that optimum may be what much of the "pursuit of happiness" is about.

Trapped, temporarily, with the limited nervous and endocrine systems given us by evolution, we must work out new tactics to help us regulate the stimulation to which we subject ourselves.

SITUATIONAL GROUPING

The trouble is that such personal tactics become less effective with every passing day. As the rate of change climbs, it becomes harder for individuals to create the personal stability zones they need. The costs of non-change escalate.

We may stay in the old house—only to see the neighborhood transformed. We may keep the old car—only to see repair bills mount beyond reach. We may refuse to transfer to a new location—only to lose our job as a result. For while there are steps we can take to reduce the impact of change in our personal lives, the real problem lies outside ourselves.

To create an environment in which change enlivens and enriches the individual, but does not overwhelm him, we must employ not merely personal tactics but social strategies. If we are to carry people through the accelerative period, we must begin now to build "future shock absorbers" into the very fabric of super-industrial society. And this requires a fresh way of thinking about change and non-change in our lives. It even requires a different way of classifying people.

Today we tend to categorize individuals not according to the changes they happen to be undergoing at the moment, but according to their status or position between changes. We consider a union man as someone who has joined a union and not yet quit. Our designation refers not to joining or quitting, but to the "non-change" that happens in between. Welfare recipient, college student, Methodist, executive—all refer to the person's condition between changes, as it were.

There is, however, a radically different way to view people. For example, "one who is moving to a new residence" is a classification into which more than 100,000 Americans fit on any given day, yet they are seldom thought of as a group. The classification "one

who is changing his job" or "one who is joining a church," or "one who is getting a divorce" are all based on temporary, transitional conditions, rather than on the more enduring conditions between transitions.

This sudden shift of focus, from thinking about what people "are" to thinking about what they are "becoming," suggests a whole array of new approaches to adaptation.

One of the most imaginative and simplest of these comes from Dr. Herbert Gerjuoy, a psychologist on the staff of the Human Resources Research Organization. He terms it "situational grouping," and like most good ideas, it sounds obvious once it is described. Yet it has never been systematically exploited. Situational grouping may well become one of the key social services of the future.

Dr. Gerjuoy argues that we should provide temporary organizations—"situational groups"—for people who happen to be passing through similar life transitions at the same time. Such situational groups should be established, Gerjuoy contends, "for families caught in the upheaval of relocation, for men and women about to be divorced, for people about to lose a parent or a spouse, for those about to gain a child, for men preparing to switch to a new occupation, for families that have just moved into a community, for those about to marry off their last child, for those facing imminent retirement—for anyone, in other words, who faces an important life change.

"Membership in the group would, of course, be temporary—just long enough to help the person with the transitional difficulties. Some groups might meet for a few months, others might not do more than hold a single meeting."

By bringing together people who are sharing, or are about to share, a common adaptive experience, he argues, we help equip them to cope with it. "A man required to adapt to a new life situation loses some of his bases for self-esteem. He begins to doubt

his own abilities. If we bring him together with others who are moving through the same experience, people he can identify with and respect, we strengthen him. The members of the group come to share, even if briefly, some sense of identity. They see their problems more objectively. They trade useful ideas and insights. Most important, they suggest future alternatives for one another."

This emphasis on the future, says Gerjuoy, is critical. Unlike some group therapy sessions, the meetings of situational groups should not be devoted to hashing over the past, or to griping about it, or to soul-searching self-revelation, but to discussing personal objectives, and to planning practical strategies for future use in the new life situation. Members might watch movies of other similar groups wrestling with the same kinds of problems. They might hear from others who are more advanced in the transition than they are. In short, they are given the opportunity to pool their personal experiences and ideas before the moment of change is upon them.

In essence, there is nothing novel about this approach. Even now certain organizations are based on situational principles. A group of Peace Corps volunteers preparing for an overseas mission is, in effect, just such a situational grouping, as are pre- and post-natal classes. Many American towns have a "Newcomer's Club" that invites new residents to casserole dinners or other socials, permitting them to mix with other recent arrivals and compare problems and plans. Perhaps there ought to be an "Outmovers Club" as well. What is new is the suggestion that we systematically honeycomb the society with such "coping classrooms."

CRISIS COUNSELING

Not all help for the individual can, or necessarily should come from groups. In many cases, what the

change-pressed person needs most is one-to-one counseling during the crisis of adaptation. In psychiatric jargon a "crisis" is any significant transition. It is roughly synonymous with "major life change."

Today persons in transitional crisis turn to a variety of experts—doctors, marriage counselors, psychiatrists, vocational specialists and others—for individualized advice. Yet for many kinds of crisis there are no appropriate experts. Who helps the family or individual faced with the need to move to a new city for the third time in five years? Who is available to counsel a leader who is up- or down-graded by a reorganization of his or her club or community organization? Who is there to help the secretary just bounced back to the typing pool?

People like these are not sick. They neither need nor should receive psychiatric attention, yet there is, by and large, no counseling machinery available to them.

Not only are there many kinds of present-day life transitions for which no counseling help is provided, but the invasion of novelty will slam individuals up against wholly new kinds of personal crises in the future. And as the society races toward heterogeneity, the variety of problems will increase. In slowly changing societies the types of crises faced by individuals are more uniform and the sources of specialized advice more easily identifiable. The crisis-caught person went to his priest, his witch doctor or his local chief. Today personalized counseling services in the high technology countries have become so specialized that we have developed, in effect, second-layer advice-givers who do nothing but counsel the individual about where to seek advice.

These referral services interpose additional red tape and delay between the individual and the assistance he needs. By the time help reaches him, he may already have made the crucial decision—and done so badly. So long as we assume that advice is something that must come from evermore specialized profes-

sionals, we can anticipate ever greater difficulty. Moreover, so long as we base specialties on what people "are" instead of what they are "becoming" we miss many of the real adaptive problems altogether. Conventional social service systems will never be able to keep up.

The answer is a counterpart to the situational grouping system—a counseling set-up that not only draws on full-time professional advice givers, but on multitudes of lay experts as well. We must recognize that what makes a person an expert in one type of crisis is not necessarily formal education, but the very experience of having undergone a similar crisis himself.

To help tide millions of people over the difficult transitions they are likely to face, we shall be forced to "deputize" large numbers of non-professional people in the community—businessmen, students, teachers, workers, and others—to serve as "crisis counselors." Tomorrow's crisis counselors will be experts not in such conventional disciplines as psychology or health, but in specific transitions such as relocation, job promotion, divorce, or subcult-hopping. Armed with their own recent experience, working on a volunteer basis or for minimal pay, they will set aside some small part of their time for listening to other lay people talk out their problems, apprehensions and plans. In return, they will have access to others for similar assistance in the course of their own adaptive development.

Once again, there is nothing new about people seeking advice from one another. What is new is our ability, through the use of computerized systems, to assemble situational groups swiftly, to match up individuals with counselors, and to do both with considerable respect for privacy and anonymity.

We can already see evidence of a move in this direction in the spread of "listening" and "caring" services. In Davenport, Iowa, lonely people can dial a telephone number and be connected with a "listen-

er"—one of a rotating staff of volunteers who man the telephone twenty-four hours a day. The program, initiated by a local commission on the aging, is similar to, but not the same as, the Care-Ring service in New York. Care-Ring charges its subscribers a fee, in return for which they receive two check-in calls each day at designated times. Subscribers provide the service with the names of their doctor, a neighbor, their building superintendent, and a close relative. In the event they fail to respond to a call, the service tries again half an hour later. If they still do not respond, the doctor is notified and a nurse dispatched to the scene. Care-Ring services are now being franchised in other cities. In both these services we see forerunners of the crisis-counseling system of the future.

Under that system, the giving and getting of advice becomes not a "social service" in the usual bureaucratic, impersonal sense, but a highly personalized process that not only helps individuals crest the currents of change in their own lives, but helps cement the entire society together in a kind of "love network"—an integrative system based on the principle of "I need you as much as you need me." Situational grouping and person-to-person crisis counseling are likely to become a significant part of everyone's life as we all move together into the uncertainties of the future.

HALF-WAY HOUSES

A "future shock absorber" of a quite different type is the "half-way house" idea already employed by progressive prison authorities to ease the convict's way back into normal life. According to criminologist Daniel Glaser, the distinctive feature of the correctional institutions of the future will be the idea of "gradual release."

Instead of taking a man out of the under-stimulating, tightly regimented life of the prison and plung-

ing him violently and without preparation into open society, he is moved first to an intermediate institution which permits him to work in the community by day, while continuing to return to the institution at night. Gradually, restrictions are lifted until he is fully adjusted to the outside world. The same principle has been explored by various mental institutions.

Similarly it has been suggested that the problems of rural populations suddenly shifted to urban centers might be sharply reduced if something like this half-way house principle were employed to ease their entry into the new way of life. What cities need, according to this theory, are reception facilities where newcomers live for a time under conditions half-way between those of the rural society they are leaving behind and the urban society they are seeking to penetrate. If instead of treating city-bound migrants with contempt and leaving them to find their own way, they were first acclimatized, they would adapt far more successfully.

A similar idea is filtering through the specialists who concern themselves with "squatter housing" in major cities in the technologically underdeveloped world. Outside Khartoum in the Sudan, thousands of former nomads have created a concentric ring of settlements. Those furthest from the city live in tents, much like the ones they occupied before migration. The next-closer group lives in mud-walled huts with tent roofs. Those still closer to the city occupy huts with mud walls and tin roofs.

When police set out to tear down the tents, urban planner Constantinos Doxiadis recommended that they not only *not* destroy them, but that certain municipal services be provided to their inhabitants. Instead of seeing these concentric rings in wholly negative terms, he suggested, they might be viewed as a tremendous teaching machine through which individuals and families move, becoming urbanized step by step.

The application of this principle, however, need not

be limited to the poor, the insane or the criminal. The basic idea of providing change in controlled, graduated stages, rather than abrupt transitions, is crucial to any society that wishes to cope with rapid social or technological upheaval. The veteran, for example, could be released from service more gradually. The student from a rural community could spend a few weeks at a college in a medium-size city before entering the large urban university. The long-term hospital patient might be encouraged to go home on a trial basis, once or twice, before being discharged.

We are already experimenting with these strategies, but others are possible. Retirement, for example, should not be the abrupt, all-or-nothing, ego-crushing change that it now is for most men. There is no reason why it cannot be gradualized. Military induction, which typically separates a young man from his family in a sudden and almost violent fashion, could be done by stages. Legal separation, which is supposed to serve as a kind of half-way house on the way to divorce, could be made less legally complicated and psychologically costly. Trial marriage could be encouraged, instead of denigrated. In short, wherever a change of status is contemplated, the possibility of gradualizing it should be considered.

ENCLAVES OF THE PAST

No society racing through the turbulence of the next several decades will be able to do without specialized centers in which the rate of change is artificially depressed. To phrase it differently, we shall need enclaves of the past—communities in which turnover, novelty and choice are deliberately limited.

These may be communities in which history is partially frozen, like the Amish villages of Pennsylvania, or places in which the past is artfully simulated, like Williamsburg, Virginia or Mystic, Connecticut.

Unlike Williamsburg or Mystic, however, through which visitors stream at a steady and rapid clip, tomorrow's enclaves of the past must be places where people faced with future shock can escape the pressures of overstimulation for weeks, months, even years, if they choose.

In such slow-paced communities, individuals who need or want a more relaxed, less stimulating existence should be able to find it. The communities must be consciously encapsulated, selectively cut off from the surrounding society. Vehicular access should be limited to avoid traffic. Newspapers should be weeklies instead of dailies. If permitted at all, radio and television should be broadcast only for a few hours a day, instead of round the clock. Only special emergency services—health, for example—should be maintained at the maximum efficiency permitted by advanced technology.

Such communities not only should not be derided, they should be subsidized by the larger society as a form of mental and social insurance. In times of extremely rapid change, it is possible for the larger society to make some irreversible, catastrophic error. Imagine, for instance, the widespread diffusion of a food additive that accidentally turns out to have thalidomide-like effects. One can conceive of accidents capable of sterilizing or even killing whole populations.

By proliferating enclaves of the past, living museums as it were, we increase the chances that someone will be there to pick up the pieces in case of massive calamity. Such communities might also serve as experiential teaching machines. Thus children from the outside world might spend a few months in a simulated feudal village, living and actually working as children did centuries ago. Teenagers might be required to spend some time living in a typical early industrial community and to actually work in its mill or factory. Such living education would give them a historical perspective no book could ever provide.

In these communities, the men and women who want a slower life might actually make a career out of "being" Shakespeare or Ben Franklin or Napoleon—not merely acting out their parts on stage, but living, eating, sleeping, as they did. The career of "historical simulant" would attract a great many naturally talented actors.

In short, every society will need sub-societies whose members are committed to staying away from the latest fads. We may even want to pay people *not* to use the latest goods, not to enjoy the most automated and sophisticated conveniences.

ENCLAVES OF THE FUTURE

By the same token, just as we make it possible for some people to live at the slower pace of the past, we must also make it possible for individuals to experience aspects of their future in advance. Thus, we shall also have to create enclaves of the future.

In a limited sense, we are already doing this. Astronauts, pilots and other specialists are often trained by placing them in carefully assembled simulations of the environments they will occupy at some date in the future when they actually participate in a mission. By duplicating the interior of a cockpit or a capsule, we allow them to become accustomed, by degrees, to their future environment. Police and espionage agents, as well as commandos and other military specialists, are pre-trained by watching movies of the people they will have to deal with, the factories they are supposed to infiltrate, the terrain they will have to cover. In this way they are prepared to cope with a variety of future contingencies.

There is no reason why the same principle cannot be extended. Before dispatching a worker to a new location, he and his family ought to be shown detailed movies of the neighborhood they will live in, the school their children will attend, the stores in

which they will shop, perhaps even of the teachers, shopkeepers, and neighbors they will meet. By pre-adapting them in this way, we can lower their anxieties about the unknown and prepare them, in advance, to cope with many of the problems they are likely to encounter.

Tomorrow, as the technology of experiential simulation advances, we shall be able to go much further. The pre-adapting individual will be able not merely to see and hear, but to touch, taste and smell the environment he is about to enter. He will be able to interact vicariously with the people in his future, and to undergo carefully contrived experiences designed to improve his coping abilities.

The "psych-corps" of the future will find a fertile market in the design and operation of such pre-adaptive facilities. Whole families may go to "work-learn-and-play" enclaves which will, in effect, constitute museums of the future, preparing them to cope with their own personal tomorrows.

GLOBAL SPACE PAGEANTS

"Mesmerized as we are by the very idea of change," writes John Gardner in *Self-Renewal*, "we must guard against the notion that continuity is a negligible—if not reprehensible—factor in human history. It is a vitally important ingredient in the life of individuals, organizations and societies."

In the light of theory of the adaptive range, it becomes clear that an insistence on continuity in our experience is not necessarily "reactionary," just as the demand for abrupt or discontinuous change is not necessarily "progressive." In stagnant societies, there is a deep psychological need for novelty and stimulation. In an accelerative society, the need may well be for the preservation of certain continuities.

In the past, ritual provided an important change-buffer. Anthropologists tell us that certain repeated

ceremonial forms—rituals surrounding birth, death, puberty, marriage and so on—helped individuals in primitive societies to re-establish equilibrium after some major adaptive event had taken place.

"There is no evidence," writes S. T. Kimball, "that a secularized urban world has lessened the need for ritualized expression . . ." Carleton Coon declares that "Whole societies, whatever their sizes and degrees of complexity, need controls to ensure the maintenance of equilibrium, and control comes in several forms. One is ritual." He points out that ritual survives today in the public appearances of heads of state, in religion, in business.

These, however, represent the merest tip of the ritual iceberg. In Western societies, for example, the sending of Christmas cards is an annual ritual that not only represents continuity in its own right, but which helps individuals prolong their all-too-temporary friendships or acquaintanceships. The celebration of birthdays, holidays or anniversaries are additional examples. The fast-burgeoning greeting-card industry—2,248,000,000 Christmas cards are sold annually in the United States alone—is an economic monument to the society's continuing need for some semblance of ritual.

Repetitive behavior, whatever else its functions, helps give meaning to non-repetitive events, by providing the backdrop against which novelty is silhouetted. Sociologists James Bossard and Eleanor Boll, after examining one hundred published autobiographies, found seventy-three in which the writers described procedures which were "unequivocally classifiable as family rituals." These rituals, arising from "some simple or random bits of family interaction, started to set, because they were successful or satisfying to members, and through repetition they 'jelled' into very definite forms."

As the pace of change accelerates, many of these rituals are broken down or denatured. Yet we struggle to maintain them. One non-religious family periodi-

cally offers a secular grace at the dinner table, to honor such benefactors of mankind as Johann Sebastian Bach or Martin Luther King. Husbands and wives speak of "our song" and periodically revisit "the place we first met." In the future, we can anticipate greater variety in the kinds of rituals adhered to in family life.

As we accelerate and introduce arhythmic patterns into the pace of change, we need to mark off certain regularities for preservation, exactly the way we now mark off certain forests, historical monuments, or bird sanctuaries for protection. We may even need to manufacture ritual.

No longer at the mercy of the elements as we once were, no longer condemned to darkness at night or frost in the morning, no longer positioned in an unchanging physical environment, we are helped to orient ourselves in space and time by social, as distinct from natural, regularities.

In the United States, the arrival of spring is marked for most urban dwellers not by a sudden greenness —there is little green in Manhattan—but by the opening of the baseball season. The first ball is thrown by the President or some other dignitary, and thereafter millions of citizens follow, day by day, the unfolding of a mass ritual. Similarly, the end of summer is marked as much by the World Series as by any natural symbol.

Even those who ignore sports cannot help but be aware of these large and pleasantly predictable events. Radio and television carry baseball into every home. Newspapers are filled with sports news. Images of baseball form a backdrop, a kind of musical obbligato that enters our awareness. Whatever happens to the stock market, or to world politics, or to family life, the American League and the National League run through their expected motions. Outcomes of individual games vary. The standings of the teams go up and down. But the drama plays itself out within a set of reassuringly rigid and durable rules.

The opening of Congress every January; the appearance of new car models in the fall; seasonal variations in fashion; the April 15 deadline for filing income tax; the arrival of Christmas; the New Year's Eve party; the fixed national holidays. All these punctuate our time predictably, supplying a background of temporal regularity that is necessary (though hardly sufficient) for mental health.

The pressure of change, however, is to "unhitch" these from the calendar, to loosen and irregularize them. Often there are economic benefits for doing so. But there may also be hidden costs through the loss of stable temporal points of reference that today still lend some pattern and continuity to everyday life. Instead of eliminating these wholesale, we may wish to retain some, and, indeed, to introduce certain regularities where they do not exist. (Boxing championship matches are held at irregular, unpredictable times. Perhaps these highly ritualistic events should be held at fixed intervals as the Olympic games are.)

As leisure increases, we have the opportunity to introduce additional stability points and rituals into the society, such as new holidays, pageants and games. Such mechanisms could not only provide a backdrop of continuity in everyday life, but serve to integrate societies, and cushion them somewhat against the fragmenting impact of super-industrialism. We might, for example, create holidays to honor Galileo or Mozart, Einstein or Cézanne. We might create a global pageantry based on man's conquest of outer space.

Even now the succession of space launchings and capsule retrievals is beginning to take on a kind of ritual dramatic pattern. Millions stand transfixed as the countdown begins and the mission works itself out. For at least a fleeting instant, they share a realization of the oneness of humanity and its potential competence in the face of the universe.

By regularizing such events and by greatly adding to the pageantry that surrounds them, we can weave

them into the ritual framework of the new society and use them as sanity-preserving points of temporal reference. Certainly, July 20, the day Astronaut Armstrong took "one small step for man, one giant leap for mankind," ought to be made into an annual global celebration of the unity of man.

In this way, by making use of new materials, as well as already existing rituals, by introducing change, wherever possible, in the form of predictable, rather than erratic chains of events, we can help provide elements of continuity even in the midst of social upheaval.

The cultural transformation of the Manus Islanders was simple compared with the one we face. We shall survive it only if we move beyond personal tactics to social strategies—providing new support services for the change-harassed individual, building continuity and change-buffers into the emergent civilization of tomorrow.

All this is aimed at minimizing the human damage wrought by rapid change. But there is another way of attacking the problem, too. This is to expand man's adaptive capacities—the central task of education during the Super-industrial Revolution.

Chapter 18

EDUCATION IN THE FUTURE TENSE

In the quickening race to put men and machines on the planets, tremendous resources are devoted to making possible a "soft landing." Every sub-system of the landing craft is exquisitely designed to withstand the shock of arrival. Armies of engineers, geologists, physicists, metallurgists and other specialists concentrate years of work on the problem of landing impact. Failure of any sub-system to function after touch-down could destroy human lives, not to mention billions of dollars worth of apparatus and tens of thousands of man-years of labor.

Today one billion human beings, the total population of the technology-rich nations, are speeding toward a rendezvous with super-industrialism. Must we experience mass future shock? Or can we, too, achieve a "soft landing?" We are rapidly accelerating our approach. The craggy outlines of the new society are emerging from the mists of tomorrow. Yet even as we speed closer, evidence mounts that one of our most critical sub-systems—education—is dangerously malfunctioning.

What passes for education today, even in our "best" schools and colleges, is a hopeless anachronism. Parents look to education to fit their children for life in the future. Teachers warn that lack of an education

will cripple a child's chances in the world of tomorrow. Government ministries, churches, the mass media —all exhort young people to stay in school, insisting that now, as never before, one's future is almost wholly dependent upon education.

Yet for all this rhetoric about the future, our schools face backward toward a dying system, rather than forward to the emerging new society. Their vast energies are applied to cranking out Industrial Men—people tooled for survival in a system that will be dead before they are.

To help avert future shock, we must create a super-industrial education system. And to do this, we must search for our objectives and methods in the future, rather than the past.

THE INDUSTRIAL ERA SCHOOL

Every society has its own characteristic attitude toward past, present and future. This time-bias, formed in response to the rate of change, is one of the least noticed, yet most powerful determinants of social behavior, and it is clearly reflected in the way the society prepares its young for adulthood.

In stagnant societies, the past crept forward into the present and repeated itself in the future. In such a society, the most sensible way to prepare a child was to arm him with the skills of the past—for these were precisely the same skills he would need in the future. "With the ancient is wisdom," the Bible admonished.

Thus father handed down to son all sorts of practical techniques along with a clearly defined, highly traditional set of values. Knowledge was transmitted not by specialists concentrated in schools, but through the family, religious institutions, and apprenticeships. Learner and teacher were dispersed throughout the entire community. The key to the system, however,

was its absolute devotion to yesterday. The curriculum of the past was the past.

The mechanical age smashed all this, for industrialism required a new kind of man. It demanded skills that neither family nor church could, by themselves, provide. It forced an upheaval in the value system. Above all, it required that man develop a new sense of time.

Mass education was the ingenious machine constructed by industrialism to produce the kind of adults it needed. The problem was inordinately complex. How to pre-adapt children for a new world—a world of repetitive indoor toil, smoke, noise, machines, crowded living conditions, collective discipline, a world in which time was to be regulated not by the cycle of sun and moon, but by the factory whistle and the clock.

The solution was an educational system that, in its very structure, simulated this new world. This system did not emerge instantly. Even today it retains throwback elements from pre-industrial society. Yet the whole idea of assembling masses of students (raw material) to be processed by teachers (workers) in a centrally located school (factory) was a stroke of industrial genius. The whole administrative hierarchy of education, as it grew up, followed the model of industrial bureaucracy. The very organization of knowledge into permanent disciplines was grounded on industrial assumptions. Children marched from place to place and sat in assigned stations. Bells rang to announce changes of time.

The inner life of the school thus became an anticipatory mirror, a perfect introduction to industrial society. The most criticized features of education today—the regimentation, lack of individualization, the rigid systems of seating, grouping, grading and marking, the authoritarian role of the teacher—are precisely those that made mass public education so effective an instrument of adaptation for its place and time.

Young people passing through this educational machine emerged into an adult society whose structure of jobs, roles and institutions resembled that of the school itself. The schoolchild did not simply learn facts that he could use later on; he lived, as well as learned, a way of life modeled after the one he would lead in the future.

The schools, for example, subtly instilled the new time-bias made necessary by industrialism. Faced with conditions that had never before existed, men had to devote increasing energy to understanding the present. Thus the focus of education itself began to shift, ever so slowly, away from the past and toward the present.

The historic struggle waged by John Dewey and his followers to introduce "progressive" measures into American education was, in part, a desperate effort to alter the old time-bias. Dewey battled against the past-orientation of traditional education, trying to refocus education on the here-and-now. "The way out of scholastic systems that make the past an end in itself," he declared, "is to make acquaintance with the past a *means* of understanding the present."

Nevertheless, decades later traditionalists like Jacques Maritain and neo-Aristotelians like Robert Hutchins still lashed out against anyone who attempted to shift the balance in favor of the present. Hutchins, former president of the University of Chicago and now head of the Center for the Study of Democratic Institutions, accused educators who wanted their students to learn about modern society of being members of a "cult of immediacy." The progressives were accused of a dastardly crime: "presentism."

Echoes of this conflict over the time-bias persist even now, in the writings, for example, of Jacques Barzun, who insists that "It is . . . absurd to try educating . . . 'for' a present day that defies definition." Thus our education systems had not yet fully adapted themselves to the industrial age when the need for a new revolution—the super-industrial revolution—

burst upon them. And just as the progressives of yesterday were accused of "presentism," it is likely that the education reformers of tomorrow will be accused of "futurism." For we shall find that a truly super-industrial education is only possible if we once more shift our time-bias forward.

THE NEW EDUCATIONAL REVOLUTION

In the technological systems of tomorrow—fast, fluid and self-regulating—machines will deal with the flow of physical materials; men with the flow of information and insight. Machines will increasingly perform the routine tasks; men the intellectual and creative tasks. Machines and men both, instead of being concentrated in gigantic factories and factory cities, will be scattered across the globe, linked together by amazingly sensitive, near-instantaneous communications. Human work will move out of the factory and mass office into the community and the home.

Machines will be synchronized, as some already are, to the billionth of a second; men will be de-synchronized. The factory whistle will vanish. Even the clock, "the key machine of the modern industrial age," as Lewis Mumford called it a generation ago, will lose some of its power over human, as distinct from purely technological, affairs. Simultaneously, the organizations needed to control technology will shift from bureaucracy to Ad-hocracy, from permanence to transience, and from a concern with the present to a focus on the future.

In such a world, the most valued attributes of the industrial era become handicaps. The technology of tomorrow requires not millions of lightly lettered men, ready to work in unison at endlessly repetitious jobs, it requires not men who take orders in unblinking fashion, aware that the price of bread is mechanical submission to authority, but men who can make critical judgments, who can weave their way through

novel environments, who are quick to spot new relationships in the rapidly changing reality. It requires men who, in C. P. Snow's compelling term, "have the future in their bones."

Finally, unless we capture control of the accelerative thrust—and there are few signs yet that we will—tomorrow's individual will have to cope with even more hectic change than we do today. For education the lesson is clear: its prime objective must be to increase the individual's "cope-ability"—the speed and economy with which he can adapt to continual change. And the faster the rate of change, the more attention must be devoted to discerning the pattern of future events.

It is no longer sufficient for Johnny to understand the past. It is not even enough for him to understand the present, for the here-and-now environment will soon vanish. Johnny must learn to anticipate the directions and rate of change. He must, to put it technically, learn to make repeated, probabilistic, increasingly long-range assumptions about the future. And so must Johnny's teachers.

To create a super-industrial education, therefore, we shall first need to generate successive, alternative images of the future—assumptions about the kinds of jobs, professions, and vocations that may be needed twenty to fifty years in the future; assumptions about the kind of family forms and human relationships that will prevail; the kinds of ethical and moral problems that will arise; the kind of technology that will surround us and the organizational structures with which we must mesh.

It is only by generating such assumptions, defining, debating, systematizing and continually updating them, that we can deduce the nature of the cognitive and affective skills that the people of tomorrow will need to survive the accelerative thrust.

In the United States there are now two federally funded "education policy research centers"—one at Syracuse University, another at Stanford Research In-

stitute—charged with scanning the horizon with these purposes in mind. In Paris, the Organization for Economic Cooperation and Development has recently created a division with similar responsibilities. A handful of people in the student movement have also begun to turn attention to the future. Yet these efforts are pitifully thin compared with the difficulty of shifting the time-bias of education. What is needed is nothing less than a future-responsive mass movement.

We must create a "Council of the Future" in every school and community: Teams of men and women devoted to probing the future in the interests of the present. By projecting "assumed futures," by defining coherent educational responses to them, by opening these alternatives to active public debate, such councils—similar in some ways to the "prognostic cells" advocated by Robert Jungk of the Technische Hochschule in Berlin—could have a powerful impact on education.

Since no group holds a monopoly of insight into tomorrow, these councils must be democratic. Specialists are vitally needed in them. But Councils of the Future will not succeed if they are captured by professional educators, planners, or any unrepresentative elite. Thus students must be involved from the very start—and not merely as co-opted rubber stamps for adult notions. Young people must help lead, if not, in fact, initiate, these councils so that "assumed futures" can be formulated and debated by those who will presumably invent and inhabit the future.

The council of the future movement offers a way out of the impasse in our schools and colleges. Trapped in an educational system intent on turning them into living anachronisms, today's students have every right to rebel. Yet attempts by student radicals to base a social program on a pastiche of nineteenth-century Marxism and early twentieth-century Freudianism have revealed them to be as resolutely chained to the past and present as their elders. The creation of

future-oriented, future-shaping task forces in education could revolutionize the revolution of the young.

For those educators who recognize the bankruptcy of the present system, but remain uncertain about next steps, the council movement could provide purpose as well as power, through alliance with, rather than hostility toward, youth. And by attracting community and parental participation—businessmen, trade unionists, scientists, and others—the movement could build broad political support for the super-industrial revolution in education.

It would be a mistake to assume that the present-day educational system is unchanging. On the contrary, it is undergoing rapid change. But much of this change is no more than an attempt to refine the existent machinery, making it ever more efficient in pursuit of obsolete goals. The rest is a kind of Brownian motion, self-canceling, incoherent, directionless. What has been lacking is a consistent direction and a logical starting point.

The council movement could supply both. The direction is super-industrialism. The starting point: the future.

THE ORGANIZATIONAL ATTACK

Such a movement will have to pursue three objectives —to transform the organizational structure of our educational system, to revolutionize its curriculum, and to encourage a more future-focused orientation. It must begin by asking root questions about the status quo.

We have noted, for example, that the basic organization of the present school system parallels that of the factory. For generations, we have simply assumed that the proper place for education to occur is in a school. Yet if the new education is to simulate the society of tomorrow, should it take place in school at all?

As levels of education rise, more and more parents

are intellectually equipped to assume some responsibilities now delegated to the schools. Near Santa Monica, California, where the RAND Corporation has its headquarters, in the research belt around Cambridge, Massachusetts, or in such science cities as Oak Ridge, Los Alamos or Huntsville, many parents are clearly more capable of teaching certain subjects to their children than are the teachers in the local schools. With the move toward knowledge-based industry and the increase of leisure, we can anticipate a small but significant tendency for highly educated parents to pull their children at least partway out of the public education system, offering them home instruction instead.

This trend will be sharply encouraged by improvements in computer-assisted education, electronic video recording, holography and other technical fields. Parents and students might sign short-term "learning contracts" with the nearby school, committing them to teach-learn certain courses or course modules. Students might continue going to school for social and athletic activities or for subjects they cannot learn on their own or under the tutelage of parents or family friends. Pressures in this direction will mount as the schools grow more anachronistic, and the courts will find themselves deluged with cases attacking the present obsolete compulsory attendance laws. We may witness, in short, a limited dialectical swing back toward education in the home.

At Stanford, learning theorist Frederick J. McDonald has proposed a "mobile education" that takes the student out of the classroom not merely to observe but to participate in significant community activity.

In New York's Bedford-Stuyvesant District, a sprawling tension-ridden black slum, a planned experimental college would disperse its facilities throughout the stores, offices, and homes of a forty-five-block area, making it difficult to tell where the college ends and the community begins. Students would be taught skills by adults in the community as well as by regular

faculty. Curricula would be shaped by students and community groups as well as professional educators. The former United States Commissioner of Education, Harold Howe, II, has also suggested the reverse: bringing the community into the school so that local stores, beauty parlors, printing shops, be given free space in the schools in return for free lessons by the adults who run them. This plan, designed for urban ghetto schools, could be given more bite through a different conception of the nature of the enterprises invited into the school: computer service bureaus, for example, architectural offices, perhaps even medical laboratories, broadcasting stations and advertising agencies.

Elsewhere, discussion centers on the design of secondary and higher education programs that make use of "mentors" drawn from the adult population. Such mentors would not only transmit skills, but would show how the abstractions of the textbook are applied in life. Accountants, doctors, engineers, businessmen, carpenters, builders and planners might all become part of an "outside faculty" in another dialectical swing, this time toward a new kind of apprenticeship.

Many similar changes are in the wind. They point, however tentatively, to a long overdue breakdown of the factory-model school.

This dispersal in geographical and social space must be accompanied by dispersal in time. The rapid obsolescence of knowledge and the extension of life span make it clear that the skills learned in youth are unlikely to remain relevant by the time old age arrives. Super-industrial education must therefore make provision for life-long education on a plug-in/plug-out basis.

If learning is to be stretched over a lifetime, there is reduced justification for forcing kids to attend school full time. For many young people, part-time schooling and part-time work at low-skill, paid and unpaid community service tasks will prove more satisfying and educational.

Such innovations imply enormous changes in instructional techniques as well. Today lectures still dominate the classroom. This method symbolizes the old top-down, hierarchical structure of industry. While still useful for limited purposes, lectures must inevitably give way to a whole battery of teaching techniques, ranging from role playing and gaming to computer-mediated seminars and the immersion of students in what we might call "contrived experiences." Experiential programming methods, drawn from recreation, entertainment and industry, developed by the psych-corps of tomorrow, will supplant the familiar, frequently brain-draining lecture. Learning may be maximized through the use of controlled nutrition or drugs to raise IQ, to accelerate reading, or to enhance awareness. Such changes and the technologies underlying them will facilitate basic change in the organizational pattern.

The present administrative structures of education, based on industrial bureaucracy, will simply not be able to cope with the complexities and rate of change inherent in the system just described. They will be forced to move toward ad-hocratic forms of organization merely to retain some semblance of control. More important, however, are the organizational implications for the classroom itself.

Industrial Man was machine-tooled by the schools to occupy a comparatively permanent slot in the social and economic order. Super-industrial education must prepare people to function in temporary organizations —the Ad-hocracies of tomorrow.

Today children who enter school quickly find themselves part of a standard and basically unvarying organizational structure: a teacher-led class. One adult and a certain number of subordinate young people, usually seated in fixed rows facing front, is the standardized basic unit of the industrial-era school. As they move, grade by grade, to the higher levels, they remain in this same fixed organizational frame. They gain no experience with other forms of orga-

nization, or with the problems of shifting from one organizational form to another. They get no training for role versatility.

Nothing is more clearly anti-adaptive. Schools of the future, if they wish to facilitate adaptation later in life, will have to experiment with far more varied arrangements. Classes with several teachers and a single student; classes with several teachers and a group of students; students organized into temporary task forces and project teams; students shifting from group work to individual or independent work and back—all these and their permutations will need to be employed to give the student some advance taste of the experience he will face later on when he begins to move through the impermanent organizational geography of super-industrialism.

Organizational goals for the Councils of the Future thus become clear: dispersal, decentralization, interpenetration with the community, ad-hocratic administration, a break-up of the rigid system of scheduling and grouping. When these objectives are accomplished, any organizational resemblance between education and the industrial-era factory will be purely coincidental.

YESTERDAY'S CURRICULUM TODAY

As for curriculum, the Councils of the Future, instead of assuming that every subject taught today is taught for a reason, should begin from the reverse premise: nothing should be included in a required curriculum unless it can be strongly justified in terms of the future. If this means scrapping a substantial part of the formal curriculum, so be it.

This is not intended as an "anti-cultural" statement or a plea for total destruction of the past. Nor does it suggest that we can ignore such basics as reading, writing and math. What it does mean is that tens of millions of children today are forced by law to spend

precious hours of their lives grinding away at material whose future utility is highly questionable. (Nobody even claims it has much present utility.) Should they spend as much time as they do learning French, or Spanish or German? Are the hours spent on English maximally useful? Should all children be required to study algebra? Might they not benefit more from studying probability? Logic? Computer programming? Philosophy? Aesthetics? Mass communications?

Anyone who thinks the present curriculum makes sense is invited to explain to an intelligent fourteen-year-old why algebra or French or any other subject is essential for him. Adult answers are almost always evasive. The reason is simple: the present curriculum is a mindless holdover from the past.

Why, for example, must teaching be organized around such fixed disciplines as English, economics, mathematics or biology? Why not around stages of the human life cycle: a course on birth, childhood, adolescence, marriage, career, retirement, death. Or around contemporary social problems? Or around significant technologies of the past and future? Or around countless other imaginable alternatives?

The present curriculum and its division into air-tight compartments is not based on any well thought out conception of contemporary human needs. Still less is it based on any grasp of the future, any understanding of what skills Johnny will require to live in the hurricane's eye of change. It is based on inertia—and a bloody clash of academic guilds, each bent on aggrandizing its budget, pay scales and status.

This obsolete curriculum, furthermore, imposes standardization on the elementary and secondary schools. Youngsters are given little choice in determining what they wish to learn. Variations from school to school are minimal. The curriculum is nailed into place by the rigid entrance requirements of the colleges, which, in turn, reflect the vocational and social requirements of a vanishing society.

In fighting to update education, the prognostic cells

of the revolution must set themselves up as curriculum review boards. Attempts by the present educational leadership to revise the physics curriculum, or improve the methods for teaching English or math are piecemeal at best. While it may be important to preserve aspects of the present curriculum and to introduce changes gradually, we need more than haphazard attempts to modernize. We need a systematic approach to the whole problem.

These revolutionary review groups must not, however, set out to design a single all-purpose, permanent new curriculum. Instead, they must invent sets of temporary curricula—along with procedures for evaluation and renovation as time goes by. There must be a systematic way to make curricular changes without necessarily triggering bloody intramural conflict each time.

A fight must also be waged to alter the balance between standardization and variety in the curriculum. Diversity carried to its extreme could produce a non-society in which the lack of common frames of reference would make communication between people even more difficult than it is today. Yet the dangers of social fragmentation cannot be met by maintaining a highly homogeneous education system while the rest of the society races toward heterogeneity.

One way to resolve the conflict between the need for variety and the need for common reference points is to distinguish in education between "data," as it were, and "skills."

A DIVERSITY OF DATA

Society is differentiating. What is more, we shall never, no matter how refined our predictive tools become, be able to forecast the exact sequence of future states of the society. In this situation, it makes eminent good sense to hedge our educational bets. Just as genetic diversity favors the survival of species, educational

diversity increases the odds for the survival of societies.

Instead of a standardized elementary and secondary school curriculum in which all students are essentially exposed to the same data base—the same history, math, biology, literature, grammar, foreign languages, etc.—the futurist movement in education must attempt to create widely diversified data offerings. Children should be permitted far greater choice than at present; they should be encouraged to taste a wide variety of short-term courses (perhaps two or three weeks in length) before making longer-term commitments. Each school should provide scores of optional subjects, all based on identifiable assumptions about future needs.

The range of subject matter should be broad enough so that apart from dealing with the "known" (i.e., highly probable) elements of the super-industrial future, some provision would be made for dealing with the unknown, the unexpected, the possible. We might do this by designing "contingency curricula"—educational programs aimed at training people to handle problems that not only do not exist now, but which may, in fact, never materialize. We need, for example, a wide range of specialists to cope with potentially calamitous, though perhaps unlikely, contingencies: back-contamination of the earth from the planets or stars, the need to communicate with extra-terrestrial life, monstrosities produced by genetic experimentation, etc.

Even now we should be training cadres of young people for life in submarine communities. Part of the next generation may well find itself living under the oceans. We should be taking groups of students out in submarines, teaching them to dive, introducing them to underwater housing materials, power requirements, the perils and promises involved in a human invasion of the oceans. And we should be doing this not merely with graduate students, but with children drawn from elementary schools, even the nurseries.

Simultaneously, other young people should be in-

troduced to the wonders of outer space, living with or near the astronauts, learning about planetary environments, becoming as familiar with space technology as most teen-agers today are with that of the family car. Still others should be encouraged, not discouraged, from experimenting with communal and other family forms of the future. Such experimentation, under responsible supervision and constructively channeled, should be seen as part of an appropriate education, not as an interruption or negation of the learning process.

The principle of diversity will dictate fewer required courses, increasing choice among esoteric specialties. By moving in this direction and creating contingency curricula, the society can bank a wide range of skills, including some it may never have to use, but which it must have at its instant command in the event our highest probability assumptions about the future turn out to be mistaken.

The result of such a policy will be to produce far more individualized human beings, more differences among people, more varied ideas, political and social sub-systems, and more color.

A SYSTEM OF SKILLS

Unfortunately, this necessary diversification of data offerings will deepen the problems of overchoice in our lives. Any program of diversification must therefore be accompanied by strong efforts to create common reference points among people through a unifying system of skills. While all students *should not* study the same course, imbibe the same facts, or store the same sets of data, all students *should* be grounded in certain common skills needed for human communication and social integration.

If we assume a continuing rise in transience, novelty and diversity, the nature of some of these behavioral skills becomes clear. A powerful case can be made, for

example, that the people who must live in super-industrial societies will need new skills in three crucial areas: learning, relating and choosing.

Learning. Given further acceleration, we can conclude that knowledge will grow increasingly perishable. Today's "fact" becomes tomorrow's "misinformation." This is no argument against learning facts or data—far from it. But a society in which the individual constantly changes his job, his place of residence, his social ties and so forth, places an enormous premium on learning efficiency. Tomorrow's schools must therefore teach not merely data, but ways to manipulate it. Students must learn how to discard old ideas, how and when to replace them. They must, in short, learn how to learn.

Early computers consisted of a "memory" or bank of data plus a "program" or set of instructions that told the machine how to manipulate the data. Large late-generation computer systems not only store greater masses of data, but multiple programs, so that the operator can apply a variety of programs to the same data base. Such systems also require a "master program" that, in effect, tells the machine which program to apply and when. The multiplication of programs and addition of a master program vastly increased the power of the computer.

A similar strategy can be used to enhance human adaptability. By instructing students how to learn, unlearn and relearn, a powerful new dimension can be added to education.

Psychologist Herbert Gerjuoy of the Human Resources Research Organization phrases it simply: "The new education must teach the individual how to classify and reclassify information, how to evaluate its veracity, how to change categories when necessary, how to move from the concrete to the abstract and back, how to look at problems from a new direction—how to teach himself. Tomorrow's illiterate will not be the man who can't read; he will be the man who has not learned how to learn."

Relating. We can also anticipate increasing difficulty in making and maintaining rewarding human ties, if life pace continues its acceleration.

Listening intently to what young people are saying makes it clear that the once-simple business of forging real friendships has already assumed new complexity for them. When students complain, for instance, that "people can't communicate," they are not simply referring to crossing the generational divide, but to problems they have among themselves as well. "New people in the last four days are all the ones that I remember," writes Rod McKuen, a songwriter and poet currently popular among the youth.

Once the transience factor is recognized as a cause of alienation, some of the superficially puzzling behavior of young people becomes comprehensible. Many of them, for example, regard sex as a quick way to "get to know someone." Instead of viewing sexual intercourse as something that follows a long process of relationship-building, they see it, rightly or not, as a shortcut to deeper human understanding.

The same wish to accelerate friendship helps explain their fascination with such psychological techniques as "sensitivity training," "T-grouping," "micro-labs," so-called "touchie-feelie" or non-verbal games, and the whole group dynamics phenomenon in general. Their enthusiasm for communal living, too, expresses the underlying sense of loneliness and inability to "open up" with others.

All these activities throw participants into intimate psychological contact without lengthy preparation, often without advance acquaintanceship. In many cases, the relationships are short-lived by design, the purpose of the game being to intensify affective relationships despite the temporariness of the situation.

By speeding the turnover of people in our lives, we allow less time for trust to develop, less time for friendships to ripen. Thus we witness a search for ways to cut through the polite "public" behavior directly to the sharing of intimacy.

One may doubt the effectiveness of these experimental techniques for breaking down suspicion and reserve, but until the rate of human turnover is substantially slowed, education must help people to accept the absence of deep friendships, to accept loneliness and mistrust—or it must find new ways to accelerate friendship formation. Whether by more imaginative grouping of students, or by organizing new kinds of work-teams, or through variations of the techniques discussed above, education will have to teach us to relate.

Choosing. If we also assume that the shift toward super-industrialism will multiply the kinds and complexities of decisions facing the individual, it becomes apparent that education must address the issue of overchoice directly.

Adaptation involves the making of successive choices. Presented with numerous alternatives, an individual chooses the one most compatible with his values. As overchoice deepens, the person who lacks a clear grasp of his own values (whatever these may be) is progressively crippled. Yet the more crucial the question of values becomes, the less willing our present schools are to grapple with it. It is no wonder that millions of young people trace erratic pathways into the future, ricocheting this way and that like unguided missiles.

In pre-industrial societies, where values are relatively stable, there is little question about the right of the older generation to impose its values on the young. Education concerns itself as much with the inculcation of moral values as with the transmission of skills. Even during early industrialism, Herbert Spencer maintained that "Education has for its object the formation of character," which, freely translated, means the seduction or terrorization of the young into the value systems of the old.

As the shock waves of the industrial revolution rattled the ancient architecture of values and new conditions demanded new values, educators backed off.

As a reaction against clerical education, teaching facts and "letting the student make up his own mind" came to be regarded as a progressive virtue. Cultural relativism and an appearance of scientific neutrality displaced the insistence on traditional values. Education clung to the rhetoric of character formation, but educators fled from the very idea of value inculcation, deluding themselves into believing that they were not in the value business at all.

Today it embarrasses many teachers to be reminded that all sorts of values are transmitted to students, if not by their textbooks then by the informal curriculum—seating arrangements, the school bell, age segregation, social class distinctions, the authority of the teacher, the very fact that students are in a school instead of the community itself. All such arrangements send unspoken messages to the student, shaping his attitudes and outlook. Yet the formal curriculum continues to be presented as though it were value-free. Ideas, events, and phenomena are stripped of all value implications, disembodied from moral reality.

Worse yet, students are seldom encouraged to analyze their own values and those of their teachers and peers. Millions pass through the education system without once having been forced to search out the contradictions in their own value systems, to probe their own life goals deeply, or even to discuss these matters candidly with adults and peers. Students hurry from class to class. Teachers and professors are harried and grow increasingly remote. Even the "bull session"—informal, extra-curricular discussions about sex, politics or religion that help participants identify and clarify their values—grow less frequent and less intimate as transience rises.

Nothing could be better calculated to produce people uncertain of their goals, people incapable of effective decision-making under conditions of overchoice. Super-industrial educators must not attempt to impose a rigid set of values on the student; but they must systematically organize formal and informal activities

that help the student define, explicate and test his values, whatever they are. Our schools will continue to turn out industrial men until we teach young people the skills necessary to identify and clarify, if not reconcile, conflicts in their own value systems.

The curriculum of tomorrow must thus include not only an extremely wide range of data-oriented courses, but a strong emphasis on future-relevant behavioral skills. It must combine variety of factual content with universal training in what might be termed "life know-how." It must find ways to do both at the same time, transmitting one in circumstances or environments that produce the other.

In this way, by making definite assumptions about the future and designing organizational and curricular objectives based on them, the Councils of the Future can begin to shape a truly super-industrial education system. One final critical step remains, however. For it is not enough to refocus the *system* on the future. We must shift the time-bias of the *individual* as well.

THE STRATEGY OF FUTURENESS

Three hundred and fifty years after his death, scientists are still finding evidence to support Cervantes' succinct insight into adaptational psychology: "Forewarned fore-armed." Self-evident as it may seem, in most situations we can help individuals adapt better if we simply provide them with advance information about what lies ahead.

Studies of the reactions of astronauts, displaced families, and industrial workers almost uniformly point to this conclusion. "Anticipatory information," writes psychologist Hugh Bowen, "allows . . . a dramatic change in performance." Whether the problem is that of driving a car down a crowded street, piloting a plane, solving intellectual puzzles, playing a cello or dealing with interpersonal difficulties, performance im-

proves when the individual knows what to expect next.

The mental processing of advance data about any subject presumably cuts down on the amount of processing and the reaction time during the actual period of adaptation. It was Freud, I believe, who said: "Thought is action in rehearsal."

Even more important than any specific bits of advance information, however, is the habit of anticipation. This conditioned ability to look ahead plays a key role in adaptation. Indeed, one of the hidden clues to successful coping may well lie in the individual's sense of the future. The people among us who keep up with change, who manage to adapt well, seem to have a richer, better developed sense of what lies ahead than those who cope poorly. Anticipating the future has become a habit with them. The chess player who anticipates the moves of his opponent, the executive who thinks in long range terms, the student who takes a quick glance at the table of contents before starting to read page one, all seem to fare better.

People vary widely in the amount of thought they devote to the future, as distinct from past and present. Some invest far more resources than others in projecting themselves forward—imagining, analyzing and evaluating future possibilities and probabilities. They also vary in how *far* they tend to project. Some habitually think in terms of the "deep future." Others penetrate only into the "shallow future."

We have, therefore, at least two dimensions of "futureness"—how much and how far. There is evidence that among normal teenagers maturation is accompanied by what sociologist Stephen L. Klineberg of Princeton describes as "an increasing concern with distant future events." This suggests that people of different ages characteristically devote different amounts of attention to the future. Their "time horizons" may also differ. But age is not the only influence on our futureness. Cultural conditioning affects it, and one

of the most important cultural influences of all is the rate of change in the environment.

This is why the individual's sense of the future plays so critical a part in his ability to cope. The faster the pace of life, the more rapidly the present environment slips away from us, the more rapidly do future potentialities turn into present reality. As the environment churns faster, we are not only pressured to devote more mental resources to thinking about the future, but to extend our time horizon—to probe further and further ahead. The driver dawdling along an expressway at twenty miles per hour can successfully negotiate a turn into an exit lane, even if the sign indicating the cut-off is very close to the exit. The faster he drives, however, the further back the sign must be placed to give him the time needed to read and react. In quite the same way, the generalized acceleration of life compels us to lengthen our time horizon or risk being overtaken and overwhelmed by events. The faster the environment changes, the more the need for futureness.

Some individuals, of course, project themselves so far into the future for such long periods that their anticipations become escapist fantasies. Far more common, however, are those individuals whose anticipations are so thin and short-range that they are continually surprised and flustered by change.

The adaptive individual appears to be able to project himself forward just the "right" distance in time, to examine and evaluate alternative courses of action open to him before the need for final decision, and to make tentative decisions beforehand.

Studies by social scientists like Lloyd Warner in the United States and Elliott Jaques in Britain, for example, have shown how important this time element is in management decision-making. The man on the assembly line is given work that requires him to concern himself only with events close to him in time. The men who rise in management are expected, with

each successive promotion, to concern themselves with events further in the future.

Sociologist Benjamin D. Singer of the University of Western Ontario, whose field is social psychiatry, has gone further. According to Singer, the future plays an enormous, largely unappreciated part in present behavior. He argues, for instance, that "the 'self' of the child is in part feedback from what it is toward what it is becoming." The target toward which the child is moving is his "future focused role image"—a conception of what he or she wishes to be like at various points in the future.

This "future focused role image," Singer writes, "tends . . . to organize and give meaning to the pattern of life he is expected to take. Where, however, there is only a hazily defined or functionally non-existent future role, then the meaning which is attached to behavior valued by the larger society does not exist; schoolwork becomes meaningless, as do the rules of middle-class society and of parental discipline."

Put more simply, Singer asserts that each individual carries in his mind not merely a picture of himself at present, a self-image, but a set of pictures of himself as he wishes to be in the future. "This person of the future provides a focus for the child; it is a magnet toward which he is drawn; the framework for the present, one might say, is created by the future."

One would think that education, concerned with the development of the individual and the enhancement of adaptability, would do all in its power to help children develop the appropriate time-bias, the suitable degree of futureness. Nothing could be more dangerously false.

Consider, for example, the contrast between the way schools today treat space and time. Every pupil, in virtually every school, is carefully helped to position himself in space. He is required to study geography. Maps, charts and globes all help pinpoint his spatial location. Not only do we locate him with respect to his city, region, or country, we even try to explain

the spatial relationship of the earth to the rest of the solar system and, indeed, to the universe.

When it comes to locating the child in time, however, we play a cruel and disabling trick on him. He is steeped, to the extent possible, in his nation's past and that of the world. He studies ancient Greece and Rome, the rise of feudalism, the French Revolution, and so forth. He is introduced to Bible stories and patriotic legends. He is peppered with endless accounts of wars, revolutions and upheavals, each one dutifully tagged with its appropriate date in the past.

At some point he is even introduced to "current events." He may be asked to bring in newspaper clippings, and a really enterprising teacher may go so far as to ask him to watch the evening news on television. He is offered, in short, a thin sliver of the present.

And then time stops. The school is silent about tomorrow. "Not only do our history courses terminate with the year they are taught," wrote Professor Ossip Flechtheim a generation ago, "but the same situation exists in the study of government and economics, psychology and biology." Time comes racing to an abrupt halt. The student is focused backward instead of forward. The future, banned as it were from the classroom, is banned from his consciousness as well. It is as though there were no future.

This violent distortion of his time sense shows up in a revealing experiment conducted by psychologist John Condry, Professor in the Department of Human Development, Cornell University. In separate studies at Cornell and UCLA, Condry gave groups of students the opening paragraph of a story. This paragraph described a fictional "Professor Hoffman," his wife and their adopted Korean daughter. The daughter is found crying, her clothes torn, a group of other children staring at her. The students were asked to complete the story.

What the subjects did not know is that they had previously been divided into two groups. In the case

of one group, the opening paragraph was set in the past. The characters "heard," "saw" or "ran." The students were asked to "Tell what Mr. and Mrs. Hoffman did and what was said by the children." For the second group, the paragraph was set entirely in the future tense. They were asked to "Tell what Mr. and Mrs. Hoffman will do and what will be said by the children." Apart from this shift of tense, both paragraphs and instructions were identical.

The results of the experiment were sharply etched. One group wrote comparatively rich and interesting story-endings, peopling their accounts with many characters, creatively introducing new situations and dialogue. The other produced extremely sketchy endings, thin, unreal and forced. The past was richly conceived; the future empty. "It is," Professor Condry commented, "as if we find it easier to talk about the past than the future."

If our children are to adapt more successfully to rapid change, this distortion of time must be ended. We must sensitize them to the possibilities and probabilities of tomorrow. We must enhance their sense of the future.

Society has many built-in time spanners that help to link the present generation with the past. Our sense of the past is developed by contact with the older generation, by our knowledge of history, by the accumulated heritage of art, music, literature, and science passed down to us through the years. It is enhanced by immediate contact with the objects that surround us, each of which has a point of origin in the past, each of which provides us with a trace of identification with the past.

No such time spanners enhance our sense of the future. We have no objects, no friends, no relatives, no works of art, no music or literature, that originate in the future. We have, as it were, no heritage of the future.

Despite this, there are ways to send the human mind arching forward as well as backward. We need to

begin by creating a stronger future-consciousness on the part of the public, and not just by means of Buck Rogers comic strips, films like *Barbarella*, or articles about the marvels of space travel or medical research. These make a contribution, but what is needed is a concentrated focus on the social and personal implications of the future, not merely on its technological characteristics.

If the contemporary individual is going to have to cope with the equivalent of millennia of change within the compressed span of a single lifetime, he must carry within his skull reasonably accurate (even if gross) images of the future.

Medieval men possessed an image of the afterlife, complete with vivid mental pictures of heaven and hell. We need now to propagate dynamic, non-supernatural images of what temporal life will be like, what it will sound and smell and taste and feel like in the fast-onrushing future.

To create such images and thereby soften the impact of future shock, we must begin by making speculation about the future respectable. Instead of deriding the "crystal-ball gazer," we need to encourage people, from childhood on, to speculate freely, even fancifully, not merely about what next week holds in store for them but about what the next generation holds in store for the entire human race. We offer our children courses in history; why not also courses in "Future," courses in which the possibilities and probabilities of the future are systematically explored, exactly as we now explore the social system of the Romans or the rise of the feudal manor?

Robert Jungk, one of Europe's leading futurist-philosophers, has said: "Nowadays almost exclusive stress is laid on learning what has happened and has been done. Tomorrow . . . at least one third of all lectures and exercises ought to be concerned with scientific, technical, artistic and philosophical work in progress, anticipated crises and possible future answers to these challenges."

We do not have a literature *of* the future for use in these courses, but we do have literature *about* the future, consisting not only of the great utopias but also of contemporary science fiction. Science fiction is held in low regard as a branch of literature, and perhaps it deserves this critical contempt. But if we view it as a kind of sociology of the future, rather than as literature, science fiction has immense value as a mind-stretching force for the creation of the habit of anticipation. Our children should be studying Arthur C. Clarke, William Tenn, Robert Heinlein, Ray Bradbury and Robert Sheckley, not because these writers can tell them about rocket ships and time machines but, more important, because they can lead young minds through an imaginative exploration of the jungle of political, social, psychological, and ethical issues that will confront these children as adults. Science fiction should be required reading for Future I.

But students should not only read. Various games have been designed to educate young people and adults about future possibilities and probabilities. *Future*, a game distributed by Kaiser Aluminum and Chemical Corporation on the occasion of its twentieth anniversary, introduces players to various technological and social alternatives of the future, and forces them to choose among them. It reveals how technological and social events are linked to one another, encourages the player to think in probabilistic terms, and, with various modifications, can help clarify the role of values in decision-making. At Cornell, Professor José Villegas of the Department of Design and Environmental Analysis, has, with the aid of a group of students, created a number of games having to do with housing and community action in the future. Another game developed under his direction is devoted to elucidating the ways in which technology and values will interact in the world of tomorrow.

With younger children, other exercises are possible. To sharpen the individual's future-focused role image, students can be asked to write their own "future

autobiographies" in which they picture themselves five, ten or twenty years in the future. By submitting these to class discussion, by comparing different assumptions in them, contradictions in the child's own projections can be identified and examined. At a time when the self is being broken into successive selves, this technique can be used to provide continuity for the individual. If children at fifteen, for example, are given the future autobiographies they themselves wrote at age twelve, they can see how maturation has altered their own images of the future. They can be helped to understand how their values, talents, skills, and knowledge have shaped their own possibilities.

Students, asked to imagine themselves several years hence, might be reminded that their brothers, parents, and friends will also be older, and asked to imagine the "important others" in their lives as *they* will be.

Such exercises, linked with the study of probability and simple methods of prediction that can be used in one's personal life, can delineate and modify each individual's conception of the future, both personal and social. They can create a new individual time-bias, a new sensitivity to tomorrow that will prove helpful in coping with the exigencies of the present.

Among highly adaptive individuals, men and women who are truly alive in, and responsive to, their times, there is a virtual nostalgia for the future. Not an uncritical acceptance of all the potential horrors of tomorrow, not a blind belief in change for its own sake, but an overpowering curiosity, a drive to *know* what will happen next.

This drive does strange and wonderful things. One winter night I witnessed a poignant quiver run through a seminar room when a white-haired man explained to a group of strangers what had brought him there to attend my class on the Sociology of the Future. The group included corporate long-range planners, staff from major foundations, publishers and research centers. Each participant spieled off his reason for attending. Finally, it was the turn of the little man in

the corner. He spoke in cracked, but eloquent English:

"My name is Charles Stein. I am a needle worker all my life. I am seventy-seven years old, and I want to get what I didn't get in my youth. I want to *know* about the future. I want to die an educated man!"

The abrupt silence that greeted this simple affirmation still rings in the ears of those present. Before this eloquence, all the armor of graduate degrees, corporate titles and prestigious rank fell. I hope Mr. Stein is still alive, enjoying his future, and teaching others, as he did us that night.

When millions share this passion about the future we shall have a society far better equipped to meet the impact of change. To create such curiosity and awareness is a cardinal task of education. To create an education that will create this curiosity is the third, and perhaps central, mission of the super-industrial revolution in the schools.

Education must shift into the future tense.

Chapter 19

TAMING TECHNOLOGY

Future shock—the disease of change—can be prevented. But it will take drastic social, even political action. No matter how individuals try to pace their lives, no matter what psychic crutches we offer them, no matter how we alter education, the society as a whole will still be caught on a runaway treadmill until we capture control of the accelerative thrust itself.

The high velocity of change can be traced to many factors. Population growth, urbanization, the shifting proportions of young and old—all play their part. Yet technological advance is clearly a critical node in the network of causes; indeed, it may be the node that activates the entire net. One powerful strategy in the battle to prevent mass future shock, therefore, involves the conscious regulation of technological advance.

We cannot and must not turn off the switch of technological progress. Only romantic fools babble about returning to a "state of nature." A state of nature is one in which infants shrivel and die for lack of elementary medical care, in which malnutrition stultifies the brain, in which, as Hobbes reminded us, the typical life is "poor, nasty, brutish, and short." To turn our back on technology would be not only stupid but immoral.

Given that a majority of men still figuratively live in the twelfth century, who are we even to contemplate throwing away the key to economic advance? Those who prate anti-technological nonsense in the name of some vague "human values" need to be asked "which humans?" To deliberately turn back the clock would be to condemn billions to enforced and permanent misery at precisely the moment in history when their liberation is becoming possible. We clearly need not less but more technology.

At the same time, it is undeniably true that we frequently apply new technology stupidly and selfishly. In our haste to milk technology for immediate economic advantage, we have turned our environment into a physical and social tinderbox.

The speed-up of diffusion, the self-reinforcing character of technological advance, by which each forward step facilitates not one but many additional further steps, the intimate link-up between technology and social arrangements—all these create a form of psychological pollution, a seemingly unstoppable acceleration of the pace of life.

This psychic pollution is matched by the industrial vomit that fills our skies and seas. Pesticides and herbicides filter into our foods. Twisted automobile carcasses, aluminum cans, non-returnable glass bottles and synthetic plastics form immense kitchen middens in our midst as more and more of our detritus resists decay. We do not even begin to know what to do with our radioactive wastes—whether to pump them into the earth, shoot them into outer space, or pour them into the oceans.

Our technological powers increase, but the side effects and potential hazards also escalate. We risk thermopollution of the oceans themselves, overheating them, destroying immeasurable quantities of marine life, perhaps even melting the polar icecaps. On land we concentrate such large masses of population in such small urban-technological islands, that we threaten to use up the air's oxygen faster than it can be

replaced, conjuring up the possibility of new Saharas where the cities are now. Through such disruptions of the natural ecology, we may literally, in the words of biologist Barry Commoner, be "destroying this planet as a suitable place for human habitation."

TECHNOLOGICAL BACKLASH

As the effects of irresponsibly applied technology become more grimly evident, a political backlash mounts. An offshore drilling accident that pollutes 800 square miles of the Pacific triggers a shock wave of indignation all over the United States. A multi-millionaire industrialist in Nevada, Howard Hughes, prepares a lawsuit to prevent the Atomic Energy Commission from continuing its underground nuclear tests. In Seattle, the Boeing Company fights growing public clamor against its plans to build a supersonic jet transport. In Washington, public sentiment forces a reassessment of missile policy. At MIT, Wisconsin, Cornell, and other universities, scientists lay down test tubes and slide rules during a "research moratorium" called to discuss the social implications of their work. Students organize "environmental teach-ins" and the President lectures the nation about the ecological menace. Additional evidences of deep concern over our technological course are turning up in Britain, France and other nations.

We see here the first glimmers of an international revolt that will rock parliaments and congresses in the decades ahead. This protest against the ravages of irresponsibly used technology could crystallize in pathological form—as a future-phobic fascism with scientists substituting for Jews in the concentration camps. Sick societies need scapegoats. As the pressures of change impinge more heavily on the individual and the prevalence of future shock increases, this nightmarish outcome gains plausibility. It is significant

that a slogan scrawled on a wall by striking students in Paris called for "death to the technocrats!"

The incipient worldwide movement for control of technology, however, must not be permitted to fall into the hands of irresponsible technophobes, nihilists and Rousseauian romantics. For the power of the technological drive is too great to be stopped by Luddite paroxysms. Worse yet, reckless attempts to halt technology will produce results quite as destructive as reckless attempts to advance it.

Caught between these twin perils, we desperately need a movement for responsible technology. We need a broad political grouping rationally committed to further scientific research and technological advance—but on a selective basis only. Instead of wasting its energies in denunciations of The Machine or in negativistic criticism of the space program, it should formulate a set of positive technological goals for the future.

Such a set of goals, if comprehensive and well worked out, could bring order to a field now in total shambles. By 1980, according to Aurelio Peccei, the Italian economist and industrialist, combined research and development expenditures in the United States and Europe will run to $73 billion per year. This level of expense adds up to three-quarters of a trillion dollars per decade. With such large sums at stake, one would think that governments would plan their technological development carefully, relating it to broad social goals, and insisting on strict accountability. Nothing could be more mistaken.

"No one—not even the most brilliant scientist alive today—really knows where science is taking us," says Ralph Lapp, himself a scientist-turned-writer. "We are aboard a train which is gathering speed, racing down a track on which there are an unknown number of switches leading to unknown destinations. No single scientist is in the engine cab and there may be demons at the switch. Most of society is in the caboose looking backward."

It is hardly reassuring to learn that when the Organization for Economic Cooperation and Development issued its massive report on science in the United States, one of its authors, a former premier of Belgium, confessed: "We came to the conclusion that we were looking for something . . . which was not there: a science policy." The committee could have looked even harder, and with still less success, for anything resembling a conscious technological policy.

Radicals frequently accuse the "ruling class" or the "establishment" or simply "they" of controlling society in ways inimical to the welfare of the masses. Such accusations may have occasional point. Yet today we face an even more dangerous reality: many social ills are less the consequence of oppressive control than of oppressive lack of control. The horrifying truth is that, so far as much technology is concerned, no one is in charge.

SELECTING CULTURAL STYLES

So long as an industrializing nation is poor, it tends to welcome without argument any technical innovation that promises to improve economic output or material welfare. This is, in fact, a tacit technological policy, and it can make for extremely rapid economic growth. It is, however, a brutally unsophisticated policy, and as a result all kinds of new machines and processes are spewed into the society without regard for their secondary or long-range effects.

Once the society begins its take-off for super-industrialism, this "anything goes" policy becomes wholly and hazardously inadequate. Apart from the increased power and scope of technology, the options multiply as well. Advanced technology helps create overchoice with respect to available goods, cultural products, services, subcults and life styles. At the same time overchoice comes to characterize technology itself.

Increasingly diverse innovations are arrayed before

the society and the problems of selection grow more and more acute. The old simple policy, by which choices were made according to short-run economic advantage, proves dangerous, confusing, destabilizing.

Today we need far more sophisticated criteria for choosing among technologies. We need such policy criteria not only to stave off avoidable disasters, but to help us discover tomorrow's opportunities. Faced for the first time with technological overchoice, the society must now select its machines, processes, techniques and systems in groups and clusters, instead of one at a time. It must choose the way an individual chooses his life style. It must make super-decisions about its future.

Furthermore, just as an individual can exercise conscious choice among alternative life styles, a society today can consciously choose among alternative cultural styles. This is a new fact in history. In the past, culture emerged without premeditation. Today, for the first time, we can raise the process to awareness. By the application of conscious technological policy—along with other measures—we can contour the culture of tomorrow.

In their book, *The Year 2000*, Herman Kahn and Anthony Wiener list one hundred technical innovations "very likely in the last third of the twentieth century." These range from multiple applications of the laser to new materials, new power sources, new airborne and submarine vehicles, three-dimensional photography, and "human hibernation" for medical purposes. Similar lists are to be found elsewhere as well. In transportation, in communications, in every conceivable field and some that are almost inconceivable, we face an inundation of innovation. In consequence, the complexities of choice are staggering.

This is well illustrated by new inventions or discoveries that bear directly on the issue of man's

adaptability. A case in point is the so-called OLIVER* that some computer experts are striving to develop to help us deal with decision overload. In its simplest form, OLIVER would merely be a personal computer programmed to provide the individual with information and to make minor decisions for him. At this level, it could store information about his friends' preferences for Manhattans or martinis, data about traffic routes, the weather, stock prices, etc. The device could be set to remind him of his wife's birthday—or to order flowers automatically. It could renew his magazine subscriptions, pay the rent on time, order razor blades and the like.

As computerized information systems ramify, moreover, it would tap into a worldwide pool of data stored in libraries, corporate files, hospitals, retail stores, banks, government agencies and universities. OLIVER would thus become a kind of universal question-answerer for him.

However, some computer scientists see much beyond this. It is theoretically possible to construct an OLIVER that would analyze the content of its owner's words, scrutinize his choices, deduce his value system, update its own program to reflect changes in his values, and ultimately handle larger and larger decisions for him.

Thus OLIVER would know how its owner would, in all likelihood, react to various suggestions made at a committee meeting. (Meetings could take place among groups of OLIVERs representing their respective owners, without the owners themselves being present. Indeed, some "computer-mediated" conferences of this type have already been held by the experimenters.)

OLIVER would know, for example, whether its owner would vote for candidate X, whether he would

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* On-Line Interactive Vicarious Expediter and Responder. The acronym was chosen to honor Oliver Selfridge, originator of the concept.

contribute to charity Y, whether he would accept a dinner invitation from Z. In the words of one OLIVER enthusiast, a computer-trained psychologist: "If you are an impolite boor, OLIVER will know and act accordingly. If you are a marital cheater, OLIVER will know and help. For OLIVER will be nothing less than your mechanical alter ego." Pushed to the extremes of science fiction, one can even imagine pin-size OLIVERs implanted in baby brains, and used, in combination with cloning, to create living—not just mechanical—alter egos.

Another technological advance that could enlarge the adaptive range of the individual pertains to human IQ. Widely reported experiments in the United States, Sweden and elsewhere, strongly suggest that we may, within the foreseeable future, be able to augment man's intelligence and informational handling abilities. Research in biochemistry and nutrition indicate that protein, RNA and other manipulable properties are, in some still obscure way, correlated with memory and learning. A large-scale effort to crack the intelligence barrier could pay off in fantastic improvement of man's adaptability.

It may be that the historic moment is right for such amplifications of humanness, for a leap to a new superhuman organism. But what are the consequences and alternatives? Do we want a world peopled with OLIVERs? When? Under what terms and conditions? Who should have access to them? Who should not? Should biochemical treatments be used to raise mental defectives to the level of normals, should they be used to raise the average, or should we concentrate on trying to breed super-geniuses?

In quite different fields, similar complex choices abound. Should we throw our resources behind a crash effort to achieve low-cost nuclear energy? Or should a comparable effort be mounted to determine the biochemical basis of aggression? Should we spend billions of dollars on a supersonic jet transport—or should these funds be deployed in the development of arti-

ficial hearts? Should we tinker with the human gene? Or should we, as some quite seriously propose, flood the interior of Brazil to create an inland ocean the size of East and West Germany combined? We will soon, no doubt, be able to put super-LSD or an anti-aggression additive or some Huxleyian soma into our breakfast foods. We will soon be able to settle colonists on the planets and plant pleasure probes in the skulls of our newborn infants. But should we? Who is to decide? By what human criteria should such decisions be taken?

It is clear that a society which opts for OLIVER, nuclear energy, supersonic transports, macroengineering on a continental scale, along with LSD and pleasure probes, will develop a culture dramatically different from the one that chooses, instead, to raise intelligence, diffuse anti-aggression drugs and provide low-cost artificial hearts.

Sharp differences would quickly emerge between the society that presses technological advance selectively, and that which blindly snatches at the first opportunity that comes along. Even sharper differences would develop between the society in which the pace of technological advance is moderated and guided to prevent future shock, and that in which masses of ordinary people are incapacitated for rational decision-making. In one, political democracy and broad-scale participation are feasible; in the other powerful pressures lead toward political rule by a tiny techno-managerial elite. Our choice of technologies, in short, will decisively shape the cultural styles of the future.

This is why technological questions can no longer be answered in technological terms alone. They are political questions. Indeed, they affect us more deeply than most of the superficial political issues that occupy us today. This is why we cannot continue to make technological decisions in the old way. We cannot permit them to be made haphazardly, independently of one another. We cannot permit them to be dictated

by short-run economic considerations alone. We cannot permit them to be made in a policy vacuum. And we cannot casually delegate responsibility for such decisions to businessmen, scientists, engineers or administrators who are unaware of the profound consequences of their own actions.

TRANSISTORS AND SEX

To capture control of technology, and through it gain some influence over the accelerative thrust in general, we must, therefore, begin to submit new technology to a set of demanding tests before we unleash it in our midst. We must ask a whole series of unaccustomed questions about any innovation before giving it a clean bill of sale.

First, bitter experience should have taught us by now to look far more carefully at the potential physical side effects of any new technology. Whether we are proposing a new form of power, a new material, or a new industrial chemical, we must attempt to determine how it will alter the delicate ecological balance upon which we depend for survival. Moreover, we must anticipate its indirect effects over great distances in both time and space. Industrial waste dumped into a river can turn up hundreds, even thousands of miles away in the ocean. DDT may not show its effects until years after its use. So much has been written about this that it seems hardly necessary to belabor the point further.

Second, and much more complex, we must question the long-term impact of a technical innovation on the social, cultural and psychological environment. The automobile is widely believed to have changed the shape of our cities, shifted home ownership and retail trade patterns, altered sexual customs and loosened family ties. In the Middle East, the rapid spread of transistor radios is credited with having contributed to the resurgence of Arab nationalism. The birth control pill,

the computer, the space effort, as well as the invention and diffusion of such "soft" technologies as systems analysis, all have carried significant social changes in their wake.

We can no longer afford to let such secondary social and cultural effects just "happen." We must attempt to anticipate them in advance, estimating, to the degree possible, their nature, strength and timing. Where these effects are likely to be seriously damaging, we must also be prepared to block the new technology. It is as simple as that. Technology cannot be permitted to rampage through the society.

It is quite true that we can never know all the effects of any action, technological or otherwise. But it is not true that we are helpless. It is, for example, sometimes possible to test new technology in limited areas, among limited groups, studying its secondary impacts before releasing it for diffusion. We could, if we were imaginative, devise living experiments, even volunteer communities, to help guide our technological decisions. Just as we may wish to create enclaves of the past where the rate of change is artificially slowed, or enclaves of the future in which individuals can pre-sample future environments, we may also wish to set aside, even subsidize, special high-novelty communities in which advanced drugs, power sources, vehicles, cosmetics, appliances and other innovations are experimentally used and investigated.

A corporation today will routinely field test a product to make sure it performs its primary function. The same company will market test the product to ascertain whether it will sell. But, with rare exception, no one post-checks the consumer or the community to determine what the human side effects have been. Survival in the future may depend on our learning to do so.

Even when life-testing proves unfeasible, it is still possible for us systematically to anticipate the distant effects of various technologies. Behavioral scientists are rapidly developing new tools, from mathematical

modeling and simulation to so-called Delphi analyses, that permit us to make more informed judgments about the consequences of our actions. We are piecing together the conceptual hardware needed for the social evaluation of technology; we need but to make use of it.

Third, an even more difficult and pointed question: Apart from actual changes in the social structure, how will a proposed new technology affect the value system of the society? We know little about value structures and how they change, but there is reason to believe that they, too, are heavily impacted by technology. Elsewhere I have proposed that we develop a new profession of "value impact forecasters"—men and women trained to use the most advanced behavioral science techniques to appraise the value implications of proposed technology.

At the University of Pittsburgh in 1967 a group of distinguished economists, scientists, architects, planners, writers, and philosophers engaged in a day-long simulation intended to advance the art of value forecasting. At Harvard, the Program on Technology and Society has undertaken work relevant to this field. At Cornell and at the Institute for the Study of Science in Human Affairs at Columbia, an attempt is being made to build a model of the relationship between technology and values, and to design a game useful in analyzing the impact of one on the other. All these initiatives, while still extremely primitive, give promise of helping us assess new technology more sensitively than ever before.

Fourth and finally, we must pose a question that until now has almost never been investigated, and which is, nevertheless, absolutely crucial if we are to prevent widespread future shock. For each major technological innovation we must ask: What are its accelerative implications?

The problems of adaptation already far transcend the difficulties of coping with this or that invention or technique. Our problem is no longer the innovation,

but the chain of innovations, not the supersonic transport, or the breeder reactor, or the ground effect machine, but entire inter-linked sequences of such innovations and the novelty they send flooding into the society.

Does a proposed innovation help us control the rate and direction of subsequent advance? Or does it tend to accelerate a host of processes over which we have no control? How does it affect the level of transience, the novelty ratio, and the diversity of choice? Until we systematically probe these questions, our attempts to harness technology to social ends—and to gain control of the accelerative thrust in general—will prove feeble and futile.

Here, then, is a pressing intellectual agenda for the social and physical sciences. We have taught ourselves to create and combine the most powerful of technologies. We have not taken pains to learn about their consequences. Today these consequences threaten to destroy us. We must learn, and learn fast.

A TECHNOLOGY OMBUDSMAN

The challenge, however, is not solely intellectual; it is political as well. In addition to designing new research tools—new ways to understand our environment—we must also design creative new political institutions for guaranteeing that these questions are, in fact, investigated; and for promoting or discouraging (perhaps even banning) certain proposed technologies. We need, in effect, a machinery for screening machines.

A key political task of the next decade will be to create this machinery. We must stop being afraid to exert systematic social control over technology. Responsibility for doing so must be shared by public agencies and the corporations and laboratories in which technological innovations are hatched.

Any suggestion for control over technology immedi-

ately raises scientific eyebrows. The specter of ham-handed governmental interference is invoked. Yet controls over technology need not imply limitations on the freedom to conduct research. What is at issue is not discovery but diffusion, not invention but application. Ironically, as sociologist Amitai Etzioni points out, "many liberals who have fully accepted Keynesian economic controls take a laissez-faire view of technology. Theirs are the arguments once used to defend laissez-faire economics: that any attempt to control technology would stifle innovation and initiative."

Warnings about overcontrol ought not be lightly ignored. Yet the consequences of lack of control may be far worse. In point of fact, science and technology are never free in any absolute sense. Inventions and the rate at which they are applied are both influenced by the values and institutions of the society that gives rise to them. Every society, in effect, does pre-screen technical innovations before putting them to widespread use.

The haphazard way in which this is done today, however, and the criteria on which selection is based, need to be changed. In the West, the basic criterion for filtering out certain technical innovations and applying others remains economic profitability. In communist countries, the ultimate tests have to do with whether the innovation will contribute to overall economic growth and national power. In the former, decisions are private and pluralistically decentralized. In the latter, they are public and tightly centralized.

Both systems are now obsolete—incapable of dealing with the complexity of super-industrial society. Both tend to ignore all but the most immediate and obvious consequences of technology. Yet, increasingly, it is these non-immediate and non-obvious impacts that must concern us. "Society must so organize itself that a proportion of the very ablest and most imaginative of scientists are continually concerned with trying to foresee the long-term effects of new technology," writes O. M. Solandt, chairman of the Science Council

of Canada. "Our present method of depending on the alertness of individuals to foresee danger and to form pressure groups that try to correct mistakes will not do for the future."

One step in the right direction would be to create a technological ombudsman—a public agency charged with receiving, investigating, and acting on complaints having to do with the irresponsible application of technology.

Who should be responsible for correcting the adverse effects of technology? The rapid diffusion of detergents used in home washing machines and dishwashers intensified water purification problems all over the United States. The decisions to launch detergents on the society were privately taken, but the side effects have resulted in costs borne by the taxpayer and (in the form of lower water quality) by the consumer at large.

The costs of air pollution are similarly borne by taxpayer and community even though, as is often the case, the sources of pollution are traceable to individual companies, industries or government installations. Perhaps it is sensible for de-pollution costs to be borne by the public as a form of social overhead, rather than by specific industries. There are many ways to allocate the cost. But whichever way we choose, it is absolutely vital that the lines of responsibility are made clear. Too often no agency, group or institution has clear responsibility.

A technology ombudsman could serve as an official sounding board for complaints. By calling press attention to companies or government agencies that have applied new technology irresponsibly or without adequate forethought, such an agency could exert pressure for more intelligent use of new technology. Armed with the power to initiate damage suits where necessary, it could become a significant deterrent to technological irresponsibility.

THE ENVIRONMENTAL SCREEN

But simply investigating and apportioning responsibility after the fact is hardly sufficient. We must create an environmental screen to protect ourselves against dangerous intrusions as well as a system of public incentives to encourage technology that is both safe and socially desirable. This means governmental and private machinery for reviewing major technological advances *before* they are launched upon the public.

Corporations might be expected to set up their own "consequence analysis staffs" to study the potential effects of the innovations they sponsor. They might, in some cases, be required not merely to test new technology in pilot areas but to make a public report about its impact before being permitted to spread the innovation through the society at large. Much responsibility should be delegated to industry itself. The less centralized the controls the better. If self-policing works, it is preferable to external, political controls.

Where self-regulation fails, however, as it often does, public intervention may well be necessary, and we should not evade the responsibility. In the United States, Congressman Emilio Q. Daddario, chairman of the House Subcommittee on Science, Research and Development, has proposed the establishment of a Technology Assessment Board within the federal government. Studies by the National Academy of Sciences, the National Academy of Engineering, the Legislative Reference Service of the Library of Congress, and by the science and technology program of the George Washington University are all aimed at defining the appropriate nature of such an agency. We may wish to debate its form; its need is beyond dispute.

The society might also set certain general principles for technological advance. Where the introduction of an innovation entails undue risk, for example, it might require that funds be set aside by the responsible

agency for correction of adverse effects should they materialize. We might also create a "technological insurance pool" to which innovation-diffusing agencies might pay premiums.

Certain large-scale ecological interventions might be delayed or prohibited altogether—perhaps in line with the principle that if an incursion on nature is too big and sudden for its effects to be monitored and possibly corrected, it should not take place. For example, it has been suggested that the Aswan Dam, far from helping Egyptian agriculture, might someday lead to salinization of the land on both banks of the Nile. This could prove disastrous. But such a process would not occur overnight. Presumably, therefore, it can be monitored and prevented. By contrast, the plan to flood the entire interior of Brazil is fraught with such instant and imponderable ecological effects that it should not be permitted at all until adequate monitoring can be done and emergency corrective measures are available.

At the level of social consequences, a new technology might be submitted for clearance to panels of behavioral scientists—psychologists, sociologists, economists, political scientists—who would determine, to the best of their ability, the probable strength of its social impact at different points in time. Where an innovation appears likely to entail seriously disruptive consequences, or to generate unrestrained accelerative pressures, these facts need to be weighed in a social cost-benefit accounting procedure. In the case of some high-impact innovations, the technological appraisal agency might be empowered to seek restraining legislation, or to obtain an injunction forcing delay until full public discussion and study is completed. In other cases, such innovations might still be released for diffusion—provided ample steps were taken in advance to offset their negative consequences. In this way, the society would not need to wait for disaster before dealing with its technology-induced problems.

By considering not merely specific technologies,

but their relationship to one another, the time lapse between them, the proposed speed of diffusion, and similar factors, we might eventually gain some control over the pace of change as well as its direction.

Needless to say, these proposals are themselves fraught with explosive social consequences, and need careful assessment. There may be far better ways to achieve the desired ends. But the time is late. We simply can no longer afford to hurtle blindfolded toward super-industrialism. The politics of technology control will trigger bitter conflict in the days to come. But conflict or no, technology must be tamed, if the accelerative thrust is to be brought under control. And the accelerative thrust must be brought under control, if future shock is to be prevented.

Chapter 20

THE STRATEGY OF SOCIAL FUTURISM

Can one live in a society that is out of control? That is the question posed for us by the concept of future shock. For that is the situation we find ourselves in. If it were technology alone that had broken loose, our problems would be serious enough. The deadly fact is, however, that many other social processes have also begun to run free, oscillating wildly, resisting our best efforts to guide them.

Urbanization, ethnic conflict, migration, population, crime—a thousand examples spring to mind of fields in which our efforts to shape change seem increasingly inept and futile. Some of these are strongly related to the breakaway of technology; others partially independent of it. The uneven, rocketing rates of change, the shifts and jerks in direction, compel us to ask whether the techno-societies, even comparatively small ones like Sweden and Belgium, have grown too complex, too fast to manage?

How can we prevent mass future shock, selectively adjusting the tempos of change, raising or lowering levels of stimulation, when governments—including those with the best intentions—seem unable even to point change in the right direction?

Thus a leading American urbanologist writes with unconcealed disgust: "At a cost of more than three

billion dollars, the Urban Renewal Agency has succeeded in materially reducing the supply of low cost housing in American cities." Similar debacles could be cited in a dozen fields. Why do welfare programs today often cripple rather than help their clients? Why do college students, supposedly a pampered elite, riot and rebel? Why do expressways add to traffic congestion rather than reduce it? In short, why do so many well-intentioned liberal programs turn rancid so rapidly, producing side effects that cancel out their central effects? No wonder Raymond Fletcher, a frustrated Member of Parliament in Britain, recently complained: "Society's gone random!"

If random means a literal absence of pattern, he is, of course, overstating the case. But if random means that the outcomes of social policy have become erratic and hard to predict, he is right on target. Here, then, is the political meaning of future shock. For just as individual future shock results from an inability to keep pace with the rate of change, governments, too, suffer from a kind of collective future shock—a breakdown of their decisional processes.

With chilling clarity, Sir Geoffrey Vickers, the eminent British social scientist, has identified the issue: "The rate of change increases at an accelerating speed, without a corresponding acceleration in the rate at which further responses can be made; and this brings us nearer the threshold beyond which control is lost."

THE DEATH OF TECHNOCRACY

What we are witnessing is the beginning of the final breakup of industrialism and, with it, the collapse of technocratic planning. By technocratic planning, I do not mean only the centralized national planning that has, until recently, characterized the USSR, but also the less formal, more dispersed attempts at systematic change management that occur in all the high technology nations, regardless of their political persuasion.

Michael Harrington, the socialist critic, arguing that we have rejected planning, has termed ours the "accidental century." Yet, as Galbraith demonstrates, even within the context of a capitalist economy, the great corporations go to enormous lengths to rationalize production and distribution, to plan their future as best they can. Governments, too, are deep into the planning business. The Keynesian manipulation of post-war economies may be inadequate, but it is not a matter of accident. In France, *Le Plan* has become a regular feature of national life. In Sweden, Italy, Germany and Japan, governments actively intervene in the economic sector to protect certain industries, to capitalize others, and to accelerate growth. In the United States and Britain, even local governments come equipped with what are at least *called* planning departments.

Why, therefore, despite all these efforts, should the system be spinning out of control? The problem is not simply that we plan too little; we also plan too poorly. Part of the trouble can be traced to the very premises implicit in our planning.

First, technocratic planning, itself a product of industrialism, reflects the values of that fast-vanishing era. In both its capitalist and communist variants, industrialism was a system focused on the maximization of material welfare. Thus, for the technocrat, in Detroit as well as Kiev, economic advance is the primary aim; technology the primary tool. The fact that in one case the advance redounds to private advantage and in the other, theoretically, to the public good, does not alter the core assumptions common to both. Technocratic planning is *econocentric.*

Second, technocratic planning reflects the time-bias of industrialism. Struggling to free itself from the stifling past-orientation of previous societies, industrialism focused heavily on the present. This meant, in practice, that its planning dealt with futures near at hand. The idea of a five-year plan struck the world as insanely futuristic when it was first put forward by

the Soviets in the 1920's. Even today, except in the most advanced organizations on both sides of the ideological curtain, one- or two-year forecasts are regarded as "long-range planning." A handful of corporations and government agencies, as we shall see, have begun to concern themselves with horizons ten, twenty, even fifty years in the future. The majority, however, remain blindly biased toward next Monday. Technocratic planning is *short-range.*

Third, reflecting the bureaucratic organization of industrialism, technocratic planning was premised on hierarchy. The world was divided into manager and worker, planner and plannee, with decisions made by one for the other. This system, adequate while change unfolds at an industrial tempo, breaks down as the pace reaches super-industrial speeds. The increasingly unstable environment demands more and more nonprogrammed decisions down below; the need for instant feedback blurs the distinction between line and staff; and hierarchy totters. Planners are too remote, too ignorant of local conditions, too slow in responding to change. As suspicion spreads that top-down controls are unworkable, plannees begin clamoring for the right to participate in the decision-making. Planners, however, resist. For like the bureaucratic system it mirrors, technocratic planning is essentially *undemocratic.*

The forces sweeping us toward super-industrialism can no longer be channeled by these bankrupt industrial-era methods. For a time they may continue to work in backward, slowly moving industries or communities. But their misapplication in advanced industries, in universities, in cites—wherever change is swift—cannot but intensify the instability, leading to wilder and wilder swings and lurches. Moreover, as the evidences of failure pile up, dangerous political, cultural and psychological currents are set loose.

One response to the loss of control, for example, is a revulsion against intelligence. Science first gave man a sense of mastery over his environment, and hence

over the future. By making the future seem malleable, instead of immutable, it shattered the opiate religions that preached passivity and mysticism. Today, mounting evidence that society is out of control breeds disillusionment with science. In consequence, we witness a garish revival of mysticism. Suddenly astrology is the rage. Zen, yoga, seances, and witchcraft become popular pastimes. Cults form around the search for Dionysian experience, for non-verbal and supposedly nonlinear communication. We are told it is more important to "feel" than to "think," as though there were a contradiction between the two. Existentialist oracles join Catholic mystics, Jungian psychoanalysts, and Hindu gurus in exalting the mystical and emotional against the scientific and rational.

This reversion to pre-scientific attitudes is accompanied, not surprisingly, by a tremendous wave of nostalgia in the society. Antique furniture, posters from a bygone era, games based on the remembrance of yesterday's trivia, the revival of Art Nouveau, the spread of Edwardian styles, the rediscovery of such faded pop-cult celebrities as Humphrey Bogart or W. C. Fields, all mirror a psychological lust for the simpler, less turbulent past. Powerful fad machines spring into action to capitalize on this hunger. The nostalgia business becomes a booming industry.

The failure of technocratic planning and the consequent sense of lost control also feeds the philosophy of "now-ness." Songs and advertisements hail the appearance of the "now generation," and learned psychiatrists, discoursing on the presumed dangers of repression, warn us not to defer our gratifications. Acting out and a search for immediate payoff are encouraged. "We're more oriented to the present," says a teen-age girl to a reporter after the mammoth Woodstock rock music festival. "It's like do what you want to do now. . . . If you stay anywhere very long you get into a planning thing. . . . So you just move on." Spontaneity, the personal equivalent of social plan-

lessness, is elevated into a cardinal psychological virtue.

All this has its political analog in the emergence of a strange coalition of right wingers and New Leftists in support of what can only be termed a "hang loose" approach to the future. Thus we hear increasing calls for anti-planning or non-planning, sometimes euphemized as "organic growth." Among some radicals, this takes on an anarchist coloration. Not only is it regarded as unnecessary or unwise to make long-range plans for the future of the institution or society they wish to overturn, it is sometimes even regarded as poor taste to plan the next hour and a half of a meeting. Planlessness is glorified.

Arguing that planning imposes values on the future, the anti-planners overlook the fact that non-planning does so, too—often with far worse consequence. Angered by the narrow, econocentric character of technocratic planning, they condemn systems analysis, cost benefit accounting, and similar methods, ignoring the fact that, used differently, these very tools might be converted into powerful techniques for humanizing the future.

When critics charge that technocratic planning is anti-human, in the sense that it neglects social, cultural and psychological values in its headlong rush to maximize economic gain, they are usually right. When they charge that it is shortsighted and undemocratic, they are usually right. When they charge it is inept, they are usually right.

But when they plunge backward into irrationality, anti-scientific attitudes, a kind of sick nostalgia, and an exaltation of now-ness, they are not only wrong, but dangerous. Just as, in the main, their alternatives to industrialism call for a return to pre-industrial institutions, their alternative to technocracy is not post-, but pre-technocracy.

Nothing could be more dangerously maladaptive. Whatever the theoretical arguments may be, brute forces are loose in the world. Whether we wish to

prevent future shock or control population, to check pollution or defuse the arms race, we cannot permit decisions of earth-jolting importance to be taken heedlessly, witlessly, planlessly. To hang loose is to commit collective suicide.

We need not a reversion to the irrationalisms of the past, not a passive acceptance of change, not despair or nihilism. We need, instead, a strong new strategy. For reasons that will become clear, I term this strategy "social futurism." I am convinced that, armed with this strategy, we can arrive at a new level of competence in the management of change. We can invent a form of planning more humane, more far-sighted, and more democratic than any so far in use. In short, we can transcend technocracy.

THE HUMANIZATION OF THE PLANNER

Technocrats suffer from econo-think. Except during war and dire emergency, they start from the premise that even non-economic problems can be solved with economic remedies.

Social futurism challenges this root assumption of both Marxist and Keynesian managers. In its historical time and place, industrial society's single-minded pursuit of material progress served the human race well. As we hurtle toward super-industrialism, however, a new ethos emerges in which other goals begin to gain parity with, and even supplant those of economic welfare. In personal terms, self-fulfillment, social responsibility, aesthetic achievement, hedonistic individualism, and an array of other goals vie with and often overshadow the raw drive for material success. Affluence serves as a base from which men begin to strive for varied post-economic ends.

At the same time, in societies arrowing toward super-industrialism, economic variables—wages, balance of payments, productivity—grow increasingly sensitive to changes in the non-economic environ-

ment. Economic problems are plentiful, but a whole range of issues that are only secondarily economic break into prominence. Racism, the battle between the generations, crime, cultural autonomy, violence—all these have economic dimensions; yet none can be effectively treated by econocentric measures alone.

The move from manufacturing to service production, the psychologization of both goods and services, and ultimately the shift toward experiential production all tie the economic sector much more tightly to non-economic forces. Consumer preferences turn over in accordance with rapid life style changes, so that the coming and going of subcults is mirrored in economic turmoil. Super-industrial production requires workers skilled in symbol manipulation, so that what goes on in their heads becomes much more important than in the past, and much more dependent upon cultural factors.

There is even evidence that the financial system is becoming more responsive to social and psychological pressures. It is only in an affluent society on its way to super-industrialism that one witnesses the invention of new investment vehicles, such as mutual funds, that are consciously motivated or constrained by non-economic considerations. The Vanderbilt Mutual Fund and the Provident Fund refuse to invest in liquor or tobacco shares. The giant Mates Fund spurns the stock of any company engaged in munitions production, while the tiny Vantage 10/90 Fund invests part of its assets in industries working to alleviate food and population problems in developing nations. There are funds that invest only, or primarily, in racially integrated housing. The Ford Foundation and the Presbyterian Church both invest part of their sizeable portfolios in companies selected not for economic payout alone, but for their potential contribution to solving urban problems. Such developments, still small in number, accurately signal the direction of change.

In the meantime, major American corporations

with fixed investments in urban centers, are being sucked, often despite themselves, into the roaring vortex of social change. Hundreds of companies are now involved in providing jobs for hard-core unemployed, in organizing literacy and job-training programs, and in scores of other unfamiliar activities. So important have these new involvements grown that the largest corporation in the world, the American Telephone and Telegraph Company, recently set up a Department of Environmental Affairs. A pioneering venture, this agency has been assigned a range of tasks that include worrying about air and water pollution, improving the aesthetic appearance of the company's trucks and equipment, and fostering experimental preschool learning programs in urban ghettos. None of this necessarily implies that big companies are growing altruistic; it merely underscores the increasing intimacy of the links between the economic sector and powerful cultural, psychological and social forces.

While these forces batter at our doors, however, most technocratic planners and managers behave as though nothing had happened. They continue to act as though the economic sector were hermetically sealed off from social and psychocultural influences. Indeed, econocentric premises are buried so deeply and held so widely in both the capitalist and communist nations, that they distort the very information systems essential for the management of change.

For example, all modern nations maintain elaborate machinery for measuring economic performance. We know virtually day by day the directions of change with respect to productivity, prices, investment, and similar factors. Through a set of "economic indicators" we gauge the overall health of the economy, the speed at which it is changing, and the overall directions of change. Without these measures, our control of the economy would be far less effective.

By contrast, we have no such measures, no set of comparable "social indicators" to tell us whether the society, as distinct from the economy, is also healthy.

We have no measures of the "quality of life." We have no systematic indices to tell us whether men are more or less alienated from one another; whether education is more effective; whether art, music and literature are flourishing; whether civility, generosity or kindness are increasing. "Gross National Product is our Holy Grail," writes Stewart Udall, former United States Secretary of the Interior, ". . . but we have no environmental index, no census statistics to measure whether the country is more livable from year to year."

On the surface, this would seem a purely technical matter—something for statisticians to debate. Yet it has the most serious political significance, for lacking such measures it becomes difficult to connect up national or local policies with appropriate long-term social goals. The absence of such indices perpetuates vulgar technocracy.

Little known to the public, a polite, but increasingly bitter battle over this issue has begun in Washington. Technocratic planners and economists see in the social indicators idea a threat to their entrenched position at the ear of the political policy maker. In contrast, the need for social indicators has been eloquently argued by such prominent social scientists as Bertram M. Gross of Wayne State University, Eleanor Sheldon and Wilbert Moore of the Russell Sage Foundation, Daniel Bell and Raymond Bauer of Harvard. We are witnessing, says Gross, a "widespread rebellion against what has been called the 'economic philistinism' of the United States government's present statistical establishment."

This revolt has attracted vigorous support from a small group of politicians and government officials who recognize our desperate need for a post-technocratic social intelligence system. These include Daniel P. Moynihan, a key White House adviser; Senators Walter Mondale of Minnesota and Fred Harris of Oklahoma; and several former Cabinet officers. In the near future, we can expect the same revolt to

break out in other world capitals as well, once again drawing a line between technocrats and post-technocrats.

The danger of future shock, itself, however, points to the need for new social measures not yet even mentioned in the fast-burgeoning literature on social indicators. We urgently need, for example, techniques for measuring the level of transience in different communities, different population groups, and in individual experience. It is possible, in principle, to design a "transience index" that could disclose the rate at which we are making and breaking relationships with the things, places, people, organizations and informational structures that comprise our environment.

Such an index would reveal, among other things, the fantastic differences in the experiences of different groups in the society—the static and tedious quality of life for very large numbers of people, the frenetic turnover in the lives of others. Government policies that attempt to deal with both kinds of people in the same way are doomed to meet angry resistance from one or the other—or both.

Similarly, we need indices of novelty in the environment. How often do communities, organizations or individuals have to cope with first-time situations? How many of the articles in the home of the average working-class family are actually "new" in function or appearance; how many are traditional? What level of novelty—in terms of things, people or any other significant dimension—is required for stimulation without over-stimulation? How much more novelty can children absorb than their parents—if it is true that they can absorb more? In what way is aging related to lower novelty tolerances, and how do such differences correlate with the political and intergenerational conflict now tearing the techno-societies apart? By studying and measuring the invasion of newness, we can begin, perhaps, to control the influx

of change into our social structures and personal lives.

And what about choice and overchoice? Can we construct measures of the degree of significant choice in human lives? Can any government that pretends to be democratic not concern itself with such an issue? For all the rhetoric about freedom of choice, no government agency in the world can claim to have made any attempt to measure it. The assumption simply is that more income or affluence means more choice and that more choice, in turn, means freedom. Is it not time to examine these basic assumptions of our political systems? Post-technocratic planning must deal with precisely such issues, if we are to prevent future shock and build a humane super-industrial society.

A sensitive system of indicators geared to measuring the achievement of social and cultural goals, and integrated with economic indicators, is part of the technical equipment that any society needs before it can successfully reach the next stage of eco-technological development. It is an absolute precondition for post-technocratic planning and change management.

This humanization of planning, moreover, must be reflected in our political structures as well. To connect the super-industrial social intelligence system with the decisional centers of society, we must institutionalize a concern for the quality of life. Thus Bertram Gross and others in the social indicators movement have proposed the creation of a Council of Social Advisers to the President. Such a Council, as they see it, would be modeled after the already existing Council of Economic Advisers and would perform parallel functions in the social field. The new agency would monitor key social indicators precisely the way the CEA keeps its eye on economic indices, and interpret changes to the President. It would issue an annual report on the quality of life, clearly spelling out our social progress (or lack of it) in terms of specified

goals. This report would thus supplement and balance the annual economic report prepared by the CEA. By providing reliable, useful data about our social condition, the Council of Social Advisers would begin to influence planning generally, making it more sensitive to social costs and benefits, less coldly technocratic and econocentric.*

The establishment of such councils, not merely at the federal level but at state and municipal levels as well, would not solve all our problems; it would not eliminate conflict; it would not guarantee that social indicators are exploited properly. In brief, it would not eliminate politics from political life. But it would lend recognition—and political force—to the idea that the aims of progress reach beyond economics. The designation of agencies to watch over the indicators of change in the quality of life would carry us a long way toward that humanization of the planner which is the essential first stage of the strategy of social futurism.

TIME HORIZONS

Technocrats suffer from myopia. Their instinct is to think about immediate returns, immediate consequences. They are premature members of the now generation.

If a region needs electricity, they reach for a power plant. The fact that such a plant might sharply alter labor patterns, that within a decade it might throw men out of work, force large-scale retraining of workers, and swell the social welfare costs of a nearby city —such considerations are too remote in time to concern them. The fact that the plant could trigger

* Proponents differ as to whether the Council of Social Advisers ought to be organizationally independent or become a part of a larger Council of Economic *and* Social Advisers. All sides agree, however, on the need for integrating economic and social intelligence.

devastating ecological consequences a generation later simply does not register in their time frame.

In a world of accelerant change, next year is nearer to us than next month was in a more leisurely era. This radically altered fact of life must be internalized by decision-makers in industry, government and elsewhere. Their time horizons must be extended.

To plan for a more distant future does not mean to tie oneself to dogmatic programs. Plans can be tentative, fluid, subject to continual revision. Yet flexibility need not mean shortsightedness. To transcend technocracy, our social time horizons must reach decades, even generations, into the future. This requires more than a lengthening of our formal plans. It means an infusion of the entire society, from top to bottom, with a new socially aware future-consciousness.

One of the healthiest phenomena of recent years has been the sudden proliferation of organizations devoted to the study of the future. This recent development is, in itself, a homeostatic response of the society to the speed-up of change. Within a few years we have seen the creation of future-oriented think tanks like the Institute for the Future; the formation of academic study groups like the Commission on the Year 2000 and the Harvard Program on Technology and Society; the appearance of futurist journals in England, France, Italy, Germany and the United States; the spread of university courses in forecasting and related subjects; the convocation of international futurist meetings in Oslo, Berlin and Kyoto; the coalescence of groups like Futuribles, Europe 2000, Mankind 2000, the World Future Society.

Futurist centers are to be found in West Berlin, in Prague, in London, in Moscow, Rome and Washington, in Caracas, even in the remote jungles of Brazil at Belém and Belo Horizonte. Unlike conventional technocratic planners whose horizons usually extend no further than a few years into tomorrow, these groups concern themselves with change fifteen, twenty-five, even fifty years in the future.

Every society faces not merely a succession of *probable* futures, but an array of *possible* futures, and a conflict over *preferable* futures. The management of change is the effort to convert certain possibles into probables, in pursuit of agreed-on preferables. Determining the probable calls for a science of futurism. Delineating the possible calls for an art of futurism. Defining the preferable calls for a politics of futurism.

The worldwide futurist movement today does not yet differentiate clearly among these functions. Its heavy emphasis is on the assessment of probabilities. Thus in many of these centers, economists, sociologists, mathematicians, biologists, physicists, operations researchers and others invent and apply methods for forecasting future probabilities. At what date could aquaculture feed half the world's population? What are the odds that electric cars will supplant gas-driven automobiles in the next fifteen years? How likely is a Sino-Soviet détente by 1980? What changes are most probable in leisure patterns, urban government, race relations?

Stressing the interconnectedness of disparate events and trends, scientific futurists are also devoting increasing attention to the social consequences of technology. The Institute for the Future is, among other things, investigating the probable social and cultural effects of advanced communications technology. The group at Harvard is concerned with social problems likely to arise from bio-medical advances. Futurists in Brazil examine the probable outcomes of various economic development policies.

The rationale for studying probable futures is compelling. It is impossible for an individual to live through a single working day without making thousands of assumptions about the probable future. The commuter who calls to say, "I'll be home at six" bases his prediction on assumptions about the probability that the train will run on time. When mother sends Johnny to school, she tacitly assumes the school will be there when he arrives. Just as a pilot cannot steer

a ship without projecting its course, we cannot steer our personal lives without continually making such assumptions, consciously or otherwise.

Societies, too, construct an architecture of premises about tomorrow. Decision-makers in industry, government, politics, and other sectors of society could not function without them. In periods of turbulent change, however, these socially-shaped images of the probable future become less accurate. The breakdown of control in society today is directly linked to our inadequate images of probable futures.

Of course, no one can "know" the future in any absolute sense. We can only systematize and deepen our assumptions and attempt to assign probabilities to them. Even this is difficult. Attempts to forecast the future inevitably alter it. Similarly, once a forecast is disseminated, the act of dissemination (as distinct from investigation) also produces a perturbation. Forecasts tend to become self-fulfilling or self-defeating. As the time horizon is extended into the more distant future, we are forced to rely on informed hunch and guesswork. Moreover, certain unique events—assassinations, for example—are, for all intents and purposes, unpredictable at present (although we can forecast classes of such events).

Despite all this, it is time to erase, once and for all, the popular myth that the future is "unknowable." The difficulties ought to chasten and challenge, not paralyze. William F. Ogburn, one of the world's great students of social change, once wrote: "We should admit into our thinking the idea of approximations, that is, that there are varying degrees of accuracy and inaccuracy of estimate." A rough idea of what lies ahead is better than none, he went on, and for many purposes extreme accuracy is wholly unnecessary.

We are not, therefore, as helpless in dealing with future probabilities as most people assume. The British social scientist Donald G. MacRae correctly asserts that "modern sociologists can in fact make a

large number of comparatively short term and limited predictions with a good deal of assurance." Apart from the standard methods of social science, however, we are experimenting with potentially powerful new tools for probing the future. These range from complex ways of extrapolating existing trends, to the construction of highly intricate models, games and simulations, the preparation of detailed speculative scenarios, the systematic study of history for relevant analogies, morphological research, relevance analysis, contextual mapping and the like. In a comprehensive investigation of technological forecasting, Dr. Erich Jantsch, formerly a consultant to the OECD and a research associate at MIT, has identified scores of distinct new techniques either in use or in the experimental stage.

The Institute for the Future in Middletown, Connecticut, a prototype of the futurist think tank, is a leader in the design of new forecasting tools. One of these is Delphi—a method largely developed by Dr. Olaf Helmer, the mathematician-philosopher who is one of the founders of the IFF. Delphi attempts to deal with very distant futures by making systematic use of the "intuitive" guesstimates of large numbers of experts. The work on Delphi has led to a further innovation which has special importance in the attempt to prevent future shock by regulating the pace of change. Pioneered by Theodore J. Gordon of the IFF, and called Cross Impact Matrix Analysis, it traces the effect of one innovation on another, making possible, for the first time, anticipatory analysis of complex chains of social, technological and other occurrences—and the rates at which they are likely to occur.

We are, in short, witnessing a perfectly extraordinary thrust toward more scientific appraisal of future probabilities, a ferment likely, in itself, to have a powerful impact on the future. It would be foolish to oversell the ability of science, as yet, to forecast complex events accurately. Yet the danger today is not

that we will overestimate our ability; the real danger is that we will under-utilize it. For even when our still-primitive attempts at scientific forecasting turn out to be grossly in error, the very effort helps us identify key variables in change, it helps clarify goals, and it forces more careful evaluation of policy alternatives. In these ways, if no others, probing the future pays off in the present.

Anticipating *probable* futures, however, is only part of what needs doing if we are to shift the planner's time horizon and infuse the entire society with a greater sense of tomorrow. For we must also vastly widen our conception of possible futures. To the rigorous discipline of science, we must add the flaming imagination of art.

Today as never before we need a multiplicity of visions, dreams and prophecies—images of potential tomorrows. Before we can rationally decide which alternative pathways to choose, which cultural styles to pursue, we must first ascertain which are possible. Conjecture, speculation and the visionary view thus become as coldly practical a necessity as feet-on-the-floor "realism" was in an earlier time.

This is why some of the world's biggest and most tough-minded corporations, once the living embodiment of presentism, today hire intuitive futurists, science fiction writers and visionaries as consultants. A gigantic European chemical company employs a futurist who combines a scientific background with training as a theologian. An American communications empire engages a future-minded social critic. A glass manufacturer searches for a science fiction writer to imagine the possible corporate forms of the future. Companies turn to these "blue-skyers" and "wild birds" not for scientific forecasts of probabilities, but for mind-stretching speculation about possibilities.

Corporations must not remain the only agencies with access to such services. Local government, schools, voluntary associations and others also need

to examine their potential futures imaginatively. One way to help them do so would be to establish in each community "imaginetic centers" devoted to technically assisted brainstorming. These would be places where people noted for creative imagination, rather than technical expertise, are brought together to examine present crises, to anticipate future crises, and to speculate freely, even playfully, about possible futures.

What, for example, are the possible futures of urban transportation? Traffic is a problem involving space. How might the city of tomorrow cope with the movement of men and objects through space? To speculate about this question, an imaginetic center might enlist artists, sculptors, dancers, furniture designers, parking lot attendants, and a variety of other people who, in one way or another, manipulate space imaginatively. Such people, assembled under the right circumstances, would inevitably come up with ideas of which the technocratic city planners, the highway engineers and transit authorities have never dreamed.

Musicians, people who live near airports, jackhammer men and subway conductors might well imagine new ways to organize, mask or suppress noise. Groups of young people might be invited to ransack their minds for previously unexamined approaches to urban sanitation, crowding, ethnic conflict, care of the aged, or a thousand other present and future problems.

In any such effort, the overwhelming majority of ideas put forward will, of course, be absurd, funny or technically impossible. Yet the essence of creativity is a willingness to play the fool, to toy with the absurd, only later submitting the stream of ideas to harsh critical judgment. The application of the imagination to the future thus requires an environment in which it is safe to err, in which novel juxtapositions of ideas can be freely expressed before being critically sifted. We need sanctuaries for social imagination.

While all sorts of creative people ought to participate in conjecture about possible futures, they should have immediate access—in person or via telecommunications—to technical specialists, from acoustical engineers to zoologists, who could indicate when a suggestion is technically impossible (bearing in mind that even impossibility is often temporary).

Scientific expertise, however, might also play a generative, rather than merely a damping role in the imaginetic process. Skilled specialists can construct models to help imagineers examine all possible permutations of a given set of relationships. Such models are representations of real life conditions. In the words of Christoph Bertram of the Institute for Strategic Studies in London, their purpose is "not so much to predict the future, but, by examining alternative futures, to show the choices open."

An appropriate model, for example, could help a group of imagineers visualize the impact on a city if its educational expenditures were to fluctuate—how this would affect, let us say, the transport system, the theaters, the occupational structure and health of the community. Conversely, it could show how changes in these other factors might affect education.

The rushing stream of wild, unorthodox, eccentric or merely colorful ideas generated in these sanctuaries of social imagination must, after they have been expressed, be subjected to merciless screening. Only a tiny fraction of them will survive this filtering process. These few, however, could be of the utmost importance in calling attention to new possibilities that might otherwise escape notice. As we move from poverty toward affluence, politics changes from what mathematicians call a zero sum game into a non-zero sum game. In the first, if one player wins another must lose. In the second, all players can win. Finding non-zero-sum solutions to our social problems requires all the imagination we can muster. A system for generating imaginative policy ideas could help us take

maximum advantage of the non-zero opportunities ahead.

While imaginetic centers concentrate on partial images of tomorrow, defining possible futures for a single industry, an organization, a city or its subsystems, however, we also need sweeping, visionary ideas about the society as a whole. Multiplying our images of possible futures is important; but these images need to be organized, crystallized into structured form. In the past, utopian literature did this for us. It played a practical, crucial role in ordering men's dreams about alternative futures. Today we suffer for lack of utopian ideas around which to organize competing images of possible futures.

Most traditional utopias picture simple and static societies—i.e., societies that have nothing in common with super-industrialism. B. F. Skinner's *Walden Two,* the model for several existing experimental communes, depicts a pre-industrial way of life—small, close to the earth, built on farming and handcraft. Even those two brilliant anti-utopias, *Brave New World* and *1984,* now seem oversimple. Both describe societies based on high technology and low complexity: the machines are sophisticated but the social and cultural relationships are fixed and deliberately simplified.

Today we need powerful new utopian and anti-utopian concepts that look forward to super-industrialism, rather than backward to simpler societies. These concepts, however, can no longer be produced in the old way. First, no book, by itself, is adequate to describe a super-industrial future in emotionally compelling terms. Each conception of a super-industrial utopia or anti-utopia needs to be embodied in many forms—films, plays, novels and works of art—rather than a single work of fiction. Second, it may now be too difficult for any individual writer, no matter how gifted, to describe a convincingly complex future. We need, therefore, a revolution in the production of

utopias: collaborative utopianism. We need to construct "utopia factories."

One way might be to assemble a small group of top social scientists—an economist, a sociologist, an anthropologist, and so on—asking them to work together, even live together, long enough to hammer out among themselves a set of well-defined values on which they believe a truly super-industrial utopian society might be based.

Each member of the team might then attempt to describe in nonfiction form a sector of an imagined society built on these values. What would its family structure be like? Its economy, laws, religion, sexual practices, youth culture, music, art, its sense of time, its degree of differentiation, its psychological problems? By working together and ironing out inconsistencies, where possible, a comprehensive and adequately complex picture might be drawn of a seamless, temporary form of super-industrialism.

At this point, with the completion of detailed analysis, the project would move to the fiction stage. Novelists, film-makers, science fiction writers and others, working closely with psychologists, could prepare creative works about the lives of individual characters in the imagined society.

Meanwhile, other groups could be at work on counter-utopias. While Utopia A might stress materialist, success-oriented values, Utopia B might base itself on sensual, hedonistic values, C on the primacy of aesthetic values, D on individualism, E on collectivism, and so forth. Ultimately, a stream of books, plays, films and television programs would flow from this collaboration between art, social science and futurism, thereby educating large numbers of people about the costs and benefits of the various proposed utopias.

Finally, if social imagination is in short supply, we are even more lacking in people willing to subject utopian ideas to systematic test. More and more young people, in their dissatisfaction with industrial-

ism, are experimenting with their own lives, forming utopian communities, trying new social arrangements, from group marriage to living-learning communes. Today, as in the past, the weight of established society comes down hard on the visionary who attempts to practice, as well as merely preach. Rather than ostracizing utopians, we should take advantage of their willingness to experiment, encouraging them with money and tolerance, if not respect.

Most of today's "intentional communities" or utopian colonies, however, reveal a powerful preference for the past. These may be of value to the individuals in them, but the society as a whole would be better served by utopian experiments based on super- rather than pre-industrial forms. Instead of a communal farm, why not a computer software company whose program writers live and work communally? Why not an education technology company whose members pool their money and merge their families? Instead of raising radishes or crafting sandals, why not an oceanographic research installation organized along utopian lines? Why not a group medical practice that takes advantage of the latest medical technology but whose members accept modest pay and pool their profits to run a completely new-style medical school? Why not recruit living groups to try out the proposals of the utopia factories?

In short, we can use utopianism as a tool rather than an escape, if we base our experiments on the technology and society of tomorrow rather than that of the past. And once done, why not the most rigorous, scientific analysis of the results? The findings could be priceless, were they to save us from mistakes or lead us toward more workable organizational forms for industry, education, family life or politics.

Such imaginative explorations of possible futures would deepen and enrich our scientific study of probable futures. They would lay a basis for the radical forward extension of the society's time horizon.

They would help us apply social imagination to the future of futurism itself.

Indeed, with these as a background, we must consciously begin to multiply the scientific future-sensing organs of society. Scientific futurist institutes must be spotted like nodes in a loose network throughout the entire governmental structure in the techno-societies, so that in every department, local or national, some staff devotes itself systematically to scanning the probable long-term future in its assigned field. Futurists should be attached to every political party, university, corporation, professional association, trade union and student organization.

We need to train thousands of young people in the perspectives and techniques of scientific futurism, inviting them to share in the exciting venture of mapping probable futures. We also need national agencies to provide technical assistance to local communities in creating their own futurist groups. And we need a similar center, perhaps jointly funded by American and European foundations, to help incipient futurist centers in Asia, Africa, and Latin America.

We are in a race between rising levels of uncertainty produced by the acceleration of change, and the need for reasonably accurate images of what at any instant is the most probable future. The generation of reliable images of the most probable future thus becomes a matter of the highest national, indeed, international urgency.

As the globe is itself dotted with future-sensors, we might consider creating a great international institute, a world futures data bank. Such an institute, staffed with top caliber men and women from all the sciences and social sciences, would take as its purpose the collection and systematic integration of predictive reports generated by scholars and imaginative thinkers in all the intellectual disciplines all over the world.

Of course, those working in such an institute would know that they could never create a single, static diagram of the future. Instead, the product of their effort

would be a constantly changing geography of the future, a continually re-created overarching image based on the best predictive work available. The men and women engaged in this work would know that nothing is certain; they would know that they must work with inadequate data; they would appreciate the difficulties inherent in exploring the uncharted territories of tomorrow. But man already knows more about the future than he has ever tried to formulate and integrate in any systematic and scientific way. Attempts to bring this knowledge together would constitute one of the crowning intellectual efforts in history—and one of the most worthwhile.

Only when decision-makers are armed with better forecasts of future events, when by successive approximation we increase the accuracy of forecast, will our attempts to manage change improve perceptibly. For reasonably accurate assumptions about the future are a precondition for understanding the potential consequences of our own actions. And without such understanding, the management of change is impossible.

If the humanization of the planner is the first stage in the strategy of social futurism, therefore, the forward extension of our time horizon is the second. To transcend technocracy, we need not only to reach beyond our economic philistinism, but to open our minds to more distant futures, both probable and possible.

ANTICIPATORY DEMOCRACY

In the end, however, social futurism must cut even deeper. For technocrats suffer from more than econothink and myopia; they suffer, too, from the virus of elitism. To capture control of change, we shall, therefore, require a final, even more radical breakaway from technocratic tradition: we shall need a

revolution in the very way we formulate our social goals.

Rising novelty renders irrelevant the traditional goals of our chief institutions—state, church, corporation, army and university. Acceleration produces a faster turnover of goals, a greater transience of purpose. Diversity or fragmentation leads to a relentless multiplication of goals. Caught in this churning, goal-cluttered environment, we stagger, future shocked, from crisis to crisis, pursuing a welter of conflicting and self-cancelling purposes.

Nowhere is this more starkly evident than in our pathetic attempts to govern our cities. New Yorkers, within a short span, have suffered a nightmarish succession of near disasters: a water shortage, a subway strike, racial violence in the schools, a student insurrection at Columbia University, a garbage strike, a housing shortage, a fuel oil strike, a breakdown of telephone service, a teacher walkout, a power blackout, to name just a few. In its City Hall, as in a thousand city halls all over the high-technology nations, technocrats dash, firebucket in fist, from one conflagration to another without the least semblance of a coherent plan or policy for the urban future.

This is not to say no one is planning. On the contrary; in this seething social brew, technocratic plans, sub-plans and counter-plans pour forth. They call for new highways, new roads, new power plants, new schools. They promise better hospitals, housing, mental health centers, welfare programs. But the plans cancel, contradict and reinforce one another by accident. Few are logically related to one another, and none to any overall image of the preferred city of the future. No vision—utopian or otherwise—energizes our efforts. No rationally integrated goals bring order to the chaos. And at the national and international levels, the absence of coherent policy is equally marked and doubly dangerous.

It is not simply that we do not know which goals to pursue, as a city or as a nation. The trouble lies

deeper. For accelerating change has made obsolete the methods by which we arrive at social goals. The technocrats do not yet understand this, and, reacting to the goals crisis in knee-jerk fashion, they reach for the tried and true methods of the past.

Thus, intermittently, a change-dazed government will try to define its goals publicly. Instinctively, it establishes a commission. In 1960 President Eisenhower pressed into service, among others, a general, a judge, a couple of industrialists, a few college presidents, and a labor leader to "develop a broad outline of coordinated national policies and programs" and to "set up a series of goals in various areas of national activity." In due course, a red-white-and-blue paperback appeared with the commission's report, *Goals for Americans*. Neither the commission nor its goals had the slightest impact on the public or on policy. The juggernaut of change continued to roll through America untouched, as it were, by managerial intelligence.

A far more significant effort to tidy up governmental priorities was initiated by President Johnson, with his attempt to apply PPBS (Planning-Programming-Budgeting-System) throughout the federal establishment. PPBS is a method for tying programs much more closely and rationally to organizational goals. Thus, for example, by applying it, the Department of Health, Education and Welfare can assess the costs and benefits of alternative programs to accomplish specified goals. But who specifies these larger, more important goals? The introduction of PPBS and the systems approach is a major governmental achievement. It is of paramount importance in managing large organizational efforts. But it leaves entirely untouched the profoundly political question of how the overall goals of a government or a society are to be chosen in the first place.

President Nixon, still snarled in the goals crisis, tried a third tack. "It is time," he declared, "we addressed ourselves, consciously and systematically, to the question of what kind of a nation we want to be

. . ." He thereupon put his finger on the quintessential question. But once more the method chosen for answering it proved to be inadequate. "I have today ordered the establishment, within the White House, of a National Goals Research Staff," the President announced. "This will be a small, highly technical staff, made up of experts in the collection . . . and processing of data relating to social needs, and in the projection of social trends."

Such a staff, located within shouting distance of the Presidency, could be extremely useful in compiling goal proposals, in reconciling (at least on paper) conflicts between agencies, in suggesting new priorities. Staffed with excellent social scientists and futurists, it could earn its keep if it did nothing but force high officials to question their primary goals.

Yet even this step, like the two before it, bears the unmistakable imprint of the technocratic mentality. For it, too, evades the politically charged core of the issue. How are preferable futures to be defined? And by whom? Who is to set goals for the future?

Behind all such efforts runs the notion that national (and, by extension, local) goals for the future of society ought to be formulated at the top. This technocratic premise perfectly mirrors the old bureaucratic forms of organization in which line and staff were separated, in which rigid, undemocratic hierarchies distinguished leader from led, manager from managed, planner from plannee.

Yet the real, as distinct from the glibly verbalized, goals of any society on the path to super-industrialism are already too complex, too transient and too dependent for their achievement upon the willing participation of the governed, to be perceived and defined so easily. We cannot hope to harness the runaway forces of change by assembling a kaffee klatsch of elders to set goals for us or by turning the task over to a "highly technical staff." A revolutionary new approach to goal-setting is needed.

Nor is this approach likely to come from those who

play-act at revolution. One radical group, seeing all problems as a manifestation of the "maximization of profits" displays, in all innocence, an econocentricism as narrow as that of the technocrats. Another hopes to plunge us willy-nilly back into the pre-industrial past. Still another sees revolution exclusively in subjective and psychological terms. None of these groups is capable of advancing us toward post-technocratic forms of change management.

By calling attention to the growing ineptitudes of the technocrats and by explicitly challenging not merely the means, but the very goals of industrial society, today's young radicals do us all a great service. But they no more know how to cope with the goals crisis than the technocrats they scorn. Exactly like Messrs. Eisenhower, Johnson and Nixon, they have been noticeably unable to present any positive image of a future worth fighting for.

Thus Todd Gitlin, a young American radical and former president of the Students for a Democratic Society, notes that while "an orientation toward the future has been the hallmark of every revolutionary —and, for that matter, liberal—movement of the last century and a half," the New Left suffers from "a disbelief in the future." After citing all the ostensible reasons why it has so far not put forward a coherent vision of the future, he succinctly confesses: "We find ourselves incapable of formulating the future."

Other New Left theorists fuzz over the problem, urging their followers to incorporate the future in the present by, in effect, living the life styles of tomorrow today. So far, this has led to a pathetic charade—"free societies," cooperatives, pre-industrial communes, few of which have anything to do with the future, and most of which reveal, instead, only a passionate penchant for the past.

The irony is compounded when we consider that some (though hardly all) of today's young radicals also share with the technocrats a streak of virulent elitism. While decrying bureaucracy and demanding

"participatory democracy" they, themselves, frequently attempt to manipulate the very groups of workers, blacks or students on whose behalf they demand participation.

The working masses in the high-technology societies are totally indifferent to calls for a political revolution aimed at exchanging one form of property ownership for another. For most people, the rise in affluence has meant a better, not a worse, existence, and they look upon their much despised "suburban middle class lives" as fulfillment rather than deprivation.

Faced with this stubborn reality, undemocratic elements in the New Left leap to the Marcusian conclusion that the masses are too bourgeoisified, too corrupted and addled by Madison Avenue to know what is good for them. And so, a revolutionary elite must establish a more humane and democratic future even if it means stuffing it down the throats of those who are too stupid to know their own interests. In short, the goals of society have to be set by an elite. Technocrat and anti-technocrat often turn out to be elitist brothers under the skin.

Yet systems of goal formulation based on elitist premises are simply no longer "efficient." In the struggle to capture control of the forces of change, they are increasingly counter-productive. For under super-industrialism, democracy becomes not a political luxury, but a primal necessity.

Democratic political forms arose in the West not because a few geniuses willed them into being or because man showed an "unquenchable instinct for freedom." They arose because the historical pressure toward social differentiation and toward faster paced systems demanded sensitive social feedback. In complex, differentiated societies, vast amounts of information must flow at ever faster speeds between the formal organizations and subcultures that make up the whole, and between the layers and sub-structures within these.

Political democracy, by incorporating larger and larger numbers in social decision-making, facilitates feedback. And it is precisely this feedback that is essential to control. To assume control over accelerant change, we shall need still more advanced—and more democratic—feedback mechanisms.

The technocrat, however, still thinking in top-down terms, frequently makes plans without arranging for adequate and instantaneous feedback from the field, so that he seldom knows how well his plans are working. When he does arrange for feedback, what he usually asks for and gets is heavily economic, inadequately social, psychological or cultural. Worse yet, he makes these plans without sufficiently taking into account the fast-changing needs and wishes of those whose participation is needed to make them a success. He assumes the right to set social goals by himself or he accepts them blindly from some higher authority.

He fails to recognize that the faster pace of change demands—and creates—a new kind of information system in society: a loop, rather than a ladder. Information must pulse through this loop at accelerating speeds, with the output of one group becoming the input for many others, so that no group, however politically potent it may seem, can independently set goals for the whole.

As the number of social components multiplies, and change jolts and destabilizes the entire system, the power of subgroups to wreak havoc on the whole is tremendously amplified. There is, in the words of W. Ross Ashby, a brilliant cyberneticist, a mathematically provable law to the effect that "when a whole system is composed of a number of subsystems, the one that tends to dominate is the one that is *least* stable."

Another way of stating this is that, as the number of social components grows and change makes the whole system less stable, it becomes less and less possible to ignore the demands of political minorities

—hippies, blacks, lower-middle-class Wallacites, school teachers, or the proverbial little old ladies in tennis shoes. In a slower-moving, industrial context, America could turn its back on the needs of its black minority; in the new, fast-paced cybernetic society, this minority can, by sabotage, strike, or a thousand other means, disrupt the entire system. As interdependency grows, smaller and smaller groups within society achieve greater and greater power for critical disruption. Moreover, as the rate of change speeds up, the length of time in which they can be ignored shrinks to near nothingness. Hence: "Freedom now!"

This suggests that the best way to deal with angry or recalcitrant minorities is to open the system further, bringing them into it as full partners, permitting them to participate in social goal-setting, rather than attempting to ostracize or isolate them. A Red China locked out of the United Nations and the larger international community, is far more likely to destabilize the world than one laced into the system. Young people forced into prolonged adolescence and deprived of the right to partake in social decision-making will grow more and more unstable until they threaten the overall system. In short, in politics, in industry, in education, goals set without the participation of those affected will be increasingly hard to execute. The continuation of top-down technocratic goal-setting procedures will lead to greater and greater social instability, less and less control over the forces of change; an ever greater danger of cataclysmic, man-destroying upheaval.

To master change, we shall therefore need both a clarification of important long-range social goals *and* a democratization of the way in which we arrive at them. And this means nothing less than the next political revolution in the techno-societies—a breathtaking affirmation of popular democracy.

The time has come for a dramatic reassessment of the directions of change, a reassessment made not by the politicians or the sociologists or the clergy or the

elitist revolutionaries, not by technicians or college presidents, but by the people themselves. We need, quite literally, to "go to the people" with a question that is almost never asked of them: "What kind of a world do you want ten, twenty, or thirty years from now?" We need to initiate, in short, a continuing plebiscite on the future.

The moment is right for the formation in each of the high-technology nations of a movement for total self-review, a public self-examination aimed at broadening and defining in social, as well as merely economic, terms, the goals of "progress." On the edge of a new millennium, on the brink of a new stage of human development, we are racing blindly into the future. But where do we *want* to go?

What would happen if we actually tried to answer this question?

Imagine the historic drama, the power and evolutionary impact, if each of the high-technology nations literally set aside the next five years as a period of intense national self-appraisal; if at the end of five years it were to come forward with its own tentative agenda for the future, a program embracing not merely economic targets but, equally important, broad sets of social goals—if each nation, in effect, stated to the world what it wished to accomplish for its people and mankind in general during the remaining quarter century of the millennium.

Let us convene in each nation, in each city, in each neighborhood, democratic constituent assemblies charged with social stock-taking, charged with defining and assigning priorities to specific social goals for the remainder of the century.

Such "social future assemblies" might represent not merely geographical localities, but social units—industry, labor, the churches, the intellectual community, the arts, women, ethnic and religious groups, students, with organized representation for the unorganized as well. There are no sure-fire techniques for guaranteeing equal representation for all, or for eliciting the

wishes of the poor, the inarticulate or the isolated. Yet once we recognize the need to include them, we shall find the ways. Indeed, the problem of participating in the definition of the future is not merely a problem of the poor, the inarticulate and the isolated. Highly paid executives, wealthy professionals, extremely articulate intellectuals and students—all at one time or another feel cut off from the power to influence the directions and pace of change. Wiring them into the system, making them a part of the guidance machinery of the society, is the most critical political task of the coming generation. Imagine the effect if at one level or another a place were provided where all those who will live in the future might voice their wishes about it. Imagine, in short, a massive, global exercise in anticipatory democracy.

Social future assemblies need not—and, given the rate of transience—cannot be anchored, permanent institutions. Instead, they might take the form of ad hoc groupings, perhaps called into being at regular intervals with different representatives participating each time. Today citizens are expected to serve on juries when needed. They give a few days or a few weeks of their time for this service, recognizing that the jury system is one of the guarantees of democracy, that, even though service may be inconvenient, someone must do the job. Social future assemblies could be organized along similar lines, with a constant stream of new participants brought together for short periods to serve as society's "consultants on the future."

Such grass roots organisms for expressing the will of large numbers of hitherto unconsulted people could become, in effect, the town halls of the future, in which millions help shape their own distant destinies.

To some, this appeal for a form of neo-populism will no doubt seem naive. Yet nothing is more naive than the notion that we can continue politically to run the society the way we do at present. To some, it will appear impractical. Yet nothing is more imprac-

tical than the attempt to impose a humane future from above. What was naive under industrialism may be realistic under super-industrialism; what was practical may be absurd.

The encouraging fact is that we now have the potential for achieving tremendous breakthroughs in democratic decision-making if we make imaginative use of the new technologies, both "hard" and "soft," that bear on the problem. Thus, advanced tele-communications mean that participants in a social future assembly need not literally meet in a single room, but might simply be hooked into a communications net that straddles the globe. A meeting of scientists to discuss research goals for the future, or goals for environmental quality, could draw participants from many countries at once. An assembly of steelworkers, unionists and executives, convened to discuss goals for automation and for the improvement of work, itself, could link up participants from many mills, offices and warehouses, no matter how scattered or remote.

A meeting of the cultural community in New York or Paris—artists and gallery-goers, writers and readers, dramatists and audiences—to discuss appropriate long-range goals for the cultural development of the city could be shown, through the use of video recordings and other techniques, actual samples of the kinds of artistic production under discussion, architectural designs for new facilities, samples of new artistic media made available by technological advance, etc. What kind of cultural life should a great city of the future enjoy? What resources would be needed to realize a given set of goals?

All social future assemblies, in order to answer such questions, could and should be backed with technical staff to provide data on the social and economic costs of various goals, and to show the costs and benefits of proposed trade-offs, so that participants would be in a position to make reasonably informed choices, as it were, among alternative futures.

In this way, each assembly might arrive, in the end, not merely in vaguely expressed, disjointed hopes, but at coherent statements of priorities for tomorrow—posed in terms that could be compared with the goal statements of other groups.

Nor need these social future assemblies be glorified "talkfests." We are fast developing games and simulation exercises whose chief beauty is that they help players clarify their own values. At the University of Illinois, in Project Plato, Charles Osgood is experimenting with computers and teaching machines that would involve large sectors of the public in planning imaginary, preferable futures through gaming.

At Cornell University, José Villegas, a professor in the Department of Design and Environmental Analysis, has begun constructing with the aid of black and white students, a variety of "ghetto games" which reveal to the players the consequences of various proposed courses of action and thus help them clarify goals. *Ghetto 1984* showed what would happen if the recommendations made by the Kerner riot commission—the U. S. National Advisory Commission on Civil Disorder—were actually to be adopted. It showed how the sequence in which these recommendations were enacted would affect their ultimate impact on the ghetto. It helped players, both black and white, to identify their shared goals as well as their unresolved conflicts. In games like *Peru 2000* and *Squatter City 2000,* players design communities for the future.

In *Lower East Side,* a game Villegas hopes actually to play in the Manhattan community that bears that name, players would not be students, but real-life residents of the community—poverty workers, middle-class whites, Puerto Rican small businessmen or youth, unemployed blacks, police, landlords and city officials.

In the spring of 1969, 50,000 high school students in Boston, in Philadelphia and in Syracuse, New York, participated in a televised game involving a simulated

war in the Congo in 1975. While televised teams simulated the cabinets of Russia, Red China, and the United States, and struggled with the problems of diplomacy and policy planning, students and teachers watched, discussed, and offered advice via telephone to the central players.

Similar games, involving not tens, but hundreds of thousands, even millions of people, could be devised to help us formulate goals for the future. While televised players act out the role of high government officials attempting to deal with a crisis—an ecological disaster, for example—meetings of trade unions, women's clubs, church groups, student organizations and other constituencies might be held at which large numbers could view the program, reach collective judgments about the choices to be made, and forward those judgments to the primary players. Special switchboards and computers could pick up the advice or tabulate the yes-no votes and pass them on to the "decision-makers." Vast numbers of people could also participate from their own homes, thus opening the process to unorganized, otherwise non-participating millions. By imaginatively constructing such games, it becomes not only possible but practical to elicit futural goals from previously unconsulted masses.

Such techniques, still primitive today, will become fantastically more sophisticated in the years immediately ahead, providing us with a systematic way to collect and reconcile conflicting images of the preferable future, even from people unskilled in academic debate or parliamentary procedure.

It would be pollyanna-like to expect such town halls of the future to be tidy or harmonious affairs, or that they would be organized in the same way everywhere. In some places, social future assemblies might be called into being by community organizations, planning councils or government agencies. Elsewhere, they might be sponsored by trade unions, youth groups, or individual, future-oriented political leaders. In other places, churches, foundations or

voluntary organizations might initiate the call. And in still other places, they might arise not from a formal convention call, but as a spontaneous response to crisis.

It would similarly be a mistake to think of the goals drawn up by these assemblies as constituting permanent, Platonic ideals, floating somewhere in a metaphysical never-never land. Rather, they must be seen as temporary direction-indicators, broad objectives good for a limited time only, and intended as advisory to the elected political representatives of the community or nation.

Nevertheless, such future-oriented, future-forming events could have enormous political impact. Indeed, they could turn out to be the salvation of the entire system of representative politics—a system now in dire crisis.

The mass of voters today are so far removed from contact with their elected representatives, the issues dealt with are so technical, that even well educated middle-class citizens feel hopelessly excluded from the goal-setting process. Because of the generalized acceleration of life, so much happens so fast between elections, that the politician grows increasingly less accountable to "the folks back home." What's more, these folks back home keep changing. In theory, the voter unhappy with the performance of his representative can vote against him the next time around. In practice, millions find even this impossible. Mass mobility removes them from the district, sometimes disenfranchising them altogether. Newcomers flood into the district. More and more, the politician finds himself addressing new faces. He may never be called to account for his performance—or for promises made to the last set of constituents.

Still more damaging to democracy is the time-bias of politics. The politician's time horizon usually extends no further than the next election. Congresses, diets, parliaments, city councils—legislative bodies in general—lack the time, the resources, or the organiza-

tional forms needed to think seriously about the long-term future. As for the citizen, the last thing he is ever consulted about are the larger, more distant, goals of his community, state or nation.

The voter may be polled about specific issues, never about the general shape of the preferable future. Indeed, nowhere in politics is there an institution through which an ordinary man can express his ideas about what the distant future ought to look, feel or taste like. He is never asked to think about this, and on the rare occasions when he does, there is no organized way for him to feed his ideas into the arena of politics. Cut off from the future, he becomes a political eunuch.

We are, for these and other reasons, rushing toward a fateful breakdown of the entire system of political representation. If legislatures are to survive at all, they will need new links with their constituencies, new ties with tomorrow. Social future assemblies could provide the means for reconnecting the legislator with his mass base, the present with the future.

Conducted at frequent and regular intervals, such assemblies could provide a more sensitive measure of popular will than any now available to us. The very act of calling such assemblies would attract into the flow of political life millions who now ignore it. By confronting men and women with the future, by asking them to think deeply about their own private destinies as well as our accelerating public trajectories, it would pose profound ethical issues.

Simply putting such questions to people would, by itself, prove liberating. The very process of social assessment would brace and cleanse a population weary to death of technical discussions of how to get someplace it is not sure it wants to go. Social future assemblies would help clarify the differences that increasingly divide us in our fast-fragmenting societies; they would, conversely, identify common social needs —potential grounds for temporary unities. In this way, they would bring various polities together in a fresh

framework out of which new political mechanisms would inevitably spring.

Most important of all, however, social future assemblies would help shift the culture toward a more super-industrial time-bias. By focusing public attention for once on long-range goals rather than immediate programs alone, by asking people to choose a preferable future from among a range of alternative futures, these assemblies could dramatize the possibilities for humanizing the future—possibilities that all too many have already given up as lost. In so doing, social future assemblies could unleash powerful constructive forces—the forces of conscious evolution.

By now the accelerative thrust triggered by man has become the key to the entire evolutionary process on the planet. The rate and direction of the evolution of other species, their very survival, depends upon decisions made by man. Yet there is nothing inherent in the evolutionary process to guarantee man's own survival.

Throughout the past, as successive stages of social evolution unfolded, man's awareness followed rather than preceded the event. Because change was slow, he could adapt unconsciously, "organically." Today unconscious adaptation is no longer adequate. Faced with the power to alter the gene, to create new species, to populate the planets or depopulate the earth, man must now assume conscious control of evolution itself. Avoiding future shock as he rides the waves of change, he must master evolution, shaping tomorrow to human need. Instead of rising in revolt against it, he must, from this historic moment on, anticipate and design the future.

This, then, is the ultimate objective of social futurism, not merely the transcendence of technocracy and the substitution of more humane, more far-sighted, more democratic planning, but the subjection of the process of evolution itself to conscious human guidance. For this is the supreme instant, the turning

point in history at which man either vanquishes the processes of change or vanishes, at which, from being the unconscious puppet of evolution he becomes either its victim or its master.

A challenge of such proportions demands of us a dramatically new, a more deeply rational response toward change. This book has had change as its protagonist—first as potential villain and then, it would seem, as potential hero. In calling for the moderation and regulation of change, it has called for additional revolutionary changes. This is less paradoxical than it appears. Change is essential to man, as essential now in our 800th lifetime as it was in our first. Change is life itself. But change rampant, change unguided and unrestrained, accelerated change overwhelming not only man's physical defenses but his decisional processes—such change is the enemy of life.

Our first and most pressing need, therefore, before we can begin to gently guide our evolutionary destiny, before we can build a humane future, is to halt the runaway acceleration that is subjecting multitudes to the threat of future shock while, at the very same moment, intensifying all the problems they must deal with—war, ecological incursions, racism, the obscene contrast between rich and poor, the revolt of the young, and the rise of a potentially deadly mass irrationalism.

There is no facile way to treat this wild growth, this cancer in history. There is no magic medicine, either, for curing the unprecedented disease it bears in its rushing wake: future shock. I have suggested palliatives for the change-pressed individual and more radically curative procedures for the society—new social services, a future-facing education system, new ways to regulate technology, and a strategy for capturing control of change. Other ways must also be found. Yet the basic thrust of this book is diagnosis. For diagnosis precedes cure, and we cannot begin

to help ourselves until we become sensitively conscious of the problem.

These pages will have served their purpose if, in some measure, they help create the consciousness needed for man to undertake the control of change, the guidance of his evolution. For, by making imaginative use of change to channel change, we cannot only spare ourselves the trauma of future shock, we can reach out and humanize distant tomorrows.

ACKNOWLEDGMENTS

Among the more hallowed clichés of our time are the notions that an author's life is a lonely one, that his ideas spring from some mystical inner source, and that he writes under the spell of inspiration. Most professional writers know better. However well these descriptions may apply to other authors and other books, they do not apply to this one. *Future Shock* is a product of gregarious, face-to-face and mind-to-mind contact with hundreds of people, so many, in fact, in so many different universities, research institutes and offices, that it would be impossible for me to list them all.

Apart from my own, the single most important influence on the book has been that of my wife, Heidi, who has been not the proverbial "patient spouse who kept the children out of the authorial den," but, rather, an active intellectual partner in the enterprise, arguing through point after point, forcing me to clarify and integrate the concepts on which the book is based. As in the past, she also served as resident editor, reading or listening to each chapter, suggesting cuts, additions, and fresh insights. It is, in large measure, her book as well as mine.

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A special note of gratitude is owed to Professor Ellis L. Phillips of the Columbia University School of Law and to the Ellis L. Phillips Foundation for displaying superhuman patience, allowing me, again and again, to defer important commitments to the Foundation while completing this book.

NOTES

Bracketed [ ] numbers indicate items listed in the accompanying Bibliography. *Thus, in the* Notes *[1] will stand for the first item in the* Bibliography, Design for a Brain *by W. Ross Ashby.*

CHAPTER ONE

PAGE

12 The Thomson comparison appears in [175], p. 1.

13 Bagrit is quoted from *The New York Times,* March 17, 1965.

13 The Diebold item is from [57], p. 48.

13 Read's statement is found in his essay, "New Realms of Art" in [302], p. 77.

13 The Marek quote is from [165], pp. 20–21. A remarkable little book.

13 Boulding on post-civilization: [134], p. 7.

13 Boulding's reference to Julius Caesar is from "The Prospects of Economic Abundance," his lecture at the Nobel Conference, Gustavus Adolphus College, 1966.

14 Figures on US agricultural output are from "Malthus, Marx and the North American Breadbasket" by Orville Freeman in *Foreign Affairs,* July, 1967, p. 587.

15 There is, as yet, no widely accepted or wholly satisfactory term to describe the new stage of social development toward which we seem to be racing. Daniel Bell, the sociologist, coined the term "post-industrial" to signify a society in which the economy is largely based on service, the professional and technical classes dominate, theoretical knowledge is central, intellectual technology—systems analysis, model building, and the like—is highly developed, and technology is, at least potentially, capable of self-sustaining growth. The term has been criticized for suggesting that the society to come will no longer be technologically based—an implication that Bell specifically and carefully avoids.

PAGE

Kenneth Boulding's favorite term, "post-civilization," is employed to contrast the future society with "civilization"—the era of settled communities, agriculture, and war. The difficulty with "post-civilization" is its hint that what will follow will somehow be barbaric. Boulding rejects this mis-connotation as vigorously as Bell does his. Zbigniew Brzezinski's choice is the "technotronic society," by which he means one based heavily on advanced communications and electronics. The objection to this is that, in its heavy emphasis on technology, and, in fact, on a special form of technology, it does little to characterize the social aspects of the society.

Then, of course, there is McLuhan's "global village" and "electric age"—once again an attempt to describe the future in terms of one or two rather narrow dimensions: communications and togetherness. A variety of other terms are possible, too: transindustrial, post-economic, etc. My own choice, after all is said and done, is "super-industrial society." It, too, suffers from serious shortcomings. It is intended to mean a complex, fast-paced society dependent upon extremely advanced technology and a post-materialist value system.

15 Fourastié is quoted in [272], p. 28.

15 U Thant's statement is quoted in [217], p. 184.

CHAPTER TWO

19 The progeria case is reported in the Toronto *Daily Star,* March 8, 1967.

22 Huxley on the tempo of change is from [267], pp. viii-ix.

23 Data on growth of cities are from *Ekistics,* July, 1965, Table 4, p. 48.

23 Estimate of the rate of urbanization is from *World Health,* December, 1964, p. 4.

24 French productivity data from [283], p. 64.

26 Early transportation speeds are estimated in "Biggest Challenge: Getting Wisdom" by Peter Goldmark in *Printer's Ink,* May 29, 1964, p. 280. See also: [137], p. 61 and [151], p. 5 .

27 For material on the delay between invention and application, see [291], pp. 47–48.

27 The reference to Appert is drawn from "Radiation Preservation of Food" by S. A. Goldblith, *Science Journal,* January, 1966, p. 41.

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28 The Lynn study is reported briefly in "Our Accelerating Technological Change" by Frank Lynn, *Management Review,* March, 1967, pp. 67–70. See also: [64], pp.3–4.

28 Young's work is found in "Product Growth Cycles—A Key to Growth Planning" by Robert B. Young, Menlo Park, Calif.: Stanford Research Institute. Undated.

30 Data on book production are drawn from [206], p. 21, [200], p. 74, and [207], article on Incunabuli.

31 The rate of discovery of new elements is given in [146], Document I, p. 21.

34 Erikson's statement appears in [105], p. 197.

CHAPTER THREE

38 Data on the brain drain is from "Motivation Underlying the Brain Drain" [131], pp. 438, 447.

39 The passage of time as experienced by different age groups is discussed in "Subjective Time" by John Cohen in [342], p. 262.

40 Author's interviews with F. M. Esfandiary.

41 For further discussion of cultural differences in attitudes toward time, see "White People's Time, Colored People's Time" by Jules Henry in *Trans-action,* March-April, 1965, pp. 31–34.

42 On man's biological rhythms, see "The Physiological Control of Judgments of Duration: Evidence for a Chemical Clock" by Hudson Hoagland in [339].
The notion of "durational expectancy" is supported by research on the eating habits of the obese. Psychologist Stanley Schachter has shown, by making imaginative use of clocks that run at half the normal speed, that hunger is partly conditioned by one's perception of time. See: "Obesity and Eating" by Stanley Schachter in *Science,* August 23, 1968, pp. 751–756.

45 Albee and Clurman quotes are from the latter's essay on the former, *The New York Times,* November 13, 1966.

CHAPTER FOUR

51 The Barbie story is told in "Marketing Briefs," *Business Week,* March 11, 1967, p. 188.

55 Age of dwellings is discussed in "Homes of the Future" by E. F. Carter in [136], vol. 2, p. 35.

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55 Michael Wood has caught the spirit of transcience in his article, "America the Unreal" in *New Society*, April 14, 1966.

55 Auchincloss is quoted from *The New York Times*, March 17, 1966.

56 Buckminster Fuller's remark is from [146], Document 3, pp. 61–62.

58 Data on portable classrooms are drawn from *The Schoolhouse in the City*, a report of the Educational Facilities Laboratories, Inc. Not to be confused with [115].

60 For a description of the "thinkbelt" idea, see "Potteries Thinkbelt" by Cedric Price, *New Society*, June 2, 1966, p. 14.

62 The development of clip-on architecture is described by Reyner Banham in *Design Quarterly* 63. Minneapolis: Walker Art Center, 1965.

63 Data on the rental business are partially based on:
Correspondence with C. A. Siegfried, Jr., Executive Secretary, American Rental Association.
"You Name It—We Rent It" by Harland Manchester, *Reader's Digest*, July, 1966, p. 114.

66 *Svensk Damtidning*, November 2, 1965.

67 Rentalism has many unnoticed implications. A continuing swing toward rentalism could profoundly alter the balance of power between producer and consumer in many industries. The rise of vast rental organizations on a national and even international scale places a powerful new force between the producer and the ultimate consumer. Hertz and Avis, for example, operate such large fleets of autos and purchase on so large a scale, that they can win price, design, and service concessions from the manufacturers that no individual car buyer could hope to obtain. The same is true in any industry. Thus the formation of large rental organizations, by concentrating purchasing power, creates countervailing force in the precise Galbraithian sense of the term. This fact has not been overlooked by the American automotive manufacturers, at least one of which, Ford, has looked into the possibility of heading off this development by going directly into the rental business itself.

Even if manufacturers go into the rental business themselves, rentalism compels them to make revolutionary changes in organization and outlook. Whereas the ordinary producer need not concern himself

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too greatly with what happens to his product after it is sold, those who rent equipment are responsible for servicing it. This puts extreme pressure on them to improve the reliability of the product. In turn, this may require a radical reorientation of management thinking, right down to the design level.

Not long ago I interviewed the chief engineer of one of the largest corporations in the United States—a company which, like some computer manufacturers, rents its equipment directly to the user. I asked whether this had any implications for his engineering staff. His reply dramatically revealed the contrast between design for sale and design for rental:

> The first thing you have to do is change the attitude of the people you're hiring . . . A lot of engineers we hire from other industries come in here and are happy when they can save two cents for us by redesigning some part. We have to explain that cutting a corner like that could cost us a service call, and a service call costs us from $20 to $30 . . . It's a rough proposition to get people educated for high quality and reliability in the product after they've been trained in other ways. It boils down to this: we don't ship our headaches. Our headaches may go out the shipping door, but as long as we are responsible for servicing them, they remain our headaches.

The economics of rentalism could raise the quality of products and relieve consumers of the increasingly exasperating problems of service and repair.

But the implications of rentalism go even further, for they tend to speed up the already highly accelerated pace of technological change. The company that sells a product disposes of it once and for all. The company that rents a product may get that product back. Rental arrangements are short term. This mean that, if a technologically advanced model appears on the market, a renter can, with little difficulty, unburden himself of the old model and switch to the new. This raises for some manufacturers the specter of receiving thousands of their products back all at once—a terrifying prospect that compels them to pour a high percentage of their revenues into research and development in a frantic, never-ending effort to stay ahead of the pack. It is no accident that IBM, which rents its computers,

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or Xerox Corporation, which rents its copying machines, are both so deeply committed to R&D. As Joseph Wilson, president of Xerox, has put it: "We, not our customers, must assume the risk of obsolescence."

Rentalism also holds deep and as yet little known implications for the financial structure of any economy. It conjures up, for one thing, the image of a completely propertyless society. Whether this image is realistic or not, rentalism alters the flow of capital in the society. The manufacturer or rental organization advances capital for use by the consumer. This permits consumers to shift capital out of what economists term "real and personal property" and into securities. Indeed, if one imagines an entire society built on rentalism, in which vast rental organizations have become the pivots of power and profit, the best investment of all might turn out to be shares in the rental organizations.

70 Turner is quoted from [67], p. 41.

70 On brand switching and share of market see [67], p. 54.

71 The turnover of top brands is discussed in "Advertising, Competition, and the Anti-Trust Laws" by Henry Schachtre in *26 American Bar Association Anti-Trust Section,* p. 161.

71 Diebold's comments are in [57], pp. 19–20.

71 On rates of attrition among consumer products, see *The New York Times,* June 9, 1967; also *Time,* October 24, 1969, p. 92.

72 Theobald is quoted from [63], p. 29.

CHAPTER FIVE

75 The Fuller estimates are from [146], Document 3, pp. 28–29.

77 Transport problems of the developing nations are examined in "Immobility: Barrier to Development" by Wilfred Owen in [243], p. 30.

78 Drucker is quoted from [140], p. 92.

78 The nomadic city dweller is discussed in "Are We a Nation of Cities?" by Daniel Elazar, *Public Interest,* Summer, 1966, p. 53.

78 The figure on Americans who move is drawn from *Population Characteristics,* Series P–20, # 188. US Department of Commerce, August 14, 1969.

79 French data from "A Cohort Analysis of Geographical

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and Occupational Mobility" by Guy Pourcher in *Population*, March-April, 1966.

See also: Supplement to Chapter Five, "Les Moyens de Regulation de la Politique de l'Emploi" by Thérèse Join-Lambert and François Lagrange in *Review Française du Travail*, January-March, 1966, pp. 305–307.

81 Intra-US brain drain is examined in "An Exploratory Study of the Structure and Dynamics of the R&D Industry" by Albert Shapero, Richard P. Howell, and James R. Tombaugh. Menlo Park, California: Stanford Research Institute, June, 1964.

82 Whyte is quoted from [197], p. 269.

82 Jacobson story from *Wall Street Journal*, April 26, 1966.

A more recent study of executive mobility has found that a middle manager can anticipate being moved once every two to five years. One executive reported moving 19 times in 25 years. Eighty percent of the companies surveyed were increasing the rate of transfer. See paper by William F. Glueck in the *Journal of Management Studies*, Vol. 6, #2 or summary in *New Society*, July 17, 1969, p. 98.

84 Dichter's remark is from [76], p. 266.

85 Hitch-hikers: see "Traveling Girls" by Ellen Goyder, *New Society*, January 20, 1966, p. 5.

86 Touraine is quoted from *Acceptance and Resistance*, [49], p. 95.

86 Clark is cited in [249], p. 26.

88 The emotional response of the mover is the subject of "Grieving for a Lost Home" by Marc Fried in [241], p. 151, 160.

88 Interview with Monique Viot.

88 Clifton Fadiman's account appears in his essay, "Mining-Camp Megalopolis" in *Holiday*, October, 1965, p. 8.

88 For the Crestwood Heights study, see [236], p. 360.

88–89 Tyhurst's statement is from his paper "The Role of Transition States—Including Disasters—in Mental Illness" in [33], p. 154.

92 Dyckman's comment is found in "The Changing Uses of the City" in [173], p. 154.

93 The demise of geography has, of course, important implications for the future of the city. According to Melvin M. Webber, Professor of City Planning at Berkeley, "A new kind of large-scale urban society is emerging that is increasingly independent of the city . . . Because societies in the past had been

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spatially and locally structured, and because urban societies used to be exclusively city-based, we seem still to assume that territoriality is a necessary attribute of social systems." This, he argues, leads us to wholly misunderstand such urban problems as drug addiction, race riots, mental illness, poverty, etc. See his provocative essay, "The Post-City Age" in *Daedalus*, Fall, 1968, pp. 1091–1110.

93 Average residence duration is taken from "New Urban Structures" by David Lewis in [131], p. 313.

CHAPTER SIX

96 References to Weber, Simmel and Wirth are from [239], pp. 70–71.

98 Cox on limited involvements: [217], pp. 41–46.

102 On the number of people who preceded us, see "How Many People Have Lived on Earth?" by Nathan Keyfitz in *Demography*, 1966, vol 3, #2, p. 581.

104 Integrator concept and Gutman quote from "Population Mobility in the American Middle Class" by Robert Gutman in [241], pp. 175–182.

106 *Crestwood Heights* material is from [236], p. 365.

107 Barth quote from [216], pp. 13–14.

109 *Fortune* survey in [84], pp. 136–155.

110 I am indebted to Marvin Adelson, formerly Principal Scientist, System Development Corp., for the idea of occupational trajectories.

110 The quote from Rice is from "An Examination of the Boundaries of Part-Institutions" by A. K. Rice in *Human Relations*, vol. 4, #4, 1951, p. 400.

112 Job turnover among scientists and engineers discussed in "An Exploratory Study of the Structure and Dynamics of the R&D Industry" by Albert Shapero, Richard P. Howell, and James R. Tombaugh. Menlo Park, California: Stanford Research Institute, 1966, p. 117.

112 Westinghouse data from "Creativity: A Major Business Challenge" by Thomas J. Watson, Jr., *Columbia Journal of World Business*, Fall, 1965, p. 32.

112 British advertising turnover rates from "The Rat Race" by W. W. Daniel in *New Society*, April 14, 1966, p. 7.

112 Leavitt quoted from "Are Managers Becoming Obsolete?" by Harold F. Leavitt in *Carnegie Tech Quarterly*, November, 1963.

113 Company officials' quotes from "The Churning Market

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for Executives," by Seymour Freedgood in *Fortune*, September, 1965, pp. 152, 236. See also: [84], p. 71.

113 S.R.I. quote is from [183], p. 148.

116 Class differences in mobility are discussed in "The Human Measure," by Leonard Duhl in [51], p. 138 and in "Urban Design and Mental Health," by Leonard Duhl in *AIA Journal*, March, 1961, p. 48.

117 Lipset and Bendix [242], p. 249.

117 Warner quoted from [350], p. 51 and [96], p. 62.

120 Florence estimate is drawn from "The Pattern of Cities to Come," *New Society*, March 10, 1966, p. 6.

120 Gurevitch study and Milgram data can be found in "The Small-World Problem," by Stanley Milgram in *Psychology Today*, May, 1967, pp. 61–67.

120 The Nebraska study is detailed in "The Primary Relations of Middle-Class Couples," by Nicholas Babchuk and Alan P. Bates in [122], p. 126.

121 Pupil turnover: "The Schoolhouse in the City," a report by the Educational Facilities Laboratories, Inc., 1966, p. 8. Not to be confused with [115].

121 Whyte quote in [197], p. 383.

122 Moore study mentioned in *American Education*, April, 1967.

Poignant note on transcience from bulletin board of communal farm, U.S.A., Summer, 1969. Quoted in *Difficult But Possible Supplement to Whole Earth Catalog*, September, 1969, p. 23.

"I hope that this week is the Farm's lowest point for the summer, because if it gets any lower I don't have a decent place to live . . . I think of this as my (at least) temporary home. And I like my home to be clear of broken glass and papers, my tools and supplies put away, I like to keep track of my guests, take care of my animals . . . But this farm is far from that . . .

"Our average farmer (Asshole) says to himself: 'I'm here visiting (for a day, a week, a month or a year) and I'm not really a part of this farm, just a guest, so I can't do anything really effective about the Farm's condition . . .' I believe the key to the problem is: STABILITY LEADS TO A FEELING OF COMMUNITY.

"We have very little sense of community here . . . This is social decay: where the natural forces of the family (helping, loving, working together) are driven out by selfishness . . . I believe that the

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decay, the pigs-at-the-trough feeling, is caused by the INSTABILITY.

"When a stable group of ten lives together for weeks, natural forces work *for* community feeling. When the Farm is more than 20% tourists, when the family feeling is broken every day or two by departures and arrivals, I see no hope."

CHAPTER SEVEN

126 For Weber, see Chapter Eight in [256].

129 Zakon cited in "Finding Buyers for the Bad Buys," *Business Week*, September 13, 1969, pp. 49–51.

129 Organizational change is discussed in "Reorganizing for Results" by D. Ronald Daniel in *Harvard Business Review*, November-December, 1966, p. 96; also in "Patterns of Organization Change" by Larry E. Greiner in *Harvard Business Review*, May-June, 1967, pp. 119–120.

131 Gardner quoted from [39], p. 26.

134 On scientific task forces and the rise of "non-routine" industries, see "The Usefulness of Scientists" by Howard Reiss and Jack Balderston in *International Science and Technology*, May, 1966, p. 44; and a profile of George Kozmetsky in "How a Businessman Ramrods a B-School" in *Business Week*, May 24, 1969, p. 84.

135 Schon is quoted from [179], vol. 1, p. 106.

137 "The Decline of Hierarchy in Industrial Organizations" is discussed by William H. Read in *Business Horizons*, Fall, 1965, pp. 71–75.

142 For quotes from Warren Bennis on this page and in the remainder of Chapter Seven, see his articles: "Beyond Bureaucracy" in *Transaction*, July-August, 1965, pp. 31–35; and "Changing Organizations" in the *Journal of Applied Behavioral Science*, vol. 2, #3, p. 261. For more detailed treatment see [252].

146 Guzzardi is from [84], p. 71.

146 Gardner is quoted from [39], p. 83.

148 Pareto is quoted in [19], p. 231.

CHAPTER EIGHT

153–54 Not only are British prime ministers moving in and out of office faster since the days of Lloyd George, but the rate of turnover among other cabinet ministers has risen, too. According to political scientist Anthony King of the University of Essex, "Britain

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now has one of the most rapid rates of turnover in high ministerial office of any major country in the Western world—or the Eastern for that matter. The rate is considerably higher than in Britain before 1939 or 1914." See "Britain's Ministerial Turnover," *New Society*, August 18, 1966, p. 257.

154 Fishwick's quote is from "Is American History A Happening?" by Marshall Fishwick in *Saturday Review*, May 13, 1967, p. 20.

154 Klapp is cited from [228], pp. 251, 261.

156 Childe quoted from [203], pp. 108–109.

159 For information on childrearing, see [102], pp. 168–169.

159 The spread of Freudianism is discussed in [190], pp. 94–95.

161 Mr. Cornberg's quote can be found in "Libraries" by Alvin Toffler in *Bricks and Mortarboards*, A Report from Educational Facilities Laboratories, Inc., on College Planning and Building, p. 93.

166 For exposure to advertising messages see [65], pp. 5–6.

168 On the conference of composers and computer specialists, see *The New York Times*, November 14, 1966.

169 The acceleration of music is also commented on by David Riesman in [192], p. 178. Professional composers and musicians I have asked generally confirm the belief that, note for note, we are playing faster today. (We are also, for whatever *that* means, playing classical music at higher pitches.)

169 Quotes from Flexner are taken from an interview with the author.

171 The article on Sontag and "camp" appeared in *Time*, December 11, 1964, p. 75.

173 Hauser reference is from [208], vol. 4, p. 167.

174 The turnover of art schools is noted in "Stop Wasting Time" by Robert Hughes in *New Society*, February 2, 1967, pp. 170–171.

174 McHale's comments are from his essay "The Plastic Parthenon" (draft version) from *Lineastruttura*, June, 1966; and from his "The Expendable Ikon" in *Architectural Design*, February/March, 1959. See also [164].

177 Rate of conceptual turnover in science is drawn from [200], p. 163.

179 Comments on the costs of relearning are from "The Changing Nature of Human Nature" by Harold D. Lasswell in the *American Journal of Psychoanalysis*, vol. XXVI, #2, p. 164.

CHAPTER NINE

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188 On ocean mining and Spiess, see *The New York Times,* July 17, 1966; "Lure of a Lost World" in the *Kaiser Aluminum News,* #2, 1966; and "The Feedback between Technology and Values" by T. J. Gordon in [131], pp. 167–169. See also: "Aquaculture" by John Bardach, *Science,* September 13, 1968, pp. 1098–1106. Data on world fishing industry will be found in [130], p. 43.

191 Dr. Walter Orr Roberts is quoted from his essay "Science—the Wellspring of Our Discontent" in *Space Digest,* June, 1967, p. 78.

192 Statement by the American Meteorological Society is from "Forecast: Weatherman in the Sky" in *Time,* July 29, 1966, p. 18. See also: "Weather Modification" by Gordon J. F. MacDonald in *Science Journal,* January, 1968, p. 39.

193 For Capek, see [271].

193 Use of fish and dolphins is described in various issues of the *Bulletin of the Centre d'Etude des Consequences Generales des Grandes Techniques Nouvelles.* See especially #32, June, 1965; #33, August-September, 1965; and #35, January, 1966.

193 For data on communication between man and dolphin, see [294] and subsequent works by Lilly.

194 Thomson on animals: [175], p. 125.

194 Clarke's quote is from [137], p. 24.

149 Delgado's famed experiment is summarized in popular form in *Science Digest,* August, 1965, p. 38. See his book: [275].

195 Johnson is quoted from his paper, "Horizons of Industrial Microbiology" in *Impact,* vol. XVII, #3. For an excellent non-technical introduction to microbiology, see also: "Living Chemical Factories" by Robert K. Finn and Victor H. Edwards in *Engineering,* a Cornell University quarterly, Winter, 1968, vol. 2.

195 Tiselius quoted from his interview with the author.

196 Fourastié is cited from [78], p. 17.

197 Information on cloning is drawn from "Experimental Genetics and Human Evolution" by Joshua Lederberg, a mimeographed paper, Department of Genetics, Stanford University School of Medicine, and from author's interview with Lederberg.

200 The work of Hafez and Petrucci is reported in "On the Frontiers of Medicine," *Life,* September 10, 1965,

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and in "The New Man—What Will He Be Like," by Albert Rosenfeld, *Life*, October 1, 1965.

201 Cawein and the "blue people" are reported in *Medicine at Work*, vol. 6, #4.

201 Gordon is quoted from [149], p. 34.

202 William Tenn's comments on genetic architecture are from "The Playboy Panel—1984 and Beyond" in *Playboy*, July, 1963, p. 36.

202 Haldane and Lederberg are cited from [177], pp. 354, 362.

203 Sinsheimer's remarks are from "The End of the Beginning," his speech at the 75th Anniversary Conference of the California Institute of Technology.

204 On the likelihood of various horrors, Dr. Hotchkiss is quoted from *Science Digest*, October, 1965, p. 7; the controversy between Neyfakh and Petropavlovsky is described in "Spectre of a Genetic 'Arms Race'" by Victor Zorza in *Guardian Weekly*, December 13, 1969, p. 6.

206 Annual Report of the Russell Sage Foundation, 1967–1968, pp. 13, 15.

206 Lederberg is quoted here from his interview with the author.

206 Professor Kenedi is cited from [136], p. 204.

208 Pickering is quoted from his "Reflections on Research and the Future of Medicine," in *Science*, July 22, 1966, p. 442.

210 Robot material drawn in part from interviews with H. D. Block and his papers, including: "Bionics and Robots" in *Engineering*, a Cornell University quarterly, Winter, 1968; and "The Perceptron: A Model for Brain Functioning, I" in *Reviews of Modern Physics*, vol. 34, #1, pp. 123–135. See also: "The Psychology of Robots" by Henry Block and Herbert Ginsburg in *Psychology Today*, April, 1968, pp. 50–55.

210 On the controversy over computer chess, see *Alchemy and Artificial Intelligence* by Hubert L. Dreyfus, RAND Paper P–3244, the RAND Corporation, Santa Monica, California, 1964, and the *SICART Newsletter* of the Association for Computing Machinery, October and December, 1967.

212 For more on cybernetic medicine, see [285], p. 281.

212 Gordon cited from [149], p. 170.

213 Page is quoted from [285], p. 282. The RAND data are found in [155], pp. 56–57.

214 Quotes from Drs. White and Massopust are found

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in "The Dead Body and the Living Brain" by Oriana Fallaci in *Look*, November 28, 1967, p. 99.

215 Editor on the telephone and press coverage of Wright Brothers are described in [162], p. 11.

215 Newcomb quote is from [137], p. 2.

216 The infeasibility of the automobile is cited in [97], p. 177.

216 The millionth Ford: see [270], p. 151.

216 Rutherford is discussed in [306], p. 34.

CHAPTER TEN

222 Demby quotes from interviews with the author.

222 British Overseas Airways Corporation venture in experientialism is described in *The New York Times*, September 13 and 16, 1969.

229 "Hon" is described in the *Scandinavian Times*, August-September, 1966. The author visited the Moderna Museet during the summer of 1966 and "experienced" the show himself.

229 Cerebrum: the author donned the diaphanous robes on opening night. Cerebrum is described in the *Village Voice*, November 7, 1968, pp. 10–11.

231 The case of the topless prize is reported in *Sweden Now*, April, 1968, p. 6.

234 Stanford Research Institute quote is drawn from "A Social and Cultural Framework for 1975" by Ely M. Brandes and Arnold Mitchell in [183], p. 172.

235 For data on earlier maturation of children, see [166], pp. 39–40.

CHAPTER ELEVEN

238 Lundberg is quoted from [163], p. 295.

238 Wolf's remarks are from an interview with the author.

239 On leisure as a family-cement, see [183], p. 7.

239 Greenberg is quoted from an interview with the author.

240 Weitzen's comments are from his article, "The Programmed Child," in *Mademoiselle*, January, 1966, pp. 70–71.

240 The "multi-mouse" experiments are reported in *The New York Times*, May 30, 1968.

242 Margaret Mead on childlessness: from her paper "The Life Cycle and its Variations: The Division of Roles" in [132], p. 872.

245 For the novels of Skinner and Rimmer, see [125], [126], and [328].

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246 The work of the Ecumenical Institute is described in *The New York Times,* November 9, 1968.

248 The British Sexual Offenses Act became law on July 27, 1967.

250 Nelson Foote is cited in "The American Family Today" by Reuben Hill in [109], pp. 93–94.

252 The black civil rights worker is quoted from ". . . Because He was Black and I was White" by Elizabeth Sutherland in *Mademoiselle,* April, 1967, p. 244.

253 The Swedish article is from *Svensk Damtidning,* November 9, 1965. It is Part 4 of a five-part series entitled "Woman '85."

253 Keil and Lazure are both quoted in "Trial by Marriage," *Time,* April 14, 1967, p. 112.

258 Neugarten is quoted from her unpublished paper, "The Changing Age-Status System." On early childbearing, see also: [121], p. 68 and [118], p. 33.

CHAPTER TWELVE

263 The Ellul quotes can be found in [186], pp. 77, 80, and 93.

264 On Toynbee, see specifically: "Why I Dislike Western Civilization" by Arnold Toynbee in *The New York Times Magazine,* May 10, 1964.

265 For the Kenneth Schwartz quote, see his "Fragmentation of the Mass Market" in *Dun's Review,* July, 1962. See also: "More Sense About Market Segmentation" by William H. Reynolds in *Harvard Business Review,* September-October, 1965.

266 Saunders is cited in "Putting a New Face on the Office," *Business Week,* September 13, 1969, p. 152.

266 Yavitz is quoted from his article, "The Anomie of the 'Paper Factory' Worker." Hare's remarks are from his paper, "The Horse that Can Save More than a Kingdom." Both appear in the *Columbia Journal of World Business,* vol. VII, #3, pp. 32, 59

268 The Mustang quote is found in "Anti-technology" by Reyner Banham in *New Society,* May 4, 1967, p. 645; see also "Selling the Golden Calf" by Jeremy Bugler in *New Society,* October 17, 1968, p. 556.

269 McLuhan: from "The Future of Education" by Marshall McLuhan and George B. Leonard, *Look,* February 21, 1967, p. 23.

270 Data on literary diversity are from [206], p. 83.

271 McHale is quoted from his paper, "Education for

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Real" in the *World Academy of Art and Science Newsletter*, Transnational Forum, June, 1966, p. 3.

273 On tendencies toward differentiation in education, see "Decentralizing Urban School Systems" by Mario Fantini and Richard Magat; "The Community-Centered School" by Preston Wilcox; and "Alternatives to Urban Public Schools" by Kenneth Clark, all in [115].

277 London movies are discussed in "The Smaller the Better," *Economist*, January 11, 1969, p. 66.

On diversity of film fare, an advertisement placed in *The New York Times* of August 10, 1969, by Walter Reade, Jr., a leading film exhibitor, is worth quoting:

> The movie-goers of this country are not as homogeneous or as sophisticated as you might think . . . It isn't widely known but many films are designed and produced exclusively for specific regions of the country, and with specific audiences in mind.
>
> Two years ago there was a Don Knotts comedy called *The Ghost and Mr. Chicken*, a low-budget Hollywood film that earned a phenomenal $2.5 million—outside of New York. Who saw it? The Middle West and the South, in the 'grass roots' areas, which also like films about stock car racing, and with country music themes. Another Hollywood studio has been very successful with a series of 'beach party' and motorcycle films. These surface only briefly in New York but are a staple of suburban drive-in theaters and their predominantly under-25 audiences.
>
> The West Coast is offered dozens of Japanese films, because of its large Oriental population, while New York sees only one or two a year . . . What are we to make of the failure of *Isadora* in Los Angeles, and its success here? What of *The Shameless Old Lady*—successful here *and* Los Angeles, not so elsewhere?

277 An interesting experiment in providing radio services for small, homogeneous audiences has taken place in Buffalo, New York, where station WBFO-FM has set up a storefront studio in the black ghetto. There, people from the neighborhood, itself, produce six hours of programming aimed at informing their neighbors about job opportunities, health measures, black history and culture.

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278 Trends in the magazine industry are discussed in *The New York Times,* April 17, 1966, April 27, 1969; *The Wall Street Journal,* August 18, 1964; and in "Aiming at the Hip" in *Time,* June 2, 1967. See also: "Fat Days for the 'How-To' Publishers," *Business Week,* July 30, 1966; and "City Magazines are the Talk of the Town," *Business Week,* February 18, 1967.

279 On underground press, see "Admen Groove on Underground," in *Business Week,* April 12, 1969.

280 Moosmann is quoted from interview with the author.

282 For Naughton, see "Goodbye to Gutenberg" in *Newsweek,* January 24, 1966; Japanese developments are reported in *The Times* (London), December 12, 1969.

CHAPTER THIRTEEN

288 On surfers, see Nadeau [231], p. 144 and "Is J. J. Really King of the Surf" by Jordan Bonfante in *Life,* June 10, 1966, p. 81.

289 For a colorful account of life among the sky-divers, see "Death-Defying Sports of the Sixties" by Mario Puzo in *Cavalier,* December, 1965, p. 19.

289 Data on the decline of the society's overall commitment to work are to be found in [74], pp. 13–14.

290 Pynchon: [235].

290 Sheckley's story is found in [237].

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308 Klapp is quoted from [228], pp. 37–38.

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314 On the pressure of overchoice: The adoption of a style also relates to the conquest of unpredictability in the society. As the level of novelty around us rises, we become more uncertain of the behavior of other individuals, leading to a withdrawal of commitment, a fear of self-revelation or deep feelings. When young people don outlandish costumes, thrift-store gowns and kooky hats, they touch off a subtle fear among the "straights" in society because they announce, by their clothing, that their behavior is likely to be unpredictable. The strength of their attachment to their own subculture, at the same time, derives from the fact that within the group, unpredictability is reduced. They can make better predictions about the behavior of their peers and subcult colleagues than about the outside world.

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Adoption of a life style and the affiliation with a subcult can be seen as efforts to lower the level of novelty or unpredictability in the microenvironment.

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333 The death rate of spouses is studied in "The Mortality of Widowers" by Michael Young, Bernard Benjamin and Chris Wallis, in *Lancet*, August 31, 1963, pp. 454–456.

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335 Lubin is quoted from an interview with the author.

338 No discussion of the adaptive reaction and stress can overlook Dr. Hans Selye whose work laid the basis

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for much of the research conducted in recent years. His book [26] has become a classic.

A brief section on ACTH and its relation to stress appears in [10], p. 306. See also [12], pp. 330–334.

339 Levi's work is discussed in [20]; in "Life Stress and Urinary Excretion of Adrenaline and Noradrenaline" by Lennart Levi in [24]; and in "Conditions of Work and Their Influence on Psychological and Endocrine Stress Reactions" by J. Froberg, C. Karlsson, L. Levi, L. Lidberg and K. Seeman, Report #8, The Laboratory for Clinical Stress Research, Karolinska Sjukhuset, Stockholm, October, 1969.

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341 Data on the effects of crowding will be found in [343]. See also "Population Density and Social Pathology" by John B. Calhoun in [241]; and *The New York Times,* December 28, 1966.

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345 Swank is quoted in [25], pp. 38–39.

346 The Waco disaster is described in [23], p. 311.

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352 The breakdown of worker performance is described in [6], pp. 47–53.

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"Automation: Some underlying Psychological Processes," by E. D. Poulton, *Transactions* (Journal of the Association of Industrial Medical Officers) 15 (3) 96–99, 1965.

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A Note on Understimulation:

The emphasis in this chapter has been on the problems of overstimulation. What is striking to anyone who reads through the scientific literature is the similarity of human response to both high *and* low stimulation. Apparently, when men are pushed either above or below the adaptive range, they exhibit some of the same symptoms of distress. Thus psychologists have recently completed extensive studies of the men who live in the seven US outposts in Antarctica. The most inhospitable environment inhabited by man, Antarctica subjects these men to enforced monotony and understimulation. The Amundsen-Scott station at the South Pole is literally isolated from the rest of the world, except for sporadic radio communications, for ten months of the year. Temperatures plummet to as low as −100° (F) and the winds that sweep across the ice sometimes reach velocities of 100 mph. In all these outposts small groups of men are compelled to live indoors, in extremely close quarters, for protracted periods. Life inside these stations is probably as "changeless" as in any social environment in which modern men find themselves.

According to E. K. Eric Gunderson and Paul D. Nelson, in the studies noted above, "Under conditions of restricted stimulation and activity for prolonged periods, participants reported an increase in the incidence and severity of emotional and somatic symptoms, particularly on items reflecting sleep

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disturbances, depression, irritability, and anxiety." The men felt leaden and fatigued. Some suffered loneliness and depression. Many exhibited extremely short tempers, flaring easily into anger.

The chronicles of polar explorers confirm the picture of psychological distress. There are repeated references to "polar ennui" and frequent symptoms of withdrawal and deadly apathy. Admiral Byrd, for example, after five months of total isolation at a remote weather station, suffered a behavior breakdown whose effects lasted for months afterward. In his diary, Byrd wrote: "Mornings it's a tough job to drive myself out of the sleeping bag. I feel as if I had been drugged. But I tell myself, over and over again, that if I give in—if I let this stupor claim me—I may never awake . . . Why bother? . . . Why not let things drift? . . . That is the direction of everlasting peace. So why resist?" (Byrd, R. E., *Alone*, New York: Putnam, 1938.)

Significantly, one of the worst punishments known to man is solitary confinement—a situation in which the individual is not only cut off from the stimulation of social interaction, but deprived of change and novelty of any kind. For this reason, it is employed by interrogators and psychologists to "soften up" prisoners whom they wish to brainwash.

It was, in fact, the successful brainwashing of captured American troops by the Red Chinese and North Koreans during the Korean conflict that spurred research into "sensory deprivation."

The psychologist D. O. Hebb, a pioneer in this field, found that monotonous sensory stimulation produces confusion—a disruption of the ability to think clearly. His associates, Heron, Scott, Bexton and Doane, confirmed that stimuli-deprived subjects had difficulty concentrating. The volunteers reported anxiety, somatic complaints, occasional hallucinations, and difficulty in judging the passage of time.

Myers, a US Navy researcher, summarized a decade of sensory deprivation research: "Most subjects find sensory isolation difficult to endure, are tempted to withdrawal, and have little appetite to repeat the experience. . . . Subjects have unusual and compelling reactions. They experience severe tedium, restlessness, anxiety, difficulty in mental concentra-

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tion, blurring of the boundaries of sleeping and waking activities and of reality . . . Performance on intellectual tasks tends to decline . . ." In a word, according to Myers, "Sensory deprivation apparently increases the desire for informative stimulation, though not necessarily the desire for relatively redundant and meaningless stimulation." ("Sensory and Perceptual Deprivation" by Thomas I. Myers in [32]).

Moving out of the laboratory, we find that certain employees in advanced automated plants frequently exhibit similar symptoms of understimulation. These workers are compelled to spend many hours alone in control booths scanning a variety of dials and screens for signs of equipment breakdown. But while there are many signals for them to monitor, the signals are, by and large, repetitive and predictable. Only rarely is there an "abnormal" or novel signal. When novelty is too low, the worker's alertness fades and he increasingly misses or fails to report abnormalities. Boredom sets in, and his very self-confidence evaporates. He begins to doubt his own ability to distinguish between normal and abnormal signals. (See [6]).

There is convincing evidence, moreover, that when deprived of the necessary stimulation we will take action to create it. Like the laboratory monkey who pushes a lever hundreds of times per hour for no reward other than the opportunity to look out a window, man exhibits a deep-seated hunger for novelty when his environment becomes too changeless. He attempts to alter his surroundings, to create change, thereby bringing the level of stimulation back into the "adaptive range."

So strong is man's need to stay within the adaptive range that internal mechanisms sometimes take over when the external environment fails to provide the needed excitement. Recent scientific research suggests that dreaming is a way of boosting the level of arousal of the brain and body at a time when they are largely cut off from needed external stimuli. Something analogous to dreaming seems to occur even in unborn babies. Indeed, the "rapid eye movements" associated with dreaming occur more frequently in young children than in adults, and even more frequently in the foetus.

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This suggests that within the womb, the least externally stimulating environment of all, internal stimulation keeps the brain, the neutral network and the endocrine systems in action. Later, as the baby develops into an adult, as levels of external stimulation rise, and as the individual develops greater control over his external environment, dreaming and rapid eye movements tend to fall off in frequency.

To sum up: when the level of environmental stimulation or change falls below a certain point, the individual is forced below his adaptive range, he suffers distinct distress and takes action to increase the level of stimulation. When the level of environmental stimulation forces him above his adaptive range, he exhibits many of the same symptoms—anxiety, confusion, irritability, and eventual apathy. In this situation, as we see in Chapter 17, the individual strives to reduce stimulation. In short, all of us, from before the instant of birth to our very deathbed, wage a continuing, sometimes desperate, sometimes quite creative struggle to keep the level of stimulation from pushing us above or below our adaptive range.

CHAPTER SEVENTEEN

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393 Gardner on continuity is from [39], p. 6.

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394 Family ritual is examined in [5], p. 32.

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401 Dewey and Hutchins are quoted in [112], the dedication and p. 70.

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402 The significance of the clock is explored in "The Monastery and the Clock" by Lewis Mumford in [293], p. 61. See also the excellent paper entitled "Time, Work-Discipline, and Industrial Capitalism" by E. P. Thompson in *Past and Present,* December, 1967, pp. 56–97.

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424 The quote from Jungk is from his paper, "Technological Forecasting as a Tool of Social Strategy" in *Analysen und Prognosen*, January, 1969, p. 12.

425–26 For a fascinating account of experiments with future autobiographies of mental patients, see [345].

CHAPTER NINETEEN

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431 Lapp is quoted from [290], p. 29.

432 Lack of science policy is charged in OECD report [335]; see also *The New York Times*, January 13, 1968.

433 Technological likelihoods are discussed in [159], pp. 51–52.

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443 For detailed theoretical and historical studies of the problems of technological assessment, see the papers of Mayo, [323], [324], and [325]. See also: "Early Experiences with the Hazards of Medical Use of X-rays: 1896–1906" by Barbara Spencer Marx. Staff Discussion Paper 205. Program of Policy Studies in Science and Technology. Washington: George Washington University.

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447 Author's interview with Raymond Fletcher.

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448 For Harrington's argument see [318].

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Alvin Toffler, former Associate Editor of *Fortune*, has been a Visiting Professor at Cornell University and a Visiting Scholar at the Russell Sage Foundation. His books include *The Culture Consumers* and *The Schoolhouse in the City*. His articles have appeared in scholarly journals as well as such varied publications as *Life* and *Playboy*.