Robert W. Kates   # Human perception
                                 of the environment

There is an environment in the minds of men. It encompasses the environment of sun and rain, bricks and mortar, people and things. For the human concerned, it is no less real than the external ambience despite its existence solely in the form of perceptions, cognitions, attitudes, beliefs and behaviour. It is the environment which men both respond to and seek to fashion.

The current explorations of human perception of environment by behavioural and social scientists are but fifteen years old, at the outside. The research field of environmental behaviour and sub-disciplines such as psychogeography and environmental psychology are in their infancy, most work having been published in the last five years. Nevertheless, major reviews of the literature are available, symposia volumes offer an immediate sampling of that literature, and at least one journal is now serving as a continuing source for reports of new work.[1]

The purpose of this article is to convey some of the diversity of human perceptions of the environment, to draw on specific studies in an attempt

1. Chronologically these reviews include: David Lowenthal, 'Geography, Experience and Imagination: Towards a Geographical Epistemology', *Annals of the Association of American Geographers*, Vol. 51, 1961, p. 241-60; Irving Rosow, 'The Social Effects of the Physical Environment', *Journal of the American Institute of Planners*, Vol. XXVII, No. 2, May 1961, p. 127-33; Mack Heyman, 'Space and Behavior', *Landscape*, Vol. 13, 1964, p. 4-10; Gilbert F. White, 'Formation and Role of Public Attitudes', *Environmental Quality in a Growing Economy*, p. 105-27, Baltimore, Md., Johns Hopkins Press, 1966; Robert W. Kates, 'Comprehensive Environmental Planning', Maynard M. Hufschmidt (ed.), *Regional Planning: Challenge and Prospects*, New York, Frederick A. Praeger, 1969; Thomas F. Saarinen, *Perception of Environment*, Washington, Association of American Geographers, 1969 (Commission on College Geography Resource Paper No. 5); Kenneth H. Craik, 'Environmental Psychology', *New Directions in Psychology*, Vol. IV, New York, Holt, Rinehart & Winston, 1970.

    The symposia include: W. Thomas (ed.), *Man's Role in Changing the Face of the Earth*, Chicago, Ill., University of Chicago Press, 1956; Robert W. Kates and J. F. Wohlwill (eds.), 'Man's Response to the Physical Environment', *The Journal of Social Issues*, Vol. 22, 1966; David Lowenthal (ed.), *Environmental Perception and Behavior*, Chicago, Ill., 1967 (University of Chicago Geography Research Paper No. 109); Gary J. Caster and Kenneth M. Muffett (eds.), *Response to Environment*, Raleigh, North Carolina State University, 1969 (Student Publication of the School of Design, Vol. 18).

    The new journal is *Environment and Behavior*, Beverly Hills, Calif., Sage Publications.

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to clarify how human beings in different social and cultural settings perceive the environment and react to it. For this purpose, I have selected four research themes from the body of literature: the use of illusion to infer the reality of visual perception, the quest for the image of the city, the interplay of environmental attitudes and landscapes, and the adjustment to drought as environmental behaviour. These themes were selected for their comparative cultural context, subsuming most of the cross-cultural effort found in behavioural studies of the environment. In addition, each theme presents a different environmental focus: person; city; landscape; natural resource and hazard. Each reflects a different scale of cognitive generalization: perception; image; attitude; and behaviour. Each draws from a different set of disciplinary and methodological sources: psychology; architecture-planning; cultural geography; art and literary history; resource economics and geography. Taken together, they exemplify what is known about comparative human perception of the environment, the varied research modes of knowing, and the promise and limitations of such knowledge for human-oriented environmental management.

The enhancement of illusion

Possibly a third of the world's human living space is carpentered, two-thirds is not. Does it make a difference in the way we view the world? For Segall, Campbell and Herskovits, who pioneered in the cross-cultural study of visual perception employing geometric illusions, the answer is strongly affirmative.[1]

Their research stretched over a decade, embraced fifteen societies (fourteen non-European and the United States), and drew field-workers from anthropology, psychology and psychiatry. Five geometric illusions were employed, four of which proved to be significant for the study (see Fig. 1 and Table 1).

The researchers explain their hypothesis and conclusion as follows:

For the Müller-Lyer and Sander parallelogram illusions we put forth the 'carpentered-world' hypothesis and an 'experience with two-dimensional representation of reality' hypothesis; both of these hypotheses led to the prediction that Western peoples would prove more susceptible to these illusions than non-Western peoples. We found considerable support for both hypotheses in our own and others' . . . data. The data on age trends did not support these hypotheses, but we argue that a real test requires data collected from children younger than those thus far studied. We must also acknowledge that in terms of these hypotheses we are unable to explain the precise position occupied by each of our samples along the dimension of illusion susceptibility; but we claim that no other hypothesis we have considered provides a better over-all prediction of these positions. In sum, then, we find the 'carpentered-world' and 'experience with pictures' hypotheses both tenable and promising with respect to future research in perception.

1.   Marshall H. Segall, Donald T. Campbell and Melville J. Herskovits, *The Influence of Culture on Visual Perception*, Indianapolis, Ind., Bobbs-Merrill, 1966.

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We offered quite another hypothesis as a source for predicting different cultural suscepti-bilities to the horizontal-vertical illusions. This hypothesis argues that another aspect of the physical environment of peoples—specifically the presence or absence of broad, horizontal vistas—is crucial in shaping the visual inference habit that leads to horizontal-vertical illusion susceptibility. If one lives in an environment that provides many opportunities for looking at horizontal expanses, one should become subject to the tendency to infer long, frontal-plane, horizontal distances from short, vertical, retinal images. This inference habit, we argued, should contribute to the horizontal-vertical illusion. Accordingly, we predicted that plains dwellers would prove maximally susceptible, urban dwellers moderately suscep-tible, and groups that live in restricted environments (e.g. equatorial forests) minimally susceptible to the horizontal-vertical illusion. Again, with just a few qualifications, we found a good fit of our data to this hypothesis.[1]

Some reviewers of the Segall-Campbell-Herskovits works appear more troubled than the authors by some of the inconsistencies of the data and its collection. Nevertheless, whoever has attempted cross-cultural research well knows its difficulties. Perhaps the cautious reader should be content with the generalization that it probably does make a difference in the way we perceive illusion whether we come from a carpentered or non-carpentered world or one of limited or extensive vistas. But whether this difference significantly influences the ways in which we see or know the world remains very much an open question.

The image of the city

In the late 1950s, Kevin Lynch set out to discover the image of three American cities: Boston, Jersey City and Los Angeles. His quest was for the 'public images, the common mental pictures carried by large numbers of a city's inhabitants'.[2] His public was a small one (sixty interviews), and his research tools new: a systematic field reconnaissance by a trained observer; and a lengthy interview (with people long-resident or employed in the areas) eliciting verbal descriptions and sketches of locations, areas and imaginary trips. From these materials he built up a city image as a function of five hypothesized elements: paths, landmarks, edges, nodes and districts. For such images he sought identity, structure and meaning, emphasizing the physical clarity of the image's identification and its structural relationship to persons and other objects.

The work struck a responsive chord among workers in environmental design and environmental behaviour. For the former, it offered an oppor-tunity to introduce laymen along with professionals into the urban design process, to create legibility along with art and function in the design product. For the latter, it was an early, inspirational effort to record the 'world inside men's minds'[3] and to link this record to social purpose.
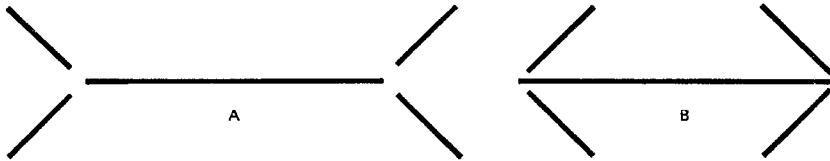
1. op. cit., p. 212-13.
2. Kevin Lynch, *The Image of the City*, p. 7, Cambridge, Mass., MIT Press, 1960.
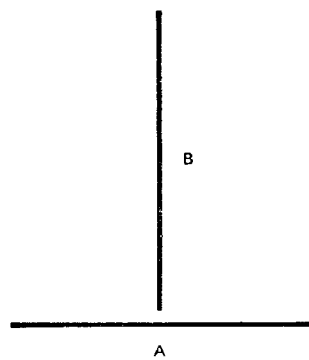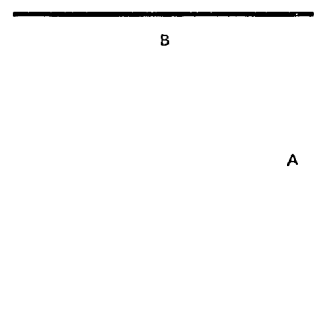3. David Lowenthal.
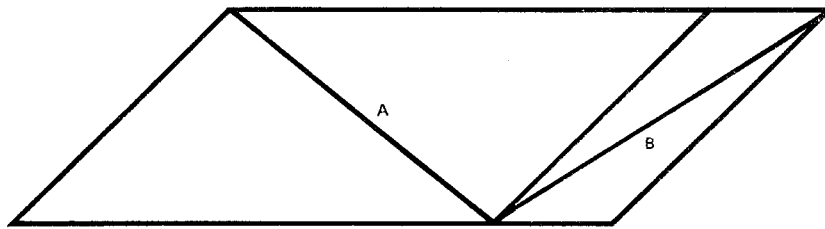
The Sander parallelogram illusion

The Müller-Lyer illusion

The horizontal-vertical illusion

(⊥)

The horizontal-vertical illusion

(˥)

FIG. 1. The four geometric illusions employed in the study. In each illusion, which is the longer, A or B ?

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TABLE 1. Sample group, location, number and rank order on four illusions

Group	Location	Number [1]	Rank order of effectiveness of illusion (decreasing from 1)			
			M-L	Sander	H-V($\perp$)	H-V($\sqcap$)
Banyankole	Ankole District	180	14	14	5	5
	(Uganda)	*164*	*11*	*11*	*2*	*6*
Batoro	Toro District	56	20	22	7	3
	(Uganda)	*53*	*4*	*13*	*14*	*1*
Basuku-Basonde	Kwango District	53	19	23	3	13
	(Republic of the Congo)	*23*	*28*	*27*	*8*	*9*
Bala-Basongye	Sentery (Republic of	47	22	24	22	12
	the Congo)	*51*	*16*	*15*	*10*	*14*
Fang (Pahouin)	Gabon Republic	49	21	12	6	16
		61	*13*	*6*	*16*	*11*
Ivory Coast Bété	Daloa (Ivory Coast)	52	24	25	27	27
		43	*25*	*17*	*26*	*28*
Ijaw	Korokorosei and	51	23	8	11	18
	Patani, Niger Delta (Nigeria)	*50*	*12*	*19*	*19*	*7*
Ijaw (school-children)	Korokorosei and	—	—	—	—	—
	Patani, Niger Delta (Nigeria)	*61*	*10*	*5*	*9*	*4*
Zulu	Natal (South Africa)	51	18	9	28	22
		49	*8*	*1*	*25*	*17*
Kalahari Bushmen	Ghanzi District of	46	26	—[2]	12	15
	the Kalahari	—	—	—[2]	—	—
South Africans of European descent	Johannesburg (South Africa)	44	6	10	23	25
		—	—	—	—	—
Baluvale, M'lozi, Machusa, Bechuana, Pondo and Chimbundu	Data collected at a gold mine near Johannesburg among labourers from diverse locations including Tanzania, Mozambique and various provinces in South Africa	72	27	26	15	10
		—	—	—	—	—
Ouolof, Bambara, Serer, Peuhl	Several villages in Senegal	137	9	21	1	23
		125	*5*	*7*	*21*	*24*
Central Dahomean tribes	Abomey (Dahomey)	—	—	—	—	—
		65	*7*	*16*	*4*	*2*
Hanunoo	Yagaw, Mansalay, Mindoro (Philippines)	43	15	20	24	26
		14	*17*	*18*	*17*	*8*
Residents of Evanston, Illinois	House-to-house in Evanston, Illinois (United States)	119	2	4	13	20
		89	*1*	*3*	*20*	*19*
Undergraduate students at Northwestern University	Evanston, Illinois (United States)	30	3	2	18	21
		—	—	—	—	—

1. Figures in roman type refer to adults, figures in italic type to children.
2. Not administered.

Source. Marshall H. Segall, Donald T. Campbell and Melville J. Herskovits, *The Influence of Culture on Visual Perception*, p. 130, 218-34, Indianapolis, Ind., Bobbs-Merrill, 1966.

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In the decade that followed, the approach spread literally around the world, and the list of cities studied is extensive (see Table 2), albeit much of the work is unpublished, its existence being rumoured in academic circles.

An attempt has been made in this table to summarize some of the comparative aspects of these studies. Generalizations are difficult to make from this brief overview, although the growing set of studies appears worthy of a much more careful analysis than that undertaken here.

One senses the importance of district: neighbourhood, local area, barrio, section, etc., in the non-European or non-North American settlement; but this may arise in part from the difference in scale of the studies—image of city centre versus image of total city. One finds support for intuitive judgements; Amsterdam, Boston, Mexico City are strong imageable cities for both residents and tourists.

Perhaps more relevant is the potential utility of the urban image analysis as a tool for planning rather than for comparative urban analysis. The public 'image' of the city is today accessible for all who would know it.

The following are unpublished, unavailable or inadequately reported city image studies[1] giving date and principal investigator of study when known:

Chile
Santiago; 1966

Italy
Rome; 1965; S. Carr

Sweden
Stockholm

Thailand
Bangkok; C. Steinitz

United States
Boston, Mass.; 1967;
  C. Steinitz
Brookline, Mass.; 1965;
  K. Lynch
Chester, Pa.
Los Angeles, Calif.;
  1967; Planning
  Commission
Manchester, N.H.; 1967;
  M. Bowden

Minneapolis, Minn.; 1965;
  Planning Commission
Rye, N.Y.; 1967;
  A. Melting
Worcester, Mass.; 1967;
  M. Bowden

West Berlin
1967; T. Sieverts

Attitudes towards landscape

'Landscapes are formed by landscape tastes', write David Lowenthal and Hugh C. Prince. 'People in any country see their terrain through preferred and accustomed spectacles and tend to make it over as they see it.'[2] The landscape tastes of Englishmen they find are for the bucolic, the picturesque, the deciduous and the tidy; they favour façades, the ancient and the fitness of place.

The landscape Englishmen have made, they find, is both one of variety of earth and atmosphere, remarkably open and changing, and one of

1. Known to Kevin Lynch or Robert Kates.
2. David Lowenthal and Hugh C. Prince, 'English Landscape Tastes', *Geographical Review* New York, American Geographical Society, April 1965, p. 186.

TABLE 2. Characteristics of city image drawn from published studies

Principal investigator and year published	City[1]	Interview sample (number and predominant type)	Importance of urban elements[2]					Investigator's comments
			Land-marks	Nodes	Paths	Edges	Districts	
K. Lynch (1960)	Boston (United States)	30 (Professional, managerial)	●	⊙	⊙	⊙	●	One strong edge; distinctive districts; confusing paths; understand structure.
	Jersey City (United States)	15 (Professional, managerial)			⊙			Lack of character; formlessness; low imageability.
	Los Angeles (United States)	15 (Professional, managerial)	⊙	⊙	●			Less sharp image; visually faceless; but active, ecologically ordered.
D. de Jonge (1962)	Amsterdam (Netherlands)	25 (Wives of skilled and white-collar workers)		●	●			A very strong image; strong predominance of main elements; spider web structure.
	Rotterdam (Netherlands)	22 (Wives of skilled and white-collar workers)	⊙	⊙	⊙			Over-all image weaker; buildings seen more clearly; no clear boundaries.
	The Hague (Netherlands)	25 (Wives of skilled and white-collar workers)	⊙		⊙		⊙	No wide straight path; separate elements and buildings; vague as to boundaries.
J. Gulick (1963)	Tripoli (Lebanon): entire city	35 (Students, upper middle class)		⊙	⊙		●	Stresses districts geographically distinctive or nodes; buildings not a major focus.
T. F. Saarinen (1969)	Chicago (United States)	42 Area workers	●		●		●	Tightly defined areas with internal detail.
		18 Suburban students			●	⊙		Broader areas.
		12 University students	●		●	⊙	●	Broader areas and external landmarks.
H. Klein (1967)	Karlsruhe (Federal Republic of Germany)	1118 (Residents)	●	●	⊙			Rational; striking landmarks; highly linear; imaged centre moving westward.

Source	Area[1]	Sample size	Elements[2]	Notes
D. Appleyard (1969)	Ciudad Guayana (Venezuela): entire city	320 (Residents of selected settlements)	● ⊙	Little 'common' urban knowledge of city; higher for local areas; higher for lower-income population.
D. Stea and D. Wood (1970)	Mexico City: city and centre	335 (Residents of selected areas)	● ⊙ ●	Edges almost entirely absent; strong domination by major paths; district landmarks.
	Puebla (Mexico): city and centre	144 (Residents of selected areas)	●	Streets extremely regular; highly legible but uninteresting.
	Guanajuato (Mexico): city and centre	114 (Residents of selected areas)	● ⊙	Highly irregular; unstructured; binodal.
	San Cristobal las Casas (Mexico): city and centre	176 (Students 12-18 years)	● ⊙ ⊙	Legible city; clear and strong pattern of spatial activity.

1. Central areas unless otherwise stated.
2. The importance of elements is given as follows: o Important element; ⊙ Important element; ● Very important element.

Sources: Kevin Lynch, *The Image of the City*, Cambridge, MIT Press, 1960; Derk De Jonge, 'Images of Urban Areas: Their Structure and Psychological Foundations', *Journal of the American Institute of Planners*, Vol. 28, November 1962; John Gulick, 'Images of an Arab City', *Journal of the American Institute of Planners*, Vol. 29, No. 3, 1963; Thomas F. Saarinen, *Image of the Chicago Loop* (unpublished paper); Hans-Joachim Klein, 'The Delimitation of the Town-Centre in the Image of its Citizens, in: E. S. Brill (ed.), *Urban Core and Inner City*, Leiden, 1967, p. 286-306; Donald Appleyard, 'City Designers and the Pluralistic City', *Planning Urban Growth and Regional Development: The Experience of the Guayana Program of Venezuela*, Cambridge, MIT Press, 1969; David Stea and Denis Wood, *Un Atlas Cognitivo: La Geografía Psicológica de Cuatro Ciudades Mexicanas* (in press).

regularity, with recurring artifacts of hedged and walled fields, village and council estates, suburban and semi-detached houses, seaside resorts, coalfield industrial districts and parklands, in all a 'world of ordered beauty'.

Leaving this world and turning homewards, Lowenthal observes: 'Face to face with the lands of his own country, the well-travelled American is characteristically dismayed.'[1] It is his theme that the dismay must have existed from the beginning as early Americans contemplated their new country. It overwhelmed them with its sheer size, wildness, formlessness, and natural extremes. It posed a challenge for taming, not landscaping or landscape viewing. These early features provide the heritage for current American landscape values in which the present landscape, both in town and country, fares poorly, for all eyes are on the idealized past or glorious future, the remote and the spectacular.

But not every attitude towards environment transforms that environment. Yi-Fu Tuan traces long-held Chinese attitudes towards landscape, idealized in philosophy and poetry but not realized in the landscape itself. The gap between ideal and real does not trouble him excessively, for: '. . . in an obvious but not trite sense, civilization is the exercise of human power over nature, which in turn may lead to the aesthetic appreciation of nature. Philosophy, nature poetry, gardens, and orderly countryside are products of civilization, but so equally are the deforested mountains, the clogged streams, and within the densely packed, walled cities, the political intrigue.'[2]

How can one generalize this way about landscapes as varied in scale as those of the United States, in detail as those of England, or in age as those of China? Lowenthal, Prince and Tuan do it by way of art and literature, social and intellectual history, folk-saying and everyday comment, and the vision of the insightful observer.[3]

Scientists accustomed to minimizing inference might prefer some of the more current behavioural techniques to these modes of inquiry. For example Sonnenfeld has effectively used paired comparisons of photo-slides and the semantic-differential test to elicit landscape preferences between such diverse groups as Eskimos and American teenagers.[4] But landscapes are inheritance from the past; to deny the use of the records of the past in understanding them may be to deny our understanding.

1.   David Lowenthal, 'The American Scene', *Geographical Review*, New York, American Geographical Society, Vol. 58, No. 1, January 1968, p. 61.
2.   Yi-Fu Tuan, 'Discrepancies between Environmental Attitude and Behavior: Examples from Europe and China', *The Canadian Geographer*, Vol. 12, No. 3, 1968, p. 184.
3.   Gilbert White raises the problem of the representatives of historical evidence from the articulate section of a society as to environmental attitudes. See his 'Public Attitudes on Environmental Quality', in Henry Jarrett (ed.), *Environmental Quality in a Growing Economy*, p. 114, Baltimore, Md., Johns Hopkins Press, 1966; and rejoinder by David Lowenthal, 'Assumptions Behind the Public Attitudes', p. 130-2 in the same book.
4.   See Joseph Sonnenfeld, 'Equivalence and Distortion of the Perceptual Environment', *Environment and Behavior*, Beverly Hills, Calif., Sage Publications, Vol. 1, No. 1, June 1969,- p. 83-100; and his 'Environmental Perception and Adaptation Level in the Arctic', in: David Lowenthal (ed.), *Environmental Perception and Behavior*, Chicago, Ill., University of Chicago Press, 1967. Other methods are described in Elwood L. Shafer Jr., 'Perception of Natural Environments', *Environment and Behavior*, Vol. 1, No. 1, June 1969, p. 71-82.

Behaviour as perception

Perhaps the most reliable indicators of human conceptual environments are human environmental actions. How men behave in the world may be the best clue as to how they view the world. Geographers have long studied human behaviour in response to extreme natural events, more specifically the perception and adoption of adjustments to natural hazards of all types.[1]

Over the next two years, major comparative studies of human adjustment to hazard will be undertaken by geographers in many countries under the aegis of the Commission on Man and Environment of the International Geographical Union. Limited data, presently available, makes possible now some comparisons.

Possibly the most widespread of all natural hazards is drought, affecting in any year the lives and livelihood of millions of the world's people. Saarinen has studied the perception of farmers to the drought hazard on the semi-arid Great Plains of the United States, Heathcote has studied pastoral and agricultural farming in Australia and Kates and Berry have carried out pilot studies of farmer perception among smallholders in Tanzania.[2] By way of illustration, the work of Saarinen and Kates can be directly compared, using farmer interviews from comparatively dry areas of the respective countries. The focus in Table 3 is on actions, alternative adjustment strategies to reduce drought losses.

The two studies were carried out quite independently, therefore it is of considerable interest that the data from differently phrased questions are comparable. The available, perceived strategies for mechanized United States grain farmers are not intrinsically different from those of hoe cultivator Tanzanians. However, the mix of perceived adjustments differs, more actions in total being proffered by the United States farmers, more of these related to farm practices, and more of these requiring high-level technological inputs. Tanzanian farmers seem to be more inclined to pursue adjustments not directly related to agricultural practices, thereby more prepared to change their livelihood pattern than to alter their specific cropping behaviour. Thus the major contrast that emerges is between a flexible life pattern with an unchanging agricultural practice as opposed to a more rigid life pattern with an adaptive agricultural practice. These behavioural patterns are suggestive either of alternative perceptions of nature itself or of opportunity

1. These studies are summarized in Ian Burton, Robert W. Kates and Gilbert F. White, *The Human Ecology of Extreme Geophysical Events*, Toronto, University of Toronto Press, 1968 (Natural Hazard Research Paper No. 1).
2. Thomas Frederick Saarinen, *Perception of the Drought Hazard on the Great Plains*, Chicago, Ill., University of Chicago, Geography Department, 1966; L. Heathcote, 'The Effects of Past Droughts on the National Economy', *Report of the ANZAAS Symposium on Drought*, p. 27-45, Melbourne, Commonwealth Bureau of Meteorology, 1967; L. Heathcote, 'Drought in Australia: a Problem of Perception', *Geographical Review*, New York, Vol. 59, No. 2, 1969, p. 175-94; Robert W. Kates and Len Berry, *Human Adjustment to Agricultural Drought in Tanzania: Some Pilot Investigations* (in press).

TABLE 3. Comparative perception of feasible adjustment to drought in dry areas of Tanzania (131 farmers interviewed) and the United States (96 farmers interviewed)

Tanzania			United States		
Adjustments	No.	%	Adjustments	No.	%
Q. *If the rains fail, what can a man do?*			Q. *If a meeting were held and you were asked to give suggestions for reducing drought losses, what would you say?*		
Do nothing, wait	17	12.14	No suggestions	16[1]	8.25
Rainmaking, prayer	15	10.71	Rainmaking, prayer	2	1.03
Move to seek land, work, food	51	36.43	Quit farming	1	0.52
Use stored food, saved money, sell cattle	16	11.43	Insurance, reserves, reduce expenditures, cattle	16	8.25
Change crops	9	6.43	Adapted crops	2	1.03
Irrigation	15	10.71	Irrigation	46	23.71
Change plot location	4	2.86	Change land characteristics by dams, ponds, trees, terraces	26	13.40
Change time of planting	—	0.00	Optimum seeding date	—	0.00
Change cultivation methods	1	0.71	Cultivation: stubble mulch, summer fallow, minimum tillage, cover crops	78	40.21
Others	12	8.57	Others	7	3.61
TOTAL	140	99.99	TOTAL	194	100.01
Adjustments per farmer = 1.07			Adjustments per farmer = 2.02		

1. Inferred from published report and subject to correction.

Source. Kates and Berry, unpublished data; T. F. Saarinen, *Perception of the Drought Hazard on the Great Plains*, p. 81 (based on table and accompanying text).

for mobility. The Tanzanian farmer seems willing to move with an uncertain nature; his American counterpart appears ready to battle it out from a fixed site.

Human perceptions of environment: what do they tell?

Taken as a group, the studies of illusion, image, attitude and behaviour speak of a universality of process, with significant differences in cognitive style, and great diversity in the content of the environments within the minds of men. In the limited world of visual illusion, men do perceive that world differently. Cities differ, but their images even more so, for the traveller, newcomer, resident; for the young and the old; for the rich and the poor. Landscapes differ, but no more profoundly than the tastes that help fashion them. All men must cope with uncertainty, but they differ in behaviour more than they differ in opportunity.

But nowhere is the difference greater than that between the designer and the people:

The designers of Ciudad Guayana—planners, architects, engineers, and others—found it difficult to establish contact with the city's population. The planning office was half a day's air travel from the new city, and many of the designers were foreign by nationality as well as class to the local culture. But the problems encountered were common to most planning operations. Urban populations are difficult to understand, inarticulate, and anonymous, so designers in a decision situation tend to fall back on their own perceptions and values, supported by their professional stock of rules and models, and 'objective' data, often unaware of their dissociation from the other reality.

. . . .

Their working environment—the symbolic world of maps, models, and data—created unknowingly a conception of the city quite distinct from the reality of those who lived there. Not that the population's view was monolithic. They, too, saw the same city in different ways.[1]

The methods of the studies reported on herein can bridge the gap between the universal culture of the professional and the particularized perception of the citizens. Where the scale of design justifies it, elaborate surveys such as those undertaken in Ciudad Guyana can be carried out. But routinized simpler assessments can be made available as planning tools. Ignorance of human perception of the environments we manage need not persist.

In addition to sensitizing those who manage environment to the needs of those who use environments, studies of environmental perceptions and attitudes can make plans and designs more effective: insuring their fit for the place and even providing a vehicle for informing as well as studying public preference and taste.[2]

But the central challenges of perception studies are neither ones of data, method or utility, but the value questions they raise. By exposing the differential perceptions of environment, they question environmental values. What clientele, interest group, social strata does the professional serve? Whose needs does the city serve? And as Sommer puts it: 'The long-range question is not so much what sort of environment we want, but what sort of man we want.'[3]

1. Donald Appleyard, 'City Designers and the Pluralistic City', in: Rodwin and Associates (eds.), *Planning Urban Growth and Regional Development: the Experience of the Guayana Program of Venezuela*, p. 422-3, Cambridge, Mass., MIT Press, 1969.
2. Ian Burton, 'The Role of Perception and Attitude Studies in Developing Public Participation'; publication expected in: Sewell and Burton (eds.), *Perception and Attitude Studies in Resource Management* (probable title), Ottawa, Queen's Printer.
3. Robert Sommer, *Personal Space: the Behavioral Basis of Design*, p. 172, Englewood Cliffs; Prentice-Hall, 1969.

*Robert W. Kates, former director of the Bureau of
Resource Assessment and Land Use Planning at the University
College of Dar-es-Salaam, is professor of geography
at Clark University, Worcester, Massachusetts. He is
the author of* Human Adjustment to Floods *(1962)
and editor of* Readings in Conservation and Resource
Management *(1965)*.