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ENVIRONIC IMPLICATIONS OF
LIGHTER THAN AIR TRANSPORTATION

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ABSTRACT: The advent of any new system of transportation must now be reviewed in the physical context and texture of the landscape. Henceforward, all transportation systems will be considered in respect of their effects upon the environment to ensure that they afford an environic asset as well as provide an economic benefit. This paper emphasizes the obligations which now confront the buoyancy engineers so that they may respond to these ethical and environic urgencies simultaneously with routine technical development.

The prospect of a system of global transportation by means of Lighter Than Air vehicles requires to be explored within the context of both the history of the economics of movement, and of the environic consequences arising from vehicular demands and impositions. There prevails a growing conviction that the right of movement supersedes any other social requisite, and the illusion is growing that transportation requirements cannot be resisted. Speed is the symbol of progress, and progress is of course irresistible. The capabilities of Lighter Than Air transportation are conditioned by particular factors which make the concept of such a system unique, while the seeming freedom from surface characteristics, which so inhibit all previous systems of incidental and scheduled mass-movement, hold vital environic promise for the improvement of the degraded human habitat. It is inevitable that inventive aeronautical genius will concentrate upon instruments that operate in the only element that is consistent in all regions of the earth,

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and redress the curious technical anomaly between the dramatic prowess achieved in aerodynamics and the tragedy strewn progress in aerostatics, by means of which the history of aviation began.

The potentialities of aerial lift of unprecedented size and weight permits the modified use of equipment of proven effectiveness tested in nuclear submarine, mammoth tanker and supersonic aircraft operations. Such exceptional advantages will ensure that the next generation of lighter than air vessels will develop comparatively rapidly. They will emerge in a sophisticated form for so wide a range of purposes that it is imperative that they should be assessed, for both their initial impact upon the environment and for the consequences of their presence.

It is now becoming mandatory planning policy to review existing, modified and proposed transport systems to determine their intended benefits and their inevitable obsolescence, under the competitive economic pressures of yet another system.

As the horse cart and the sailing ship have passed into the realms of kinetic romance, so will pass the wheel, and even the wing, but these present means of movement produce a legacy of environic degradation that no society can further afford.

It is essential, therefore, that any new or revised concept of transportation be fostered by those concerned with the quality of environic conditions, in their indivisible entirety.

For these pressing reasons that the Environic Foundation International sponsored the intended Symposium on Airship Development, in London, earlier this year,¹ it is believed that the prospects for Lighter Than Air transportation should be conveyed, cultivated and confirmed within the context of environmental seamliness as a social benefit. By such a strategy it is hoped that emotional antagonisms, economic frictions, legal conflicts and environmental affront can be avoided. Such sponsorship can encourage the realization that, for the first time since the invention of the sail, a system of movement can be achieved, on an unprecedented scale, without damage to the quality of life.

It is difficult to imagine any form of mechanized transportation without the vision of the scene despoiled. The railyards and stations, the docks and harbors, the roads and superhighways and even the newest airports, with their inseparable deserts of automobile parking, are all areas of spiritual and aesthetic desolation. Since the harnessing of steam, the wheel in its varying rotations, has become an environmental tyranny.

Lighter Than Air vehicles present, it would seem, a very different prospect. They may become an instrument of salvation, redeeming the effects of automotive despoilation, without imposing further demands upon the overstrained urban energies and spacial resources. It is now a planning imperative that this positive possibility be understood at this moment of the technical reassessment of a once discarded concept of transportation. It is axiomatic that those concerned with the physical conditions of good order become involved in the lighter than air research and investment from the beginning, in this exceptional instance, the re-beginning.

The justification for the inclusion of the subject of Environic Implications of Lighter Than Air Transportation in this, the first Workshop devoted to the technicalities of a revised concept of bulk transportation, lies in the urgency of obvious planning disarray, environmental degradation wrought by previous transport systems, and upon the potential reach (territorial and aquatic) which this system portends.

PROFESSIONAL COORDINATION, STRATEGIC AND TACTICAL

Recent social history has shown that the physical consequences of new systems of transportation have consistently increased environmental stress upon ecological and human well-being alike. No matter how convenient each new conveyance might have been, environic degradations increased as the demands of each particular system expanded.

Under the momentum of competition, new systems have momentarily superseded their predecessors in performance, but seldom have the new systems reoccupied areas or routes previously used. In consequence, the landscape, urban and rural alike, has become dominated by both the demands and the effects of successive systems of transportation.

For the first time, it is possible to consider a revised/new system of movement that is not hindered by the dispositions of land and water, or by the structural investment thereon. While this freedom of vehicular maneuver and of direct place to place contact may soon become fact; the stimulating effects of this facility upon land-use speculations require immediate acknowledgement. The aero-tactics of land and water planning must be propounded coincidentally with the designing and the testing of lighter-than-air craft, in all their likely hybridizations.

The planning professions, environologists, architects, engineers, urbanologists and landscape designers must appreciate the third dimension and the third, all-pervading element, air, as being their responsibility, indivisible from the surfaces of their design commissions.

The prospects of receipt and dispatch of materials and personnel from 'above', by suspension, in unprecedented quantity, without investment in costly intermediary equipment, structures, etc., are impelling and will exert an effect upon planning concepts that may be termed 'involuntary'. The consequent effects of such a transportation system on land values, will stimulate real-estate speculations, everywhere, and will impose new demands upon unencumbered territories that will range from industrial to recreational uses in locations that are presently inaccessible.

Such concepts of elemental planning coordination necessitate the creation of a particular transportation planning research office that is independent of government departments and of industrial/professional influences, so that the essential imagination required for the promotion of this unique vessel, the 'airship' is not hindered by conventional procedures and investments.

Reference to the post World War II position of maritime commerce is here relevant, in that the design of ships, ports and port facilities were less than co-incident and necessitated the founding of the International Cargo-Handling Coordination Association. The extension of this organization to meet the same requirements to facilitate air to ground/water and air to other vehicle trans-handling would seem to be justified to ensure both equipment standardization and the effective re-use or 'supra-use' of those surfaces already in service.

It is essential, moreover, that the viability of such vessels are not exaggerated thereby causing operational disappointments, stimulate real-estate speculations, and premature investments combining to produce a loss of public confidence of the kind experienced by successive railway investment booms of the nineteenth century.

A comparative analysis of social amenity cost/benefit/degradation and of lasting convenience, based upon the environmental consequences of concurrent transportation systems, is fundamental in creating public and political confidence in the claims made in favor of any new system.

It would be a tactical and an economic misfortune if the advancement of lighter than air vessels were to be delayed by opposition from those who champion environmental causes, necessary and imagined. It would be unfortunate, indeed, if lighter than air transportation concepts were to be hindered by public hostility and political antagonism arising from misapprehensions about the environic consequences. It would be strategically disastrous if lighter than air pioneering were to be harassed by industrial or trades union interests, opposed to any challenge to their traditional means of livelihood.

ENVIRONIC FACT AND SPECULATION

The scale of transport planning is now so vast and so complicated that no new system can be added to general operations without dire spacial, social, material and particular environic consequences. These vital issues are the concern of the environologists and their associated planning specialists and justify their practical participation in supporting the developments of lighter than air transportation at this moment of technological review and revival.

The laudible injunction requiring those invited to contribute Workshop Papers to concentrate upon the separation of fact from speculation is difficult to fulfill for the subject of environic condition includes the unknown. There is no formula for conditional measurement as applied to the material environment indivisible. While reports confirm that the condition of the inhabited landscape is deteriorating in ecological quality, and is increasing as an economic liability, the evidence is seldom accepted as fact, but rather as an opinion, and that mitigating circumstances can be pleaded.

Speculation, however, continues apace, and speculation is unavoidable so long as demands vary from place to place, and as the human purposes shift from time to time. The whole kaleidoscope of economic operations is predated upon speculation, and the reality of this fact must be recognized as the prime stimulant for invention. It is speculation, that has produced the crisis now reached in the demand for a more simplified, dependable and economic transportation system. This is a fundamental environic fact that is confirmed by environmental conditions.

EDUCATIONAL COMMITMENT

As the pressures of transportation inadequacy increase, the search for economic relief continues with intensified urgency. In consequence, this is a period of multiple specialization, and of inventive pioneering in diverging directions. There now prevails an educational commitment to specialization which will be disastrous, socially, economically and ecologically, unless it is tempered by a consistent attention to environic consequences of all that is undertaken in the re-redevelopment of transport operations. The emerging challenge of the lighter than air vessel, combining the most advanced mechanical and electronic technology with the most direct means of movement, offers the most positive prospects for environic quality redemption ever to arise.

I wish, therefore, to emphasize the opportunities for symbiosis between the lighter than air engineers and the territorial planners for the achievement of environic rejuvenation. The lighter than air transportation potentialities are of transcending importance, and constitute an unprecedented incident in the history of

invention, and in the economics of mechanical movement. Special educational programs are required to comprehend the rebirth of such vessels, since their emergence will impose significant intellectual challenges in social behavior and in geo-political relationships.

The subject of 'airships' is already familiar, and of proven validity in that craft using the 'first principal of flight' are, indeed, a practical proposition. After 40 years of oblivion, and of almost no advancement in popular uses (with the exception of the unique experiences of the Goodyear Aerospace Corporation), the coordination of several technological achievements will facilitate the production of a vessel of such varied use and potentiality that a particular educational program will be justified in advance of the event.

Transportation economics will undergo profound changes if any system can be devised which will reduce the necessity of vast structural investments, as exist in the form of harbors, railroad marshalling yards, airports and their supporting facilities. The economic appeal of any system which dispenses with the construction and maintenance of previously indispensable interconnecting routes, and between remote terminals is not to be denied.

Vertical lift and float movement of loads of quantity, weight and bulk appear to offer such exceptional economic advantages that every aspect of territorial planning and disposition, urban, suburban, industrial, agricultural, recreational and constructional will be affected — immediately, as a matter of desperate real estate speculation. In consequence, the educational commitment to transport planning strategies, spacial reuses and territorial re-formations becomes a prime urgency and must be met simultaneously with the technological development of aerostatic vessels.

ENVIRONIC CONTEXT

For almost two centuries the landscape has suffered the surgery of successive systems of transportation. Nowhere is this more obvious than in the superbly varied landscapes of these United States, and nowhere has the price of social amenity been paid at such a high cost in the loss of personal and aesthetic amenities. Nowhere is there greater need for the redemption of these lost qualities of scene and serenity.

It is in this context of the wheel-riven landscape that I quote from Abraham Lincoln's healing address to the 62nd Congress, following the distractions of the Civil War, in which he expressed our present technical and professional planning perplexities so succinctly.

"The dogmas of the quite past are inadequate to the stormy present. The occasion is piled high with difficulty, and we must rise with the occasion. As our case is new so we must think anew and act anew. We must disenthrall ourselves, and then we shall save (the condition of) our country."

Nowhere are the difficulties piled higher than in the competitive patterns of successive systems of transportation. Nowhere is it more necessary to disenthrall ourselves than with the concepts of the conventional systems. Nowhere is the landscape so lacerated with the scars or so vibrant from the sounds of movement than in our country.

The transportation planners now have the exceptional advantage of reliable, consistent, repetitive, information upon the condition of the earth, in degrees of thermal and meteorological detail that confirm the primacy of environic discipline in all planning design and operation. This comprehension of context, continuity,

and consequence is now readable in the evidence from remote sensing satellites and must be reorganized as the critical factor in any systematic change in existing transportation by the addition of new systems. The consequences that follow from transport innovations are never anticipated, and the accumulative costs that society eventually has to bear are never estimated in advance, notwithstanding the lessons learned from railroad and shipping enterprises which are, even now, plaguing the aero-industries. Apart from the initial advantages, the effects of wheeled movement become a tyranny which society is swift to tolerate but slow to condemn.

Hitherto, concept has always preceded the technology. Now, in the instance of 'airship' revival, technology is in search of concept. The potential rapidity of development is phenomenal, the size of vessel unprecedented, the pay load and maneuverability unsurpassed, while the range and reach is almost without limit. In consequence appraisals made in the interests of the carriers and investors must be broadened to include the effects upon the environic context.

The re-emergence of the lighter than air vessel represents a momentary opportunity to reconcile the seemingly irreconcilable demands of improved mobility with improved environic conditions, provided that appropriate applications are foreseen and encouraged. Never again must the convenience of those in motion be gained at cost of the comfort of those in place.

APPROPRIATE APPLICATIONS

New technological developments are hindered, inevitably, in reaching full potential by their threat to existing investments, and it would seem prudent and politically dynamic to emphasize the advantages of using lighter than air vessels over those regions where existing services are few or non-existent. Northern Canada is the most obvious and challenging location for testing, where the development of the North depends upon the provision and maintenance of the most costly construction whether it be in the form of railways, highways, or runways.³

With the advent of the lighter than air vessel, to stimulate the competitive commercial economy, there is now no place that is remote — and virtually no place that is inaccessible. Within the limits of operational height (pressure height), there is now no obstacle which cannot be avoided, no weather conditions and movements which cannot be observed in advance, computed, and position circumvented. In particular, the formidable dangers presented by weather conditions are much reduced as a result of consistent and continuous satellite recordings of the meteorological patterns. This reduction in risk, and resulting insurance economies, may compensate for the delays in rescheduling and rerouting necessitated by avoiding approaching storms by means of the vessels own speed of escape, whether the threat arises while the vessel is tethered or in passage.

Three questions may serve to identify the categories of task to which lighter than air vessels, and their specialized hybrids, can be applied: 1) What can be done better by lighter than air vessels than by any present system of transportation? 2) What can be done by lighter than air vessels that cannot be done by any present system of transportation? 3) What supporting services and facilities can lighter than air vessels dispense with, thereby providing maintenance and other economics which will ensure lower costs for routine operations, and reduce the varied impedimenta representing the conventional transport infrastructure that is so demanding of space, so imposing upon the scene?

The most significant influence of lighter than air vessels will be felt by those concerned with urban, wilderness and marine planning where the services of the 'aerocrane' hybridizations will permit the removal of site debris and the delivering of construction materials without imposition upon the conventional transport

services. The prospect of working platforms lowered from above are especially appealing to contractors whose operations are entirely dependent upon the nature of the routing to the site. The 'aerocrane' recalls the concept of Dr. Buckminster Fuller, first illustrated in 1927, where substantial building components are lowered complete at remote sites or within the crowded urban and industrial locations.

Such concepts, however, remain speculation since practical experience in aerocrane operations is limited, and largely concentrated in the pioneering constructional commissions undertaken by the Okanagan Helicopter Group.⁵ The most relevant evidence of economic/invention shifts may be found, also, in the profitable achievements of the containerization systems of cargo-handling pioneered by the British shipping company, Manchester Liners Limited, and in the simplification of trans-handling operations upon a world-round scale.⁶

Lighter than air vessel operations are of immediate relevance to geological and mineral exploration; forestry management and logging; agricultural services; crop fertilization spraying and even selective irrigation; stock supervision; pollution observation and assessment; mariculture and fisheries; off-shore oil-rig servicing; scheduled bulk transportation of routine cargos, of fragile perishables, and livestock; unscheduled, incidental deliveries and pipeline inspections. Hybrid 'aerocranes' are urgently required for the trans-shipment of cargos at transportation infrastructures and depositories, and may be especially effective for use in the routine collection, delivery and sorting of industrial/municipal 'waste' materials and garbage for recycling and return for further processing. Such vessels have obvious uses in the inventorying materials and conditions recorded by the Earth Resources Technology Satellite services and for harbor/canal/polder/causeway/island/dam constructions; dredging and excavation; mass-produced factory-assembled house moving and siting. Humanitarian uses of lighter than air vessels would include all forms of disaster; forest and oil refinery fire-fighting, oil-rig crew removal prior to tempest, aircraft and highway accidents, policing and general public safety. Special hospital facilities and operating equipment could be assembled aloft, as in any field hospital, and emergency food distribution, human and livestock, are obvious benefits, while educational travel and exploration, and tourism (for the revelation of territorial and natural wonders and wildlife sanctuaries to which public should not have access) are among the more pleasurable operations required of lighter than air vessels.

LEGAL ISSUES

The seeming economic and amenity advantages suggested by these likely activities for lighter than air vessels must be considered within the license of international law, for each operation is bound by legal obligations and hazards.

It is imperative, therefore, that an organization is created to arouse the interest of imaginative lawyers in this particular aspect of transportation, and to assess the few legal actions involving aerostatic craft that are on record. It is essential, also, to organize a body of informed opinion through whom to anticipate the various of legal issues that such flight is certain to create, ranging from injunctions based upon the charge of invasion of privacy, to implied danger to life and property, to insurance risks and policies. Even actions based upon the infringement of aesthetic and amenity rights caused by proximity and by shadows cast by such aerial leviathans must be expected.

PROFESSIONAL ASSOCIATION

The economic urgencies that now prevail justify the speedy formation of an independent organization devoted to the promotion of the lighter than air vessel, on

an international scale, and in a professional manner. The value of such associations for informing the public, for political lobbying, for strategies of policy, for encouraging concurrent educational programs, for fostering technical developments, and for stimulating the necessary investments are obvious. The effectiveness of forming subsections devoted to the promotion of particular uses and the development of the hybrid vessels required is also manifest.

The initiative shown by the convocation of this assembly should be commemorated by the inauguration of such an organization: THE INTERNATIONAL ASSOCIATION OF LIGHTER THAN AIR TRANSPORTATION, to ensure that governments, environic interests, industries, the press and the populace become acquainted with both the economic and environmental consequences of such a system of transport in the most effective way compatible with the emerging evidence. Such an association should draw members of all professional disciplines who share an enthusiasm for the purpose, and possess experience relevant to the promotion of this, the most promising transportation system yet devised.

PROMOTION

The advent of the lighter than air vessel represents a relatively new kinetic experience with aesthetic no less than commercial value. It is, essentially, a positive instrument of construction, offering advantages beyond the reach and realm of anything previously available. Recent centuries may be distinguished by particular transportational achievements, which have altered previous lifestyles and created the characteristic cultural momentum. The horsedrawn wagon had been the common carrier until the domination of the eighteenth century by the influence of the sailing ship; the nineteenth century was enthralled by the steam engine, while this twentieth century is atremble with the roar of the internal combustion engine in all its forms. The promise of aerial tranquility that is offered by the silence of the Lighter Than Air vessel confirms that this means of movement is, indeed, the most significant technological advancement, that will exert a greater influence over more varied territories with less imposition upon environic qualities than any instrument in the history of transportation.

Such a vessel deserves, I believe, a distinctive name and accompanying terminology wherewith to promote its re-emergence without the historic overtones associated with the appalation 'airship'.

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