

toil Carlyle and the Pre-Raphaelites promulgated the doctrine of *Work* as a mystical social communion, and millionaires like Ruskin and Morris toiled like navvies for esthetic reasons. Marx was an impressionable recipient of these doctrines. Most bizarre of all the reversals in the great Victorian age of mechanization and high moral tone is the counter-strategy of Lewis Carroll and Edward Lear, whose nonsense has proved exceedingly durable. While the Lord Cardigans were taking their blood baths in the Valley of Death, Gilbert and Sullivan were announcing that the boundary break had been passed.

4 The Gadget Lover

Narcissus as Narcosis

The Greek myth of Narcissus is directly concerned with a fact of human experience, as the word *Narcissus* indicates. It is from the Greek word *narcosis*, or numbness. The youth Narcissus mistook his own reflection in the water for another person. This extension of himself by mirror numbed his perceptions until he became the servomechanism of his own extended or repeated image. The nymph Echo tried to win his love with fragments of his own speech, but in vain. He was numb. He had adapted to his extension of himself and had become a closed system.

Now the point of this myth is the fact that men at once become fascinated by any extension of themselves in any material other than themselves. There have been cynics who insisted that men fall deepest in love with women who give them back their own image. Be that as it may, the wisdom of the Narcissus myth does

41 not convey any idea that Narcissus fell

in love with anything he regarded as himself. Obviously he would have had very different feelings about the image had he known it was an extension or repetition of himself. It is, perhaps, indicative of the bias of our intensely technological and, therefore, narcotic culture that we have long interpreted the Narcissus story to mean that he fell in love with himself, that he imagined the reflection to be Narcissus!

Physiologically there are abundant reasons for an extension of ourselves involving us in a state of numbness. Medical researchers like Hans Selye and Adolphe Jonas hold that all extensions of ourselves, in sickness or in health, are attempts to maintain equilibrium. Any extension of ourselves they regard as "autoamputation," and they find that the autoamputative power or strategy is resorted to by the body when the perceptual power cannot locate or avoid the cause of irritation. Our language has many expressions that indicate this self-amputation that is imposed by various pressures. We speak of "wanting to jump out of my skin" or of "going out of my mind," being "driven batty" or "flipping my lid." And we often create artificial situations that rival the irritations and stresses of real life under controlled conditions of sport and play.

While it was no part of the intention of Jonas and Selye to provide an explanation of human invention and technology, they have given us a theory of disease (discomfort) that goes far to explain why man is impelled to extend various parts of his body by a kind of autoamputation. In the physical stress of superstimulation of various kinds, the central nervous system acts to protect itself by a strategy of amputation or isolation of the offending organ, sense, or function. Thus, the stimulus to new invention is the stress of acceleration of pace and increase of load. For example, in the case of the wheel as an extension of the foot, the pressure of new burdens resulting from the acceleration of exchange by written and monetary media was the immediate occasion of the extension or "amputation" of this function from our bodies. The wheel as a counter-irritant to increased burdens, in turn, brings about a new intensity of action by its amplification of a separate or isolated function (the feet in rotation). Such

amplification is bearable by the nervous system only through numbness or blocking of perception. This is the sense of the Narcissus myth. The young man's image is a self-amputation or extension induced by irritating pressures. As counter-irritant, the image produces a generalized numbness or shock that declines recognition. Self-amputation forbids self-recognition.

The principle of self-amputation as an immediate relief of strain on the central nervous system applies very readily to the origin of the media of communication from speech to computer.

Physiologically, the central nervous system, that electric network that coordinates the various media of our senses, plays the chief role. Whatever threatens its function must be contained, localized, or cut off, even to the total removal of the offending organ. The function of the body, as a group of sustaining and protective organs for the central nervous system, is to act as buffers against sudden variations of stimulus in the physical and social environment. Sudden social failure or shame is a shock that some may "take to heart" or that may cause muscular disturbance in general, signaling for the person to withdraw from the threatening situation.

Therapy, whether physical or social, is a counter-irritant that aids in that equilibrium of the physical organs which protect the central nervous system. Whereas pleasure is a counter-irritant (e.g., sports, entertainment, and alcohol), comfort is the removal of irritants. Both pleasure and comfort are strategies of equilibrium for the central nervous system.

With the arrival of electric technology, man extended, or set outside himself, a live model of the central nervous system itself. To the degree that this is so, it is a development that suggests a desperate and suicidal autoamputation, as if the central nervous system could no longer depend on the physical organs to be protective buffers against the slings and arrows of outrageous mechanism. It could well be that the successive mechanizations of the various physical organs since the invention of printing have made too violent and superstimulated a social experience for the central nervous system to endure.

In relation to that only too plausible cause of such develop-

ment, we can return to the Narcissus theme. For if Narcissus is numbed by his self-amputated image, there is a very good reason for the numbness. There is a close parallel of response between the patterns of physical and psychic trauma or shock. A person suddenly deprived of loved ones and a person who drops a few feet unexpectedly will both register shock. Both the loss of family and a physical fall are extreme instances of amputations of the self. Shock induces a generalized numbness or an increased threshold to all types of perception. The victim seems immune to pain or sense.

Battle shock created by violent noise has been adapted for dental use in the device known as *audiac*. The patient puts on headphones and turns a dial raising the noise level to the point that he feels no pain from the drill. The selection of a *single* sense for intense stimulus, or of a single extended, isolated, or "amputated" sense in technology, is in part the reason for the numbing effect that technology as such has on its makers and users. For the central nervous system rallies a response of general numbness to the challenge of specialized irritation.

The person who falls suddenly experiences immunity to all pain or sensory stimuli because the central nervous system has to be protected from any intense thrust of sensation. Only gradually does he regain normal sensitivity to sights and sounds, at which time he may begin to tremble and perspire and to react as he would have done if the central nervous system had been prepared in advance for the fall that occurred unexpectedly.

Depending on which sense or faculty is extended technologically, or "autoamputated," the "closure" or equilibrium-seeking among the other senses is fairly predictable. It is with the senses as it is with color. Sensation is always 100 per cent, and a color is always 100 per cent color. But the ratio among the components in the sensation or the color can differ infinitely. Yet if sound, for example, is intensified, touch and taste and sight are affected at once. The effect of radio on literate or visual man was to reawaken his tribal memories, and the effect of sound added to motion pictures was to diminish the role of mime, tactility, and kinesthesia. Similarly, when nomadic man turned to sedentary and specialist

ways, the senses specialized too. The development of writing and the visual organization of life made possible the discovery of individualism, introspection and so on.

Any invention or technology is an extension or self-amputation of our physical bodies, and such extension also demands new ratios or new equilibriums among the other organs and extensions of the body. There is, for example, no way of refusing to comply with the new sense ratios or sense "closure" evoked by the TV image. But the effect of the entry of the TV image will vary from culture to culture in accordance with the existing sense ratios in each culture. In audile-tactile Europe TV has intensified the visual sense, spurring them toward American styles of packaging and dressing. In America, the intensely visual culture, TV has opened the doors of audile-tactile perception to the non-visual world of spoken languages and food and the plastic arts. As an extension and expeditor of the sense life, any medium at once affects the entire field of the senses, as the Psalmist explained long ago in the 113th Psalm:

Their idols are silver and gold,
The work of men's hands.
They have mouths, but they speak not;
Eyes they have, but they see not;
They have ears, but they hear not;
Noses have they, but they smell not;
They have hands, but they handle not;
Feet have they, but they walk not;
Neither speak they through their throat.
They that make them shall be like unto them;
Yea, every one that trusteth in them.

The concept of "idol" for the Hebrew Psalmist is much like that of Narcissus for the Greek mythmaker. And the Psalmist insists that the *beholding* of idols, or the use of technology, conforms men to them. "They that make them shall be like unto them." This is a simple fact of sense "closure." The poet Blake developed the Psalmist's ideas into an entire theory of communication and social change. It is in his long poem of *Jerusalem* that he explains why men have become what they have beheld.

What they have, says Blake, is "the spectre of the Reasoning Power in Man" that has become fragmented and "separated from Imagination and enclosing itself as in steel." Blake, in a word, sees man as fragmented by his technologies. But he insists that these technologies are self-amputations of our own organs. When so amputated, each organ becomes a closed system of great new intensity that hurls man into "martyrdoms and wars." Moreover, Blake announces as his theme in *Jerusalem* the organs of perception:

If Perceptive Organs vary, Objects of Perception seem to vary:
If Perceptive Organs close, their Objects seem to close also.

To behold, use or perceive any extension of ourselves in technological form is necessarily to embrace it. To listen to radio or to read the printed page is to accept these extensions of ourselves into our personal system and to undergo the "closure" or displacement of perception that follows automatically. It is this continuous embrace of our own technology in daily use that puts us in the Narcissus role of subliminal awareness and numbness in relation to these images of ourselves. By continuously embracing technologies, we relate ourselves to them as servomechanisms. That is why we must, to use them at all, serve these objects, these extensions of ourselves, as gods or minor religions. An Indian is the servo-mechanism of his canoe, as the cowboy of his horse or the executive of his clock.

Physiologically, man in the normal use of technology (or his variously extended body) is perpetually modified by it and in turn finds ever new ways of modifying his technology. Man becomes, as it were, the sex organs of the machine world, as the bee of the plant world, enabling it to fecundate and to evolve ever new forms. The machine world reciprocates man's love by expediting his wishes and desires, namely, in providing him with wealth. One of the merits of motivation research has been the revelation of man's sex relation to the motorcar.

Socially, it is the accumulation of group pressures and irritations that prompt invention and innovation as counter-irritants.

War and the fear of war have always been considered the main incentives to technological extension of our bodies. Indeed, Lewis Mumford, in his *The City in History*, considers the walled city itself an extension of our skins, as much as housing and clothing. More even than the preparation for war, the aftermath of invasion is a rich technological period; because the subject culture has to adjust all its sense ratios to accommodate the impact of the invading culture. It is from such intensive hybrid exchange and strife of ideas and forms that the greatest social energies are released, and from which arise the greatest technologies. Buckminster Fuller estimates that since 1910 the governments of the world have spent 3½ trillion dollars on airplanes. That is 62 times the existing gold supply of the world.

The principle of numbness comes into play with electric technology, as with any other. We have to numb our central nervous system when it is extended and exposed, or we will die. Thus the age of anxiety and of electric media is also the age of the unconscious and of apathy. But it is strikingly the age of consciousness of the unconscious, in addition. With our central nervous system strategically numbed, the tasks of conscious awareness and order are transferred to the physical life of man, so that for the first time he has become aware of technology as an extension of his physical body. Apparently this could not have happened before the electric age gave us the means of instant, total field-awareness. With such awareness, the subliminal life, private and social, has been hoicked up into full view, with the result that we have "social consciousness" presented to us as a cause of guilt-feelings. Existentialism offers a philosophy of structures, rather than categories, and of total social involvement instead of the bourgeois spirit of individual separateness or points of view. In the electric age we wear all mankind as our skin.

psychological effects. Literate man undergoes much separation of his imaginative, emotional, and sense life, as Rousseau (and later the Romantic poets and philosophers) proclaimed long ago. Today the mere mention of D. H. Lawrence will serve to recall the twentieth-century efforts made to by-pass literate man in order to recover human "wholeness." If Western literate man undergoes much dissociation of inner sensibility from his use of the alphabet, he also wins his personal freedom to dissociate himself from clan and family. This freedom to shape an individual career manifested itself in the ancient world in military life. Careers were open to talents in Republican Rome, as much as in Napoleonic France, and for the same reasons. The new literacy had created an homogeneous and malleable milieu in which the mobility of armed groups and of ambitious individuals, equally, was as novel as it was practical.

10 Roads and Paper Routes

It was not until the advent of the telegraph that messages could travel faster than a messenger. Before this, roads and the written word were closely interrelated. It is only since the telegraph that information has detached itself from such solid commodities as stone and papyrus, much as money had earlier detached itself from hides, bullion, and metals, and has ended as paper. The term "communication" has had an extensive use in connection with roads and bridges, sea routes, rivers, and canals, even before it became transformed into "information movement" in the electric age. Perhaps there is no more suitable way of defining the character of the electric age than by first studying the rise of the idea of transportation as communication, and then the transition of the idea from transport to information by means of electricity. The word "metaphor" is from the Greek *meta* plus *pherein*, to carry across or transport. In this book we are

concerned with all forms of transport of goods and information, both as metaphor and exchange. Each form of transport not only carries, but translates and transforms, the sender, the receiver, and the message. The use of any kind of medium or extension of man alters the patterns of interdependence among people, as it alters the ratios among our senses.

It is a persistent theme of this book that all technologies are extensions of our physical and nervous systems to increase power and speed. Again, unless there were such increases of power and speed, new extensions of ourselves would not occur or would be discarded. For an increase of power or speed in any kind of grouping of any components whatever is itself a disruption that causes a change of organization. The alteration of social groupings, and the formation of new communities, occur with the increased speed of information movement by means of paper messages and road transport. Such speed-up means much more control at much greater distances. Historically, it meant the formation of the Roman Empire and the disruption of the previous city-states of the Greek world. Before the use of papyrus and alphabet created the incentives for building fast, hard-surface roads, the walled town and the city-state were natural forms that could endure.

Village and city-state essentially are forms that include all human needs and functions. With greater speed and, therefore, greater military control at a distance, the city-state collapsed. Once inclusive and self-contained, its needs and functions were extended in the specialist activities of an empire. Speed-up tends to separate functions, both commercial and political, and acceleration beyond a point in any system becomes disruption and breakdown. So when Arnold Toynbee turns, in *A Study of History*, to a massive documentation of "the breakdowns of civilizations," he begins by saying: "One of the most conspicuous marks of disintegration, as we have already noticed, is . . . when a disintegrating civilisation purchases a reprieve by submitting to forcible political unification in a universal state." Disintegration and reprieve, alike, are the consequence of ever faster movement of information by couriers on excellent roads.

Speed-up creates what some economists refer to as a *center-margin* structure. When this becomes too extensive for the generating and control center, pieces begin to detach themselves and to set up new center-margin systems of their own. The most familiar example is the story of the American colonies of Great Britain. When the thirteen colonies began to develop a considerable social and economic life of their own, they felt the need to become centers themselves, with their own margins. This is the time when the original center may make a more rigorous effort of centralized control of the margins, as, indeed, Great Britain did. The slowness of sea travel proved altogether inadequate to the maintenance of so extensive an empire on a mere center-margin basis. Land powers can more easily attain a unified center-margin pattern than sea powers. It is the relative slowness of sea travel that inspires sea powers to foster multiple centers by a kind of seeding process. Sea powers thus tend to create centers without margins, and land empires favor the center-margin structure. Electric speeds create centers everywhere. Margins cease to exist on this planet.

Lack of homogeneity in speed of information movement creates diversity of patterns in organization. It is quite predictable, then, that any new means of moving information will alter any power structure whatever. So long as the new means is everywhere available at the same time, there is a possibility that the structure may be changed without breakdown. Where there are great discrepancies in speeds of movement, as between air and road travel or between telephone and typewriter, serious conflicts occur within organizations. The metropolis of our time has become a test case for such discrepancies. If homogeneity of speeds were total, there would be no rebellion and no breakdown. With print, political unity via homogeneity became feasible for the first time. In ancient Rome, however, there was only the light paper manuscript to pierce the opacity, or to reduce the discontinuity, of the tribal villages; and when the paper supplies failed, the roads were vacated, as they were in our own age during gas-rationing. Thus the old city-state returned, and feudalism replaced republicanism.

It seems obvious enough that technical means of speed-up should wipe out the independence of villages and city-states. Whenever speed-up has occurred, the new centralist power always takes action to homogenize as many marginal areas as possible. The process that Rome effected by the phonetic alphabet geared to its paper routes has been occurring in Russia for the last century. Again, from the current example of Africa we can observe how very much visual processing of the human psyche by alphabetic means will be needed before any appreciable degree of homogenized social organization is possible. Much of this visual processing was done in the ancient world by nonliterate technologies, as in Assyria. The phonetic alphabet has no rival, however, as a translator of man out of the closed tribal echo-chamber into the neutral visual world of lineal organization.

The situation of Africa today is complicated by the new electronic technology. Western man is himself being de-Westernized by his own new speed-up, as much as the Africans are being detribalized by our old print and industrial technology. If we understood our own media old and new, these confusions and disruptions could be programmed and synchronized. The very success we enjoy in specializing and separating functions in order to have speed-up, however, is at the same time the cause of inattention and unawareness of the situation. It has ever been thus in the Western world at least. Self-consciousness of the causes and limits of one's own culture seems to threaten the ego structure and is, therefore, avoided. Nietzsche said understanding stops action, and men of action seem to have an intuition of the fact in their shunning the dangers of comprehension.

The point of the matter of speed-up by wheel, road, and paper is the extension of power in an ever more homogeneous and uniform space. Thus the real potential of the Roman technology was not realized until printing had given road and wheel a much greater speed than that of the Roman vortex. Yet the speed-up of the electronic age is as disrupting for literate, lineal, and Western man as the Roman paper routes were for tribal villagers. Our speed-up today is not a slow explosion outward from center to margins but an instant implosion and an interfusion

of space and functions. Our specialist and fragmented civilization of center-margin structure is suddenly experiencing an instantaneous reassembling of all its mechanized bits into an organic whole. This is the new world of the global village. The village, as Mumford explains in *The City in History*, had achieved a social and institutional extension of all human faculties. Speed-up and city aggregates only served to separate these from one another in more specialist forms. The electronic age cannot sustain the very low gear of a center-margin structure such as we associate with the past two thousand years of the Western world. Nor is this a question of values. If we understood our older media, such as roads and the written word, and if we valued their human effects sufficiently, we could reduce or even eliminate the electronic factor from our lives. Is there an instance of any culture that understood the technology that sustained its structure and was prepared to keep it that way? If so, that would be an instance of values or reasoned preference. The values or preferences that arise from the mere automatic operation of this or that technology in our social lives are not capable of being perpetuated.

In the chapter on the wheel it will be shown that transport without wheels had played a big role before the wheel, some of which was by sledge, over both snow and bogs. Much of it was by pack animal—woman being the first pack animal. Most wheelless transport in the past, however, was by river and by sea, a fact that is today as richly expressed as ever in the location and form of the great cities of the world. Some writers have observed that man's oldest beast of burden was woman, because the male had to be free to run interference for the woman, as ball-carrier, as it were. But that phase belonged to the prewheel stage of transport, when there was only the tractless waste of man the hunter and food-gatherer. Today, when the greatest volume of transport consists in the moving of information, the wheel and the road are undergoing recession and obsolescence; but in the first instance, given the pressure for, and from, wheels, there had to be roads to accommodate them. Settlements had created the impulse for exchange and for the increasing movement of raw material and produce from countryside to processing centers, where there

was division of labor and specialist craft skills. Improvement of wheel and road more and more brought the town to the country in a reciprocal spongelike action of give-and-take. It is a process we have seen in this century with the motorcar. Great improvements in roads brought the city more and more to the country. The road became a substitute for the country by the time people began to talk about "taking a spin in the country." With super-highways the road became a wall between man and the country. Then came the stage of the highway as city, a city stretching continuously across the continent, dissolving all earlier cities into the sprawling aggregates that desolate their populations today.

With air transport comes a further disruption of the old town-country complex that had occurred with wheel and road. With the plane the cities began to have the same slender relation to human needs that museums do. They became corridors of showcases echoing the departing forms of industrial assembly lines. The road is, then, used less and less for travel, and more and more for recreation. The traveler now turns to the airways, and thereby ceases to experience the act of traveling. As people used to say that an ocean liner might as well be a hotel in a big city, the jet traveler, whether he is over Tokyo or New York, might just as well be in a cocktail lounge so far as travel experience is concerned. He will begin to travel only after he lands.

Meantime, the countryside, as oriented and fashioned by plane, by highway, and by electric information-gathering, tends to become once more the nomadic trackless area that preceded the wheel. The beatniks gather on the sands to meditate *haiku*.

The principal factors in media impact on existing social forms are acceleration and disruption. Today the acceleration tends to be total, and thus ends space as the main factor in social arrangements. Toynbee sees the acceleration factor as translating the physical into moral problems, pointing to the antique road crowded with dog carts, wagons, and rickshaws as full of minor nuisance, but also minor dangers. Further, as the forces impelling traffic mount in power, there is no more problem of hauling and carrying, but the physical problem is translated into a psychological one as the annihilation of space permits easy annihilation

of travelers as well. This principle applies to all media study. All means of interchange and of human interassociation tend to improve by acceleration. Speed, in turn, accentuates problems of form and structure. The older arrangements had not been made with a view to such speeds, and people begin to sense a draining-away of life values as they try to make the old physical forms adjust to the new and speedier movement. These problems, however, are not new. Julius Caesar's first act upon assuming power was to restrict the night movement of wheeled vehicles in the city of Rome in order to permit sleep. Improved transport in the Renaissance turned the medieval walled towns into slums.

Prior to the considerable diffusion of power through alphabet and papyrus, even the attempts of kings to extend their rule in spatial terms were opposed at home by the priestly bureaucracies. Their complex and unwieldy media of stone inscription made wide-ranging empires appear very dangerous to such static monopolies. The struggles between those who exercised power over the hearts of men and those who sought to control the physical resources of nations were not of one time and place. In the Old Testament, just this kind of struggle is reported in the Book of Samuel (I, viii) when the children of Israel besought Samuel to give them a king. Samuel explained to them the nature of kingly, as opposed to priestly, rule:

This will be the manner of the King that shall reign over you: he will take your sons, and appoint them unto him for his chariots; and they shall run before his chariots: and he will appoint them unto him for captains of thousands, and captains of fifties; and he will set some to plough his ground, and to reap his harvest, and to make his instruments of war, and the instruments of his chariots. And he will take your daughters to be confectionaries, and to be cooks and to be bakers. And he will take your fields, and your vineyards, and your oliveyards, even the best of them, and give them to his servants.

Paradoxically, the effect of the wheel and of paper in organizing new power structures was not to decentralize but to centralize. A speed-up in communications always enables a

central authority to extend its operations to more distant margins. The introduction of alphabet and papyrus meant that many more people had to be trained as scribes and administrators. However, the resulting extension of homogenization and of uniform training did not come into play in the ancient or medieval world to any great degree. It was not really until the mechanization of writing in the Renaissance that intensely unified and centralized power was possible. Since this process is still occurring, it should be easy for us to see that it was in the armies of Egypt and Rome that a kind of democratization by uniform technological education occurred. Careers were then open to talents for those with literate training. In the chapter on the written word we saw how phonetic writing translated tribal man into a visual world and invited him to undertake the visual organization of space. The priestly groups in the temples had been more concerned with the records of the past and with the control of the inner space of the unseen than with outward military conquest. Hence, there was a clash between the priestly monopolizers of knowledge and those who wished to apply it abroad as new conquest and power. (This same clash now recurs between the university and the business world.) It was this kind of rivalry that inspired Ptolemy II to establish the great library at Alexandria as a center of imperial power. The huge staff of civil servants and scribes assigned to many specialist tasks was an antithetic and countervailing force to the Egyptian priesthood. The library could serve the political organization of empire in a way that did not interest the priesthood at all. A not-dissimilar rivalry is developing today between the atomic scientists and those who are mainly concerned with power.

If we realize that the city as center was in the first instance an aggregate of threatened villagers, it is then easier for us to grasp how such harassed companies of refugees might fan out into an empire. The city-state as a form was not a response to peaceful commercial development, but a huddling for security amidst anarchy and dissolution. Thus the Greek city-state was a tribal form of inclusive and integral community, quite unlike the specialist cities that grew up as extensions of Roman military

expansion. The Greek city-states eventually disintegrated by the usual action of specialist trading and the separation of functions that Mumford portrays in *The City in History*. The Roman cities began that way—as specialist operations of the central power. The Greek cities ended that way.

If a city undertakes rural trade, it sets up at once a center-margin relation with the rural area in question. That relation involves taking staples and raw produce from the country in exchange for specialist products of the craftsman. If, on the other hand, the same city attempts to engage in overseas trade, it is more natural to “seed” another city center, as the Greeks did, rather than to deal with the overseas area as a specialized margin or raw material supply.

A brief review of the structural changes in the organization of space as they resulted from wheel, road, and papyrus could go as follows: There was first the village, which lacked all of these group extensions of the private physical body. The village, however, was already a form of community different from that of food-gathering hunters and fishers, for villagers may be sedentary and may begin a division of labor and functions. Their being congregated is, itself, a form of acceleration of human activities which provides momentum for further separation and specialization of action. Such are the conditions for the extension of feet-as-wheel to speed production and exchange. These are, also, the conditions that intensify communal conflicts and ruptures that send men huddling into ever larger aggregates, in order to resist the accelerated activities of other communities. The villages are swept up into the city-state by way of resistance and for the purpose of security and protection.

The village had institutionalized all human functions in forms of low intensity. In this mild form everyone could play many roles. Participation was high, and organization was low. This is the formula for stability in any type of organization. Nevertheless, the enlargement of village forms in the city-state called for greater intensity and the inevitable separation of functions to cope with this intensity and competition. The villagers had all participated

in the seasonal rituals that in the city became the specialized Greek drama. Mumford feels that "The village measure prevailed in the development of the Greek cities, down to the fourth century . . ." (*The City in History*). It is this extension and translation of the human organs into the village model without loss of corporal unity that Mumford uses as a criterion of excellence for city forms in any time or locale. This biological approach to the man-made environment is sought today once more in the electric age. How strange that the idea of the "human scale" should have seemed quite without appeal during the mechanical centuries.

The natural tendency of the enlarged community of the city is to increase the intensity and accelerate functions of every sort, whether of speech, or crafts, or currency and exchange. This, in turn, implies an inevitable extension of these actions by subdivision or, what is the same thing, new invention. So that even though the city was formed as a kind of protective hide or shield for man, this protective layer was purchased at the cost of maximized struggle within the walls. War games such as those described by Herodotus began as ritual blood baths between the citizenry. Rostrum, law courts, and marketplace all acquired the intense image of divisive competition that is nowadays called "the rat race." Nevertheless, it was amidst such irritations that man produced his greatest inventions as counter-irritants. These inventions were extensions of himself by means of concentrated toil, by which he hoped to neutralize distress. The Greek word *ponos*, or "toil," was a term used by Hippocrates, the father of medicine, to describe the fight of the body in disease. Today this idea is called *homeostasis*, or equilibrium as a strategy of the staying power of any body. All organizations, but especially biological ones, struggle to remain constant in their inner condition amidst the variations of outer shock and change. The man-made social environment as an extension of man's physical body is no exception. The city, as a form of the body politic, responds to new pressures and irritations by resourceful new extensions—always in the effort to exert staying power, constancy, equilibrium, and *homeostasis*.

The city, having been formed for protection, unexpectedly generated fierce intensities and new hybrid energies from accelerated interplay of functions and knowledge. It burst forth into aggression. The alarm of the village, followed by the resistance of the city, expanded into the exhaustion and inertia of empire. These three stages of the disease and irritation syndrome were felt, by those living through them, as normal physical expressions of counter-irritant recovery from disease.

The third stage of struggle for equilibrium among the forces within the city took the form of empire, or a universal state, that generated the extension of human senses in wheel, road, and alphabet. We can sympathize with those who first saw in these tools a providential means of bringing order to distant areas of turbulence and anarchy. These tools would have seemed a glorious form of "foreign aid," extending the blessings of the center to the barbarian margins. At this moment, for example, we are quite in the dark about the political implications of Telstar. By outerring these satellites as extensions of our nervous system, there is an automatic response in all the organs of the body politic of mankind. Such new intensity of proximity imposed by Telstar calls for radical rearrangement of all organs in order to maintain staying power and equilibrium. The teaching and learning process for every child will be affected sooner rather than later. The time factor in every decision of business and finance will acquire new patterns. Among the peoples of the world strange new vortices of power will appear unexpectedly.

The full-blown city coincides with the development of writing—especially of phonetic writing, the specialist form of writing that makes a division between sight and sound. It was with this instrument that Rome was able to reduce the tribal areas to some visual order. The effects of phonetic literacy do not depend upon persuasion or cajolery for their acceptance. This technology for translating the resonating tribal world into Euclidean lineality and visibility is automatic. Roman roads and Roman streets were uniform and repeatable wherever they occurred. There was no adaptation to the contours of local hill or

custom. With the decline of papyrus supplies, the wheeled traffic stopped on these roads, too. Deprivation of papyrus, resulting from the Roman loss of Egypt, meant the decline of bureaucracy, and of army organization as well. Thus the medieval world grew up without uniform roads or cities or bureaucracies, and it fought the wheel, as later city forms fought the railways; and as we, today, fight the automobile. For new speed and power are never compatible with existing spatial and social arrangements.

Writing about the new straight avenues of the seventeenth-century cities, Mumford points to a factor that was also present in the Roman city with its wheeled traffic; namely, the need for broad straight avenues to speed military movements, and to express the pomp and circumstance of power. In the Roman world the army was the work force of a mechanized wealth-creating process. By means of soldiers as uniform and replaceable parts, the Roman military machine made and delivered the goods, very much in the manner of industry during the early phases of the industrial revolution. Trade followed the legions. More than that, the legions were the industrial machine, itself; and numerous new cities were like new factories manned by uniformly trained army personnel. With the spread of literacy after printing, the bond between the uniformed soldier and the wealth-making factory hand became less visible. It was obvious enough in Napoleon's armies. Napoleon, with his citizen-armies, was the industrial revolution itself, as it reached areas long protected from it.

The Roman army as a mobile, industrial wealth-making force created in addition a vast consumer public in the Roman towns. Division of labor always creates a separation between producer and consumer, even as it tends to separate the place of work and the living space. Before Roman literate bureaucracy, nothing comparable to the Roman consumer specialists had been seen in the world. This fact was institutionalized in the individual known as "parasite," and in the social institution of the gladiatorial games. (*Panem et circenses.*) The private sponge and the collective sponge, both reaching out for their rations of sensation,

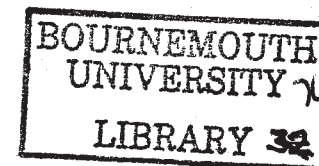
achieved a horrible distinctness and clarity that matched the raw power of the predatory army machine.

With the cutting-off of the supplies of papyrus by the Mohammedans, the Mediterranean, long a Roman lake, became a Muslim lake, and the Roman center collapsed. What had been the margins of this center-margin structure became independent centers on a new feudal, structural base. The Roman center collapsed by the fifth century A.D. as wheel, road, and paper dwindled into a ghostly paradigm of former power.

Papyrus never returned. Byzantium, like the medieval centers, relied heavily on parchment, but this was too expensive and scarce a material to speed commerce or even education. It was paper from China, gradually making its way through the Near East to Europe, that accelerated education and commerce steadily from the eleventh century, and provided the basis for "the Renaissance of the twelfth century," popularizing prints and, finally, making printing possible by the fifteenth century.

With the moving of information in printed form, the wheel and the road came into play again after having been in abeyance for a thousand years. In England, pressure from the press brought about hard-surface roads in the eighteenth century, with all the population and industrial rearrangement that entailed. Print, or mechanized writing, introduced a separation and extension of human functions unimaginable even in Roman times. It was only natural, therefore, that greatly increased wheel speeds, both on road and in factory, should be related to the alphabet that had once done a similar job of speed-up and specialization in the ancient world. Speed, at least in its lower reaches of the mechanical order, always operates to separate, to extend, and to amplify functions of the body. Even specialist learning in higher education proceeds by ignoring interrelationships; for such complex awareness slows down the achieving of expertness.

The post roads of England were, for the most part, paid for by the newspapers. The rapid increase of traffic brought in the railway, that accommodated a more specialized form of wheel than the road. The story of modern America that began with the dis-



covery of the white man by the Indians, as a wag has truly said, quickly passed from exploration by canoe to development by railway. For three centuries Europe invested in America for its fish and its furs. The fishing schooner and the canoe preceded the road and the postal route as marks of our North American spatial organization. The European investors in the fur trade naturally did not want the trapping lines overrun by Tom Sawyers and Huck Finns. They fought land surveyors and settlers, like Washington and Jefferson, who simply would not think in terms of mink. Thus the War of Independence was deeply involved in media and staple rivalries. Any new medium, by its acceleration, disrupts the lives and investments of whole communities. It was the railway that raised the art of war to unheard-of intensity, making the American Civil War the first major conflict fought by rail, and causing it to be studied and admired by all European general staffs, who had not yet had an opportunity to use railways for a general blood-letting.

War is never anything less than accelerated technological change. It begins when some notable disequilibrium among existing structures has been brought about by inequality of rates of growth. The very late industrialization and unification of Germany had left her out of the race for staples and colonies for many years. As the Napoleonic wars were technologically a sort of catching-up of France with England, the First World War was itself a major phase of the final industrialization of Germany and America. As Rome had not shown before, and Russia has shown today, militarism is itself the main route of technological education and acceleration for lagging areas.

Almost unanimous enthusiasm for improved routes of land transportation followed the War of 1812. Furthermore, the British blockade of the Atlantic coast had compelled an unprecedented amount of land carriage, thus emphasizing the unsatisfactory character of the highways. War is certainly a form of emphasis that delivers many a telling touch to lagging social attention. However, in the very Hot Peace since the Second War, it is the highways of the mind that have been found inadequate. Many have felt dissatisfaction with our educational methods since Sput-

nik, in exactly the same spirit that many complained about the highways during the War of 1812.

Now that man has extended his central nervous system by electric technology, the field of battle has shifted to mental image-making-and-breaking, both in war and in business. Until the electric age, higher education had been a privilege and a luxury for the leisured classes; today it has become a necessity for production and survival. Now, when information itself is the main traffic, the need for advanced knowledge presses on the spirits of the most routine-ridden minds. So sudden an upsurge of academic training into the marketplace has in it the quality of classical peripety or reversal, and the result has been a wild guffaw from the gallery and the campus. The hilarity, however, will die down as the Executive Suites are taken over by the Ph.D.s.

For an insight into the ways in which the acceleration of wheel and road and paper rescramble population and settlement patterns, let us glance at some instances provided by Oscar Handlin in his study *Boston's Immigrants*. In 1790, he tells us, Boston was a compact unit with all workers and traders living in sight of each other, so that there was no tendency to section residential areas on a class basis: "But as the town grew, as the outlying districts became more accessible, the people spread out and at the same time were localized in distinctive areas." That one sentence capsulates the theme of this chapter. The sentence can be generalized to include the art of writing: "As knowledge was spread out visually and as it became more accessible in alphabetic form, it was localized and divided into specialties." Up to the point just short of electrification, increase of speed produces division of function, and of social classes, and of knowledge.

At electric speed, however, all that is reversed. Implosion and contraction then replace mechanical explosion and expansion. If the Handlin formula is extended to power, it becomes: "As power grew, and as outlying areas became accessible to power, it was localized in distinctive delegated jobs and functions." This formula is a principle of acceleration at all levels of human organization. It concerns especially those extensions of our physical bodies that appear in wheel and road and paper messages. Now

that we have extended not just our physical organs but the nervous system, itself, in electric technology, the principle of specialism and division as a factor of speed no longer applies. When information moves at the speed of signals in the central nervous system, man is confronted with the obsolescence of all earlier forms of acceleration, such as road and rail. What emerges is a total field of inclusive awareness. The old patterns of psychic and social adjustment become irrelevant.

Until the 1820s, Handlin tells us, Bostonians walked to and fro, or used private conveyances. Horse-drawn buses were introduced in 1826, and these speeded up and extended business a great deal. Meantime the speed-up of industry in England had extended business into the rural areas, dislodging many from the land and increasing the rate of immigration. Sea transport of immigrants became lucrative and encouraged a great speed-up of ocean transport. Then the Cunard Line was subsidized by the British government in order to ensure swift contact with the colonies. The railways soon linked into this Cunard service, to convey mail and immigrants inland.

Although America developed a massive service of inland canals and river steamboats, they were not geared to the speeding wheels of the new industrial production. The railroad was needed to cope with mechanized production, as much as to span the great distances of the continent. The steam railroad as an accelerator proved to be one of the most revolutionary of all extensions of our physical bodies, creating a new political centralism and a new kind of urban shape and size. It is to the railroad that the American city owes its abstract grid layout, and the nonorganic separation of production, consumption, and residence. It is the motorcar that scrambled the abstract shape of the industrial town, mixing up its separated functions to a degree that has frustrated and baffled both planner and citizen. It remained for the airplane to complete the confusion by amplifying the mobility of the citizen to the point where urban space as such was irrelevant. Metropolitan space is equally irrelevant for the telephone, the telegraph, the radio, and television. What the town planners call "the human scale" in discussing ideal urban spaces is equally

unrelated to these electric forms. Our electric extensions of ourselves simply by-pass space and time, and create problems of human involvement and organization for which there is no precedent. We may yet yearn for the simple days of the automobile and the superhighway.

barians, and translated their sinuosities and obtusities into the uniformities of the visual culture of the Western world. It is this uniform, connected, and visual order that we still use as the norm of "rational" living. In our electric age of instant and non-visual forms of interrelation, therefore, we find ourselves at a loss to define the "rational," if only because we never noticed whence it came in the first place.

12
Clothing
Our Extended
Skin

Economists have estimated that an unclad society eats 40 per cent more than one in Western attire. Clothing as an extension of our skin helps to store and to channel energy, so that if the Westerner needs less food, he may also demand more sex. Yet neither clothing nor sex can be understood as separate isolated factors, and many sociologists have noted that sex can become a compensation for crowded living. Privacy, like individualism, is unknown in tribal societies, a fact that Westerners need to keep in mind when estimating the attractions of our way of life to nonliterate peoples.

Clothing, as an extension of the skin, can be seen both as a heat-control mechanism and as a means of defining the self socially. In these respects, clothing and housing are near twins, though clothing is both nearer and elder; for housing extends the inner heat-control mechanisms of our organism, while clothing is a more

direct extension of the outer surface of the body. Today Europeans have begun to dress for the eye, American-style, just at the moment when Americans have begun to abandon their traditional visual style. The media analyst knows why these opposite styles suddenly transfer their locations. The European, since the Second War, has begun to stress visual values; his economy, not coincidentally, now supports a large amount of uniform consumer goods. Americans, on the other hand, have begun to rebel against uniform consumer values for the first time. In cars, in clothes, in paperback books; in beards, babies, and beehive hairdos, the American has declared for stress on touch, on participation, involvement, and sculptural values. America, once the land of an abstractly visual order, is profoundly "in touch" again with European traditions of food and life and art. What was an *avant-garde* program for the 1920 expatriates is now the teenagers' norm.

The Europeans, however, underwent a sort of consumer revolution at the end of the eighteenth century. When industrialism was a novelty, it became fashionable among the upper classes to abandon rich, courtly attire in favor of simpler materials. That was the time when men first donned the trousers of the common foot soldier (or *pioneer*, the original French usage), but it was done at that time as a kind of brash gesture of social "integration." Up until then, the feudal system had inclined the upper classes to dress as they spoke, in a courtly style quite removed from that of ordinary people. Dress and speech were accorded a degree of splendor and richness of texture that universal literacy and mass production were eventually to eliminate completely. The sewing machine, for example, created the long straight line in clothes, as much as the linotype flattened the human vocal style.

A recent ad for C-E-I-R Computer Services pictured a plain cotton dress and the headline: "Why does Mrs. 'K' dress that way?"—referring to the wife of Nikita Khrushchev. Some of the copy of this very ingenious ad continued: "It is an icon. To its own underprivileged population and to the uncommitted of the East and South, it says: 'We are thrif-ty, simple, hon-est; peace-

ful, home-y, go-od.' To the free nations of the West it says: 'We will bury you.'"

This is precisely the message that the new simple clothing of our forefathers had for the feudal classes at the time of the French Revolution. Clothing was then a nonverbal manifesto of political upset.

Today in America there is a revolutionary attitude expressed as much in our attire as in our patios and small cars. For a decade and more, women's dress and hair styles have abandoned visual for iconic—or sculptural and tactual—stress. Like toreador pants and gaiter stockings, the beehive hairdo is also iconic and sensuously inclusive, rather than abstractly visual. In a word, the American woman for the first time presents herself as a person to be touched and handled, not just to be looked at. While the Russians are groping vaguely toward visual consumer values, North Americans are frolicking amidst newly discovered tactile, sculptural spaces in cars, clothes, and housing. For this reason, it is relatively easy for us now to recognize clothing as an extension of the skin. In the age of the bikini and of skin-diving, we begin to understand "the castle of our skin" as a space and world of its own. Gone are the thrills of strip-tease. Nudity could be naughty excitement only for a visual culture that had divorced itself from the audile-tactile values of less abstract societies. As late as 1930, four-letter words made visual on the printed page seemed portentous. Words that most people used every hour of the day became as frantic as nudity, when printed. Most "four-letter words" are heavy with tactile-involving stress. For this reason they seem earthy and vigorous to visual man. So it is with nudity. To backward cultures still embedded in the full gamut of sense-life, not yet abstracted by literacy and industrial visual order, nudity is merely pathetic. The Kinsey Report on the sex life of the male expressed bafflement that peasants and backward peoples did not relish marital or boudoir nudity. Khrushchev did not enjoy the can-can dance provided for his entertainment in Hollywood. Naturally not. That sort of mime of sense involvement is meaningful only to long-literate societies. Backward peoples approach nudity, if at all, with the attitude we have come

to expect from our painters and sculptors—the attitude made up of all the senses at once. To a person using the whole sensorium, nudity is the richest possible expression of structural form. But to the highly visual and lopsided sensibility of industrial societies, the sudden confrontation with tactile flesh is heady music, indeed.

There is a movement toward a new equilibrium today, as we become aware of the preference for coarse, heavy textures and sculptural shapes in dress. There is, also, the ritualistic exposure of the body indoors and out-of-doors. Psychologists have long taught us that much of our hearing takes place through the skin itself. After centuries of being fully clad and of being contained in uniform visual space, the electric age ushers us into a world in which we live and breathe and listen with the entire epidermis. Of course, there is much zest of novelty in this cult, and the eventual equilibrium among the senses will slough off a good deal of the new ritual, both in clothing and in housing. Meantime, in both new attire and new dwellings, our unified sensibility cavorts amidst a wide range of awareness of materials and colors which makes ours one of the greatest ages of music, poetry, painting, and architecture alike.

13

Housing

New Look and New Outlook

If clothing is an extension of our private skins to store and channel our own heat and energy, housing is a collective means of achieving the same end for the family or the group. Housing as shelter is an extension of our bodily heat-control mechanisms—a collective skin or garment. Cities are an even further extension of bodily organs to accommodate the needs of large groups. Many readers are familiar with the way in which James Joyce organized *Ulysses* by assigning the various city forms of walls, streets, civic buildings, and media to the various bodily organs. Such a parallel between the city and the human body enabled Joyce to establish a further parallel between ancient Ithaca and modern Dublin, creating a sense of human unity in depth, transcending history.

Baudelaire originally intended to call his *Fleurs du Mal*, *Les Limbes*, having in mind the city as corporate extensions of

our physical organs. Our letting-go of ourselves, self-alienations, as it were, in order to amplify or increase the power of various functions, Baudelaire considered to be flowers of growths of evil. The city as amplification of human lusts and sensual striving had for him an entire organic and psychic unity.

Literate man, civilized man, tends to restrict and enclose space and to separate functions, whereas tribal man had freely extended the form of his body to include the universe. Acting as an organ of the cosmos, tribal man accepted his bodily functions as modes of participation in the divine energies. The human body in Indian religious thought was ritually related to the cosmic image, and this in turn was assimilated into the form of house. Housing was an image of both the body and the universe for tribal and nonliterate societies. The building of the house with its hearth as fire-altar was ritually associated with the act of creation. This same ritual was even more deeply embedded in the building of the ancient cities, their shape and process having been deliberately modeled as an act of divine praise. The city and the home in the tribal world (as in China and India today) can be accepted as iconic embodiments of the *word*, the divine *mythos*, the universal aspiration. Even in our present electric age, many people yearn for this inclusive strategy of acquiring significance for their own private and isolated beings.

Literate man, once having accepted an analytic technology of fragmentation, is not nearly so accessible to cosmic patterns as tribal man. He prefers separateness and compartmented spaces, rather than the open cosmos. He becomes less inclined to accept his body as a model of the universe, or to see his house—or any other of the media of communication, for that matter—as a ritual extension of his body. Once men have adopted the visual dynamic of the phonetic alphabet, they begin to lose the tribal man's obsession with cosmic order and ritual as recurrent in the physical organs and their social extension. Indifference to the cosmic, however, fosters intense concentration on minute segments and specialist tasks, which is the unique strength of Western man. For the specialist is one who never makes small mistakes while moving toward the grand fallacy.

Men live in round houses until they become sedentary and specialized in their work organization. Anthropologists have often noted this change from round to square without knowing its cause. The media analyst can help the anthropologist in this matter, although the explanation will not be obvious to people of visual culture. The visual man, likewise, cannot see much difference between the motion picture and TV, or between a Corvair and a Volkswagen, for this difference is not between two visual spaces, but between tactile and visual ones. A tent or a wigwam is not an enclosed or visual space. Neither is a cave nor a hole in the ground. These kinds of space—the tent, the wigwam, the igloo, the cave—are not “enclosed” in the visual sense because they follow dynamic lines of force, like a triangle. When enclosed, or translated into visual space, architecture tends to lose its tactile kinetic pressure. A square is the enclosure of a visual space; that is, it consists of space properties abstracted from manifest tensions. A triangle follows lines of force, this being the most economical way of anchoring a vertical object. A square moves beyond such kinetic pressures to enclose visual space relations, while depending upon diagonal anchors. This separation of the visual from direct tactile and kinetic pressure, and its translation into new dwelling spaces, occurs only when men have learned to practice specialization of their senses, and fragmentation of their work skills. The square room or house speaks the language of the sedentary specialist, while the round hut or igloo, like the conical wigwam, tells of the integral nomadic ways of food-gathering communities.

This entire discussion is offered at considerable risk of misapprehension because these are, spatially, highly technical matters. Nevertheless, when such spaces are understood, they offer the key to a great many enigmas, past and present. They explain the change from circular-dome architecture to gothic forms, a change occasioned by alteration in the ratio or proportion of the sense lives in the members of a society. Such a shift occurs with the extension of the body in new social technology and invention. A new extension sets up a new equilibrium among all of the senses and faculties leading, as we say, to a “new outlook”—new attitudes and preferences in many areas.

In the simplest terms, as already noted, housing is an effort to extend the body's heat-control mechanism. Clothing tackles the problem more directly but less fundamentally, and privately rather than socially. Both clothing and housing store warmth and energy and make these readily accessible for the execution of many tasks otherwise impossible. In making heat and energy accessible socially, to the family or the group, housing fosters new skills and new learning, performing the basic functions of all other media. Heat control is the key factor in housing, as well as in clothing. The Eskimo's dwelling is a good example. The Eskimo can go for days without food at 50 degrees below zero. The unclad native, deprived of nourishment, dies in a few hours.

It may surprise many to learn that the primitive shape of the igloo is, nonetheless, traceable to the primus stove. Eskimos have lived for ages in round stone houses, and, for the most part, still do. The igloo, made of snow blocks, is a fairly recent development in the life of this stone-age people. To live in such structures became possible with the coming of the white man and his portable stove. The igloo is an ephemeral shelter, devised for temporary use by trappers. The Eskimo became a trapper only after he had made contact with the white man; up until then he had been simply a food-gatherer. Let the igloo serve as an example of the way in which a new pattern is introduced into an ancient way of life by the intensification of a single factor—in this instance, artificial heat. In the same way, the intensification of a single factor in our complex lives leads naturally to a new balance among our technologically extended faculties, resulting in a new look and a new "outlook" with new motivations and inventions.

In the twentieth century we are familiar with the changes in housing and architecture that are the result of electric energy made available to elevators. The same energy devoted to lighting has altered our living and working spaces even more radically. Electric light abolished the divisions of night and day, of inner and outer, and of the subterranean and the terrestrial. It altered every consideration of space for work and production as much as the other electric media had altered the space-time experience of

society. All this is reasonably familiar. Less familiar is the architectural revolution made possible by improvements in heating centuries ago. With the mining of coal on a large scale in the Renaissance, inhabitants in the colder climates discovered great new resources of personal energy. New means of heating permitted the manufacture of glass and the enlargement of living quarters and the raising of ceilings. The Burgher house of the Renaissance became at once bedroom, kitchen, workshop, and sale outlet.

Once housing is seen as group (or corporate) clothing and heat control, the new means of heating can be understood as causing change in spatial form. Lighting, however, is almost as decisive as heating in causing these changes in architectural and city spaces. That is the reason why the story of glass is so closely related to the history of housing. The story of the mirror is a main chapter in the history of dress and manners and the sense of the self.

Recently an imaginative school principal in a slum area provided each student in the school with a photograph of himself. The classrooms of the school were abundantly supplied with large mirrors. The result was an astounding increase in the learning rate. The slum child has ordinarily very little visual orientation. He does not see himself as becoming something. He does not envisage distant goals and objectives. He is deeply involved in his own world from day to day, and can establish no beachhead in the highly specialized sense life of visual man. The plight of the slum child, via the TV image, is increasingly extended to the entire population.

Clothing and housing, as extensions of skin and heat-control mechanisms, are media of communication, first of all, in the sense that they shape and rearrange the patterns of human association and community. Varied techniques of lighting and heating would seem only to give new flexibility and scope to what is the basic principle of these media of clothing and housing; namely, their extension of our bodily heat-control mechanisms in a way that enables us to attain some degree of equilibrium in a changing environment.

Modern engineering provides means of housing that range from the space capsule to walls created by air jets. Some firms now specialize in providing large buildings with inside walls and floors that can be moved at will. Such flexibility naturally tends toward the organic. Human sensitivity seems once more to be attuned to the universal currents that made of tribal man a cosmic skin-diver.

It is not only the *Ulysses* of James Joyce that testifies to this trend. Recent studies of the Gothic churches have stressed the organic aims of their builders. The saints took the body seriously as the symbolic vesture of the spirit, and they regarded the Church as a second body, viewing its every detail with great completeness. Before James Joyce provided his detailed image of the metropolis as a second body, Baudelaire had provided a similar "dialogue" between the parts of the body extended to form the metropolis, in his *Fleurs du Mal*.

Electric lighting has brought into the cultural complex of the extensions of man in housing and city, an organic flexibility unknown to any other age. If color photography has created "museums without walls," how much more has electric lighting created space without walls, and day without night. Whether in the night city, the night highway, or the night ball game, sketching and writing with light have moved from the domain of the pictorial photograph to the live, dynamic spaces created by out-of-door lighting.

Not many ages ago, glass windows were unknown luxuries. With light control by glass came also a means of controlling the regularity of domestic routine, and steady application to crafts and trade without regard to cold or rain. The world was put in a frame. With electric light not only can we carry out the most precise operations with no regard for time or place or climate, but we can photograph the submicroscopic as easily as we can enter the subterranean world of the mine and of the cave-painters.

Lighting as an extension of our powers affords the clearest-cut example of how such extensions alter our perceptions. If people are inclined to doubt whether the wheel or typography or the plane could change our habits of sense perception, their

doubts end with electric lighting. In this domain, the medium is the message, and when the light is on there is a world of sense that disappears when the light is off.

"Painting with light" is jargon from the world of stage-electricity. The uses of light in the world of motion, whether in the motorcar or the movie or the microscope, are as diverse as the uses of electricity in the world of power. Light is information without "content," much as the missile is a vehicle without the additions of wheel or highway. As the missile is a self-contained transportation system that consumes not only its fuel but its engine, so light is a self-contained communication system in which the medium is the message.

The recent development of the laser ray has introduced new possibilities for light. The laser ray is an amplification of light by intensified radiation. Concentration of radiant energy has made available some new properties in light. The laser ray—by thickening light, as it were—enables it to be modulated to carry information as do radio waves. But because of its greater intensity, a single laser beam can carry as much information as all the combined radio and TV channels in the United States. Such beams are not within the range of vision, and may well have a military future as a lethal agents.

From the air at night, the seeming chaos of the urban area manifests itself as a delicate embroidery on a dark velvet ground. Gyorgy Kepes has developed these aerial effects of the city at night as a new art form of "landscape by light through" rather than "light on." His new electric landscapes have complete congruity with the TV image, which also exists by light *through* rather than by light *on*.

The French painter André Girard began painting directly on film before the photographic movies became popular. In that early phase it was easy to speculate about "painting with light" and about introducing movement into the art of painting. Said Girard:

I would not be surprised if, fifty years from now, almost no one would pay attention to paintings whose subjects remain *still* in their always too-narrow frames.

The coming of TV inspired him anew:

Once I saw suddenly, in a control room, the sensitive eye of the camera presenting to me, one after another, the faces, the landscapes, the expressions of a big painting of mine in an order which I had never thought of. I had the feeling of a composer listening to one of his operas, all scenes mixed up in an order different from the one he wrote. It was like seeing a building from a fast elevator that showed you the roof before the basement, and made quick stops at some floors but not others.

Since that phase, Girard has worked out new techniques of control for painting with light in association with CBS and NBC technicians. The relevance of his work for housing is that it enables us to conceive of totally new possibilities for architectural and artistic modulation of space. Painting with light is a kind of housing-without-walls. The same electric technology, extended to the job of providing global thermostatic controls, points to the obsolescence of housing as an extension of the heat-control mechanisms of the body. It is equally conceivable that the electric extension of the process of collective consciousness, in making consciousness-without-walls, might render language walls obsolescent. Languages are stuttering extensions of our five senses, in varying ratios and wavelengths. An immediate simulation of consciousness would by-pass speech in a kind of massive extrasensory perception, just as global thermostats could by-pass those extensions of skin and body that we call houses. Such an extension of the process of consciousness by electric simulation may easily occur in the 1960s.

14

Money

The Poor Man's Credit Card

Central to modern psychoanalytical theory is the relation between the money complex and the human body. Some analysts derive money from the infantile impulse to play with feces. Ferenczi, in particular, calls money "nothing other than odorless dehydrated filth that has been made to shine." Ferenczi, in his concept of money, is elaborating Freud's concept of "Character and Anal Erotism." Although this idea of linking "filthy lucre" with the anal has continued in the main lines of psychoanalysis, it does not correspond sufficiently to the nature and function of money in society to provide a theme for the present chapter.

Money began in nonliterate cultures as a commodity, such as whales' teeth on Fiji; or rats on Easter Island, which later were considered a delicacy, were valued as a luxury, and thus became a means of mediation or barter. When the Spaniards were besieging Leyden in 1574, leather