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ADVISORY COMMITTEE
ON MEDICAL RESEARCH

THIRD MEETING

15-19 JUNE 1964
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JUL 22 1964

SPECIAL SESSION ON
ENVIRONMENTAL DETERMINANTS OF
COMMUNITY WELL-BEING

AGENDA ITEM A

Summit

Ref: RES 3/6

17 June 1964

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

WASHINGTON, D.C.

Environmental Determinants
of Community Well-Being

Abel Wolman

(Opening Statement, PAHO Advisory Committee
on Medical Research, June 17, 1964)

Almost 2500 years ago, Hippocrates crystallized the gropings of many observers of earlier centuries on the topic before us today. He described (1) that physician as an honor to his profession "who has been led through the whole circle of the sciences; who has a due regard to the seasons of the year, and the diseases which they are observed to produce, -- to the states of the wind peculiar to each country, and the qualities of its waters; who marks carefully the localities of towns, and of the surrounding country, whether they are low or high, hot or cold, wet or dry; who, moreover, neglects not to mark the diet and regimen of the inhabitants and, in a word, all the causes which may produce disorder in the animal economy."

This emphasis on the "airs, the waters and the places," in course of time and with the advance of science and technology, has now reached the philosophic concept of "holism" of General Suits and of the constellation of causes of disease of Dr. Dubos. The environment of man, embodying the biological, physical, chemical and social components of his world, thus confronts us as a primary part of that ecosystem, only partially envisaged, it is true, by Hippocrates and others.

Today we concern ourselves with the interaction of organism and environment. As Marston Bates has recently pointed out, (2) we no longer

(1) Hippocrates, The General Works of Hippocrates, translated by Francis Adams, M.D., Sydenham Society, 1844.

(2) The Human Environment, Marston Bates, The Horace M. Albright Conservation Lectureship, University of California, 1962.

speaking of organism versus environment or vice versa. Our concern is with the interaction of man and his environment, at once natural and man-made. And he reminds us, as today's discussions will undoubtedly reiterate, that the old aphorism of Francis Bacon still applies - "you cannot command nature except by obeying her."

It might even be suggested that the theme for today's discussions is epitomized in the last few sentences of Bates' recent Albright Lecture,⁽²⁾ as follows:

"I find some grounds for hope - and they go back to that conceptual environment that governs so many of our activities. We made it. Surely, then, we can alter it and patch it - somehow develop a noösystem that is more just, more practical, and more beautiful than the one we have. At least it is our duty to try - without trying we are surely doomed."

In providing an "ecological slant", we must seek greater specificity than these general observations might suggest. The geographical setting is in those countries for which PAHO has high responsibility. They are characterized by great diversity in almost all their attributes, except perhaps that they all suffer from diseases supposedly long laid low in the literature plus those dominant in more favored regions. They all wait upon the promises of the Charter of Punta del Este of 1961.

Can we disclose at this session the directions in which PAHO may best embark upon the attack upon an environment, which has the earmarks of 1890, enriched by the fruits of the science and technology of 1964? What are the bases for selection of actions requiring minimum expenditures of money, men, and materials for maximum returns in lives saved, in deaths and disabilities avoided and in products increased?

What does existing knowledge offer for sound action? What are the areas of research most pressing for immediate maximum values and for the best long-range promise? What are the socio-cultural obstacles to success in any of the environmental control endeavors? How may these be hurdled most rapidly? In Latin America, as elsewhere, the impatience of people is high.

What is "the metabolism" of the institutions, present and prospective, which may best serve the purposes of these disparate issues and countries, while we simultaneously explore the roots of their ecological behavior?

Everything that engages us today is an extension of the issues posed half a century ago by Graham Wallace, the English political scientist and teacher. He asked "how human nature responds to the conditions of the complex urbanized life which industrial and mechanical civilization has created."

Central and South America pose the unusual situation of millions of people living in rural and urban areas spanning at least two centuries of cultural and political contrasts. One is confronted, therefore, with, literally, riches of problem, too often unsupported by successful formulas for solution and action. Yet, while the search proceeds toward isolating and clarifying the roots of human behavior, current action must proceed with what science and technology already has to offer, and social science hopefully can validate, support and guide.

In some areas of effort, exorbitant removal in rural populations is a striking example, real success has been at a minimum. It would appear that the time is long overdue to undertake deep inquiry into human motivations which have restrained greater success. On the other hand, urban water supply, for whatever reasons, seems to have wider and prompter

acceptance and use. This kind of cleanliness, in contrast to privy use, shows a minimum of cultural lag in general adoption.

In between these extremes of human behavior are the reactions to literally hundreds of other private and public functions which people desire or should have. PAHO is driven again into decision making and selection with its permanently limited resources - and with "the rising expectations of man" militantly at its heels.

Although the definition of the relative significances of environmental determinants of well-being is a first order of business, it is of equal importance to isolate areas of ignorance in which PAHO must press for prompt exploration. It is hoped that guide-posts will be delineated today which will facilitate the actions of tomorrow.

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**SPECIAL SESSION ON
ENVIRONMENTAL DETERMINANTS OF
COMMUNITY WELL-BEING**

AGENDA ITEM 1

President's address

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17 June 1964

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

WASHINGTON, D.C.

Special Session on
ENVIRONMENTAL DETERMINANTS OF
COMMUNITY WELL-BEING

Agenda Item No.1: The Environment in Human Ecology

ARTIFACTS: THE SIGNIFICANCE OF MODIFIED ENVIRONMENT*

The primary concern of ecology is an understanding of ecosystems -- that is, integrated systems comprising both living organisms and the milieu in which they live and through which they exchange 'information' (in the cybernetic sense). Ecological research must include many restricted studies of individual organisms or individual species, in which case the remaining parts of the ecosystem directly relevant to the organism concerned are referred to as its 'environment'. This environment includes both living and non-living components. This separation of organism from environment is artificial and often encourages confused thinking about the integrity of the ecosystem, of which the 'environments' are an integral part. Bearing this risk in mind, the following account attempts to re-examine, in what I hope is a new light, those environmental structures which have been modified by the behavior of animals. This essay in one aspect of animal ecology will then be extended to that special animal, man.

For our present purpose, we define an artifact as a structure which is the product of behavior of an animal. By definition it must be

*Prepared for the Third Meeting of the PAHO Advisory Committee on Medical Research, 15-19 June 1964, by Dr. J. Ralph Audy, Director, The George Williams Hooper Foundation for Medical Research, University of California Medical Center, San Francisco, California.

structural and must be produced de novo or by modifying a pre-existing structure. The most conspicuous artifacts are nests and burrows -- the product of an individual, a mated pair, or, as with the termitarium or rabbit-warren, a group. Other examples of artifacts are: the cases of caddis-larvae, the deliberately planted camouflage of various arthropods, and the clothing of man. Many arthropods make use of the growth-potentials of plant tissues to produce special temporary homes or galls, which may be very elaborate. Similarly, certain tiny crabs induce coral polyps to produce capsular living quarters. These galls in plants or corals are artifacts produced by the behavior of the arthropods. On the other hand, a snail's shell is not an artifact by our present definition -- it is part of its body, a form of exoskeleton. A hermit crab occupying a shell is occupying what is left of a dead snail, in much the same manner as springtails may live in the interstices of cancellous bone of a dead animal. I deal with this example dogmatically in order to be free to get on with the main argument, although the snail's shell and the caterpillar's cocoon are critical examples which show us that the ecologist -- but not ourselves for present purposes -- must explain more clearly what is meant by 'behavior' in our definition.

We need a derived term, so let us define a total or collective artifact as the sum total of artifacts of a population or of a species (when 'species' is used as a collective noun for creatures of a given kind and not as an abstract taxon).

At this point it is worth noting that I intend to elaborate considerably on the simple concept of an artifact. The ideas that cling to established words often hobble fresh excursions of thought. I have found this to be so in the present case, because the word artifact so obviously and

obstinately means a manufactured article; but I have often failed to communicate the concept which I shall now try to put on paper. I have therefore been using the cumbersome term specific artifact and about three years ago tried to coin a new term, such as ipsefact (somewhat dubious Latin, hopefully conveying the idea of 'he himself made it'), or even ethophane (in the sense that the animal's behavior shows through or is manifest in the structure concerned). I believe that a new term is required, preferably of a sort which can be readily modified to serve as a noun, adjective or verb.

The primary purpose of this paper is to draw particular attention to the artifact and especially the total artifact as a function of the organism rather than as a mere physical structure in the environment. My first interest in artifacts was in the structural sense, when I began to consider commensalism as adaptation to the artifacts of another species, leading to a greater or a lesser degree of artifact-specificity. One organism is frequently in the nature of a guest occupying a niche created in the distinctive artifact (usually a nest or burrow) of the other organism, which is in the nature of an unwitting host (Audy, 1948). But I did not fully recognize the significance of artifacts until I collected Stenogaster wasps in Malaya. These wasps make a great variety of small nests (cf. Audy, 1956, fig.2), each peculiar to a species. Most species of Stenogaster are more easily identified by gross characters of their nests than by physical characters of the wasps themselves. The morphology of these nests is subject to evolution as much as is the morphology of the individuals, simply because artifacts are an expression of behavior. As such, the comparative study of the artifacts of species may indicate subtleties of adaptation and changing behavior to the student

of evolution and to the ethologist alike. This is exactly what has happened in the case of Emerson's (1938, 1952) studies of termite phylogeny: he almost forgets the termites in literally studying the evolution of the intricate morphology of the nests.

A secondary purpose of this paper is to re-examine human artifacts in the light afforded by the concept of 'ipsefacts'. I first propose, however, to dispose of the conventional physical aspect of artifacts, at least in this written account.

Artifacts as centers of action

In a thorough survey of the structure of animal communities, Elton and Miller (1954:491) referred to a miscellany of 'numerous small but rather concentrated centers of action' scattered generally throughout major systems. They listed and described the following: (1) dying and dead wood, (2) macrofungi, (3) dung, (4) carrion, (5) animal artifacts, especially nests and burrows, and (6) human artifacts, referring particularly to the smaller structures such as grain-stacks, fence-posts, and stone-walls, rather than to the large-scale artifacts such as buildings and gardens (which they grouped under the 'Domestic System'). The purpose of this study was to devise a practical system of classifying habitats by their structural characters; in this the authors succeeded.

In order to distinguish the contributions made to the ecosystem by each animal species, let us consider three kinds of new elements which appear in the ecosystem when a newcomer is introduced and becomes established -- or, at a slower tempo, when a new species evolves. The three kinds of new elements are: (a) living bodies of the species concerned;

(b) dead and disintegrating bodies of the species concerned; and (c) artifacts, i.e. modified environment, or contributions to the environment which the species makes by means of its behavior.

The living bodies (a) provide many new niches combining both food and microhabitat, to which various organisms will become adapted. Pavlovsky (1934) has referred to this as 'organism as habitat'. The ecologist Shipley has referred to birds as 'aviating zoological gardens' because an individual animal or bird may become home to such great numbers and varieties of parasites which occupy the niches available in and on the host organism itself (see Clay and Rothschild, 1952). The aggregate of parasites in and on a host is indeed a small-scale system or biocenose, the parasitic moiety of which has been called a 'parasite-mix' (e.g. Noble and Noble, 1961) or 'parasitocenose' (Pavlovsky, 1959). Such parasites within a single individual frequently interact with each other as well as with the host, an example being the intestinal flagellate Giardia lamblia, encouraged by a coexisting tapeworm but inhibited by roundworms (Ascaris lumbricoides).

In the case of (b), dead bodies, niches become available for scavengers ranging from bacteria to fly-maggots, burying-beetles, jackals, lions, and vultures. In both cases, (a) and (b), the assemblages of organisms directly dependent on the living or the dead host may support predators, such as cheyletid mites among the ectoparasites of an animal or macrochelid mites among the fly-maggots in carrion.

New niches in the specific artifacts: domiciliation, commensalism

Because it is a specific kind of modification of the existing environment, a specific artifact offers distinctive new 'potential niches'

tantamount to job-opportunities. These are explored by individuals of a wide range of species until the niche is adopted, perhaps reluctantly at first. Two different species would fill a given potential niche in two different ways. It follows that niche-adoption is followed by one or both of two processes, (i) niche-adaptation by the occupying populations, and (ii) niche-differentiation, by which I mean modification of the original rather ill-defined potential-niche by means, on the one hand, of having part of it sharply defined by the occupying organism, and, on the other hand, of perhaps having part of it left as a modified new potential-niche. The occupying organism may also itself create diversity by its own artifact, as when a rat makes its nest in the home of man.

The creation of new potential-niches in specific artifacts, followed by niche-adoption, -adaptation, and -differentiation, is one of the ways by which ecosystems increase in complexity or evolve.

When a guest-organism adopts for its habitat the nest or home of a host-organism, this is known as domiciliation (Hoare, 1955; Audy, 1958). This is to be distinguished from domestication, when the guest-organism is deliberately introduced or encouraged in the specific artifact of the host, e.g., pets and livestock amongst men, the relation between guest and host being mutualistic. Examples of domiciliation are bedbugs in the nests of man, reduviid bugs in nests and houses, soft-ticks (Ornithodoros, Argas) in burrows, nests and houses. Rats domiciliated in human artifacts (houses) make their own artifacts (nests) in which fleas and other arthropods become domiciliated in their turn. 'Nidicoles' are domiciliated parasites or commensals.

Commensalism, and domiciliation which is a form of it, may be regarded in a new light if they are considered in relation to artifact-specificity.

Specific artifacts as expressions of behavior

Artifacts are usually characteristic of the species which makes them, i.e. the species (and sometimes the individual) can be identified by the artifact alone. Some students of behavior have already turned to specific artifacts just as Emerson and others have turned to them in studies of evolution. Two examples may be given: the spider's web is characteristic of each species. Slight derangements in the behavior of the spider may produce obvious changes in the character of the web, and this sensitive indicator of derangement has been used to study the effects of drugs.

It is well known among students of rodent behavior that socially deranged females are unable to make proper nests. This is observed in the laboratory as well as in the field. In some species the nests are very elaborate, for example the dens of the pack-rat or wood-rat Neotoma. We are currently studying the structure of wood-rat nests and the manner of their building and elaboration, year after year, with the intention of studying deranged behavior using the nests as indicators (and at the same time studying the many artifact-specific nidicoles).

The specific artifact as an extension of the organism itself

An important feature of specific artifacts is best illustrated by the evolution of the bower birds (briefly surveyed by Gilliard, 1963). The closeness of the bond between male-female pairs varies greatly with different species of birds. In extreme cases, independently evolved in different groups of birds, the male is divorced from all the usual responsibilities shared by pair-bonded species, and in these cases the

males set up bachelor groups. This sets the stage for sexual selection favoring males with bright plumage and/or elaborate display behavior, restricted display-spaces for each male being grouped into a general display arena for the clan. If the arena is modified, as it usually is, then the display-arena is a specific artifact of the clan. Among the bower birds of Australia (as well as among other groups) the males have greatly developed a different type of display behavior, decorating their display-spaces with a variety of colorful gewgaws and even flowers which are changed daily. Sometimes the colored berries or other objects in the bower are picked up and displayed by the male. Sexual selection is based more and more on morphological characters of the specific artifact and less and less on the characters, either morphological or behavioral (individual display), of the males. In the case of the three species of gardener bowerbirds (Amblyornis), the males of one species have long colorful crests, of the second short crests, and of the third no crest at all (thus being almost indistinguishable from the females of all three species). The bowers of these three species are increasingly elaborate, and it is clear that morphological characters are being transferred from the individuals themselves to their specific artifacts through the evolution of increasingly elaborate behavior. Gilliard says: 'I believe that in these birds the forces of sexual selection have been transferred from morphological characteristics -- the male plumage -- to external objects and that this "transferral effect" may be the key factor in the evolution of the more complex bowerbirds.'

We may conclude that the specific artifact of a species (or individual), being a more or less characteristic product of its peculiar behavior, can be regarded as an extension of the organism itself. Furthermore,

evolutionary trends may be observed in the artifacts with as much validity as they are observed in the morphology of individuals.

The question here arises as to whether or not we may regard as parts of specific artifacts the clothing of a human being or the camouflage of lichens or of debris which certain microlepidopterous larvae, reduviid bugs, and crabs do plaster on their backs. Also, is excrement part of the specific artifact of a species? I suggest that these are indeed artifacts as here defined. The clothing and the external camouflage have evolved as the result of sociocultural and biological selection pressures respectively, acting through modification of behavior. (It is, however, exceptional for specific artifacts to be carried about by the organism.) The deposition of excrement is frequently the result of deliberate behavior -- some species select special sites and many birds dispose of droppings in elegant ways -- and behavior is the essential criterion in description of specific artifacts.

Specific artifacts in human ecology

1. The concept which concerns us is that of the specific artifact or ipsefact as being an extension of the organism, and at the same time, a visible product of activity -- a sort of crystallization of behavioral acts. Since there are many in this audience who will be able to apply this concept to human artifacts better than I, I propose to discuss only a few points and to leave the rest to discussion.

2. Man has learnt that some features of human specific artifacts tend to encourage domiciliation of undesirable commensals including parasites and vectors of disease, examples being house-rodents,

cockroaches, reduviid vectors of American trypanosomiasis, sandfly vectors of leishmaniasis, mosquito vectors of urban yellow-fever, and tick vectors of relapsing fever. As a consequence of this knowledge, many houses are planned to minimize the encouragement of such domiciliated pests, e.g. rat-proofing is practiced over the world. In parts of East Africa where tick-borne relapsing fever is endemic, a popular type of double hut is built with an inner enclosure in which livestock are kept while the family lives in the outer part, until after a few months when the tick population becomes disturbing and the family exchanges quarters with the animals -- the animals render conditions much less suitable for the ticks and thus exercise a degree of control (Walton, 1963).

3. Behavior which produces specific artifacts may be identifiable as individual or cooperative. It is the behavior of an individual which produces the bower of a male bowerbird, the web of a spider, the nest of a hummingbird. It is cooperative behavior of pairs or of groups or even of entire colonies which produces the wasp-nest, the beehive, the termitarium, the nests of pair-bonded birds, the African colonial weaver-birds' nest, the rabbit-warren, or the burrow-system of a gregarious rodent. In all these cases, individual or cooperative, the animal builds its lodge, nest, or burrow-system with its own limbs and teeth or beak, for itself and to suit its own requirements. Its building behavior-pattern is described as largely instinctive, i.e. largely genetically controlled. The behavior is directed towards the goal of making a micro-habitat to which the animal is adapted.

With a few exceptions, this does not obtain with urbanized man. Modern man is obliged to leave the building of human nests and burrow-systems to others skilled in trades. In addition, roads are laid down,

and telegraph-poles and billboards are erected. The demands set by people and the fashions adopted by builders are decided for socially, economically and technically complex reasons. Such reasons always involve some degree of whimsicality or irrationality, following the dictates of custom. The growing city inherits the outmoded artifacts of the past, and this leads to difficulties in later planning which may become almost insuperable and certainly become greater as time passes. Reasonably efficient planning of the growing metropolis may be impossible for several different reasons: the inheritance of large-scale faulty structures; lack of competent city-planners; lack of appropriate machinery for planning to be effective; the fragmentation of administrative units as metropolises spread over the countryside. Connery (1963) gives an example of the latter from the Philadelphia-Camden metropolitan area, in which Chester County, with a population of 210,000, has 144 government units (57 townships, 16 boroughs and 70 school districts). This contrasts with Philadelphia County, with ten times the population of Chester but having a single combined city-county government and one school district. In this and many other ways, man raises almost insuperable barriers to efficient functional development of his collective artifacts, the ecosystem of the metropolis.

4. The influence of one's immediate surroundings on one's feeling of well-being or behavior may be subtle, but it is definite and may be profound. It is possible by arranging the carpets and furniture in a room in two different patterns to make it easy or awkward for a group to become sociable (i.e. to communicate freely), and it is well known that the inside of a home not only reflects the personalities of

the occupants but it influences their mood. Furthermore, there is an act of personal creativeness in the changes an individual will make in a home -- even if he only makes an untidy mess of it. This bestowal of creative acts makes the home, or part of it, an extension of oneself.

We should ask ourselves if the same does not obtain for collective artifacts such as a city or an urban district.

5. Man must have some form of recreation if he is to preserve his mental and social health. Some recreation consists in relaxation from responsibility or arduous work. Some consists in achieving variety, a change of occupation, as with exercise for those with sedentary jobs. But an increasingly large proportion of recreation consists in escaping from human artifacts which have become insufferable without the occupants realizing this. The many who are responsible for conservation of natural resources of wilderness and of wildlife (see Leydet, 1963) are inevitably also concerned with outdoor recreation, since human depredations tend to extinguish the resources. This makes it all the more necessary to structure our artifacts so as to ensure a life full of warmth, interest, and variety. The supermarket may be very efficient, but it cannot replace the social function of the small grocer's shop.

Referring back to the previous section (4), a human group does not function meaningfully unless it is socially integrated by shared activities and what we may call 'group possessions' (both abstract and concrete). This is the integration which Erik Erikson refers to as 'group identity'. Spatial elements are an essential part of this pattern of integration, as Fried (1963) has stressed in referring to a 'sense of

spatial identity'. This is also in part the concept of an ecosystem, which must include all artifacts and the media through which information is exchanged. A study of relocation from slums in the West End of Boston has shown that this spatial component of the local ecosystem is very much more important among the working classes than among the middle classes (Fried, 1963; Fried and Gleicher, 1961); hence the paradox that relocation of working people from a slum to greatly 'improved' quarters is very much more traumatic than relocation of middle-class families to only moderately 'improved' quarters. This is particularly important to those concerned with rural-urban and inter-urban migrations.

6. A growing field of study in animal and human ecology, sometimes referred to as 'the social use of space' (Calhoun, 1964), is very much relevant to human health. Different cultures will pattern living-spaces differently and we can learn from comparative studies of these. An American culture which regards exposure and copulation as private acts cannot possibly structure acceptable living-quarters on the lines of Eskimos and many Polynesians, among whom exposure and copulation are regarded as unembarrassing acts making no special demand for privacy. Perhaps in the case of Eskimos in their igloos, and among many of the world's poverty-stricken people, lack of living-space forces this acceptance of particular acts as unembarrassing to others or to themselves. On the other hand, in some other cultures, it is eating which demands privacy, i.e. private space.

In a given floor-space, a given number of rats will be so crowded that they suffer stress through interpersonal contacts (coaction). The introduction of partitions in the middle, or the alteration of the

boundaries so as to provide more corners, will reduce the stress or allow a greater number of rats in the same area to suffer the same level of stress as before. An increase in physical 'complexity' of the living-space results in a reduction in total complexity in the framework of the rats' lives. In the case of social man, a somewhat similar increase in complexity can reduce stress, but much more than avoidance of interpersonal coaction is required. A window-box of plants or an aquarium can reduce claustrophobia and add to the small-scale richness of one's spatial identification. The Japanese have superbly developed the art of miniaturization, as exemplified by the Japanese garden, the structuring of a Japanese inn, and the tokonoma, a specially respected space on one side of the livingroom in even the poorest home, bearing some sort of simple decoration and symbolizing among many other things the larger open spaces which are denied to the town-dweller.

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THIRD MEETING

**15-19 JUNE 1964
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**SPECIAL SESSION ON
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PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

WASHINGTON, D.C.

LA ADAPTABILIDAD DEL COMPORTAMIENTO HUMANO* **

El propósito de este trabajo es ofrecer una serie de interrogantes que se han planteado al revisar algunas modalidades de adaptación personal e interpersonal a la vida urbana en la América Latina. Hemos utilizado, a manera de ilustración, el caso peruano, aunque mencionamos otros sin ningún intento de generalización.

1. La esencia del proceso de adaptación

Esta es dominio de la realidad a través de la solución de los problemas o demandas que aquélla plantea a las personas y a los grupos. Conviene delimitarle, siguiendo a O.H. Mowrer y a Clyde Kluckhohn, del ajuste, simple remoción de estímulos o tensiones, sin que esto se acompañe de solución efectiva de problemas o de satisfacción real de necesidades fundamentales. La adaptación es una relación entre el organismo y el ambiente que asegura su supervivencia. Esta relación, cuando es efectiva, asegura el futuro desenvolvimiento del organismo por las potencialidades que moviliza y, en muchos casos, entraña una verdadera creación, la emergencia de nuevas formas de comportamiento que asientan sobre nuevas bases al individuo y al grupo a que éste pertenece.

El hombre que pertenece a la especie animal más educable es sin embargo víctima, no rara vez, de la inercia y fijeza de sus viejos hábitos, costumbres y actitudes. Muchos de los problemas que presentan los migrantes a las grandes ciudades pueden referirse a sus actitudes que les

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** Not edited.

permitían un funcionamiento adecuado en el medio estable de sus colectividades rurales o en situaciones de dependencia familiar o con respecto a "patrones".

El cambio, mayor o menor, gradual o súbito, del ambiente en que vive el hombre o los que se producen cuando éste se desplaza, voluntaria o involuntariamente, exigen de él una tarea ininterrumpida de adaptación o de intento de dominio de esa realidad cambiante o nueva a fin de sobrevivir y desarrollarse.

Podrá engañarse si utiliza técnicas de ajuste que no le permiten movilizar sus potencialidades y resolver los problemas que le plantean las diversas situaciones de la vida en la ciudad, por ejemplo. Pero esas técnicas, por lo común evasivas, de auto-engaño, terminan por disminuir su efectividad para el afronte de las diversas demandas o exigencias de la vida urbana.

Pueden distinguirse dos grandes formas de adaptación: la alloplástica y la autoplástica, la primera se refiere a los cambios que el individuo y el grupo efectúan en el ambiente, como el caso de muchas empresas de auto-ayuda en ciertas barriadas marginales de América Latina en donde, con asistencia técnica y ayuda mutua, los pobladores modifican un ambiente insalubre con las consiguientes ventajas para su supervivencia y desarrollo. Sin embargo, estos cambios pueden ser favorecidos mediante la inteligente utilización de formas tradicionales de ayuda mutua que hacían en sus comunidades o pueblos de origen. En este sentido, conviene estudiar las maneras cómo esas formas o patrones tradicionales pueden ser orientados de acuerdo a las técnicas de organización de la comunidad. Formas tradicionales de auto-ayuda o de cooperación popular son así

utilizadas para enfrentarse a exigencias de vida urbana en algunas barriadas de la ciudad de Lima e, incluso, revitalizadas con asistencia técnica en las mismas áreas rurales donde se iniciaron.

El compadrazgo, el parentesco, las relaciones amistosas pueblerinas continúan, en nuestro medio, en forma muy parecida a como se desenvolvían en el pequeño pueblo o villorrio. Estas formas de relaciones primarias se extienden, de otra parte, a través de una amplia red de "clubes" de provincianos, nuevas agrupaciones que incluyen las formas tradicionales de relación y que ofrecen apoyo, seguridad, orientación en el nuevo medio, obrando, más o menos efectivamente como un para-choque frente a las incertidumbres de la gran ciudad. William P. Mangin, que les ha estudiado intensamente, señala sus aspectos integradores y su función de intermediarios con respecto a las nuevas costumbres. De otra parte, nos parece, que al mantener identidades tradicionales, por lo menos durante un período, aseguran frente a la ansiedad o inseguridades referentes a su posible aceptación de parte de los habitantes de la ciudad.

Cambios en el propio sujeto que incrementen por ejemplo sus habilidades técnicas refuerzan el sentido de competencia de su Yo y de esta manera son un medio efectivo de adaptación autoplástica. En este sentido se advierte una extendida actitud, en esa población de migrantes provincianos, rurales o citadinos, de aprecio de la educación y de participación creciente en los programas de educación del adulto que se le ofrecen. Aún personas fracasadas en sus aspiraciones, en el medio urbano, mantienen dichas aspiraciones para sus hijos.

2. Urbanización sin industrialización y los problemas de adaptación urbana

¿Puede compararse la cultura urbana de las ciudades de los países sub-desarrollados a la de los países altamente industrializados o desarrollados? ¿Qué semejanzas y diferencias existen entre los pobladores de los clásicos "slums" y los habitantes de las llamadas favelas, ciudades callampas, barriadas marginales? Esto merece estudios especiales particularmente frente a la formulación de Oscar Lewis acerca de una llamada "cultura de la pobreza".

En buena parte de las grandes ciudades latinoamericanas nos encontramos frente a fenómenos de gran crecimiento urbano, por migración interna, sin que paralelamente se haya producido una industrialización conveniente. Sub-empleo, desarrollo lento de las economías plantean problemas entre los migrantes, buena parte de los cuales llega con aspiraciones elevadas si no para ellos por lo menos para sus hijos. Se pueden observar áreas de apatía, de gran pobreza en algunas de esas barriadas, pero en otras asistimos a la emergencia de una orientación esforzada y esperanzada, para los hijos, aún en medio de gran pobreza. A este respecto puede hablarse de la existencia de actitudes de esperanza al lado de la frustración, lo que es evidentemente un factor de integración y de soporte. El desarrollo creciente de expectativas, de otra parte favorecido por las comunicaciones de masa, plantean problemas dignos de estudio en sus repercusiones positivas y negativas sobre todo cuando las aspiraciones no guardan relación a las oportunidades y a la competencia personal.

3. Conveniencia de estudiar intensamente las adaptaciones exitosas

Aún en las áreas clásicas de tugurios, en plena ciudad, se pueden advertir sectores donde la desorganización social es mínima. Es raro un

estudio de los sectores urbanos pobres que se haya interesado en un análisis de las familias estables, con un mínimo de desintegración. Necesitamos conocer qué es lo que defiende, sostiene e integra. En la América Latina hay pocos estudios comparables a los de Oscar Lewis en la ciudad de México; éste, siguiendo a familias rurales en su proceso de migración a la gran ciudad, halló la persistencia de un campesinado urbano con mantenimiento de la cohesión familiar, relaciones de vecindario, mantenimiento de los lazos de la familia extensa.

En Lima, Delia Zamalloa, bajo nuestra dirección, efectuó una investigación sobre la ayuda informal en un vecindario, en el centro de la ciudad, donde moraban emigrantes provincianos que habían llegado entre 10 y 15 años atrás. Había entre ellos y sus parientes estrechos lazos de unión, ayuda en caso de necesidad, visitas frecuentes y correspondidas. Por otra parte los vínculos con el pueblo natal no se habían roto e inclusive se verificó intercambio de servicios entre familiares físicamente muy distantes.

4. El inicio del proceso de cambio o la instalación de las llamadas
barriadas tiene un carácter integrativo

La instalación de los migrantes provincianos en las áreas de tugurios y en las áreas denominadas de barriadas marginales, favelas, villas miserias etc. se encuentra en relación evidente con los altos alquileres, para ellos, en las zonas de mejor vivienda y vecindario. Al lado de esta motivación negativa se advierte una motivación positiva, una actitud esperanzada, en todos aquéllos que participan en las llamadas invasiones de los terrenos baldíos de los alrededores de las grandes ciudades.

Ahí construyen sus chozas, las mejoran progresivamente y se sienten satisfechos debido a que tienen una casa propia para sí y sus hijos. Sea como fuere mejoran su condición y poco a poco puede apreciarse una mejoría en la calidad del material empleado en la vivienda y una acogida fácil de la ayuda técnica que se le brinde.

Hugo Neira, estudiante de antropología social y periodista, ha destacado el aspecto optimista de los pobladores de una barriada en pleno proceso de instalación en áreas baldías de la vecindad de Lima (pampas del Ermitaño): "conversar con los hombres y mujeres del Ermitaño es volver a aprender el idioma de la esperanza. Ha nacido hace poco esta barriada. Y quizás debido a eso no tienen la luz eléctrica, ni agua, ni escuela. Pero en cambio el empuje de su organización, el orden que mantienen en su incipiente ciudad alejan del ánimo del visitante los fantasmas del desaliento. No hay que olvidar que, después de todo, cada uno de estos hombres es un propietario".

William Mangin, siguiendo una suerte de historia natural de las barriadas de Lima, ha encontrado gran cohesión e integración social entre todos aquellos pobladores iniciales de esas zonas. A fenómenos de solidaridad se agregan sentimientos de satisfacción por los logros alcanzados y por los esfuerzos realizados. Sin embargo, en una segunda etapa o momento estos fenómenos decrecen, en algunas áreas se mantienen, y emergen, más tarde, tensiones y rivalidades en relación a la dirección de las llamadas asociaciones de pobladores.

Es del todo indispensable un estudio del "liderismo" en esas agrupaciones. Algunas observaciones de Elías Flores, contenidas en el "Informe para la Comisión para la Reforma Agraria y la Vivienda. Cuarta Parte.

"Dinámica del Grupo" destacan el efecto desintegrador de las actitudes de algunos dirigentes. En otros casos ha continuado un verdadero proceso de organización y desarrollo de la comunidad. Faltan análisis de las diferentes formas de dirección, de las características psicológicas, culturales y sociales de los llamados dirigentes de "barriadas"... Por su influencia constructiva o destructiva de las actividades del grupo merecen un estudio especial.

5. Dependencia, recelo, fatalismo

Andrew Pearse ha señalado los problemas condicionados por las actitudes de dependencia que traen los emigrantes rurales a las ciudades brasileras. Los que tienen una escasa creencia de que la habilidad y la perseverancia son más eficaces que las influencias personales para progresar. "Sus pasatiempos y sus prácticas religiosas reflejan su preocupación por su importancia para mejorar o aún afianzar su suerte y las actividades de su familia y su habitual esperanza de que contará con la intervención y protección de un buen patrón, un dirigente político o un santo poderoso. Al propio tiempo, aunque todavía no ha llegado a ver la sociedad urbana como un todo abierto en que las realizaciones y el talento cuentan más que los privilegios y la situación para progresar, encuentra gran satisfacción en sistemas de "jugar" en que las destrezas y poder del individuo traen el éxito y en que la buena suerte puede favorecer a cualquiera, independientemente de su condición".

Actitudes semejantes han sido descritas por nosotros y por William P. Mangin en algunos grupos de mestizos peruanos. En estos casos estas actitudes se manifiestan por una tendencia a descargar responsabilidades

a ciertas figuras paternalísticas, "por una tremenda dependencia con respecto al gobierno, la iglesia o alguna fuerza fuera de sí mismo" (William P. Mangin). Pudiera que estas actitudes de dependencia estuvieran en relación a circunstancias de extrema pobreza o necesidad, cabe la posibilidad de que estén en relación con un sistema permanente de actitudes, quizás en relación con alguna forma de personalidad básica. ¿Guarda alguna relación con el familismo tan frecuente en esos sectores? Se encuentran, en otra parte, verdaderas actitudes conflictivas, quizás en relación con una situación de transición o de cambio cultural y social. Hay en los mestizos, estudiados por nosotros, una suerte de expectativa de encontrar apoyo y dirección en figuras de un tipo paternal y al mismo tiempo, como lo comprobamos en las ciudades, un sentimiento de que no pueden esperar nada de nadie. "Las actitudes de dependencia se manifiestan como una necesidad de ser guiados, orientados, de que alguien les diga lo que deben hacer". Sin embargo, estas actitudes de dependencia no son necesariamente negativas en esos casos, pues su utilización con fines de educación para la auto-ayuda, con una asistencia técnica un tanto paternalística, les da un valor de adaptación.

Una actitud negativa que puede entorpecer programas de promoción local es una extendida actitud de recelo o desconfianza. Es cierto que dicha disposición es típica del poblador de pueblo pequeño y aislado que quizás continúa en el medio urbano bajo forma de disposición o actitud estable. Esta desconfianza hacia los demás ha sido hallada en otros estudios como los de William F. Whyte en estudiantes, en los que alcanzó una frecuencia de 69.9% comparativamente a un 19% encontrado en estudiantes universitarios norteamericanos....

En migrantes mestizos, como en el medio rural, es frecuente una disposición fatalista y pesimista. La creencia en la buena suerte o en la mala suerte interviene pronto para hallar explicaciones de éxitos y fracasos denotando así su evidente función de ajuste o de simple disminución de tensiones a través de una racionalización. A este respecto hallamos en diferentes áreas tipo barriadas una alta prevalencia de la creencia de que el "éxito de la vida depende más de la suerte que de la habilidad real". Creencias de este tipo sin duda alguna no favorecen la movilización de muchas potencialidades necesarias para ciertas exigencias competitivas que pueden presentarse en las grandes ciudades. Tenemos así, pues, muchas actitudes culturales obrando negativamente para los fines de la buena adaptación personal e interpersonal....

6. La pre-adaptación

Sin embargo, no todos los migrantes que llegan a las grandes ciudades provienen de ambientes rurales. Un estudio realizado por Joseph Stycos y Cara Richards de Dobyns sobre las fuentes de la migración a la gran Lima comprobó que la mitad de los migrantes son ya urbanos de nacimiento, con las ventajas culturales de la vida urbana, una mejor educación y con mayores éxitos económicos comparativamente a los de procedencia rural.

Muchas familias de emigrantes rurales traen factores de estabilización. Así en el Brasil, por ejemplo, Andrew Pearse halló en la ciudad de Río de Janeiro un gran grupo de pobladores de favelas en los que evidentemente la buena organización familiar, pese a las circunstancias desfavorables, constituían una fuente de seguridad, "en todos esos casos antes del matrimonio hubo amistad estrecha e íntima entre las familias de los contrayentes; los grupos de parientes surgen a raíz del matrimonio y las relaciones

dentro de ellos se refuerza con los vínculos del compadrazgo... La mayoría de las familias rurales investigadas pueden contar con varios grupos de parientes que viven en las mismas favelas o en otras partes de la ciudad y sólo con éstas se visitan..."

En el Perú, José M. Arguedas y Gabriel Escobar han llamado la atención a lo que se está observando en Ayacucho, Cuzco y Puno, donde el nuevo mestizo, el que abandona las formas de vida tradicional, el llamado "cholo emergente", manifiesta una orientación individualista, pragmática, lo que pudiera favorecerlo en su adaptación a medios competitivos urbanos.... Por su parte Joan Snyder, estudiando la colectividad de Recuayhuanca, ha destacado cómo muchos de sus integrantes tienen ahí, en la sierra de Ancash, a la sociedad de la costa como su grupo de referencia, con la que se identifican. Programas de desarrollo regional, los cambios sociales que pudieran presentarse en el agro evidentemente plantean problemas especiales que merecen estudiarse, también, en relación a los procesos de adaptación y de pre-adaptación a la vida urbana.

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THIRD MEETING

**15-19 JUNE 1964
WASHINGTON, D.C.**

**SPECIAL SESSION ON
ENVIRONMENTAL DETERMINANTS OF
COMMUNITY WELL-BEING**

AGENDA ITEM 6

Discussion on Air Quality #123

Ref: RES 3/6

17 June 1964

PAN AMERICAN HEALTH ORGANIZATION
Pan American Sanitary Bureau, Regional Office of the
WORLD HEALTH ORGANIZATION

WASHINGTON, D.C.

Special Session on
ENVIRONMENTAL DETERMINANTS OF
COMMUNITY WELL-BEING

Agenda Item No.6: Managerial and Cost Factors in Improving the Environment

BASIC HOUSING SANITATION SERVICES IN SHANTY TOWNS.
MIGRATION AND URBANIZATION*

1. Population growth and distribution in Latin America

It is only relatively recently that censuses have been systematically made in Latin American countries. It is unfortunate that the procedure adopted in 1950, namely simultaneous censuses, was not repeated in 1960. As a result, the published data show discrepancies. Nevertheless they do allow us to appreciate the tendencies and characteristics of population growth. Table A on page 17, which shows the population in 1950 and in 1960 for 20 countries in the Western Hemisphere, is taken from a publication of the Economic Commission for Latin America on statistical evaluation of housing conditions (1) and provides a comprehensive picture of Latin American population, its growth, its distribution by rural and urban areas, and the growth rates both for the total population and for each sector.

A characteristic of Latin American development is a high and accelerated growth of the total population. There is a marked difference

*Prepared for the Third Meeting of the PAHO Advisory Committee on Medical Research, 15-19 June 1964, by Eng. Humberto Olivero, Jr., Department of Sanitary Engineering, School of Engineering, University of San Carlos, Guatemala City, Guatemala.

between urban and rural growth, that of the urban being on the average three times greater than the rural.

Although these facts are well known, it must be pointed out that the definition of urban and rural population varies according to the criteria used by the countries and that this fact must be taken into account when comparing the situation in different countries with respect to water supply and sewage disposal services in urban and rural sectors. Table B on page 19 contains in a summary form a tabulation of the basic criteria used by Latin American countries for delimiting the urban and the rural sectors in the 1950 censuses.

With respect to population growth and its distribution, Arias (2) states that "experience shows that the natural growth of the population tends to be slightly greater in rural areas than in urban areas, so that ultimately higher values would be expected for the rural population. However, in view of the trends in urbanization exhibited by different countries, as a consequence of the unsatisfactory conditions prevailing in the agriculture sector buttressed by a rather inadequate system of land tenure; the greater educational, medical, recreational, and work opportunities in towns; the industrial development and the excessive concentration of most of the economic activities in the great cities and especially in the capitals, it is to be expected that the rural to urban migration will be maintained and will increase."

The concentration of the urban population in the capitals, which is disproportionate in relation to the urban population of the medium-sized and small towns, is also a consequence of excessive centralization, especially of governmental activities and in general of all activities, commercial, industrial, cultural, educational, recreational, etc. By

way of illustration Table 1 shows the distribution of the urban population in the cities, towns, and villages in Guatemala according to the 1950 census. The situation it discloses is characteristic of the countries of Central America and of some of those of South America.

Table 1
Communities in Guatemala by Number of Inhabitants*

Number of inhabitants	Number of communities	Percentage of urban population
100,000 - 500,000	1	32.8
10,000 - 99,000	4	7.5
5,000 - 9,999	19	14.9
2,000 - 4,999	63	22.2
1,000 - 1,999	86	13.6
200 - 999	142	9.0

* Censo de Población 1950 - Dirección General de Estadística, República de Guatemala. The total population in 1950 was 2,790,868. The population in this Table is 866,139.

2. The rural to urban migration and its causes

Very little information is available about internal migration in different countries. In the publication concerning Demographic Aspects of Urbanization in Latin America, published by the Population Division of the United Nations Department of Social Affairs (3), it is stated, with reference to the three components of urban population growth namely, a) natural growth; b) rural to urban migration and c) international migration, that in the Latin American countries the proportion of persons

born abroad is very small and continues to get smaller; thus international immigration has been of little importance and can be discounted as a factor in the growth of the total population as well as in that of the urban population.

The approximate percentages of the urban growth due to natural increase and to migration in one group of countries, according to the study mentioned above, are shown in Table 2.

Table 2

Percentage of Total Growth of the Urban Population due to Natural Growth and to Migration During the Intercensal Periods in Some Latin American Countries

Country	Census period	Approximate percentage of urban growth due to	
		Natural increase	Migration
Venezuela	1941-1950	29	71
Colombia	1938-1951	32	68
Dominican Republic	1935-1950	35	65
Nicaragua	1940-1950	35	65
Paraguay	1937-1950	45	55
El Salvador	1930-1950	46	54
Brazil	1940-1950	51	49
Chile	1940-1952	53	47
Mexico	1940-1950	58	42

As for the motivations behind migration from rural to urban areas, surveys carried out in different countries show that they are mainly economic, social, and educational.

The findings of a survey made in the city of Lima, Peru (4), and covering more than 17,000 families that had moved there from the provinces are given in Table 3.

Table 3
Migration to the City: Reasons Given

Reasons	Number of families	Percentage
Economic	13,713	61.05
Social	5,133	22.85
Educational	1,936	8.62
Military (compulsory military service)	766	3.41
Health	595	2.65
Housing	179	0.80
Other	139	0.62
Total	22,461*	100.00

*These were the reasons given by 17,426 head of households; the discrepancy is due to the fact that some gave more than one reason.

From this Table it may be inferred that, as reasons for rural to urban migration, housing, hygiene, and health occupy a secondary place in relation to economic, social, and educational motivations.

Generally speaking the migration is from agrarian communities or rural areas to the nearest population centers. There is then a second stage when the migration is from these population centers to a larger population center which is generally the capital or the major town in the district and finally there is a migratory trend from these population centers to the capitals and the large cities. This trend is

the consequence of the lack of a balanced development between the medium sized and small cities and the capitals.

A survey of internal migration in Guatemala (5) illustrates the principal characteristics of this phenomenon, which may be summed up as follows:

- a) The tendency to migrate is less pronounced among the Indian population than among the non-Indian population. In Guatemala the Indian population is estimated to be slightly more than 50% of the total population.
- b) The Indian population tends to migrate for only short distances as compared to the non-Indian population.
- c) With the exception of the capital city, where economic, cultural, and governmental activities are concentrated, and of a few areas where the principal agricultural plantations are situated and port areas, the main migratory movements are between neighboring departments.
- d) Indian migrations tend to follow the same direction; that of the non-Indian population varies.
- e) It is not possible to establish accurate relationships with respect to urban and rural migration because of the lack of such data in the censuses, but it is a fact that most migrants moved to the urban areas, although in some areas there were movements towards the rural areas and in this case the capital city served as a redistribution center of the migratory currents.

f) As to the sex distribution of migrants there are more men than women, except in migration to the capital where the women go to seek domestic employment.

3. Housing and availability of basic services

Urbanization in Latin America, in the sense of concentration of the population, has had its greatest physical and environmental impact on housing and its basic services.

Statistics and information about the housing situation and its basic services consist of rather general and not very accurate data. This is a result in part of the relatively recent development of housing censuses in Latin America, most of the countries having taken their first housing census in or about 1950.

In addition to information about construction and building materials, density of occupants, tenancy or type of occupancy, the housing censuses in Latin America recorded information about a) water service; b) sanitary services; c) lighting.

The basic information requested in the Census of the Americas was in accordance with the statistical indicators of housing conditions chosen by the United Nations to reflect housing conditions which are considered fundamental for the protection of the private life of families and their members, the protection of individuals against certain environmental hazards, and the availability of such indispensable facilities as drinking water (1). The importance of water services and of sanitary

installations as fundamental components of housing is generally recognized and accepted and is a fact which must be emphasized.

The statistical data available about water and excreta disposal services in houses are deficient and incomplete.

The information about basic housing services given in the publication "The Housing Situation in America" (6) is subject to considerable reservations since in most instances the terms used referring to services were not defined. Nevertheless, with a view to presenting a general picture of the housing situation as far as basic services are concerned, information for some countries in the Americas, based on the 1950 census, is presented in Table 4.

It is to be hoped that the 1960 censuses and those taken in subsequent years will provide better information than that available at present, which although it does point up the magnitude and seriousness of the problem, does not allow comparisons to be made.

Table 4

Housing and its Basic Services in Selected Countries of the Americas*
(In Percentages)

Country	Year	Piped water			Excreta disposal			Electric lighting		
		Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural
Brazil	1950	15.6	39.5	1.4	33.0(a)	71.3(a)	10.4(a)	24.6	60	3.6
Colombia	1951	26	63.1	5.1	32.4(a)	70.2(a)	11.3(a)	25.8	64.3	4.2
Venezuela	1950	31.1	53.2	6.1	46.8(a)	74.3(a)	12.9(a)	42.5	72.0	9.1
Canada	1951	74	94.1	39.5	68.3(b)	91.7(b)	28.2(b)	87	99.3	65.9
United States	1950	85.2	91.5	45.4	75.5(c)	83.1(c)	28 (c)	94	96.7	77.7

* From the chapter "Private Dwellings According to Availability of Services" in "The Housing Situation in America", MIT, School of Engineering, February 1964.

- (a) Any type.
- (b) Flush toilet.
- (c) Inside the dwelling.

4. Shanty towns and basic services

As a result of migration from rural areas and from towns in the interior, the increase in population in the capitals and the larger towns in Latin American countries has had a marked influence on the formation of so-called "shanty towns."

These shanty towns are generally situated on the outskirts of the cities. They generally arise from the simultaneous invasion by many families of unused lands belonging to the state or municipalities and in some cases to private owners. Each family immediately begins to build its dwelling, using a variety of materials, in order to ensure the right of "ownership." As time goes by, the original construction is little by little replaced by more formal materials such as wood, adobe, or brick.

It is during the initial period of the formation of these shanty towns that their development and growth can be prevented by means of a firm attitude on the part of the municipal and governmental authorities. The contrary stance creates an environment favorable to their promotion and development.

Once the inhabitants of the shanty towns are installed, they generally establish a committee to begin negotiations to obtain water services and lighting. Sewerage is given little importance at the beginning.

Water service is provided by public fountains or public stand pipes which are installed for them, free of charge, by the municipalities. As time goes on, some persons organize house distribution services and transport the water in cans or vessels and charge a small sum for the service. In certain shanty towns in Guatemala City the charge for the transportation of a container of about 19 liters (5 gallons) is 4 cents of a quetzal (1 quetzal = US\$1.00) and at least one container is the absolute minimum amount

of water needed daily for food preparation. This means that part of the population of these shanty towns is paying as a minimum Q1.20 a month in order to obtain a volume of water which, at the same price, is approximately 30 to 50 times less than that which would be obtained in a house with a piped water supply.

A similar situation is described in a study of water supplies in the city of Tegucigalpa (?), where in some areas of the city inhabited by low income families persons with water services sell water to their neighbors that do not have any, at prices which are 20 to 50 times greater than the water rate for domiciliary service.

The above-mentioned facts show that the supply of water to areas in the cities whose inhabitants are in the low-income bracket, should be further studied with a view to finding an appropriate solution.

With respect to electricity it is well known that most of the houses of low-income families have lighting services. It must be borne in mind that generally speaking electricity rates in Latin America are higher than water rates, and what is more, collection of bills is more strict, a fact that lends further support to the thesis that it is necessary to try to find a solution for water supply.

The construction of a sewerage system in shanty towns frequently presents technical and construction problems which are in general more complicated than those connected with water supply and lighting services. Unless a better solution is found, it is probably necessary to continue to dispose of excreta by means of privies and of liquid waste through absorption pits.

5. Cost of low-cost housing and of their basic services

This section contains information on the cost of housing for low-income families and the cost of basic services, such as, water supply, sewerage and electricity. These costs which enable one to form a general idea of the problem, have been provided by the Inter-American Cooperative Housing Institute in Guatemala and are based on programs which are being carried out in three projects, 2 for Guatemala City and 1 in the major town of a department.

In housing projects there are two main types of costs: that of construction of the house itself and that of the cost of urbanization. In order to give a general picture, since under these two heads there are costs which can be attributed to water supply, sewerage, and electricity, the various tables presented give information on these different aspects.

Table 5 shows the total average cost per dwelling, and the cost of urbanization and of construction of the house itself. These costs do not include the value of the land nor the cost of interest rates, insurance, and loan servicing. But they do include the cost of the administration and supervision of the construction program.

Table 5
Construction Cost per Dwelling
(Cost in Quetzales)*

Costs	Total	Urbanization	Dwelling
Per dwelling	2,230	526	1,704
Percentage	100	24	76

*1 quetzal = US\$1.00

The cost of the basic services under the head "Urbanization" are shown in Table 6. These costs include:

a) Drinking water: the distribution center within the urbanization and its connection to the main city network as well as external house-connections, including the cost of the water meter.

b) Sewerage: the system of drains within the urbanization up to their connection to the sewerage network of the city and the external domiciliary connection.

c) Electricity: the distribution network (aerial) and its connection to the principal city network as well as the external connection excluding the cost of the electric meter.

Table 6

Cost of Basic Services Included Under the Head "Urbanization"
(Cost in Quetzales)

Costs	Total urbanization	Water	Sewerage	Electricity	Excavation; paving
Per dwelling	526	90	102	16	318
Percentage of total cost	24	4	5	1	14

The costs for water services, sewerage, and electricity under the head "Housing" shown in Table 7 include the following:

a) Drinking water: In addition to the internal piping, it includes the cost of the sanitary devices (flush toilet, wash basin, shower, and sink). It would perhaps be more advisable to consider separately the sanitary devices and their installation (approximately 75%).

- b) Sewerage: covers piping inside the house.
- c) Electricity: internal electrical installation.

Table 7

Cost of Construction of Basic Services within the Dwelling

Costs	Total construction dwelling	Water	Sewerage	Electricity	Construction, excluding services
Per dwelling	1,704	100	53	70	1,481
Percentage of total cost	76	4.5	2.5	3	66

The costs shown in the foregoing tables, although applying to a type of dwelling that may vary for other countries and for other types of construction, characteristics, and prices, do make it possible to judge the relative magnitude of the costs of the various basic services in relation to the cost of the dwelling itself. It is to be noted:

a) that the costs of basic sanitation services are relatively low in relation to the cost of the dwelling itself; and

b) that water and sewerage services in housing programs generally depend on the city services. Therefore the solution of the fundamental problem of water and sewerage services in areas whose inhabitants are in the low-income bracket depends in large measure on the capacity and efficiency of the general services of the city.

6. Study and planning

In the complex problem of housing, almost all authorities in this field are agreed that the solution of the problem depends both on raising

family incomes and on constructing a sufficient number of dwellings within the financial reach of those incomes.

Low-income families which live in large towns cannot afford dwellings of the type that satisfy generally accepted standards and requirements. Furthermore, the governments and the countries do not have at their disposal or cannot obtain sufficient funds to heavily subsidize large-scale housing programs for low-income groups.

In view of this it would be advisable to concentrate on the following aspects:

- a) Construction of small, simple dwellings which, although they depart in some measure from the standards at present in force, do satisfy minimum housing requirements at a lesser cost and have the basic services of water and excreta disposal although in the simplest possible form.
- b) Research programs aimed at reducing the cost of construction by means of utilizing cheaper materials and improving working efficiency.
- c) It is difficult, perhaps almost impossible, to attempt to replace all dwellings in bad condition by new dwellings. In view of this it would be advisable, in the case of some shanty towns, to examine the possibility of urban renewal programs and to improve and rehabilitate existing dwellings, provided they can be brought up to certain minimum standards. This type of program would require technical assistance and guidance for the inhabitants.

As far as planning is concerned, there are two aspects to take into consideration: the national plan and the local plan. In various Latin American countries in the last decade there has been a tendency to attempt

to solve all problems by means of national bodies, which naturally have their headquarters in the capital, and thereby to increase the already exaggerated centralization and to reduce even more the importance of local authorities and administrations. This leads to an increase in inertia and to the undermining of the initiative and interest of the communities, which is the fundamental basis for the development of a nation within the framework of a democratic regime. In this regard the following statement is made in the book "Urbanization and Physical Planning in Peru" (8) with respect to governmental centralization: "The public has come to a point where it believes that the State is the only body responsible for improving living conditions in the urban centers, since they do not demand anything from their municipalities; thus life languishes in the provinces. The inhabitants' sole wish is to establish themselves in the capital, so that they can improve their living conditions."

Generally speaking then, it would be more advisable to increase the activity and initiative of municipal authorities and establish, or strengthen, if it already exists, a planning unit at the national level which would be responsible for establishing standards for municipal plans and for providing technical assistance for studies, preparation of plans, and improvement of administrative practices.

7. Final considerations

1. The accelerated urbanization to be observed in Latin America which has resulted in an excessive concentration of population in a limited number of towns has created environmental sanitation problems whose solution is a difficult and complex matter.

2. Shanty towns - and, as far as their physical aspect is concerned, housing and the absence of basic services - appear at first sight as the most important problem of urbanization, but in actual fact it is only an external manifestation of the much larger and more complicated problem of the economic and social development of the country.

3. Possibly the principal problem of the urban environment is that related to housing due to the fact that it is impossible for many low-income families to find housing with the minimum facilities, in particular water and sewerage services.

4. The sudden growth of shanty towns is in many cases the consequence of the lack of a firm attitude on the part of governmental and municipal authorities.

5. The water supply and sewerage problem in shanty towns is to be solved primarily through the water and sewerage systems which serve the city. In exceptional instances a separate and independent solution is justified. It is because of this that the importance and priority of water supply and sewerage systems in cities becomes even greater when it is borne in mind that the logical way of solving the problem of low-income neighborhoods is through those systems and that it will be in cities with extensive and efficient services that the appropriate solutions will be more easily found.

Table A
Population Increase in Latin America

Country	Area	Population				1950/60 annual growth percentage
		Thousands				
		1950		1960		
Latin America	Total	155	423	199	195	2.5
	Urban	61	366	91	103	4.0
	Rural	94	057	108	092	1.4
Argentina	Total	15	942	20	998	2.1
	Urban	9	977	14	203	2.8
	Rural	5	965	6	795	1.0
Bolivia	Total	3	019	3	709	2.1
	Urban	1	013	1	381	3.1
	Rural	2	006	2	328	1.6
Brazil	Total	51	976	65	862	2.4
	Urban	16	021	24	134	4.2
	Rural	35	955	41	728	1.5
Chile	Total	6	295	7	634	2.5
	Urban	3	771	5	007	3.6
	Rural	2	524	2	627	0.5
Colombia	Total	11	459	14	771	2.9
	Urban	4	416	7	066	5.4
	Rural	7	043	7	705	1.0
Costa Rica	Total		801	1	144	3.8
	Urban		232		415	6.0
	Rural		569		729	2.5
Cuba	Total	5	508	6	819	2.2
	Urban	2	713	3	731	3.3
	Rural	2	795	3	088	1.0
Dominican Republic	Total	2	131	2	845	2.9
	Urban		458		806	5.8
	Rural	1	673	2	039	2.0
Ecuador	Total	3	197	4	287	3.0
	Urban		885	1	468	5.2
	Rural	2	312	2	819	2.0
El Salvador	Total	1	868	2	396	2.5
	Urban		517		829	4.8
	Rural	1	351	1	567	1.5

Table A (Cont.)
Population Increase in Latin America

Country	Area	Population		
		Thousands		1950/60 annual growth percentage
		1950	1960	
Guatemala	Total	2 805	3 755	3.0
	Urban	674	1 157	5.2
	Rural	2 131	2 598	2.2
Haití	Total	3 112	3 726	1.8
	Urban	312	633	7.3
	Rural	2 800	3 093	1.0
Honduras	Total	1 428	1 932	3.1
	Urban	247	492	7.1
	Rural	1 181	1 440	2.0
Mexico	Total	25 826	34 626	3.0
	Urban	11 003	17 423	4.7
	Rural	14 823	17 203	1.5
Nicaragua	Total	1 060	1 465	3.3
	Urban	298	536	6.1
	Rural	762	929	2.0
Panama	Total	797	1 052	2.8
	Urban	337	491	3.8
	Rural	460	561	2.0
Paraguay	Total	1 397	1 624	1.5
	Urban	388	564	3.8
	Rural	1 009	1 060	0.5
Perú	Total	8 521	10 857	2.5
	Urban	2 973	4 418	4.0
	Rural	5 548	6 439	1.5
Uruguay	Total	2 407	2 760	1.4
	Urban	1 893	2 246	1.7
	Rural	514	514	0.0
Venezuela	Total	4 974	6 933	3.4
	Urban	2 430	4 259	5.8
	Rural	2 544	2 674	0.5

Source: Table 12, Evaluación Estadística de las Condiciones de Habitación, CEPAL - Julio 1962.

Table B

Definitions of Urban and Rural Population used in the 1950 Censuses

Country	Urban	Rural
Argentina (1947)	Population centers with 2,000 inhabitants or more	Under 2,000 inhabitants
Bolivia (1950)	Capitals of departments, provinces, cantons	Other
Brazil (1950)	Cities and towns	Other
Canada	Population centers with 1,000 inhabitants or more	Under 1,000 inhabitants
Chile (1952)	Chief towns of communes populated areas with basic services	Without basic services
Colombia (1951)	Population centers with 1,500 inhabitants or more	Under 1,000 inhabitants
Costa Rica (1950)	Areas with sanitary services, drainage, lighting, etc.	Without basic services
Cuba (1953)	Centers with 1,500 inhabitants or more with basic services	Without basic services
Dominican Republic (1950)	Chief town of communes and municipal districts	Other
Ecuador (1950)	Provincial capitals and chief towns of cantons	Other (rural parishes)
El Salvador (1950)	Chief towns of municipalities	Other
Guatemala (1950)	Centers with more than 2,000 inhabitants and those between 1,500 and 2,000 with water service	Other
Haiti (1950)	No clear definition; usually towns, villages, hamlets	Other

Table B (Cont.)

Definition of Urban and Rural Population used in the 1950 Censuses

Country	Urban	Rural
Mexico (1950)	Localities with 2,500 inhabitants or more	Other
Panama (1950)	Localities with more than 1,500 inhabitants with basic services	Other
Paraguay (1950)	Localities with certain urban features (streets, squares) and basic services	Other
United States (1950)	Centers with 2,500 inhabitants or more	Other
Venezuela (1950)	Population centers with 1,000 inhabitants or more	Other

Source: Pan American Union (1962) La Situación de la Vivienda en América, Instituto Interamericano de Estadística (Appendix 5)

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