IMPLOSIONS / EXPLOSIONS

NEIL BRENNER

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"I'LL BEGIN WITH THE FOLLOWING HYPOTHESIS: SOCIETY HAS BEEN COMPLETELY URBANIZED."
—HENRI LEFEBVRE, *LA RÉVOLUTION URBAINE* (1970)

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# IMPLOSIONS / EXPLOSIONS

## TOWARDS A STUDY OF PLANETARY URBANIZATION

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EDITED BY NEIL BRENNER

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# TWO APPROACHES TO "WORLD MANAGEMENT": C.A. DOXIADIS AND R.B. FULLER

Nikos Katsikis

First published in 1970, Henri Lefebvre's classic text *La révolution urbaine* famously declared that society was entering a critical zone of complete urbanization in which the urban problematic was becoming global.[1] This hypothesis suggested the need for an expanded understanding of urbanization as a process of sociospatial transformation that transcends the traditional definition of the city and encompasses the entire planet. Six years later, the United Nations (UN) organized the first Habitat Conference, an event that seemed to signal a recognition of this expanded geography of urbanization by thematizing the organization of human life and settlement on a planetary scale.

Against the background of the themes raised in the first UN Habitat Conference in 1976, this chapter considers two approaches to global urbanization developed in the 1960s and previously by Constantinos Doxiadis and R. Buckminster Fuller, which arguably represent important precedents for contemporary efforts to conceptualize, envision and manage the world as a whole. Driven by a belief in scientific rationality and an aspiration for systematic knowledge and control, the agendas of Fuller and Doxiadis were largely aligned, and provided important intellectual foundations for the ideas put forward at the 1976 UN Habitat conference. Working backwards from that event, this discussion surveys the most important elements of these authors' ideas and thus unveils an important yet neglected episode in the long intellectual and political history of the contemporary *problematique* of planetary urbanization.



Doxiadis' and Fuller's engagement with the pressures of population growth, land management, resource consumption, unequal development and environmental degradation represent pioneering forays into the debate on global urbanization. Their attempts to grasp these issues at a global scale, through systematic indexing, diagramming and mapping, highlight the projective power of design in relation to some of the key regulatory and distributive challenges associated with contemporary urbanization. However, Doxiadis' and Fuller's approaches also clearly reveal the limits of technoscientific approaches to reshaping sociospatial structures, which treat fundamentally political questions regarding humanity's future as matters of rational administration. These technoscientific ideologies promoted the universality of managerial approaches to the organization of the world, and were largely indifferent to the social contexts and geopolitical domains in which such strategies were supposed to be mobilized.

Already during the period of Doxiadis' and Fuller's interventions, critical theorists such as Jürgen Habermas, Herbert Marcuse and Henri Lefebvre had criticized the technoscientific determinism of such approaches, underscoring their fundamentally political character and their complex yet often hidden interplay with the power relations, inequalities and contradictions of capitalism.[2] Yet, such critical perspectives on the regulation of worldwide urbanization remain as urgently relevant as ever because technoscientific ideologies continue to be mobilized under early twenty-first-century conditions, albeit in new guises and in relation to contemporary socioenvironmental problems. A critical evaluation of these earlier technoscientific approaches to world urbanization may thus inform and enhance our ability to recognize, deconstruct and counteract more recent incarnations of such approaches both in theory and in practice.

## The Institutionalization of the Urbanization Question

In May and June of 1976, the UN organized the first Habitat Conference in Vancouver. Officially titled "Habitat: United Nations Conference on Human Settlements" (later relabeled as Habitat I), the conference marked a historical moment in which the need for an integrated understanding of the interrelationship between urbanization, development and the environment was thematized by one of the most important governance institutions in the world.[3] The concept of human settlements was understood not only with reference to cities and towns, but as the basis for a synthetic framework for considering, under the rubric of urbanization, a series of global concerns that had been discussed in previous UN conferences—the environment (Stockholm, 1972), population (Bucharest, 1974), food (Rome, 1974), and the world economic order (Nairobi, 1976, UNCTAD). The conference discussions explicitly emphasized that the problems of settlements were not only internal to specific places, towns and cities, but reflected the spatial and social organization of entire (national) territories.[4] Moreover, it offered a prescient critique of the urban/rural divide, highlighting the need to "get away from rigid and misleading divisions between rural and urban regions, and to see a country's settlements as part of a continuum of national

existence and movement in which the health and viability of the various parts are essential to the vigour and development of the whole."[5]

However, while the 1976 Habitat conference was one of the first prominent public initiatives in the twentieth century to draw attention to the global dimensions of urbanization beyond the traditional definition of cities, its approach was characterized by an unproblematized methodological nationalism. Its main strategy document, the "Vancouver Action Plan," was codified as a set of "Recommendations for National Action" that were to be formulated into development policies by its member states, thus reflecting the national-developmentalist, Keynesian moment in which it was elaborated. Despite its global vision, its policy strategies actually enhanced the role of the nation-state in spatial development and thus implied that the challenges of world urbanization and the inequalities of spatial development could best be resolved on a state-by-state basis. The overall assumption was that:

> there are fundamental relationships among the distribution of population, environment, economic activities, and the pattern of human settlements. National policies for economic and social development can no longer afford to neglect or minimize the role of human settlements.[6]

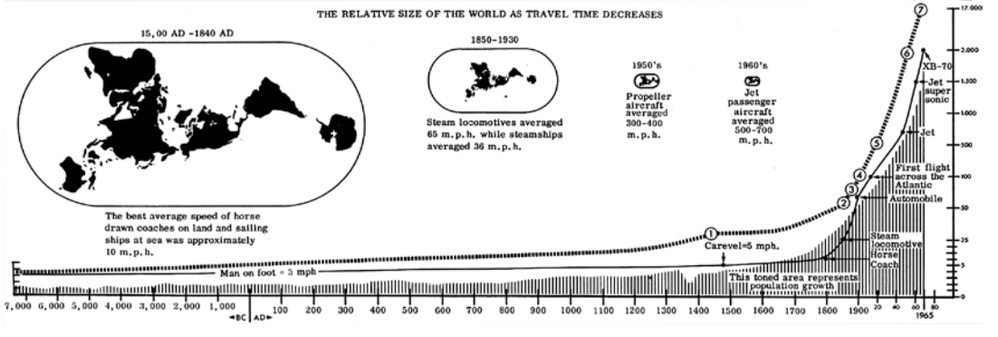
But how could these "fundamental interrelationships" be analytically decoded and effectively shaped? According to the American anthropologist Margaret Mead, one of the key participants of the conference, even though it had begun to open up an important new agenda for "planetary housekeeping," the bureaucratic and state-centric character of the UN prevented the elaboration of a more rational, systematic approach.[7] What was needed, she believed, was a more comprehensive, transnational and scientific approach to global urbanization that, based on the advancements in general systems theory, would combine an understanding of its constitutive processes with technocratic methods for confronting large-scale social, environmental and institutional problems.[8] Mead's proposal was grounded upon a technoscientific viewpoint that was widespread during her time, reflecting an uncritical faith in technological progress and a corresponding endorsement of scientific rationality as the basis for addressing even the most complex, politically contentious societal problems. Elements of this technoscientific approach to urbanization were, in fact, already being crystallized in the early 1960s through the interdisciplinary efforts of the World Society for Ekistics (WSE), to which Mead herself had actively contributed for many years.

## Doxiadis, Fuller and the World Society of Ekistics

From 1963 until 1975, the well-known Greek architect and planner Constantinos Doxiadis organized a series of annual symposia on the Aegean island of Delos, in an attempt to bring together leading figures from different disciplines related to urbanism, including geographers, architects, engineers, technologists, sociologists and historians.[9] His goal was to create a scientific community, labeled the World Society of Ekistics, which would be well equipped to confront the global dimensions of urbanization in a more versatile, interdisciplinary and technically competent way than the earlier *Congrès International d'Architecture Moderne* (CIAM) had been able to do.[10] While the modernist ideas of CIAM were associated closely with postwar national planning policies, Doxiadis highlighted the need for a transnational approach that would be better articulated through international organizations such as the UN. According to architectural historian Panagiota Pyla, the 1976 Habitat Conference was in many respects the culmination of the WSE's intense efforts to highlight the global dimensions of urbanization and to develop common approaches for managing them.[11]

The famous American philosopher, writer, designer, cartographer and inventor R. Buckminster Fuller was likewise a founding figure of and major influence in the WSE, having participated since the first Delos symposium and later serving as the organization's president following Doxiadis' death. Already well known at the time of the UN conference through his versatile practical and theoretical contributions, Fuller had been working for many decades to elaborate the capacity of design to promote what he hoped would be more efficient, universal solutions to a wide range of questions regarding forms of settlement, systems of transportation and methods of energy- and resource-management on a world scale.

Doxiadis and Fuller, brought together through WSE, shared an understanding of the planetary both as a scale of analysis and as a terrain of intervention. In their view, population growth, industrialization and technological development were intensifying human impacts upon the earth, opening up new problems of migration, resource allocation and territorial organization that had to be grasped and confronted at a global scale. Their expectations were grounded upon a simplistic technological determinism according to which the development of communication and transportation technologies would eliminate the friction of distance, making possible the expansion of human interactions at very large scales and producing a "shrinking earth." R.B. Fuller's 1965 diagram (Figure 29.1) illustrates this vision paradigmatically. At the same time, emerging risks of global catastrophe (for




**29.1** Diagram of a shrinking earth 500,000 BC–1963

instance, through nuclear war) and new geopolitical struggles over resource allocation (as exemplified in the 1972 oil crisis) were presenting increasingly urgent dilemmas and highlighting the global interdependence of human and environmental problems. As a result, both designers believed that a framework for worldwide management was imperative for human survival.

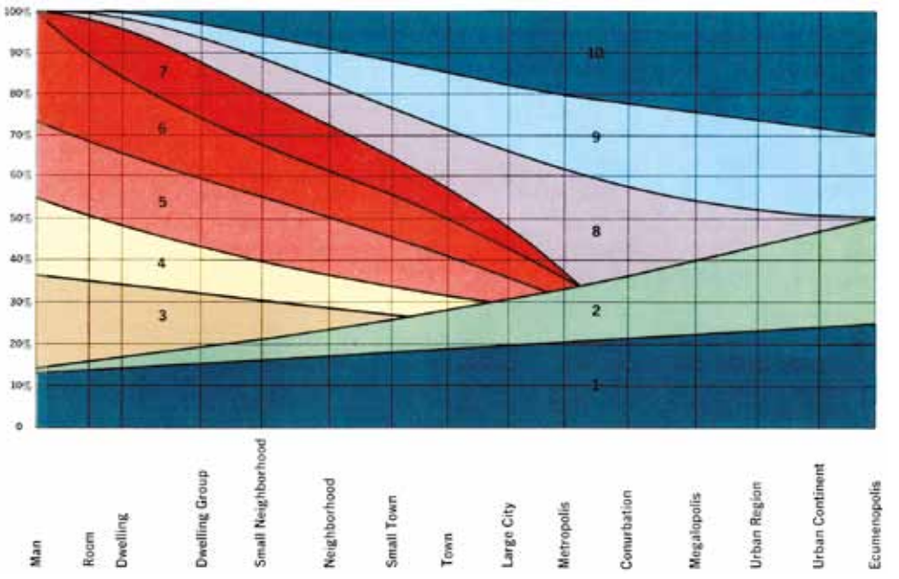
Although technoscientific and managerial approaches to human development can be traced to the mid-nineteenth-century efforts of the Saint-Simonians for radical social reform, the postwar approaches promoted by Doxiadis and Fuller were characterized by the use of certain new techniques, including cybernetics, general systems theory, linear programming and computer modeling.[12] These methodological tools produced the illusion that problems of immense social complexity and intense political contestation could be addressed effectively simply by being translated into quantifiable, computable variables and codes. In different yet allied ways, both Doxiadis and Fuller mobilized such technoscientific assumptions to analyze the fabric of world urbanization, and on this basis, to propose various interventions for managing its socioenvironmental dislocations.

## Doxiadis and Planetary Zoning

Doxiadis developed his theory of "ekistics"—"the science of human settlements"—in order to offer what he believed to be a rational, comprehensive answer to the problems of world urbanization that traditional planning had been unable to address.[13] Ekistics incorporated major developments from urban ecology and the first quantitative revolution in the discipline of geography in the 1950s. During this time, the descriptive, site-based and historically specific approach of regional geography had been superseded by a positivist, nomothetic spatial science that attempted to uncover the supposed "laws" underlying spatial configurations, which were to be quantified and modeled mathematically. Doxiadis' theory of ekistics was derived directly from such approaches; it was an early effort to develop a "scientific" theory of urbanization without presupposing any fixed, historically inherited units of territorial organization, such as city or town, urban or rural. Rather, Doxiadis structured his theory around the more generic interrelation of five key elements:

> Our subject, the whole range of human settlements, is a very complex system of five elements—nature, man, society, shells (that is, buildings), and networks. It is a system of natural, social, and man-made elements, which can be seen in many ways—economic, social, political, technological, and cultural.[14]

Doxiadis' theory was intended to explore and categorize the putatively universal forces of urbanization that were thought to shape the human occupation of the planet as a whole. Figure 29.2 is a characteristic illustration of Doxiadis' effort to codify and diagram the complexities of urbanization with reference to principles he considered to be universally valid. The diagram summarizes how various generic forces corresponding to the five key




**29.2** Synthesis of ekistic forces and their probable relative importance by ekistic unit. (1) Gravity; (2) Geographical; (3) Biological; (4) Physiological; (5) Social; (6) Internal Structure; (7) External Structure; (8) Growth; (9) Movement; (10) Organization

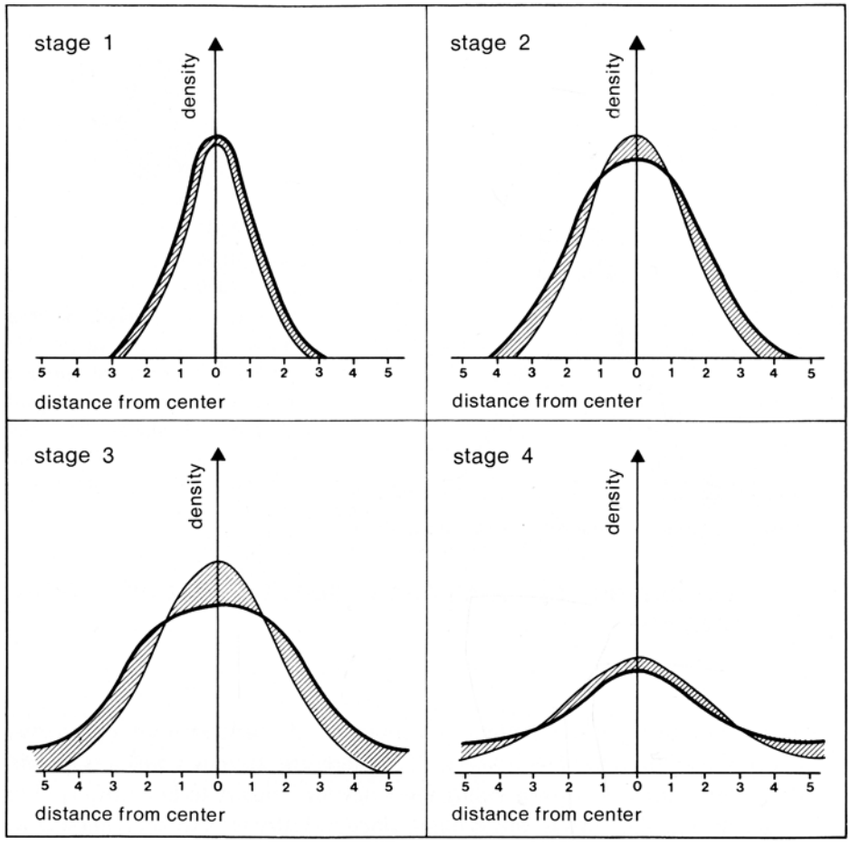
elements (nature, man, society, shells and networks) structure human settlement patterns at various spatial scales, with smaller scales mostly influenced by forces related to humans and society, and larger ones influenced more powerfully by the forces of nature, shells and networks. Based on abstractions such as these, Doxiadis attempted to confront what he viewed as the ultimate question: how most effectively to settle the world as a whole?

Unlike other influential urban thinkers of his time, such as Lewis Mumford, Doxiadis did not believe that explosive population growth and metropolitan expansion could be prevented; he viewed such megatrends as inevitable and thus that they had to be accommodated through planning. Much of Doxiadis' research was thus an effort not to contain, but to manage the growth and dynamic evolution of settlement systems. The flagship project in this effort was a multiyear investigation into the "City of the Future," which Doxiadis launched in 1960 as an experimental attempt to develop projections on the nature, dimensions and distribution of human settlements and to explore a variety of scenarios for the complete urbanization of the world.[15]

Following the pioneering work of Jean Gottmann on the northeast US Megalopolis, Doxiadis had already in the 1960s begun a systematic investigation of the patterns associated with megalopolitan systems around the world.[16] Observing density gradients merging into what was presciently termed "megalopolitan confluence zones," Doxiadis

considered megalopolitan formations as intermediate stages in a process of establishing an increasingly continuous pattern of urbanization.[17] The diagrams presented in Figure 29.3 show the flattening out of population densities (and also of incomes) and reveal the transition from a concentrated, nodal form of urbanization to more decentralized, diffuse and regionalized urbanization patterns. At the same time, Doxiadis argued that commuter sheds were also expanding around agglomeration systems, from metropolitan to megalopolitan and subcontinental scales. The diffusion of technological developments in transport and communications, illustrated in Figure 29.1 (page 483), would facilitate the formation of "ecumenic systems of life" that would eventually cover the whole planet. Doxiadis believed that these trends would produce a functionally interconnected, worldwide mesh of continuous urbanization zones of varying densities—a situation that he famously labeled "Ecumenopolis."[18]

The City of the Future project embarked on a detailed investigation of the pattern, shape, structure, density and dimensions of Ecumenopolis. The project exemplified the application



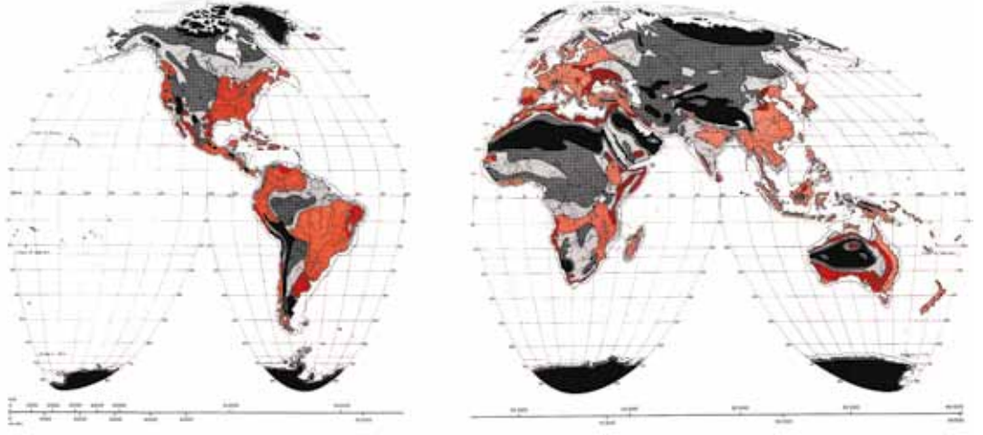

**29.3** Evolution of population density and income gradients



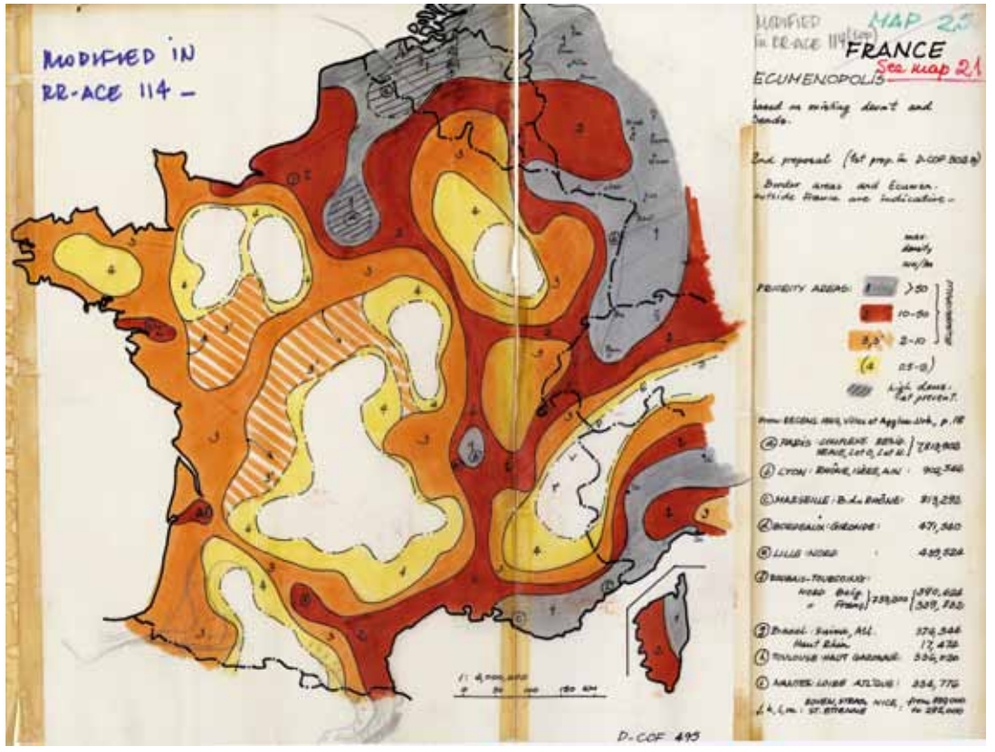
of statistical projections, calculations and forecasting in the study of urbanization in relation to social and environmental indicators. Various projections of maximal population levels were constructed based on estimates of future population growth rates, technological development, income patterns and resource availability (including water, energy, food and minerals). These estimates were then projected onto a "habitability envelope" in which the surface of the earth was classified based on its suitability for inhabitation (using environmental criteria such as elevation, climate and the availability of fresh water). On this basis, as illustrated in Figure 29.4, Doxiadis delineated the areas that, in his model, could potentially support extensive urbanization.

Doxiadis abstracted the factors that would shape Ecumenopolis with striking simplicity. They included, he argued, the centripetal forces of existing agglomerations and the population growth rates of regions; and the centrifugal forces of major transportation corridors, economic and industrial clusters, and other landscape features such as coastal areas. Figure 29.5 (next page) illustrates Doxiadis' methodology for defining the structure of Ecumenopolis with specific reference to its probable structure in France. The form of urban expansion around existing agglomerations and along major corridors and coastlines was demarcated and extended based on studies of composite habitability, with projected settlement patterns deformed by major physical obstacles such as mountains, coastlines, deserts and hostile climatic zones.

Doxiadis argued that Ecumenopolis would begin to assume a mature form around the year 2100, at which point it would have achieved a stable state of equilibrium between human settlement systems, processes of resource appropriation and consumption, and terrestrial space. The projected structure of Ecumenopolis was thus characterized by increasing functional interconnectedness between large-scale settlements, which were in



**29.4** Composite habitability of the globe, Year 2100




**29.5** Preliminary study of Ecumenopolis in France, 1962

turn to be situated along linear development corridors. As Figure 29.6 (page 490) shows, these processes were projected to create a mesh-like settlement pattern covering the major habitable areas of the world.

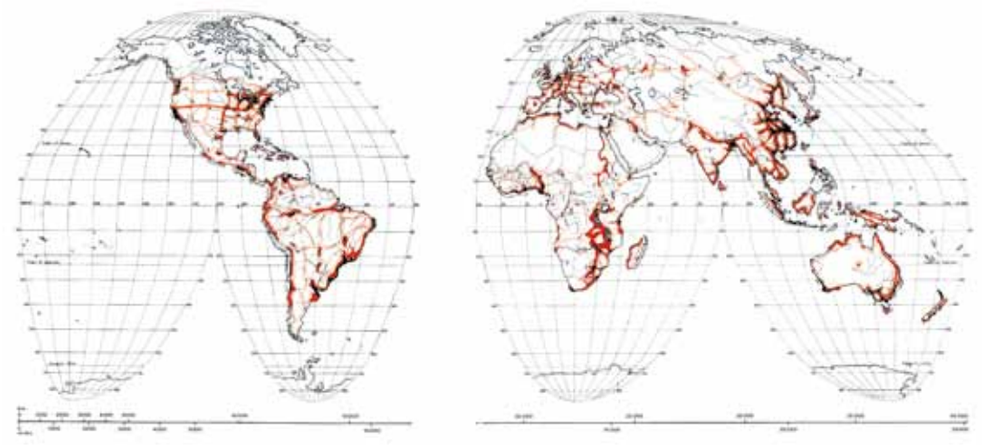
Doxiadis attributed crucial agency to the plasticity of the expanding "ekistic fabric" of Ecumenopolis. He expected that it would become increasingly sclerotic and difficult to reshape as it was simultaneously extending and densifying around the world. Crucially, however, Doxiadis maintained that the long-term implications of this spatial pattern could indeed be managed through planning and governance techniques. If well planned, he believed, Ecumenopolis could become the successful "real city of man."[19] Thus, developing comprehensive guidelines for the future planning of Ecumenopolis seemed extremely urgent.

Much like earlier approaches to metropolitan growth in the first half of the twentieth century, Doxiadis was centrally concerned with the question of optimal settlement size. Although he believed that the future geography of Ecumenopolis would correspond to the complete spatial organization of the entire human population, Doxiadis insisted that its basic unit should be fixed, small-scale settlements, composing a "unified texture consisting of many cells," nested hierarchically and not scaled up to form larger megalopolitan entities.[20] Based on his research on the size and structure of human communities, he concluded that the physical size of the optimum cell should not be more than 1.3 x 1.3 miles, with a population of no more than 50,000—a size that, he argued, could support all major urban services while offering a level of accessibility and social interaction that promoted a sense of belonging to a whole.

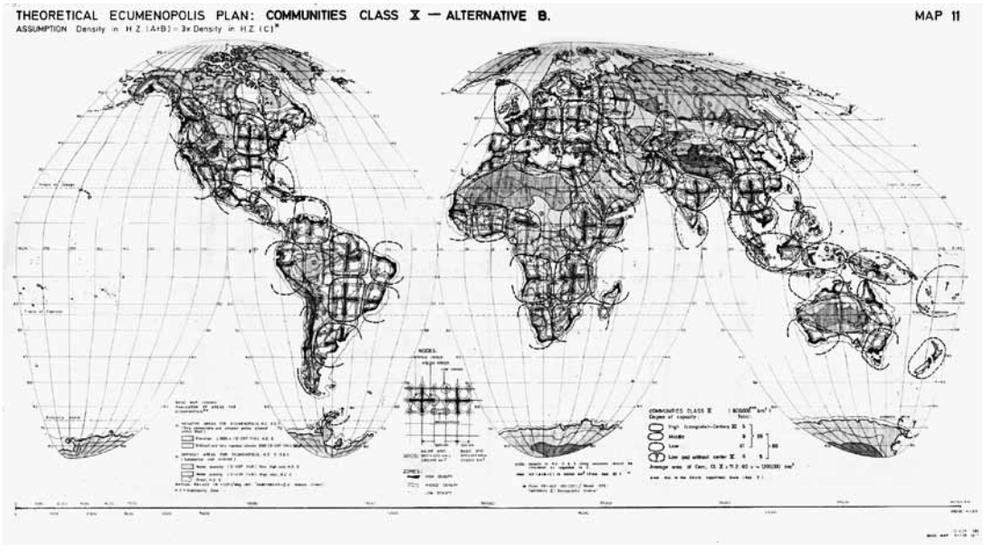
For Doxiadis, then, the question of the social structure of Ecumenopolis involved successfully aggregating the small-cell communities into a larger, coherent formation.[21] Doxiadis responded to this challenge in characteristically technoscientific terms by proposing a system of nested communities organized along an "Ekistic Logarithmic Scale," which extended the central place theory of influential mid-century German geographer Walter Christaller to the entire world. To this end, Doxiadis proposed a comprehensive spatial plan for Ecumenopolis, a grid pattern in which communities would be positioned along large-scale development axes. This model is illustrated through a comparison of the projected configuration of Ecumenopolis in Figure 29.6 with the structure Doxiadis proposed in Figure 29.7 (next page). Within this scheme, the cells served as the building blocks of Ecumenopolis, and the development axes served as its expansion vectors.

As most of the agglomeration zones were organized around the linear development axes, the interior of the mesh was "freed up" and characterized by lower density settlements, vegetation and natural areas. Rather than being conceived as external, non-urban or leftover parts of Ecumenopolis, Doxiadis interpreted this mostly natural pattern as being complementary to the system of agglomerations; it was accordingly labeled "Ecumenokepos," meaning the "global garden." Ecumenokepos was understood not as a non-urban wilderness, but as an indispensible part of the urbanized fabric of the world (Figure 29.8, page 491). Doxiadis' key insight was that urbanization was articulated not only in the hierarchy of agglomerations, but also in the form of an encompassing social and environmental process. This perspective led him to develop a combined vision of Ecumenopolis and Ecumenokepos, an interdependent system that, through appropriate forms of settlement planning, would produce a condition of "Global Ecological Balance."[22] In this way, Doxiadis offered an early perspective on what is today usually envisioned as "sustainable development."

For Doxiadis, an optimal zoning of the earth was needed to promote an appropriate system of world management. Doxiadis thus exploded the concept of land-use zoning from the city and regional scales, complementing it with an environmental dimension, at a planetary scale. Doxiadis believed that a balanced approach to settlement and environment would result from the efficient classification of the entire planetary surface (both land and water), as well as the atmosphere.[23] His proposed categorization included four general types of space—natural areas (*naturareas*); cultivation areas (*cultivareas*), including both on land

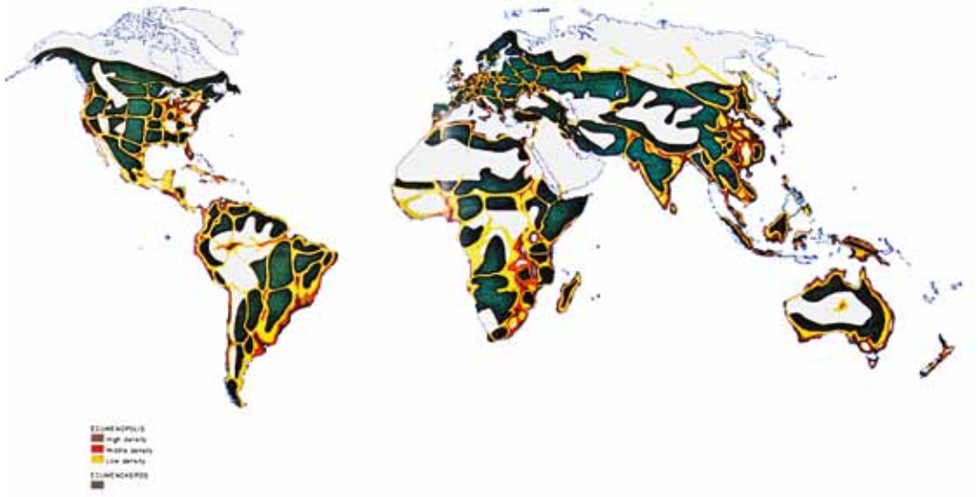


**29.6** Probable structure of Ecumenopolis in the year 2100 (population: 15 billion)




**29.7** Theoretical Ecumenopolis plan showing the proposed grid, nodes and structure of communities

(agriculture, cattle) or in water (fishing); human areas (*anthropareas*), including settlement space but also zones of recreation and other infrastructures; and industrial and mining areas (*industrareas*), including resource extraction, industrial production as well as recycling, waste management and so forth. Doxiadis applied these four types of space to land, water and air, which were in turn subdivided into 12 zones each, classified according to degrees of human intervention.



**29.8** Ecumenopolis and Ecumenokepos

Figure 29.9 (next page) exemplifies this taxonomical approach to the organization of world settlement. With striking precision, the diagram outlines the percentage of global land that would be occupied by each of the twelve zones, as well as the extent of built-up (artificially covered) areas that should correspond to each zone. In Doxiadis' scheme, a regulatory system would be used to define the uses that were compatible with each zone, and their relation to the fabric of both Ecumenopolis and Ecumenokepos. This zoning scheme was the foundation of Doxiadis' framework for managing the world.

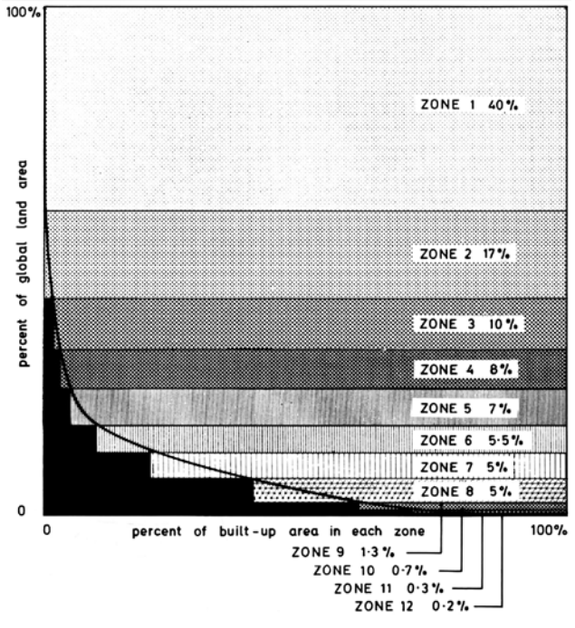
Doxiadis' framework exemplified the idea of a planetary city without an "outside," in which a single "ecumenic system of life" encompassed agglomerations and their global hinterlands. Based on systematic investigations of emerging forms of agglomeration and their effects, the thrust of Doxiadis' work was to reject the inherited model of the bounded city, and to focus instead on the variations among population distributions within and among zones of agglomeration across the earth's surface. His emphasis on ecological balance, and his concern to identify optimal proportions of land use and land cover, presciently anticipated the sustainable development agenda that was adopted by the UN in 1996 and that continues to guide contemporary discussions of urbanization.

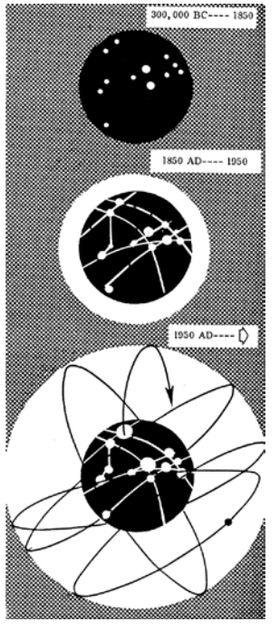
## Fuller and Planetary Resource Utilization

Whereas Doxiadis emphasized the distribution of agglomerations and the structure of land-use patterns across the earth's surface, R. Buckminster Fuller was concerned primarily with the question of flows—of energy, people or other resources (such as food and minerals). During the course of an impressive half-century of work from the late 1920s to the early

1970s, Fuller developed an applied philosophy of design that was focused on questions of energy and material efficiency, as well as on design methodology, and connected to an almost cosmological theoretical apparatus. Fuller managed to develop numerous outlets for his ideas and constructions: he built a series of prototypes (houses, cars and domes); he published a large number of articles, magazines and books; he taught in various universities; he served as science and technology advisor for *Fortune* magazine; and he founded the World Resources Inventory at Southern Illinois University.

For Doxiadis, the worldwide thickening of the urban fabric was a challenge that required new forms of planning; by contrast, Fuller envisioned an almost immaterial world of dense flows of interaction, largely freed from the constraints of political and natural geography. In Fuller's scheme, structures based on politically constructed territorial boundaries, such as nation-states, were the root of global inequality and prevented a more efficient distribution of energy, resources, technologies and knowledge. Like Doxiadis, he believed that the accelerated evolution of transport and communication technologies was eradicating the friction of distance, leading to a "shrinking planet" (Figure 29.1, page 483). Fuller emphasized that surface-based modes of transportation and communication were being superseded by air transport, satellite systems and wireless networks, leading to what he somewhat esoterically termed a vertical "ecological sweep-out" of humanity (Figure 29.10). The three diagrams presented in Figure 29.9 outline the three main stages of the "ecological geometry of man on earth"—a formation of relatively isolated settlements; a terrestrial




**29.9** (left) The twelve global zones of land and their built-up areas
**29.10** (right) History of man's Ecological Sweep-Out

mesh of interconnected nodes; and finally, the volumetric expansion of settlement space into the atmosphere and outer space. This technologically deterministic framework led Fuller to envision the future of the world largely without reference to land, territorial boundaries or terrestrial spatial configurations.[24]

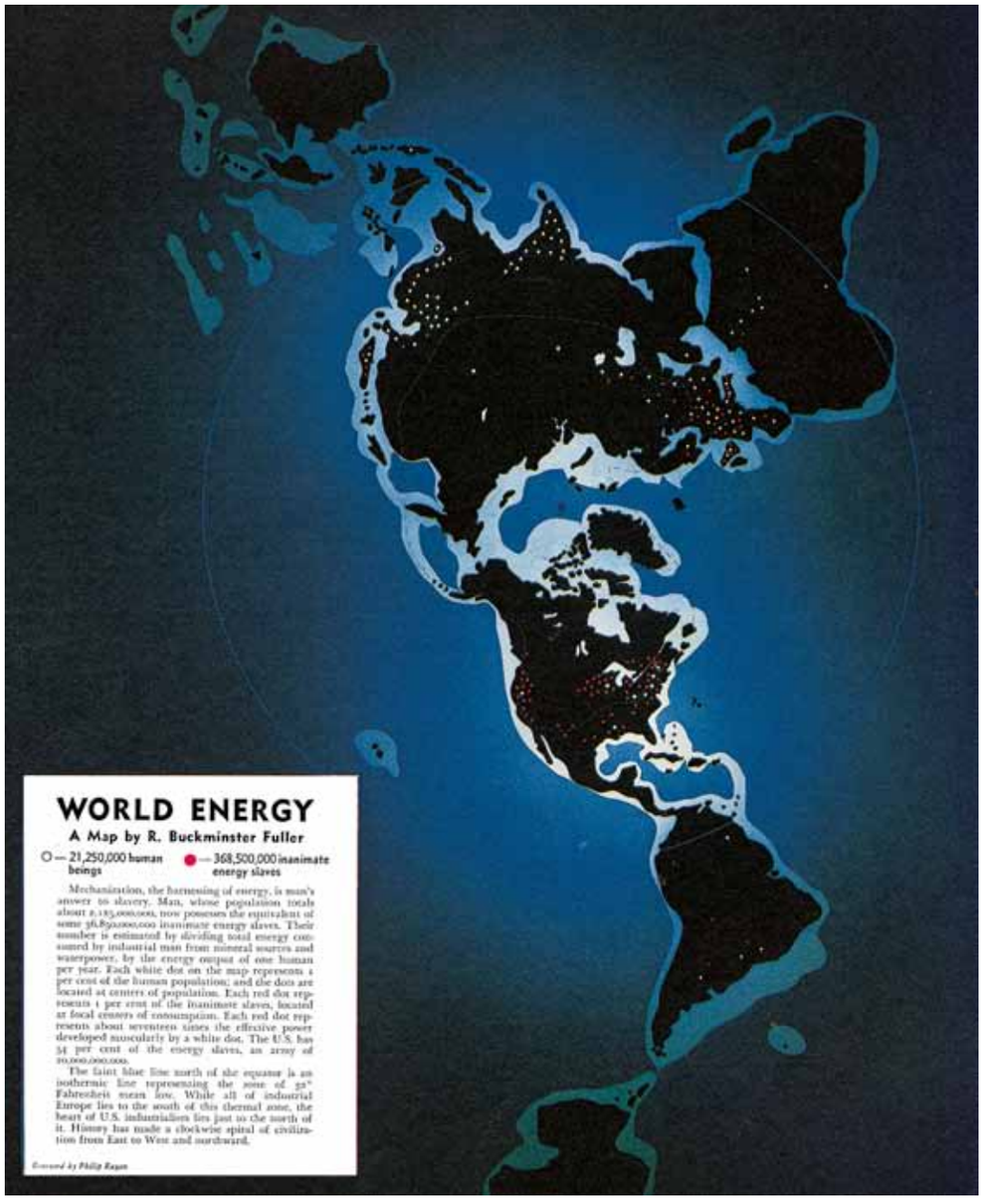
Fuller believed that technological progress would not only eradicate the friction of distance but also the significance of climatic differences, thus permitting the settlement of remote or inhabitable places, such as precisely those that had been excluded from Doxiadis' "habitability zones" (Figure 29.4, page 487). Indeed, already in 1927, Fuller had imagined the possibilities that this interconnected system of flows, detached from earthly boundaries, could unveil for a unified "one-town world" (Figure 29.11).[25] This early


**29.11** Early sketch of One-town Air Ocean World

sketch illustrates Fuller's vision of a future world society as an archipelago of earth-bound structures operating merely as "jumping-off points" onto a seamlessly interconnected planetary system of flows, almost entirely detached from earthly boundaries. Lightweight structures such as these, later elaborated in his models of Dymaxion houses and geodesic domes, offered controlled internal environments, and thus could be transported by air and "planted" in inaccessible, climatically unsuitable places such as the Sahara, the Arctic and Siberia.[26]

In Fuller's view, then, material space and physical geography were losing significance; it was the efficient management of global flows, not formal control over land or territory that would lead to the formation of a world society in which humans could peacefully coexist.[27] Much like Doxiadis, however, Fuller proposed to confront the challenges of world management through the mobilization of technoscientific strategies that were detached from political debate or social struggles over resource allocation. In a characteristically blunt statement, Fuller argued that "pure science paces applied science, which paces industry, which paces economics and which eventually paces social political and everyday life."[28] For him, humanity's problems of hunger, housing, poverty and inequality resulted from the inefficient use of resources and energy, not from their scarcity; they could thus be resolved most effectively through the application of scientific rationality and the innovative use of technology. Opposing the influential Malthusian doctrine of overpopulation, Fuller embraced the possibility of unlimited growth and development through the creation of new technological structures, artifacts and systems of production that could, he believed, unleash massive new developmental potentials.[29] Unlike Doxiadis, who expected Ecumenopolis to reach an eventual point of balance due to the constraints associated with the earth's physical size (Figure 29.4, page 487), Fuller believed that the efficient application of design principles could permit the accommodation of "more needs of more people with higher living standards with [the] ever more efficient investment of overall resources per given function."[30] Fuller introduced the notion of "ephemeralization" to describe this process of doing "more and more with less and less until eventually you can do everything with nothing."[31]

In February 1940, Fuller published a study of US industrialization in an issue of *Fortune*. This text synthesized the major elements of his approach. It presented data on resource extraction and industrial processing in the US, and it included a uniquely configured world map depicting the distribution and consumption of global energy resources in relation to population geographies (Figure 29.12). Fuller here introduced the notion of the "energy slave" in order to connect the pace of energy consumption to levels of human productivity to processes of industrial development.[32] This was also one of the first publications of Fuller's now-famous Dymaxion world map, which used an innovative cartographic projection system centered on the north pole, in which the planet was presented as a "one-world island in a one-world ocean, without any visible distortion in the relative size and shape of any of the land masses and without any breaks in the continental contours."[33]



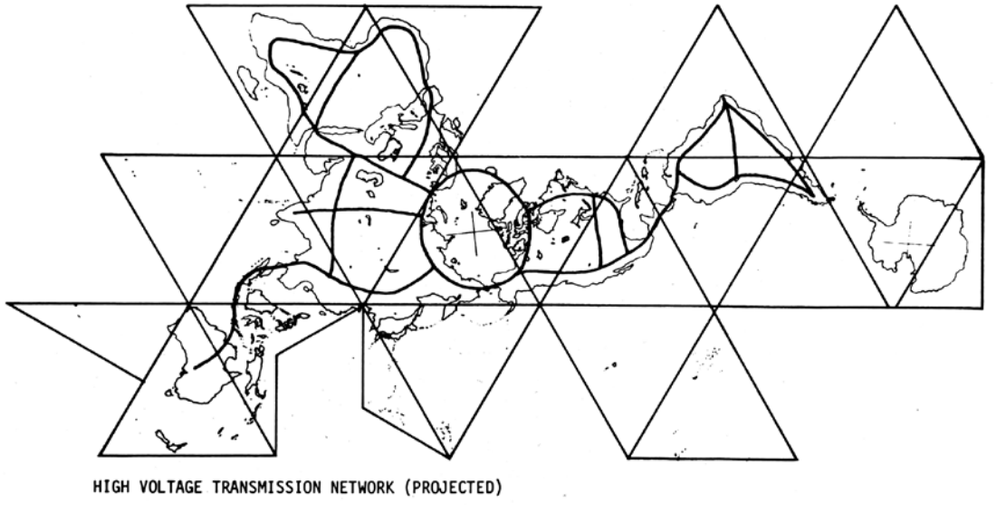

**29.12** Early Dymaxion map of world energy

In this way, through the image of a worldwide "continuous continent," Fuller aimed to highlight the possibility for a global reorganization and coordination of the major issues humanity was facing.

The Dymaxion map illustrated Fuller's emphasis on the importance of conceptual reorientations to the project of promoting global integration. If the world could be *conceived*

as a single entity, Fuller believed, it could also be experienced and designed as such. His famous proposal for a global energy grid thus hinged upon the use of a Dymaxion map projection to reveal a potential link between the continental grids of Eurasia and America via the North Pole (Figure 29.13). The proposal was based on the assumption that world energy problems could best be confronted through efficient, reflexive distribution systems that would promote inter-continental infrastructural integration. Fuller accredited crucial agency not only to the Dymaxion map, but also to other newly developed techniques of analysis and representation, including computation. A global scale of operation required new methods, such as indexing and organizational diagramming, that would potentially illuminate key aspects of processes that remained conceptually inaccessible, whether due to their inherent complexity or their long-term temporal scale.

Since Fuller's main concern was with the efficient organization of networks, he highlighted the necessity of mapping the metabolism of the earth's resources. Fuller argued that the invisibility of the processes through which resources were extracted, produced and distributed seriously complicated the prospects for their rational organization. As a result, he engaged in a systematic effort to create an inventory of global energy and resources (such as food and minerals), developing several projects intended to uncover, visualize and redesign their metabolic relation to human development. As part of this effort, in 1961, Fuller launched a ten-year research project with the sociologist John McHale at Southern Illinois University. Their "World Resources Inventory" aimed not only systematically to catalogue, map and analyze the distribution and use of world resources, but also to explore new potentials for design practices in reshaping these sociometabolic systems. Crucially, for Fuller, the project of design was not limited to the configuration of artifacts, but should include the organization of systems of production, distribution, recycling and so forth—

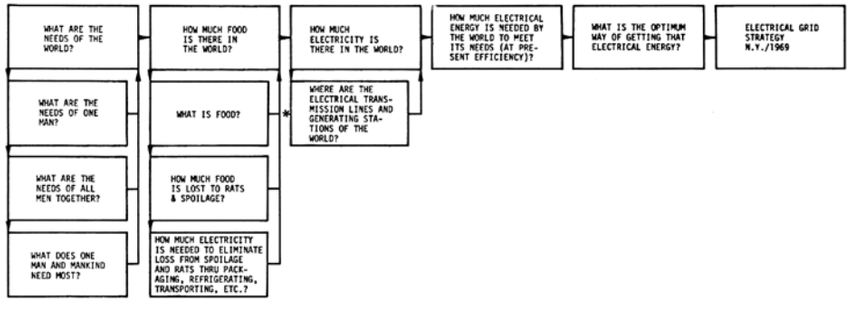



**29.13** Proposal for a global energy grid

indeed, it ultimately encompassed the design of the entire world. Much like Doxiadis' proposed "science of human settlements," one of Fuller's major goals was to develop a framework of "anticipatory design science" that would promote this wide-ranging vision of using design in its broader sense to manage world problems.[34]

The project that best synthesized Fuller's ambitions for world management was the "World Game," a hybrid political strategy and gaming program that entailed a large-scale computer simulation of major human, social and environmental problems. The World Game clearly articulated Fuller's vision of rational decision-making, mediated through computational techniques, applied to the management of the world as a whole. It was envisioned as a way to develop design strategies that would confront large-scale challenges of economic and social planning, such as managing global food or energy supplies (Figure 29.14). Based on Fuller's database of world resources, the World Game was also intended to illustrate the potential roles of new satellite technologies in environmental monitoring and remote sensing. As the game unfolded, Fuller proposed, participants would be able to track the impacts of their design decisions on worldwide processes through various kinds of simulations, often depicted through the use of giant Dymaxion maps. Fuller expected that the game's participants would thereby be empowered to adopt more rational design decisions regarding the future of humanity.

In sum, while Doxiadis structured his planning scheme in anticipation of a future equilibrium state of world urbanization, Fuller believed that the world could be managed dynamically, through real-time, information-based and participatory decision-making. Fuller's vision of a kind of cyborg-democracy operating through informational flows exemplified his belief in the ability of "rational man" to manage his environment through the use of quantitative, statistical forms of knowledge. Thus, though Fuller's vision of the future differed from that of Doxiadis in important ways, especially in its emphasis on immaterial flows rather than territorial landscapes, his model likewise endorsed the same underlying technoscientific orientation as the methodological and practical basis for managing the world's problems.




**29.14** Steps in a World Game scenario regarding global food supply

## The Persistence of Technoscientific Ideologies

Doxiadis and Fuller viewed their approaches as realistic responses to emergent challenges, not as utopian dreams. Fuller proposed the "World Design Science Decade" to the International Union of Architects as a way to transform the curriculum of design schools and to reorient the profession towards his agenda of anticipatory design practice. Doxiadis, meanwhile, organized a series of interventions for the 1976 UN Conference on Human Settlements and prepared several books for release in order to publicize and advance his proposals. However, Doxiadis died in 1975, and thus it was Fuller who eventually presented his "red books" to the plenary session "with an emotional speech, after which the UN's Secretary General referred to Doxiadis as 'the father of human settlements' and suggested that the conference be dedicated to him."[35]

Although both approaches did deal with important questions of global governance, especially in relation to urbanization processes, they were largely driven by a naïve faith in the positive agency and universal knowledge of the "expert." Thus Doxiadis viewed the UN largely as a transnational agent for implementing his proposed solutions for Global Ecological Balance.[36] By contrast, Fuller generally preferred to bypass political institutions entirely; his approach is strikingly summarized in his remark that it would be preferable to invest in "technologically reforming the environment instead of trying politically to reform the people."[37]

Consequently, both Doxiadis' and Fuller's approaches largely ignored the political-economic contexts in which world urbanization was unfolding, and the intense sociopolitical conflicts (for instance, over resource distribution, decision-making authority and public accountability) this process was provoking. It is characteristic, therefore, that state territorial boundaries and systems of economic power were almost completely absent from their analyses of global issues. The proliferation of new information technologies, with their promise of offering ever more fine-grained quantitative descriptions of the world, further entrenched both thinkers' preference for statistical description, quantitative reasoning and calculative modes of argumentation over any form of political-economic or institutional analysis.

Indeed, both Doxiadis and Fuller viewed the realm of politics basically as a disturbance to the scientific procedures of world management. As Lefebvre pointed out in a more general critique of such views in the early 1960s: "the political [*le politique*] was viewed as an obstacle to rationality and scientific procedure, as a perturbation, a kind of irrationality."[38] Lefebvre's harsh critique of such technoscientific approaches in the mid-1970s thus applies with remarkable precision to the two approaches outlined in this chapter:

> In these approaches toward the political and its intervention in urban planning, the postulate of space as objective and neutral was retained. But now it appears that space is political. Space is not a scientific object removed from ideology or politics; it has always been political and strategic.[39]



Doxiadis and Fuller naively saw their models as rational tools for promoting social and economic modernization. Although driven by a radical reformist optimism, and intellectually pioneering in several important ways, support for their projective models for comprehensive land-use and efficient resource management largely dissolved in the late 1970s with the collapse of the Fordist-Keynesian-national-developmentalist growth regime and the subsequent global turn to neoliberalism in the 1980s.

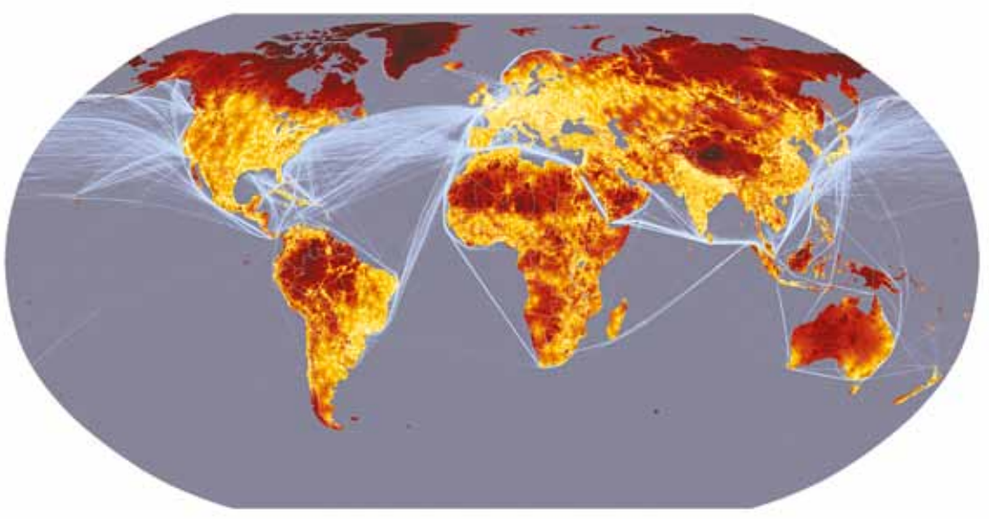
And yet, even as politico-regulatory struggles and socioenvironmental challenges intensify under the contemporary formation of neoliberalized urbanization, the tendency to neutralize, quantify and objectify planetary space through technoscientific reasoning is being reinvented in a radically new geoeconomic context. Methodologies borrowed from the natural sciences, reinforced through the development of new informational technologies and new forms of geospatial analysis, are now being widely mobilized, especially in relation to debates on sustainability and urban governance. Quantitative, statistical approaches are once again seen as the optimal means for grasping and managing the complexities of large-scale urban transformations, and once again the normative and political dimensions of such processes are being hidden behind a techoscientific veneer. The development of advanced computational and remote sensing techniques, which have dramatically increased the capacity of designers, planners and policy makers to process, analyze and visualize spatial information, appears to offer contemporary "experts" a comforting reassurance—strongly reminiscent of the approaches developed by Doxiadis and Fuller nearly a half-century ago—that the global problems of urbanization can be resolved through the rational deployment of science and technology.

Reflecting this paradigm, efforts to establish universal technoscientific methodologies are becoming increasingly influential within the scientific community as well as within popular media outlets. Influential examples of this renewed, largely unreflexive reliance on natural-scientific paradigms in debates on urban questions include, among many others, studies of urban metabolism through the standardization of material flow analysis (MFA); the physicist Geoffrey West's "general equation" governing city sizes and characteristics; and the popularization of the notion of the Anthropocene to characterize humanity's impact on the transformation of the planet.[40] Whatever their differences of method, data and empirical focus, such approaches share an understanding of urbanization as a politically neutral, almost organic force, and in this sense reintroduce some of the same technoscientific ideologies that were endorsed and popularized among urbanists by Doxiadis and Fuller.[41]

Admist these scholarly trends, influential international institutions are also promoting new forms of research that still further legitimize and entrench the vision of planetary space as politically neutral and fully accessible via quantitative forms of knowledge. A paradigmatic

example of this is the World Bank Development Report from 2009, which proposes an alternative representation global urbanization on the basis of a newly constructed "global agglomeration index."[42] This rather striking "heat map" representation of human concentration, derived from data sets on population density and accessibility, closely parallels Doxiadis' earlier scheme (Figure 29.7, page 490) in which a future formation of balanced human development is assumed to follow logically from the establishment of a uniformly accessible urban fabric (Figure 29.15). In the contemporary context, the World Bank's approach privileges the formal clarity of abstract models—a proxy for its vision of seamless worldwide economic integration—over any consideration of the distorting complexities of political institutions, social inequalities, infrastructural misallocations, market failures and ecological crises.[43]

Another characteristic example of this technoscientific vision of planetary space is presented in Figure 29.16, which elaborates upon Fuller's earlier energy grid (Figure 29.13, page 496) as part of a recent World Wildlife Fund report on global energy in collaboration with the research office of Rem Koolhaas' acclaimed firm, the Office for Metropolitan Architecture (OMA).[44] Here, Fuller's vision is updated in technological terms—the representation now includes consideration of the world's potentially renewable energy sources—but once more there is no attempt to consider the geopolitical frameworks and transnational circuits of capitalist control that mediate the appropriation of such resources, much less the territorial conflicts, sociopolitical struggles and socioecological diasters that are often provoked by such processes of extraction. Here, too, then, a global imaginary is produced in which the challenges of contemporary urbanization are understood in narrowly technoscientific terms, simply as a matter of rational management.



**29.15** Global map of accessibility. The accessibility surface corresponds to travel time to major cities with population of 50,000 or more in year 2000. The map is a major component of the Agglomeration Index.

Despite their technoscientific blind-spots, the postwar approaches of Doxiadis and Fuller were connected to broader, reformist visions for the future of human development. Their rationalistic models were still linked to goals that may be viewed as broadly progressive—including, for instance, the redistribution of human resources and assets; the promotion of a more balanced model of settlement space; and the need for ecological sustainability. Such agendas are notably absent from most contemporary approaches to world management, which usually endorse the analytical capacities of technoscience in the interest more


**29.16** WWF and OMA proposal for a global energy grid

efficiently calibrating existing conditions and trends, without connecting them to an alternative vision for a more balanced, socially just or democratic future for global human society. For this reason, such models fail to grapple with, much less to challenge, the destructive, polarizing consequences of the still-dominant neoliberal model of promoting seamless global market integration.

Clearly, any attempt to analyze and shape contemporary urbanization patterns can build productively upon the accumulation of quantitative knowledge and data processing capacities that has been accomplished over the past decades. However, such an endeavor will be most productive if it does not equate information and data gathering with substantive understanding. Indeed, there is today a quite urgent need for conceptual leaps and representational innovations, perhaps akin to those offered by Doxiadis' metaphors of planet-wide zoning or Fuller's Dymaxion map, in order to uncover the qualitative transformations of political-economic and ecological space that are currently under way around the world. Without the conceptual perspective, analytic insight and representational imagination that such experiments can promote, the massive technoscientific apparatus we now have at our disposal will serve to do little more than process data, and thus to recycle inherited assumptions and understandings that may have become obsolete. From this point of view, although ideologically quite divergent from Lefebvre, the approaches developed by Doxiadis and Fuller may actually offer some productive intellectual resources for considering some of the forms in which his "virtual object" of complete urbanization might eventually be materialized on a planetary scale. Perhaps more importantly still, these designers also offered some preliminary sketches and visions of the potential global society that could emerge—through coordination, negotiation and struggle—beyond the critical point of the urban revolution.

## Notes

1 Henri Lefebvre, *La révolution urbaine* (Paris: Gallimard, 1970).

2 See Jurgen Habermas, "Technology and Science as Ideology," *Toward a Rational Society: Student Protest, Science, and Politics,* trans. Jeremy J. Shapiro (Boston: Beacon Press, 1970); Herbert Marcuse, *One-dimensional Man: Studies in the Ideology of Advanced Industrial Society* (Boston: Beacon Press, 1964); and Henri Lefebvre, "Reflections on the Politics of Space," *State, Space, World: Selected Essays*, eds. Neil Brenner and Stuart Elden, trans. Gerald Moore, Neil Brenner and Stuart Elden (Minneapolis: University of Minnesota, 2009).

3 The conference took place in Vancouver, Canada from May 31 – June 11, 1976. It led to the creation of the United Nations Centre on Human Settlements (UN-Habitat) two years later in 1978. Since then, the interplay of development and environment has been a central focus for UN strategies. The next UN Conference on Human Settlements (Habitat II) was held 20 years later in Istanbul (1996) and emphasized the notion of sustainable development. For an extensive review of the first Habitat conference see *Ekistics* 252 (1976).

4 United Nations, *The Vancouver Declaration*, Habitat: United Nations Conference on Human Settlements, Vancouver, Canada, 31 May - 11 June 1976, published in *Ekistics* 252 (1976) 252-66.

5 Ibid., 268.

6 Ibid., 253.

7 In a postconference report she noted: "The UN and its agencies, fragmented as they remain today, continue to exemplify separate headings which reflect ancient bureaucratic arrangements—and these unfortunately have been replicated in the bureaucratic arrangements of the new nations." Margaret Mead, "Habitat: Building a Global Constituency," *Habitat International* 3, 3-4 (1976) 284.

8 Ibid., 283-6.

9 The World Society for Ekistics (WSE) was conceived at the 1965 Delos Symposium. The Society was inaugurated in 1967, and its founding members included Doxiadis and Fuller, as well as Jean Gottmann and Margaret Mead. Every year, the proceedings of the Delos symposia were presented in the journal *Ekistics*, published by Doxiadis' Athens Center for Ekistics.

10 For a review of CIAM debates on planning and radical social reform see Eric Mumford, *The CIAM Discourse on Urbanism, 1928-1960* (Cambridge: MIT Press, 2002).

11 See Panagiota Pyla, "Planetary Home and Garden: Ekistics and Environmental-Developmental Politics," *Grey Room* 36 (2005) 6-35.

12 Antoine Picon, *Les Saint-Simoniens: Raison, Imaginaire et Utopie* (Paris: Belin, 2002); and Antoine Picon, "Fuller's Avatars: A View From the Present," *Buckminster Fuller: Starting With the Universe,* eds.



Michael Hays and Dana Miller (New Haven: Yale University Press, 2008).

13 Constantinos Doxiadis, *Ekistics: an Introduction to the Science of Human Settlements* (London: Hutchinson, 1968).

14 Ibid., 393.

15 The "City of the Future" was one of three projects that Doxiadis' office, the Athens Center of Ekistics, initiated in 1960 and pursued for over 15 years. The findings of the project were presented in condensed form in several issues of the journal *Ekistics*, and eventually in Constantinos Doxiadis and John Papaioanou, *Ecumenopolis: The Inevitable City of the Future* (New York: Norton, 1974).

16 Jean Gottmann, *Megalopolis: The Urbanized Northeastern Seaboard of the United States* (Cambridge: MIT Press, 1964). For a systematic investigation of megalopolitan formations around the world as part of the City of the Future project see John Papaioannou, *Megalopolises: A First Definition* (Athens: Athens Technological Organization / Athens Center of Ekistics, 1967).

17 Doxiadis developed his approach to Megalopolitan Confluence zones based on the findings of a report that he commissioned to geographer Brian Berry in the context of the City of the Future project. See Brian J. L. Berry, *Megalopolitan Confluence Zones: New Growth Centers in the United States* (Athens: Athens Technological Organization / Athens Center of Ekistics, 1971). See also Edward Soja, "Regional Urbanization and the End of the Metropolis Era," Ch. 19, this book.

18 Ecumenopolis is terminologically based on the Greek word *Ecoumeni* which refers to the whole world as an entity. First coined in 1961, Doxiadis defined Ecumenopolis as "the coming city that, together with the corresponding open land which is indispensable for man, will cover the entire earth as a continuous system forming a universal settlement." See Doxiadis and Papaioannou, *Ecumenopolis*, 436.

19 Doxiadis envisioned that Ecumenopolis would help humanity overcome regional differences and disparities. See Constantinos Doxiadis, "Ecumenopolis: Tomorrow's City," paper prepared for *Britannica, Book of the Year 1968,* C.A. Doxiadis Archives, Athens, Folder 2924.

20 Ibid., 21.

21 Ibid., 20.

22 Constantinos Doxiadis, *Ecology and Ekistics*, ed. Gerald Dix (Boulder: Westview Press, 1977) 28.

23 Constantinos Doxiadis, *Building Entopia* (Athens: Athens Publishing Center, 1975); Doxiadis, "The Ecological Types of Space That We Need," *Environmental Conservation* 2 (1975) 3-13; and Doxiadis, *Ecology and Ekistics.*

24 Buckminster Fuller and Robert Marks, *The Dymaxion World of Buckminster Fuller* (New York: Reinhold, 1973) 153.

25 Fuller's concept of the One-Town World first appeared in the 1927 sketch above. For Fuller's supra-national vision of an integrated world society, see Buckminster Fuller, "Preparing for a Small One Town World," Congressional Record at US Senate May 15, 1975, published in Buckminster Fuller, *Humans in Universe* (Berlin: Walter de Gruyter, 1983) 207-14.

26 Fuller and Marks, *The Dymaxion World of Buckminster Fuller.*

27 Buckminster Fuller, *Operating Manual for Spaceship Earth* (Carbondale: Southern Illinois University Press, 1969); and Fuller, *Synergetics* (New York: Macmillan, 1975).

28 Fuller and Marks, *The Dymaxion World of Buckminster Fuller*, 152.

29 In 1966 the British economist Barbara Ward, a key member of the World Society of Ekistics and one of the organizers of the 1976 UN conference, published an influential book on the concept. See Barbara Ward, *Spaceship Earth* (New York: Columbia University Press, 1966).

30 Buckminster Fuller, "The World Game," *Ekistics* 28, 167 (1969) 286-92.

31 Buckminster Fuller, *Nine Chains to the Moon* (New York: Anchor Books, 1971) 252.

32 Buckminster Fuller, "U.S. Industrialization," *Fortune* 21, 2 (1940) 50-7.

33 Buckminster Fuller, "Humanity's Critical Path: From Weaponry To Livingry," *Proteus* 1 (1983) 3.

34 Buckminster Fuller and John McHale, *World Design Science Decade, Document 4* (Carbondale: World Resources Inventory, 1965).

35 Pyla, "Planetary Home and Garden," 28.

36 Doxiadis presented an incremental plan structured around the 1976 UN conference, which he hoped would adopt his scheme for Global Ecological Balance. See Constantinos Doxiadis, "Global Ecological Balance: the Human Settlement that We Need," Paper prepared for the *Tyler Ecology Award*, September 1974, C.A. Doxiadis Archives, Athens, Folder 6287.

37 Fuller, "Humanity's Critical Path: From Weaponry To Livingry," 2.

38 Lefebvre "Reflections on the Politics of Space," 170.

39 Ibid.

40 For an application of material flow analysis to the study of planetary metabolism, see Peter Baccini and Paul H. Brunner, *Metabolism of the Anthroposphere: Analysis, Evaluation, Design* (Cambridge: MIT Press, 2012); and Fridolin Krausmann and Marina Fischer-Kowalski, "The Global Sociometabolic Transition," *Journal of Industrial Ecology* 12 (2008) 637-56. For Geoffrey West's "Science of Cities," see Luis Bettencourt and Geoffrey West, "A Unified Theory of Urban Living," *Nature* 467 (2010) 912-13. On the "Anthropocene" see, among other works, Paul Crutzen, "The Geology of Mankind," *Nature* 415 (2002) 22-3.

41 For a critique of such views, see Brendan Gleeson, "What Role for Social Science in the 'Urban Age'?" this book, Ch. 22. For a critique of technoscientific approaches to urban metabolism, see Nik Heynen, Maria Kaika and Erik Swyngedouw eds., *In the Nature of Cities: Urban Political Ecology and The Politics of Urban Metabolism* (London: Routledge, 2006); and Timothy Luke "At the End of Nature: Cyborgs, 'Humachines,' and Environments in Postmodernity," *Environment and Planning A 29, 8* (1997) 1367-80.

42 Hirotsugu Uchida and Andrew Nelson, *Agglomeration Index: Towards a New Measure of Urban Concentration*. Background paper for the *World Bank World Development Report 2009*, February (2008). www.worldbank.org; published in *World Institute for Development Economics Research*, 29 (2010) www.hdl.handle.net/10419/54112.

43 For a critique of 2009 World Bank Development Report see David Harvey, "Reshaping Economic Geography: The World Development Report 2009," *Development and Change* 40 (2009) 1269-77.

44 World Wildlife Fund, Ecofys and Office for Metropolitan Architecture, *The Energy Report: 100% Renewable Energy by 2050* (Gland: World Wildlife Fund, 2011). www.wwf.panda.org

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**29.1** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller and John McHale, *World Design Science Decade (WDSD),* Document 4 (Carbondale: World Resources Inventory, 1965) 111.

**29.2** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos Doxiadis, *The Future of Human Settlements,* Paper prepared for the Nobel Foundation symposium on "The Place of Value in a World of Facts," Stockholm, 19 September 1969. Constantinos A. Doxiadis Archives, Athens. Folder 6006.

**29.3** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos Doxiadis and John Papaioanou, *Ecumenopolis: the Inevitable City of the Future* (New York: Norton, 1974), 128.

**29.4** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos Doxiadis and John Papaioanou, *Ecumenopolis: the Inevitable City of the Future* (New York: Norton, 1974), 192-3.

**29.5** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos A. Doxiadis Archives, Athens. Folder 35982.

**29.6** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos Doxiadis and John Papaioanou, *Ecumenopolis: the Inevitable City of The Future* (New York: Norton, 1974), 368-9.

**29.7** Courtesy of Constantinos and Emma Doxiadis Foundation. Constantinos A. Doxiadis Archives, Athens. Folder 26409.

**29.8** Courtesy of Constantinos and Emma Doxiadis Foundation. *Ekistics* 47, 282 (1980), cover.

**29.9** Courtesy of Constantinos A. Doxiadis Archives. Constantinos Doxiadis, *Ecology and Eekistics*, ed. Gerald Dix (Boulder: Westview Press, 1977) 28.

**29.10** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller and Robert Marks, *The Dymaxion World of Buckminster Fuller* (New York: Reinhold, 1973), 153.

**29.11** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller and Robert Marks, *The Dymaxion World of Buckminster Fuller* (New York: Reinhold, 1973) 141-2.

**29.12** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller, "World energy map," *Fortune* 21, 2 (1940) 57.

**29.13** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller, *The World Game: Integrative Resource Utilization Planning Tool.* (Carbondale: Southern Illinois University Press, 1971) 100.

**29.14** Courtesy of the Estate of R. Buckminster Fuller. Buckminster Fuller, *The World Game: Integrative Resource Utilization Planning Tool.* (Carbondale: Southern Illinois University Press, 1971) 122-3.

**29.15** Andrew Nelson, *Estimated travel time to the nearest city of 50,000 or more people in year 2000.* (Ispra Italy: Global Environment Monitoring Unit - Joint Research Centre of the European Commission, 2008). http://bioval.jrc.ec.europa.eu/products/gam.

**29.16** World Wildlife Fund, Ecofys and Office for Metropolitan Architecture, *The Energy Report: 100% Renewable Energy by 2050* (Gland: World Wildlife Fund, 2011) 53.

# 30
# CITY BECOMING WORLD: NANCY, LEFEBVRE AND THE GLOBAL-URBAN IMAGINATION

David J. Madden

## Introduction: A Vast Urban Hive

> Will the city disappear or will the whole planet turn into a vast urban hive?—which would be another mode of disappearance.
>
> –Louis Mumford[1]

The twenty-first century is coming to be known as the moment when the planet became urban. For a growing number of analysts, boosters, critics and political actors, this is the era of megacities and urban hyper-development, an epoch marked by the demise of rural autonomy and the unprecedented permeation of the world by urban society. It is becoming part of the common sense of mainstream public discourse that the contemporary age is a "new urbanized era."[2] The United Nations and the World Bank seek to manage the "global urban expansion."[3] Think tanks mull the arrival of the "urban future."[4] Geologists debate the emergence of an "anthropocenic" epoch when human action transforms the planet and "Urbanisation totally dominates the huge metalogistical systems. … that make up the contemporary world."[5] Geographers, planners, philosophers, economists and environmental historians all propose, from a wide range of perspectives, the idea that we are witnessing a "transition to a predominantly urban world."[6]