ENVIRONMENTAL ASPECTS OF THE PRESERVATION OF HISTORIC URBAN AREAS

The rehabilitation of the central districts of the world's cities confronts municipal administrators, architects and planners with very difficult problems; for these centres are also the nexus of a complex system of forces — economic, cultural and artistic. Criteria which normally apply to the development of peripheral communities or wholly new settlements in open land must be modified to meet the special complexities of the central districts of large cities. This paper attempts to outline only some of these problems; specifically those connected with preservation and/or amelioration of environmental conditions in such districts. Here, a new man-made environment has almost completely supplanted the pre-existing natural environment of the site. And the marked deterioration of this urban environment is the cause of rising concern everywhere.

Plans to raise the environmental quality of central city districts must therefore manipulate not merely meteorological, geographic and botanical factors but social and cultural, physiological and psychological factors as well. For example, the most valuable buildings in the nation, from an historical and artistic point of view, are usually concentrated in these districts. But many of these same buildings may be either physically or technologically obsolete. Characteristically, some of the worst housing conditions in the city may obtain there. The rehabilitation of such areas therefore cannot be regarded as a simple matter of either historic preservation or slum clearance.Venice is today the prototypal example of this environmental paradox. Whole sections of the city are in a stage of advanced physical deterioration; much of her housing is substandard — some of it actually uninhabitable. Yet this same urban tissue is one of the world's rarest architectural patrimonies. Moreover, it is the basis of Venice's largest industry, tourism. The environmental causes of her degradation are partly natural, partly man-induced. The sea level is rising and the land simultaneously sinking : these geological forces conspire to erode building foundations. But this process is aggravated by the wave action generated by hundreds of motor-powered boats. Atmospheric pollution resulting from industries on the mainland and domestic heating in the city is corroding her stone and marble; and this chemical attrition is aggravated by the droppings of millions of pigeons. Clearly, the salvation of Venice will require a broad and sophisticated program of environmental manipulation.

But, dramatic as are the problems of Venice, they are by no means unique to her. Few of the world's cities have an historic core as valuable, as extensive and as undisturbed as Venice. But in varying degrees, they share many of her problems and will require much the same types of intervention. Thus, the next stage of central city regeneration will be one in which the massive « slum-clearance » of the Forties and Fifties will be replaced by the discriminating insertion of new buildings and facilities to reinforce desirable neighbourhood patterns and life styles; where wholly degenerated urban tissue is surgically removed or — if artistically and historically significant — carefully restored; where old buildings are rehabilitated for new uses not envisioned by the original owners; where the existing infrastructure of service and utilities is modernized; and where transportation systems are strengthened with special reference to the pedestrian scale of the central city.

DOES THE CITY ITSELF HAVE A FUTURE ?

But we cannot discuss the conservation and rehabilitation of the central city without confronting the problem of the city itself. Perhaps one of the most serious problems before us, especially in Western Europe and North and South America, is psychological : the feeling in many important circles that the city itself may be historically doomed. Traditionally, it would never have been necessary to justify the existence of the city, since it was so abviously the source of all the things which made civilized existence attractive. The technological revolution of the last century and a half had served to obscure this central fact. Today the mechanization of life in the technically-advanced countries has gone far towards equalizing the historic disparity between the material conditions of urban and rural life. A whole range of amenities which had been hitherto the monopoly of the city has been extended into the countryside — amenities of which the public school, the paved road, the ambulance, and the powerline are merely symbols. Mechanization has also made possible the decentralization of manufacturing, thereby introducing new modes of work and thought into the rural hinterland. Thus the countryside has been opened up as the theatre of a much wider and more varied life than was conceivable in pre-industrial times. The same developments have, of course, affected the function and the form of the metropolis. Mechanization makes possible the unprecentedly fluid movement of

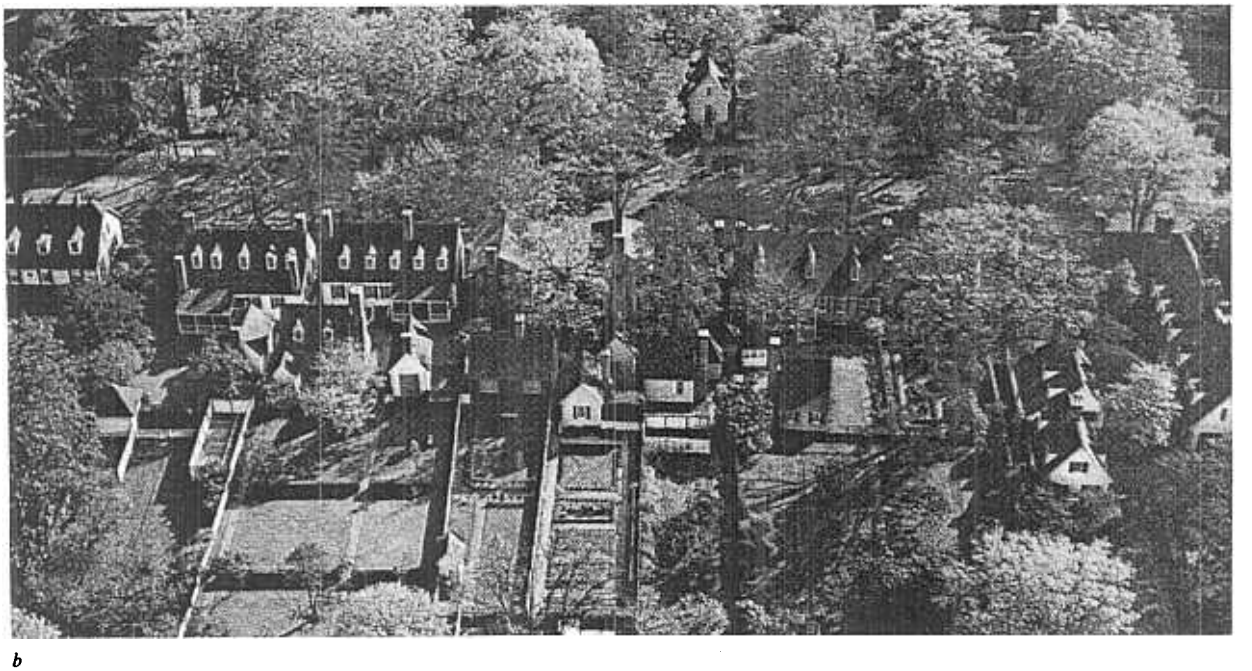
Fig. 1. — *Rehabilitation of Historic Complexes.*
Quincy Markets, Boston, Massachusetts, Alexander Parris, architect, 1825-1826. This remarkable Greek Revival commercial development, consisting of a 535-ft. long granite market house flanked by two rows of granite store-and-warehouse blocks, is now undergoing complete rehabilitation as part of the urban redevelopment program for downtown Boston. An 1828 view of the market complex shows Fanieul Hall in background. (*a*). A recent view of the area while used as a wholesale market : note new City Hall (1966) in background (*b*). Architect Frederick A. Stahl's sketch (*c*) shows how complex will appear after rehabilitation a a traffic-free, retail shopping district.

people and goods. This has meant that many of the commercial and industrial activities historically concentrated in the city could be moved out of it; with those activities could go the populations connected with them. These shifting populations and processes have, especially in recent decades, left ugly vacuums and imposed dreadful strains upon the physical and social fabric of the central city. The resulting confusion and squalor have driven further sectors of the population out to the suburbs, even though their economic and cultural focus remained in the city.

The result of all this has been the blurring of the physical and cultural distinction between the city and the countryside. Indeed, urban amenities have become so widely distributed beyond the urban area that a whole new set of misconceptions, as well-intentioned as they are misinformed, has come into being about the city. Not only is the countryside now described as a more pleasant place in which to live (The urban elite, Virgil no less than Vanderbilt, have often felt this way during epochs of social peace); but now, for the first time in Western history, it is seriously being argued that the city itself is no longer viable. A whole literature on the " disappearing city " has appeared. Following that special brand of social Darwinism which is endemic in so many current technical and academic circles, it is argued that the central city is " doomed " and " obsolete ", its disappearance from the stage of history ineluctable. According to this interpretation of the " law " of survival of the fittest, the city is destined simply to dissolve, distributing its amenities in a thin film of suburban houses, shopping centres, and country day schools across the landscape.

This is a grotesque misreading of the city's historic function. As the etymology of the word suggests, the city has always been not merely the vessel but the actual generator of civilization. It is not at all accidental that such words and concepts as civil, civilized, citizen, or urbane and urbanity cluster around the word and concept of the city. Urban experience with the city as a special instrument of social organization is the basis for all such concepts. It has always been the lodestar of farmer, herdsman, hunter, sailor. It offered them paved streets, lighted taverns, and buzzing markets instead of barnyard mud or storm-tossed ocean nights. It promised them music, dancing, theatre, and spectacle. Even more precious, it gave them relative safety from war, a place of sanctuary, an asylum for dissent. But beneath all of these was the city's most splendid gift : a *range of choice*, an entire spectrum of possible lines of action.

This attractive power of the city is somewhat obscured in the technically advanced countries by the surface glitter of universal mechanization. But even in many such countries (e.g., the North of England, the American Prairie States) the steady attrition of villages and small towns, continues apace. In such under-industrialized countries as Egypt or Greece, the centripetal pull of the



b

Fig. 2. — *Restoration of Historic Districts.*
Duke of Glouster Street, Williamsburg, Virginia. Founded in 1699, Williamsburg was the capital of the province until 1780, when the seat of government was moved to Richmond. Hence a " cut off " date of 1780 was established for the restoration, with all later structures demolished. This policy, together with that of reconstructing vanished buildings, has been a controversial aspect of Williamsburg. The consequences of this policy are clear in these two views of the principal street : as it appeared in 1890 (*a*) and as it appears today (*b*), with all the houses restored and outhouses and gardens reconstructed according to pre-1780 criteria.

city is even more marked. The peasantry flees the stupefying poverty and monotony of a countryside ravished by centuries of ignorance and neglect. This instinct is correct, however inadequately or unevenly Cairo or Athens may live up to its promises, for the amelioration of the material conditions of life can be accomplished only by the science and technology of the city. Even the regeneration of agriculture and the countryside is, culturally, the task of such urban institutions as the universities and research laboratories.

CHANGES IN THE CENTRAL CITY

For the last century, technology has served to accelerate two superficially contradictory tendencies in the cities of the world — one centrifugal, the other centripetal. These two tendencies — made possible above all by the development of mechanical transport and rapid communications — have altered both the form and the function of central urban districts. Commercial, cultural and governmental functions are still concentrated in the centre. In fact, in cities where a wide use has been made of skyscrapers (San Paulo, Chicago, Moscow) they are probably more concentrated than ever before in history. But the population which use and support these centers are now widely distributed in space, since home place and work place need no longer to be close together. Thus, while the city has grown enormously in size and spatial extension, its over-all density has often diminished (Los Angeles, Houston).

This process of decentralization has been made possible by the technological development of a whole succession of transportation forms, all of them based on the mechanical prime mover : steam commuting trains, steam ferries, electric trolleys, elevated railways and subway systems. Though they accelerated the centrifugal dispersion of the city, they were confined to the fixed trajectories of rail lines; and this set rational (or at least comprehensible) parameters to the process. But the scale of this process was altered by the introduction of the auto bus, the auto truck and most of all the private automobile. This new means of moving people and things across the landscape has acted like a powerful acid, dissolving the very tissue of the historic city.

The result of this shift has been to alter the life styles of the central city. The purely residential function has been almost everywhere reduced. Many of the older European metropoli continue to have sizeable residential populations at or near the centre (London, Paris, Rome). But in many cities where there has been extensive modernization, especially as a result of World War II, there has been a deliberate policy of shifting residential functions to newly-created micro-communities and satellite towns (Moscow, Warsaw, Stockholm, London). However, the most characteristic pattern has been the steady centrifugal spread of suburbia. This evisceration of the central city of a large part of its resident population varies, of course, from country to country. It is much less evident in densely built-up countries like Holland or Portugal than in western USA or South America. It is even affected by local geography : cities located on islands or peninsulas (Stockholm, New Orleans, San Francisco) show a tendency to maintain a much firmer central district than cities in which such constraints do not occur (Detroit, Mexico City, Sao Paulo). Finally, the tendency is most marked in those cities where the private automobile has supplanted mass transit (Houston, Los Angeles). In its most extreme cases, it has left a still-viable central business district surrounded by a widening ring of no-man's-land of abandoned buildings and empty lots (Bedford-Stuyvesant district in Brooklyn; Chicago's South Side).

Fig. 3. — *Rehabilitation of Historic Districts.*
Le Marais, Paris, France. This district is the site of ambitious and far-reaching plans, jointly sponsored by the French national government, the municipality of Paris and private interests, to rejuvenate the entire district. The plan envisages the preservation and restoration of historic monuments; the rehabilitation of old and erection of new housing for all income groups; the insertion of parking garages, new parks and green paces. The intensive land coverage (shown in map of district) will be greatly reduced by removal of substandard buildings, outhouses and appendages.

Nevertheless, and despite these profound changes, the central urban districts, by definition, are the oldest areas of the city. Because of this, they all share certain characteristics, irrespective of climate, culture or age.

1. They remain the locus of finance and banking, of nationally significant businesses, of communication, publication and mass media.
2. They tend to be densely built-up and densely populated, at least during working hours.
3. They are the site of the most important secular and religious institutions - castles, parliaments, city halls; cathedrals, monasteries, universities.
4. Most cultural institutions are central-city based : opera, ballet, symphony, theatres; museums and art galleries; libraries.

5. Finally, the central city tends to be the locus of most monuments and districts of artistic and historic significance; because of this, they are also the centre of tourism.

Because of their historic development, all central urban areas also display a characteristic range of idiosyncrasies. These include :

1. Intricate, random and complex physical structure. They show both vertical and horizontal discontinuities due to such cataclysmic events as war (Warsaw), earthquake (Lisbon), fire (London).
2. Land costs are highest though not necessarily equally distributed throughout.
3. Ownership of land and buildings is highly diversified and complex.
4. Infrastructure is complete (paved streets, sidewalks, squares; sewers, water systems, street-lighting; fire-fighting and waste disposal systems, etc.) but because of its evolution across time, some infrastructure may be redundant, obsolete or irrational.
5. Municipal services (hospitals, clinics, morgues, police, fire fighting and waste disposal; educational facilities at all levels) are dense and complex. Again, individual components may be obsolete or redundant.
6. Transportation systems, both intra- and inter-city were typically better than adequate until after World War II. In most European cities, this system is intact; in North and South American cities it has been largely demolished.
7. The physical condition of many old buildings, especially if they are privately owned, may be very unsatisfactory — structurally unsound, not fire-safe, inadequate sanitary facilities, lack of light and air, etc. This becomes especially serious when buildings are used as housing.

Such a list as that above suggests both the urgency and the difficulties of any program for the regeneration of the total physical environment of central urban districts.

THE APPLICATION OF TECHNOLOGY TO THE REGENERATION OF THE CENTRAL CITY

Ironically, modern technology is often used as the argument for abandoning completely the central city. It is declared to be " obsolete " : the only " progressive " response is held to be either (1) complete redevelopment or (2) extra-urban development in the form of endless suburban sprawl (Los Angeles, Detroit, Rome); or the creation of New Towns (England, Washington, D.C.); or micro-communities (Moscow, Bucharest, Warsaw). There are, of course, many situations in which the creation of brand new urban tissue on raw land is justified. But the same technical expertise can be fruitfully applied to the regeneration of central city districts.

The basic argument to justify this decision to abandon the central city is usually based upon economic factors : " It's cheaper to start from scratch. " While it may often be more expensive to modernize an individual building than to construct the same cubage on raw land, such costs take no account of the life-support systems, the infrastructure of institutions, services and utilities without which no building could operate at all.

Missing from such arguments about the " economy " of building anew are such hidden costs as : loss of arable land to agriculture; costs of installing new highways, streets, sidewalks, street lighting, sewer and water systems; cost of new health, hospital, educational and governmental facilities, etc.

However, if such hidden costs are properly taken into account, then the expediency of redeveloping the central city with its huge infrastructure, in being and paid for, becomes much more attractive. Of course, in many of the world's older cities, elements of this infrastructure are often archaic, fragmentary and confused. In the rehabilitation of such areas, it may often be advisable to by-pass an existing system altogether. For example, to eliminate the atmospheric pollution caused by the burning of brown coal in Middle Europe (Cracow, Prague, Budapest) it might be advisable to install district heating and relinquish any effort to modernize individual heating systems, as has been done in central Warsaw. The installation of such new heating mains might be integrated with the rationalization of water, gas, electricity and sewers. Again, it seems probable that in most cities with centres of ancient or medieval origin, where the street pattern is too small and irrational for any rational organization of surface traffic, subways will in the long run be the most economical — as they are certainly the most efficient — means of diurnal movement into and out of the centre. That such subways can also furnish extremely pleasant transportation is amply demonstrated by the new lines in Mexico City, Montreal and Leningrad.

Concretely, the regeneration of the city must necessarily involve coming to grips with the following factors :

1. *Environmental pollution or degradation*

a) atmospheric : pollution due to emission of noxious wastes from factories, power stations, heating plants, automobiles;

b) thermal pollution : due to heat-holding characteristics of urban tissue; inefficient heating and cooling systems; inefficient thermal insulation of building; " haze hood " over cities from atmospheric pollutants;

c) aquaceous : due to discharge of fluid wastes into waterbodies and underground streams;

d) sonic : due to wasteful energy conversion in manufacturing, transportation;

e) luminous : due to wasted light from signs, autos, street lights, etc.

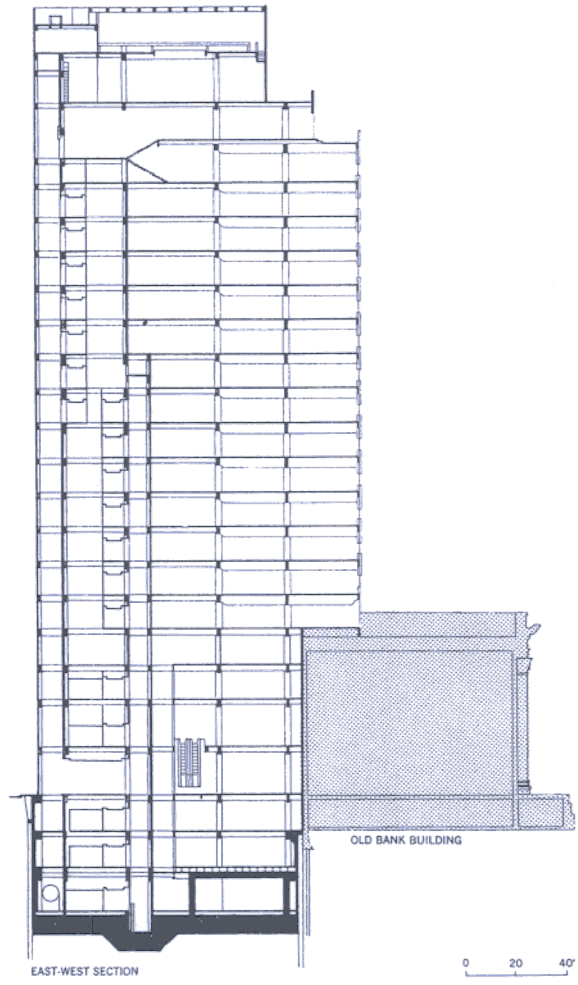
2. *Substandard performance of individual buildings*

a) overcrowding — lack of sunshine, ventilation, privacy;

b) inadequate or obsolete sanitation (bacteria, insects, vermin);

b

d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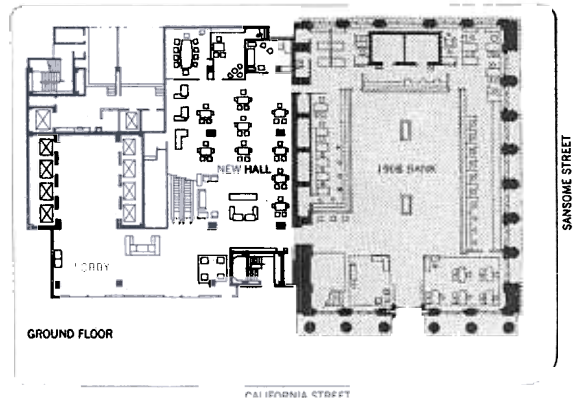

NEW HALL
LOBBY
GROUND FLOOR
SANSOME STREET
CALIFORNIA STREET

Fig. 4. — *Rehabilitation of Historic Buildings.*
Bank of California, San Francisco, California, 1968. Anshen and Allen, architects; James Marston Fitch, historic consultant. One of the oldest buildings in the central city (*a*) (it was built in 1908 immediately after the great earthquake), this Corinthian-style banking room was completely rehabilitated as part of a big expansion program. A new 20-story office tower was built next door to house the bank's commercial offices. This posed a big aesthetic problem — how to connect the old and new structures. It was solved by setting back face of tower and returning Corinthian facade against it (*b*). Another aesthetic problem was the " roofscape " of old pavilion which had become a visual slum as a result of fan rooms, attics and penthouses (c). New tower was cantilevered over old pavilion and roof was converted into a landscaped terrace to serve employee's dining rooms and lounge (*d*). Result is a new piazzetta-in-the-sky (*e*).

c) inadequate or obsolete heating;
d) structural instability;
e) lack of fire-proofness.
3. *Inadequate, obsolete, or unevenly distributed amenities and services, schools, playgrounds, parks, markets, etc.*

SPECIAL PROBLEMS OF THE URBAN ENVIRONMENT

Physically, cities should be regarded as organisms with their own special metabolism. This special metabolism has two origins : structurally, it has heat-holding capacities without parallel in surrounding nature; functionally, it concentrates and consumes unprecedented amounts of energy (fuel, food) in small areas. According to Abel Wolman the input-output energy ratios per 1,000,000 urban inhabitants are as follows (1) :

Input (fuel) per day			Output (waste) per day	
Water		625,000 tons	Sewage	500,000 tons
Food		2,000 tons	Solid wastes	2,000 tons
	- coal	3,000 tons	Particles	150 tons
Fuel	- oil	2,800 tons	Sulfur dioxides	100 tons
	- gas	2,700 tons	Nitrogen oxides	100 tons
	- motor	1,000 tons	Carbon monoxide	450 tons

All cities create their own micro-climate; and this climate is always hotter and dryer than the natural climate which it displaces. This effect is due to three causes :
1. Cities by definition replace the natural ground cover by masonry and cementatious and bituminous surfaces. These surfaces, because of their tendency to absorb solar energy and only slowly to release it back to the environment, create a desert-like thermal regime. This is the opposite of the thermal behaviour of plant materials which absorb solar energy and convert its sensible heat into other forms of energy.
2. All cities generate immense amounts of heat. This is more marked in the upper latitudes, where buildings must be heated to be habitable. But it also is true of cities in the lower latitudes, where almost any process — from cooking a meal to smelting steel — generates a waste product of excess heat.
3. All cities generate a " haze hood " — an umbrella of the waste products of the combustion of fossil fuels discharged into the atmosphere. This hood acts to trap both solar and man-made heat, slowing down its escape by either convection to the upper atmosphere or re-radiation to outer space.
From a purely thermal point of view, this tendency of cities to create a warmer microclimate might be considered as advantageous in the high latitudes, where an absolute shortage of environmental heat is basic; and as disadvantageous in the lower latitudes, where an

(1) Abel WOLMAN, " The Metabolism of Cities ", *Scientific American,* vol. 213, no. 3, September 1965, p. 180.

Fig. 5. — *Replication of Historic Structures.*
The Parthenon, Nashville, Tennessee, 1895. This full-scale, archaeologically-correct replica of the Athenian Parthenon is unique in the world. Built as a temporary pavilion in plaster on lath, it was reconstructed in polychromed reinforced concrete in the 1930's. It is now used as an art gallery. Replication is perhaps most appropriate when environmental attrition compels the transfer of the artifact into a museum, with the replica *in situ* as a substitute for the original artifact.

absolute surplus of environmental heat is very stressful. Unfortunately, however, the environmental problem is not exclusively thermal; it is also (and increasingly) atmospheric. For the by-products of the combustion of all forms of fossil fuel, from wood fires to automobiles to thermal power plants, constitute a grave threat to the environment. These waste products are not only themselves directly hazardous to health (e.g., the carcinogenic and pulmonary disorders of automobile exhausts). But, as particulates suspended in the atmosphere, they set in motion another level of environmental disturbances — typified by the smogs which are becoming endemic in cities in all latitudes.

Thus, effects n° 1 and n° 2, could presumably be considered as potential assets in cities in the high latitudes. That is to say, far northern or far southern cities could be considered as thermal mega-structures in which heat-holding and heat-generating capacities could become a *planned* aspect of their design, rather than as today in Moscow or Calgary, *accidental.*

The reverse is true of cities in the low latitudes (Miami, Cairo, Bombay) where effects n° 1 and n° 2 are largely or wholly negative. Here the heat-holding and heat-generating characteristics of cities should be minimized in every possible way, from the design of the individual building to the design of the whole city. Here again, the city should be regarded as a thermal mega-structure but with the fundamental task of rejecting solar energy, minimizing the production of heat and maximizing its dispersal. It is worth noting that devices for minimizing heat gain are a feature of traditional low-latitude architecture and urbanism, either architectural (e.g., the white walls, narrow streets and dense self-shading compartmentalization of space which marks most Mediterranean cities); or botanical (e.g., the continuous canopy of eucalyptus trees in Addis-Ababa, the parasol of spreading banyan in many Caribbean towns or the nut palms of the Egyptian Delta).

In such cities in which a surplus of solar energy is a major environmental problem, a whole series of regulations governing architectural and landscaping plans could be written into zoning law. Small in themselves, their cumulative impact on the urban microclimate would be very large. For example :

1. the planting of deciduous trees along all streets;
2. stringent control of paved surfaces, especially of asphalt;
3. encouragement of continuously canopied sidewalks (Modena, Bologna, Turin);
4. compulsory shading of all open-air parking lots (deciduous vines on stainless steel net trellises would be relatively light, low cost, maintenance free);
5. encouragement of roof-top landscaping, especially turf;
6. wall and room colours could be controlled (dark for colder climates, light for hotter ones);
7. prohibition of unshaded glass walls (to cut down on air-conditioning loads at peak over-heating periods).

It is obvious that the third effect — atmospheric pollution — threatens the continuing viability of all cities in all latitudes : it can be considered as absolutely negative and every step should be taken to eliminate it. These should cover every activity or process which involves the combustion of fossil fuels : the heating of residential, commercial and industrial buildings; all industrial processes; traffic and transportation and above all, the use of the internal combustion engine. The success of London in her antismoke campaign or of rebuilt Warsaw, with her central thermo-electric plants, demonstrate the feasibility of reducing pollution from heating sources. Success in reducing industrial smoke and gases has been more erratic, though because of economic rather than technical reasons. But the latest, largest and by now gravest source of atmospheric pollution, the automobile, has yet to be faced. Even at this late date, when the environmental hazards of the automobile have been documented beyond any possibility of doubt, most of the world's largest cities will be

Fig. 6. — *Protection of Archaeological Remains.*
The Kiosk of Alaeddin, Konya, Turkey, 1221. In the process of archaeological exploration and preservation of this historic site, this important fragment was exposed. This elliptical concrete shelter was erected over it to minimize environmental degredation. Such protective devices call for great discretion on the part of modern architects if the monument is not to suffer aesthetically. Comparable shelters in other materials are to found over the Roman mosaics at Piazza Armerina in Sicily (aluminium and plastic) and at the Roman villa at Fishbourne, England (wood and glass).

found to be still at work on highway schemes which can only result in more cars being introduced into the central city. The almost universal corollary is the decline of mass transit either relatively (as in Moscow or London) or absolutely (New York, Rome and Paris).

SONIC POLLUTION AND NOISE CONTROL

Co-extensive with atmospheric pollution, and often generated by the same processes and activities, is the phenomenon of sonic pollution. All mechanical work involves the incomplete conversion of energy; and noise (counter productive sound) is one characteristic expression of this inefficiency. The deleterious effect of noise upon health and efficiency is fairly well established. For example Rosen and his colleagues, in comparing the health and hearing of certain primitive African people with contemporary Americans, discovered a startling correlationship between good hearing and good health (2). But the epidemiological aspect of urban noise has not received anything like the same attention in the mass media as has the connection between atmospheric pollution and morbidity. Since the factors which produce atmospheric pollutants (industry, aviation, railroads, trucking, automobiles) are the same as those which produce noise, it follows that steps taken to ameliorate one condition are apt to be helpful in the other. (Thus, the atrocious custom of removing auto mufflers and " gunning the motor " which makes Italian streets a nightmare could be controlled either by making muffler removal a legal offence or by excluding all cars from those streets.) Today, air-pollution control measures are beginning to be recognized as necessary : but noise-abatement criteria are fragmentary and incomplete and legislation often non-existent.

POLLUTION OF WATERBODIES WITH WASTE MATERIALS

Another great area of environmental pollution which threatens the welfare not merely of cities but of entire regions is the dumping of wastes into the waterbodies on which most cities stand (and on whose continuing viability they still largely depend). The " death " of the Great Lakes and the catastrophic decline of the Rhine are merely among the most spectacular examples of such pollution : we can assume that the same processes are at work wherever urbanization and industrialization are occurring. On the other hand, London's reclamation of the Thames, where fish are now swimming again for the first time in a century, is a spectacular demonstration of how comparatively simple measures have effected a reversal of this trend.

Generally speaking, two broad categories of wastes imply different methodologies of disposal and/or conversion :

1. *Industrial wastes* : these are of such increasing complexity, with such unpredictable environmental consequences, that they must be controlled at the point of origin — i.e., the industrial plant itself. This certainly implies a new criterion for industrial plant design : the so-called closed production cycle in which all waste products are either fed back into the cycle or completely " disarmed " to prevent atmospheric, thermal, aqueous or nuclear pollutants being discharged into the local environment.

2. *Sewerage, garbage* : many of the world's great cities have inadequate waste disposal systems (New York still dumps some of her raw sewage into the Hudson : Miami Beach pumps all hers a mile out to sea). Some have none at all (Addis-Ababa). But even those cities which have " up-to-date " systems, including sewage treatment plants and garbage incinerators or sanitary dumps, are merely disarming wastes. None of these systems make any effort to conserve the enormous amounts of organic materials and hence potential energy sources which they contain. Here and there, one hears of isolated experiments aimed at one or another form of conservation : the use of methane from sewage to power electric generators (New York); the use of sewage solids as fertilizer and humus (Milwaukee); the use of heat from decaying garbage to heat greenhouses (Moscow). Such piecemeal experiments at least suggest

(2) Samuel ROSEN et. al., " Presbycusis Study of a Relatively Noise-Free Population in the Sudan ", Annals of Otology, Rhinology and Laryngology, vol. 71, no. 3, pp. 732-733.

the enormous potentials inherent in municipal waste disposal systems which are also closed-cycle, where the aim is not merely to neutralize waste materials but to return them to productive use.

Fortunately, facilities for such types of conservation and energy conversion could be regarded as discrete elements in city-wide collection systems. Even such equipment as garbage grinders in apartment houses could be used to enrich the sewage for generation of methane gas for power.

SPATIAL DEGRADATION BY THE AUTOMOBILE

In addition to the well-documented threat of the auto to life and limb (as a result of sheer physical impact and well-established causal link between its exhausts and lung cancer, emphysema and respiratory ailments generally) the auto is responsible for another from of environmental pollution — that of the sheer degradation and wasteful use of urban space. Since the automobile occupies exactly the same life-zone as the human being — i.e., the first six feet above the earth's surface — it is in constant, irreconciliable kinesthetic and aesthetic conflict with the pedestrian. When moving, it displaces some 600 cu. ft., as opposed to some 12 cu. ft. for a standing man. When parked it occupies 120 sq. ft. (a reclining man is comfortable in under 20); the parking and unparking process requires three times that much area. Because it occupies precisely the same zone as the pedestrian, it is a constant obstacle to his movement. It is even an obstacle to the free movement of his vision when standing still. Anyone who compares the Italian piazze, for example, in the years before World War II and their present state as traffic roundabouts and carparks can only be appalled at the qualitative drop in amenity.

But the aspect of the private automobile which is perhaps most destructive to urban experience (and the one which has been least studied) is its absolute lack of capacity for autonomous movement. Every other form of transport, including bus and taxi, has the capacity to deliver its passengers and *then take itself away under its own power*. But the private car is tied to its owner like the tail of a dinosaur: by its very nature, it is compelled to occupy the same space as its owner. To try to escape this paradox, Americans have lavished ingenuity and funds on parking schemes: but no parking system (vertical or horizontal, automatic or chauffeur-operated) escapes this fundamental limitation. The result of this "foreign body" in the pedestrian zone is to radically reduce the pedestrian population per sq. ft. of earth surface. This, in turn lowers the whole richness, intensity and diversity of the urban experience: the very quality of urban life is impoverished and degraded.

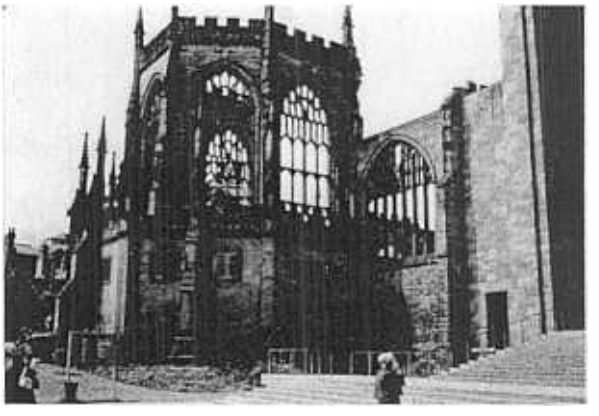
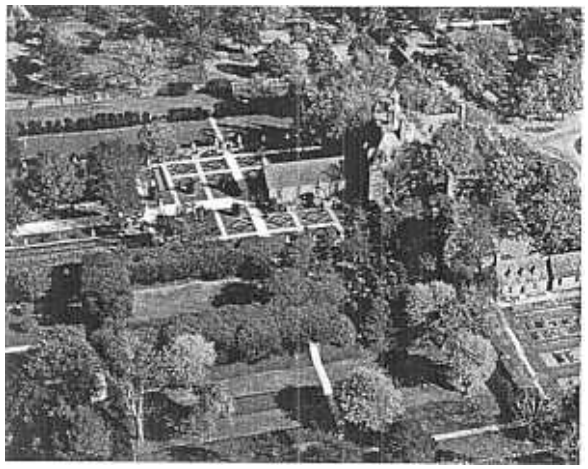
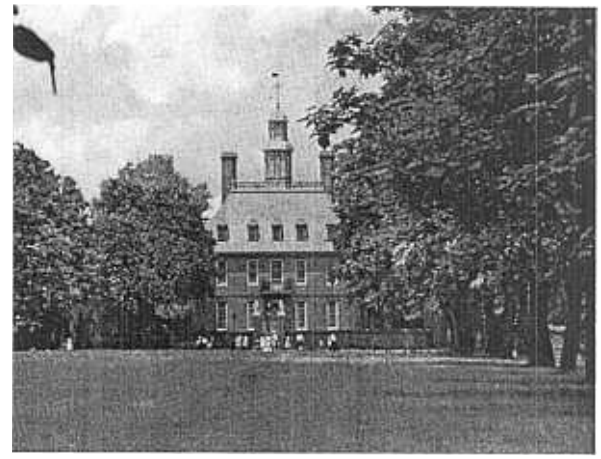
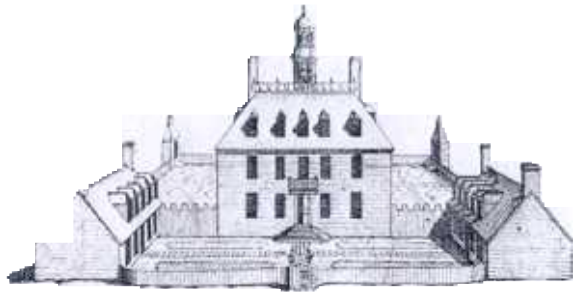


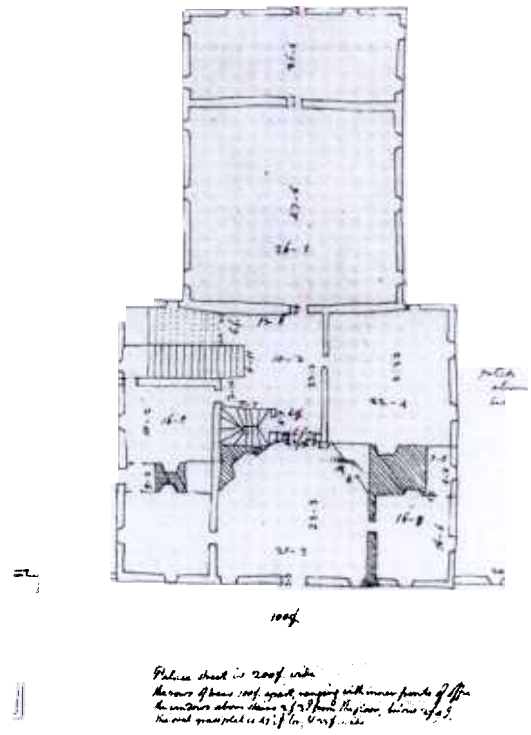
Fig. 7. — *Consolidation of Ruins.*
Cathedral of Coventry, Coventry, England. The fourteenth century sandstone structure was gutted by fire bombs in the air-raids of World War II. Subsequently there was a long discussion as to whether to (1) reconstruct the old structure in situ; (2) demolish it and build a modern structure on the site; or (3) build a new church on another site. It was finally decided to consolidate the tower and walls of the old church and build the new cathedral on the line of the north transept. Seen here is the ruined apse (left) with the narthex of new cathedral (right).

All of which suggests still another reason why the regeneration of the physical environment of central cities will be to a large extent dependent upon the way in which the internal combustion engine, and above all the private automobile, is handled in the future. It may be possible to design completely new human settlements in such a way as to minimize the severe spatial dislocation caused by the automobile. (Provided, of course, that the internal combustion engine has been replaced by other motive power such as electricity or steam.) The New Town of Cumbernauld in Scotland represents perhaps the best experiment to date along these lines. Here the entire town centre is handled as a huge, elevated mega-structure with all motor traffic and parking confined to one submerged plane below it, completely separated from the pedestrian world above. But most central city districts, in their basic street patterns, predate modern vehicular traffic by centuries.









Evens when large in extent, they are small in scale, fundamentally designed to facilitate pedestrian movement. This scale becomes absolutely critical when an historic district is to be developed for touristic purposes. Such areas can only be enjoyed on foot. This suggests that a policy of permitting no wheeled traffic in such areas (except for fire, ambulance, waste removal, etc.) is the correct one. Though merchants in such areas are often initially sceptical of the impact of such measures on retail trade, they have proved to be successful in certain cities (Piazza Navona in Rome, the New Precinct in Coventry). As we have said, the subway is unquestionably the most rational means of moving people into and around such districts. In cities where many tourists arrive by bus or private car, parking facilities should be provided around the periphery — preferably underground and in small, dispersed units to avoid peak-hour traffic jams.

Fig. 8. — *Reconstruction of Long-vanished Buildings.*
The Governors' Palace, Williamsburg, Virginia. Because of its strategic location as the terminus of one of the main avenues of the capital, the decision was made to reconstruct this long-vanished complex. Archival materials were abundant but graphic evidence on the appearance of the Palace was very scant — limited to such fragments as the " Bodleian Plate " c. 1740; and Thomas Jefferson's sketch plan of the *piano nobile,* dating from his first governorship. Hence archaeology of Palace and gardens was main source of this elaborate reconstruction. Houses in upper right of aerial photo are restorations of extant structures.

CORRECTING ENVIRONMENTAL DEFICIENCIES

Old buildings and old neighborhoods are often declared " slums " on the basis of quite superficial examination and inadequate data. Actually, many factors enter into the viability (or lack thereof) of any old urban tissue. These factors may be listed under four headings : *microclimatic response*; *structural stability; sanitary level*; *historic and artistic significance*. No truly effective rehabilitation program can be evolved without due consideration to all four.

1. *Microclimatic response* : most old urban areas, especially if they predate the Nineteenth Century, represent an adroit manipulation of climatic and topographic factors — maximizing the positive aspects and minimizing the negative. This is very evident around the entire littoral of the Mediterranean, where both town planning and architecture are aimed at minimizing impact of excessive heat, light and glare; or along the Baltic and North Seas, where the aim was the reverse — maximum exposure to the sun. From this point of view, many old town centres incorporate environmental principles which ought to be extended to the design of brand new neighbourhoods and settlements.

Negative environmental factors — such as rooms without adequate light or ventilation, or lack of visual and aural privacy — are usually due to alterations over the years, especially the tendency to build over former yards, courts and patios. Correcting such conditions usually means the removal of such appendages, thus restoring light and air and reducing overcrowding.

2. *Structural stability* of old buildings is too often judged on the basis of cosmetic effects (peeling paint, stained stucco, rusted gutters). In most cities masonry construction is predominant; in many parts of the world, where wood has long been in short supply or non-existent, floors and roofs will be of masonry as well as walls. New techniques for consolidating old masonry (injection of mortar under pressure, insertion of reinforced concrete members) as well as availability of prefabricated concrete beams and columns, lightweight floor and roof slabs make the rehabilitation of old masonry buildings much more feasible than hitherto. In those areas where the cost of labour is low relative to materials, the balance is especially favourable.

3. *Sanitary levels* in central city housing will almost always be deficient relative to contemporary standards. Inadequate cooking and bathing facilities; inadequate or environmentally-defective heating equipment; lack of fire-safeness; over-crowding; these are typical of such districts. In view of the difficulty of inserting new plumbing into old buildings, efforts should be concentrated on perfecting lightweight, prefabricated kitchen and bathroom units. Central steam/hot water from district plants, or from local boilers in each building, is efficient but difficult to install in old buildings. Unit heaters are simpler to install but raise serious problems of local asphyxiation or area pollution. Electric radiant heating is optimal, architecturally and environmentally, but still too expensive to be practical in most parts of the world.

Overcrowding is a social, not an architectural phenomenon : it can only be corrected by broad programs of housing construction and rental subsidies.

4. *Historic and artistic significance* of old districts must be judged by quite different criteria than 2 and 3 above. Some of the most deteriorated sections may well have the greatest value and offer the largest touristic potentials for restoration and preservation. This aspect is discussed in some detail in the final section of this paper.

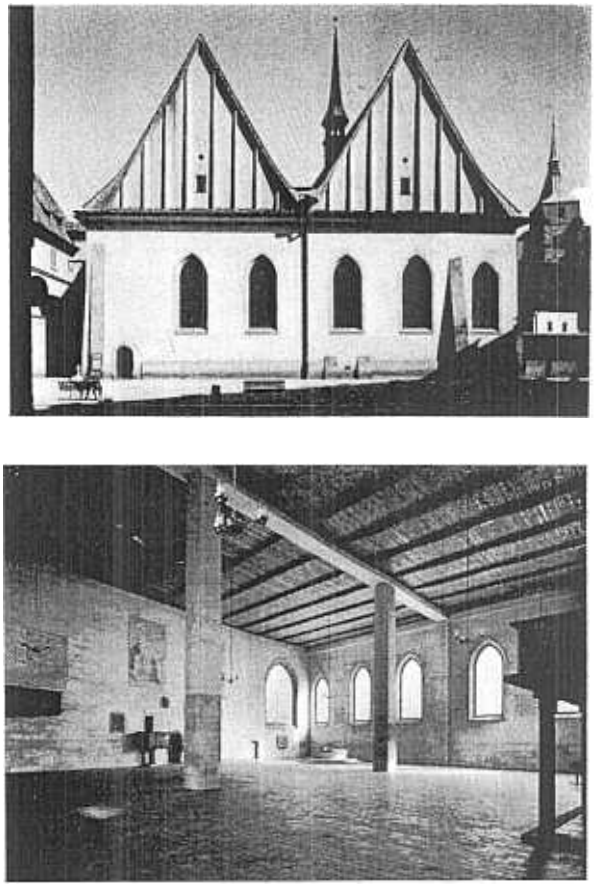


Fig. 9. — *Reconstruction of Long-vanished Buildings.*
The Bethlehem Chapel, Prague, Czechoslovakia. Because of its great historic significance to Czech traditions — it was in this church that Jan Hus preached for a reformation before Martin Luther — the decision was made in the 1960's to reconstruct it. Since the bases for the reconstruction were largely archival — archaeology determined only the location, shape and size of the floor-plan — the appearance of this reconstruction is largely hypothetical. Note that, from a cosmetic point of view, all exposed surfaces are obviously new, no attempt being made to make them look old or weathered.

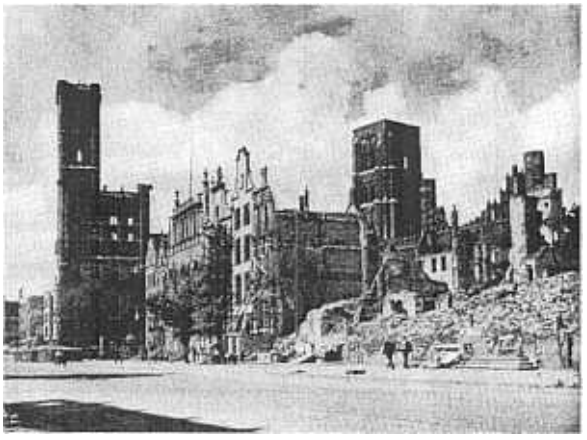


Fig. 10. — *Reconstruction/restoration of Recently-Damaged Buildings.*

Town Hall Square, Gdansk, Poland. Savagely mauled by aerial and artillery bombardment, the end of Worrld War II found Gdansk largely in ruins. Although much of the city was completely replanned and built anew, the decision was made to reconstruct the historic core with its great Hanseatic brick Gothic cathedral and blocks of burghers' houses. These two views show the Square in 1946 (*a*) and again twenty years later (*b*). Especially notable today is the restored polychromy of the Baroque and Roccoco house facades.

CONFLICTING USES AND OVERLAPPING FUNCTIONS

From one point of view, cities can be regarded as vessels or containers in which a number of complementary processes are simultaneously occurring. But, because of their development across time, both vessel and process change — and often along accidental or unanticipated lines. As a consequence, uses often conflict and functions overlap, because they occur in buildings and districts which might have been designed originally to house quite different activities. The older the urban district in question, the more pronounced such contradictions are apt to be. However, the consequences are by no means wholly negative. On the contrary, the very intricacy of old urban centres is precisely what nourishes the urbane activities of the regular population, on the one hand, and makes them so attractive to visitors and tourists, on the other ([3]). The rehabilitation of such centres confronts architects and planners with problems of unprecedented intricacy. Yet Vienna inside the Ringstrasse or Split inside the Diocletian precinct afford excellent examples of how these problems can be met. Both areas have been rehabilitated in such a way as to strengthen their central business district function. At the same time, old buildings have been refurbished; sub-standard housing either improved or eliminated; monumental complexes restored and adapted to new uses. The result is an urban " mix " that is richly stimulating for all concerned. Of course, as we have suggested, the oldest and historically most significant districts in many cities which seem so romantic to the tourist (Venice, central Rome, East London), will often appear as offering intolerably poor living conditions to the people who live there. Thus, the regeneration of such districts involves meeting simultaneously the needs of two or three quite separate populations. It should be remembered that, in many cities, the worst living conditions occur precisely in these historic districts; but these are often also the areas with lowest rents. Thus, while slum dwellers may identify old buildings with low living standards (and new ones with high standards), plans for restoration and rehabilitation will often seem to them to run

([3]) The complexity of central city functions, and the dangers of over-simplified solutions to them, have been the source of increasing interest to many observers. Jane JACOBS has dealt at length with some aspects of the problem in two books, *The Death and Life of Great American Cities* (New York : 1959) and *The Economy of Cities* (New York : 1969). Louis WINNICK, the economic historian, has described the city as man's greatest invention a labour-saving device for helping man to overcome his two great limitations : " the friction of distance " and " the affliction of uncertainty ". The city, he points out, overcomes these by affording economic man three advantages : *proximity* to goods and services; predictability of supply due to duplication; and *option* — i.e., a range of choice within a given category. WINNICK, " The Economic Functions of the City, Yesterday and Tomorrow ", in *Urban Problems* (New York : Columbia University, Academy of Political Science, 1960).

against their most fundamental short-range interests. That is, they will see programs for area restoration as merely a pretext for evicting them from the only housing they can afford without providing new housing within their means. This has proved to be the case in several American cities (Charleston, Savannah, Providence) where very successful restoration projects have been carried out. These projects, which have been executed by private non-profit institutions, were unfortunately not matched by any complementary public programs for rehousing the evicted poor, either in new buildings elsewhere or in rehabilitated housing in their old neighbourhoods. The antagonisms resulting from such errors of policy are often serious. Thus, any comprehensive plan for the rehabilitation of central city areas will have to include precise plans for rehousing the evicted and careful scheduling of transfers to minimize the trauma of relocation.

MASS TOURISM AND THE PRESERVATION OF HISTORIC URBAN CORES

For millenia, the urban rich have been tourists, leaving home to visit the shrines of potent deities, to take the waters at famous spas or merely — like Pausanias or Pliny the elder — to see how the foreigners lived. In Europe cultural tourism has been a commonplace among wealthy *cognoscenti* since the beginning of the Seventeenth Century. As a matter of fact, it was these cultural tourists — and above all the English, the Russian and the American — who established the travel itineraries of today: the Alhambra, Florence, Venice, Rome, Athens. Cultural tourism had already reached such proportions by the end of the Eighteenth Century as to constitute an important factor in the economic life of these cities. Nevertheless, the volume of such tourist traffic never reached a stage where it posed any serious threat to the continued survival of those centres as tourist attractions. It remained for modern life to raise that problem.

People travel today in order to enjoy two broad types of experience:

1. *Natural scenery* — mountains, beaches, fiords, waterfalls, etc.
2. *Man-made scenery* — cities, castles, gardens, churches, museums, galleries, zoos, theatres, opera, concerts, restaurants.

A careful analysis will reveal that tourism in its broadest sense is one of the major industries of the world. Certainly, it is the major industry of many of the world's largest cities which are foci for local, regional, national and international tourism. By definition, this activity is concentrated in the historic urban core. Here are found structures and complexes which are famous either in their own right (The Louvre, The Hermitage, Uffizi) or because of the institutions they house (opera houses in Vienna, Milan, Paris, London). The world's greatest religious shrines are almost without exception urban

b

Fig. 11. — *Reconstruction/restoration of Recently-Damaged Buildings.*

Nowy Swiat Street, Warsaw, Poland. At the end of World War II, with some 88 % of her buildings destroyed by bombing and demolition squads, Warsaw began the herioc task of reconstruction. These views of the historic core, looking north towards the Stare Miasto, show the condition in 1945 (*a*) and again in 1965 (*b*) when the work was largely complete. The restoration of their capital city to pre-Hitler conditions was of great ideological importance to the Poles. Since war damage was so extensive and severe, comprehensive archaeology was possible. With this new knowledge about the architectural history of the city, many structures were restored to periods much earlier than 1939.

(Hagia Sophia, Mosque of el-Akbar, Notre-Dame, Westminster) as are the seats of national power (White House, Westminster, Kremlin).

These centres have become the generators of the enormous international enterprise of mass cultural tourism. While on the one hand, this has focused popular attention on the historic and artistic patrimonies, it has, on the other, become the greatest single threat to their survival. The paradox is compounded, as we have said, by the fact that the very means of transport which we so deplore are precisely what makes mass tourism possible and without which it could not survive.

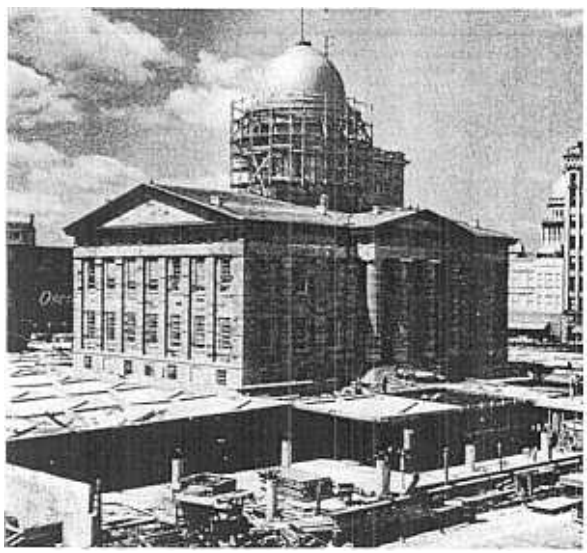


Fig. 12. — *Reconstitution of Extant Structures.*

Old State House, Springfield, Illinois, 1837. John F. Rague, architect. This handsome Greek Revival Building, long abandoned by the state government, was slated for demolition to make way for an underground municipal parking garage. Happily, it was decided instead to disassemble the building, storing the ashlar dolomite stones for re-use. The entire square was excavated for a two-level parking garage (*a*). A concrete skeleton, following the configuration of the old building, was erected (*b*). This was then sheathed with the old stones. The garage roof was covered with earth and landscaped to restore the building to its 1840 appearance (*c*).

The great historic significance of the building lay in the fact that the state funeral for Abraham Lincoln was held here in 1865. Hence the vanished Chamber of the House of Representatives in which the body lay in state was reconstructed and furnished to approximate as closely as possible its appearence on that historic date (*d*).

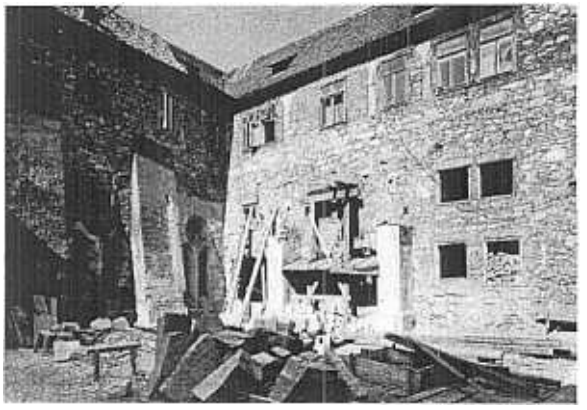


Fig. 13. — *Adaptive Use of Historic Buildings.*
Convent of St. Agnes, Prague, Czechoslovakia. The regeneration of this great Medieval complex, long buried in one of the city's most notorious slums, is underway. Ultimately, it will house the national museum of Medieval art. The project is important urbanistically as well as architecturally since it removes the last blighted area from the monumental quais along the river front. Pictures show one of the courtyards during and after restoration.

The objective basis of this new phenomenon is an increasing interest on the part of the citizens of the more advanced countries in the artistic and historic past of their own and other cultures. The increasing leisure in these countries makes it possible for them to indulge this interest by visiting the relics of this past : and since these sites and monuments are overwhelmingly urban, the new tourism tends to agglutinate in the historic cities of the world — Kyoto, New Orleans, Paris, Leningrad. But in these centres, the sheer volume of visitors during the height of the tourist season, begins to threaten their actual physical fabric. Thus London, with a shortage of low-cost hotels, tried the experiment of allowing young tourists to sleep in het parks; but the wear and tear on the landscaping was so severe that this permission has now been rescinded. In many famous individual monuments, tourist traffic has reached its absolute limits : at Mt. Vernon, George Washington's residence, stairs and floors have had to be reinforced to carry the weight of the visitors; and the abrasion of flooring surfaces is so severe that protective membranes must be replaced in a matter of weeks. Faced with the noise, confusion and downright squalor which such overcrowding often produces, it would be all too easy to reject the whole concept of mass tourism and yearn for a return to the good old days of aristocratic travel.

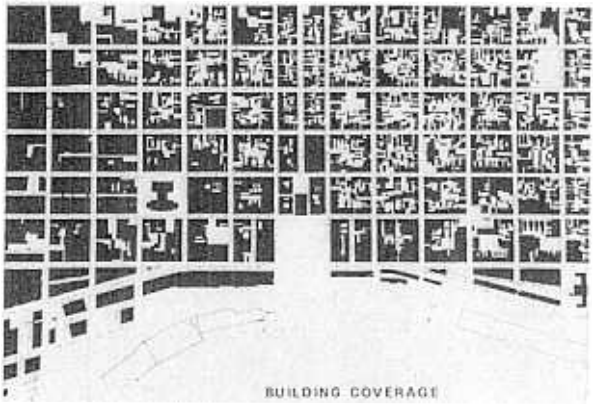


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Fig. 14. — *Preservation of Historic Districts.*
Vieux Carrée, New Orleans, Louisiana. The historic centre of this city, founded in 1717, is protected by some of the earliest preservation legislation in the U.S.A. However, this legislation is negative, controlling only the visual appearance of the streetscapes, and does not provide for any dynamic amelioration of substandard counditions in housing, public services, etc. Plan of the district (a) shows dense land coverage of uniformly low masonry buildings. Aerial view of Jackson Square, ancient Place d'Armes, (b) has the Cathedral facing the river and flanked by the Cabildo (left) and Archepiscopal Palace (right); both of the latter are now historical museums.

But, as the Second General Assembly of ICOMOS at Oxford in July, 1969, correctly resolved :

" Cultural tourism, by creating the conditions for a new humanism, must henceforth be one of the fundamental means, on a universal level, of insuring man's equilibrium and the enrichment of his personality, in a civilization which, owing to the ever more rapid development of technical progress, may now be daily directed further towards the intelligent use of its leisure. " (4)

The Assembly resolution takes the position that the complex and unprecedented problems posed by mass cultural tourism can be resolved only by a comprehensive program. Mass tourism has been made possible by developments in transportation technology — above all, the large jet plane, the tourist bus and the private automobile. Without their high-speed, low-cost transportation, the great mass of vacationers would have neither the time nor the money to travel during their limited vacations. But, here again, another paradox : the very machines which make these sites and monuments accessible to a mass public jeopardizes their continued existence. First, directly, by their noxious wastes and vibration and now sonic boom; and indirectly, by their tendency to inundate a given area or monument with spectators beyond its physical capacity to support. (The daily summer attendance at the Roman Forum, for example, is physically destroying the footpaths, benches and landscaping, not to mention the monuments themselves !)

The physical attrition caused by automotive invasion of urban cores — whether historic or contemporary — has reached a degree of urgency which can no longer be met with palliative measures. The crisis is as obvious in Addis Ababa or Lagos as it is in Paris or Rome; but it has reached the most acute stage in the United States where the almost complete collapse of public transport has paralleled an increasing dependence upon the private automobile. Architects and planners from countries with as yet low per capita ownership of automobiles should study American experience particularly as a guide to what not to do.

Each of the above problems is intricately related to the others; and all are encapsulated in the economic and political structure of each country. Means of effecting a comprehensive program for the preservation of the artistico-historical patrimony must therefore extend across a wide range of legislative, institutional and financial measures.

CONCEPTUAL ASPECTS OF HISTORIC DISTRICT PRESERVATION

Because of the immense prestige which attaches nowadays to the new, the technologically advanced, to " progress " real or putative, many people tend to regard organized intervention in defence of historic buildings and districts as sentimental or antiquarian — an " un-natural " policy which runs counter to " common sense ". Such suppositions often lead people to consider historic preservation as being somehow " artificial ". The facts of modern life no longer permit such a narrow, mechanically functionalist view of urban development. The sheer volume of tourists who now flock to such centres all over the world is proof of the great hunger of modern man for first-hand contact with the physical evidence of his history. We are beginning to see that the protection of the artistic and historic patrimony, against the ravages of uncontrolled technology, is a fundamental aspect of the protection of the environment as a whole. *The two environments, natural and man-made, are actually complementary halves of man's biosphere* (5).

There is no denying that this new conceptual approach to the past implies new tasks of unprecedented complexity for both architect and planner. Historic centres will have to be handled like valuable artifacts, deserving the sort of care and expertise which we have hitherto associated with art museums and galleries. The entire urban tissue is to be placed upon display and all devices of modern museology brought to bear upon it. We must recognize that the museological approach has inherent limitations when applied to artifacts like buildings or cities. One is the tendency to " prettify " the past. Any museological or curatorial function involves selection and interpretation. The *whole* past could never be displayed, if only for reasons of space or budget. There are also many aspects which could not be replicated or exhibited for reasons of convention and taste : the smell of the burned flesh of the branded slave or the blood on the headsman's axe; the mud and garbage of Eighteenth Century streets; the flies and ordure (not to mention the truculent bull) of the farmyard. Sanitary and safety regulations would, in any case, prohibit such realistic details.

The restoration of historic urban districts presents aesthetic problems which are not found in the isolated villa or village church. In such cases the monument

(4) " Resolution of July 11, 1969, at Second International Conference, Oxford, England ", (*International Council of Monuments and Sites,* Hôtel St-Aignan, 75, rue du Temple, Paris : 1969).

(5) There is, of course, a sense in which such conservation might be called artificial : but so, too, could museums, art galleries, libraries — indeed the whole apparatus of formal education. In each case, the artifact or theory has been removed from its life-context in order to study it. This is in contrast to preliterate societies, where all wisdom is conventional, transmitted either orally or by apprenticeship. But in such societies there is no sense of time or change : each individual thinks of himself as being embedded in the only cultural matrix that ever was. Modern man, on the other hand, needs fixed points in his physical environment, landmarks which afford intellectual and emotional orientation in a world of terrifyingly rapid change.

Fig. 15. — *Preservation of Individual Historic Buildings.*
" Lyndhurst ", Tarrytown, New York, Alexander Jackson Davis, architect. Built 1838, enlarged 1865. Typical example of the historic house museum — oldest and most familiar form of historic preservation — this Gothic Revival country house has been a property of the National Trust since 1964. Architecturally, the house remained remarkably unchanged throughout its history. Entrance front (*a*) with 1865 porte-cochère, and one of the bedrooms with " gothic " bed designed by the architect for the first owners (*b*).

a

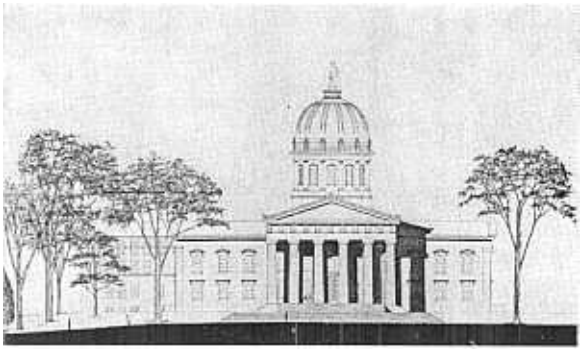
b

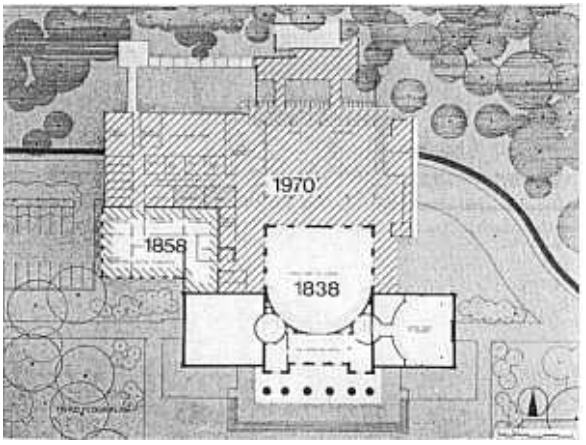
still stands in its original visual environment. In some old cities, such as Prague or Vienna, the historic core remains largely intact, undestroyed by Nineteenth and Twentieth Century improvements. In such cases, the restoration of old buildings or the insertion of new ones is largely a matter of discretion and good taste. But most of the world's great eities have seen a continuous process of urbanization : here the historic cores have been fragmented (Mexico City, Milan). Formerly uniform street-scapes of three and four storey houses have been interrupted with incongruous replacements, ranging from single storey filling stations to multi-storey skyscrapers. In many cities, the resulting distortion in scale takes on Surrealist proportions, contrasts without precedence in the whole history of architecture.

Yet no one can seriously visualize a return of these urban cores to the small-scaled, low-profiled cityscape of the past. For better or worse, this is the condition the preservationist must face. In such circumstances, many contemporary architects will argue that it is " too late " to save anything. Or, applying some metaphysical criterion of " consistency ", will argue that the historic fragments which have survived cannot be successfully re-integrated into the changed city. Admittedly, the problem is not without its difficulties but the fact that such juxtapositions are without historic precedent is not especially relevant. Building and zoning ordinances should be stiffened to prevent the future intrusion of large-scale buildings (such as the skyscrapers around Westminster in London or the Cathedral complex in Milan). But the juxtaposition of old and new buildings can often lead to exhilarating new passages in the cityscape — as is obvious in the current redevelopment of Fanieul Hall Square in Boston or the precincts around St Paul's in London.

As a result of more than a century's professional activity in the field of historic preservation, it is both necessary and possible to define with some precision the various scales and types of technical intervention which are possible; and also to establish norms or criteria for estimating the putative desirability of each. The famous Venice Charter of 1964 made an historic beginning along these lines (6). While accepting without reservation the general conceptual attitudes embodied in the Charter, it is necessary to define the parameters of available measures and techniques in more detail. International experience seems to indicate that the more conservative the intervention, the safer in the long run. But it is obvious that any or all of these techniques will be employed, especially in complex preservation projects such as the rehabilitation of historic urban cores (see attached chart).

(6) *Decisions and Resolutions,* International Congress of Architects and Technicians of Historic Monuments (Venice, 31 May 1964) Document no. 1, pp. 4 et ff.





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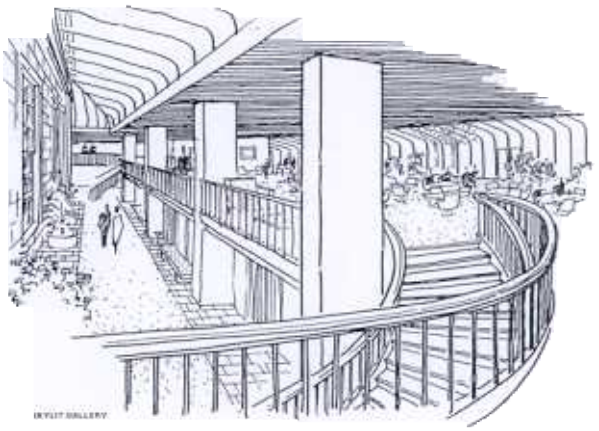

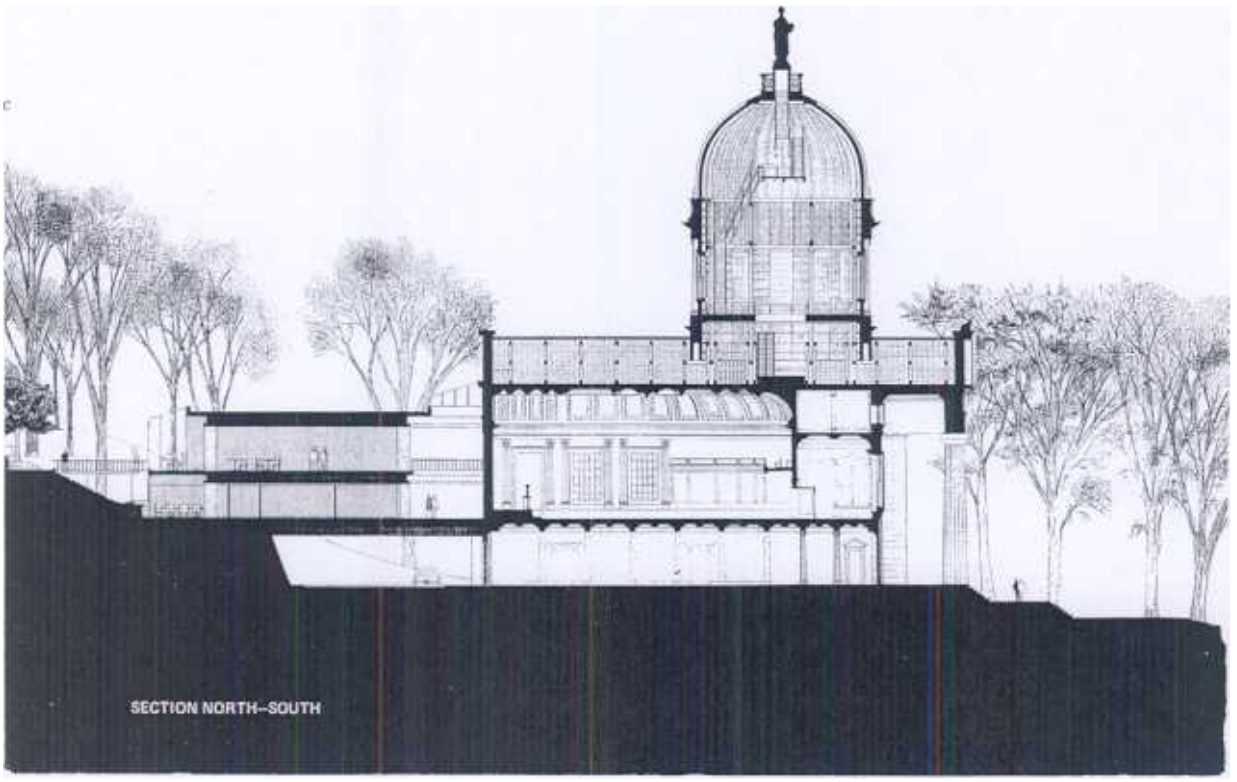

Fig. 16. — *Rehabilitation of Historic Buildings.*

The State House, Montpelier, Vermont, Ammi B. Young, architect, 1838 (*a*). One of the many state capitols erected in the U.S.A. during the 1830s and 1840s, this handsome Greek Revival structure is currently undergoing a complete restoration of its historic portion. In addition, a large modern office block is being added at the rear, to house new offices, lounges, restaurants, etc. Plan (*b*) and section (*c*) show the care and discretion with which the architect Robert Burley is directing this work. Note how a top-lighted gallery is used to connect old and new elements (*d*).

RESTORATION VS. PRESERVATION

Whether a given historic building or complex is to be preserved in the condition in which it has come down to us, or is to be restored to some previous condition, will depend upon a host of factors which must be locally adjudicated. Sheer aestehtic congruity in a streetscape may very well dictate that anachronistic facades be removed; this was the case in the Baroque square in the Czech town of Telc, where 19th century "modernizations" had destroyed the visual unity of the whole. Or there may be compelling historical reasons for returning a building to some fixed point in time, as in the case of the birthplace of Shakespeare at Stratford-on-Avon or the theatre in which Abraham Lincoln was assassinated in Washington. Or finally, there may be overwhelming archaeological and artistic reasons, as in the case of Diocletian's Palace in Split, where a monument of world-wide significance is being freed of less important accretions of millenia. Of course, nowadays, if often happens that a building associated with a recent historical event comes to us unscathed, in exactly the condition in which we hope to preserve it. Such is the case with the ancestral home of Franklin Delano Roosevelt at Hyde Park : it is being kept by the National Park Service exactly as it was on the occasion of Roosevelt's last stay there.

PARAMETERS OF HISTORIC PRESERVATION SCALE OF INTERVENTION

1. *Entire Historic towns*
   Telc, Bohemia
   Venice
   Williamsburg, Virginia
2. *Historic Districts*
   Vieux Carree in New Orleans
   Mala Strana in Prague
   Stare Miastro in Warsaw
3. *Historic Building Complexes*
   Regent's Park, London
   La Fayette Square, Washington
   Kremlin Palace, Moscow
4. *Individual Historic Buildings*
   a) *in situ*
   Versailles
   Hampton Court, London area
   Mt. Vernon, Virginia
   b) *relocated on new sites*
   Abu Simbel, Egypt
   London Bridge, Arizona
   c) *relocated in groups*
   Skansen, Stockholm
   Cooperstown Farm Museum, N.Y.
   Freiland-museet, Copenhagen
5. *Building fragments*
   Decorative Arts Museums
   Victoria and Albert, London
   Metropolitan Museum, New York
   Ethnographic Museum, Leningrad

PROFUNDITY OF INTERVENTION

1. *Conservation*
   a) *natural environment*
   California redwoods
   birds and animals of Africa
   b) *works of art*
   sculpture, painting,
   frescoes, mosaics
2. *Preservation*
   Hyde Park, New York
   Brighton Royal Pavilion, England
   Wavel Palace, Warsaw
3. *Restoration*
   Independence Hall, Philadelphia
   Hradcany Castle, Prague
   Monticello, Virginia
4. *Structural Consolidation*
   The White House, Washington
   York Minster, York
   Norwich Cathedral, England
5. *Adaptive modification*
   Castello Sforszeca, Milan
   Casa Rosa, Genoa
   Opera House, Warsaw
   Ford's Theater, Washington
6. *Reconstitution*
   a) *in situ*
   Santa Trinita Bridge, Florence
   Iwo Treasure Houses, Japan
   III. State Capitol, Springfield
   b) *on new sites*
   Skansen, Stockholm
   Abu Simbel, Egypt
7. *Reconstruction*
   Governor's Palace, Williamsburg; Church of Jan Hus, Prague; Fort Louisburg, ...
8. *Replication*
   Full-scale replica of the Parthenon at Nashville, Tennessee

RECONSTRUCTION AND REPLICATION

The Venice Charter correctly warns against the hazards in the re-creation of vanished buildings. But there may be extraordinary circumstances in which such radical interventions are justified. The reconstruction of the Medieval centre of Warsaw appears to be such a case. As is well known, the razing of this symbol of Polish resistance was a cardinal point of Nazi geopolitics. Therefore, its reconstruction by the Poles appears as an absolutely inevitable concomitant of their victory. Perhaps the special conditions under which such reconstructions are justifiable could be listed thus :

1. The reconstructed building or complex should be of unique importance either nationally (e.g., the Stare Miastro in Warsaw, the House of Commons in London) or internationally (e.g., the Hanseatic Gothic Old Town of Gdansk in Poland).

2. The destruction of the original should have been the result of some cataclysm (e.g., military action, earthquake or flood).

3. The reconstruction of the monument or district should take place during the lives of the people who actually knew it and for whom its existence is psychologically important (e.g., Santa Trinita Bridge in Florence, Church of St. John in Warsaw).

4. The replacement of the structures is made necessary by climatic attrition of fragile materials. The great bamboo and thatch royal tombs of Uganda and the monumental log-cabin treasure houses of Iwo in Japan are two cases in which periodic reconstruction has long been carried on — in the Japanese case, every twenty years for the last nine centuries !

Whether old complexes are remodelled for new uses or entirely new elements added, such new architectural constructions should never attempt to imitate or replicate historic tissue. Such interventions should always produce contemporary designs, recognizable as such even to the layman. But such new elements should be congruent with the old, in terms of scale, profile, materials and colour. One thinks of the many brilliant demonstrations of this principle in Italy today : the area around the Ponte Vecchio in Florence, reconstructed after World War II; of the new museums which have been so successfully installed in old buildings in Genoa, Milan, Lucca and Palermo and elsewhere.

From an analysis of the problems discussed in this paper, it should be abundantly clear that the regeneration of the central districts of our cities will prove to be a much more complex and intricate task than the construction of new settlements on open land. But the rewards will be higher, also; it promises a richer and more satisfying life style for the city dweller — inhabitant, commuter and tourist alike. To accomplish the task successfully, it will be necessary to redefine the human environment as being at once natural and man-made, physical and psychological, in which history and memory are forces quite as real as those of gravity or climate.

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RESUME

Autrefois, et jusqu'à une époque encore proche, l'œuvre de préservation du patrimoine artistique et historique se limitait à des interventions isolées en vue de la conservation de tel ou tel site ou monument; cet état des choses tend, pourtant, à se transformer profondément à l'heure actuelle, sous la pression de l'urbanisation et du progrès technique. On se rend compte de plus en plus que c'est l'environnement dans son ensemble qui est en jeu, et dans ces conditions il devient évident que, l'architecture d'intérêt historique étant par définition une architecture urbaine, sa conservation est intimement liée au maintien de la viabilité de la cité.

Toutefois, il existe, au sein de la société occidentale, des secteurs importants et puissants de l'opinion pour lesquels le concept même de « cité » est dépassé. Il s'agit là, bien entendu, d'une déformation grotesque de la réalité; la cité, contrairement à ce que peuvent laisser supposer certaines apparences superficielles, demeure plus que jamais génitrice de la civilisation elle-même. La sauvegarde de l'architecture historique et celle des centres urbains ne sont donc que les deux faces d'une même médaille.

La somme de bâtiments historiques que possède un pays, constitue l'une de ses ressources nationales et doit être conservée, exploitée et « réinvestie » au même titre que toute autre forme de richesses matérielles. Cette thèse trouve d'ailleurs dans le tourisme de masse de notre époque une confirmation éclatante, puisque la raison d'être principale de ce genre de tourisme, est l'occasion qu'il offre de contempler les trésors d'art et d'architecture du passé. A remarquer que le tourisme est devenu l'une des premières industries du monde moderne. Paradoxalement, ce type de tourisme tend à devenir lui-même une menace pour ce patrimoine auquel il doit son existence. Pour faire face à cette situation nouvelle, il va falloir mettre au point un réseau administratif complet à des niveaux différents. Notre définition même de ce qui constitue une valeur artistique ou historique, ou de ce qui a sur l'environnement une incidence sensible, demande à être élargie, approfondie, nuancée. La Charte de Venise devra être développée de manière à embrasser toute une hiérarchie de niveaux différenciés d'intervention pour la défense de ce patrimoine, chaque niveau correspondant à un ensemble précis de circonstances.

Fig. 1. — Rénovation d'un ensemble historique.
Quincy Markets, Boston, Massachusetts, 1825-1826. Architecte : Alexander Parris.
Ce remarquable ensemble commercial néo-classique, composé d'un marché couvert en granit de 160 m de longueur avec, de part et d'autre, une série de corps de bâtiment, également en granit, abritant entrepôts et magasins, est actuellement en cours de rénovation complète, dans le cadre du programme de réaménagement du quartier des affaires de la ville de Boston. Sur une vue du marché en 1828 (a), on aperçoit Fanieul Hall au fond. (b) Vue récente de l'ensemble, à l'époque où il servait de marché de gros. Au fond, le nouvel Hôtel de Ville (1966). (c) Croquis de l'architecte Frederick A. Stahl, montrant l'aspect futur de l'ensemble rénové, transformé en centre commercial de détail, fermé à la circulation automobile.

Fig. 2. — Restauration d'un quartier historique.
Duke of Glouster Street, Williamsburg, Virginie. La ville, fondée en 1699, était demeurée la capitale de la province jusqu'en 1780, date à laquelle le siège du gouvernement fut transféré à Richmond. On a donc pris l'année 1780 comme terminus post quem, *à partir duquel toute construction ultérieure devait être démolie, tandis que les bâtiments existant auparavant étaient à reconstruire, même s'ils avaient totalement disparu; il s'agit, d'ailleurs, d'une décision qui a été fort discutée. Une comparaison entre deux vues de la rue principale en fait ressortir les résultats d'une manière frappante; on voit en (a) la ville telle qu'elle était en 1890 et en (b) telle qu'elle apparaît aujourd'hui, avec toutes ses maisons restaurées et les communs et jardins refaits selon les normes d'avant 1780.*

Fig. 3. — Rénovation d'un quartier historique.
Le Marais, Paris (France). Ce quartier fait actuellement l'objet d'un vaste programme entrepris sous la triple égide de l'Etat, de la Ville de Paris et du secteur privé, le but final étant le rajeunissement de toute cette partie de la capitale. Il est prévu de conserver et de restaurer les monuments historiques, de rénover de vieilles maisons et de construire des maisons de rapport accessibles à toutes les couches sociales, et d'aménager des garages, des jardins et des espaces verts. L'indice très élevé d'occupation du sol (visible sur le plan du quartier) sera très sensiblement diminué par la suppression de taudis, de baraquements et de dépendances.

Fig. 4. — Rénovation d'un bâtiment historique.
Banque de Californie, San Francisco (Californie). Architectes : Anshen et Allen, conseiller historique : James Marston Fitch, date des travaux : 1968. Cette banque, de style « corinthien » est un des bâtiments les plus anciens du centre de la ville, ayant été construit en 1908, immédiatement après le grand tremblement de terre. Il vient d'être complètement rénové dans le cadre d'un programme général d'aménagement urbain. La tour de vingt étages, prévue pour abriter les services commerciaux de la banque, posait un problème d'esthétique; comment, en effet, relier le vieux et le neuf ? La solution adoptée a consisté à construire la tour en retrait, camouflant ainsi la façade « corinthienne » (b). Un autre problème d'esthétique était posé par le profil de la terrasse d'un vieux pavillon, lequel, par la présence de cheminées d'aération, de mansardes et d'auvents avait un aspect de véritable taudis (c). La tour a donc été construite en « encorbellement », et cette terrasse transformée en élégante terrasse-restaurant pour le personnel avec salles de repos (d), dotant ainsi l'ensemble d'une « piazzetta en plein ciel » (e).

Fig. 5. — Reproduction à l'identique d'un bâtiment historique.
Le « Parthénon », Nashville (Tennessee), 1895. C'est une réplique archéologiquement exacte, et unique au monde, du Parthénon d'Athènes. Construite à l'origine comme pavillon temporaire en pisé, elle fut reconstruite pendant les années '30 en béton armé polychromé et abrite actuellement une galerie d'art. Cette solution de la réplique exacte pourrait convenir, en premier lieu, dans les cas où le progrès de l'altération due aux agents atmosphériques rend obligatoire le transfert d'une œuvre dans un musée; on peut laisser alors la réplique in situ.

Fig. 6. — Protection de vestiges archéologiques.
Kiosque d'Alaeddin, Konya, Turquie, 1221. C'est au cours des fouilles archéologiques et des travaux de conservation que fut mis au jour, sur un site d'un grand intérêt historique, cet important ouvrage fragmentaire. L'abri, de forme elliptique, en béton, a été conçu pour limiter au maximum l'altération due aux agents naturels; de telles solutions exigent de la part de l'architecte une très grande discrétion s'il veut éviter de porter atteinte à l'esthétique du monument protégé. Des dispositifs analogues mais faits en d'autres matériaux ont été employés ailleurs : aluminium et matière plastique pour protéger les mosaïques romaines de Piazza Armerina, en Sicile; bois et verre pour la villa romaine de Fishbourne, en Angleterre.

Fig. 7. — Consolidation de ruines.
Cathédrale de Coventry, Angleterre. Le bâtiment du XIV^e^ siècle en grès fut presque entièrement détruit par des bombes incendiaires au cours de la Deuxième Guerre Mondiale. Il y eut par la suite de longues discussions au cours desquelles furent envisagées trois solutions possibles, à savoir :
— reconstruction de la cathédrale in situ *et à l'identique;*
— démolition des vestiges et construction sur le même emplacement d'une église moderne;
— construction d'une cathédrale moderne sur un autre emplacement.
Il fut finalement décidé de consolider la tour et ce qui restait des murs et de construire la nouvelle cathédrale sur l'emplacement du bras nord du transept. On voit ici, à gauche, les vestiges de l'abside et, à droite, le narthex de la nouvelle cathédrale.

Fig. 8. — Reconstruction à l'identique de bâtiments disparus depuis longtemps.
Palais du Gouverneur, Williamsburg (Virginie). C'est en raison de sa situation centrale à l'extrémité d'une des principales artères de la capitale que la décision fut prise de reconstruire cet ensemble, totalement disparu depuis fort longtemps. Alors que les textes descriptifs abondaient, l'iconographie relative au Palais était minime, composée uniquement de documents fragmentaires tels que la « Bodleian Plate » datant d'environ 1740, ou le plan schématique du piano nobile *exécuté par Thomas Jefferson pendant son premier mandat de gouverneur. La reconstruction minutieuse du Palais et de son parc que l'on voit ici repose, donc, essentiellement sur des données archéologiques. Les maisons qu'on aperçoit en haut et à droite sur la photo aérienne étaient encore debout, mais ont été restaurées.*

Fig. 9. — Reconstruction à l'identique de bâtiments disparus depuis longtemps.
Chapelle de Bethléem, Prague.
La décision fut prise, en 1960, de reconstruire cette chapelle, en raison de sa signification historique pour le peuple tchèque; ce fut, en effet, le lieu où Jean Hus — bien avant Martin Lüther — prêchait en faveur d'une réforme de l'Eglise. Les travaux ont été faits dans une très grande mesure à l'aide de documents — les fouilles archéologiques n'ayant permis de déterminer que l'emplacement du bâtiment, sa disposition générale et ses dimensions au sol — et le résultat doit être donc considéré comme assez conjectural. A remarquer que toutes les surfaces apparentes ont conservé leur aspect neuf, rien n'ayant été fait pour obtenir par une patine l'impression d'un vieillissement ou d'une altération due aux intempéries.

Fig. 10. — Reconstruction / restauration de bâtiments récemment endommagés.
Place de l'Hôtel de Ville, Gdansk. Cette ville, sauvagement pilonnée par l'aviation et l'artillerie au cours de la Deuxième Guerre Mondiale, se trouvait dans une grande mesure détruite

à la fin des hostilités. Des quartiers entiers furent alors entièrement réaménagés et reconstruits dans un syle moderne; mais il fut décidé de reconstruire le vieux noyau historique, avec sa grande cathédrale gothique construite avec la brique caractéristique des ports de la Hanse, et ses grandes maisons bourgeoises de la même époque. On voit ici la Place en 1946 (a), et la même Place telle qu'elle apparaît vingt ans plus tard (b). A remarquer surtout: les façades des maisons baroques et rococo avec leurs revêtements polychromes restaurés.

Fig. 11. — Reconstruction / restauration de bâtiments récemment endommagés.
Rue Nowy Swiat, Varsovie. Lorsque, à la fin de la Deuxième Guerre Mondiale, fut entreprise la tâche héroïque que représentait la reconstruction de Varsovie, la ville se trouvait détruite à peu près à 88 %, à la suite des bombardements et des démolitions systématiques. On voit ici le centre historique de la ville, photographié en regardant vers le Stare Miasto, au nord, d'abord (a) en 1945 et ensuite (b) en 1965, lorsque les travaux étaient dans une grande mesure terminés. Pour les Polonais, la restauration de leur capitale telle qu'elle avait été avant les destructions hitlériennes présentait une grande importance sur le plan idéologique. En raison de l'étendue et de la gravité de ces destructions, il s'avéra possible de procéder à des fouilles archéologiques généralisées; les nouvelles données ainsi obtenues concernant l'histoire de l'architecture de la ville ont permis de donner à de nombreux bâtiments reconstruits l'aspect qu'ils présentaient à une époque très antérieure à 1939.

Fig. 12. — Démontage et reconstruction d'un bâtiment existant.
L'ancienne State House, Springfield, Illinois, 1837. Architecte: John F. Rague. Il s'agit d'un beau bâtiment néo-classique, ne servant plus depuis longtemps de siège au gouvernement de l'Etat d'Illinois et promis à un certain moment à la démolition pour permettre la construction d'un garage souterrain municipal. Il fut finalement décidé d'adopter une solution plus heureuse et le bâtiment fut démonté pierre par pierre et ses matériaux stockés en attendant sa reconstruction. On creusa ensuite la place sur toute sa largeur pour permettre la construction d'un garage à deux niveaux (a); puis on construisit, sur l'emplacement retrouvé, une ossature en béton ayant la forme et les dimensions du bâtiment original (b), qu'on habilla entièrement de pierres de taille provenant de celui-ci. Le toit du garage fut recouvert d'une couche de terre et le paysage de 1840 reconstitué (c).
La grande signification historique de ce bâtiment réside dans le fait que c'est le lieu où fut exposé en 1865 le corps d'Abraham Lincoln et d'où partit le cortège funèbre le jour des obsèques nationales. On a reconstitué la salle même de la Chambre des Représentants où eut lieu l'exposition du corps, en cherchant, par sa décoration intérieure et son ameublement à lui redonner, dans la mesure du possible, l'aspect qu'elle présentait lors de cet événement mémorable.

Fig. 13. — Adaptation d'un monument historique à un but nouveau.
Couvent de Sainte Agnès, Prague. La rénovation de ce vaste ensemble médiéval, resté longtemps enfoui au fond d'un quartier populaire célèbre par ses taudis, est actuellement en cours; ses salles abriteront par la suite le Musée National d'Art Médiéval. L'opération a une importance non seulement du point de vue architectural mais également dans le cadre de l'aménagement général de la ville, car elle comporte la suppression de la dernière zone de taudis subsistant encore sur les magnifiques quais le long de la rivière. On voit ici l'une des cours du couvent, pendant les travaux et telle qu'elle apparaît à l'heure actuelle.

Fig. 14. — Sauvegarde d'un quartier historique.
Vieux Carré, Nouvelle Orléans, Louisiane. Le centre historique de cette ville, fondée en 1717, est protégé en vertu de certains textes, parmi les premiers, adoptés aux Etats-Unis pour la sauvegarde des monuments. Mais il s'agit de textes purement négatifs, qui ne concernent que l'aspect visuel du paysage urbain et ne contiennent aucune disposition énergique visant les conditions insalubres de logement, l'amélioration des services de voirie, etc. Le plan du quartier (a) fait ressortir un indice élevé d'occupation du sol, les constructions étant uniformément de faible hauteur et en maçonnerie. Sur la vue aérienne de Jackson Square (anciennement la Place d'Armes) (b), on voit la Cathédrale faisant face au fleuve avec, à gauche, le Cabildo *et, à droite, le Palais de l'Archevêque; ces deux monuments sont maintenant des musées d'histoire.*

Fig. 15. — Conservation d'un monument historique isolé.
« Lyndhurst », Tarrytown, New York. Architecte: Alexander Jackson Davis. Construit en 1838, aggrandi en 1865. Ce « château » néo-gothique, transformé en musée, offre un exemple typique de l'application de la formule de conservation la plus ancienne et la plus répandue; il appartient depuis 1964 au National Trust. L'architecture du « château » est demeurée inchangée tout au long de son histoire. On voi ici (a) une partie de la façade avec sa porte-cochère datant de 1865, et (b) une chambre à coucher contenant le lit « gothique » conçu par l'architecte pour le premier propriétaire.

Fig. 16. — Rénovation d'un monument historique.
State House, Montpelier, Vermont, 1838. Architecte: Ammi B. Young. Bâtiment néo-classique élégant (a), un des nombreux « capitoles » construits aux Etats-Unis entre 1830 et 1850; sa partie ancienne est actuellement en cours de restauration complète. A l'arrière, on construit un grand immeuble fonctionnel pour abriter des nouveaux bureaux, des salons, des restaurants, etc. Le plan (b) et la coupe (c) font ressortir le soin et la prudence dont fait preuve l'architecte Robert Burley, qui dirige ces travaux. A noter: le lien entre l'ancien et le nouveau, obtenu au moyen d'une galerie surmontée d'une verrière (d).