FORM vs. FUNCTION, CONTENT vs. STRUCTURE

To ask questions which are addressed to form vs. function such as, "Do we grasp because we have hands or do we have hands because we grasp?" has proved quite fruitless in my opinion. I have not been as preoccupied with the content of culture as some of my colleagues, for it has been my experience that overemphasis on content often results in distortion. It also leads to failure to understand situations where content has been greatly diminished. This is the case with American Negro culture, for example. In fact, it is believed by many that American Negroes have no culture of their own simply because the visibly explicit content of their culture has been reduced. For such observers, the Spanish American in New Mexico who speaks English, sends his children to an urban school, lives in a modern house, and drives a Buick, has the same culture as his Anglo-American neighbors. While I take exception to this point of view, it has, in fact, been slowly changing, witness Glazer and Moynihan's book, *Beyond the Melting Pot*. The point I wish to make is subtle and offers many opportunities for misunderstanding. This is because I have generalized about groups that are clearly distinguishable from each other in some contexts (for the most part in their private life), and indistinguishable in others (predominantly in their public life), or where content is quite similar but structure varies. As the reader might suspect, proxemic patterns are only a few of the many differences that do enable people to distinguish one group from another.

For example, I have recently been conducting research on non-verbal communication between lower-class Negroes and lower middle-class whites. Differences in the handling of time represent a very common source of misunderstanding. In addition, the voice, the feet, hands, eyes, body, and space are all handled differently, which often causes even highly motivated Negroes to fail to get jobs for which they apply. These failures are not always because of prejudice, but can be traced to instances where both parties misread each other's behavior. In general, the Negro communications which my

students and I have been studying tend to be quite subtle so that even the signs reflecting the strength of the Negro's desire for a particular job may go undetected by the white interviewers who are looking for strong motivation as an important indicator that the applicant would do well. At times like these one can demonstrate the danger of overemphasizing content. The Negro is well aware of the fact that his white interlocutor is not "reading him." What he doesn't know is that while he may be more aware of the nuances of white-Negro interaction than the white man, there are many, many points at which he too is being miscued.

Because we Americans apparently direct our attention more toward content than structure or form, the importance of culture is often minimized. We tend to overlook the influence of the form of a building on the people in it, or the results of overcrowding on Negroes, or the consequences of having one's senses conditioned by Negro culture while trying to cope with "white" teachers and "white" educational materials. *Most important, we have consistently failed to accept the reality of different cultures within our national boundaries.* Negroes, Indians, Spanish Americans, and Puerto Ricans are treated as though they were recalcitrant, undereducated, middle-class Americans of northern European heritage instead of what they really are: members of culturally differentiated enclaves with their own communication systems, institutions, and values. Because we Americans have an "a-cultural bias" we believe only in the superficial differences between the peoples of the world. Not only do we miss much of the richness which comes from knowing others but often we are slow to correct our actions when difficulties begin to develop. Instead of pausing and taking a second look, we are apt to increase our earlier efforts, which can have serious, often unexpected consequences. Furthermore, preoccupation with the content of communications often blinds us to the adumbrative or foreshadowing functions of communication referred to in Chapter I. When people don't respond to adumbrative communications, emotional commitment moves from out-of-awareness to increasingly higher levels of awareness. It is at the point at which the ego is consciously involved that it is difficult to back out of a controversy; whereas the ability to

correctly assess adumbrative shifts smooths ruffled feathers before one is cognizant that a situation is even developing. In animals terrible fighting breaks out when adumbrative sequences are short-circuited. This happens with overcrowding or when strange animals are introduced into a stable situation.

MAN'S BIOLOGICAL PAST

Western man has set himself apart from nature and, therefore, from the rest of the animal world. He could have continued to ignore the realities of his animal constitution if it had not been for the population explosion, which has become particularly acute in the past twenty years. This, together with the implosion into our cities of poverty-stricken people from rural areas, has created a condition which has all the earmarks of population buildup and subsequent crash in the animal world. Americans in the 1930s and '40s used to fear economic cycles; today we may have more to be alarmed about in the population cycle.

Many ethologists have been reluctant to suggest that their findings apply to man, even though crowded, overstressed animals are known to suffer from circulatory disorders, heart attacks, and lowered resistance to disease. One of the chief differences between man and animals is that man has domesticated himself by developing his extensions and then proceeded to screen his senses so that he could get more people into a smaller space. Screening helps, but the ultimate buildup can still be lethal. The last instance of severe urban overcrowding over a significant period of time was in the Middle Ages, which were punctuated by disastrous plagues.

Harvard historian William Langer, in his article "The Black Death," states that from 1348 to 1350, after a period of rather rapid growth, the population of Europe was reduced one-quarter by the plague. Transmitted by fleas from rats to man, this disease was caused by a specific organism (*Bacillus pestis*). There is little agreement as to why the plague ended, and, while the relationship of man to the disease is certainly complex, there is something suggestive about the fact that the end of the plague coincided with social and architectural

changes that must have considerably reduced the stress of urban living. I am referring to the changes in the home described by Philippe Ariès which protected and solidified the family (see Chapter IX). These changed conditions bolstered by more stable political conditions did much to reduce the stress from crowded urban living.

If man does pay attention to animal studies, he can detect the gradually emerging outlines of an endocrine servomechanism not unlike the thermostat in his house. The only difference is that instead of regulating heat the endocrine control system regulates the population. The most significant discoveries of experimental ethologists whose works are described in Chapters II and III are the catastrophic physiological and behavioral consequences of population buildup prior to crash, and the advantages enjoyed by those animals which have a territory, a space of their own.

Recent reports by pathologists H. L. Ratcliffe and R. L. Snyder of the Philadelphia Zoo's Penrose Laboratory may be of interest. Their report on a twenty-five-year cause-of-death study of 16,000 birds and mammals demonstrates not only that a wide variety of animals are stressed from overcrowding but that they suffer from exactly the same diseases as man: high blood pressure, circulatory diseases, and heart disease, even when fed a low-fat diet.

The animal studies also teach us that crowding per se is neither good nor bad, but rather that overstimulation and disruptions of social relationships as a consequence of overlapping personal distances lead to population collapse. Proper screening can reduce both the disruption and the overstimulation, and permits much higher concentrations of populations. Screening is what we get from rooms, apartments, and buildings in cities. Such screening works until several individuals are crowded into one room; then a drastic change occurs. The walls no longer shield and protect, but instead press inward on the inhabitants.

By domesticating himself, man has greatly reduced the flight distance of his aboriginal state, which is an absolute necessity when population densities are high. The flight reaction (keeping distance between one's self and the enemy) is one of the most basic and successful ways of coping with

danger, but there must be sufficient space if it is to function. Through a process of taming, most higher organisms, including man, can be squeezed into a given area provided that they feel safe and their aggressions are under control. However, if men are made fearful of each other, fear resurrects the flight reaction, creating an explosive need for space. Fear, plus crowding, then produces panic.

Failure to appreciate the importance of the intimate relationship of man to his environment has led to tragic consequences in the past. Psychologist Marc Fried and sociologist Chester Hartman reported deep depression and grief on the part of the relocated Boston West Enders following the destruction of their urban village as part of a renewal program. It wasn't just the environment for which the West Enders grieved but the entire complex of relationships—building, streets, and people—as an integrated way of life. Their world had been shattered.

THE NEED FOR ANSWERS

In order to solve the many complex urban problems facing the United States today we must begin by questioning our basic assumptions concerning the relationship of man to his environment, as well as man's relationship to himself. Over two thousand years ago, Plato concluded that the most difficult task in the world was to know one's self. This truth has to be continually rediscovered; its implications are yet to be fully realized.

The discovery of self on the level of culture is possibly even more demanding than it is on the individual level. The difficulty of this task, however, should not cause us to slight its importance. Americans must be willing to underwrite and participate in team research on a massive scale directed toward learning more about the interrelationship of man and his environment. A point repeatedly stressed by the transactional psychologists has been *the error of assuming that these two were separate and not part and parcel of one interacting system* (see Kilpatrick's book, *Explorations in Transactional Psychology*).

In the words of Ian Mc Harg writing in "Man and His Environment" in *The Urban Condition:*

. . . no species can exist without an environment, no species can exist in an environment of its exclusive creation, no species can survive, save as a non-disruptive member of an ecological community. Every member must adjust to other members of the community and to the environment in order to survive. Man is not excluded from this test.

It isn't just that Americans must be willing to spend the money. Some deeper changes are called for which are difficult to define, such as a rekindling of the adventuresome spirit and excitement of our frontier days. For we are confronted with urban and cultural frontiers today. The question is, How can we develop them? Our past history of anti-intellectualism is costing us dearly, for the wilderness we must now master is one requiring brains rather than brawn. We need both excitement and ideas and we will discover that both are more apt to be found in people than in things, in structure than content, in involvement rather than in detachment from life.

Anthropologists and psychologists must discover how to compute peoples' involvement ratios in a reasonably simple way. It is known, for example, that some groups, such as the Italians and Greeks, are much more sensorially involved with each other than some other groups, such as the Germans and the Scandinavians. In order to plan intelligently we must have a quantitative measure of such involvement. Once we know how to compute involvement ratios, questions for which we will need answers are: What is maximum, minimum, and ideal density for rural, urban, and transition groups? What is the maximum viable size of the different groups living under urban conditions before normal social controls begin to break down? What different types of small communities are there? How related do they need to be? How are they integrated into larger wholes? In other words, how many different urban biotopes are there? Is the number unlimited or is it possible to categorize them? How can space be used

therapeutically to help relieve social tensions and cure social ills?

YOU CAN'T SHED CULTURE

In the briefest possible sense, the message of this book is that no matter how hard man tries it is impossible for him to divest himself of his own culture, for it has penetrated to the roots of his nervous system and determines how he perceives the world. Most of culture lies hidden and is outside voluntary control, making up the warp and weft of human existence. Even when small fragments of culture are elevated to awareness, they are difficult to change, not only because they are so personally experienced but *because people cannot act or interact at all in any meaningful way except through the medium of culture.*

Man and his extensions constitute one interrelated system. It is a mistake of the greatest magnitude to act as though man were one thing and his house or his cities, his technology or his language were something else. Because of the interrelationship between man and his extensions, it behooves us to pay much more attention to what kinds of extensions we create, not only for ourselves but for others for whom they may be ill suited. The relationship of man to his extensions is simply a continuation and a specialized form of the relationship of organisms in general to their environment. However, when an organ or process becomes extended, evolution speeds up at such a rate that it is possible for the extension to take over. This is what we see in our cities and in automation. This is what Norbert Wiener was talking about when he foresaw dangers in the computer, a specialized extension of part of man's brain. Because extensions are numb (and often dumb, as well), it is necessary to build feedback (research) into them so that we can know what is happening, particularly in regard to extensions that mold or substitute for the natural environment. This feedback must be strengthened both in our cities and in our conduct of interethnic relations.

The ethnic crisis, the urban crisis, and the education crisis

are interrelated. If viewed comprehensively all three can be seen as different facets of a larger crisis, a natural outgrowth of man's having developed a new dimension—*the cultural dimension*—most of which is hidden from view. The question is, How long can man afford to consciously ignore his own dimension?

APPENDIX

SUMMARY OF JAMES GIBSON'S
THIRTEEN VARIETIES OF PERSPECTIVE
AS ABSTRACTED FROM
THE PERCEPTION OF THE VISUAL WORLD

In the beginning of his book, Gibson says that there is no such thing as perception of space without a *continuous* background surface. Also, like the transactional psychologists, he observes that perception depends upon memory or past stimulation, i.e., it has a *past* that lays the foundation for the perceptions of here and how. He identifies thirteen varieties of perspective "sensory shifts"—visual impressions which accompany the perceptions of depth over a continuous surface and "depth at a contour." These sensory shifts and varieties of perspective are somewhat analogous to the large classes of the contrasting sounds that we call vowels and consonants. They constitute the basic structural categories of experience into which the more specific varieties of vision fit. In other words, a scene contains *information* that is built up out of a number of different elements. What Gibson has done is to analyze and describe the system and the component "stimulus variables" which combine to provide the information man needs in order to move about effectively and to do all that movement implies on the surface of our globe. The important thing is that Gibson has given us a complete system and not just unrelated parts of a system.

Gibson's sensory shift and varieties of perspective fall into four classes: perspective of position; perspective of parallax;

perspective independent of position or motion; and depth at a contour.

Many of these will be readily recognized by the reader. Their importance and the significance of their description is evidenced by the talent, energy, and emotion that have gone into the many different attempts on the part of painters to discover and describe these same principles. Spengler recognized this when he characterized spatial awareness as the prime symbol of Western culture. Writers like Conrad, who wanted to make his readers see what he had seen, and Melville, who was obsessed with communication, built and continue to build their visual imagery on the process described below.

A. *Perspectives of Position*

1. TEXTURE PERSPECTIVE. This is the gradual increase in the density of the texture of a surface as it recedes in the distance.

2. SIZE PERSPECTIVE. As the objects get farther away they decrease in size. (Apparently not fully recognized by the Italian painters in the twelfth century as applying to humans.)

3. LINEAR PERSPECTIVE. Possibly the most commonly known form of perspective in the Western world. Renaissance art is the best known for its incorporation of the so-called laws of perspective. Parallel lines like railroad tracks or highways that join at a single vanishing point at the horizon illustrate this form of perspective.

B. *Perspectives of Parallax*

4. BINOCULAR PERSPECTIVE. Binocular perspective operates very much out of awareness. It is sensed because, owing to the separation of the eyes, each projects a different image. The difference is much more apparent at close distances than at great distances. Closing and opening one eye and then the other makes the differences in the images apparent.

5. MOTION PERSPECTIVE. As one moves forward in space, the closer one approaches a stationary object, the faster it appears to move. Likewise, objects moving at uniform speeds appear to be moving more slowly as distance increases.

C. *Perspectives Independent of the Position or Motion of the Observer*

6. AERIAL PERSPECTIVE. Western ranchers used to have fun at the expense of dudes unfamiliar with regional differences in "aerial perspective." Untold numbers of these innocents would awaken refreshed and stimulated, look out the window and, seeing what looked like a nearby hill, announce that it was such a nice, clear morning they were going to walk to the hill and back before breakfast. Some were dissuaded. Others took off only to discover that the hill was little closer at the end of half an hour's walk than when they started. The "hill" proved to be a mountain anywhere from three to seven miles away and was seen in reduced scale because of an unfamiliar form of aerial perspective. The extreme clarity of the dry, high-altitude air altered the aerial perspective, giving the impression that everything was miles closer than it really was. From this we gather that aerial perspective is derived from the increased haziness and *changes in color* due to the intervening atmosphere. It is an indicator of distance but not as stable and reliable as some of the other forms of perspective.

7. THE PERSPECTIVE OF BLUR. Photographers and painters are more likely than laymen to be aware of perspective of blur. This form of visual space perception is evident when focusing on an object held out in front of the face, so that the background is blurred. Objects in a visual plane other than the one on which the eyes are focused will be seen less distinctly.

8. RELATIVE UPWARD LOCATION IN THE VISUAL FIELD. On the deck of a ship or on the plains of Kansas and eastern Colorado, the horizon is seen as a line at about eye level. The surface of the globe climbs, as it were, from one's feet to eye level. The further from the ground one is, the more pronounced this effect. In the context of everyday experience, one looks *down* at objects that are close and *up* to objects that are far away.

9. SHIFT OF TEXTURE OR LINEAR SPACING. A valley seen

over the edge of a cliff is perceived as more distant because of the break or rapid increase in texture density. Although several years have passed since I first saw a certain Swiss valley, I can recall clearly the bizarre sensations it produced. Standing on a grassy ledge, I looked down 1500 feet at the streets and houses of a village. Blades of grass were sharply etched in the visual field, while each blade was the width of one of the small houses.

10. SHIFT IN THE AMOUNT OF DOUBLE IMAGERY. If one looks at a distant point, everything between the viewer and the point will be seen as double. The closer to the viewer, the greater the doubling; the more distant the point, the less doubling. The gradient in the shift is a cue to distance; a steep gradient is read as close, a gradual gradient as far.

11. SHIFT IN THE RATE OF MOTION. One of the most dependable and consistent ways of sensing depth is the differential movement of objects in the visual field. Those objects which are close move much more than distant objects. They also move more quickly, as noted in Point 5. If two objects are seen as overlapping and they do not shift positions relative to each other when the viewer changes positions, they are either on the same plane or so far away that the shift is not perceived. Television audiences have become accustomed to perspective of this type because it is so pronounced whenever the camera moves through space in a manner similar to the moving viewer.

12. COMPLETENESS OR CONTUNUITY OF OUTLINE. One feature of depth perception that has been exploited during wartime is *continuity of outline*. Camouflage is deceptive because it breaks the continuity. Even if there is no texture difference, no shift in double imagery, and no shift in the rate of motion, the manner in which one object obscures (eclipses) another determines whether the one is seen as behind the other or not. If, for example, the *outline* of the nearest object is unbroken and that of the obscured objects is broken in the process of being eclipsed, this fact will cause one object to appear behind the other.

13. TRANSITIONS BETWEEN LIGHT AND SHADE. Just as an abrupt shift or change in the texture of an object in the

visual field will signal a cliff or an edge, so will an abrupt shift in *brightness* be interpreted as an edge. Gradual transitions in brightness are the principal means of perceiving molding or roundness.

BIBLIOGRAPHY AND REFERENCES

ALLEE, WARDER C. *The Social Life of Animals*. Boston: Beacon Press, 1958.

AMES, ADELBERT. *See* Kilpatrick.

APPLEYARD, DONALD, LYNCH, KEVIN, and MYER, JOHN R. *The View from the Road*. Cambridge: The MIT Press and Harvard University Press, 1963.

ARIÈS, PHILIPPE. *Centuries of Childhood*. New York: Alfred A. Knopf, 1962.

AUDEN, W. H. "Prologue: The Birth of Architecture." *About the House*. New York: Random House, 1965.

BAIN, A. D. "Dominance in the Great Tit, Parus Major." *Scottish Naturalist*, Vol. 61 (1949), pp. 369–472.

BAKER, A., DAVIES, R. L., and SIVADON, P. *Psychiatric Services and Architecture*. Geneva: World Health Organization, 1959.

BALINT, MICHAEL. "Friendly Expanses—Horrid Empty Spaces." *International Journal of Psychoanalysis*, 1945.

BARKER, ROGER G., and WRIGHT, HERBERT F. *Midwest and Its Children*. Evanston: Row, Peterson & Company, 1954.

BARNES, ROBERT D. "Thermography of the Human Body." *Science*, Vol. 140 (May 24, 1963), pp. 870–77.

BATESON, GREGORY. "Minimal Requirements for a Theory of Schizophrenia." *AMA Archives General Psychiatry*, Vol. 2 (1960), pp. 477–91.

BATESON, GREGORY, with JACKSON, D. D., HALEY, J., and WEAKLAND, J. H. "Toward a Theory of Schizophrenia." *Behavioral Science*, Vol. 1 (1956), pp. 251–64.

For description of Bateson's work and discussion of his term "double bind" see chapter by Don D. Jackson, "Interac-

tional Psychotherapy," in *Contemporary Psychotherapies*, edited by Morris I. Stein. New York: Free Press of Glencoe, 1961.

BENEDICT, RUTH. *Chrysanthemum and the Sword*. Boston: Houghton Mifflin, 1946.

BERKELEY, GEORGE (Bishop Berkeley). *A New Theory of Vision and Other Writings*. (Everyman's Library edition) New York: E. P. Dutton, 1922.

BIRDWHISTELL, RAYMOND, L. *Introduction to Kinesics*. Louisville: University of Louisville Press, 1952.

BLACK, JOHN W. "The Effect of Room Characteristics upon Vocal Intensity and Rate." *Journal of Acoustical Society of America*, Vol. 22 (March 1950), pp. 174–76.

BLOOMFIELD, LEONARD. *Language*. New York: H. Holt & Company, 1933.

BOAS, FRANZ. Introduction, *Handbook of American Indian Languages*. Bureau of American Ethnology Bulletin 40. Washington, D.C.: Smithsonian Institution, 1911.

—— *The Mind of Primitive Man*. New York: The Macmillan Company, 1938.

BOGARDUS, E. S. *Social Distance*. Yellow Springs, Ohio: Antioch Press, 1959.

BONNER, JOHN T. "How Slime Molds Communicate." *Scientific American*, Vol. 209, No. 2 (August 1963), pp. 84–86.

BRODEY, WARREN. "Sound and Space." *Journal of the American Institute of Architects*, Vol. 42, No. 1 (July 1964), pp. 58–60.

BRUNER, JEROME. *The Process of Education*. Cambridge: Harvard University Press, 1959.

BUTLER, SAMUEL. *The Way of All Flesh*. Garden City, N.Y.: Doubleday & Company, Inc.

CALHOON, S. W., and LUMLEY, F. H. "Memory Span for Words Presented Auditorially." *Journal of Applied Psychology*, Vol. 18 (1934), pp. 773–84.

CALHOUN, JOHN B. "A 'Behavioral Sink,'" in Eugene L. Bliss, ed., *Roots of Behavior*. New York: Harper & Brothers, 1962. Ch. 22.

—— "Population Density and Social Pathology." *Scientific American*, Vol. 206 (February 1962), pp. 139–46.

—— "The Study of Wild Animals under Controlled Condi-

tions." *Annals of the New York Academy of Sciences*, Vol. 51 (1950), pp. 113–22.

CANTRIL, HADLEY. *See* Kilpatrick.

CARPENTER, C. R. "Territoriality: A Review of Concepts and Problems," in A. Roe and G. G. Simpson, eds., *Behavior and Evolution*. New Haven: Yale University Press, 1958.

CARPENTER, EDMUND, VARLEY, FREDERICK, and FLAHERTY, ROBERT. *Eskimo*. Toronto: University of Toronto Press, 1959.

CHOMBART DE LAUWE, PAUL. *Famille et Habitation*. Paris: Editions du Centre National de la Recherche Scientific, 1959.

—— "Le Milieu Social et L'Etude Sociologique des Cas Individuels." *Informations Sociales*, Paris, Vol. 2 (1959), pp. 41–54.

CHRISTIAN, JOHN J. "The Pathology of Overpopulation." *Military Medicine*, Vol. 128, No. 7 (July 1963), pp. 571–603.

CHRISTIAN, JOHN J., and DAVIS, DAVID E. "Social and Endocrine Factors Are Integrated in the Regulation of Growth of Mammalian Populations." *Science*, Vol. 146 (December 18, 1964), pp. 1550–60.

CHRISTIAN, JOHN J., with FLYGER, VAGN, and DAVIS, DAVID E. "Phenomena Associated with Population Density." *Proceedings National Academy of Science*, Vol. 47 (1961), pp. 428–49.

—— "Factors in Mass Mortality of a Herd of Sika Deer (*Cervus nippon*)." *Chesapeake Science*, Vol. 1, No. 2 (June 1960), pp. 79–95.

DEEVEY, EDWARD S. "The Hare and the Haruspex: A Cautionary Tale," *Yale Review*, Winter 1960.

DE GRAZIA, SEBASTIAN. *Of Time, Work, and Leisure*. New York: Twentieth Century, 1962.

DELOS SECRETARIAT. "Report of the Second Symposion." Delos Secretariat, Athens Center of Ekistics, Athens, Greece (*See* Watterson).

DORNER, ALEXANDER. *The Way Beyond Art*. New York: New York University Press, 1958.

DOXIADIS, CONSTANTINOS A. *Architecture in Transition*. New York: Oxford University Press, 1963.

EIBL-EIBESFELDT, I. "The Fighting Behavior of Animals."

Scientific American, Vol. 205, No. 6 (December 1961), pp. 112–22.

EINSTEIN, ALBERT. Foreword, *Concepts of Space* by Max Jammer. New York: Harper Torch Books, 1960.

ERRINGTON, PAUL. *Muskrats and Marsh Management.* Harrisburg: Stackpole Company, 1961.

—— *Of Men and Marshes.* New York: The Macmillan Company, 1957.

—— "Factors Limiting Higher Vertebrate Populations." *Science,* Vol. 124 (August 17, 1956), pp. 304–07.

—— "The Great Horned Owl as an Indicator of Vulnerability in the Prey Populations." *Journal of Wild Life Management,* Vol. 2 (1938).

FRANK, LAWRENCE K. "Tactile Communications." *ETC. A Review of General Semantics,* Vol. 16 (1958), pp. 31–97.

FRIED, MARC. "Grieving for a Lost Home," in Leonard J. Duhl, ed., *The Urban Condition.* New York: Basic Books, 1963.

FRIED, MARC, with GLEICHER, PEGGY. "Some Sources of Residential Satisfaction in an Urban Slum." *Journal of the American Institute of Planners,* Vol. 27 (1961).

FULLER, R. BUCKMINSTER. *Education Automation.* Carbondale: Southern Illinois University Press, 1963.

—— *No More Secondhand God.* Carbondale: Southern Illinois University Press, 1963.

—— *Ideas and Integrities.* Englewood Cliffs, N.J.: Prentice-Hall, 1963.

—— *The Unfinished Epic of Industrialization.* Charlotte: Heritage Press, 1963.

—— *Nine Chains to the Moon.* Carbondale: Southern Illinois University Press, 1963.

GANS, HERBERT. *The Urban Villagers.* Cambridge: The MIT Press and Harvard University Press, 1960.

GAYDOS, H. F. "Intersensory Transfer in the Discrimination of Form." *American Journal of Psychology,* Vol. 69 (1956), pp. 107–10.

GELDARD, FRANK A. "Some Neglected Possibilities of Communication." *Science,* Vol. 131 (May 27, 1960), pp. 1583–88.

GIBSON, JAMES J. *The Perception of the Visual World.* Boston: Houghton Mifflin, 1950.

—— "Observations on Active Touch." *Psychological Review,* Vol. 69, No. 6 (November 1962), pp. 477–91.

—— "Ecological Optics," *Vision Research,* Vol. 1 (1961), pp. 253–62. Printed in Great Britain by Pergamon Press.

—— "Pictures, Perspective and Perception." *Daedalus,* Winter 1960.

GIEDION, SIGFRIED. *The Eternal Present: The Beginnings of Architecture,* Vol. II. New York: Bollingen Foundation, Pantheon Books, 1962.

GILLIARD, E. THOMAS. "Evolution of Bowerbirds." *Scientific American,* Vol. 209, No. 2 (August 1963), pp. 38–46.

—— "On the Breeding Behavior of the Cock-of-the-Rock (Aves, *Rupicola rupicola*)." *Bulletin of the American Museum of Natural History,* Vol. 124 (1962).

GLAZER, NATHAN, and MOYNIHAN, DANIEL PATRICK. *Beyond the Melting Pot.* Cambridge: The MIT Press and the Harvard University Press, 1963.

GOFFMAN, ERVING. *Behavior in Public Places.* New York: Free Press of Glencoe, 1963.

—— *Encounters.* Indianapolis: Bobbs-Merrill, 1961.

—— *The Presentation of Self in Everyday Life.* Garden City, N.Y.: Doubleday & Company, Inc., 1959.

GOLDFINGER, ERNO. "The Elements of Enclosed Space." *Architectural Review,* January 1942, pp. 5–9.

—— "The Sensation of Space. Urbanism and Spatial Order." *Architectural Review,* November 1941, pp. 129–31.

GROSSER, MAURICE. *The Painter's Eye.* New York: Rinehart & Company, 1951.

GRUEN, VICTOR. *The Heart of Our Cities.* New York: Simon and Schuster, 1964.

GUTKIND, E. H. *The Twilight of Cities.* New York: Free Press of Glencoe, 1962.

HALL, EDWARD T. *The Silent Language.* Garden City, N.Y.: Doubleday & Company, Inc., 1959.

—— "Adumbration in Intercultural Communication." The Ethnography of Communication, Special Issue, *American Anthropologist,* Vol. 66, No. 6, Part II (December 1964), pp. 154–63.

—— "Silent Assumptions in Social Communication." *Disorders of Communication*, Vol. XLII, edited by Rioch and Weinstein. Research Publications, Association for Research in Nervous and Mental Disease, Baltimore: Williams and Wilkins Company, 1964.

—— "A System for the Notation of Proxemic Behavior." *American Anthropologist*, Vol. 65, No. 5 (October 1963), pp. 1003–26.

—— "Proxemics—A Study of Man's Spatial Relationships," in I. Galdston, ed., *Man's Image in Medicine and Anthropology*. New York: International Universities Press, 1963.

—— "Quality in Architecture—An Anthropological View." *Journal of the American Institute of Architects*, July 1963.

—— "The Madding Crowd." *Landscape*, Fall 1962.

—— "The Language of Space." *Landscape*, Fall 1960.

HARTMAN, CHESTER W. "Social Values and Housing Orientations." *Journal of Social Issues*, January 1963.

HEDIGER, H. *Studies of the Psychology and Behavior of Captive Animals in Zoos and Circuses*. London: Butterworth & Company, 1955.

—— *Wild Animals in Captivity*. London: Butterworth & Company, 1950.

—— "The Evolution of Territorial Behavior," in S. L. Washburn, ed., *Social Life of Early Man*. New York: Viking Fund Publications in Anthropology, No. 31 (1961).

HELD, RICHARD, and FREEDMAN, S. J. "Plasticity in Human Sensory Motor Control." *Science*, Vol. 142 (October 25, 1963), pp. 455–62.

HESS, ECKHARD H. "Pupil Size as Related to Interest Value of Visual Stimuli." *Science*, Vol. 132 (1960), pp. 349–50.

HINDE, R. A., and TINBERGEN, NIKO. "The Comparative Study of Species—Specific Behavior," in A. Roe and G. G. Simpson, eds., *Behavior and Evolution*. New Haven: Yale University Press, 1958.

HOCKETT, CHARLES F., and ASHER, ROBERT. "The Human Revolution." *Current Anthropology*, Vol. 5, No. 3 (June 1964).

HOWARD, H. E. *Territory in Bird Life*. London: Murray, 1920.

HUGHES, RICHARD. *A High Wind in Jamaica*. New York: New American Library, 1961.

ITTELSON, WILLIAM H. *See* Kilpatrick.

IZUMI, K. "An Analysis for the Design of Hospital Quarters for the Neuropsychiatric Patient." *Mental Hospitals* (Architectural Supplement), April 1957.

JACOBS, JANE. *The Death and Life of Great American Cities*. New York: Random House, 1961.

JOOS, MARTIN. "The Five Clocks." *International Journal American Linguistics*, April 1962.

KAFKA, FRANZ. *The Trial*. New York: Alfred A. Knopf, 1948.

KAWABATA, YASUNARI. *Snow Country*. New York: Alfred A. Knopf, 1957.

KEENE, DONALD. *Living Japan*. Garden City, N.Y.: Doubleday & Company, Inc., 1959.

KEPES, GYORGY. *The Language of Vision*. Chicago: Paul Theobald, 1944.

KILPATRICK, F. P. *Explorations in Transactional Psychology*. New York: New York University Press, 1961. Contains articles by *Adelbert Ames, Hadley Cantril, William Ittelson, F. P. Kilpatrick*, and other transactional psychologists.

KLING, VINCENT. "Space: A Fundamental Concept in Design," in C. Goshen, ed., *Psychiatric Architecture*. Washington, D.C.: American Psychiatric Association, 1959.

KROEBER, ALFRED. *An Anthropologist Looks at History*, edited by Theodora Kroeber. Berkeley: University of California Press, 1963.

LA BARRE, WESTON. *The Human Animal*. Chicago: University of Chicago Press, 1954.

LANGER, WILLIAM L. "The Black Death." *Scientific American*, Vol. 210, No. 2 (February 1964), pp. 114–21.

LEONTIEV, A. N. "Problems of Mental Development." Moscow, USSR: RSFSR Academy of Pedagogical Sciences, 1959. (*Psychological Abstracts*, Vol. 36, p. 786.)

LEWIN, KURT, LIPPIT, RONALD, and WHITE, RALPH K. "Patterns of Aggressive Behavior in Experimentally Created 'Social Climates.'" *Journal of Social Psychology*, SPSSI Bulletin, Vol. 10 (1939), pp. 271–99.

LISSMAN, H. W. "Electric Location by Fishes." *Scientific American*, Vol. 208, No. 3 (March 1963), pp. 50–59.

LONDON COUNTY COUNCIL. *Administrative County of London Development Plan. First Review 1960*. London: The London County Council, 1960.

LORENZ, KONRAD. *Das Sogenannte Böse; Zur Naturgeschichte der Aggression*. (The biology of aggression.) Vienna: Dr. G. Borotha-Schoeler Verlag, 1964.

—— *Man Meets Dog*. Cambridge: Riverside Press, 1955.

—— *King Solomon's Ring*. New York: Crowell, 1952.

—— "The Role of Aggression in Group Formation," in Schaffner, ed., *Group Process*. Transactions of the fourth conference sponsored by Josiah Macy, Jr., Foundation. Princeton: 1957.

LYNCH, KEVIN. *The Image of the City*. Cambridge: The MIT Press and Harvard University Press, 1960.

McBRIDE, GLEN. *A General Theory of Social Organization and Behavior*. St. Lucia, Australia: University of Queensland Press, 1964.

McCULLOCH, WARREN S. "Teleological Mechanisms." *Annals of the New York Academy of Sciences*, Vol. 50, Art. 9 (1948).

McCULLOCH, WARREN S., and PITTS, WALTER. "How We Know Universals, the Perception of Auditory and Visual Forms." *Bulletin of Mathematical Biophysics*, Vol. 9 (1947), pp. 127–47.

Mc HARG, IAN. "Man and His Environment," in Leonard J. Duhl, ed., *The Urban Condition*. New York: Basic Books, 1963.

McLUHAN, MARSHALL. *Understanding Media*. New York: McGraw-Hill, 1964.

—— *The Gutenberg Galaxy*. Toronto: University of Toronto Press, 1963.

MATORÉ, GEORGES. *L'Espace Humain. L'expression de l'espace dans la vie, la pensée et l'art contemporains*. Paris: Editions La Colombe, 1961.

MEAD, MARGARET, and METRAUX, RHODA. *The Study of Culture at a Distance*. Chicago: University of Chicago Press, 1953.

MOHOLY-NAGY, LASZLO. *The New Vision*. New York: Wittenborn, Schultz, 1949.

MONTAGU, ASHLEY. *The Science of Man*. New York: Odyssey Press, 1964.

MOWAT, FARLEY. *Never Cry Wolf*. Boston: Atlantic Monthly Press. Little, Brown, 1963.

MUMFORD, LEWIS. *The City in History*. New York: Harcourt, Brace, 1961.

NORTHRUP, F. S. C. *Philosophical Anthropology and Practical Politics*. New York: The Macmillan Company, 1960.

OSMOND, HUMPHRY. "The Relationship Between Architect and Psychiatrist," in C. Goshen, ed., *Psychiatric Architecture*. Washington, D.C.: American Psychiatric Association, 1959.

—— "The Historical and Sociological Development of Mental Hospitals," in C. Goshen, ed., *Psychiatric Architecture*. Washington, D.C.: American Psychiatric Association, 1959.

—— "Function as the Basis of Psychiatric Ward Design." *Mental Hospitals* (Architectural Supplement), April 1957, pp. 23–29.

PARKES, A. S., and BRUCE, H. M. "Olfactory Stimuli in Mammalian Reproduction." *Science*, Vol. 134 (October 13, 1961), pp. 1049–54.

PIAGET, JEAN, and INHELDER, BARBEL. *The Child's Concept of Space*. London: Routledge & Kegan Paul, 1956.

PORTMANN, ADOLF. *Animal Camouflage*. Ann Arbor: University of Michigan Press, 1959.

RATCLIFFE, H. L., and SNYDER, ROBERT L. "Patterns of Disease, Controlled Populations, and Experimental Design." *Circulation*, Vol. XXVI (December 1962), pp. 1352–57.

REDFIELD, ROBERT, and SINGER, MILTON. "The Cultural Role of Cities," in Margaret Park Redfield, ed., *Human Nature and the Study of Society*, Vol. 1. Chicago: University of Chicago Press, 1962.

RICHARDSON, JOHN. "Braque Discusses His Art." *Realités*, August 1958, pp. 24–31.

ROSENBLITH, WALTER A. *Sensory Communication*. New York: The MIT Press and John Wiley & Sons, 1961.

ST.-EXUPÉRY, ANTOINE DE. *Flight to Arras.* New York: Reynal and Hitchcock, 1942.

—— *Night Flight.* New York: Century Printing Company, 1932.

SAPIR, EDWARD. *Selected Writings of Edward Sapir in Language, Culture and Personality.* Berkeley: University of California Press, 1949.

—— "The Status of Linguistics as a Science." *Language,* Vol. 5 (1929), pp. 209–10.

SCHÄFER, WILHELM. *Der kritische Raum und die kritische Situation in der tierischen Sozietät.* Frankfurt: Krämer, 1956.

SEARLES, HAROLD. *The Non-Human Environment.* New York: International Universities Press, 1960.

SEBEOK, T. "Evolution of Signaling Behavior." *Behavioral Science,* July 1962, pp. 430–42.

SELYE, HANS. *The Stress of Life.* New York: McGraw-Hill, 1956.

SHOEMAKER, H. "Social Hierarchy in Flocks of the Canary." *The Auk,* Vol. 56: pp. 381–406.

SINGER, MILTON. "The Social Organization of Indian Civilization." *Diogenes,* Spring 1964.

SMITH, CHLOETHIEL W. "Space." *Architectural Forum,* November 1948.

SMITH, KATHLEEN, and SINES, JACOB O. "Demonstration of a Peculiar Odor in the Sweat of Schizophrenic Patients." *AMA Archives of General Psychiatry,* Vol. 2 (February 1960), pp. 184–88.

SNOW, CHARLES PERCY. *The Two Cultures and the Scientific Revolution.* Cambridge, England: Cambridge University Press, 1959.

SNYDER, ROBERT. "Evolution and Integration of Mechanisms that Regulate Population Growth." *National Academy of Sciences,* Vol. 47 (April 1961), pp. 449–55.

SOMMER, ROBERT. "The Distance for Comfortable Conversation: A Further Study." *Sociometry,* Vol. 25 (1962).

—— "Leadership and Group Geography." *Sociometry,* Vol. 24 (1961).

—— "Studies in Personal Space," *Sociometry,* Vol. 22 (1959).

SOMMER, ROBERT, and ROSS, H. "Social Interaction on a Geriatric Ward." *International Journal of Social Psychology,* Vol. 4 (1958), pp. 128–33.

SOMMER, ROBERT, and WHITNEY, G. "Design for Friendship." *Canadian Architect,* 1961.

SOUTHWICK, CHARLES H. "Peromyscus leucopus: An Interesting Subject for Studies of Socially Induced Stress Responses." *Science,* Vol. 143 (January 1964), pp. 55–56.

SPENGLER, OSWALD. *The Decline of the West.* 2 vols. New York: Alfred A. Knopf, 1944.

THIEL, PHILIP. "A Sequence-Experience Notation for Architectural and Urban Space." *Town Planning Review,* April 1961, pp. 33–52.

THOREAU, HENRY DAVID. *Walden.* New York: The Macmillan Company, 1929.

Time MAGAZINE. "No Place Like Home," July 31, 1964, pp. 11–18.

TINBERGEN, NIKO. *Curious Naturalists.* New York: Basic Books, 1958.

—— "The Curious Behavior of the Stickleback." *Scientific American,* Vol. 187, No. 6 (December 1952), pp. 22–26.

TRAGER, GEORGE L., and BLOCH, BERNARD. *Outline of Linguistic Analysis.* Baltimore: Linguistic Society of America, 1942.

TRAGER, GEORGE L., and SMITH, HENRY LEE, JR. *An Outline of English Structure.* Norman: Battenburg Press, 1951.

TWAIN, MARK (SAMUEL L. CLEMENS). "Captain Stormfield's Visit to Heaven," in Charles Neider, ed., *The Complete Mark Twain.* New York: Bantam Books, 1958.

WARD, BARBARA. "The Menace of Urban Explosion." *The Listener,* Vol. 70, No. 1807 (November 14, 1963), pp. 785–87. London: British Broadcasting Corporation.

WATTERSON, JOSEPH. "Delos II. The Second Symposion to Explore the Problems of Human Settlements." *Journal of the American Institute of Architects,* March 1965, pp. 47–53.

WEAKLAND, J. H., and JACKSON, D. D. "Patient and Therapist Observations on the Circumstances of a Schizophrenic Episode." *AMA Archives Neurology and Psychiatry,* Vol. 79 (1958), pp. 554–75.

WHITE, THEODORE H. *The Making of the President 1960.* New York: Atheneum, 1961.

WHITEHEAD, ALFRED NORTH. *Adventures of Ideas.* New York: The Macmillan Company, 1933.

WHORF, BENJAMIN LEE. *Language, Thought, and Reality.* New York: The Technology Press and John Wiley & Sons, 1956.

—— "Linguistic Factors in the Terminology of Hopi Architecture." *International Journal of American Linguistics,* Vol. 19, No. 2 (April 1953).

—— "Science and Linguistics." *The Technology Review,* Vol. XLII, No. 6 (April 1940).

WIENER, NORBERT. *Cybernetics.* New York: John Wiley & Sons, 1948.

—— "Some Moral and Technical Consequences of Automation." *Science,* Vol. 131 (May 6, 1960), pp. 1355–59.

WYNNE-EDWARDS, V. C. *Animal Dispersion in Relation to Social Behavior.* New York: Hafner Publishing Company, 1962.

—— "Self-Regulatory Systems in Populations of Animals." *Science,* Vol. 147 (March 1965), pp. 1543–48.

ZUBEK, JOHN P., and WILGOSH, L. "Prolonged Immobilization of the Body Changes in Performance and in Electroencephalograms." *Science,* Vol. 140 (April 19, 1963), pp. 306–08.

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