Arcology

The City in the Image of Man

Paolo

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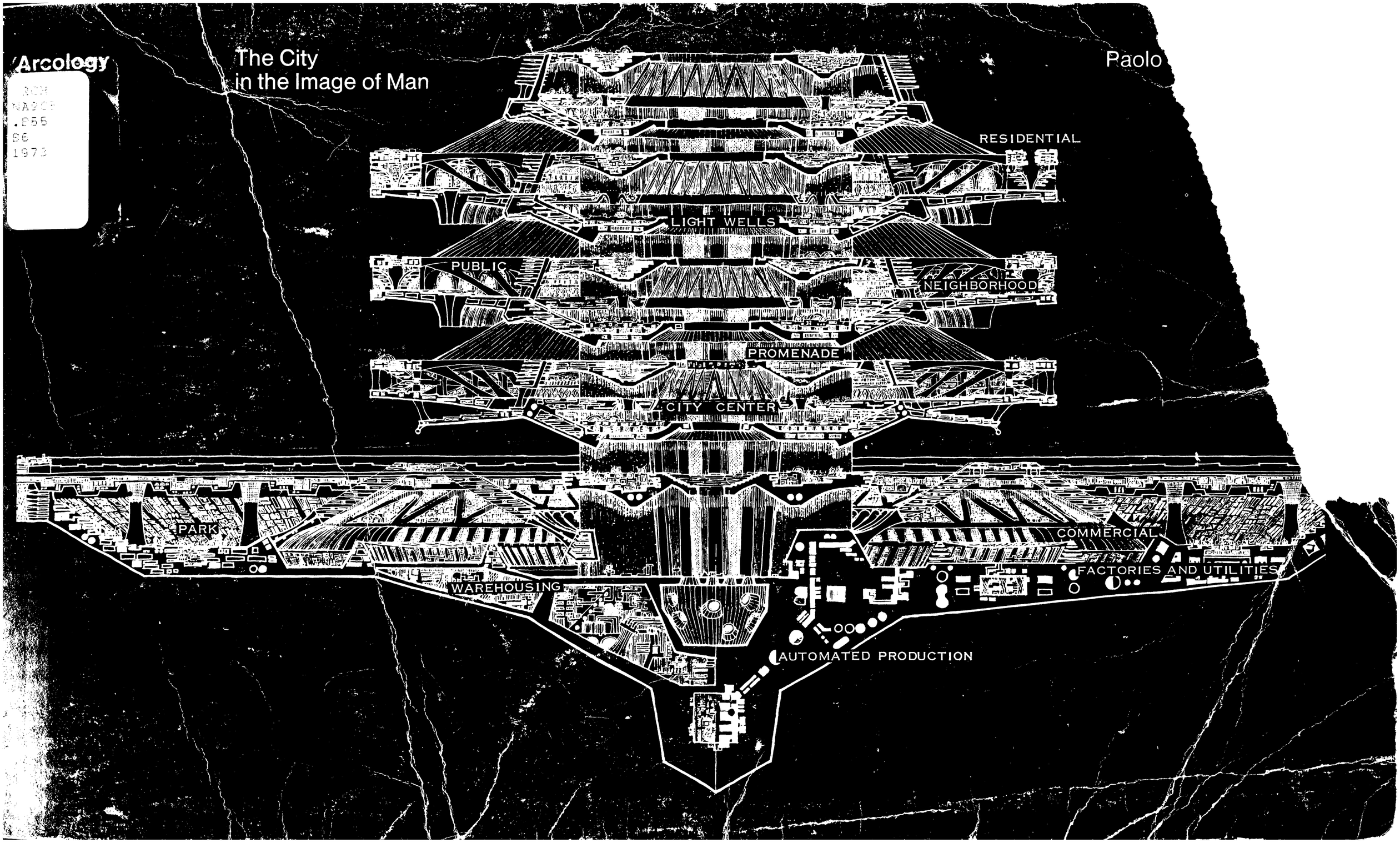

This book is about miniaturization.

Arcology: The City in the Image of Man

Paolo Soleri

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To Colly and my father

Foreword

It has never been very clear to me why a book requires a foreword. If the reason is that the body of the book is not self-explanatory, then the need for a foreword does not speak very well for the body of the book. And if the reason is that the book requires some sort of endorsement, then the foreword should, really, be written by a book salesman, i.e., an *obviously* interested party. (Nobody is ever fooled by ostensibly "disinterested parties" anyway.)

I am not really in a position to write a traditional foreword to Paolo Soleri's book: first, because I am not sure I understand it—and so I cannot possibly interpret it with authority. (I am awed by it.) And, second, because I am not a disinterested party; I am his friend.

Having disqualified myself, let me proceed with the ritualistic foreword.

Who is Soleri? Answer: He is a wiry, medium-height man around fifty who was born in Torino, in Northern Italy, where he received his Doctorate in Architecture. After World War II, he came to the United States and became apprenticed to Frank Lloyd Wright. He was one of Wright's two or three most brilliant students and was therefore kicked out by the master. Since that time, more or less, he has lived and worked in Scottsdale, Arizona, writing, drawing (on endless sheets of butcher paper), and building—both on his own acres in Scottsdale and elsewhere in the United States and Europe. He supports himself and his family by making ceramic and metal bells that swing in the breeze and make nice sounds.

What is he trying to say? Answer: I am not completely sure, because this is a very difficult book to read. Like many so-called visionary types, Soleri has invented his own language, and some of the words in that language won't be found in any English dictionary. (Curiously enough, some of those words are a bit reminiscent of Italian Futurist talk of fifty years ago.) What I *think* he is trying to say is this: there is an inherent logic in the structure and nature of organisms that have grown on this planet. Any architecture, any urban design, and any social order that violates that structure and nature is destructive of itself and of us. Any architecture, urban design, or social order that is based upon organic principles is valid and will prove its own validity.

What is he trying to draw? Answer: A new world based upon those principles. And beautifully, too! What is more, it seems as if the first settlement of this new world may soon be rising on 4,000 acres some 70 miles from Phoenix, Arizona, on a lovely plauteau 3,700 feet above sea level. Here, Soleri and his students—eventually as many as 2,000 people in all—will soon build "Arcosanti," a community based upon the principles developed in this book. It will be, in Soleri's words, "a self-testing school for urban studies," a place where teaching and the lesson itself. It is a daring project, and it will require financial support; but it is, to the best of my knowledge, the only "New Town" currently planned in the United States that started with a visionary idea of real force—rather than a mortgage.

Is he practical or is he crazy? Answer: In view of what has been happening on this planet in recent years, it is safe to say that those in charge are neither practical nor sane. This does not mean, of course, that any "visionary" living will go on in an environment that is, in fact, the profoundly critical of the present order of things is necessarily more practical or more sane. All it does mean is that anyone committed to the present way of building buildings, cities, or societies should disqualify himself as a critic of Soleri's proposals. In one of his more lucid statements, Soleri says that "the care of the citizen is the sap of the city. But one can care only for that which one loves. A lovable city is the key to a living city. A lovely city is not an accident, as a lovely person is not an accident." I rather doubt that the New York City Planning Commission, say, is likely to make LOVE its master plan; but if it were to do just that, who is to say that LOVE is not a more practical and a more sane policy than whatever that Commission is following at present?

Why should anyone read Soleri's book? Answer: Because that is the best way to gain access to some very remarkable ideas—ideas that will challenge just about everything all the rest of us keep doing, day after day. Soleri says that "the fundamental distinction between the city and the anthill" will be "not just brains by the score but also minds by the score." This book is the work of an extraordinary mind. I keep thinking of Antonio Sant' Elia, who—to the best of my knowledge—never built anything at all, but whose drawings of "ideal cities" have profoundly shaped every modern city in the world.

In any event, I have not seen a book on architecture and urban design, recently, that has bothered me as much as this one. If that is an improper foreword, so be it.

Peter Blake
New York
January 1969

Preface

The written content of this book is really an endogenous affair for and with myself. In both knowledge and information my credentials are very limited, but it must be recognized that the conceptual criteria for the arcologies are the necessary stuff of their makeup. If I were to present the arcologies without their theoretical background, I would not be supplying any foundation for the conceptual process nor any comprehensive justification for the results. By limiting myself to the presentation of my own model of reality, I would be presenting a fragmented thesis and would not be able to follow up with a constructive proposal. There are perhaps many people better qualified than I am to elaborate a credible or usable model of reality. There is no one to my knowledge who has an awareness of the environmental consequences of the thesis here presented, much less made a serious effort at the deployment of any proposal.

The thesis demands a transfiguration of the earth without defiling or disfiguring its own cosmic aspects. The performance of the professionals, engineers, architects, and planners are doodles on the back of a cosmic phenomenon and will not do. Unlimited doodling produces squalor. In fact, the massive intrusion of irrelevance is enough sand in the cogs of civilization to spew out evil, in a very pragmatic sense. The exponential savagery of chaos is the outcome of false order, an order deprived of structure.

This work seeks a definition of the problem in its more general terms, an environment suitable for the species of man, a coherence that may be historically valid. To keep the reader engaged in the continuity of the process and conscious of its cosmic scale (and thus meaningful only within such dimensions), terms have been used that reiterate this concern. For the purpose of self-clarification, a "theory" has thus been developing parallel to the planning ideas. A theory is a framework of reference per se, fairly neutral. The use one makes of it measures its validity. Though constant adherence to a theory may sometimes dull the mind, it is a way of seeking and achieving coherence in one's work. One tests both theory and the new idea by wedging one into the other. What follows is such a framework, whose great limitations do not completely cancel the advantage the author has derived from its personal construction.

To help the reader understand the material presented here, I have adopted two devices. The first is the use of diagrams to illustrate roughly the concepts. *The second is the use of italics for the fraction of the written parts that I feel carries or condenses the ideas.* It is possible for the reader to go through the italicized portions in an uninterrupted sequence and then come back to the complete text. Each chapter was written on a different occasion, a partial explanation for the lack of continuity.

A warning is necessary for the student. The graphics are not to be taken literally. The symbolism is evident and is characterized by the different hands that helped to produce it. The complexity of the system would in any case preclude the possibility of well-thought-out detail in the general context in which this book should remain.

Paolo Soleri
Scottsdale, Arizona, January 1969

Preface to the Paperback Edition

More than nine years have passed since the early arcologies. Many things have surfaced in the meantime to confirm the rightness of the propositions put forward then, and even though the time gap would reveal itself quite strongly had I to "redesign" the arcologies now, they more than ever symbolize what I think is the only inclusive environmental methodology of "salvation." I use the term salvation and not survival for three reasons.
1. Salvation implies rescue, which in this case is the successful response to a specific set of emergencies: population increase, energy crisis, land, air, water contamination, segregation, opulence, materialism, waste-pollution.
2. Through the crisis, caused by such emergencies, will emerge the new in the form of a quantum jump by which these same necessities, caused by emergencies, will become the virtue of the emergence: a salvation and a redemption.
3. The word salvation has a theological inflection, and since I am convinced now that religious systems are powerful attempts to predict the future, what the theological effort is, is the establishment of those operational "constraints" that will best force spirit out of matter.

Therefore, in a not-too-long thread of rationalization, it appears that ecological dynamism is a theological unfolding of the future. At present, for this unfolding, sainthood and aesthetogenesis are the most direct and powerful ways. They are ever so slowly constructing the immanent sacredness that is symbolized in its potentials by the simulated god of the religious tradition.

If in the arcologies there is an ever-so-dim hint at the "Civitate Dei," it is because by intent they stand for "ecological" discipline, and consequently they are theologically oriented. But since they are only remotely what one might call blueprints for cities, they stand abstract and removed from the concreteness of reality, symbols of as yet only a hypothetical but necessary future, a future more densely spirited and, as such, infinitesimally closer to the Omega God which life is intent upon creating.

At the same time, indeed as a consequence of this, the arcologies stand among the so-called real things, as the normal among the exceptions. This is so because taking life as the total lengthy process it has been, the history of the planet, the position the arcology occupies in it is not the position of the strange, the extravagant, the unproved, the disconnected, the expedient, but the position of the normative, the proved, the demonstrated, the verified, the successful – that is to say, of that which is within the boundaries of the methodology of life in evolution. In other words, *the exception within the evolutionary perspective is not the small three-dimensional arcology but the gigantic flat townscape.* The arcology is simply a congruent stepping stone from the individual, analytical to the "collective," holistic – in the direction of the spirit, part of the asentropic pull, away from the pollution of entropy.

Now that the energy crisis is catching up with our consciousness (if not conscience) through one of our most powerful idolatries, the automobile, the reader might want to reassess the coherence of the arcological commitment as the "place of convergence," a "theoecological centration" where we can uncover the "necessity-virtue" of conservation, fitness, desegregation, frugality, intensity, differentiation, spiritualization, creation . . . .

P.S.
May 1973

Foreword by Peter Blake
Preface

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Part One
The Concept of Arcology

"Man can be understood only by *ascending* from physics, chemistry, biology, and geology. In other words he is *first of all* a cosmic problem."
Teilhard de Chardin
"Reflections of Energy"
Revue des questions scientifiques (October 1952)

". . . cette puissance dont nous tirons tant d'orgueil, qu'est-elle en vérité sinon la conscience subjective d'une soudure progressive de l'humanité à l'univers physique dont les grands déterminismes agissent désormais, non plus en étrangers redoutables, mais par l'intermédiaire de la pensée elle-même, nous colonisant au profit d'un monde silencieux dont nous sommes devenus les agents?"

Claude Lévi-Strauss
Tristes Tropiques (1955)

1.Utopia

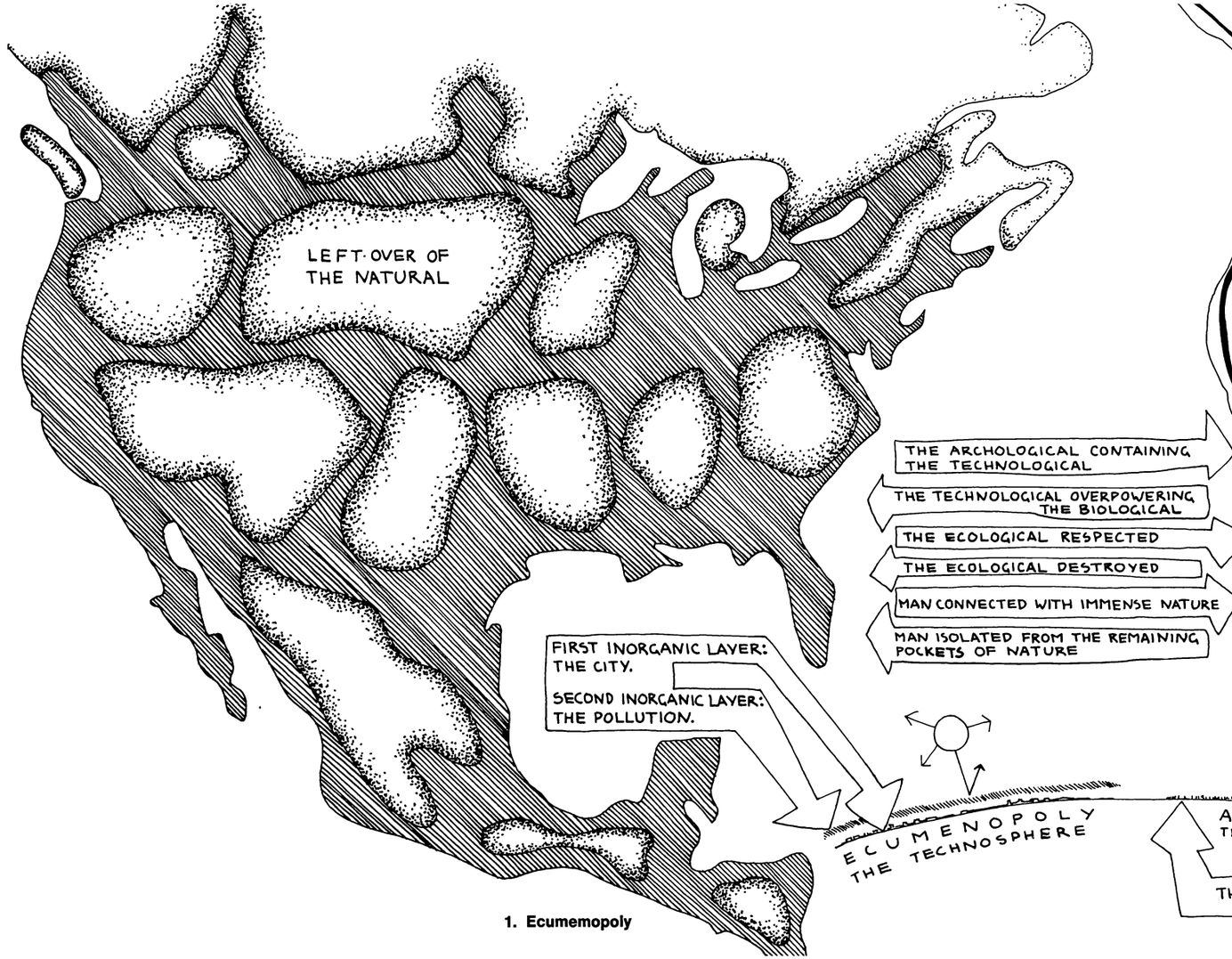
This work has a critical part and a constructive part. They are treated concurrently in the first section, where criticism is coupled with what in my view is a perspective suggesting a greater coherence. To help focus the problem, I have simplified it greatly. I do not feel this invalidates the results because the argument is kept in the context of a peach not being a potato and not of a peach being yellow or peachy; and the results are not a blueprint for a city-civilization but only a guideline toward a new option. After this first part follows the development of thirty schemes based on theoretical propositions and then a proposed microexperiment in Arcosanti by the Cosanti Foundation.

In the critical inquiry it is assumed that the best hopes for contemporary man have been fulfilled and the urban medium has been cleared of slums and cleansed of ills and grievances. If there is no mention of segregated minorities, of slum clearance, of exploiter and exploited, of tax unfairness, of bossism, of children killed by delivery trucks, of skid-row peripatetics, of "pets not allowed," of profit incentives, of self-help, it is because one assumes that in time the skill of man will take care of them all. *The foundation of equity is thus granted.* There is then happy man within the full-fledged "coordination" of city and suburban expanse. Megalopoly stretches over the continents from top to bottom, from left to right, emerging victorious and shiny above an unending and felicitous suburbia.

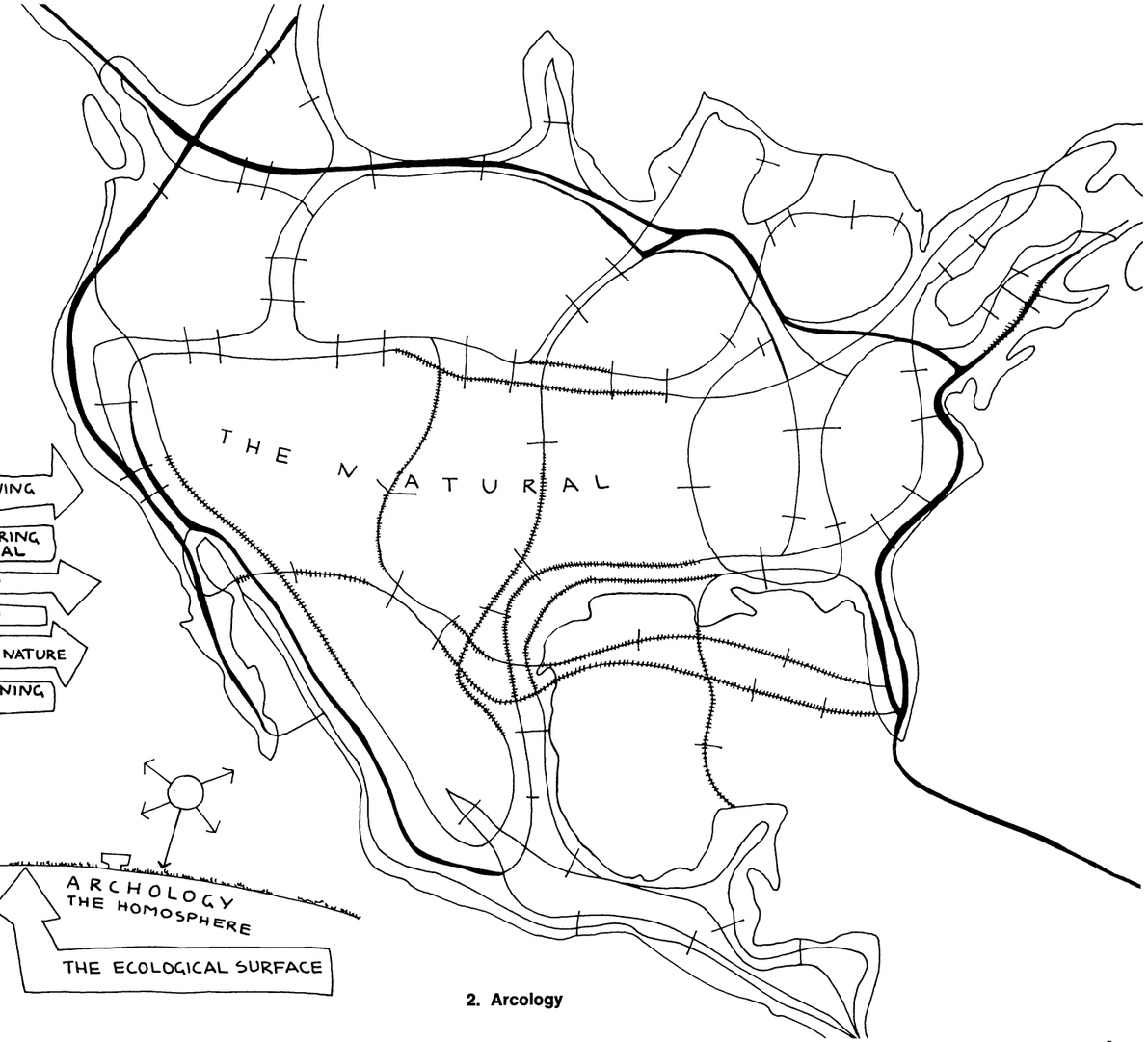
The critical end of this work is to confute the truth of such a condition; that is to say, such a hope is doubly false. It is false because it is not feasible; it is utopian in its inner contradictions and its detachment from the tenets of life itself. It is false in the sense of being deadly, a scourge many times worse than the squalor of present days.

Life's bulk is negated when megalopoly and suburbia are taken as the environmental bulk. Their existence and hypothetical validity are at best only peripheral, the spurious fringe to a far more substantial structure. The inquiry is then into the construction of a congruous environment that such structure may define.

The questioning implicit in the first part of this book is aimed at the validity of the ideal we have put to ourselves. The contention is that this ideal is the result of a mortification of the worth of man and a partly involuntary abdication from the fullness of life, that it is fundamentally an evil, antilife proposition. The constructive end of this work is not to find either a timid alternative or a cure-all answer. What is attempted is the clarification of some of the very elementary processes by which the life of man and society seem to evolve, and then, using these concepts, the effort to define broadly some concrete organism coherent to the platform of the fundamentals reached, a platform regarded as historically valid. The position taken is evolutionist. That is to say, *I have little doubt that life in general and human life in particular can be symbolized by a vector and cannot be symbolized by a random pattern. Vectoriality is the character of living reality, and the care of man is basically a willful or unconscious action with or against it.* (Figs. 9, 10) Antivector forces collect themselves in the unlimited reservoirs of entropy. The provector forces are striving at the reduction and eventual consumption of such reservoirs through a process called here the aesthetogenesis of the real, process and end, themselves the stuff of life. In this context utopia is the disavowal of any vectorial urge that might exist in the species of man and a settlement for something less than engrossing, for instance, a giving up in the "calm" sea of affluence.



1. Ecumemopoly



2. Arcology

2.The Map of Despair

Constantine Doxiadis presents a frightening world map. The American continent is covered with a kind of fabric that reminds one of a dark and torn flannel worn by a strong torso. The holes are large but are just holes. (Fig. 1) The dark fabric is ecumenopoly, the universal city. The holes are the areas where the earth breathes and renews itself: a map of despair. Doxiadis forecasts a continent transformed into a human backyard. The teeming human ants are everywhere, and everywhere are human ants. Nor will the holes be spared. They will not be pockets of farmland or wilderness. They will be dotted by subcolonies and will be invaded weekly by waves of schizophrenic vacationers and seasonally flooded by a tide of discouraged suburbanites given to temporary nomadism.

The quasi-unbroken membrane of biological and mental matter prognosticated by Doxiadis will be sheltered by the nonbiological paraphernalia of the man-made. The Athens and the Florence of the Golden Ages will be stamped out in thousands of copies—ten thousand of them for a mass of one billion, one hundred thousand for a mass of ten billion, and so on. The thinking is that of a creature bound to a surface existence. *He has been given a surface enveloping a solid sphere, and he is doing his level best to carpet it with one or two or five layers of performance. It will not do.*

One hundred to five hundred layers of performance will grossly produce a shrinkage of ecumenopoly to one one-hundredth of its suggested size. Instead of a stagnant and far too extensive layer of pseudo-urban environment, there would then be fibers of dense vitality running over continents and seas, ribbing the surface of the planet. (Fig. 2) They would actually be urban rivers whose core would serve for transportation and communication, whose top would be an endless airport, and the sides the actual urban substance. In the foundations and around them, the producing plants would be cybernetically organized. Taking off from the urban rivers, or coming to them, would be urban systems of smaller dimension ending or taking off from large modular cities, the subject of this book. *The material presented here is a schematic reference to modular urban systems that find full coherence as appendices and as origins of the urban rivers, carriers of the bulk of civilization.*

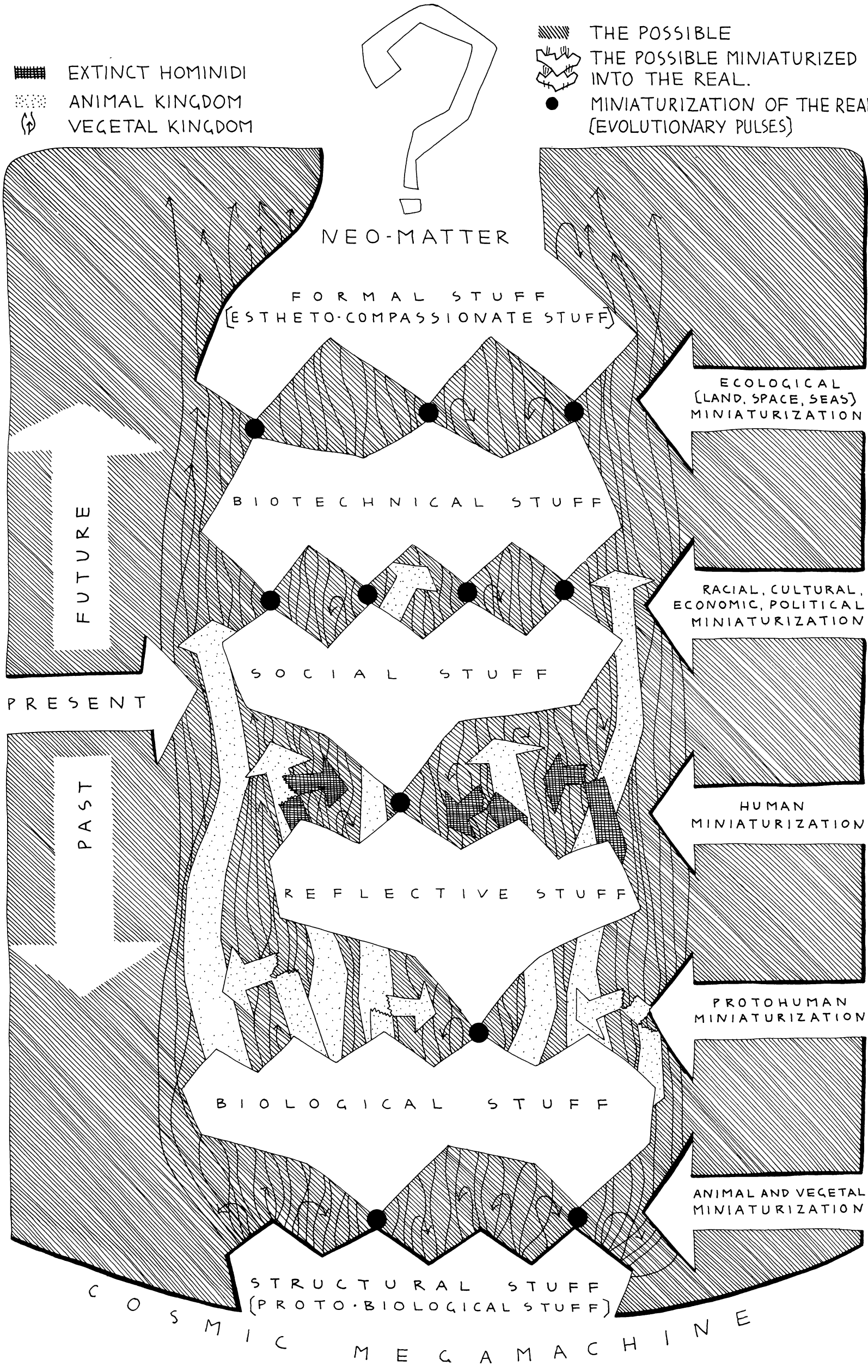
3.Miniaturization

The demands of acceleration and deceleration, a slavery peculiar to matter in motion, a slavery not imposed on light, ultimately force on matter the inescapable need for miniaturization. *Miniaturization is the process that minimizes the prime handicap of the physical world: the time-space strait jacket.* This law or rule is so universal as to guide investigation possibly to the ultimate convergence among the apparent divergences that occur within the universal stuff of matter and energy and the puzzle of life versus death. *Miniaturize or die has been the key rule for incipient life.*

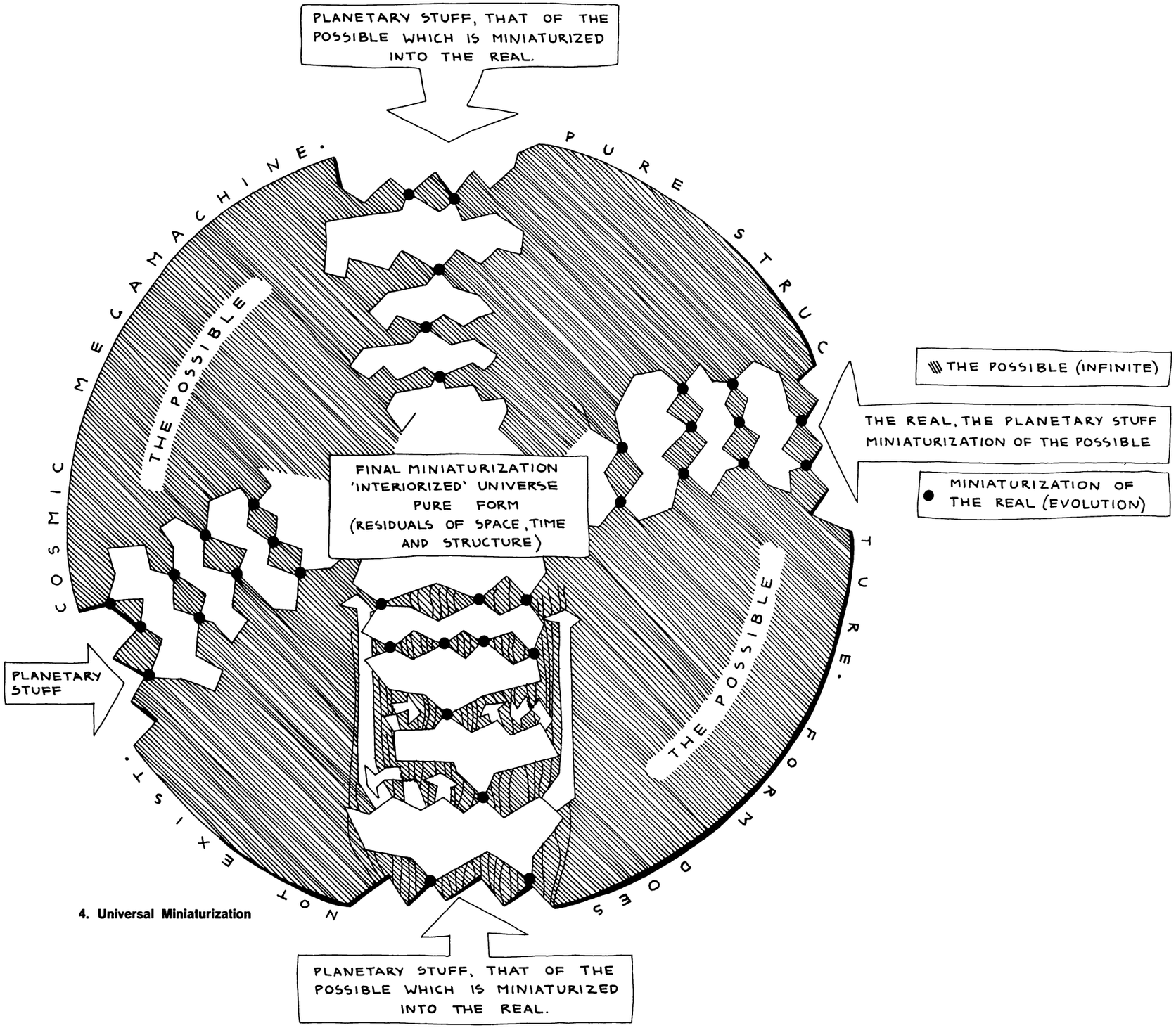
As the subject of this work is the city, one might anticipate here, and not just metaphorically, that miniaturize-or-die is and remains the condition sine qua non for the development of the social, collective animal contained in the towns and cities of the world. Secularization, the existential mark of our present, will be allowed or rejected by the advent or not of the physical miniaturization of our urban centers. *This occurrence is not just the key to success but the aim evolution has put to itself at this conjuncture of history.*

It could be argued that nothing new ever occurs in time, if not that a certain and constant polarity is slowly producing, in increasing numbers, clusters of performances in ever more complex systems. The living organism would be the collection from the four corners of the universe of a number of compatible happenings. Conception would be the trigger for such an implosive process.

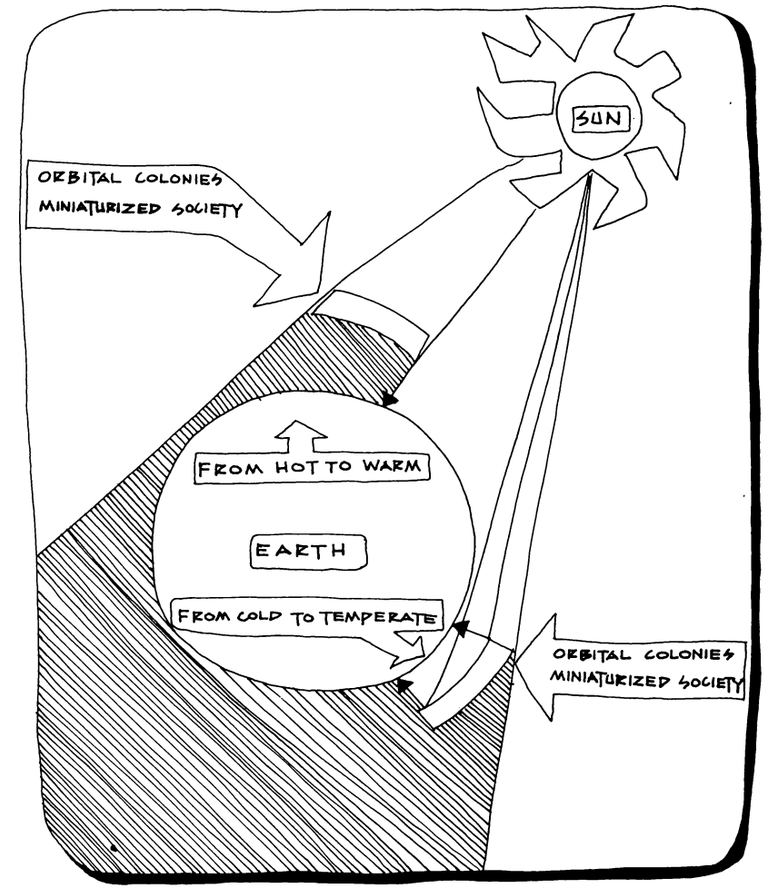
In the case of the mind, where the unlimited possible implodes into the finite real, the farther away it finds food for its development and the more numerous the data caught in its net, the greater is its power, that is to say, the greater is its miniaturizing power, which depends in turn upon the degree of its own miniaturization. *It is as if step-by-step evolution would take account of itself and make a complete synopsis (miniaturization) of its achievements in order to have at its finger tips all the available power for the next leap* (Fig. 3), demonstrating that the container of universality or wholeness must be the miniaturization of the best instruments available.



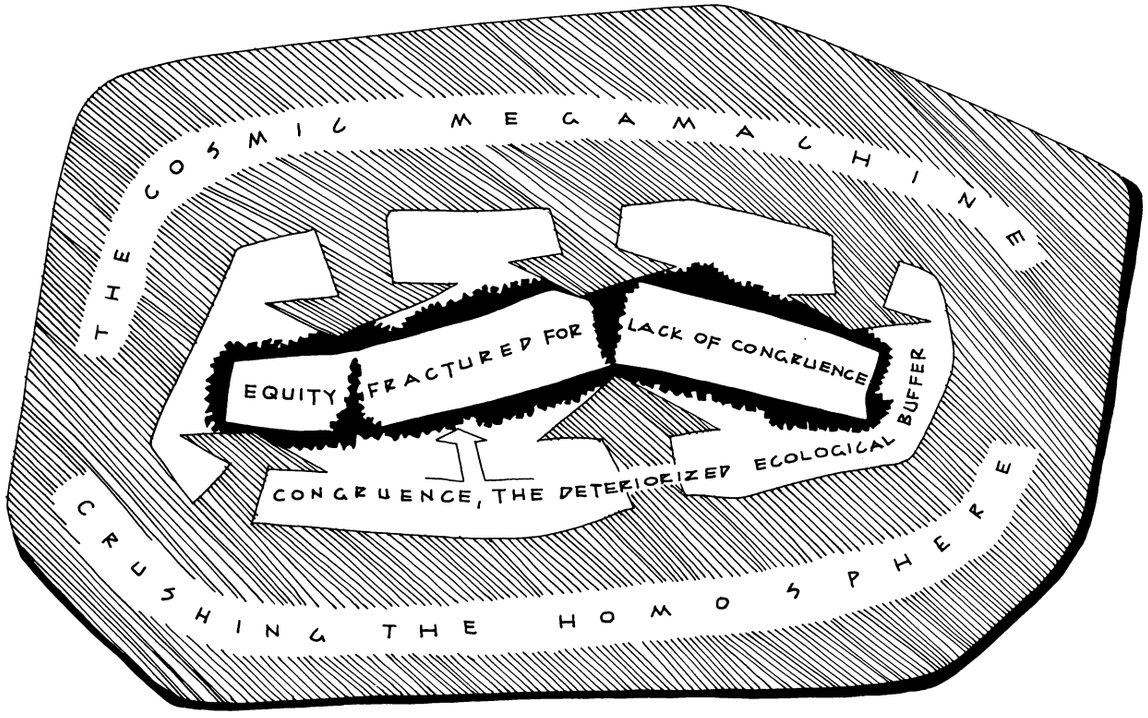
3. Miniaturization



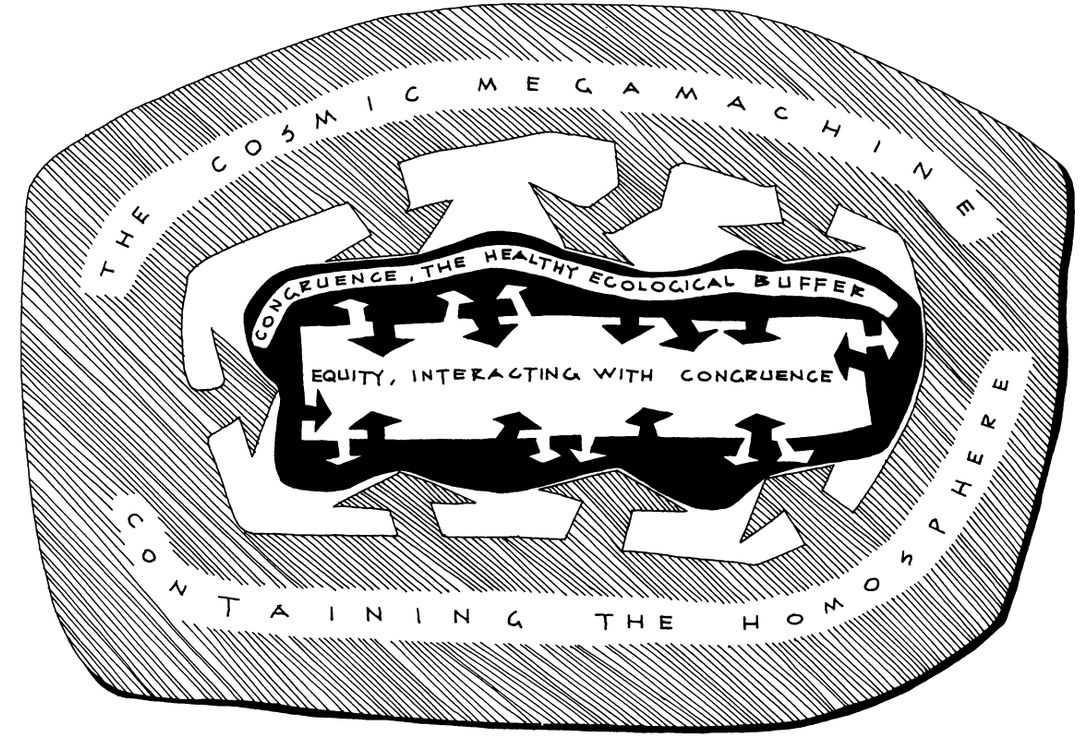
4. Universal Miniaturization



5. Miniaturization and Space



6. Equity without Congruence



7. Equity with Congruence

In a sense, there is miniaturization of matter and miniaturization of performance. One copes with the challenge of the future to the degree of success permissible by the degree of the other (and vice versa).

Evolution suggests a pulsatory behavior that has devised a miniaturizing process for each step moving from matter to mind: miniaturization from unending and spare cosmic existence to geological matter, miniaturization from geological matter to organic stuff, miniaturization from organic to organism, miniaturization from organism to animality, miniaturization from animality to reflectivity (man). *Now that man is working at the full characterization of the ultraorganism of the human group, another miniaturization is mandatory.*

All these successive miniaturizations are necessary because of the incremental complexity inherent in the progression. The greater the complexity, the greater the spatial and temporal obstacles to performance. Thus the necessity of fitting more into less, both spatially and temporally speaking, is proportionally greater. Furthermore, one can distinguish two kinds of miniaturization: *general miniaturization*—from the possible to the real; *specific miniaturization*—the evolutionary complexification of the real. (Fig. 4)

If the universe is a deterministic machine, general miniaturization now belongs specifically to man, as he is the one whose inquietude makes the choice among many possibilities a more than theoretical decision.

That which miniaturizes into the real, but does not subsequently undertake *specific* self-miniaturization, becomes one of the dead limbs of history and is given back to naught. The society of man faces this danger, and because of the scale of his existence relative to the size of the earth, man is also directly endangering the existence of the earth itself. Inwardly, any organism is a superb device, a marvel in complexity, compactness, and congruence—a miniaturized universe. Outwardly, as a member of a group, it is little more than a torpid fraction of a cumbersome mechanism. *The superanimal constituting society has not undergone the miniaturizing metamorphosis, and it is by its very nature totally unprepared for the performance of its designated task.*

Society must become a true organism that will perform adequately. This will be made possible through the power of miniaturization. The physical miniaturization of its container, the city, is a necessary step to this end.

If we do not succeed in specifically miniaturizing our society, which has come from a possible existence in the species of man to a condition of elemental concreteness through the phase of general miniaturization, then this same society will not accede to the existential dimension of groping evolution.

Society has not yet been given the self-perpetuating stamina that characterizes organisms. It has to be constantly reasoned or forced into accepting its own existence and taking it more seriously than it does when facing its incipient death wish.

Society is still an awkward animal suffering from a kind of "flat gigantism" that nails it to the surface of the earth. (Fig. 24) It is sclerotic, asphyxiated. It is poisoned by the wastes it profusely produces and cannot expel. It is troubled by inner strife, not so much out of exuberance as out of cellular self-centeredness. It is to a very dangerous degree unfit to live. But society may well be the only road open to man. *Its miniaturization will make the difference between his confirmation or his death.*

This situation makes technology not simply useful but necessary. Man cannot possibly work at the miniaturization of the environment he produces before the right instrumentality has been invented. That *the reason for the existence of technology is the necessity for the miniaturization of the world of man* is not consciously known by the technocrat. It would help if he were conscious of this because a clear aim may avoid the occurrence of major mistakes, conspicuous among them the car and suburbia. The urban implosion will have two by-products. *One will be a proportional expansion of the earth. The other will be the feasibility of orbital colonies interacting with earthly ecologies.* (Fig. 5)

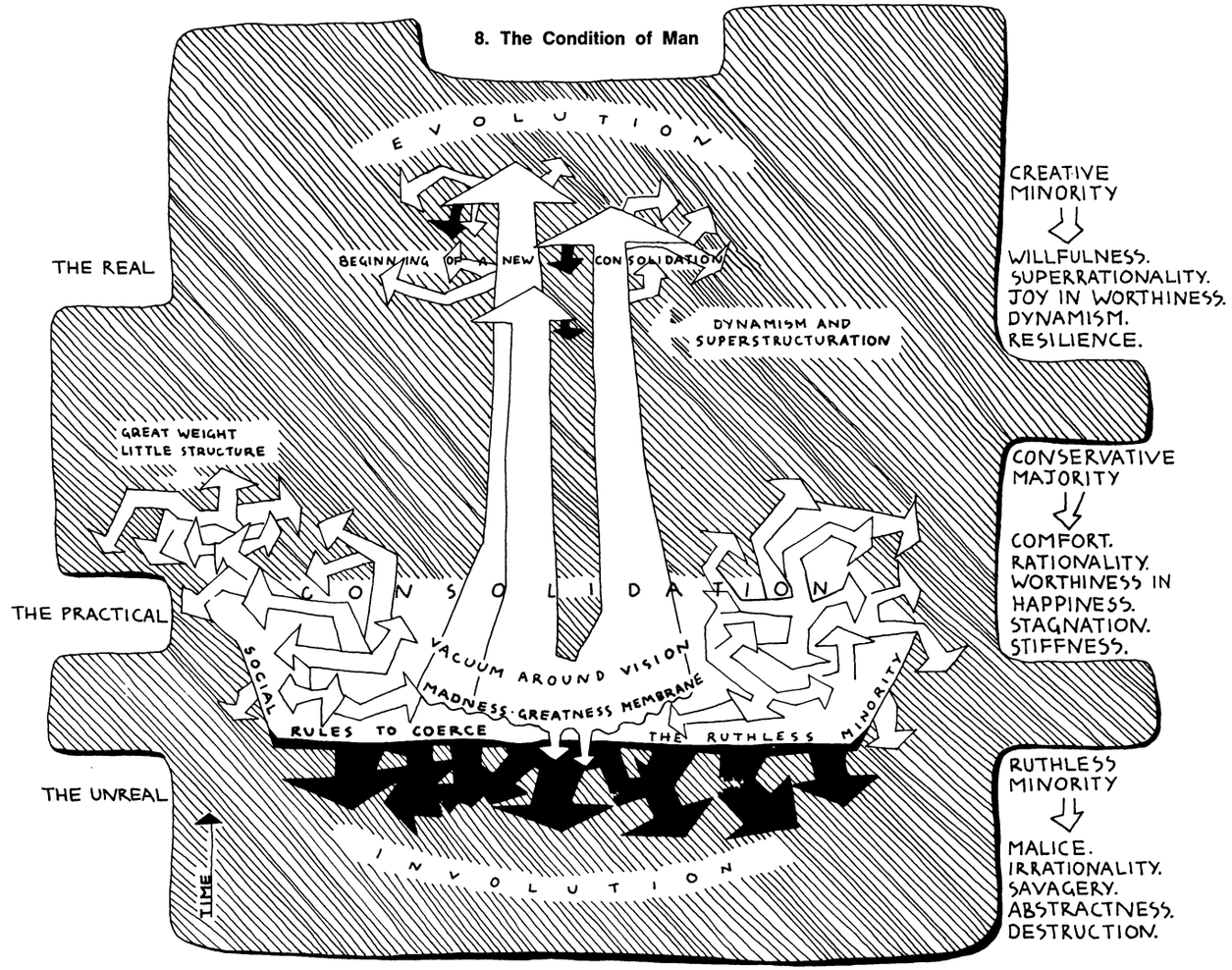
4.Equity and Congruence

Society is founded on equity and is constructed on congruence. The category of equity is specific to the human species and owes its existence to man's peculiar ability for doing "wrong."

Congruence is a more universal character. It is present in nature. In a sense it is nature itself because her working is a constant coordination of disparate things into congruous patterns. With man this apparently automatic congruence ends. Most of man's deeds are governed instead by antagonistic rules: love and hatred, enlightenment and obscurantism, peacefulness and belligerence.

The plight of the underprivileged and the indigent demands the instauration of equity. The pursuit of equity is primary and essential to man.

The pursuit of congruence is substantially the transposition and the transfiguration of natural congruence into a congruence embracing the human condition. It is the humanization of the earth, and as such it demands a global coherence.



To try for congruence bypassing equity is to give up the human condition. The sort of congruence so pursued may well end in total determinism, for which life can come as cheaply as the deterministic mechanism proposes. This would be a congruence of things soon to diffuse back into the sluggish congruence of fate. Congruity, be it between means and ends, between effort and result, between pain and the worth, between stresses, between dimensions, or in general between the part and the whole, is a relationship or a measure of balance. It is an ecological factor.

In the concept or precept of equity the congruence factor is purely internal, relative to the ethical frailty of man, a measure of equality in the face of misfortune or, more generally, a comparable ability to face hardship socially and economically. But because of its internality it may well happen that a good measure of equity will not imply a general congruence at all. A good social and economic precongruence does not correspond to a general global congruence (Fig. 6), that congruence which relates man not only to his social and economic milieu but also to the whole earthly (ecological) environment.

Congruence is a function that tends to overflow all boundaries because it must call in cause whatever exists at a specific time, hence its ecological relevance. (Fig. 7)

The contemporary human milieu lacks both equity and congruence. To take the United States as an example, despite extremely complex overlappings one can immediately see which devastation is caused by inequity and which is caused by incongruence. Racism, bigotry, greed, and fear are working against equity. Imbalance between efforts toward analysis and efforts toward synthesis, unconcern toward the ever more chaotic environmental puzzle, unwillingness to look for the roots and consequences of any endeavor, and, in general, an unlimited permissiveness construed as freedom are working against congruence.

If indeed equity is a clear demand upon the personal and collective conscience, the essential force of congruence is broadly unfelt or ignored in both personal action and social and environmental ways. There are now no signs that such congruity within society and between man and nature is consciously or unconsciously pursued. There is instead a kind of savage intercourse of forces toward a poorly understood neighborliness on a space ship that grows relatively smaller and concretely uglier.

It is thus that even equity per se would not assure validity nor would it be a grantor of perpetuity. It might instead resolve itself in equity in death, a man's exodus into inequity.

The hard fact is that equity without congruence is illusory. It is only an egalitarian common condition surrounded by an outer inertia and indifference that in its natural pervasiveness will dispose of the depositories of equity as a matter of natural fact.

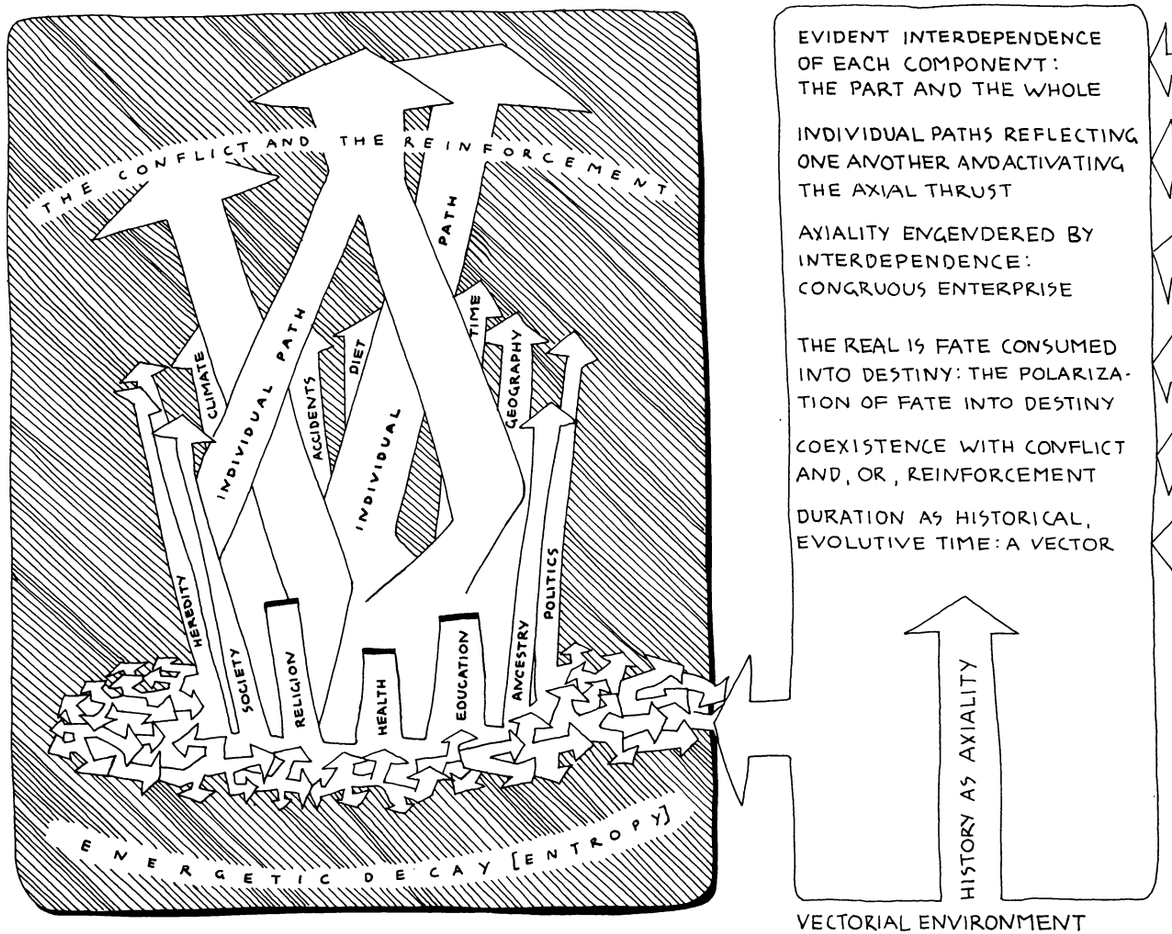
The starting point of the exposition is that a platform of equity is far from defining a condition of congruity and that the pursuit of such an elusive and constantly fluctuating condition is a task as staggering as it is essential. In bits and shreds the concepts pursued in this book are about congruence. The import and the indispensability of equity are taken as obvious and, for the purpose of the book, close at hand. In this sense the outlook is futuristic or, better, evolutionary.

5.The Condition of Man

Man is not created equal. Man is not created equal because he is not created but evolved. With evolution comes inequality. It is quite possible that if there were pure order at the beginning, order by order, an identical ancestry would extend each man down to his origin with an identical pattern of facts and wills. The horror of that needs no further consideration. As things are, each ancestry is an original unreproducible reality that the present vitalizes through each individual endowed by it. This inequality is all that blesses man and that brings him sorrow. *One of the consequences of inequality is the endless variety of expression by which the stringently organized species of man goes on seeking its own plenitude.* (Fig. 8)

Is there a sense in defining a threshold beyond which variety spills into chaos? Or is chaos itself the full substance of variety? If variety and chaos coincide, we are the helpless spectators of an unbreakable cycle that sees an amorphous state of origin end in an amorphous state of finality where a potentiality for freedom has been bartered for a self-deceiving randomness. (Figs. 9, 10) *If, on the other hand, variety is exactly what chaos cannot be, then variety must be essentially a structural phenomenon. The inequality of man will then be not a sign of weakness toward chaos but the ribbing of the social body (homosphere) by its own propensity toward structuration. Society is structuralized by its own unevenness.* If this is so, such unevenness cannot be a blind scattering of resistances to a noncorresponding set of stresses. It has to be a circumstantial distribution of resiliences to the no-less-circumstantial set of environmental stresses.

Planning is the word used for the grouping of the configuration, the result of all the elements of investigation, analysis, data collecting, and data processing in reference to a particular set of stresses. There is the planning of nature and the planning of man. Geological nature "plans" by its unending patience, made of unlimited time carving unlimited spaces. Biological nature "plans" the construction of instinctive drives, the instinctive wisdom of the biological life developing over immense cycles of time. Man deprived himself of such a marvel the day he first saw himself and the first question came to his mind. *Man, short on time, small in space, plans by constant extrapolation, and he can do so in ever greater measure*



9. Axiality

EVIDENT INTERDEPENDENCE OF EACH COMPONENT: THE PART AND THE WHOLE

INDIVIDUAL PATHS REFLECTING ONE ANOTHER AND ACTIVATING THE AXIAL THRUST

AXIALITY ENGENDERED BY INTERDEPENDENCE: CONGRUOUS ENTERPRISE

THE REAL IS FATE CONSUMED INTO DESTINY: THE POLARIZATION OF FATE INTO DESTINY

COEXISTENCE WITH CONFLICT AND, OR, REINFORCEMENT

DURATION AS HISTORICAL, EVOLUTIVE TIME: A VECTOR

HISTORY AS AXIALITY

VECTORIAL ENVIRONMENT

THE SYSTEM RELIES ON RATIONAL AND SUPER RATIONAL FORCES. A DESTINED ENVIRONMENT.

ABSURD NON-INTERDEPENDENCE OF EACH COMPONENT ACTING AS GRANULAE

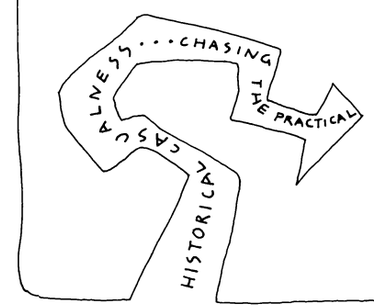
INDIVIDUAL PATHS INDIFFERENT TO ONE ANOTHER OR CRASHING INTO EACH OTHER

ATOMISM [DEPRIVED OF GRAVITATIONAL LAWS···] CHAOS FREE ENTERPRISE → LICENSE

THE PRACTICAL: THE REACTION AGAINST FATE, THUS DIRECTED BY IT

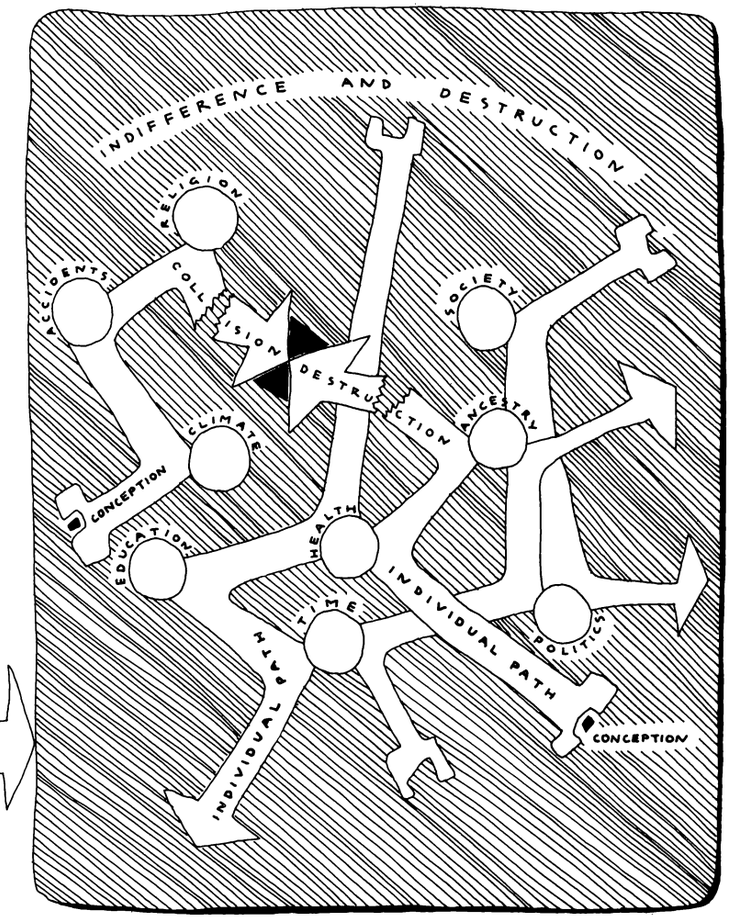
COEXISTENCE WITHOUT CONTACT· INDIFFERENCE

TIME, PERHAPS, AS THE BEAT OF FATE· POOR DURATION



GRANULAR ENVIRONMENT

THE A-SYSTEM IS GOVERNED BY THE LAWS OF GREAT NUMBERS. A FATAL ENVIRONMENT.



10. Casualness

by pushing farther and farther the boundary of complexity, complexity being his own special kind of unlimitedness—infinity. Planning is then essential to life, the alternative being chaos. It is somehow the stuff life is made of. Man lives by it, even if more than often he meets death because of it. Bad planning in such a case.

In the context of environmental planning one could say that a valid renewal plan for a city can hardly be conceived if the mind does not have a stored-up vision of what the possible can offer under optimal conditions, or if the actual problem is not put in theoretical perspective wherein each of the many facets takes light from a unique focus, the focus of the historical moment to which the solution must remain true or else fail. The focus is really the head of a vector thrusting into the future (Figs. 9, 10); thus the necessity of general, theoretical investigation and the importance of "utopias" where the ifs are accepted as the best potential, the hows must produce as much as they can, and the whys embody the real motivations.

The practical will always pluck out one by one the "impossibilities," but even from such benighted archetypes will come enough design, structure, and inspiration to reconstruct a coherent organism.

On the other hand, the fragmented, industrious approach will not stand a coherent judgment. *If the knack for the "feasible" does not show the powdery nature of the practical, it is because it can only reach the periphery of the real, which is where, at best, the practical stands.* The real is the present. The practical is in most cases the past, a frozen imagery of the real not fully becoming. The American dream is the present as practicality rather than the present as the real.

Man is faced with the following syllogism: (1) The city is the cradle and the expression of civilization, and (2) materialistic society has all but destroyed the city. Thus, (1) materialism is foreclosing man's destiny, and (2) the city is a nonmaterialistic phenomenon. If the city is a nonmaterialistic phenomenon, it follows that a speculative (business) attack on the urban problem is devoid of the fundamental power the solution demands, i.e., the care of a nonspeculative commitment. As speculation is, or was, instrumental for wealth, that which is not instrumental to it, but is rather its user, is that which is committed beyond speculative aims. Speculation can be instrumental to the city. It cannot be its aim.

As the city cannot be speculative, so it cannot be a handout by "authority." The handout never cares. It is indifferent, just another aspect of the speculative exercise. Any care it may have had at its origin has been lost in bureaucratic meanders and their parasitic agents. *Care is a first-person undertaking. The care of the citizen is the sap of the city. But one can care only for that which one loves. Lovableness is the key to a living city. A lovely city is not an accident, as a lovely person is not an accident.*

Free enterprise, the accidental compounding of speculative endeavors, if extended from the hows to the whys of man, becomes a killer. Free enterprise has had a technological success of a sort. Socially and environmentally it has been catastrophic. That is possibly the strongest reason for the impoverished environment of the United States. Its cities are a monument to chaos, social savagery, and amorphism.

Architecture redefined may open a door to the quest of the city for a new life. Architecture is the physical framework for the life of man, exterior to his own and all other biological frameworks. Architecture is the physical form of the ecology of the human, that configuration of matter which allows for the best energetic and willful flux. The care of architecture for a single building is peripheral to its basic weight as the environmental determinant. The city is a human problem that has to find its answer within ecological awareness. Short of that there is no answer; the problem remains unsolved. If to some this may seem a matter of course, to most the proposition carries no weight at all.

The condition of man is strictly dependent on environment because man is eminently an environmental animal. If one adds that man is also eminently a social animal, then one sees that environment comes close to being preponderantly the city. The city is the true concern of architecture.

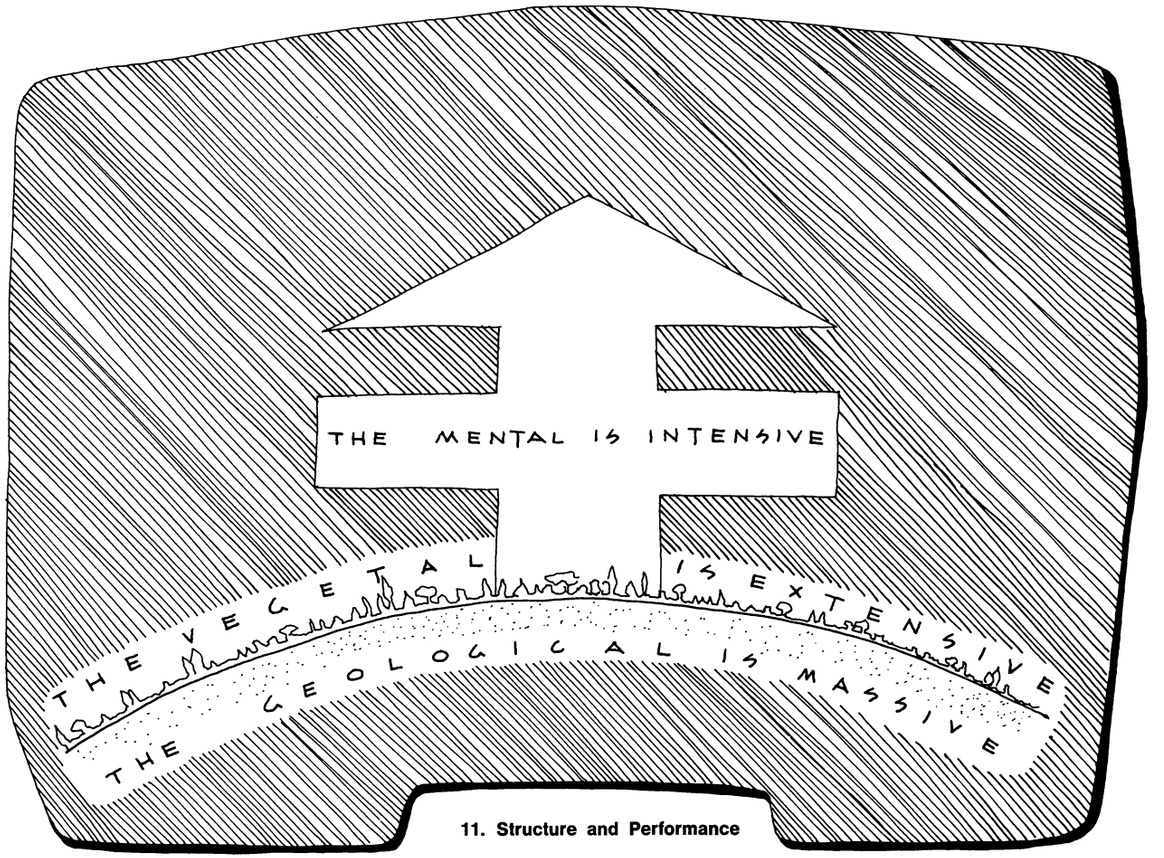
6. Yesterday's City and Today's Reality

The subject of city planning is then metropolitan man. How can physical conditions be such that he may *be* and express himself fully? What he does within the society he so constructs is our civilization.

Metropolitan existence is a construct of private and public life so articulated as to provide each resident with a plentiful physical and economic access to both.

Metropolitan life means access to the source of economic well-being, to all the institutions that make up the culture of a country, to the institutions of health, education, leisure, play interaction, and to the noninstitutionalized aspects of private and collective life; short of this plenitude (access to it, that is to say), metropolitan life is not justifiable. In brief, the social animal is a lively and splendid animal, or it is a contemptible one, depending upon whether the city is to be sought for what is liveliest in man or whether it is a dump for all the parasitic aspects of his character.

In view of the exponential enlargement of what the "possible" is, and consequently the ever-growing appetite of



11. Structure and Performance

man for all and everything, in view of the consequent impatience contained in ever-shrinking time packages, metropolitan life is assuming a sprinter pace that tends to be sustained for the whole marathon of an individual life.

The existing metropolitan pattern is not made for that. Even if constructed around a less insane transportation system, it would remain a pretty inefficient mechanism at best. (Fig. 23)

Practicality, the pride of this nation, has failed American civilization. The most practical man on earth, and the wealthiest on top of that, finds himself in a most extravagant and irrational position. The American metropolitan man is just plain silly, and he is becoming conscious of it.

The evolution of the one-layer city has been brought to an end by the rubber wheel. There are no real answers in the cities as we have known them, and, what is more, practical man must face reality. Economic incentive is not a realistic guideline to the intricacies and the mystery of life. One Detroit makes this clear; fifty Detroits would make it fifty times clearer.

Logistical failure is the one fundamental and purely mechanical reason for the decay of the city. Because of it, the price of metropolitan life is beyond what society can afford to pay. Mechanical failure makes it humanly unfeasible and economically impossible for the city dweller to desire and reach metropolitan institutions, whether they exist or not. (Fig. 19) If such institutions are put out of man's reach, they die, or they are not even conceived (suburbia). The outcome is a cultural stillness in the small community or large suburbia, combined with the worst aspects of megalopoly.

No organism can overcome prolonged starvation, even if it is starvation in the midst of plenty. Every one of its organs becomes segregated in an attempt to survive, and such mutilation brings about their abandonment one by one. (Fig. 19) The present reduction of metropolitan life to a pure struggle for survival is the reason for the conception of a more apt system.

It is most reasonable to begin somewhere with an island of functional sanity and let its pattern spread according to its own merits, neither coerced nor coercing.

7.Structure and Performance

The Geological is the Massive.
The originator of gravity and the grand storage of raw material and energy

The Vegetative is Extensive.
The fixer of sun's energy and the life-maker

The Reflective is Intensive.
The transfigurative and creative

Nature goes from bulk (the geological)
to complexity (man);
nature goes from static (the geological)
to dynamic (man);
nature goes from torpid time beat
(the geological) to duration (man)
by the intermediary of photosynthesis and animality.

That which lives wants to become three-dimensional for the sake of complexity and intensity. But it has to keep itself two-dimensional in the whole so as to deploy itself and feed on the sun (less so in the seas). Nature harvests extensively so as to be able to become intensive by man's presence and evolution. *In the cosmic context the massive statistical, just, and logical mass of the earth becomes sensitized and, groping with its surface, vectorial and aesthetocompassionate in its nodular focuses, the society of man.* (Fig. 11)

The photosynthetic veneer, the vegetal world, must not be overlaid by a man-caused opaque veneer. This would mean final disaster. The opaque veneer might be the physical institutions of man (home, city) or the wastes these institutions produce, such as pollution. In either case ecological balance is fractured, and the consequences escape man's foresight.

An observer situated on Mars and looking at the earth would have registered in this last century (1) an opaqueness extending between the surface of the earth and his instrument, an uninterrupted cloud of dust and fumes produced by civilized man; (2) a shrinking of the greenish areas covering vast parts of the earth's surface—not the yearly pulsation from one season to the next but an apparently irreversible process suggesting an alteration in the nature of the earth's surface; he sees the substitution of an urban and suburban web for the countryside; (3) a graininess of the seas extending from every delta and estuary far into the open in a tide of polluted waters.

The task of ecological architecture is the inversion of the process that the Martian can detect from his cosmic viewpoint. It is a cosmic task, that is to say, an evolutionary phenomenon. (See Miniaturization.) (Figs. 3, 4, 5) The projection of vectorialized society on the surface of the earth may well show itself in a pattern not too dissimilar from the one Schiaparelli wishfully thought he had detected on Mars, the channeling of the doings of man into vast rivers of action on a harmoniously preserved and man-organized (agricultural) landscape. (Figs. 2, 25, 41)

8 Life is in the [qualified] thick of things.

1. The earth is a solid wrapped by a sensitized skin. The sensitized skin is the spread of vegetation and animal life covering its surface. In the seas such skin is thickened within the depth of the water's body.

2. Man is the direct off-spring of the sensitized skin of the earth. He is an hyper-sensitized and vectorial fiber of it. He, like all animals, depends on the vegetal world for survival. If the vegetal world perishes, man perishes. The ecological balance of the earth is awesome but delicate.

3. Both vegetal and animal life are possible only within a condition of relative densemess. The degree of liveliness is proportional to the degree of compactness of the organism. Tenuity is inimical to life.

4. In the vegetal world the necessarily low ratio of energy yield to irradiated surface is the barrier to greater compactness and thus to the complexity of its life. The liveliness of the vegetal world is limited by the extension of its skin and the dilution of its body.

A. In direct translation: The liveliness of man's world is hindered by the physical extension of his shelter and the spatial dilution of his institutions.

B. Life is in the (qualified) thick of things.

5. Compactness is the "structure" of efficiency. Within compactness the energy flow is commensurate to the function that is being performed.

6. Richer is the life where greater is the complexity. Therefore, greater the need for energy and thus greater the need for compactness (immediate relay).

7. If man is not the inventor of society, he is its liberator from the prison of determinism. With man the social organism is not solely a dogma to abide by (insects and other proto-human societies), but a creative force seeking even greater individualization.

8. The city is the container of man's social organism. It is the body of the social super-organism. It is where man makes history.

9. In the city post-determinism man constructs his highest approximation to plenitude, in a world totally unconceivable by the bee-hive or the ant hill.

10. If the city organism is to flourish, the container must be the most apt system to care for its life. It must allow for the greatest and freest flow of energies and things, for their swift interaction, for the liveliness and knowledge such interactions produce.

C. The city must then be predicated on compactness. Lack of compactness is lack of efficiency. A functionally weak system is the worst foundation for a complex society.

11. The compact city is a three-dimensional city. Its vertical dimension is congruous to its horizontal dimensions (cube, sphere, cylinder, tetrahedron). The city must be a solid not a "surface".

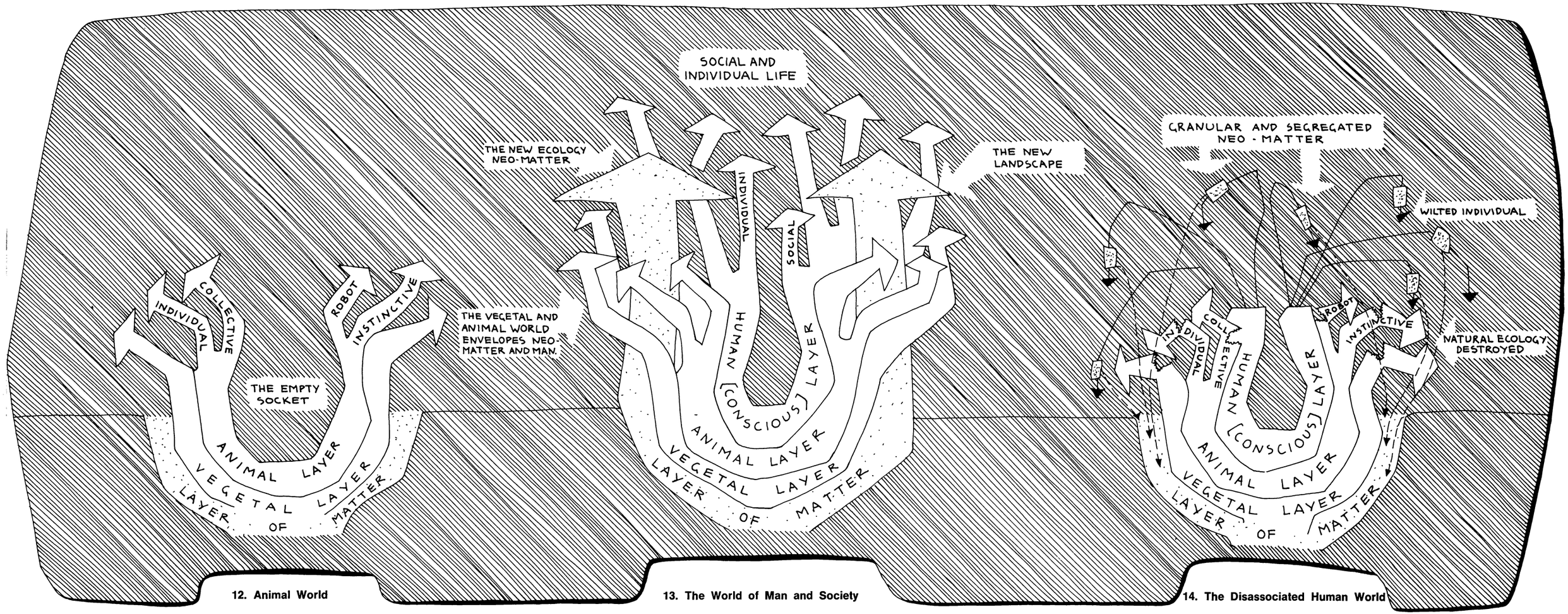
12. The three-dimensional city is respectful of the earth's sensitized skin. It does not spread an inorganic crust (megalopoly-ecumenopolis-suburbia) over the vital green carpet of the earth.

13. The three-dimensional city, because of its true efficiency (frugality), is also respectful of the earth's ecological systems and its atmosphere. It does not pollute the earth.

14. The three-dimensional city is respectful of man because it is the best instrument for a full private and social life. The three-dimensional city is an instrument of culture.

D. In the three-dimensional city, man defines a human ecology. In it he is a country dweller and metropolitan man in one. By it the inner and the outer are at "skin" distance. He has made the city in his own image.

Archology: the city in the image of man.



12. Animal World **13. The World of Man and Society** **14. The Disassociated Human World**

9.The Bulb of Reality

It is obvious that attention must be centered on the subject: man. But man has an ancestry and an immanence, and man is truly the earth itself if he is anything. Total man is a preponderance of physical matter organized to perform physiological processes. These physiological processes are ends in themselves inasmuch as they are self-gratifying, and they are means to an end inasmuch as they participate in the construction of a species. The species is an end in itself inasmuch as it defines a specific triumph of sensitivity over indifference (the inorganic) and a means to an end inasmuch as it is the constant originator of the individual. The individual is an end in himself inasmuch as he is self-gratifying and a means to an end inasmuch as he is a member of the family structure. The family structure is an end in itself inasmuch as it is self-gratifying and a means to an end inasmuch as it is the smallest plurality of individuals of which society is composed.

The real organizes itself like layers in an onion bulb. Each of these is an end in itself and a means toward greater complexity and scope. Whatever the layer, any motion toward a new synthesis (or layer) is predicated on the backing of the preceding. If the vegetal layer were not there to feed it, the world of the flesh would be inconceivable. In the same way the species of man is not possible without the preceding animal layer. (Fig. 12) *Each new layer is contained and sustained by the preceding. It is not an accidental excrescence.*

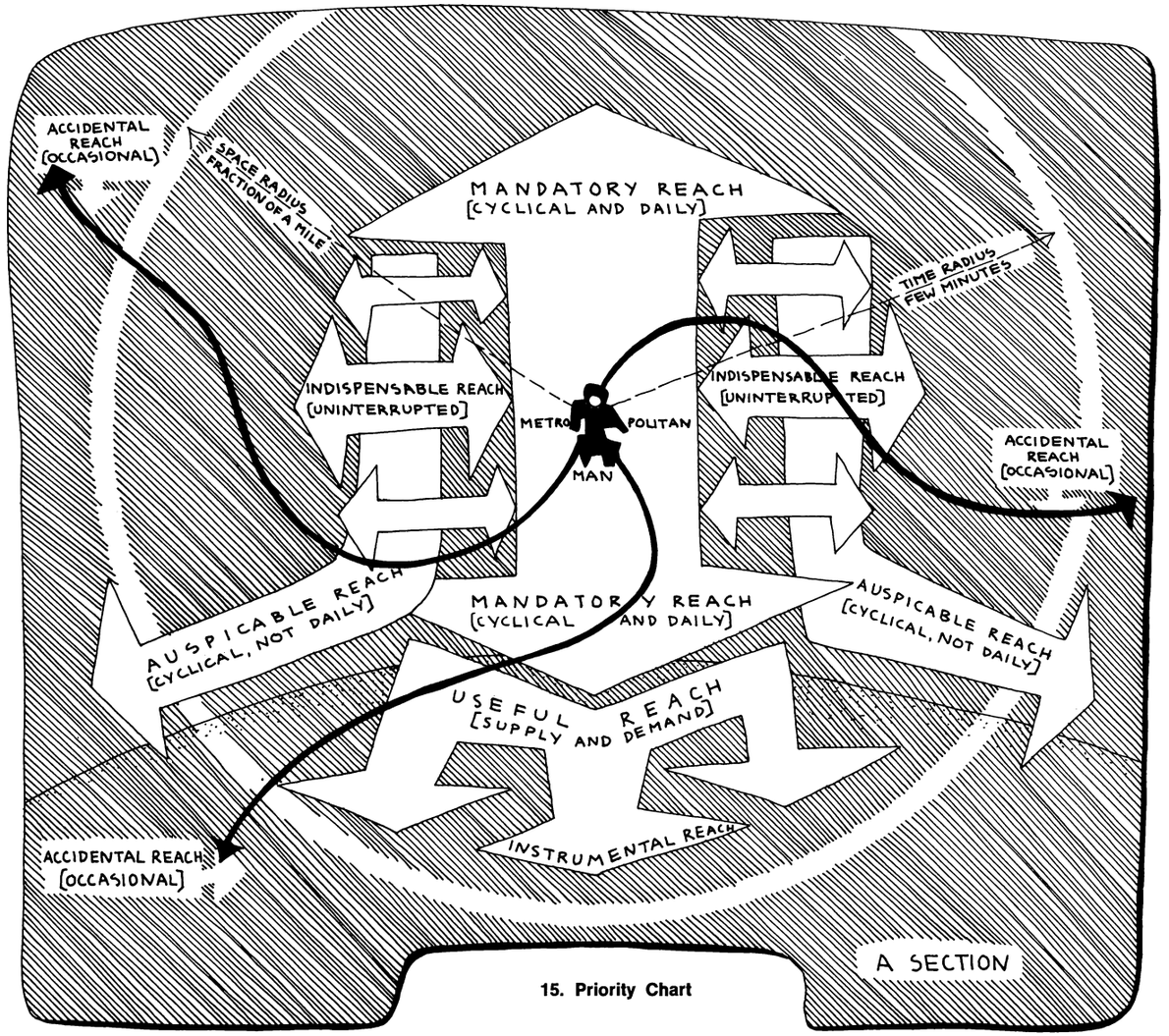
As to the individual, the family, and the social layer, we see them welding and compenetrating each other. The growing complexity sends back to the biological and physical layers messages that become more and more exotic. Their answers become less and less satisfying. It is perhaps then that the individual jumps out of the family and social layer to seek his own answer (rugged individualism, free enterprise . . .). He soon finds out that his energies are not commensurate to the effort required. *He, as an individual, cannot create the world in his own image.* The fire of reality burns him to a crisp. (Fig. 14)

And yet the world, as it is, is not fair or satisfactory. *Man must refund society as a cradle instead of a prison and communally move toward the establishment of a new physical layer, a neo-ecology that will be the new fertile ground where the seeds of the species may break into fruition.* (Fig. 13)

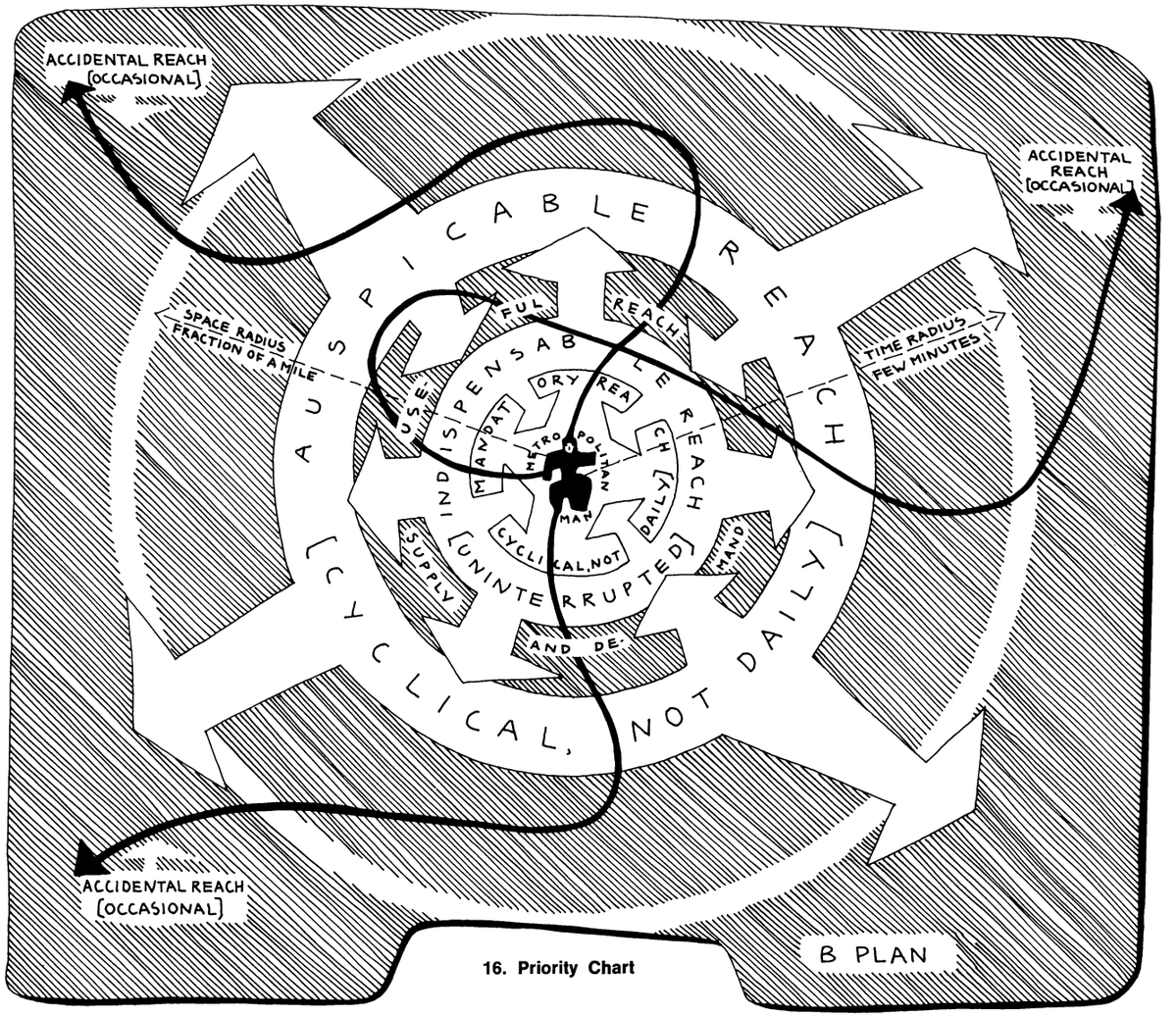
The body social is as if it were not, because of its fragmented physical container. It is a prisoner of its own inefficiency. An ideal container, working as a prototype, must then be introduced as the ideal pattern of the neo-ecology. This new physical layer is the new necessary container for man's changing nature and the enormous bulk of man-made goods he wants to carry along.

That is to say, the first step must remain as much as possible in the layer of the physical, that new geo-ecology that supports the biological, human, and social. The scope of the model phase of arcology is then to produce a theoretical plan of such a neo-ecology.

Thus we remain in the layer of the neonatural, the physical. Because of this, information from other disciplines is limited in this model phase to background reference, a bit of a sounding board on one's own experience as a social animal.



15. Priority Chart



16. Priority Chart

10.Priority Chart

Reaches
(Such reaches are submitted to curtailments and to physical barriers.)

Discriminative (human)

Mandatory	food, shelter
Indispensable	freedom, culture
Instrumental	productivity (useful)
Auspicial	occupation, leisure
Accidental	singular experiences

Curtailments
Segregational (subhuman)

Destructive	poverty, hunger, spite
Coercive	ignorance, segregation, bigotry
Sterile	automatism
Debasing	sloth
Nonsensical	the extravagant

Physical Barriers
Energy- Time- Space-consuming

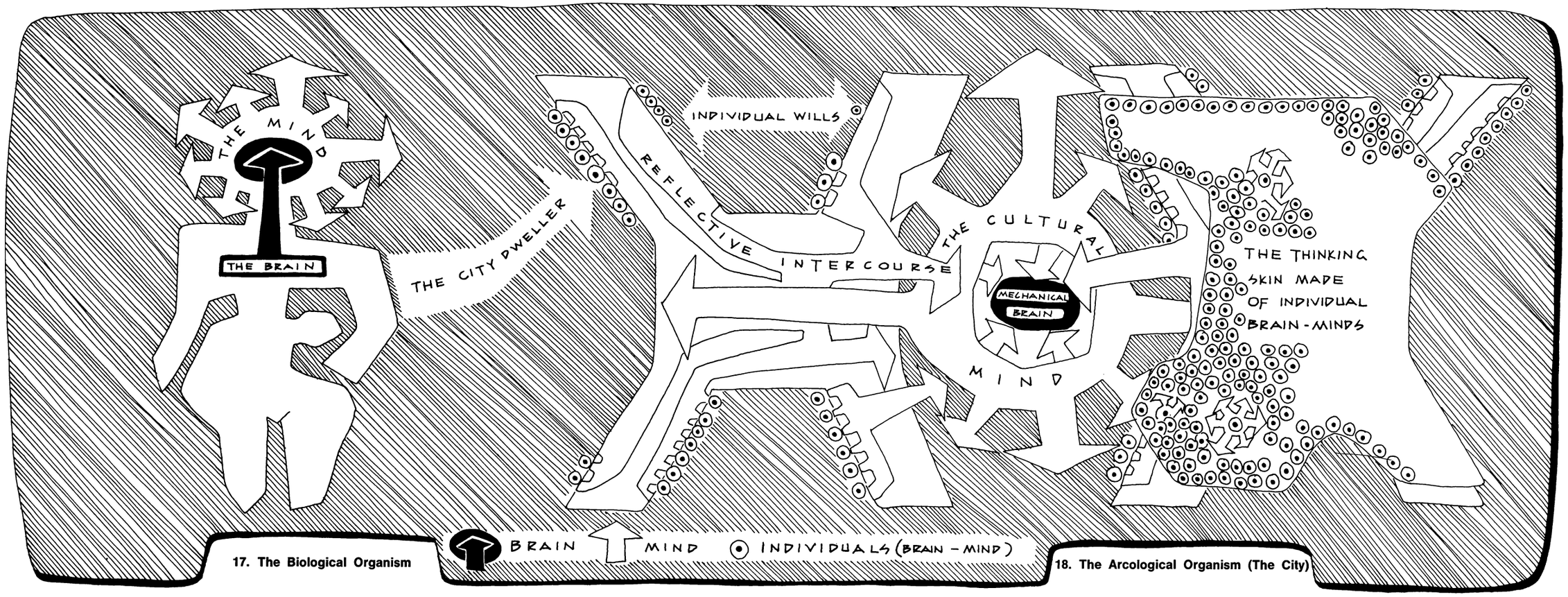
Distance
Time
Weather
Tenuity
Disorder
Traffic loads
Lack of design
Rigid schedule
Cost
Storage of transportation means

1. Each metropolitan man has to be at the center of the metropolitan world.

2. Such a world at the exclusive use of one man is not possible for two reasons: it is physically nonsensical and culturally contradictory.

3. Then the only open avenue is the organization of all urbanites into a very close fabric around a dense urban center. No technical treaties or semantic convolutions can change this. True urban life is that, or it is not. (Figs. 15, 16)

4. It is surprising that with this a great number of other problems find adequate answers (see Summary). One suffices here: urban man finds himself to be a country man as well because the countryside is at walking distance from any point in the city. (Figs. 20, 21, 22)



17. The Biological Organism

18. The Arcological Organism (The City)

11.The Organism of a Thousand Minds

To govern the miniaturized universe of an organism, there is the brain, the mastermind and collector of memories. It is said that in some of the largest animals of the past, in addition to the cranial brain, there were also local substations of decision-making matter. But in a very substantial way, to each body belongs one, and only one, central institution of give, take, and accounting. (Fig. 17)

If we ever have a superorganism made up of men, men retaining their own uniqueness, then such an organism will be made up of thousands or millions or more of brains. Furthermore, each of those brains will contain a mind, that is to say, will overgovern that power of choice among the endless propositions of the possible, the one-at-a-time performances making the present. (Fig. 18)

This will be the fundamental distinction between the city and the anthill, the beehive, the termite colony, and so on: not just brains by the score but also minds by the score.

The romantic and the rugged individualist will speak out immediately about the mindlessness of the human beehive. They might want to glance at nightmarish suburbia with its six billion individuals; but it is their privilege not to reason about mankind and the staggering logistics it is faced with.

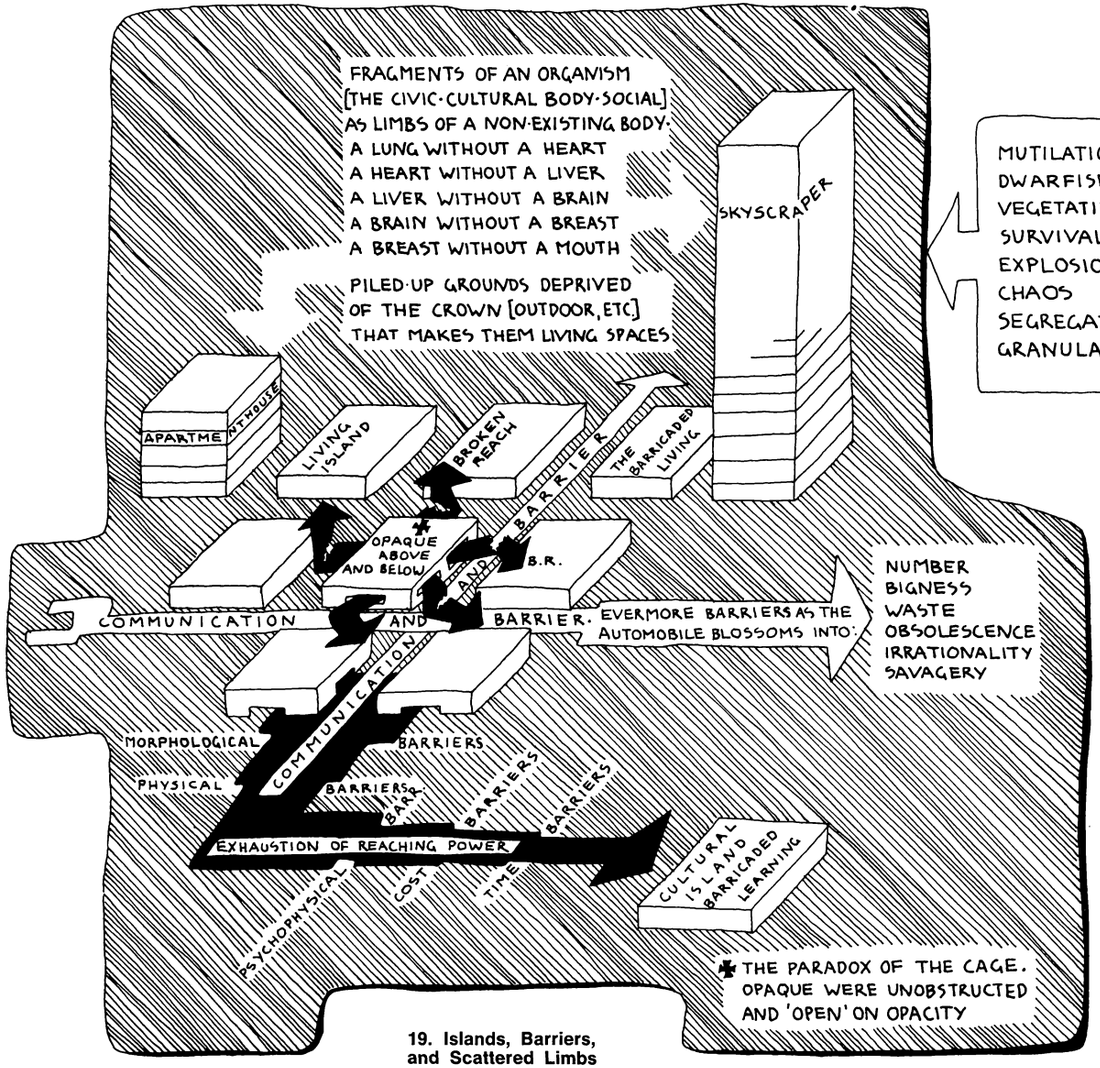
Indeed, the organism of a thousand minds exists today in thousands of examples: the towns and cities of the world, none too successful, most of them without a future. It is an organism so flaccid and so tenuous that even the elementary demands of sustaining its spare physical energies, of cleansing its receptacles and arteries (of giving to each cell its due), of procuring for itself a coherent reference to natural elements are hardly met. (Fig. 22)

It is no surprise then that surrounded by foul play the individual mind reacts against any diminution of its right to self-determination. The pathetic thing is that this right has been wrapped for so long in a physical knot of chaos and irrelevancy that only a tenuous and ill flame still burns there.

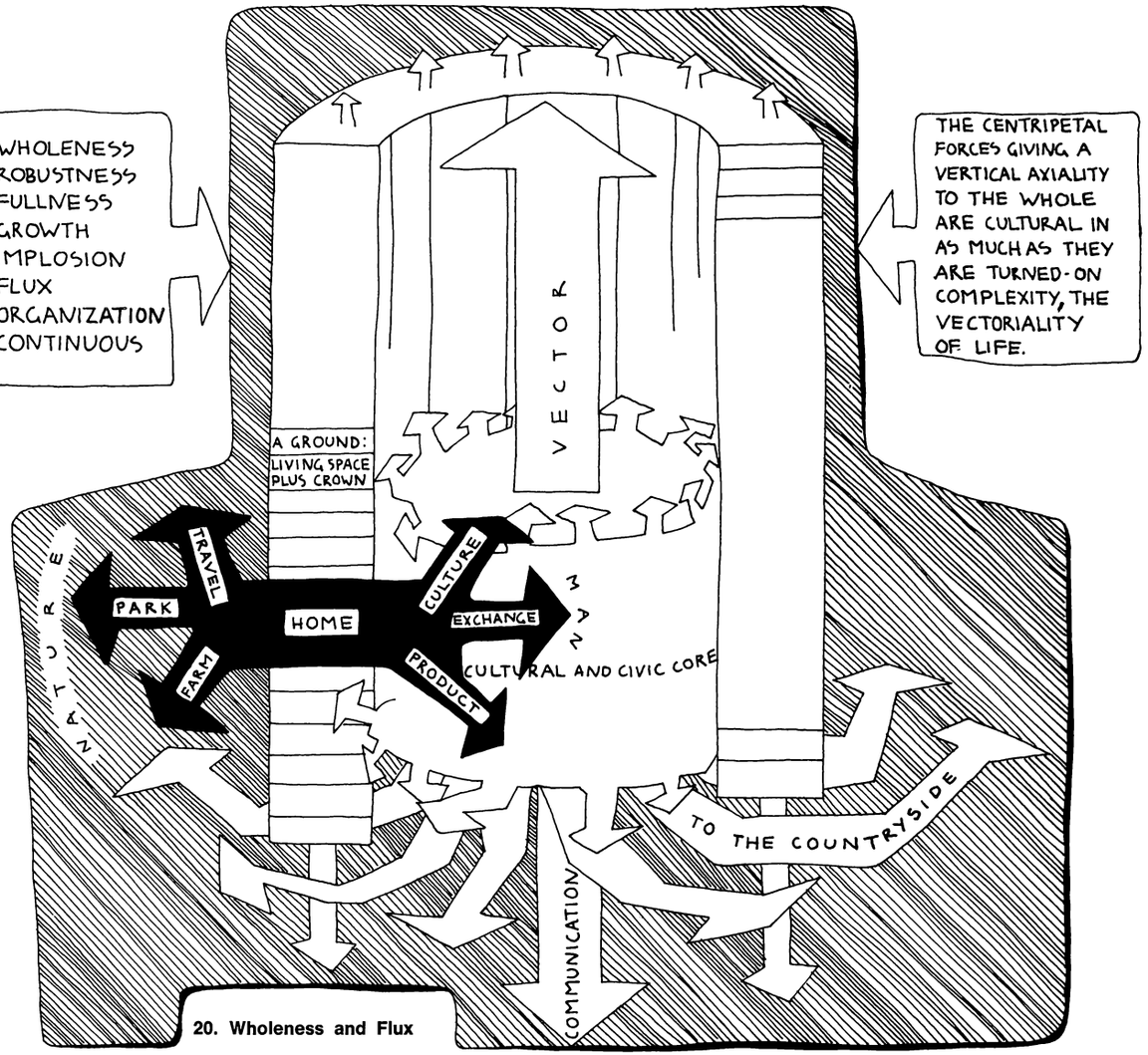
If there is any question about the inevitability of a society of man that will carry the individual to his personal fulfillment, there is no question of the inevitability of a superorganism of a thousand minds that will ecologically cradle such persons; it is the city of tomorrow. In such a superorganism the individual brain will have a collective counterpart: the nonbiological memory archive and logical decision-maker, the computer. Then there will be a triad: the central physicochemical brain and peripherally the individual brains, each in turn hosting individual minds. (Fig. 18)

The morphology of the city will be determined by this "epidermic" distribution of wills, the mind of the city, composed of thousands of peripatetic particles all operating from individual brains. In addition to this multiplicity of wills posturing themselves in collective veneers oriented toward the light (see the vegetal kingdom), there will be a centralized brain of nonbiological character (unless technology allies itself to biology and medicine and brings computer "science" back to the ancestral father—the organic).

The phenomenon then of the city, a congruent, humanized micro-universe sustained by the neonatural layer (Fig. 13) (the physical structure of the city), is *an ultracomplex organism whose centralized brain is the instrument that works for the satisfaction of the thousands of epidermal individual minds bound together by forces of sociality and culture.*



19. Islands, Barriers, and Scattered Limbs



20. Wholeness and Flux

12. Arcology: The City in the Image of Man

The concept is that of a structure called an arcology, or ecological architecture. Such a structure would take the place of the natural landscape inasmuch as it would constitute the new topography to be dealt with. This man-made topography would differ from natural topography in the following ways:

1. It would not be a one-surface configuration but a multi-level one.

2. It would be conceived in such a way as to be the carrier of all the elements that make the physical life of the city possible—places and inlets for people, freight, water, power, climate, mail, telephone; places and outlets for people, freight, waste, mail, products, and so forth.

3. It would be a large-dimensioned sheltering device, fractioning three-dimensional space in large and small subspaces, making its own weather and its own cityscape.

4. It would be the major vessel for massive flow of people and things within and toward the outside of the city. (Figs. 15, 16)

5. It would be the organizing pattern and anchorage for private and public institutions of the city.

6. It would be the focal structure for the complex and ever-changing life of the city.

7. It would be the unmistakable expression of man the maker and man the creator. It would be diverse and singular in all of its realizations. Arcology would be surrounded by uncluttered and open landscape.

The concept of a one-structure system is not incidental to the organization of the city but central to it. It is the wholeness of a biological organism that is sought in the making of the city, as many and stringent are the analogies between the functioning of an organism and the vitality of a metropolitan structure. (Fig. 18) Fundamental to both is the element of flow. Life is there where the flow of matter and energy is abundant and uninterrupted. With a great flow gradient the city acquires a cybernetic character. The interacting of its components erases the space and time gaps that outphase the action-reaction cycles and ultimately break down the vitality of the system. (Figs. 19, 20)

These are mechanical but fundamental premises for a functioning metropolitan life. In reality the idea is that of a very comprehensive "plumbing system" for the social animal, which the city is. The plumbing system consists of the previously mentioned man-made topography. (Fig. 48) Social, ethical, political, and aesthetic implications are left out, as they are valid and final only if and when physical conditions are realistically organized.

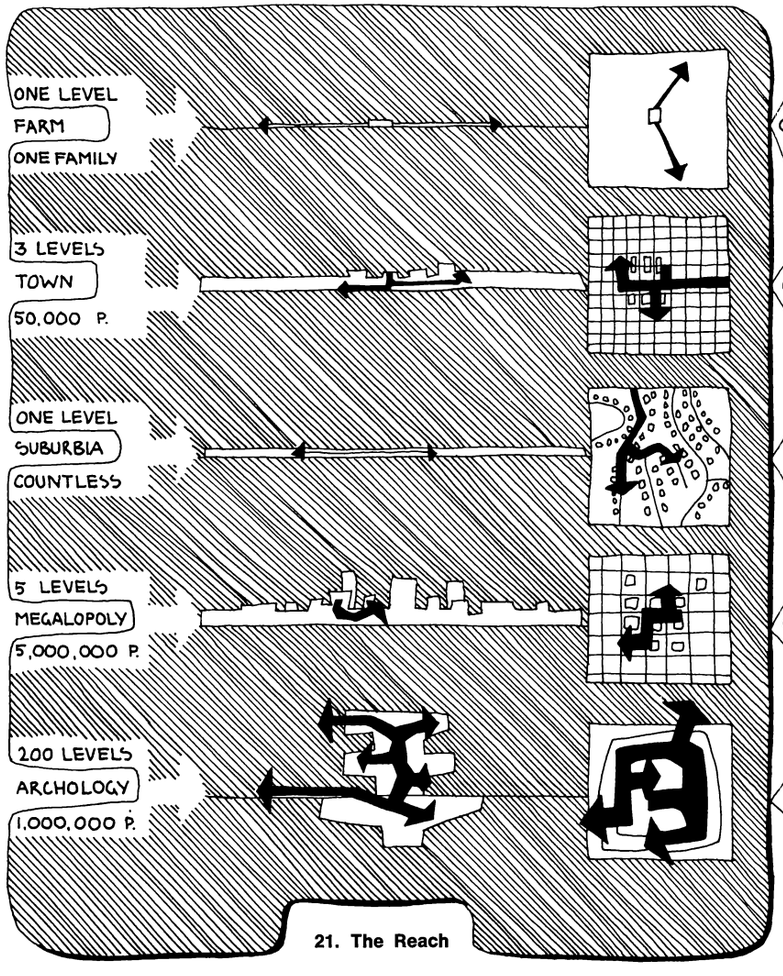
To dispel the aura of cerebralism or utopianism from the concept presented, there is another way to see the central problem of the city: The degree of fullness in each individual life depends on the reaching power unequivocally available to each person. (Fig. 21) In turn this reaching power is in direct proportion to the richness and variety of information coming to and going from the person. Information means not only sounds, sight, and so forth, but all the sensorial data, all the physical intermediaries that make any sensitivity possible; all kinds of inorganic, organic, organized, or man-made matter or material or instruments, from foodstuff to wireless, from toilets to television, from mothers' reprimands to theater. This wholeness of information must include packaged and remote information such as television, radio, telephone, and the communications media, as well as environmental information. Environmental information calls in the technology of transportation, distribution, and transfer, and calls for the no less fundamental quality of the environment itself.

This combination of remote and synthetic information and environmental information is indispensable to the nature of metropolitan life. In physical terms it means that the distances, the time, and the obstacles separating the person from all civilized institutions have to be scaled down to the supply of energy available to the person himself.

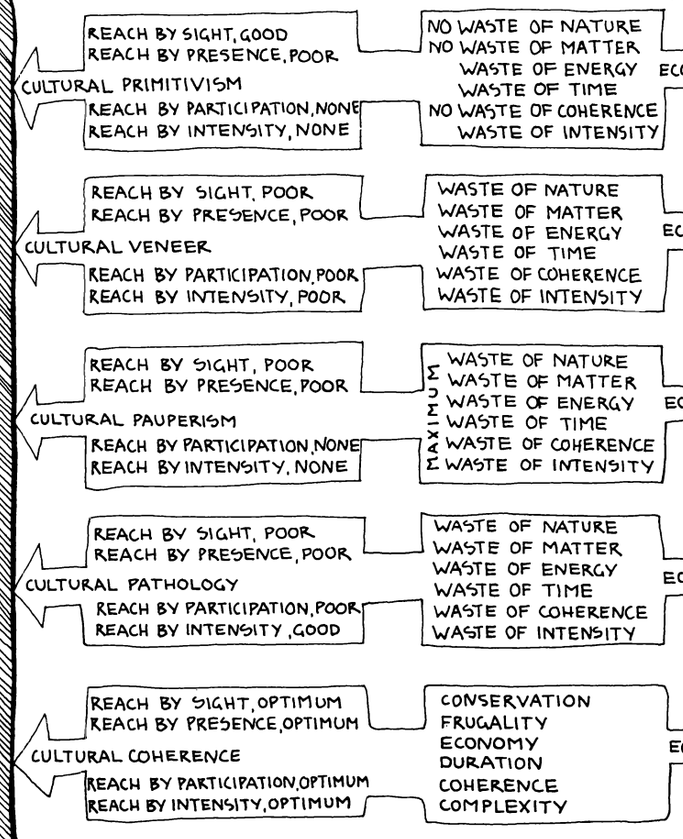
If we inject into the picture the sheer bulk of products and devices wanted by and forced upon each man, we can see the dimension and the absolute priority of the logistic problem. The burden of matter, part of the environmental information weighing on every man, is impressive and also irrational. This matter has to be transformed, manipulated, moved, serviced, stored, exchanged, rejected, and substituted—the warehouses of arcology will have to be enormous. One thing nomadism has not been able to teach us is frugality. (Fig. 22) What is the mechanism by which the rich and complex life of society can flow back into the structure of the city?

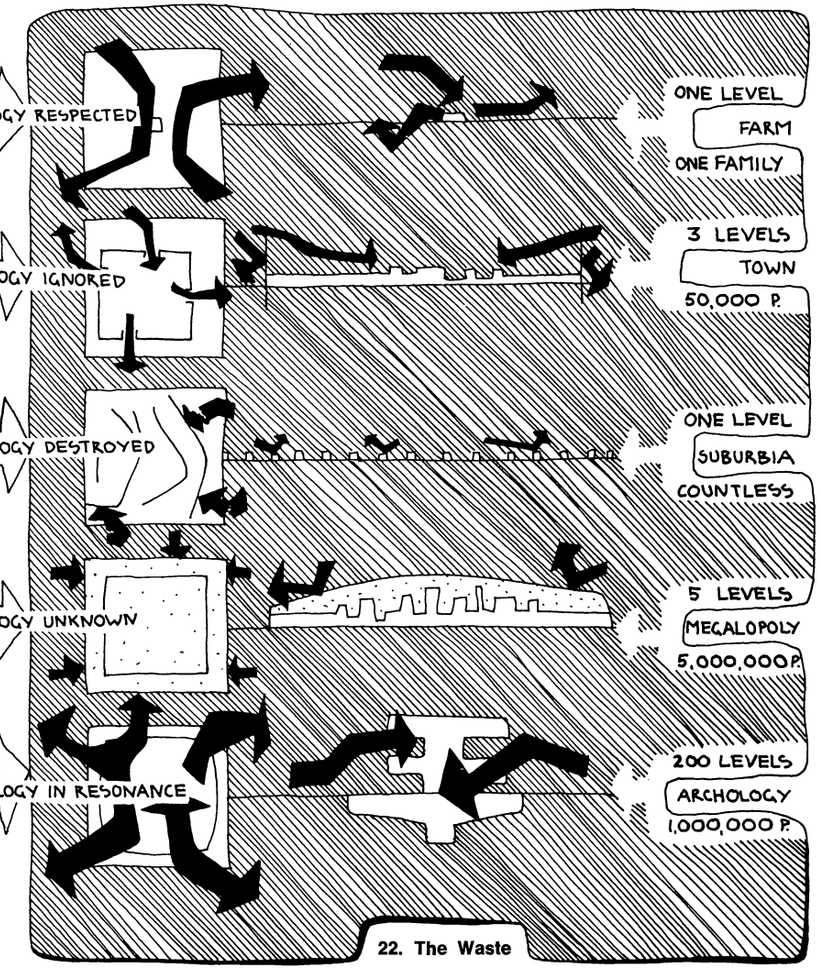
In a society where production is a successful and physically gigantic fact, the coordination and congruence of information, communication, transportation, distribution, and transference are the mechanics by which that society operates. It is not accidental that these are also dynamic aspects of another phenomenon, the most dynamic of all: life.

In every dynamic event of physical nature the elements of time and space, and thus acceleration, speed, and deceleration, are crucial. The speed of light, a space and time shrinker, well serves the communication of information of the packaged kind—television, radio, telephone—the synthetic information. Thus a good supply of synthetic information can reach even the scattered suburbanite (for him environmental information is and remains monotone, bone stripped).



21. The Reach





22. The Waste

The picture is totally altered when we come to transportation and distribution. Unless the feeding in and feeding out of these two is highly centered and axialized, the laws of matter and energy will see that sluggishness and possibly stillness prevail. *Swiftness and efficiency are inversely proportional to dispersion. Scattered life is by definition deprived or parasitic.* (Figs. 24, 25) This can be verified by approaching the problem from the opposite end: The environment is vital and living information; it is the bulk of information available to man.

Blighted environment is blighted information. The cause of blighted environment is the breakdown of environmental information occurring when there is no follow-through from synthetic information to transportation, distribution, and reach. When this occurs, the energies of the individual are exhausted in the struggle to keep the avenues of environmental information open, to keep the flow of things going. (Fig. 19) Man's mechanically low-grade energies are absorbed, not euphemistically, by cement, asphalt, steel, pollution, and all sorts of mechanical, static, and dynamic barriers in an ever-enlarging frame of space and time. The flow becomes sluggish, if it does not come to a standstill. (Fig. 23) This blighted environment is a direct consequence of sluggish or dying flow.

Impaired flow is ultimately the disproportion between the validity of the individual reach and the amount of energy that is expended to make the reach possible.

One may thus say that because of the biophysical makeup of our world, rich flow—that is, rich potentiality—is the direct consequence of minimal separation between components. *Minimal separation between components cannot be achieved by using only two or three coordinates of space. Minimal separation between components is structured three-dimensionally, or it is not feasible.* The solid and not the surface is the environment where adequate flow is possible, thus where environmental information is rich and where life can flourish.

The surface of the earth, for all practical purposes, is by definition a two-dimensional configuration. *The natural landscape is thus not the apt frame for the complex life of society.* (Fig. 24) Man must make the metropolitan landscape in his own image: a physically compact, dense, three-dimensional, energetic bundle, not a tenuous film of organic matter. The man-made landscape has to be a multilevel landscape, a solid of three congruous dimensions. (Fig. 25) The only realistic direction toward a physically free community of man is toward the construction of truly three-dimensional cities. *Physical freedom, that is to say, true reaching power, is wrapped around vertical vectors.* (Fig. 20)

There is a further and reinforcing reason for verticality. As individuals we act horizontally and need horizontal dimensions up to six to ten times the vertical dimensions. Thus, the compactness and richness of social collective life can be found only vertically. (Fig. 26) *Around vertical vectors, megalopoly and suburbia can contract, moving from flat gigantism toward human and solid scale.* (Fig. 23)

If this concept is valid, as it seems to be in view of the nature of the physical and energetic world, then a dense urban structure is mandatory, regardless of the what, how, where, or when. A few generations of men reared and grown in an environment badly stripped of cultural and aesthetic scope may be sufficient for the brutalization of society. Signs that such brutalization is already at work are abundant and impressive. If man is quality against quantity, then the priority is clear. It is much too late for our present generation, bound to the spell of arrogance and license. It may even be quite late for the just born, but there is hope for the children of our children. The when is now, for lack of any reachable yesterday.

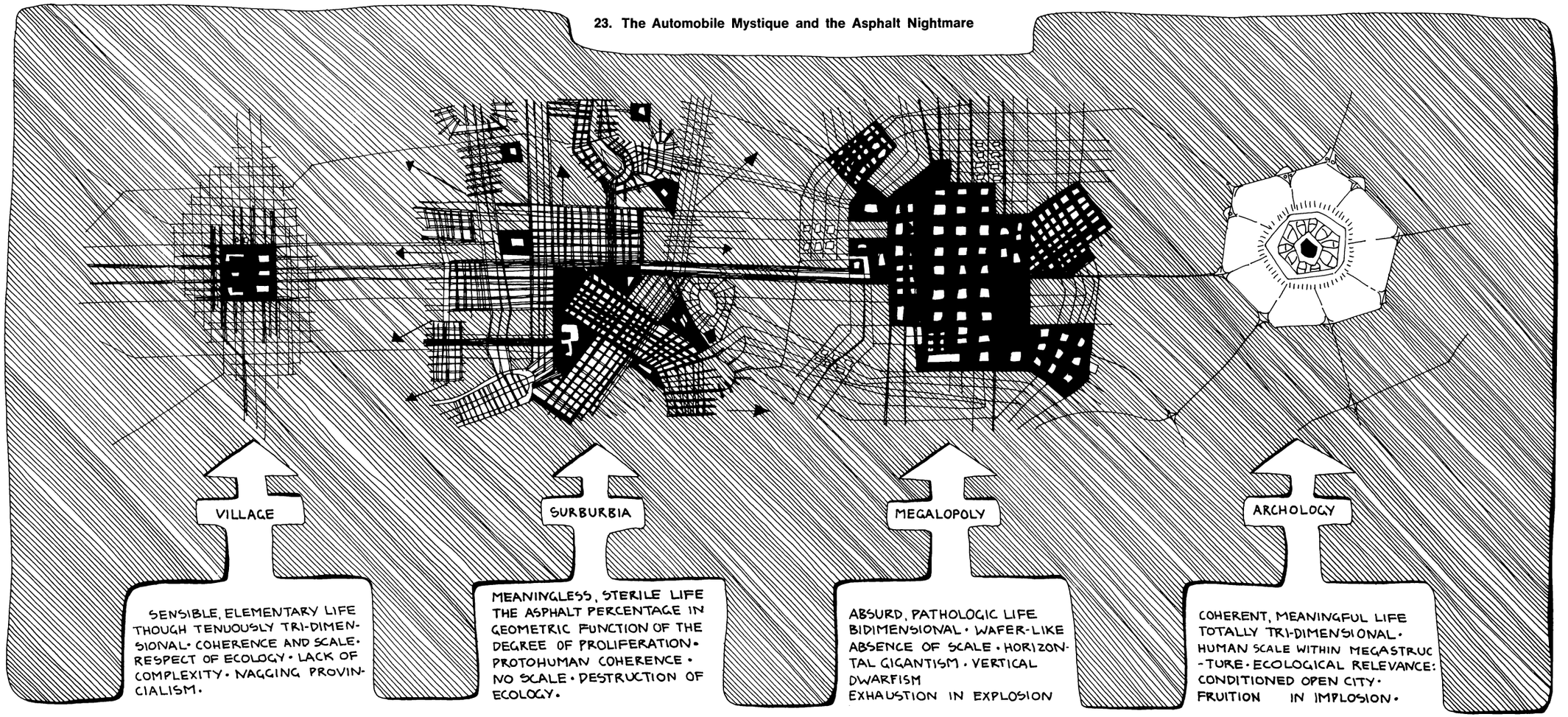
13. The Characteristics of Arcology

A passenger liner is the closest ancestor of arcology. The common characteristics are compactness and definite boundary; the functional fullness of an organism designed for the care of many, if not most, of man's needs; a definite and unmistakable three-dimensionality.

Three main characteristics on the other hand are not common: the liner is structurally and functionally designed for motion within fluid; the liner is a shell for a temporary society of unrelated people; the liner is a sealed package connected to the outside only by way of synthetic information. Relieved of these three tyrannies, the liner, the concept of it, can open up and, retaining its organizational suppleness, become truly a "machine for living," that is to say, a physical configuration that makes man physically free.

We have then architecture as the materialization of the human environment and ecology as the physical, biological, and psychological balance of conditions that account for the specific site and its participation in the whole.

23. The Automobile Mystique and the Asphalt Nightmare



Arcology becomes the cleavage of the human in the body of matter and life, probing for the ever-changing condition of the present in a manner congruous to the aesthetocompassionate nature of man (see Aesthetogenesis).

Arcology is then that architecture so complex in scope, so sound in structure, so infrastructurally subtle and pliable, so comprehensive, and of such miniaturizing force as to alter substantially the local ecology in the human direction.

Arcology is then, *morphologically*, that of the man-made (I will call it neonature), which parallels in one an ecology and an organism—an ecology in scale, pervasiveness, and balance, an organism in complexity and dynamism; *skeletally*, a structure of such dimension, scale, and organization as to be favorable to the interplay of the forces by which man and society grow; *functionally*, a compact, dense, and efficient organization caring for the intake, processing, storing, consuming, expelling, recycling of the elements needed by the complex life of man and society; *humanly*, an apt shelter for the multiple expressions and longing of man as an individual and man as a society; *formally*, a foundation for the aesthetogenesis of nature (into neonature).

If, for the sake of clarity, one separates the not-too-separable instrumentality from the scope (ends) (Fig. 38), one may say that the instrumental purpose of arcology is the definition of a well-rounded service system which, cutting into the waste of time and space, presents man with a few extra years of "positive" time, time to use to his personal, social advantage if he so pleases. That this may be invaluable lies in the assumption that life is precious enough and unique enough to demand rightly the best environmental conditions for its flowering and that coercion and frustration are inimical to life. Life is coerced by the environment man has produced and lives in. It is basically coerced by the very fact of the physical conditions he himself has compounded. (Fig. 19)

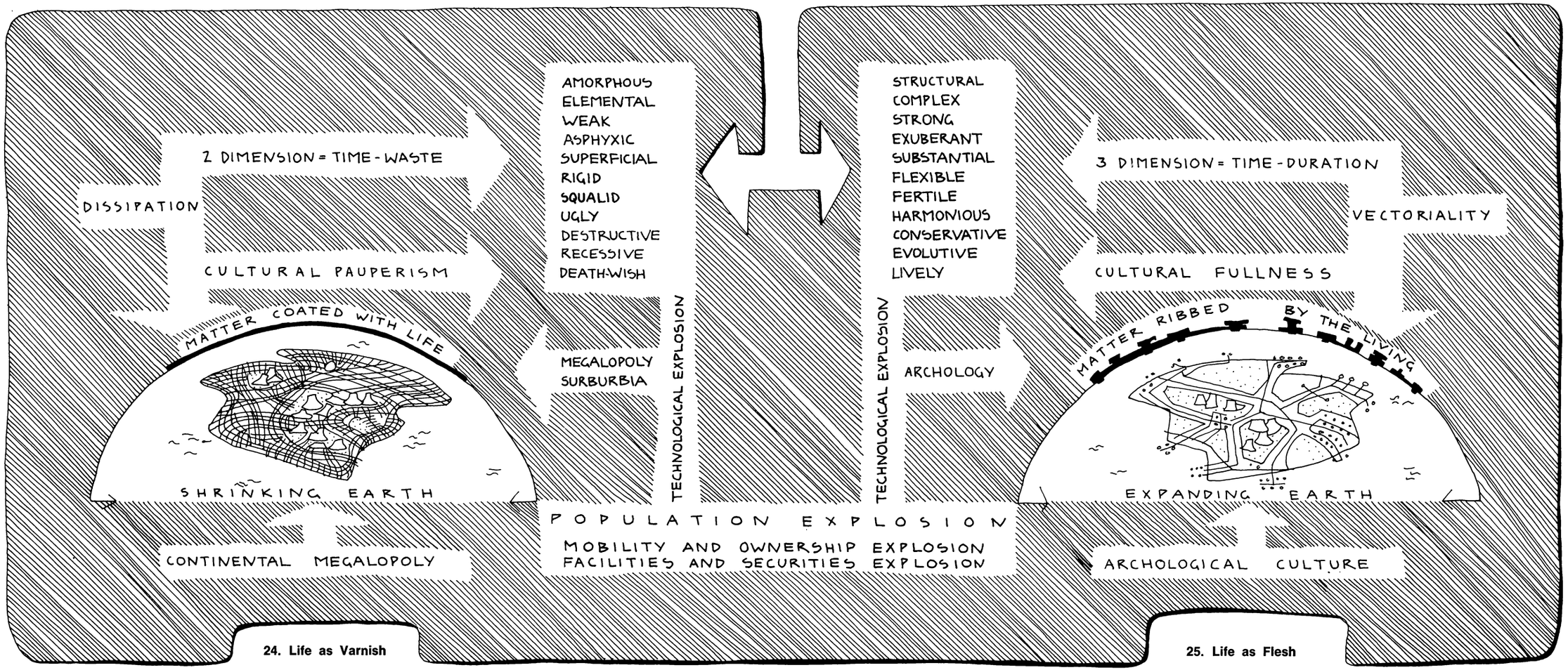
The time-waste brought about by space-waste (functional and structural) by force of physical laws, including fatigue, results in cultural pauperism; thus, a waste of life at the level where such waste is unwarranted and unreasonable. (Fig. 22)

The achievement of the instrumental purpose of arcology coincides by force of physical laws with nature's conservation. The coincidence, which is also a reinforcing element in the qualitative scope of the life developing within the arcology itself, is a direct consequence of the identity of efficiency (in its full meaning, frugality) with axiality of life. Then instrumentality in its over-all power is vital to efficiency and thus, indirectly, is itself vital. (See Miniaturization.) *But the fruition of growth is in things that are not commensurable to that which would seem to be their cause.* While an apple is the fruition of a tree seeking continuity in the next apple tree, and in a sense all that is the new tree was already in the parent tree, the fruition of man is the creation of the "never been before and never to be again."

At the same time the observation that life has never been so rich is invalid in the two directions of ratio and history. The ratio fulfillment-wealth seems to dwindle constantly. This indicates an ultimate exhaustion of human values submerged by and in a mechanism of ever-powerfulness lost to man's purpose. Historically, the stage of affluence seems more a leveling of, rather than a stronger stimulus to, growth, as if affluence were at the same time cause and effect of a weakening in the thrust of evolution. Totalitarianism recognizes, or instinctively senses, this and capitalizes on it by putting ideals before affluence and in so doing, though possibly for the wrong reason, injects new purposefulness into individual motivations.

The mechanisms channeling life positively may consist of the replacement of comfort and security by joy. In joy, motivations are carried, uplifted, while in comfort and security they seem to be drugged, sinking into naught. Possibly then wealth would instrumentalize a joyful state instead of a security at any price, the negative side of conservatism. Joy comes from plenitude. Plenitude, though basically an inner condition, can be invited by an inspiring and stimulating environment and the feeling of working toward achievements that overreach one's own limitation and embrace not just oneness but otherness as well: therefrom, the fruitions of creativity.

The pertinence of arcology to the condition of man, the condition of joy or indifference, is direct and immediate. *Joy is then the burst of liveliness that comes with the fitness and coherence of a process that is developing under one's eyes; it is the opposite of senselessness and squandering.*



24. Life as Varnish

25. Life as Flesh

14.The Wastes

The boundless squandering of the wealth of the earth is compounding all the other already harsh conditions and may produce a "civilization" without an earth to host it. One by one, in the short time of two to three generations, ecologies, fruit of eons of refinements, are destroyed. The degree of destruction seems to be in direct proportion to the amount of wealth or power; thus a dismal forecast of even greater destruction. (Fig. 1)

The biological wisdom of an agricultural civilization has no parallel in technocracy. The frugality of the former has been followed by an irresponsible redundance. Nothing in scale, wealth, energy, and impact can equal the menace of technocratic urban and suburban sprawl. There, waste is a compound from the field of geography, agriculture, materials, energy, functionality, biology, and mind. Arcology is opposed to all of this. (Fig. 22)

Geographic Waste Among the most hospitable and gentle lands, increasing acreage is taken by the chaotic fervor of real-estate and other enterprises, even when urban premises are absent and not forthcoming. The action, based on profit, automatically dissipates the premises, the serenity that was there. Even a real motivation would not prevent destruction unless predicated on long-sought care.

Farmland Waste Farming centers are becoming huge suburbias by means of speculation and illusion; again, total destruction of that which was the reason for the intervention of man, the fertility of the land.

Material Waste The atomistic nature of suburbia plays the sweetest song to the production madness of "free" enterprise. Nothing is indeed sweeter than raping nature and getting dollar bills in return, with its concomitant exhilarating power. Forests are transformed into cheap lumber, then cheaper shelters, from wilderness to slums in a matter of half a generation. Oil deposits are depleted in a few years by one sixth of the earth's population for more than questionable ends. The same goes for everything else, from floors to roofs, from pavements to poles, from engines to tires, from printed paper to napkins.

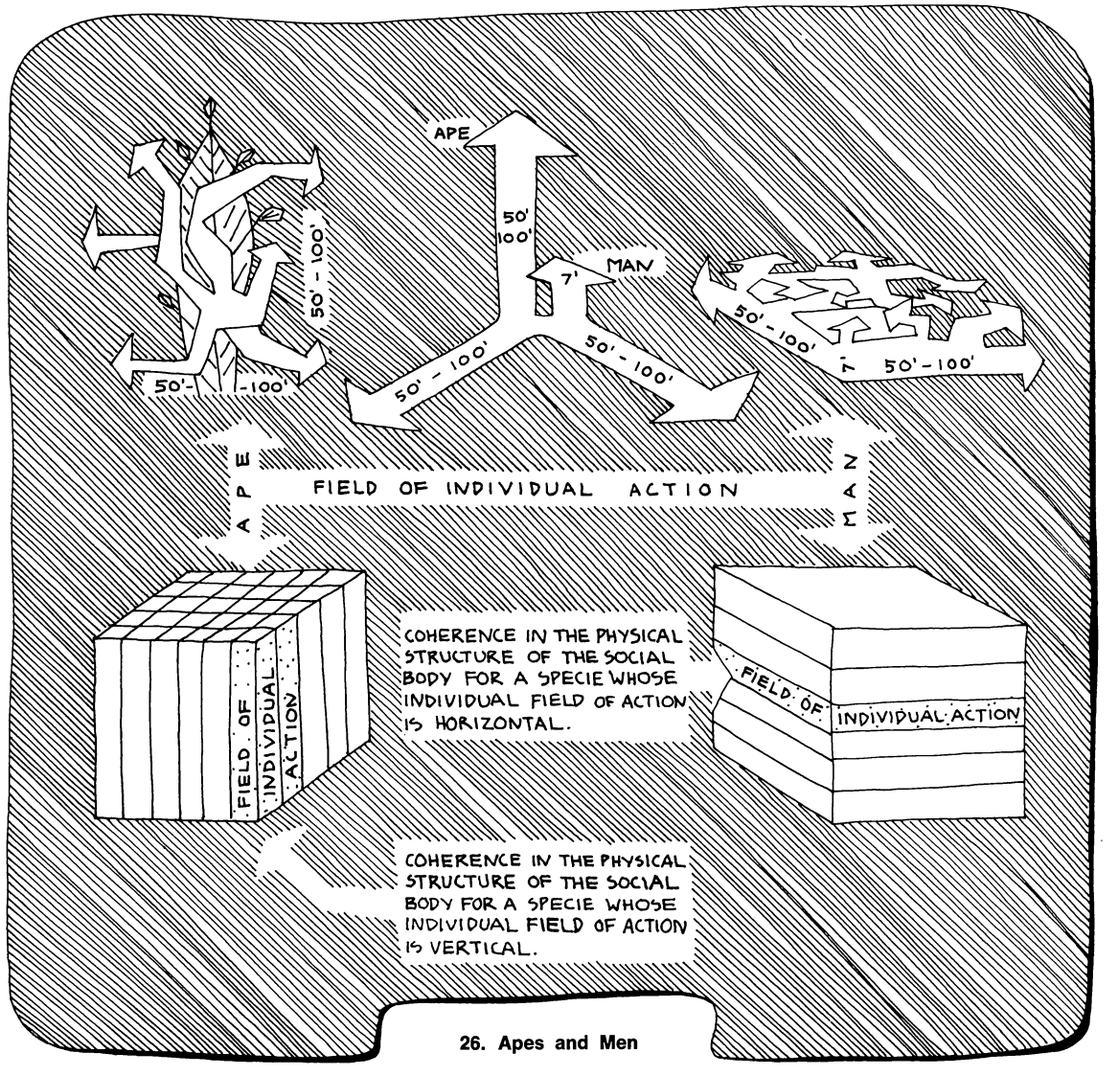
Functional Waste The unnecessary reiteration of purely functional activities, mainly of a maintenance nature, robs the whole of its wholeness. One may think of an organism trying to exist with thousands of weak hearts frantically pumping fatigued blood through inadequate, schlerotic veins, thousands of livers, thyroids, lungs—there vegetativity at its passive worst would be miraculous.

Biological Waste It goes hand in hand with functional waste: a fractured landscape, poisoned and scorched vegetation, dust fumes, hot pavements, combustions, animal species displaced or destroyed, pollution reaching as far as rivers go—disruption and destruction of ecologies.

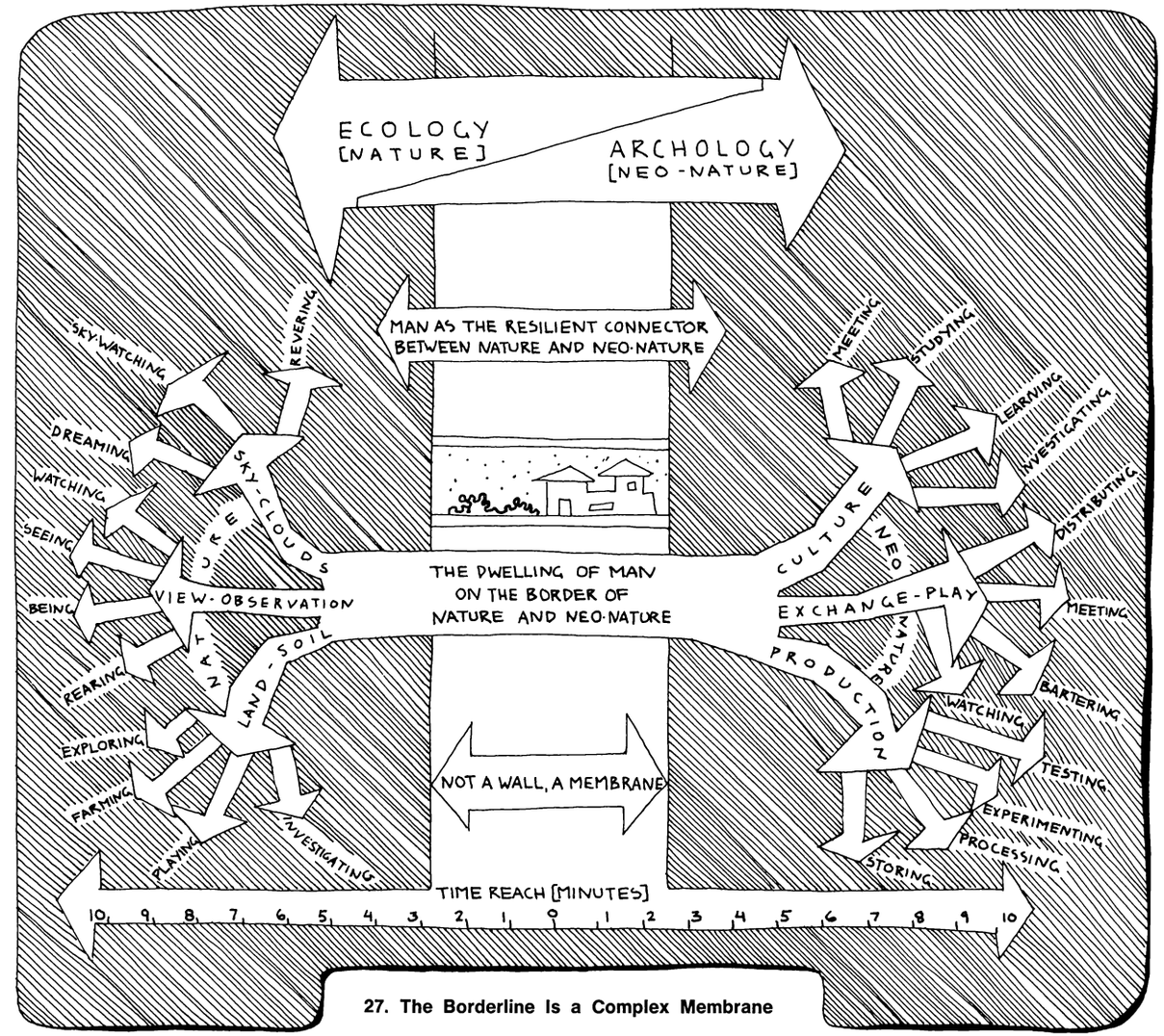
Energetic Waste The linkage to suburban cells, forever inadequate, is forever wasteful. The car, by no means the only case, is a good instance. (Fig. 23) One sixth of the whole U.S. working force exists to keep wheels rolling, to say nothing of road building and maintenance. This alone is a terrible indictment of the sterility, grossness, and cruelty of our civilization. The whole thing assumes a gory and savage aspect when we add the 50,000 deaths per year, the countless crippled, the countless family wrecks, countless mental wrecks, and all the care, assistance, hospitalization, rehabilitation. The car is now a brutal and mesmerizing instrument, both physically and mentally.

The saddest aspect of waste on the energetic side is that no matter how much we produce and install in horsepower, kilowatt hours, gas mains, fuel tanks, coaxial cables, the linkage is inevitably far too tenuous for a truly complex and vivifying society. True life cannot be spread that thin. (Figs. 21, 47)

Mental Waste Independence gone, variety gone, nature gone, "good air" gone, uniqueness gone—the frustration in discovering that one's actions destroy the reasons for the action itself; instead, isolation, confusion, artificiality, ugliness, pettiness, and cultural death. If waste, meaning greed, callousness, and foolishness, is to be confined to a reasonable residual, action is in order, from the detail to the whole. The former deals mainly with an improved psychosomatic coherence between the individual and his acquired ability to telescope problems in their dimensions, spatial and historical (education). The latter is the relevance of this spatial historical dimension itself. *It is arcological in the sense that it provides answers only if faced comprehensively and nonsegregationally.* The configuration of society must change in its material as well as immaterial aspects. The two must fuse into one another. (This is achieved only through an aesthetogenesis.) To be sick of one's culture is a well-kept tradition. But the explosive power of things at hand now is unprecedented, and the tide of an "instinctive," robot-automatic neonature, overwhelming the biological instincts, is being sown among us by ourselves (against ourselves).



26. Apes and Men



27. The Borderline Is a Complex Membrane

15.Man on Earth

All the preceding observations strongly suggest that physical clustering must prevail over scattering. One might say that scattering consumes its power in the act of scattering and, like shrapnel, brings death with each of its fragments.

Clustering "activates by compression, and the media undergoes a change of state." It etherializes; that is what the good city has shown through history.

Nothing could be sillier than telling people they must cluster. Besides, people have definite ideas about overcrowding, functional asphyxia, freedom, taxation, urban crime—nor would they accept being herded forcibly into "wild" experiments. The smallest degree of leadership should see through the urgent plight of an exponentially decaying environment to the need for bold investigation-experimentation.

The arcologies presented here are in their abstractness an effort to suggest new approaches to urban dilemmas. In each arcology it is necessary to distinguish the concept, which one hopes to be valid, from the personal "sound" with which the concept is invested. The concept could be said to be the skeletal structure in its most abstract terms. Personal "style" would be the "formative beginning," that is, the broad outline of a formal investiture of the organism; *hence the acceptance, or not, of the idea, separable from the acceptance, or not, of its aesthetic side.* (Beware of literal deductions.)

To position the meaning of arcology so that the hindrance of the present becomes proportionate to the relevance of the problem, some observations are necessary. Their generality should not distract from the truth that the energies of man cannot validly be directed against man or mankind. *Man's struggle is within and somehow against a basically indifferent universe.* (Fig. 55) *In it the phenomenon of life is inexhaustible inasmuch as and as long as it is miraculous.* The bleeding of man at the hand of man in a fragmented earth, short of any hypothetically pedagogical value, should be matter for wonder and revulsion to all of us.

The Physical Premises

1. The size of the earth is given and, grossly speaking, unchangeable (in the time cycle of civilizations at least).

2.The ratio acreage-man is shrinking rapidly on a planet rich in land of a forbidden nature, at least for a long time to come.

3. Gravity is an overriding force, perpetually governing the logistics of man-matter on our earth.

4. Climate, seasons, and day-night cycles are ecological realities and, as such, worth cherishing.

The Biological Premises

1. The energetic rules of life designate most or all of the fertile land for foodstuff production at the greatest rate of real efficiency.

2. The ecological balance of the whole planet is predicated on nonamorphisms, that is, on differentiations. (Fig. 54) The functional equilibrium of the whole is in the dynamics of micro-macro interactions and in the fluid character of the total media. The earth surface is not a woven fabric but a pluriaxial, relevance-studded, hollowed-out bas-relief and it will become even more so (Fig. 25) lest an indifferent and undifferentiated mold takes possession of it. Under a microscope the mold would reveal itself as pervasive suburbia. (Fig. 24)

3. Biologically, the warm-blooded mammal, man, short of major and numerically relevant genetic alterations, is a sun-and-air animal, a surface, land, or sea animal.

4. Moving upward toward the rewards of sensi
living organism reaches for compactness. *Full*
sionality of the biological seems to be the prir
for psychological fullness, so that the venture
sustained by rich parameters, manifold articul
relays. (Figs. 15, 16) On the contrary, dust anc
reflect only tenuous action and no sensitivity t
ever may be at bay. (Fig. 47) *As it is for natur*
nature of man finds liveliness, resilience, and
to complexify only in full tridimensionality and
wealth of a sustained duration. (Fig. 46)

5. Man operates horizontally. The field of his c
stant influence is an extended space limited by
zontal planes six to eight feet apart. As a cor
the most direct, shortest, most efficient, comp
nomic, and organic composition for the intera
many men, of society, is vertically oriented, p
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life, requires functional denseness. Logisticall
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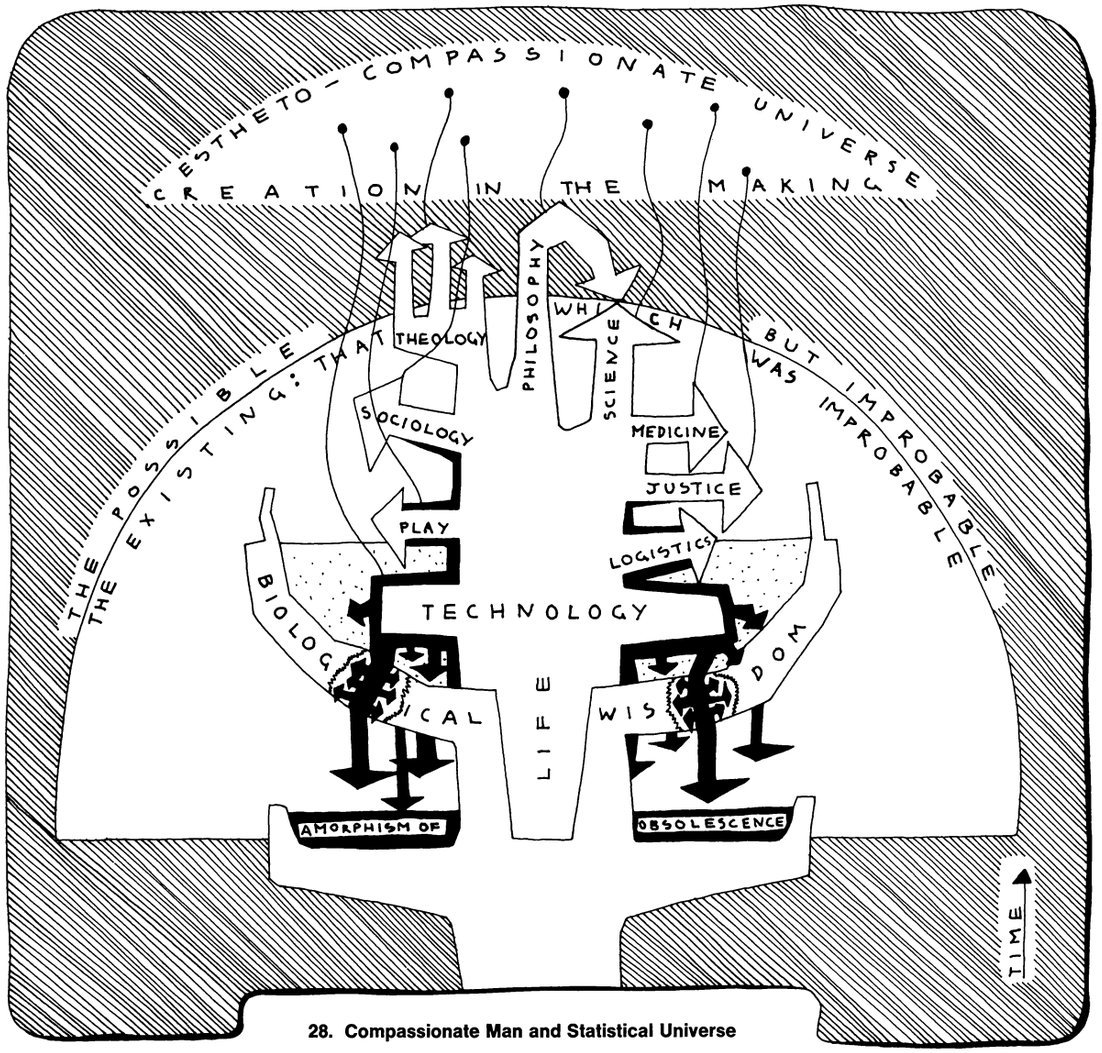
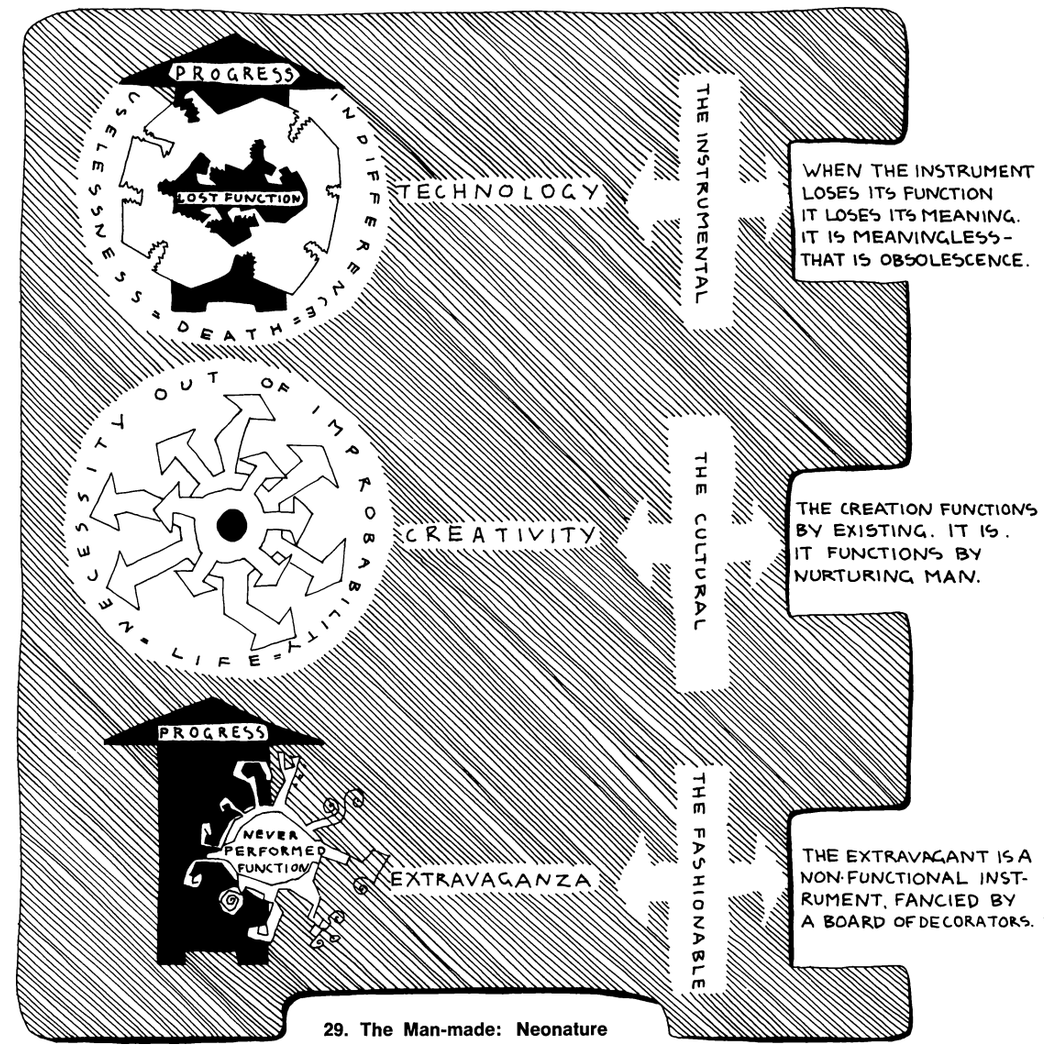


28. Compassionate Man and Statistical Universe



29. The Man-made: Neonature

The Reflective (Individual) Premises
A double pull works on man: (1) *The pull of what has been,* mainly prehistoric animality; therefore the primeval urges, the leasing of one's self to the omnipresent whole, the terror in it, the exhilaration of muscular prowess, instincts, joys, and fears in a cosmos that is so awesome. (2) *The pull of what will be,* weightless in its nonexisting form, arbitrary at the low price of its fancying, dogmatic, drained as it is of the sap of reality, and artificial.

But man is prey to a much more real artificiality. He is always leaving nature, seeking the haven his mind prods him into seeing there, just around the last vestigials of the unconscious and vegetative. Leaving nature behind proves to be blood, tears, and even more, squalor, quite possibly all unnecessary.

The fullness of man's life may lie in the balance between instinctive longing that reaches down through the flesh of ancestry and an intellectual unrest that seeks an etherialized universe. *Thus, man is positioned at the welding point where at the one "window" nature and wilderness are at sight and touch, and at the other is the mechanism of the man-made, displaying bold forms, sympathetic shelter, and a wealth of care and power for the human condition.* (Fig. 27)

If society is able to put man on this borderline of nature and neonature (one displaying its unlimited and tale-telling structure—the other, a superstructure, the new world man is creating) and keep him at the same time as a vital citizen, it is there at the cleavage point that man, the lonely individual, may seek and find identification.

This identification translates physically into the container of his life and work, the home, in the whole and in the details such a life uses and expresses. Within it also is uninterrupted sowing for a richer present.

This means that, if so inclined, the individual should be his own master builder. The fruits of technology will afford him this (see Leisure). Better education and a harmony-oriented society would be strong guidelines, channeling his expressions away from cleverness toward qualitative coherence. This coherence is fully colored by his own personal sensitivity but reflects whatever the body-social has given to him and is now articulated by him and reinserted as the infrastructure of society (the city).

This is his contribution to the transfiguration of such structures into form (see Aesthetic Universe). *Neonature man is rooted in the earth landscape and seascape. The wealth and strength of his flight is founded on the consciousness and in the sensing of such rooting, on the nursing and care in him and around him of that which is "earth oriented."*

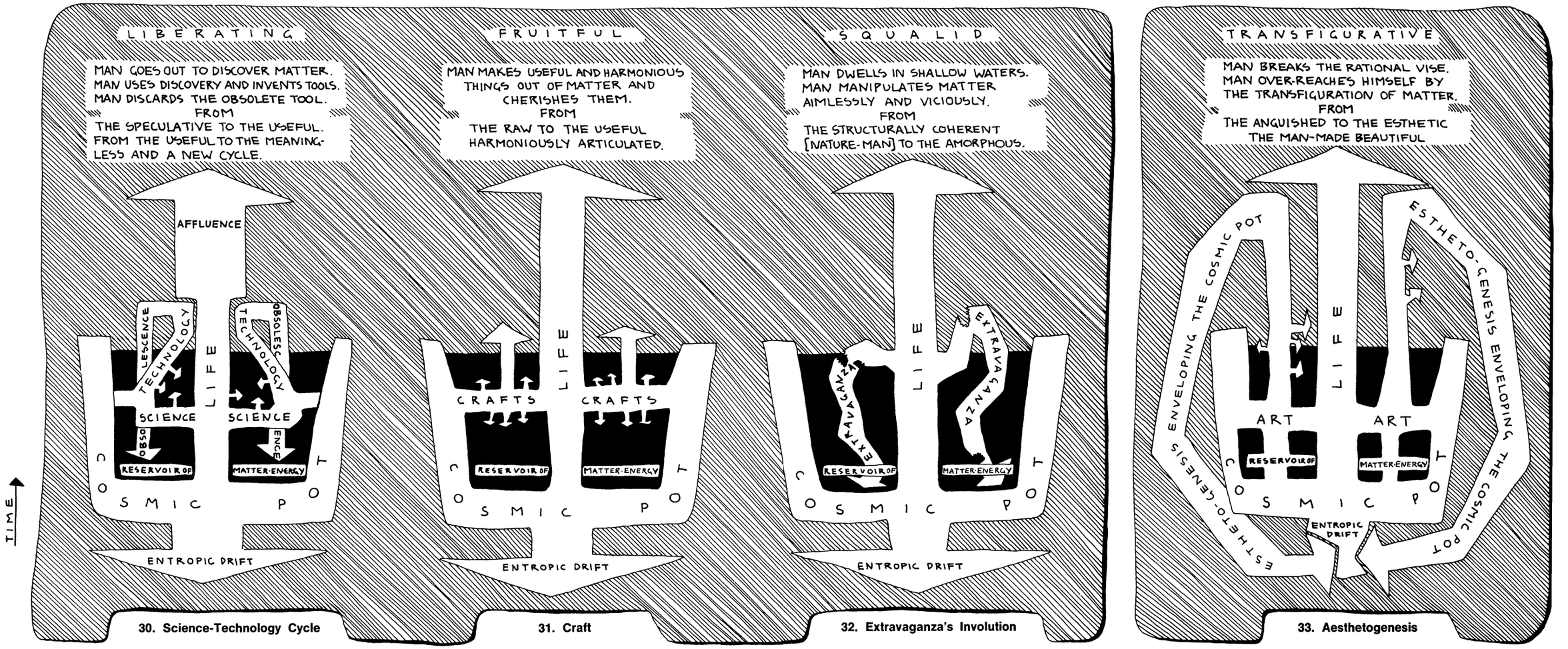
The Social (Collective) Premises
The social superorganism, contriving and nursing mores, culture, and destinies, lives within the physical, social body. Its metamorphoses are not sequences of obsolescent skins and interior gadgetries but the slow or rapid emergence of the new from within the historically real. (Fig. 28) The practical as a frozen likeness of the real is obsolescence. *A function of the real is to confine the practical to its function of lubricant in the cogs of the evolving present.* Then the structure of the body-social is slowly invested with the flesh of humanness, and its form disengages itself into freedom. The skeleton (structure) finds delivery from immobility through the supple exercise of the whole muscle-flex system, the superstructure. (The real thus becomes aesthetic and defies obsolescence.) (Figs. 33, 35, 38) So it is that the present may loose the brittleness of a flaking plane (obsolescence) separating an estranged past from a foreign future and may become instead the powerful thrust of an engrossing past pressing against that which is not yet.

This shows the need for a spatial tridimensionality of large proportions (arcology) capable of letting life run throughout in every direction in conspicuous flow and in "warm" surroundings, with the energies stored in it by a not-obsolescent past; only this flow can carry and power the dynamics of ever-changing reality. (Fig. 50)

The Instrumental (The Technological World) Premises
Defining neonature as all that was, is, and will be "man-made," a nature filtered and manipulated by man's mind and hands, this neonature can be grossly divided into two kinds: the instrumental and the aesthetic. (Fig. 38) A third, as residual from the two not in size but in meaning, is extravaganza. (Fig. 29) As in the blackest black an element of whiteness still persists and in the whitest white an element of blackness, so the pure technological does not exist any more than the pure aesthetic.

The technological could be defined as the substructure of the aesthetic which is essentially "formal," that is to say, the superstructuration engendered by man's compassion on the structure of existing things. Compassion in this context I regard as the fire that makes the purely just overreach itself into the genuinely human. Form would thus be the overreaching of structure. By this, structure finds its own full significance. *As the universe is structure, the purpose of life is to take hold of it and help it to find its meaning, its form. Man is the eyes and the ears of a blind and dumb universe.*

At the hinge point where structure interlocks or transfigures into form, and partakes of both in function and meaning, is the crafted—that neonature that more aptly shows by the biotechnical character of its form the ties man has with nature, while at the same time indicating clearly the resort of the species to artificial instruments and media for extending its control and manipulation of things instead of the constant development of new somatic "tools." There is no symmetry between the two kinds, nor is craftsmanship constantly the separative or connective third kind.



30. Science-Technology Cycle **31. Craft** **32. Extravaganza's Involution** **33. Aesthetogenesis**

The situation can be illustrated by a man with no tools and determined to make an object for a gift.

1. The man has an idea, and feelings brush and whisper around him, an everyday condition.

2. If a particular material or object was the starting point for the making of the gift, the man will try to act upon it according to what he "knows" to be its character. Thus, *working in the "nature of materials," the man works at least potentially as a craftsman.* (Fig. 31) *If the idea is the dominant factor and its expression occupies his attention almost entirely, the man at least potentially acts as an artist.* (Figs. 32, 33) The material will be more of a choice from necessity rather than preference. (It will be a reference.) Here then is the man and the intention as the avowed object (the fairly irrelevant category of such object: spoon, portrait, carriage, still life. . .).

3. The man needs an intermediate element that will permit his action (energy) to modify that material or object, if as a craftsman he had made the choice or if he tends to proceed as an artist. *Whatever the medium, man must make an instrument.* He proceeds by tooling himself, and with the use of his energies or borrowing them he will then act. (Fig. 30)

In embryo, one has the craftsman and/or artist borrowing from the technologist the instruments he needs, the means of achieving a definite end; man, the knife, and the carved splinter.

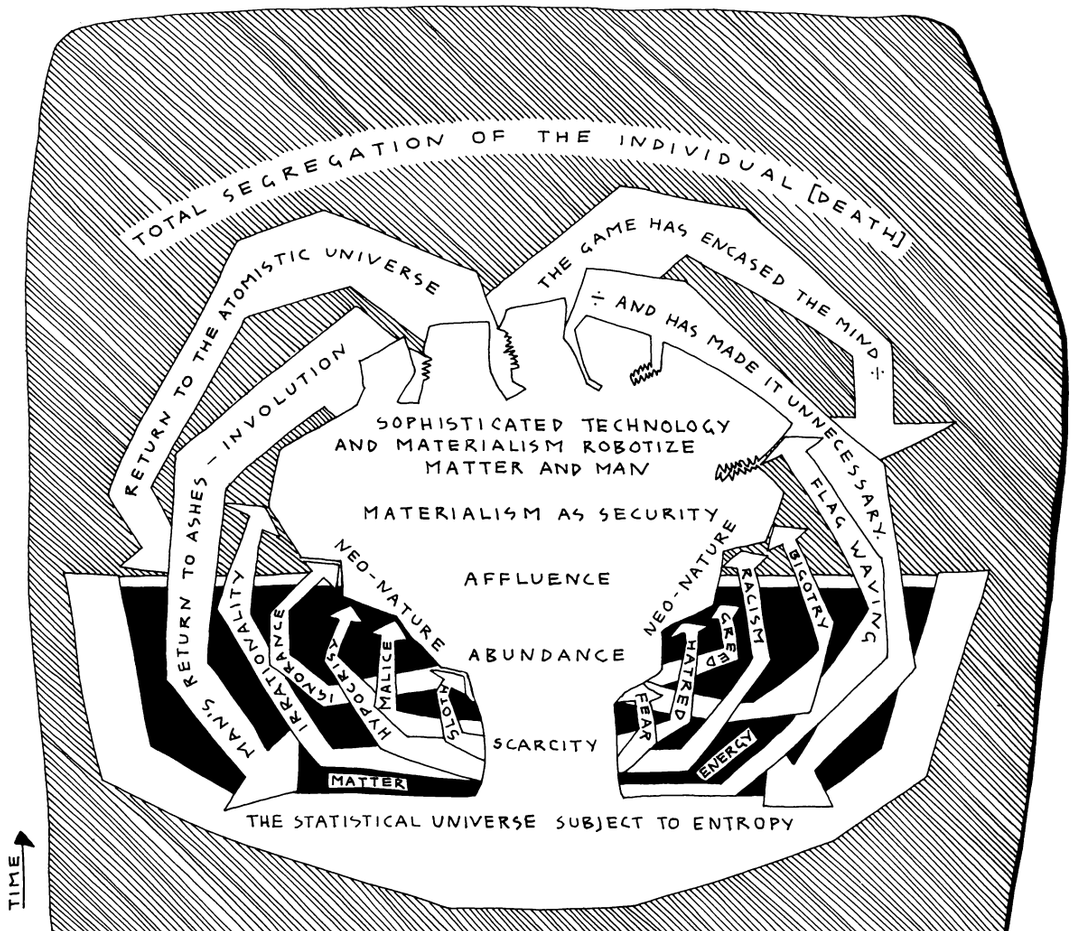
Is this sequence a yardstick valid beyond the elementarity of the situation? If in the situation man is the demiurge and if he must keep this position no matter how complex the parameters may become, then this elementary pattern has universal validity. If this is so, our civilization is in mortal danger. What is happening is that the man got so wrapped up in the making of his tool (man the maker) as to lose view of the aim—the gift (man the creator). *The giving, not the making of a tool or the selling or the bartering, is the unmistakable sign of caring, and the weight of the giving is in the nonobsolescent value of the gift.*

The reason why the refrigerator or the TV set is not "the gift" is not because it is still an end to a means; the handmade spoon is so, too. It is because they are only a means to an end. Life rejects, as it must, as fundamentally irrelevant everything not directly and "physically" touched by the care of man (that is, the combination of intelligence, vision, compassion, and human awe peculiar to the species). That which is not so touched is and remains purely instrumental and indeed marginal to the fiber of evolving man, no matter how complicated and stringent its walled-in rationality. The substantial irrelevance of instrumentality is hard to grasp when man himself suffers from the same lack of "finality" or sacramentality. (Fig. 34) The tool and the gift are heterogeneous in the sense that the soil and the fruits are in the natural world, or better, as the physical and biological rules are relevant to the fruition of life—relevant to life but meaningless as soon as life itself is canceled by the real. *Their relevance is one of functionality, not of meaningfulness.*

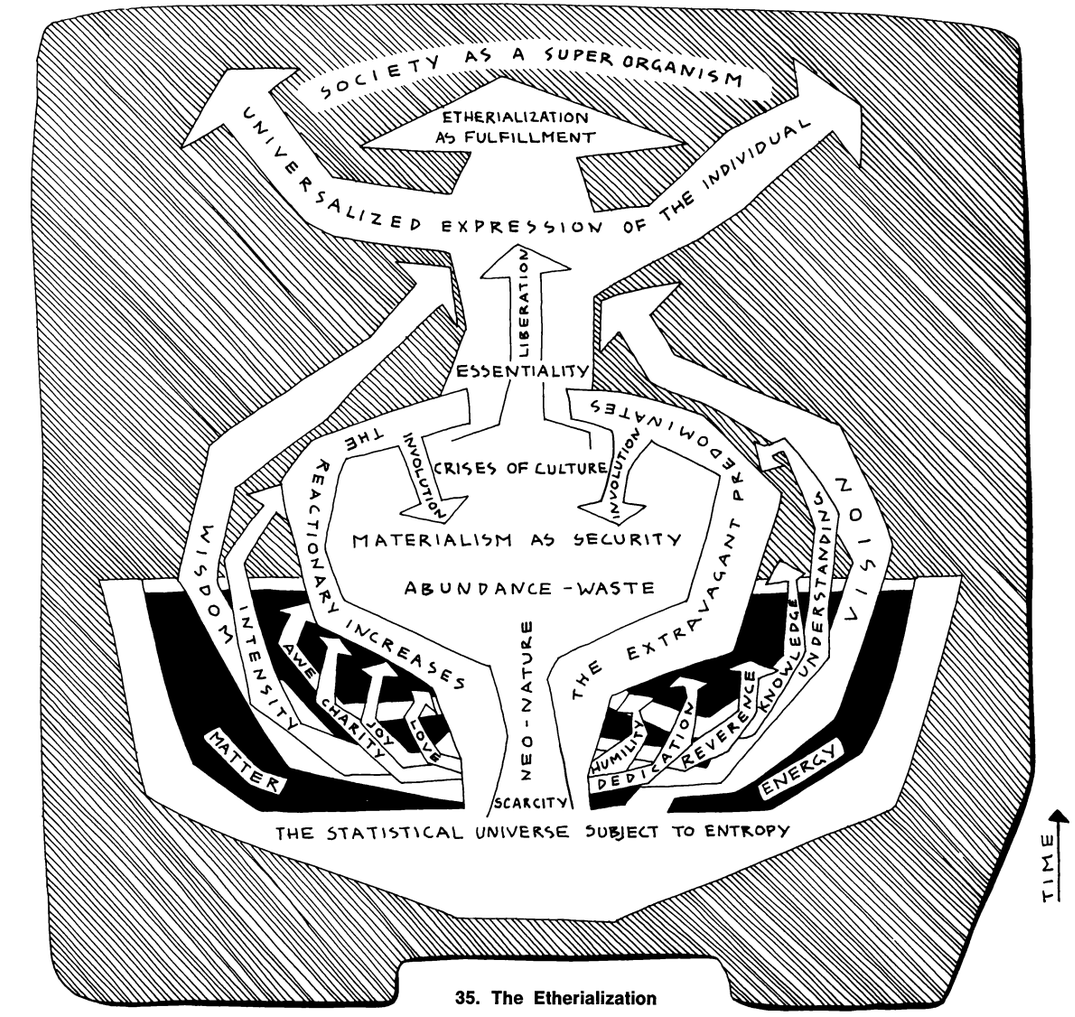
Technology is instrumental neonature. (Fig. 38) In it structure and function are overriding conditions, and their unadorned presence is the best sign of efficiency and coherence. But no amount of efficiency (good design) will keep the instrument away from the annihilation of obsolescence. Indeed, *obsolescence is the sure measuring scale for the validity of neonature.* All of neonature that is obsolescent is instrumental, and the rate of obsolescence measures the decay of its validity. (Exception is made for those tools that are direct extensions of man's biological structure: the spoon is a good example, footwear, sight devices. . . .) All of neonature that is not obsolescent is aesthetic. In a more encompassing proposition one may add: *Of all that which exists, nature and neonature, the aesthetic is that part and only that part of neonature which is not obsolescent* (hence the distinction between the beautiful/natural and the aesthetic neonatural).

The validity of the instrumental is its functionality within historical terms (one minute-one century). It is because it functions. Aesthetic neonature creates its own validity by its mere existence. It "functions" because it is. In the environmental field, neonature of the instrumental kind is "construction" (obsolescent). Neonature of the aesthetic kind is "architecture" (nonobsolescent). Physical permanence is not a pertinent aspect.

Architecture becomes ecological when a scale and complexity "explosion" occurs, and the sheer physical proportions of the organism, together with the potentiality of the life within, become an ecological determinant. Society must decide if the environment is purely instrumental (obsolescent) or if it has to contain in itself a different validity: aesthetic. *It must be remembered that the aesthetic is not the absence of the functional but the shrouding of it with the compassion of man (a person).*



34. The Dead End



35. The Etherialization

The aesthetic shroud is not an overcoat but flesh, that is, a vectoriality—permanently meaningful. This is why it has to be compassion, not whim, or greed, or fear, or bigotry, or hypocrisy, or arrogance. . . . A structuralized environment is a skeletal configuration in quest of a form (the aesthetic shroud), and unless this quest is given full opportunity, the society living in such a skeleton will be willfully forfeiting its human prerogatives and putting itself in the lap of a protohuman rationality. The end of the road is the total robotization of the species. What is more and, in short, worse, is that the skeletal condition being fundamentally repellent to man and life, man himself tries to camouflage the dried bones with fanciful dresses. This is fraud at its classical best. *Its whimsical moments cannot conceal the utter squalor of which it is cause and effect in one. Extravaganza is involution.* The anguish, deeply buried or clearly exposed in the "work of art" (all of them), is an almost biological consciousness of this "living death" pervasively scattered over the earth, overpowering by sheer mass and idolized by stultified life. This is the dark future with a technology for technology's sake, and the many grim pictures given in literature will never convey the total nightmare of its advent. (Fig. 34)

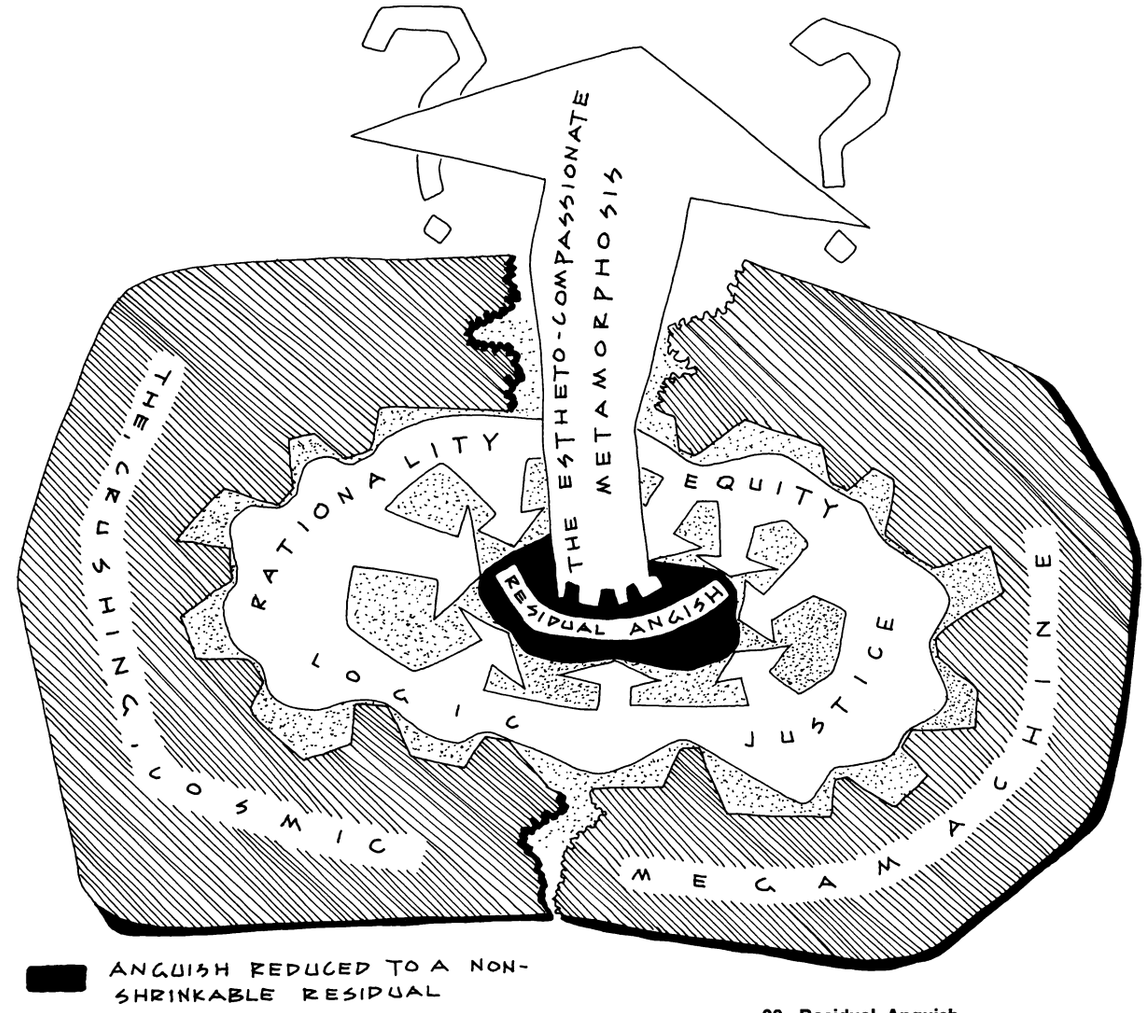
The Aesthetic Premises

The common confusion of the aesthetic with the extravagant makes it difficult to try to convey the relevance of the aesthetic. At best, it is considered a pleasant superfluity, helpful for a status-seeking frame of mind, one of the amenities of life. Any effort to make of it something more is futile unless its place is found in the center of historical life.

As nothing survives time but that which is essential, the aesthetic is not a worthy burden to carry on unless it is the burden of life itself. *The core of life is aesthetic.*

The burden of life, its underbrush cared for, is the grasping of a universe statistically driven, finding its structure (science), retranslating it in rational terms (will-technology), and superstructuralizing it into a "form" in the image of man. *Man's intensity shapes the natural world into the instrumental world to the point where the "critical temperature" reached, a metamorphosis of the instrumental, makes it into an aesthetocompassionate universe.* (Fig. 35)

The aim of man is an aesthetocompassionate universe: aesthetic, compassionate, the two aspects of the living at its "living best." The living is only the living best. The rest is the aura of a past no longer pertinent. There is in the Western languages an undeniable indication of the central position of the aesthetic in the life of man: *the beautiful, il bello, le beau, el hermoso* . . .; it is in any and all fields the ultimate qualification. It is as if the redeeming power of the aesthetic could redirect even the most evil of evils toward a positive pattern.



36. Residual Anguish

16.Residual Anguish

Access from the structural to the formal is possible only by leaping over all the structural, logical, and just diaphragms when they prove themselves inept because their presence does not disentangle the state of anguish that preys on the individual. *The residual anguish that does not abate in the comfort of the rational, the logical, the just is a residual that life carries in itself as the pressure of an immense megamachine*, all-enveloping and all-powerful, to which life is a dependent and fragile filiation. (Fig. 36) The megamachine is the physical universe. The rules of the physical universe are not benign to man because the stuff he is made of is soft, delicate, impermanent and because performance in life is dependent upon very few gauges of all the unlimited substance of the physical.

The combination of powerful mental processes and the utter precariousness of living tissue cannot but produce this residual anxiety, impervious to all attacks if one excludes faith in a providence instituted by a divine guidance.

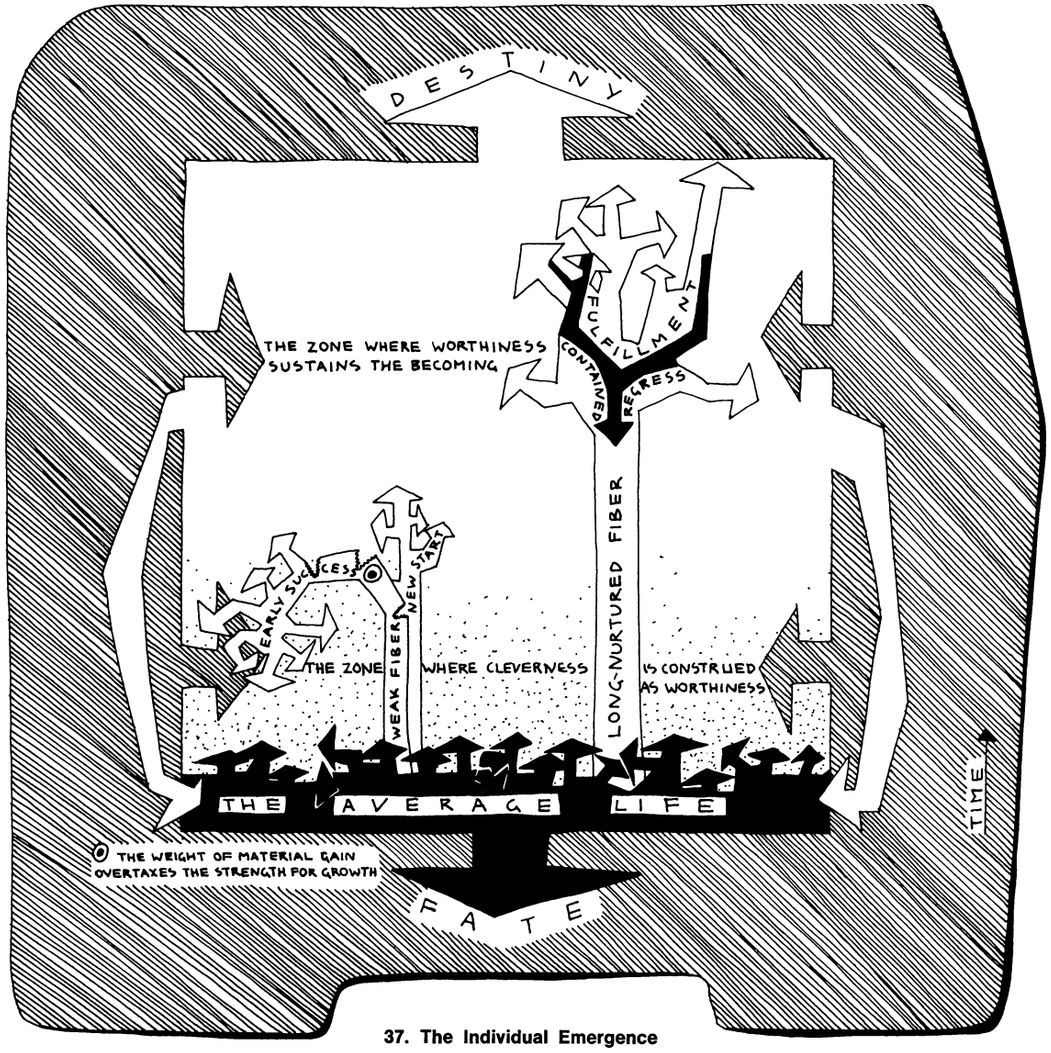
Residual anguish demands a resolution that can be found in the hands of a God or that can be created by the mind and the hands of man. In the absence of an extrahuman faith, the alternative is the metamorphosis of the real by the aesthetic act. By way of it inward-bent anguish mutates into outward-moving compassion, carried and fused within the formal substance of the creative.

The aesthetocompassionate act bends the structural reality of space-time into a rarefied condition governing itself through ultrastructural, formative forces. (Fig. 33)

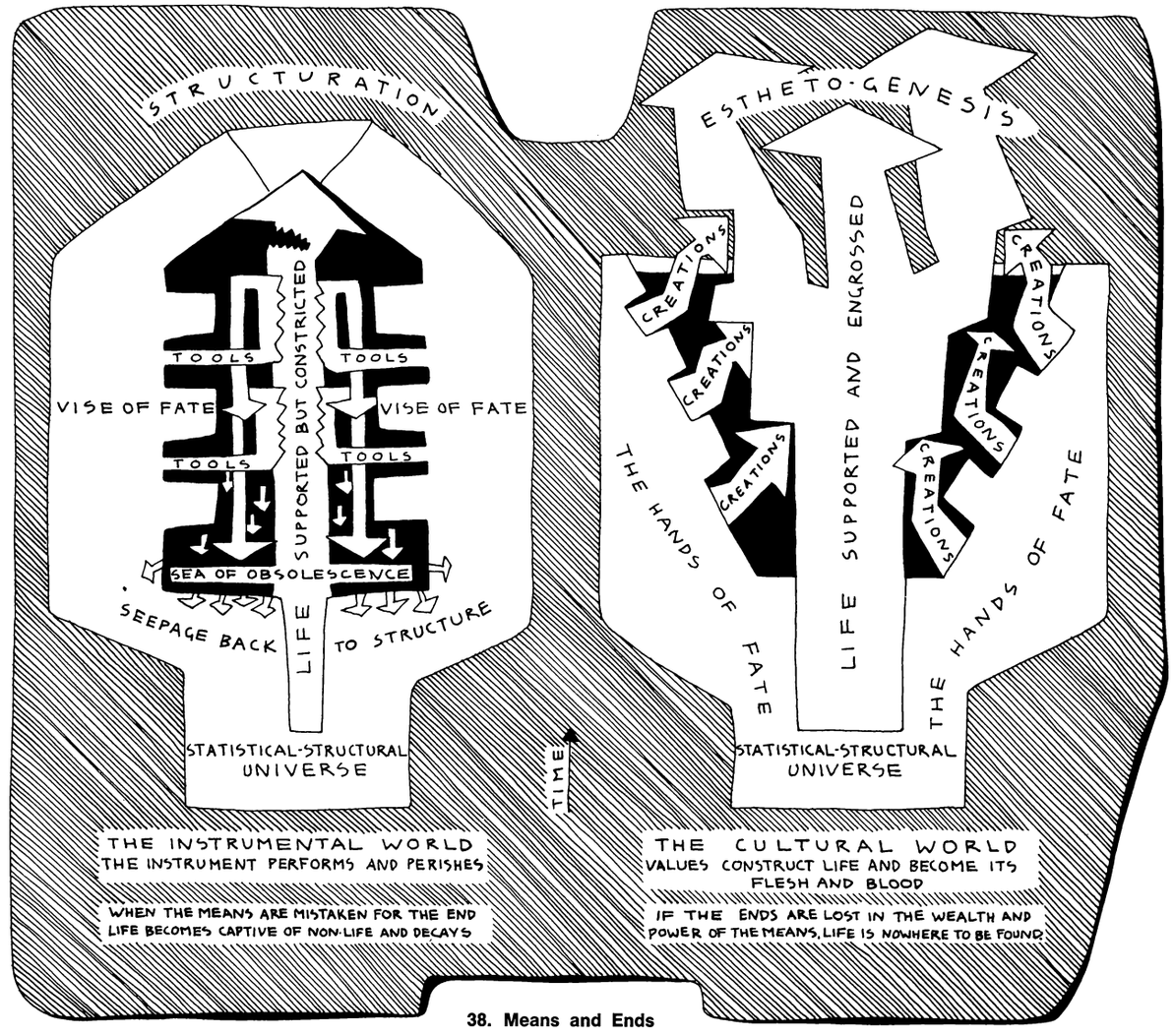
The aesthetic, not being descriptive, cannot be explained (described) from without. It can only "be" from within itself. In this exclusiveness is the wholeness of the aesthetic performance.

In a sense, that which can be described (translated into a new media) has not reached the outer limit of its own realm and is constantly awash in the surf of obsolescence, as if the lack of a containing and fitting membrane had made the content easy prey to the enormity of the total envelope, the megamachine.

The aesthetic conclusion is a secure harbor where the mental stuff can shelter particles of itself in wait for the last sweep of fire that will weld them together into the ultimate form of reality, a reality of which evolutionary man is a partial and historicized image.



37. The Individual Emergence



38. Means and Ends

17.Leisure

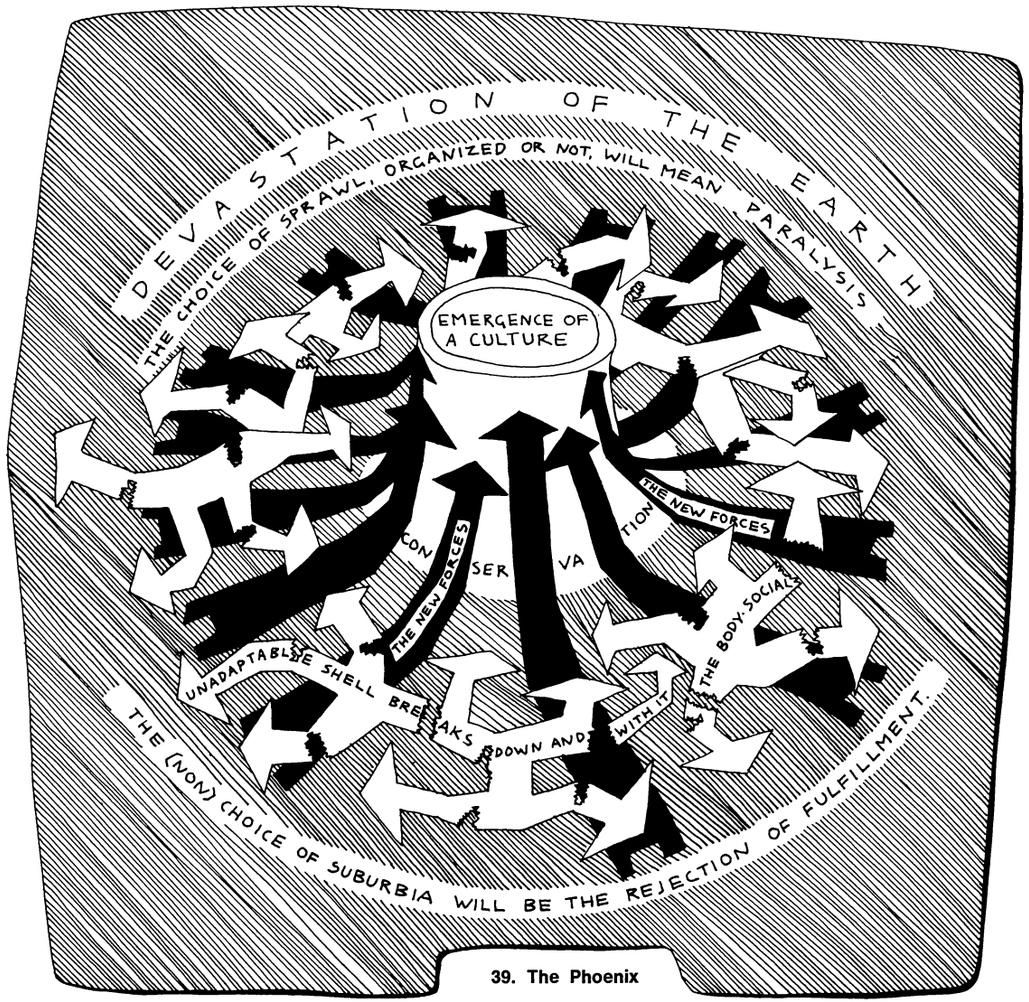
This may all be well—but what about starvation, pauperism, slavery, and ignorance, so widespread, so cruelly overcasting human life? Any effort in any field is doomed to frustration if it is not guided by a thrust into the pattern of the future that not only makes sense but is also dynamic. *Action is sterile without a vision that makes it real and engrossing. The fuel of action, short of being truly compassionate, is counter to life, unhuman.* The disheartening slowness of any progress toward freedom from need is mainly fruit of a greed out of proportion to any justifiable fear of insecurity.
To make matters worse, there is the misplaced exhilaration of man when presented with an extraordinary amount of power that opens the door onto countless rooms cluttered with hypnotic, shiny, utterly fractured things.

The rationalizing ability of man would be amply sufficient, even redundant, for a rapid elimination of his ills if only he could distinguish the contingent and the precarious from the permanent and the humanizing. By so doing, man would adhere to the essentials (not the skeletal only, nor even the extravagant). Short of total savagery, all men will "one day" be biologically relieved of need, that is, not just free from physical need but also free from labor. Equity will be a state of being (Figs. 6, 7); *on that day man will be able to work.* The age of leisure will test his worth, from roots to leaves. It will be unqualified disaster unless a long preparation precedes the "year one" (almost upon us), preparation of the individual for the tyranny of freedom. (Fig. 37)

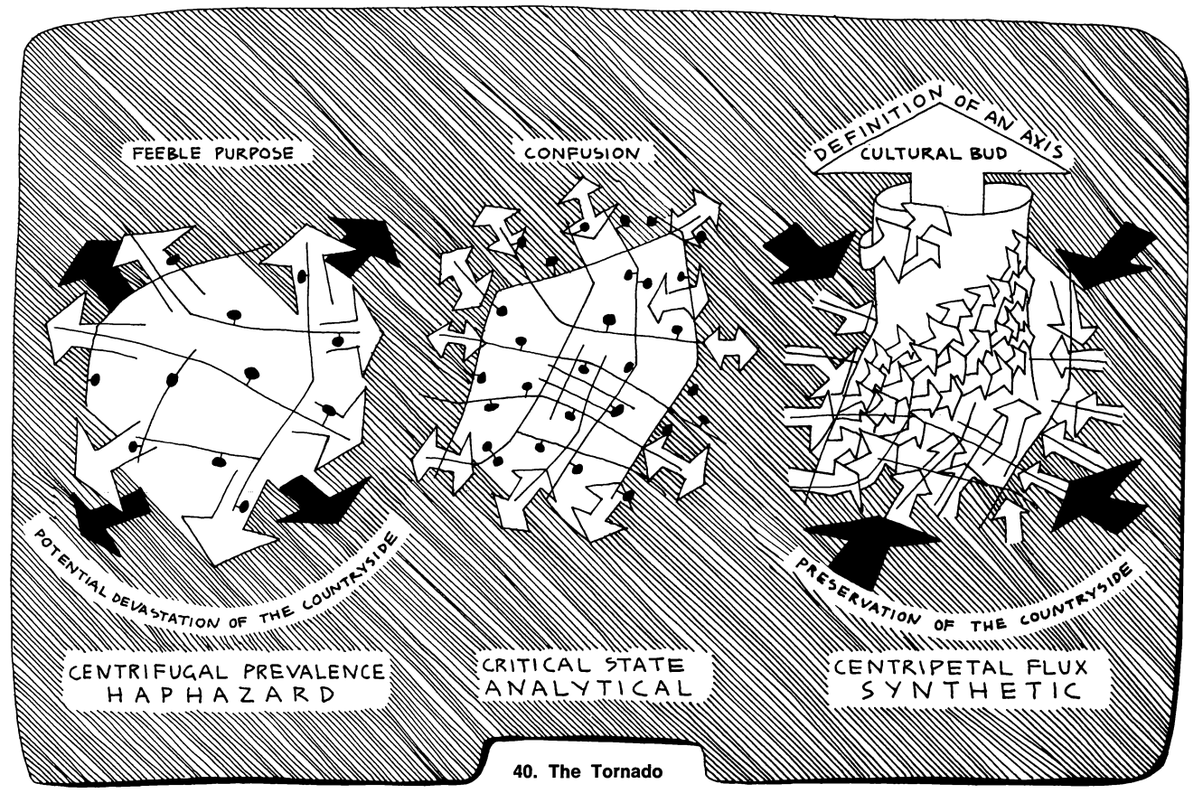
Sloth, rationality, or aesthetogenesis will then be the three choices, because lurking in the folds of indifference will be the manipulators of sloth-man; because in the ticking and shrieking of a synthetic world will come, electronically, the mating call of sexless rationality; or because the dedication of man, the individual, and society will work at the aesthetogenesis of the world. *A subtly organized technology, mostly automated, a less fearful hominidae firmly holding the reins on the awesome monster, and a better notion of what a humanized ecology will be, will make the solid piers from which will be launched the fantastic journey into the not-yet-created.*

The metamorphosis of man the maker into man the creator will be fostered by transference of the making to automation—technological neonature—and by the involvement of liberated man in the creation of an environment in his own image: man, the creator; aesthetic neonature, his creation. (Figs. 33, 38)

We see the tide of boredom investing society at her affluent best, leaving on her lap a litter and waste of persons, bodies, and souls. *If we are not able to spark the imagination of man with powerful vision on those points where power is clustered manyfold (the city), we miss, not peripherally but totally and centrally.* This is the responsibility of power, and the shrinking from it is an irresponsible act.



39. The Phoenix



40. The Tornado

18.Procedures

The decision to undertake the construction of an arcology will rest on the prime premises of experimentation: the investigation, to be carried out to its conclusion, of an urban problem framed within an arcological conviction. This is the experimental phase common and inevitable in any pioneering venture. A very feasible and significant step in this direction would be the participation of ten to twenty major business corporations in the development of a superstructure containing the home office of each, plus residential facilities for personnel, laboratories, and the necessary cultural ingredients. This would be a pilot "city" of arcological momentum.

Once the experimental phase had furnished guidelines, arcologies could be conceived for specific programs. A refusal to face this necessity and pay the price for it will result in an accelerated decline of the urban tangle and a rapid decay of civilization. This direct interdependence is what we have tried to illustrate in the preceding pages.

Examples for the "arcological approach":
1. The failure of an existing urban center to rally and recapture its needed vitality induces urban authorities to plan a step-by-step withdrawal of the social body from the condemned town. This could mean a dislocation of the whole population away from the old site. If the site has proved obsolete or nefarious per se, a more suitable site may be chosen. If not, the arcology can spring out from the discarded shell (the town).

In the long run this latter situation may prove to be the wiser choice. It would rehabilitate a depleted site while carrying a continuity into the process. It would clear the rubble, restore a few structures worth preserving, and would not take a new parcel of land away from the environment. (Fig. 39)

2. A starting condition of houses scattered haphazardly, as in pioneering communities. This amorphous condition spreads with centrifugal acceleration (the community is "growing"). A need and a demand for a centripetal counterflow is solicited by the stiffening caused by such scattering. A critical level is reached when the necessity and the demand for convergence becomes dominant. The idea of an organism is injected into the "critical status" condition.

An (abstract) archtype, the arcology, helps to establish a structure. At the critical moment, when the change of state will occur from scattered atomist to centered organism, the abstract structure is put aside, the pertinent morphology is conceived and gradually realized. In accelerated motion one would see something like a benign tornado uprooting one by one the loose cells of the town, clustering while transforming them on a functional axiality, leaving at the feet of the new "town" a large space for the rehabilitation of nature as it may fit the needs of the citizens. (Fig. 40)

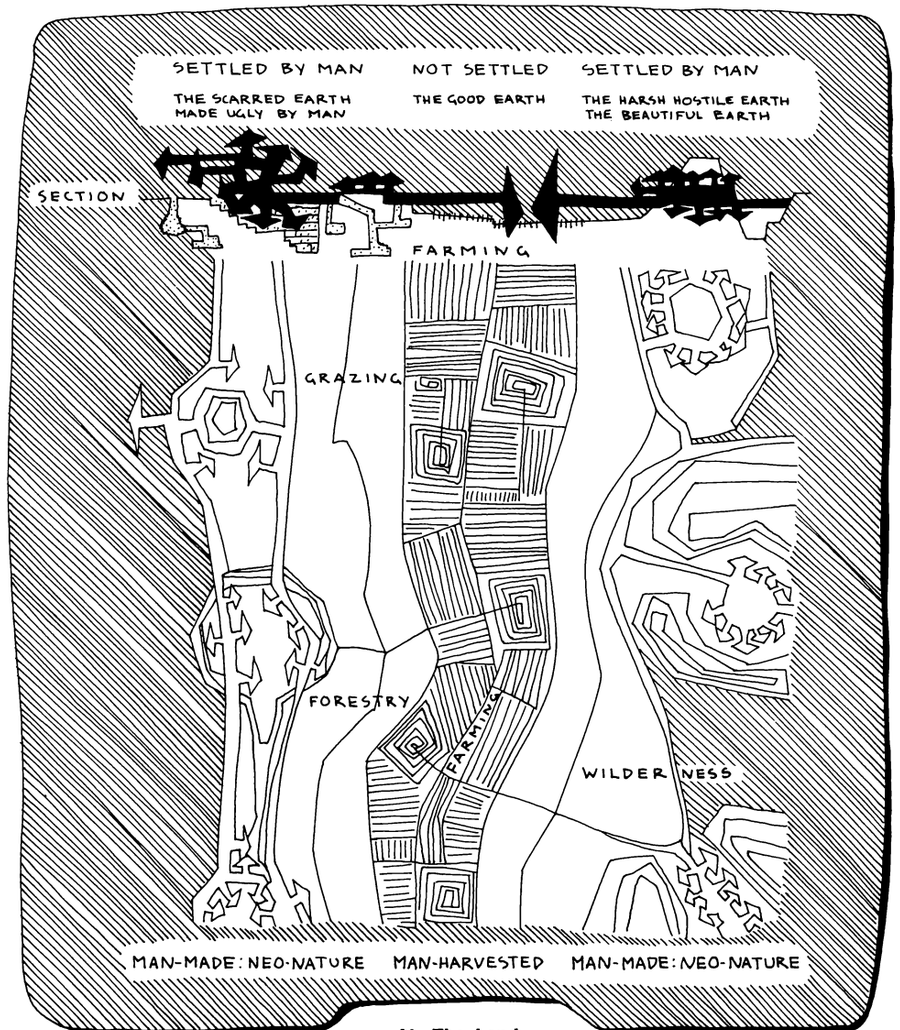
3. The recognized need for limiting the expansion of an existing urban area, expansion that will end in the destruction of the city itself. A new center (arcology) is conceived to care for developing activities and increasing population.

4. Mining, quarrying, or other similar undertakings have left a large scar on the body of the land. Its idleness and ugliness, the danger it represents as an ecologically regressive factor—soil erosion, floods, depletion of wild life—are demanding a healing action.

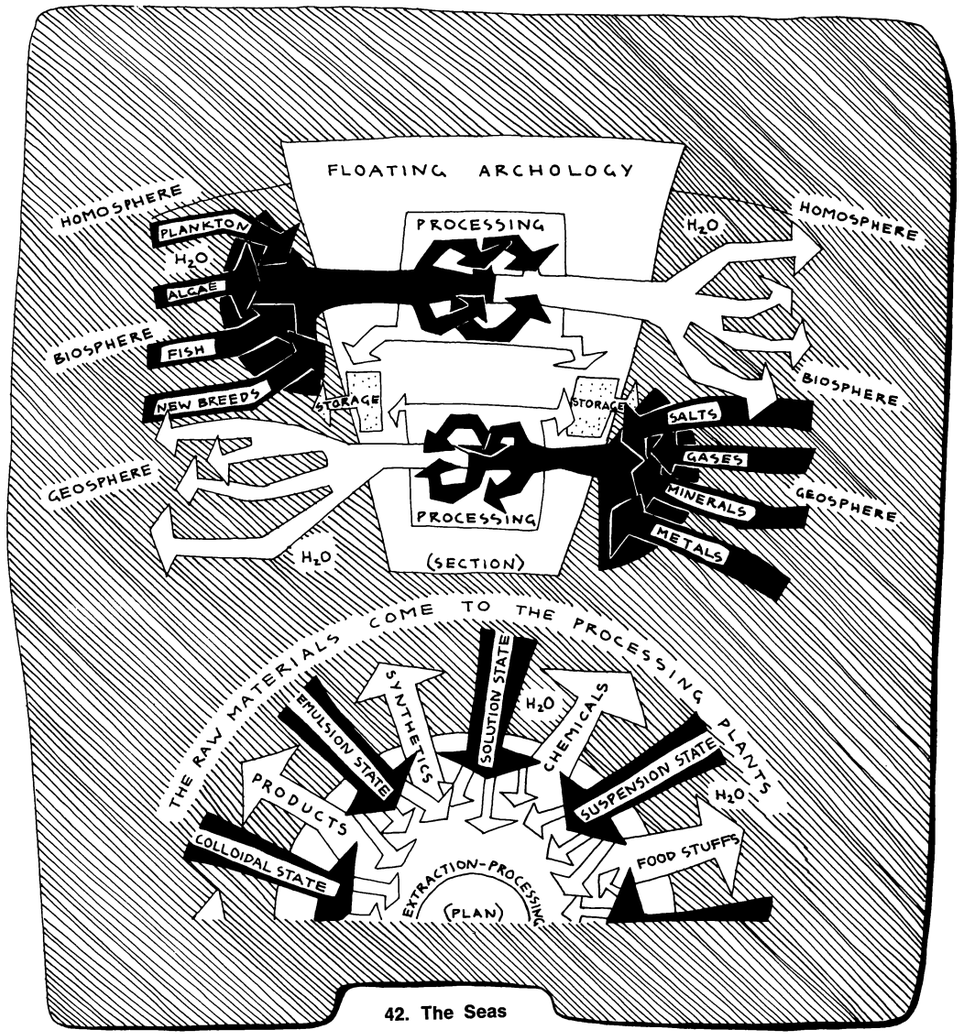
A vacation center, a health center, or research, or culture may be the nucleus of the new city, establishing an ecology of its own, "a monument" to man's care. In this case the exposure of the geological backbone would be advantageously used for the rooting of the arcology. (Fig. 41)

5. The construction of large or colossal masonry wo for specific functions—dams, tide breakers, retainin walls, chasm bypasses, superhighways, watershed c versions, waterways, river control—are combined wi creation of new urban centers, arcologies of opportu In each of the listed cases a great mobilization of re sources has been needed: science, engineering, pow power machinery, and labor. Furthermore, all kinds utilities are brought into use: roads, railroads, landin fields, water, power, telephone. The sites, more ofte not, are beautifully endowed. Finally there are the c sal structures themselves, bold but lifeless.

The organization of such megastructures into plurif tional organisms seems not only justifiable but so re ing as to make man regret their absence. *This injec of man's society into the body of the megastructure essentially an introduction of "porosity"—from undi entiated solidity to cellular resilience,* structurally fr passive weight resistance to dynamic contrapositior of forces. Even here at the elemental protoliving le there is a suggestion of becoming.



41. The Land



42. The Seas

These constructs, so diverse at their roots, would foment —almost force by the nature of their scope—infrastructures, social as well as physical, of unexpected and fertile novelty. The minds as well as the meter would have to rise to the challenge or risk the grotesque. (Fig. 41)

6. It is found necessary to establish a new community for what at the beginning may be a very specialized undertaking (Los Alamos, Kitimat, etc.).

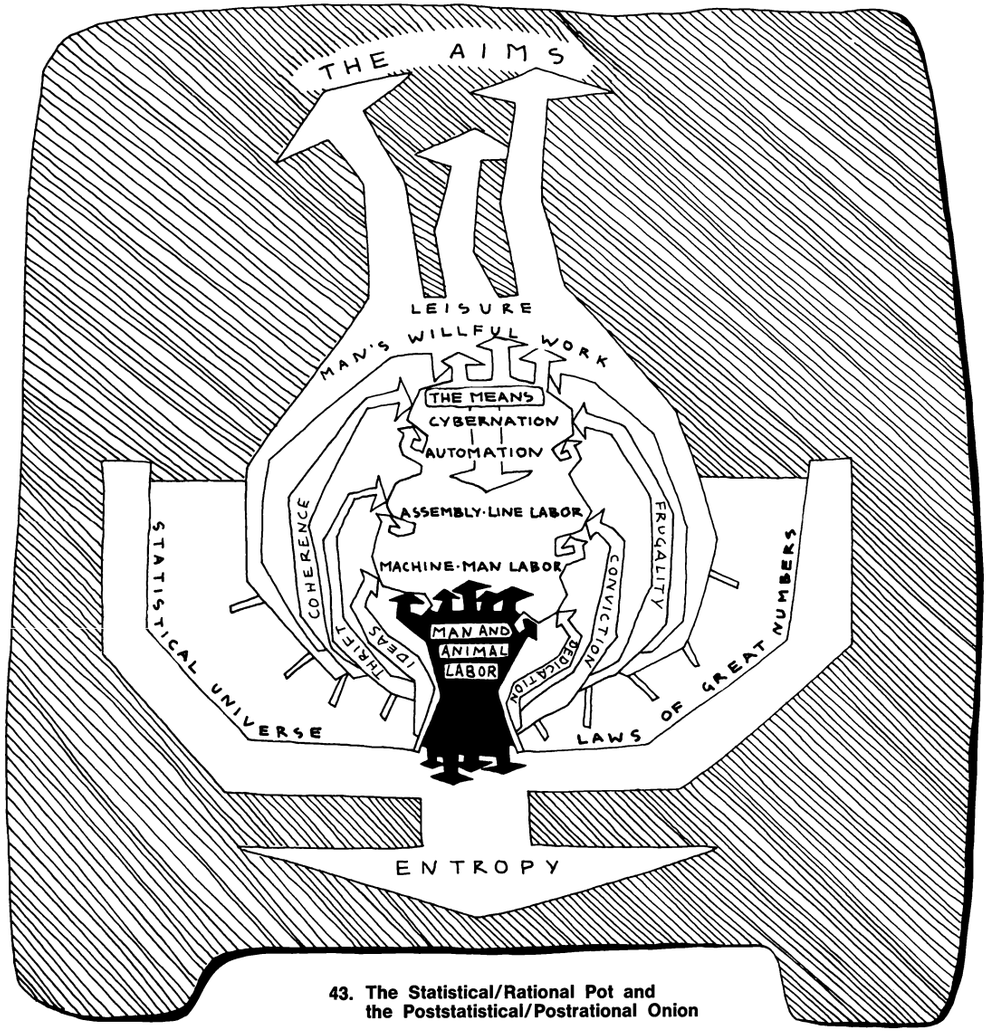
The functionality itself of specialization demands the diversification of the urban texture so that the specialist may reflect himself fully in the full person. To plan so as to universalize the character of the new city, its planning will foresee an evolution from specialization to complexity: an arcology.

7. When the complex marine ecology is understood, the stream and current flux mapped, the channeling of climates, biological life, chemical concentration predicted, an ideal "force line" could be patrolled by floating arcologies. Like gigantic digestive apparatuses, they would selectively absorb the wealth of the seas and its stored energies in vegetal stuff, animal life, minerals, chemicals, transforming them into usable and exportable food, raw materials, and commodities. Such highly productive organisms would at the same time alleviate the population pressure of those sea-conscious nations (Japan) that have been exploring and harvesting the seas for centuries. Such would be the new forms of life and society on and within the seas, where the surface marine life would have a mirror-imagelike counterpoint in the submarine, manned by the new oceanaut breed. (Fig. 42)

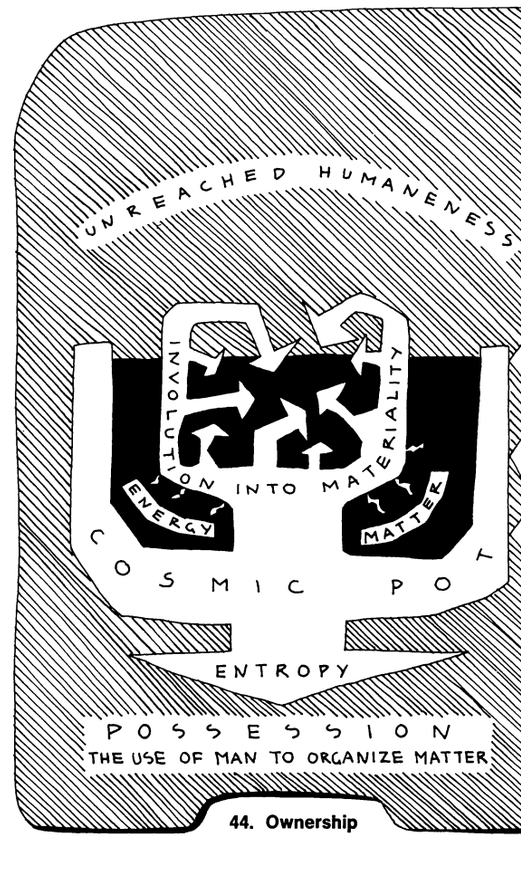
8. The abstract nature of space will find its match in the abstract machines man is going to put in it, abstract machines inhabited by humans; thus, the need for a balance of the mechanical and psychobiological to afford spaceman a reasonably human life. This will not be achieved by a flowerpot on the computer counter (real flowers), nor by predigested salad, nor by a Picasso on the wall. It will have to be environmental, ecological: arcological.

9. The simple recognition that the worth of a civilization is born and reflected by its cites, that the well-being of its citizens is conditioned to the care given to them, and that a bold new assessment is needed in this field. *Land conservation will succeed only if and when man creates beautiful cities wherein he will feel it a privilege to be, live, and work.*

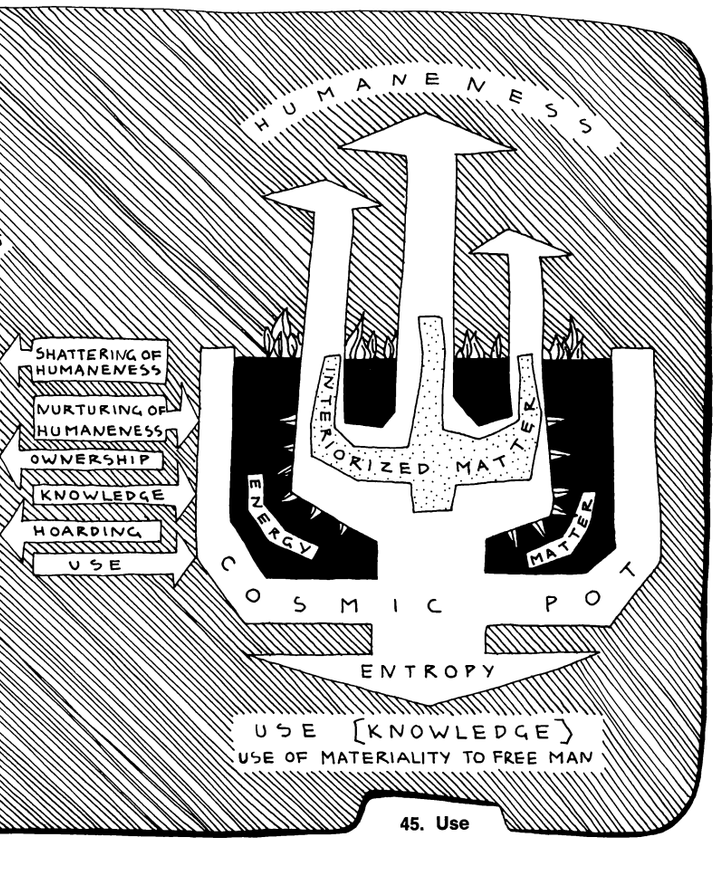
10. The pressure of economic crises, the specter of unemployment because of automation, the conversion from overkill or flag-murder to fruitfulness, the potentials of the underdeveloped countries—all idling or liberating immeasurable amounts of skill, intelligence, power, and materials—a new urbane era at bay, begging for answers.



43. The Statistical/Rational Pot and the Poststatistical/Postrational Onion



44. Ownership



45. Use

19. Arcology for the Individual

The technological trauma by which the individual feels depersonalized and degraded to a condition of interchangeable cell, dipped in red if productive, green if manutentive, blue if communicative, and so on, is the mal du siècle (Western). Standardization is the virus.

The countless blessings of standardization must not blind man to the incontrovertible fact that total standardization is total depersonalization. This is after all the means by which it *can* work: to take out of a product everything that, colored by "personality," may infringe on the capability of being "uniformly" produced.

Is there an ontological dilemma? Wealth by standardization—with it and by it a society of automata, or a society of "hand-makers" rich in individualism but forever pauper? Certainly not. Standardization has built into it the means to an answer. (Fig. 43)

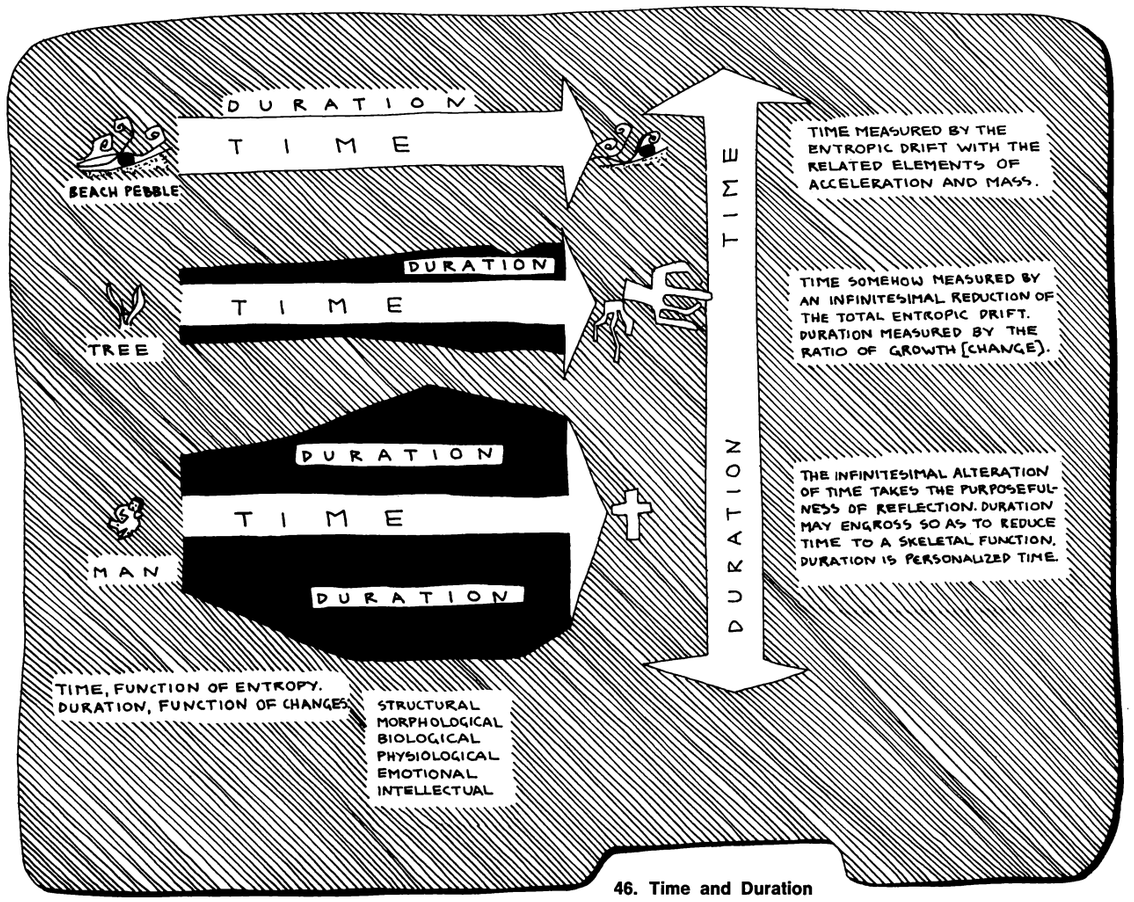
Automation is the answer: man's release from the toil of labor, that activity to which man has always been bound so as to produce on his own and/or to acquire the buying power he needs to survive. *With production (and then maintenance) given to automation via cybernation, the acquisition of buying power will take on a totally different meaning.* The choices for man, paid for living but no longer for laboring, will be two: idleness or creativity (play in between by choice), the two faces of leisure. *The responsibility for personalizing the automated society will fall on the creative use of leisure.* Free man disinterestedly working, and the gift again appears. It does so justly and right in the center of life, there where man is seen as a unique element co-operatively involved in the formation of his culture: the aesthetic universe. (Fig. 28) This individual creativity could articulate on nonanonymous terms the infrastructure of the arcologies by physically inserting the individual's own construction (home, office, workshop, store) within the broadly constructed megastructure: organism and individuality as against chaos and coercion.

It should be remembered that such a base of organization, the arcology, is per se a superrational and superstructural phenomenon. Thus there is an enveloping aesthetic neonature and within it the detailing of "molecular" aesthetic personalities. (Fig. 18)

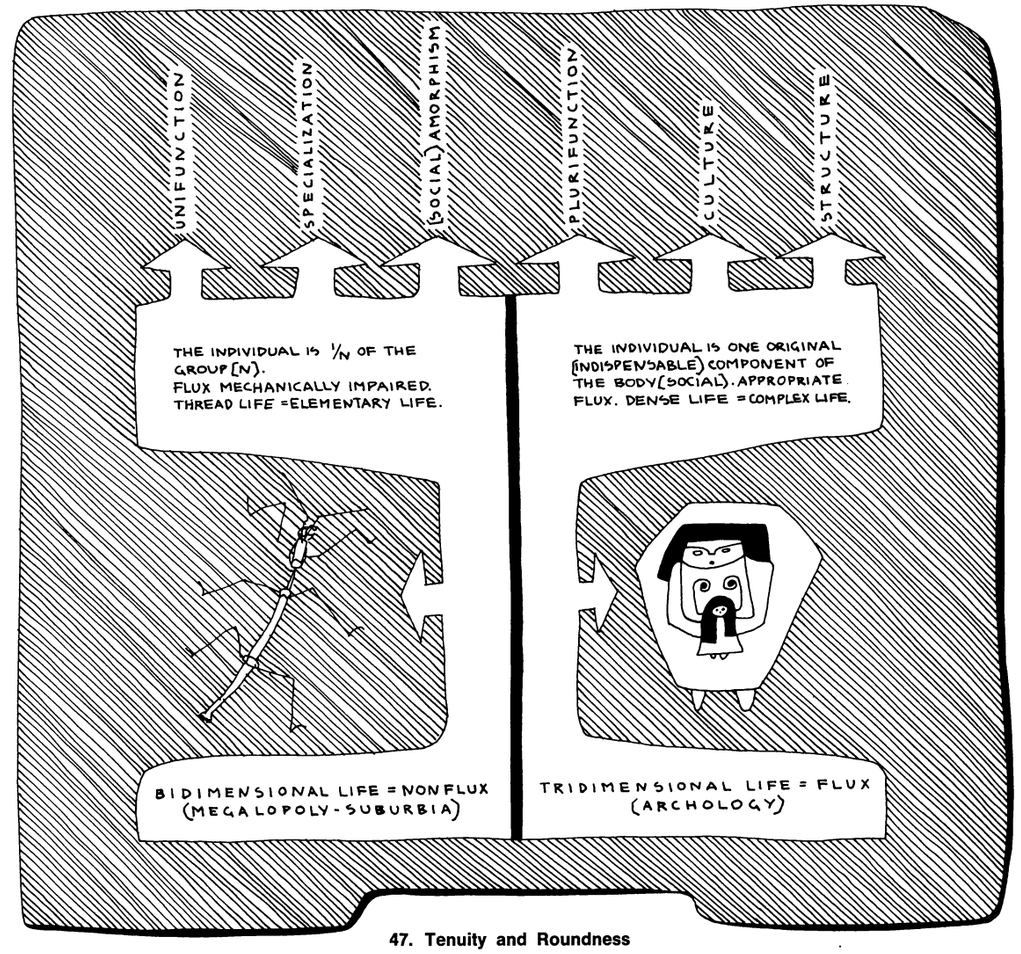
The organization of man's life, subtly directed by the machine, which is organization, is going to reach forms unheard of. Hour by hour, minute by minute, *man will be on a track on which his freedom will be "traveling." Mentally as well as physically, he will abide by schedules computed for efficiency.* If this pattern is only temporary and made obsolete by greater sophistication in cybernetics (and discarding the intervention of evil), it will still be with us for more than one generation. What is more, it will be, and is already, conditioning man to a generalized form of nonresponsibility and nonwill which is very hard to overcome. (The illusion of the profit incentive through free enterprise is on a dead limb.)

The "organized freedom" promised by progress will conquer the contradiction inherent in itself only if instrumentally contained. In other words if an ever greater interiorization of reality takes place, a jealously private and cherished individuality will correspond to a collectively resolved and working functionality. Thus, the pattern of today's society will reverse. In this pattern there is an almost pathological concern for the possession of matter (organized or not), and as a psychobiological consequence the mind is the slave of the "system" that makes this possible. For the true, free individual, the common use of matter as instrumentality will release his energies for his own free flights. (Figs. 44, 45)

Real ownership is knowledge, while we must possess only that which is foreign to us. *That which I understand is mine, and the understanding is the true possession, not the physical holding of it.* Interiorization is the ability and joy of grasping what is out there and assimilating it. It is the first phase of the two-phase cycle of the aesthetic process: interiorization and expression. Expression is the materialization of that which, originally physical, has been interiorized. This transfigured matter is aesthetic neomatter, and it is not solely our anchor to freedom, it is freedom itself. *Freedom is creativity, or it is only the "choice" of that which is unavoidable.*



46. Time and Duration



47. Tenuity and Roundness

20. Nature – Neonature – Man

Customarily man constructs his immediate environment by inserting individual, man-made structures into the larger structure of nature. He accepts or takes for granted that the natural setting is the only possible base of departure, and he sets out as an individual to get the best of it. The approach does not change when the given base is no longer the original ecology but an aggregation of the man-made, composed of all the other individual, granular undertakings that preceded its arrival (homes, shops, gas stations). Thus, he will accept his lot among "the lots," that roof among those other roofs—*he will submit in other words to a situation that carries coercion without a reason behind it, if one excludes the nature of randomness.* The problems arising from the unnatural conditions that this pattern develops do not find solution in any of the natural devices that one may call, generally and comprehensively, ecological.

The reasons for the deficiency or inefficiency of the natural laws are probably inherent in man's basic nature, man the maker, that is, and in the strictly related phenomenon of duration—and the forcing of biology into the kind of rationality that is no longer bound by laws of probability but by intelligence-will. Man literally rushes evolution at the pace the intellect seems to press for, even when and if too much is scattered and lost by the wayside. (Fig. 46)

The element of individualism compounds the difficulty because of the limited historical significance inherent in the struggle for self-assertion and the fundamental inefficiency of the total aggregation, instrumentally stifled by the unaccountable bypasses of each human monad.

Hence man, instead of stepping from "natural" ecology to man-made ecology and from there to culture, sidesteps into that condition of amorphism which is chaos. The gap, structure of nature—structure of man, needs a bridge. (Fig. 13) This is the "in-between" whose character may be the coordinating form through which nature itself may be filtered, transfigured, and humanized, that is to say, torn away from the laws of great numbers by which the proto-living abides and aestheticized as the human seeks.

This in-between bridge is the city. It is a neonature within which each individual granule should find its location tridimensionally significant and durationally congruous with history.

This was the "polis," organized on a few fundamentals, each a handful of ideas-processes: the earth ruler, the divine ruler, productive skill, administrative skill, bartering skill, play—the plague. It was a relatively simple "organism," instrumentally efficient in the satisfaction of relatively simple needs. As the organizing process lost track of the parameters, ever increasing and interwoven, organization broke down until the idea itself of organization was questioned (laissez-faire).

Unfortunately, or luckily, biology and physics are not bypassed by disregard. *Very basically, one may say that matter must move swiftly if ideas are to grow* (which they must). This is the miracle of biology, a miracle reaching the sublime in reflection: man.

The mental finds in biological harmony the means to creativity. Biological harmony is based on subtle logistics: the flow of energy-matter and its manipulation at the optimum of its potential. (Figs. 15, 16) The concept of depth is both physically and mentally meaningful here. It is self-evident that a one-layer mechanism is inapt for the care of ever-increasing complexity. And the failure of granular neonature on its purely instrumental basis is also self-evident.

Megalopolis as well as suburbia is functionally irrational because it is essentially bidimensional, even when made of granular stratas. (Fig. 47)

This condition of outer bidimensionality reaches down to the individual, isolating him, causing upheaval and disruption.

We interpose between the scattered plenitude of nature (remember its unhuman module of space-time) and the dense introspective plenitude of man the platitude of our handiwork, the artificial. *What we need is that in-between structural system by which nature itself is filtered and welded in forms more apt to carry the extreme valence of contemporary man,* an ecology made of nature and man, framed in an architectural system.

Then man will step from natural ecology into a man-made ecology to find a number of assets:

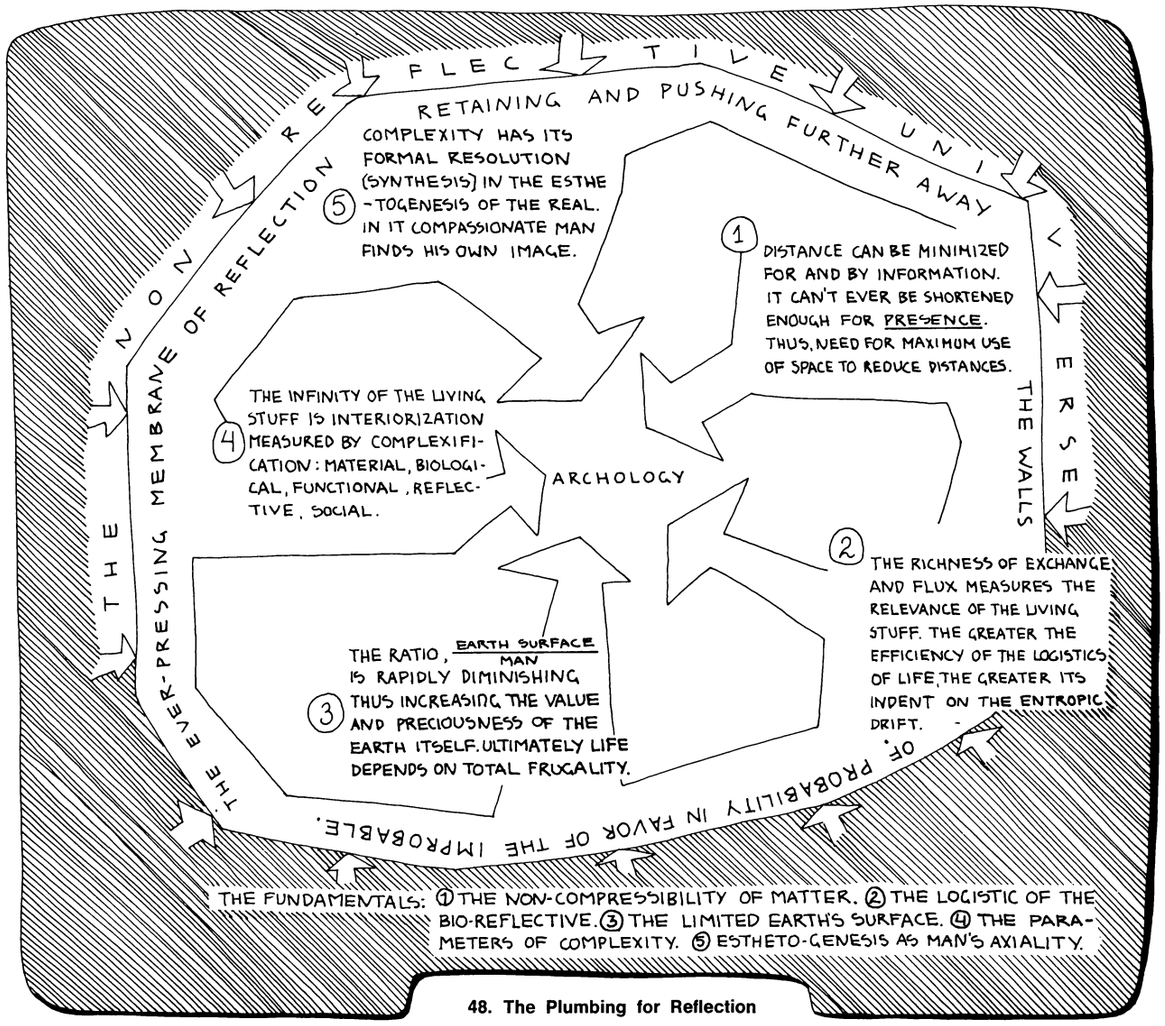
1. Mechanically, the structure of the whole serves him efficiently for all his material necessities.

2. Humanely, to the mechanical freedom acquired and because of it, he can add an access to self-expression, integrally compounded and not just encroached on the whole.

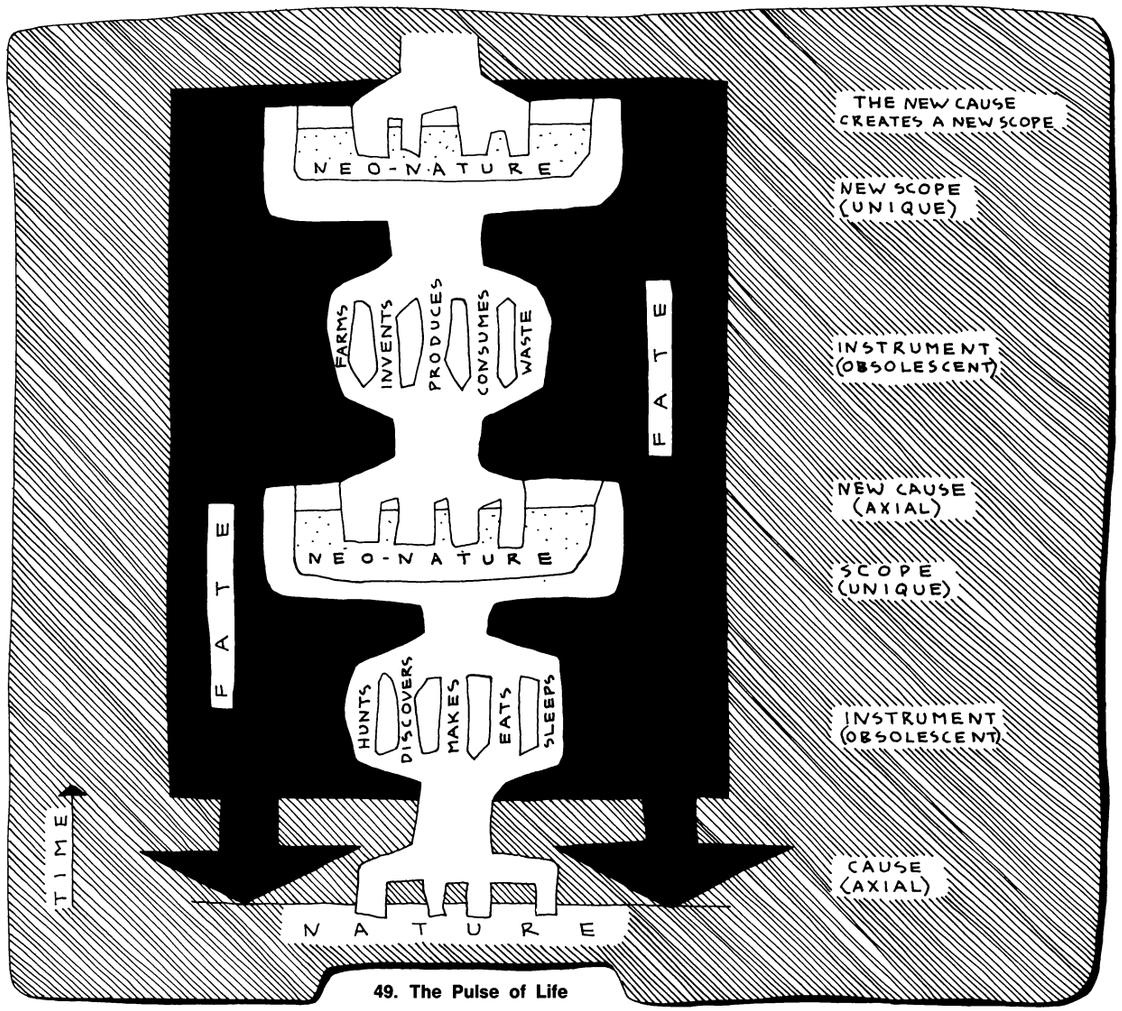
3. If he so chooses, he can feel and be part of a graspable and awesomely alive and telling system.

4. Culture in bountiful amounts is where he is; it is infinitely varied as an infinitely complex life develops in the four dimensions of the organism (duration being the fourth dimension).

5. Nature, the ancestry of man in its unending novelty and secrecy, its generosity and harshness, is at his window and at his door. He can visually reach into it from his "living room," physically be in it within a few minutes. (Fig. 27)



48. The Plumbing for Reflection



49. The Pulse of Life

Arcology is not a new strait jacket put around society. It is meant to be a framework well equipped to sustain and inspire the action of man. In it, free man would be "urged on" by the superrational substance of the framework itself, expressing, in one, faith in him and the acceptance of his divine-demonic nature. (Fig. 48)

21. Science and Human Environment

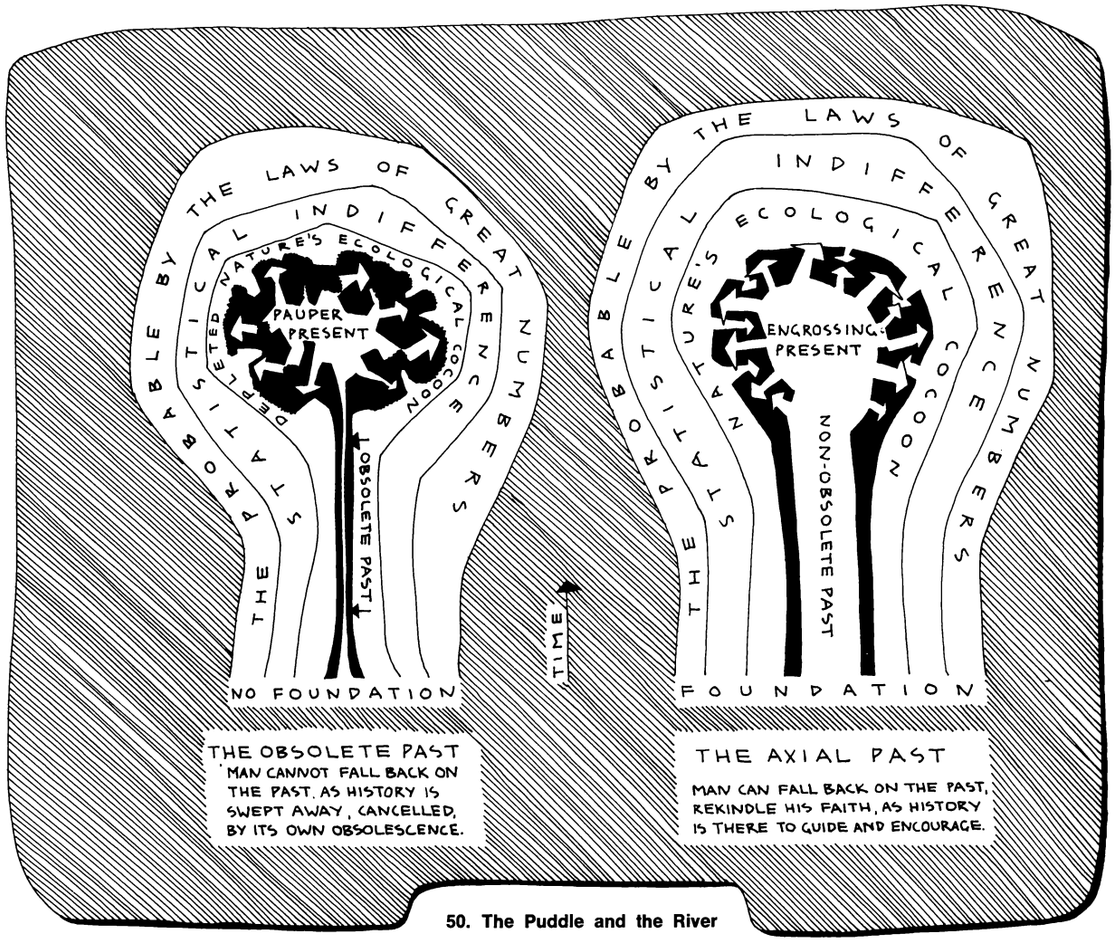
The vision of science is to acquire enough knowledge to reach the point from which man can, at will, wisely and knowingly reproduce whatever of the existing he chooses to. Knowledge becomes power, and what else but to produce the most sophisticated and complex machine on earth, man, may be the ultimate triumph? An improved man, one may say. Laboratories produced organic matter at first, while physics and astronomy became a mathematical cosmos, constructing lethal formulas on the side. Then came genetic repair, then genetic constructions, then assemblage of genetics and electrochemical devices, and finally the man-made man. . . .

If to collect litter may be the aim of the street sweeper, it is not the aim of sweeping institutions. The aim of the sweeping institutions is cleanliness. In a similar way, though the scientist may claim total indifference to what he calls the application of science, the institution of science is ultimately not the understanding of things but the power that man acquires through such understanding and by this power the ability to guide his destiny.

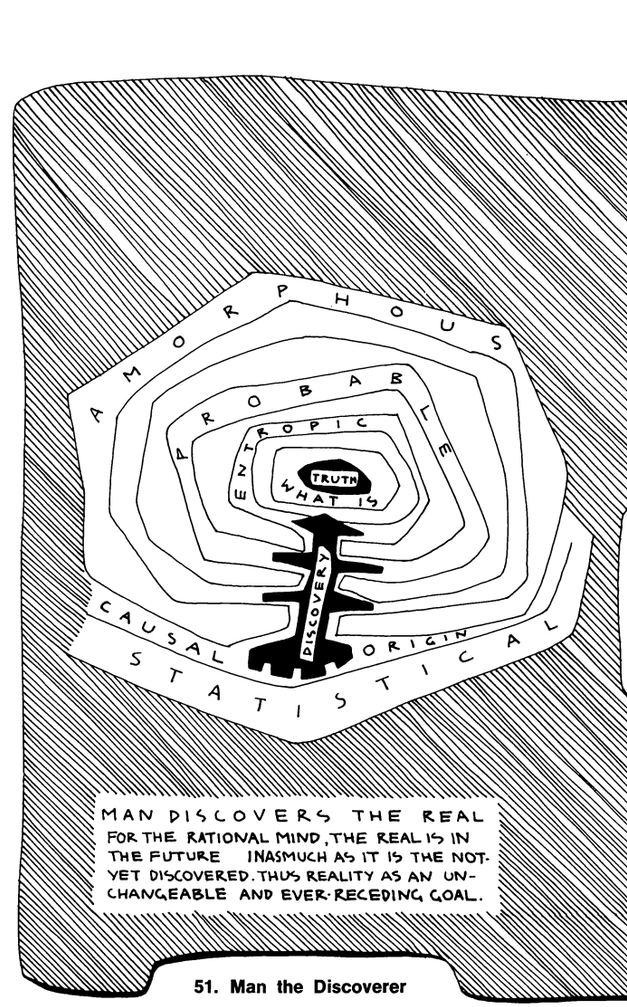
If man were a purely self-constructing knowledge, then one could maintain that the aim of science is knowledge. But man, being essentially a clustered energy (power), his and science's aim can then only be the organization of such power in ever more fruitful forms. (One can then see that at this "superenergetic" position man becomes a creator in his transfiguration of matter through the aesthetocompassionate process.)

It would be utterly senseless, unscientific, to achieve knowledge and stop short of making it an instrument for the fruition of life. *As the pulse of life tends to establish ever higher platforms, science and technology are responsible for their structural solidity.* (Fig. 49)

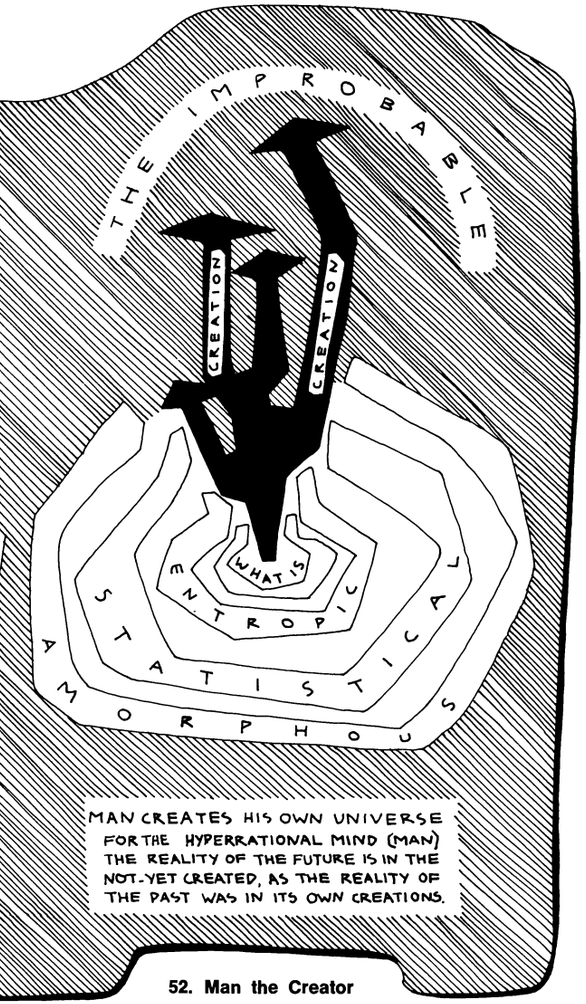
Technological betrayal lies in deficiency most of the time, not in evil. Thus, the joy and fulfillment of knowledge is in its power to coerce universal indifference into a willed structure. But the willed structure that science can construct is only a copy of nature's work; we call it invention. It is a copy within a compressed duration, bridging above the laws of probability. *Anything that science does above and beyond a copy, it does as aesthetic, not as science. This is because in such instances science no longer proceeds rationally beyond the individual but, at the very opposite, as a most personalized and intimate experience. There lies the aesthetic phenomenon.*



50. The Puddle and the River



51. Man the Discoverer



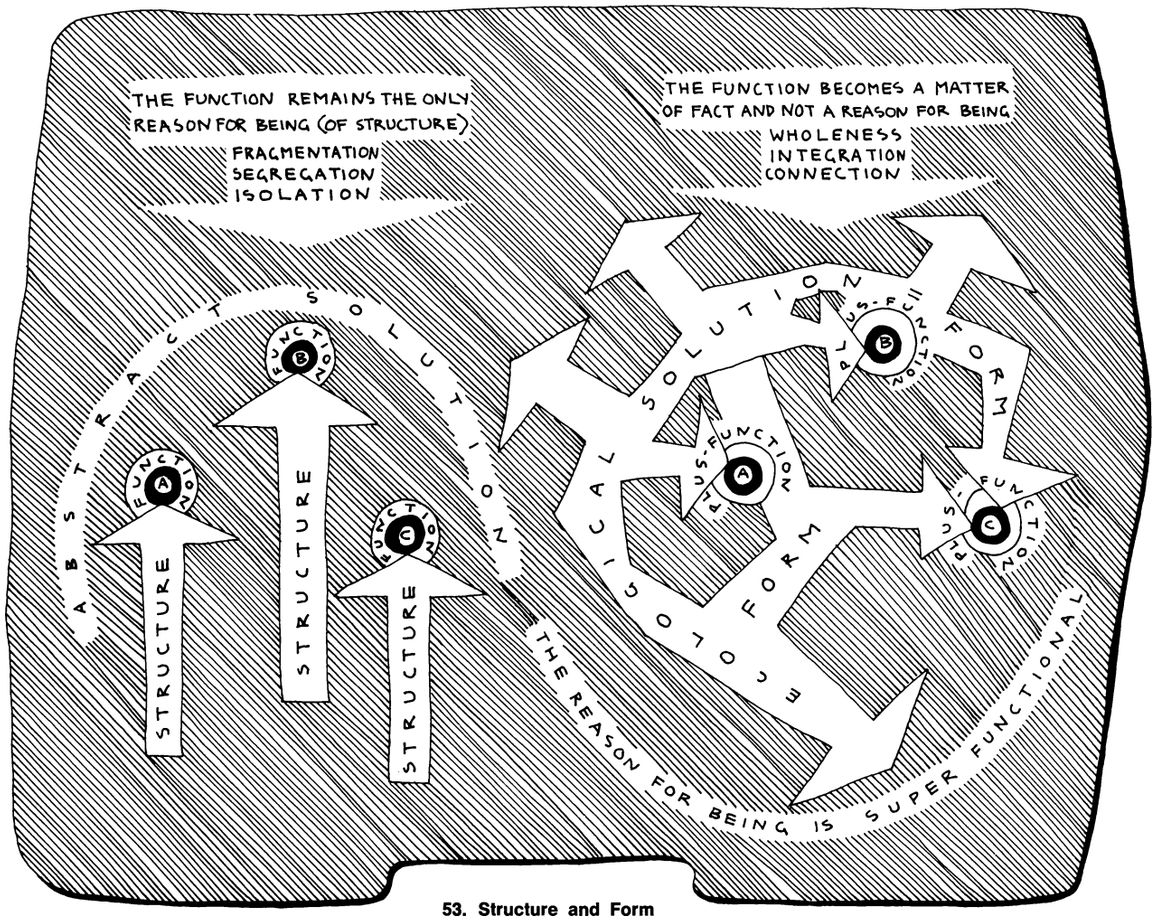
52. Man the Creator

To do what nature does is just the preparatory work for the creative step whereby a surnature (or neonature) is conceived and developed. Thus the meaning of science is in its finding of efficiency through guided endeavors, guidance not left to the drift of cosmic "laws" but held in by the purposeful energies of reflection. To do is to know ("actively"), and the asset of knowledge is its positioning of the energetic world in such a pattern and structure as to make the doing not just easier but also unavoidable. This unavoidable doing that makes man look like a madness-driven creature, carves the tunnel of life within nature and frames the walls and ceiling (encumbered by their entropic drift) with the structures of neonature. Those structures can be purely instrumental (structural), in which case obsolescence will obliterate them, or can overreach into form, making explicit and lasting the reverence and awe of man toward both the infinity that surrounds him and the complexity (infinity of another kind) that is within himself and is himself. (Fig. 50)

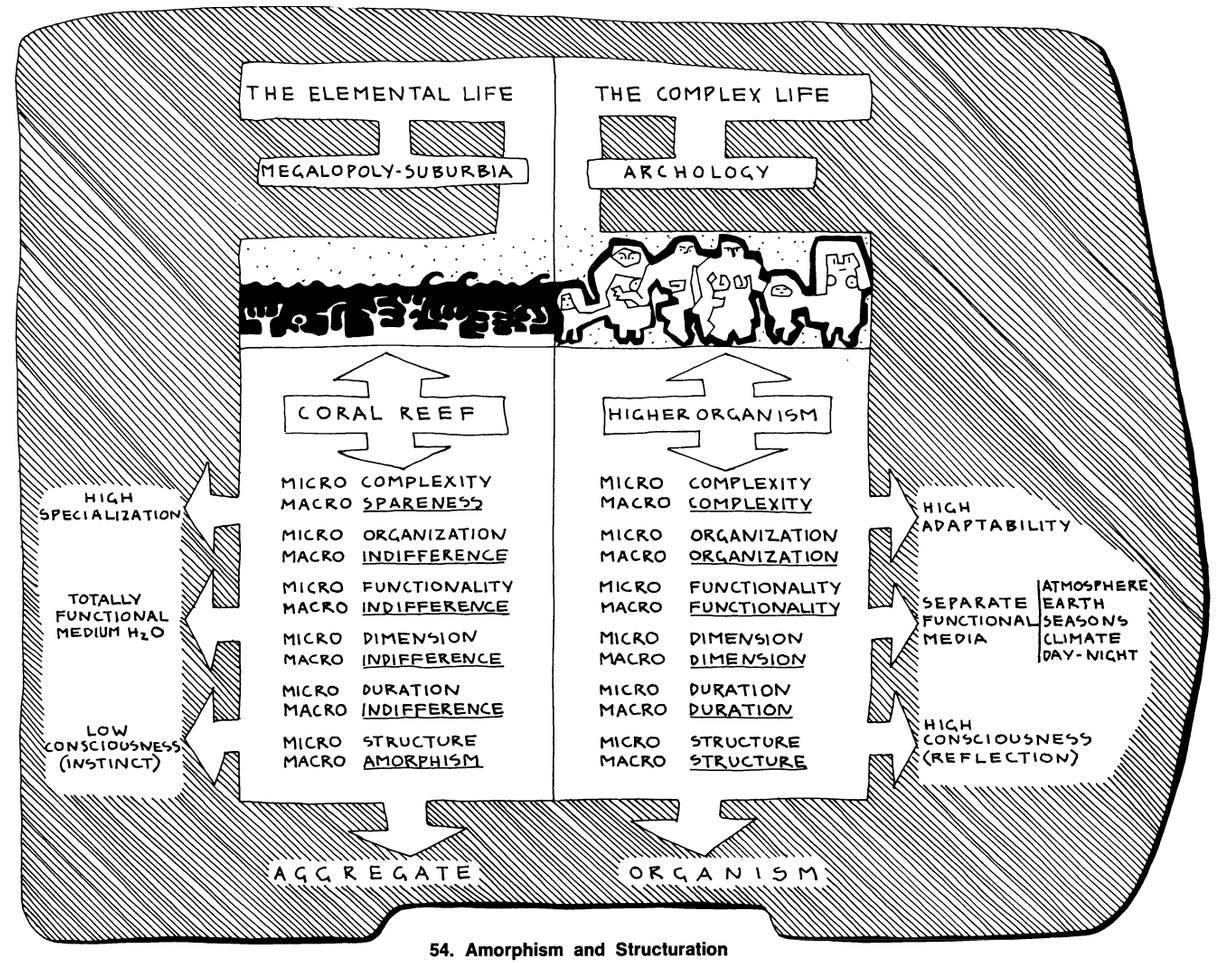
The aim of pure science is knowledge, and this it does through the progressive uncovering of the secrets nature stores and is. *The unspoken aim of science is the manipulation of those (once) secrets to remake things in the image of nature, of which those secrets are in the first place. Thus science can be said to be the recycling of nature through the human filter.* (Fig. 51) *If and when from the recycling a "never-before" thing results, the aesthetic act comes into being.* (Fig. 52)

In this way there is in science a bartering of existing things between the stony infinity of cosmos and the utterly fantastic turmoil of life, a bartering that alters the character of them both but does not really spill into the new. This would be creation, and creation is of another nature. It has to deal with superrational processes, unscientific by definition. Science rejects the nonrational as unreal. In so doing she puts herself in a position of noncompetence in all those fields or things that though existing, inasmuch as they modify the real, do not avail themselves of any computation or any methodological inquiry. If then science shows that part of the real may not be rational, it will immediately add that *of the real* only that which can be methodologically understood is meaningful: that which I do not know and I will not be able to know is irrelevant—*implying again that since knowledge is only possible of that which is measurable, measurability is the only reality. Is creation measurable? Is it not measurable out of ignorance or is it not measurable out of incommensurability?*

It seems to me that in the answer to this question rests the qualification of all of man's doing and the clarification of where the substance of life and humaneness lie. If the answer is that creation is not measurable only because of a temporary lack of knowledge, then the real (universe in its totality) is a "scientific" system gazing upon itself by way of man's intellect (reflection).



53. Structure and Form



54. Amorphism and Structuration

If the answer is that creation is incommensurable in the sense of being beyond measurability, then the real is a superscientific system (generating from a scientific foundation). *I have been calling this ultrascientific "system" the aesthetogenesis of the universe.* Aesthetogenesis, and not ethos-genesis, or virtue-genesis, or sociogenesis, or love-genesis—because those are somehow the facets of the total, co-ordinative body of that harmony which aesthetogenesis means by grouping them under the name of compassion. I see them as the substance structuralizing life, to the point where form is "conceived": the hyperstructuration of the real. Creation appears at the inception of form, where what one may call a content is sufficiently organized as to structure itself and leaps or explodes into a new status, its own form, the (aesthetic) shroud to its own self (compassion). If the second answer is closer to what existence is, then the position of science is to be circumscribed within the boundary of instrumentality. As such it cannot dictate to man his future but is to be weighed by man himself step by step so as to keep its uncovering and use within the boundaries of humaneness, the boundaries that science cannot define as they are beyond its reach. (Fig. 53)

In a very direct way this signifies that a technological environment is a nonhuman environment, and the question is not of adapting man to it but of investing a lean system of not purely instrumental flesh on its skeletal structure, the shroud here indicated.

One may now say that everyone knows that we must beautify our lives if we want to find joy and happiness. This is a truism so mechanically repeated that no one bothers even to believe in it or act by it. And this is so because there is no real compelling force behind it all in the way the whole thing is explained. The usual explanation is that for lack of more serious or weighty things to do one can always find reward in putting up veneers of prettiness on the substance of matter. But that naturally is matter that does not count.

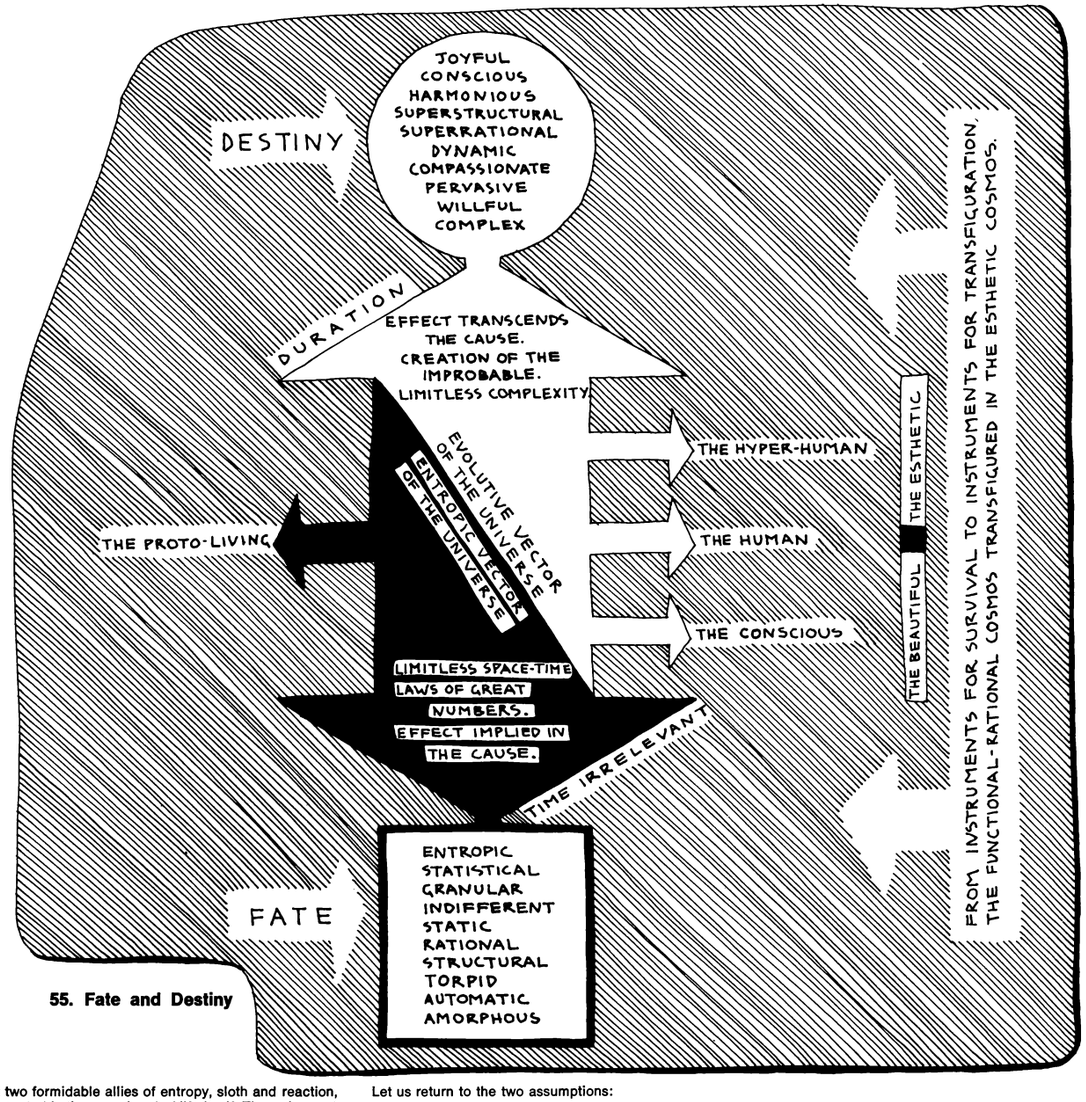
You do not eat beauty, nor can you scrub yourself with it. The answer is naturally immediate and unmerciful: *man does not create in order to eat. He eats in order to be human.* To be human is to be a creator. If this were not so, the greatest service science could do for man would be to return him to the jelly life of the primeval seas. (Fig. 54)

This taking back of man is practically perpetrated by every single coercion on humaneness, be it by means of individual renunciations, giving up, as one says, or by means of many institutionalized allegiances. In short, it is the choice between evolution and involution, between amorphism and (structured) superstructuration.

22. Free Enterprise and Aesthetogenesis

Free enterprise assumes that things controlled by man can operate as any other phenomenon does, that is, according to the laws of great numbers. This assumes that (1) the "materials" with which it begins are structural, and (2) time is for man's purposes unlimited.

Before disputing these concepts, one has to confute the position that nature works by average laws. Up to the inception of life, in pasts beyond imagination, this was probably close to being so. Beyond that threshold and facing the future, choice—that is, the rejection of a statistical unfolding of things—ingrains itself ever more deeply into the texture of nature. *With the birth of choice, the structure of the fatal, rigidly framed by the limitlessness of space, in a time beat scarcely audible (or conceivable), is chiseled away as marble is by a sculptor seeking a "historically valid form."* Evolution carves itself out of the immense body of matter-energy, and the barriers of the impossible as well as the decay-entropy are constantly, unremittingly pushed aside, the probable giving way to the ever more improbable.



55. Fate and Destiny

Yet two formidable allies of entropy, sloth and reaction, are nested in the arrowhead of life itself. Through countless disguises, within the folds of free enterprise, the statistical finds enough ground to work itself into "motivation." *One then acts not out of intensity or reverence or, one might say, love and compassion but because a tabulated experience, abstraction of the past, "strongly" suggests the way to go.* That amounts to a past, sterilized by the extraction of averages, unexplained and unexplainable in its progression but tabulated in its "results," which is taken as the unfailing guideline for a future of no future because it essentially feeds on hopelessness (fate). (Fig. 55)

If reality moves on, it is not because of perfect calculation but lucky miscalculation. Life stronger than death—the past that the statistical appeals to is not really our past. It is just a guideline based on a protoliving system, the one life itself sinks its roots into and at the same time pulls (or pushes) away from.

Let us return to the two assumptions:

1. The "materials" with which free enterprise begins are structural. *The materials, aggregate of accident (ego) and the shaped instrumentality, are not structural.* Accidents and ego have altered the "probable" structure of the nonliving without co-ordinating it and themselves within any structure, much less any superstructure.

2. Time is for man's purpose unlimited. Such time is not unlimited. Time moves for man by the beats of generations or, more humanly, by the flickering of an eye, the hint of a smile. *The fault with laissez-faire and free enterprise is their basically irreverent outlook on life.* Theirs is the loveless position of a conscience that beats not in resonance with universalized individuality but in agreement with the granulation of rules which, if they do make the protoliving universe what it is, are counter to the trust life moves by. This trust is of her own making, and that is definitely a contradiction of the statistical. To go back to the sculptor, his action is the opposite of casual labor if he hopes to conclude his effort with something meaningful such as a form, a destined entity.

23.Summary

Architecture is in the process of becoming the physical definition of a multilevel, human ecology. It will be arc-ology. Arcology, instrumented by science and technology, will be an aesthetocompassionate phenomenon. Its advent will be the implosion of the flat megalopolis of today into an urban solid of superdense and human vitality.

1. Arcology, or Ecological Architecture
This is the definition of urban structures so "dense" as to host life, work, education, culture, leisure, and health for hundreds of thousands of people per square mile. The weak veneer of life ridden with blight and stillness, which megalopolis and suburbia are, is thus transformed and miniaturized into a metropolitan solid, saturated with flux and liveliness.

2. Arcology and Man
Man, a creature of culture, is given such instrumentality as to have his reach greatly incremented. Education, culture, production, service, health, play, and an untouched countryside are at his fingertips. He can walk to them from his home, the place where he is master and the place he can define and construct by himself if he so pleases.

3. Arcology and Change
As for the cities we have, we will live with them. We cannot live for them. Thus, while effort will go into improving what we have, great and persistent effort must go into the development, parallel to the condemned patterns, of new systems coherent with man's needs. Arcology is, in short, an efficient plumbing system for contemporary society.

4. Arcology and Dimension
The squandering in land, time, energy, and the wealth of megalopolis and suburbia, now well entangled in their increasing contradictions, is rejected as obsolete. With arcology there are two conditions: (1) immense nature: extensive, kind, and brutal, the reservoir of life; and (2) the man-made: dense, organized, powerful, and serving man well. With the third dimension, the vertical, no longer a limitless sea of housing in a choked system of dim vitality, man is reinstated as the measure of things and primarily as the compassionate measure of himself and nature.

5. Arcology and Scale
Scale is that characterization that makes the performance effort congruous with the aim.

The configuration that makes it impossible for the hungry man to sit at the bountiful table is a configuration that is not human. Dimension, proportions, and visual grasp are subordinate categories made human or unhuman by the amount of real reaching power they offer to the individual. A building or a city are out of scale with the people they serve when the function they promise is put out of the realm of the possible.

Arcology is both dimensionally (1 cubic kilometer as against 400 square miles) and functionally on the human scale without loss of its awesome force, indeed almost because of it.

6. Arcology and Distance
Distance is a tax on reaching power. By the aberration of the car, such a tax is starving our culture. The car is dividing things more and more by scattering them all over. Then one finds that it becomes more and more difficult to reach them one by one, impossible to reach them all in one. Acceleration-deceleration, natural sluggishness, and the antiswiftness inherent to scatterization make high speed urban transportation a perpetual illusion.

In arcology, distances are measured again by walks and in minutes. Within it the car is nonsensical. It has nowhere to go.

7. Arcology and Land Conservation
The compactness of arcology gives back to farming and to land conservation 90 per cent or more of the land that megalopolis and suburbia are engulfing in their sprawl. To be a city dweller and a country man at one and the same time, to be able to partake fully of both city and country life, will make the arcology a place in which man will want to live. The creation of truly lovable cities is the only lasting solution for land conservation.

8. Arcology and Natural Resources
The reserves of ores and fuels are not infinite. The squandering of such collective capital wealth, while proclaiming the sacredness of exclusive and personal possession, is irrational, to say the least. Chemistry and biochemistry might find a magnificent future for such resources. By then most of these will be reduced to the second-rate pockets that will have escaped man's greed. The frugal character of arcology moves consumption toward the use of the earth's income rather than the exhaustion of its capital.

9. Arcology and Industry
The destructive bite of the car on the U.S. economy and life will not last another fifteen years, nor will the Pentagon's ravenous hunger for war hardware. The car will follow the horse to the pastures of sport and eccentricity. War hardware will destroy us or will be destroyed by us.

There is the colossal and challenging task of punctuating the earth's landscape with a humane, beautiful "culturescape." Each arcology will be an industry in itself with its original standardizations, its automated systems, a cybernetic organism growing of its own volition. It will be an industry turned forward instead of backward.

10. Arcology and Pollution
We are concerned with the immediate menaces of pollution, but the long-term consequences escape us. These may well reach into our genetic structure as well as into the total geophysical and biochemical balance of the planet.

In arcology the ratio of efficiency to energy becomes many times greater, thus pollution will be manyfold smaller. Pollution is a direct function of wastefulness. The elimination of wastefulness is the elimination of pollution.

11. Arcology and Climate
For both extremes of heat and cold, as for any intermediate condition, the compactness of arcology makes it a most workable system. Instead of sealing the outside out, conditioning will extend to the ground, space, and the air enveloping the structure. The climate of the arcology, not a sealed cell but an open city, will be a tamed facsimile of the regional climate.

12. Arcology and Waste
As a sprawled-out man 2,000 square feet in area and 3 inches tall can work only on paper, if at all, so possibly can our megalopoly and suburbias work only on paper. They will never truly and substantially work for real. They are not real. They are utopian. Arcology can be a congruous system and, as such, an optimum system for the full and complex logistics of individual and social life.

13. Arcology and Cost
The initial cost of research and experimentation is by necessity high. A radical turn is never inexpensive. The actual planning and production cost of an arcology would be a fraction of the cost of our gigantic dwarfs for equal population, but not equal fullness, of life.

14. Arcology and Obsolescence
Flexibility and dynamism cannot be found where there is built-in obsolescence (a downgraded system is by nature inflexible). These are to be found where the full flow of life runs throughout a structure. If the tempo of obsolescence has the same beat as individual growth—childhood, youth, maturity, age—the individual himself is obsolete. The precariousness of his significance will destroy him. Arcology is a mirror of man's identity and a support to his doings.

15. Arcology and Underdeveloped Countries
With arcology comes the possibility of leaping beyond the mechanical age into the cybernetic culture and thus the chance of avoiding the robotization of men, the blight of the environment, the slavery of the car, the starvation of culture, all scourges of our Western success story.

16. Arcology and Leisure
A cybernetic system of immediate feedback with information, communication, transportation, and transfer quickened by shrunken distances, is an organism for true leisure.

For many, if not most, of the citizens such leisure will be voluntary work at the enrichment of the city, starting from one's own home and reaching throughout the intrastructure of the whole city. This will be a totally new challenge for artists, performers, craftsmen, and the engaged citizenry.

17. Arcology and Segregation
Segregation concerns not only ethnics and religions. It concerns activities and all age levels as well as it concerns, and stills, life itself. A social pattern is influenced, if not directed, by the physical pattern that shelters it. In a one-container system are the best premises for a nonsegregated culture. The care for oneself will tend to be care for the whole.

18. Arcology, Aggression, and Guilt
Aggression and guilt are in good proportion a bridge of a sort connecting meaninglessness to meaningfulness. Therefore a better bridge must be found. If man is really in need of risk and violence, if frustration and guilt are really tearing society asunder, then the awesomeness of arcology and the complexity of its construction are positive alternatives to war, social strife, and squalor.

19. Arcology and Medical Care
In arcology there is interchangeability and diffusion of functions because the obstacles of time and space are minimized, miniaturized. As all of arcology can be called a marketplace, all of it a learning organism, all of it a productive mechanism and a playground, so in a true sense arcology can be considered a total medical-care system. Home nursing becomes as feasible and as professional as hospital care, but far less costly and far more personal. Nurses and doctors move from home to home, as from ward to ward, making the family doctor real again. Infirmaries, clinics, and hospitals are always at walking distance, leaving no pockets of indifference (if not those maliciously wanted) that might be maliciously ignored.

20. Arcology and Survival
To pinpoint an orbital warhead on a square mile or so is a feat for the not-too-distant future. Evacuation in arcology can be almost instantaneous; its vast underground structure for foundations, anchorages, and automated industries will be good emergency systems. Arcology is the coherent expression of a faith in man, and as such it is beyond the survival platform.

21. Arcology and the Underground
Man must refute underground living. He is a biological animal of sun, air, light, and seasons. He is an aesthetic animal, and his senses are more and more oriented toward a usefulness of purely aesthetic worth.

The underground is ideal for automated production in need of technologically sophisticated environment: pressure, vacuum, radiation, heat, cold, rare atmospheres, and so forth. (It is also ideal for sense-less and senseless man.)

22. Arcology and Spaces
Man has been experiencing what one might call flat spaces. It is congruous with the space age itself that man acquaints himself and lives with the deep spaces an arcology creates.

As man lives intensely on the horizontal, the density of his societies can only be achieved vertically.

23. Arcology and Space
If we are destined to a "space" life of some sort, this life will be miniaturized by necessity. In arcology are the elements of interiorization, living inside instead of on top, and of compactness. In this sense arcology is a space architecture as much as it is a land and sea architecture.

24. Arcology and the Sacred
Limitless energies in limitless spaces for limitless time are the scattered ingredients by which nature works. For man to succeed, he must make tight bundles of that minimal portion of them allowed to him so that his own infinity—the infinite complexity of his compassionate and aesthetic universe—can blossom.

Life is literally in the thick of things. Its sacramentality is in the awesome power concealed in its "densified" fragility.

25. Arcology and Geriatrics
One of the ravages of "mobility," or at least directly accountable to it, is the institutionalized ghetto for the elderly. Following the generalized scattering of things and thoughts, the family has broken down into four main fragments: the young, the parents, the grandparents, and the anonymous relative. Aging being common to all (the lucky ones), all will have a taste of the tragic segregation of the aged; the insurance company and social security will not do, lest man become or remain marketable goods.

The implications of "arcological life" are the most favorable for reintegration of the different age groups and thus for the knitting of family strands.

26. Arcology and Play
The playground is the act of condescending to playfulness in a habitat where grimness, ugliness, and danger are endemic and offer the last measure of unconcern in an adult world gone sour. The playground is segregative. The absence of children in the so-called respectable public places is disheartening. The child has reason to become irresponsible and destructive, caged, as he is, away from the "other world."

Arcology is an "environmental toy." As a miniaturized universe it offers unending elements for surprise and stimulation. There will not be fenced-in playgrounds. The whole city is the place where the child is acting out the learning process, one aspect of which is play.

27. Arcology and Youth
The rift between youth and the holders of power, from the home up to the nation's policy makers, parallels the schism that exists between the preaching and the doing of the elders. The flow of hypocrisy is constant and perhaps irresistible. The revolt is at times blind, at times cynical, but it is a matter of survival within the limits of self-respect. If mere survival is to be dislodged by hopefulness, a form of things to come has to be suggested that will not drift away in the sea of the faceless, the irrelevant, and the expedient. As the god of the past "ill-serves" imperfect man and technology may yet cancel his humaneness, a step toward realism at the expense of powerful but conservative, if not reactionary, "practicality" is what the young may need most.

Arcology is a container where ideas and vision can meet man in his quest for a structure for living and not just an amorphous container for depersonalized survival.

28. Arcology, the Practical and the Real
The function of the practical is to instrumentalize the real. The function of the real is to dictate why, what, where, and when the practical is to operate. This antimaterialistic tenet is lost in the feverish idolatry of the feasible and the license of "free" enterprise. Most of what is feasible is irrelevant or unreal. It is not real because it does not converge with the aims of free man. The practical is no longer the specially tempered tip of a willfully driven utensil but is instead a vain, aimless, and squalid façade imposed upon the well burdened train of the real. The real is to be sought by the skill of the practical. The practical is a subskill whenever it is enthroned on the idol's chair. Arcology rejects as totally unreal the practicality of such a bigoted position.

29. Arcology and Identification
The capacity of suburbia and megalopolis for unending sprawl, the amorphism caused by the lack of structuralization, the blurring of everything into the countless makes the identification of the individual as difficult as the identification of the environment. What one reflects in, one is or one tends to become. Arcology is physical identification. The whole of it is at grasp and unmistakable, while the detail in its secretiveness can be unlimited and ever changing.

30. Arcology and Culture
To be exposed early in life to the complex workings of the individual and of society, to have a substantial reach for all those things and institutions that make metropolitan life rewarding, to be able at the same time to seek and be in the midst of nature, to enjoy the limitless and meaningful variety the life of society may produce for itself and the individual are all built-in characteristics of arcology. Arcology is the largest cultural whole physically available to men day in and day out.

31. Arcology and Aesthetics
The beauty of nature is achieved in the awesome reservoirs of space and time where things are hammered out in the order that probability dictates, justly, rationally, impassionately. The genesis of man-made beauty, the aesthetic, is of a different nature. It is not incidental to man's action but is the very essence of man himself. By necessity it has to be frugal. It does away with probability and predictability. It is synthetic and transfigurative. It is never irrational because it is always superrational. It cannot simply be just, because it must also be compassionate.

With the aesthetogenesis of nature, man reaches into the structure of reality and forms a new universe in his own image. Arcology can be one of these forms. Arcology is essentially an aesthetocompassionate phenomenon.

32. Arcology and Politics
The long involvements of the generations that have produced today's cities constitute such tightly interwoven interests that the hopes are very dim for a really purposeful renewal.

What has been the living cause has become very much that which takes life away. Too many things in our cities are spent cartridges, too little is of a nonbrittle nature. Even doodling around any of the city's many problems tends to weaken this or that interest or this or that group. And doodling seems to be what at best we do with them. An urban culture is per se the *n*th power of complexity. The burden of a not-too-glorious past may be just the amount of ballast that will not allow the take-off.

33. Arcology and Miniaturization
In its evolution from matter to mind, the real has been submitted to numerous phases of miniaturization so as to fit more things into smaller spaces in shorter times. This process, from haphazardness and dislocation to co-ordination and fitness, has been mandatory because each successive form of reality carried in itself a greater degree of complexity. Any higher organism contains more performances than a chunk of the unlimited universe light years thick, and it ticks on a time clock immensely swifter. This miniaturization process may well be one of the fundamental rules of evolution. Now that the inquietude of man is turned to the construction of the superorganism, which society is, a new phase of miniaturization is imperative. Arcology is a step toward it.

Arcological miniaturization will cause the scale of the earth to "expand" and will also make feasible the migration of man to the seas and orbital lands. The orbital lands will also function as transformers on the earth's climate. The population explosion will then have different meanings. Both terrestrial and extraterrestrial towns and cities will be arcological.

34. Arcology and Symmetry
There are, among others, the following three kinds of symmetry: structural symmetry, functional symmetry, and formal symmetry. Structural symmetry is probably observed throughout the universe. It is the necessary balancing of stresses that finds its patterns around points, lines, planes, and spaces of symmetry.

Functional symmetry is observed very clearly in any organism, be it monocellular or highly composite. Functional symmetry is the direct solution to the constant wavering of the energy balances composing the living organism and its nonsymmetrical behavior. Without such symmetry the organism would be constantly lopsided, that is to say, unfit for life. Formal symmetry might well be the imprint of all other kinds of symmetry into the mind and the sensitivity of man. Even if the impositions of structure and function were lifted, impositions that result in formal symmetry, there would still linger in man the need for a visual and in general sensorial symmetry.

The greater the symmetry, the greater the vitality of the performance. Arcology is not an exception, especially when one considers the enormous structural and functional complexity involved. It is to be noted that arcology is never symmetrical for the individual user. In other words, the individual user is always eccentric to the whole: symmetry in the whole, singularity in the parts.

35. Arcology and Mobility
Structure defines a certain configuration suited to a particular set of performances. Urban planning supposedly defines that structure which channels, contains, and swiftens the performances of society.

Mobility in society does not reside in migratory waves but in the minute and perpetual shifting of bodies, functions, relationships, and mental processes of the body-social. To suppose that lack of structure favors mobility is tantamount to saying that a disintegrating corpse can function as a living body. To suppose furthermore that tenuity can favor mobility is like saying that nature was foolish in inventing almost exclusively three-dimensional organisms.

The explicit structurality of arcology and its three-dimensional congruence are, at least potentially, the basis for full and pragmatic mobility. In arcology coercive mobility is unnecessary—the kind of mobility, commuting for instance, that orders and pushes people and things around. (The penalty for noncooperation is the loss of man's source of livelihood.) Unburdened of coercive mobility, free and functional mobility obtains the necessary elbow room for the full display of its dynamics.

36. Arcology and the Biological
An animal is an organism of one mind. The city is an organism of one thousand minds. This is the most significant difference between a biological organism and the city. Furthermore, those one thousand minds do not stay put. They are eminently peripatetic, but in clusters of three or four or so (the family) they tend to define a territoriality that is more static (the home). What confronts the planner is the organization of the body to the satisfaction of the thousand minds. One may say that while an inner center, the brain, is the center to which the body renders service biologically, urbanistically the epidermis made up of a thousand brains is the "center" to which the body is dedicated.

The mental processes of the biological entity are centralized and interiorized; the mental processes of the city are diffuse and epidermal. While the skin is prevalently a defensive and containing device for the animal body, for the city it is eminently a casual, ontological structure. The miniaturizing implosion of the social body is thus accompanied by a micro-explosion of the thousand brains toward the periphery of the miniaturized organism. The mental, installed within its biological receptacle (the individual), places itself in the skin where its senses can capture both the natural vastness of the outer and the man-made miniaturization of the inner. This is a description of arcology.

37. Arcology and Cybernation
The urban organism has a new tool on hand. It can delegate to a nonbiological brain some of its labors. This nonbiological brain can be collectivized and can be interiorized because it does not belong to a body, to any body. Then the parallel between the biological and the urban is modified. In the biological, the brain and the body are single and almost certainly spatially coincidental. In the urban organism, the brain may be imagined as split: one part is the group of the single brains, each belonging to individuals; the other part is the collectivized nonbiological brain ideally centered in the organism.

In the urban organism, the mind remains in independent but correlated parcels divided spatially and coincidental with the parceled brains, the whole forming the mental or thinking skin of the city. In the function of the urban organism the implosion of the whole performance is paralleled by the parceling of the mind-brain toward the skin, leaving in the "cranial box" a shadow brain which is mechanically and chemically composed and not biologically developed. Such a centralized brain cares for the collective and instrumental functions while individual minds govern the pluralism inherent in the whole organism. Arcology is such an organism.

Part Two
Thirty Arcologies

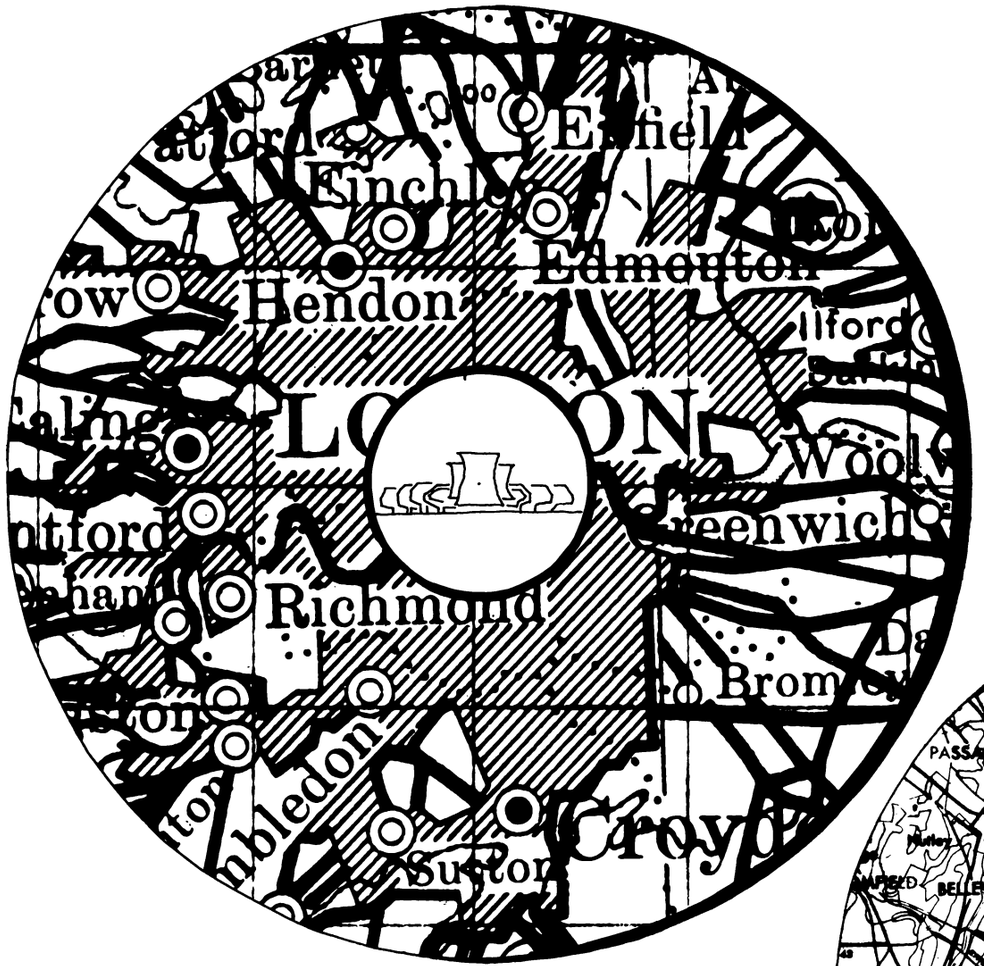
"By the combined effect of multiplication (in number) and of expansion (in radius of action) of human individuals on the surface of the globe, the noosphere has begun to compress itself sharply and to compenetrate itself organically, for almost a century now. This, without doubt, is the most enormous and central of modern events on the earth."

Teilhard de Chardin
The Convergence of the Universe (1951)

"Ce n'est donc pas de façon métaphorique qu'on a le droit de comparer—comme on l'a si souvent fait—une ville à une symphonie ou à un poème; ce sont des objets de même nature. Plus précieuse peut-être encore, la ville se situe au confluent de la nature et de l'artifice. Congrégation d'animaux qui enferment leur histoire biologique dans ses limites et qui la modèlent en même temps de toutes leurs intentions d'êtres passants, par sa genèse et par sa forme la ville relève simultanément de la procréation biologique, de l'évolution organique et de la création esthétique. Elle est à la fois objet de nature et sujet de culture; individu et groupe; vécue et rêvée: la chose humaine par excellence."

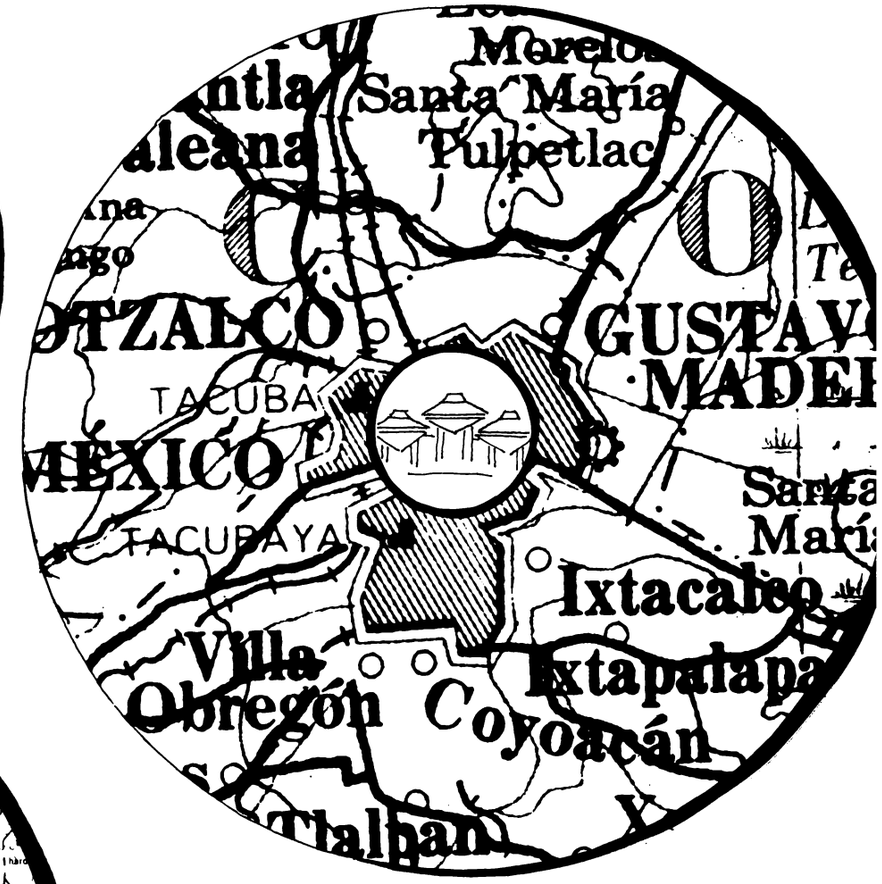
Claude Lévi-Strauss
Tristes Tropiques (1955)

About the Names Adopted
I feel an absolute continuity relating the various historical patterns within which urban society has developed and the arcologies developed here. I have adopted two Biblical names to maintain a semantic tie to the past. However, in any general consideration of the Babels and the Noahs, there is more than semanticism involved. Most of the other names are combinations of the term arcology and a new term referring to a morphological, structural, or functional characteristic of the system. If up to this point I have failed to assert the concept of genesis as the central import of life, I am too late to explain it now. May the names used be of some help.

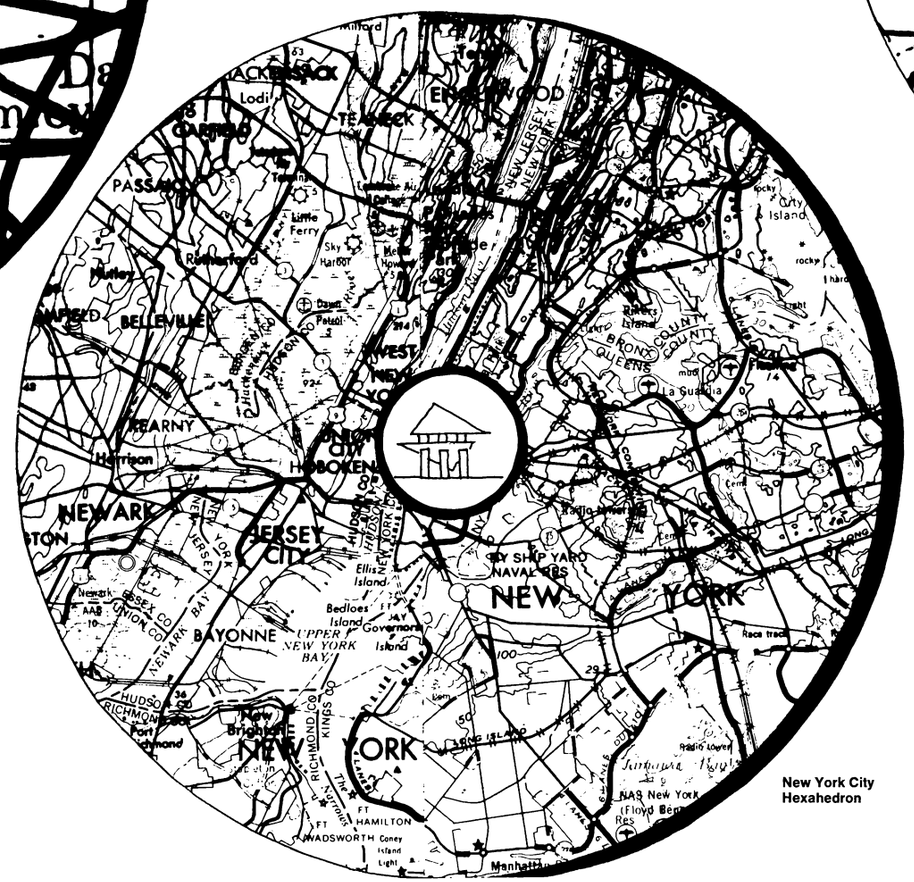


London	27/hectare	11/acre
Babelnoah	822/hectare	333/acre

Paris	264/hectare	107/acre
Babel Canyon	2,341/hectare	948/acre



Mexico City	22/hectare	9/acre
Babeldiga	1,643/hectare	665/acre



New York City	82/hectare	33/acre
Hexahedron	2,964/hectare	1,200/acre

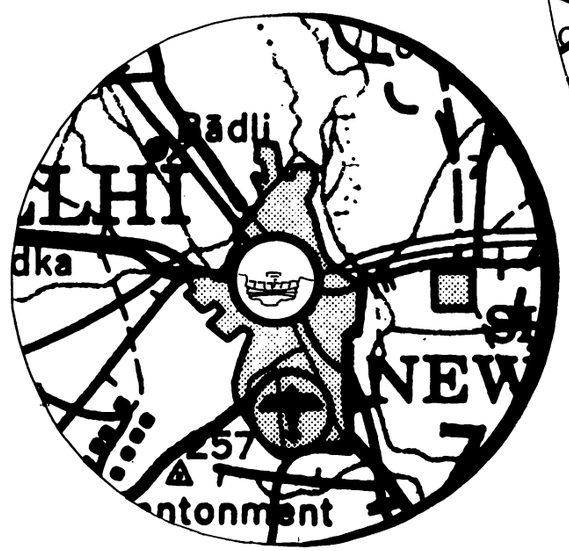
Comparative Densities

Comparative Densities
This is not a suggestion for implanting an arcology in the middle of an existing city. It might be worth mentioning, nevertheless, that if an arcology were to be conceived for an "urban renewal," one great asset would be the nondislocation of the population at the beginning of the process; in fact, only 3 to 4 per cent of the future population of the arcology would have to move at all before transfer into the new structure.

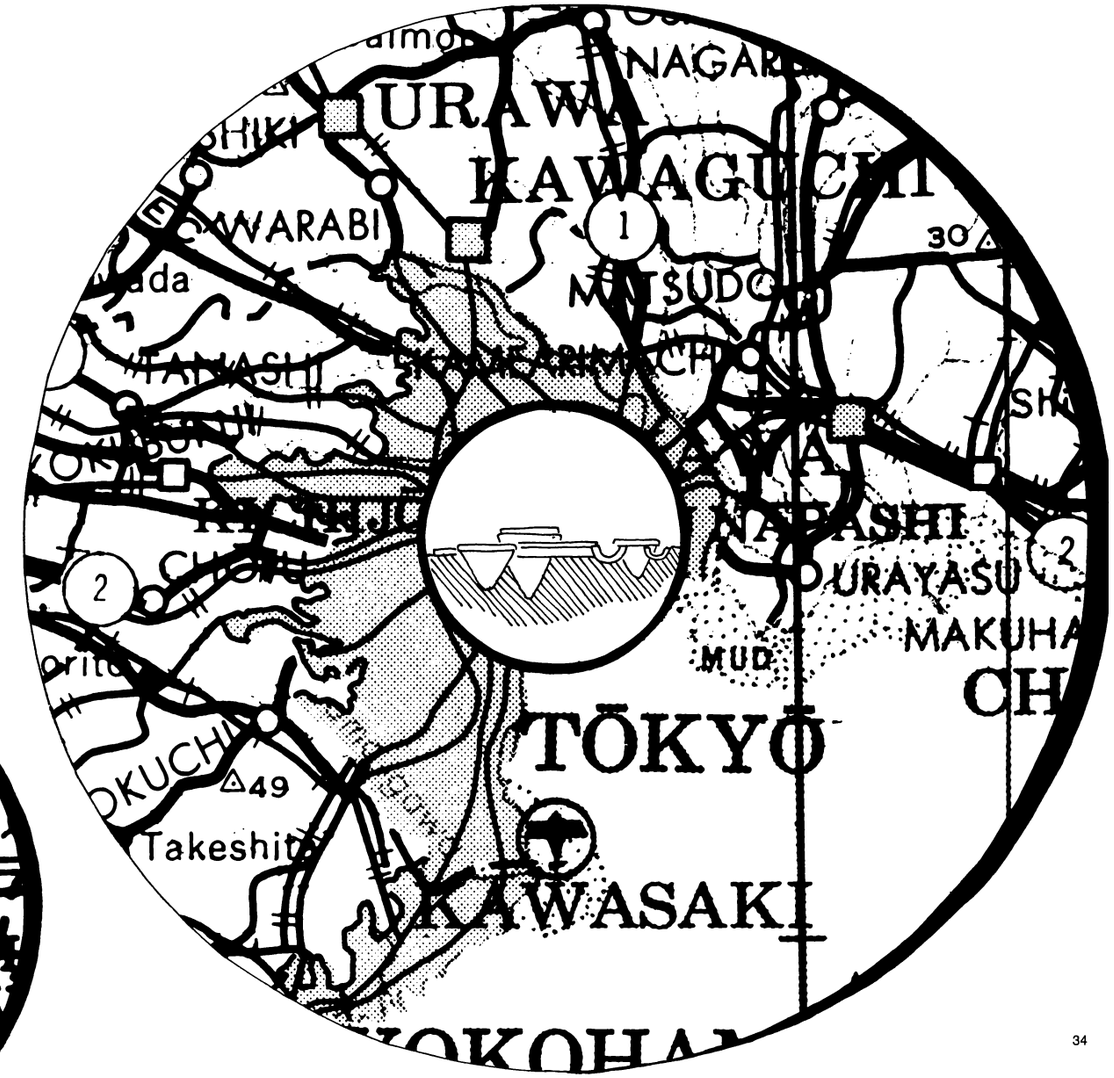
The diagrams must be read as follows: If the density of the population contained in the large circle were to become equal to the density of the population of the arcology (symbolized in the small circle), such population (of the large circle) would be contained in an arcological system of which the horizontal projection would be equivalent to the small circle. It must be clear that the symbol of the arcology in the small circle is not in scale. It only symbolizes a density of population.

Chicago	64/hectare	26/acre
Arcube	2,717/hectare	1,100/acre

Phoenix	8.3/hectare	3.3/acre (Dec. 1968)
Babel IIB	662/hectare	268/acre



Delhi	179/hectare	72/acre
Arcodiga	1,331/hectare	538/acre

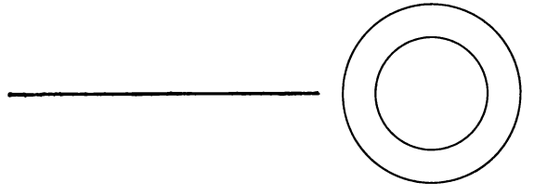


Tokyo	124/hectare	50/acre
Novanoah B	852/hectare	345/acre

Comparative Densities

Schedule Sequence

SCHEDULE SEQUENCE OF AN ARCHOLOGY.
THE SIZE, BULK AND COMPLEXITY OF THE UNDERTAKING WARRANTS THE ESTABLISHMENT OF A VAST BUILDING INDUSTRY TO BE LATER PARTIALLY CONVERTED.

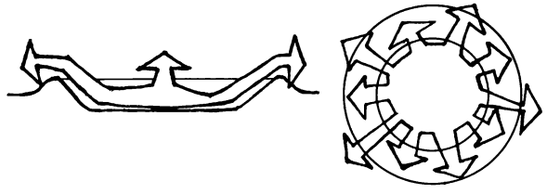


PHASE 1

TIME: MONTHS–YEARS

SELECTION OF SITE

ECOLOGICAL SURVEY
SOCIAL AND ECONOMICAL SURVEY
REGIONAL AND STATE LINKAGE VIA RAIL, ROAD, AIR, RADIO, POWER STATION, WATER, GAS...

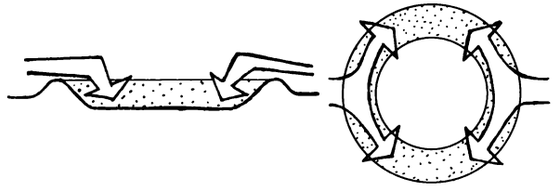


PHASE 2

TIME: MONTHS

EXCAVATION AND QUARRYING

PRODUCTION OF BUILDING MATERIALS: SAND, GRAVEL, STONE, (CEMENT)
PRODUCTION OF NEW TOPOGRAPHY AND FOUNDATION PLATFORM.

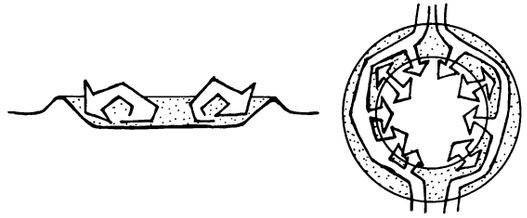


PHASE 3

TIME: MONTHS

INSTRUMENTATION OF THE GROUNDS

TOOLING FOR THE PRODUCTION OF STANDARD AND CUSTOM MADE STRUCTURAL AND UTILITY ELEMENTS.
THE INDUSTRIAL BASE OF THE FUTURE CITY IS ESTABLISHED.

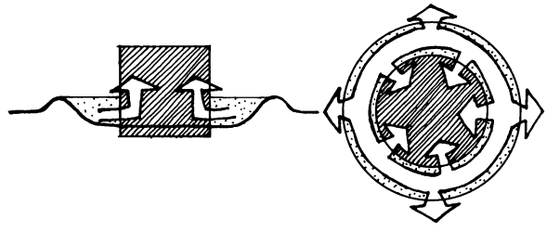


PHASE 4

TIME: MONTHS–YEARS

INDUSTRIAL PRODUCTION OF CITY'S PARTS

STOCK PILE OF MANUFACTURED MATERIALS.
ESTABLISHMENT OF INLETS AND OUTLETS.

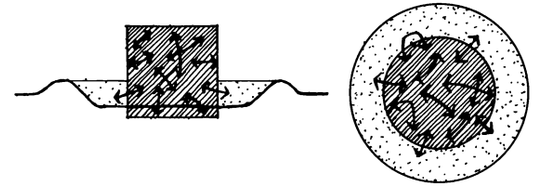


PHASE 5

TIME: MONTHS–YEARS

ASSEMBLAGE AND CONSTRUCTION OF SKELETON

THE 3-DIMENSIONAL LANDSCAPE IS CONSTRUCTED AND LINKED TO THE REGION.
PARTS OF THE 3 D LANDSCAPE GOES INTO USE.

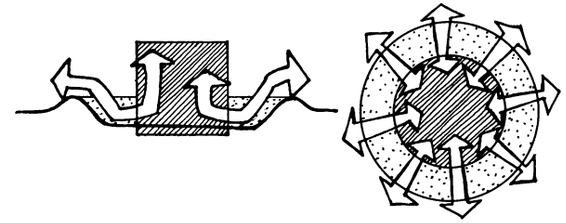


PHASE 6

TIME: YEARS

THE INFRASTRUCTURALIZATION OF SKELETON

CONSTRUCTION OF PRIVATE STRUCTURE.
CONSTRUCTION OF PUBLIC STRUCTURES.
BEGINNING OF THE METROPOLITAN LIFE.

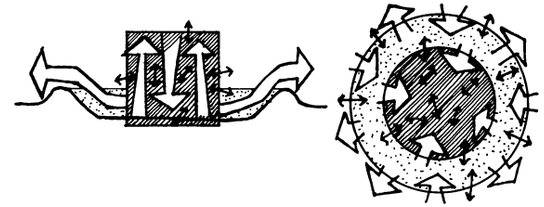


PHASE 7

TIME: MONTHS–YEARS

INDUSTRIAL CONVERSION

THE CONSTRUCTION INDUSTRIES BREAK OUT IN DIVERSIFIED PRODUCTION FOR LOCAL CONSUMPTION AND EXPORT.

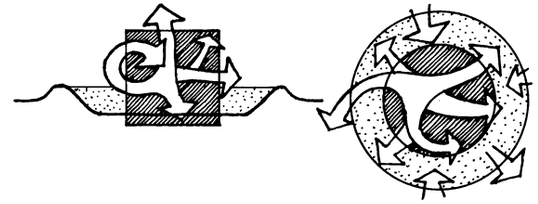


PHASE 8

TIME: YEARS

METROPOLITAN LIFE

FULL BLOOM OF THE CITY.
A PERCENTAGE OF THE POPULATION BECOMES PERMANENT.
BALANCING OF ALL COMPONENTS–LIVING, CULTURE, PRODUCTION, LEISURE.

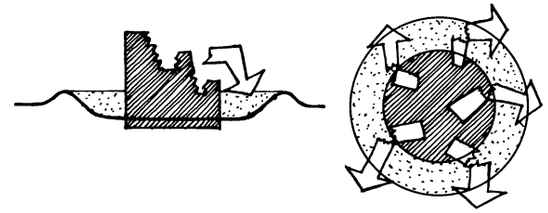


PHASE 9

TIME: 1–X GENERATIONS

METAMORPHOSIS OF THE CITY

THE INFRASTRUCTURE UNDERGOES THE ADJUSTMENTS AND CHANGES DEMANDED BY THE TIMES.
THE CITY BECOMES HISTORICALLY SIGNIFICANT.

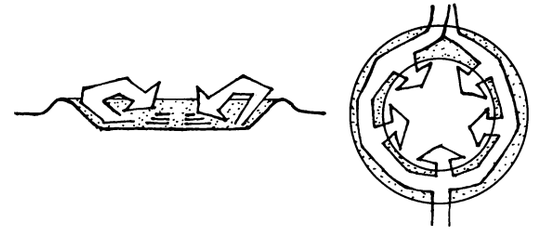


PHASE 10

TIME: MONTHS–YEARS

DISASSEMBLING OF ARCHOLOGY

WHEN FUNCTIONAL OBSOLESCENCE OVERSHADOWS THE LIVELINESS OF THE CITY THE CITY ITSELF MAY BE PARTIALLY OR TOTALLY DISASSEMBLED WITH POPULATION MOVED TO A NEARBY ARCHOLOGY.

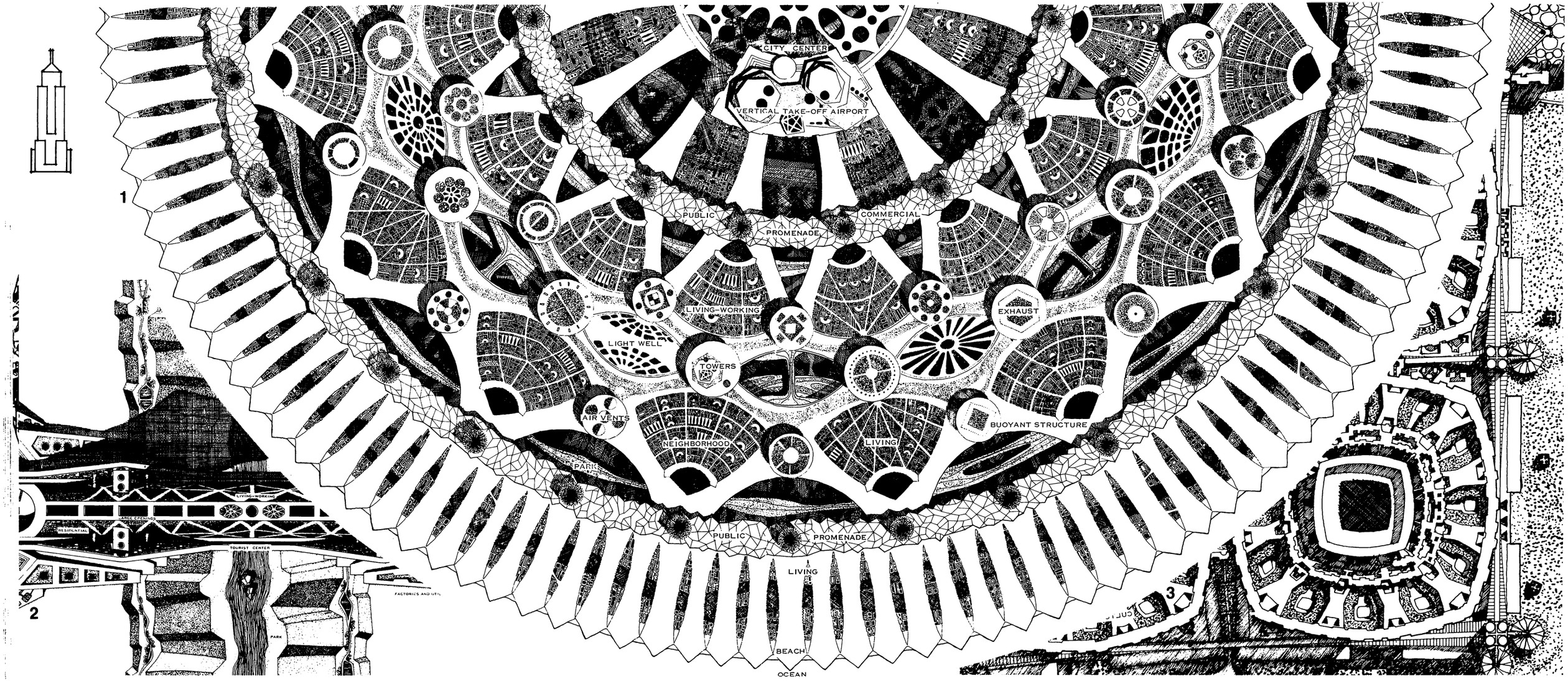


PHASE 11

TIME: GENERATIONS

NEW CYBERNETIC CYCLES

IT IS A NEW CYCLE BEGINNING AT PHASE 4.



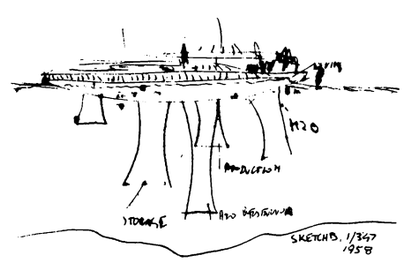
1.Novanoah I

Novanoah I
(Continental shelf or open sea)

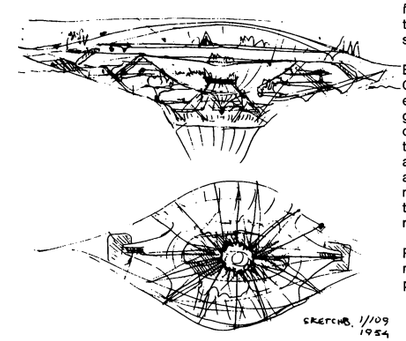
Population	400,000
Density	148/hectare; 60/acre
Height	1,000 meters
Surface covered	2,750 hectares; 6,800 acres
1. Half of top view: scale	1:10,000

Comparative Arcologies

Stonebow	
Population	200,000
2. Partial top view: scale	1:10,000
Babel IIA	
3. Population	300,000
Partial top view: scale	1:10,000



4.5 mile

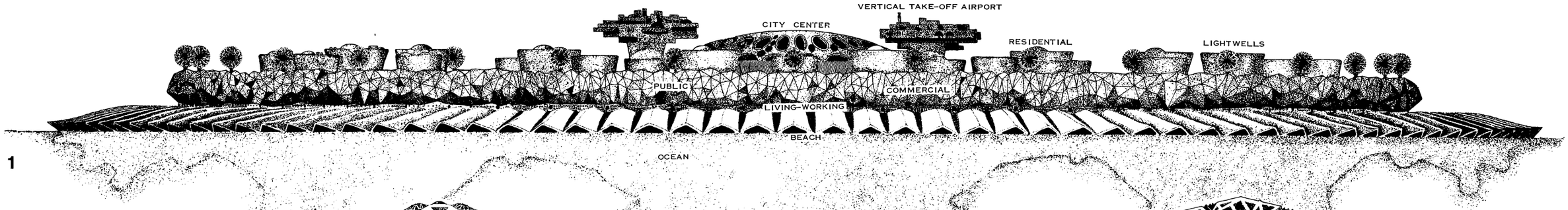


Life came out of the sea when the time was ripe for a next step toward complexity. Then the ecological flood came to cleanse the earth and let the "elected" few re-engage in the homogenesis of the earth. The biological flood invested in the human species is now edging man toward the same seas that eons ago saw the exodus of some of his creatures.

Ecologically the seas behave as a many-layered medium. One could almost say that the earth has one layer of ecologies and the seas have a whole thickness of ecologies wrapped one around the other. It could also be observed that it is the element itself, water, that makes the biological "thickness" of the seas possible and that is also the cause of their great homogeneity, stability, balance, and diffusion. These elements of relative homogeneity, stability, balance, and diffusion are the characteristics that, combined with fluidity, make sea arcology relevant.

Physically, one may say that the sea (water) performs for man the tasks of (1) mining, (2) transporting, and even part of (3) the processing of the stuffs the seas are rich in. Biologically, one may say that of the five, (1) farming husbandry, (2) transporting, (3) distributing, (4) eating, (5) assimilating, the sea itself would perform at least part of the first four and leave to society the fundamental and conclusive assimilation, in the sense that the fluid mass itself can be seen as a global metabolic system willing to sustain the biosphere.

Approached globally then, the harvesting of the seas is not only pertinent to man's precarious condition (predictions of widespread famine come from different and supposedly informed sources) but indispensable to his survival. Will we make of this harvesting another purely instrumental process, denying it of a larger connotation and depriving man himself of the superinstrumental treasures it offers for the taking? Will we, in other words, have a mechanistic sea civilization indifferent to humaneness, taking the food without the substance? Or will we pursue in the civilizations of the seas an all-new and fantastic culture, adding new folds to the human condition?



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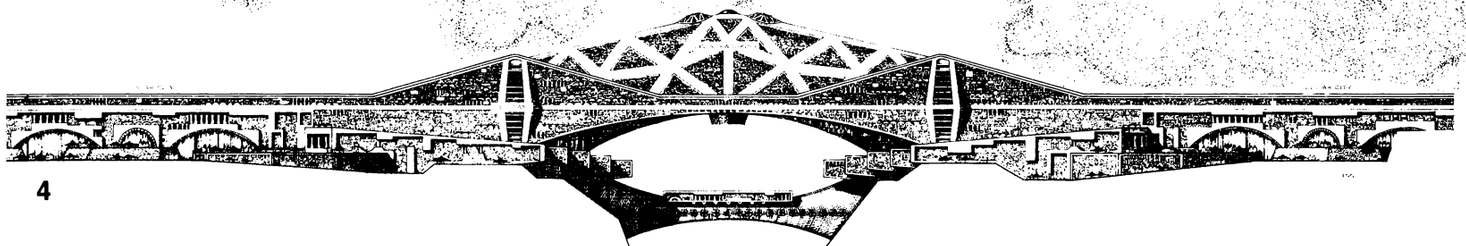

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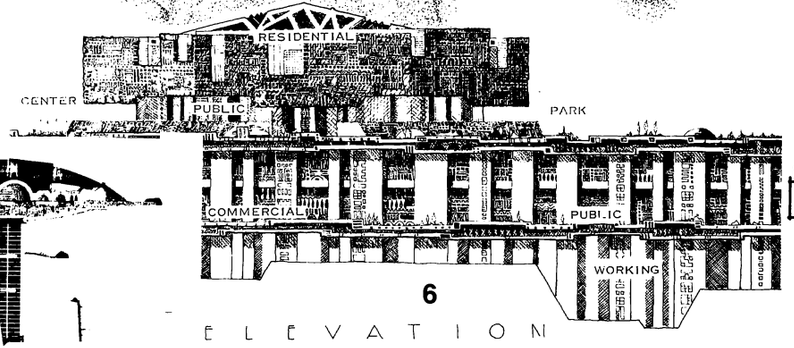

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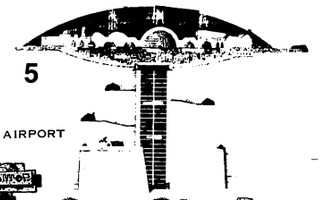

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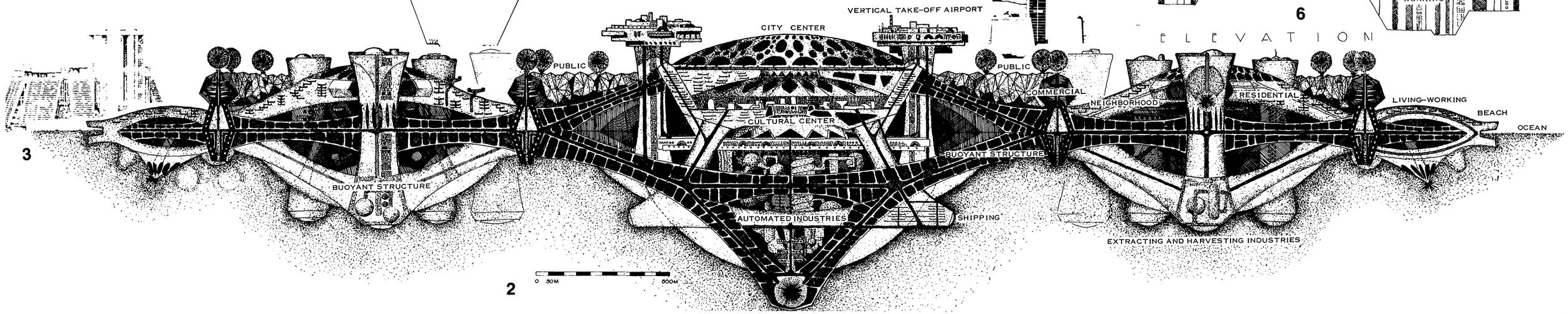

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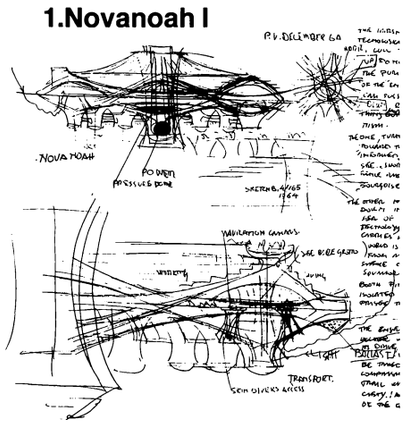
1.Novanoah I



	Novanoah I	
	Population	400,000
	Density	148/hectare; 60/acre
	Height	1,000 meters
	Surface covered	2,750 hectares; 6,800 acres
1.	Elevation: scale	1:10,000
2.	Section: scale	1:10,000
	Comparative Arcologies	
	Arcoforte	
	Population	10,000
3.	Elevation: scale	1:10,000
	Stonebow	
	Population	200,000
4.	Elevation: scale	1:10,000
	Theology	
	Population	13,000
5.	Elevation: scale	1:10,000
	Arcanyon	
	Population	40,000/kilometer
6.	Elevation: scale	1:10,000

Directly dependent on the productive processes would be many specialized laboratories for investigating new potentials arising from growing knowledge, and there would be facilities for a vast undertaking in general research. Link by link the chain of a full cultural organism would establish itself so that the society developing in the arcology would be a rounded microcosmos and not a thin pancake of rationales and techniques. Floating on, and immersion in, the water would be a morphological determinant of culture, as the functionality naturally occurring in the resources of the sea is its instrumental determinant.

Better feeding will be instrumental to a wealth uniquely fused with the ecologies of the seas. Wholeness or segregation, as always and ever, is the crucial test of lastingness or obsolescence. The sea arcologies are viewed as an integral system for satisfaction of needs and purposefulness. That is to say that, though man moves into the seas in his quest for food and material, he does it with open eyes, and in his exploitation he carries those same elements that exploitation feeds and perpetuates.

In other words, he does not just exploit the new environment, he works and lives in it, by it, with it. This is not in order to make the sea a more "humane" element, though this may be very fundamental in the long run, but because a new world opens to him who is by nature a world-maker. In this new environment, not only enormous but also very dense in its fluid layers, the arcology must deepen its structure, reaching thus, as by a cross section of the ecological mass, to all the variants of which it is composed and by which it is enriched.

The arcology, like an enormous digestive system, would ingest the mass of water, extract from it the elements designated by the function of the diverse plants, and eliminate the used water in an uninterrupted cycle. The different materials—vegetable and animal, chemical and mineral—once trapped, would be processed and/or stored, then in part consumed, in part exported as food, fertilizer, and so on, or used as material for production of goods.

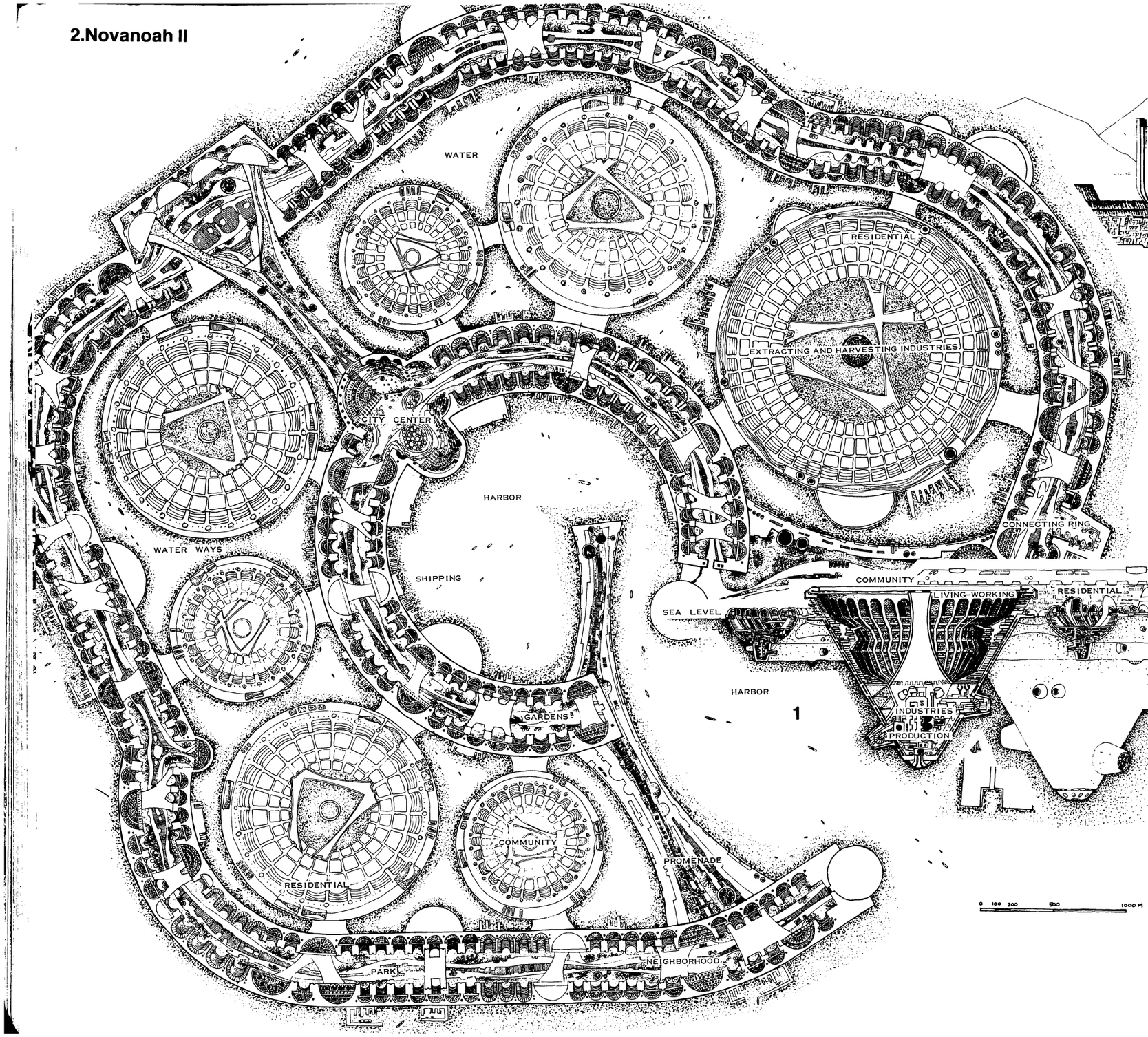
The necessity for man to move into the sea, pushed by the biological flood rising 'within' him and the riches contained in the seas themselves, suggests the genesis of a floating civilization with nodular centers constructed within floating arcologies. The buoyant section of these would furnish frames and spaces for the automated processing plants of (1) food stuff, animal and vegetal, (2) water, and (3) minerals and chemicals. Oceanographic labs and labs for underwater-life development would also find ideal facilities and pertinent environment.

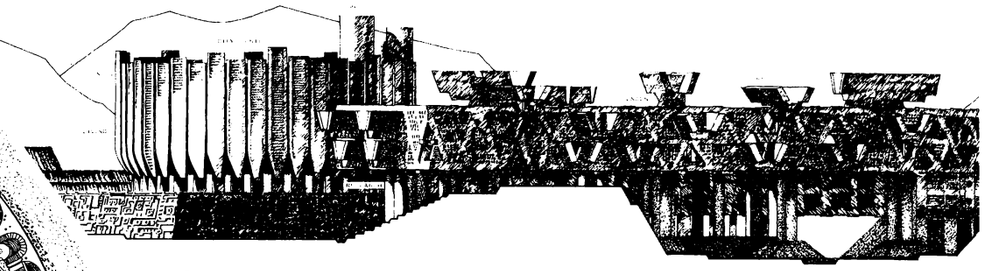
The upper structures would be for living, learning, and working. There would be vertical transportation systems, as in Babel II and horizontal transportation systems on and under water freed from the slavery of "roads." Novanoah could drift with the currents or be slowly "propelled" on short or long journeys according to seasons, seas, harvests, fishing opportunities, or vacation cruises. Such arcologies would appeal strongly to overcrowded countries, sun-starved countries, sea labor unions hard pressed by automation, steel and aluminum corporations, chemical corporations, shipbuilders. . . .

Novanoah I could develop by concentric rings starting from the central canister. While Novanoah II is a water city with open-air, surface navigation, Novanoah I has interiorized waterways as it has interiorized gardens. The structural system, a hollow tubular space frame, indicates and carries the transportation and transfer systems. The productive and storing programs are developed in the lower parts of the system.

It might be worth noticing that with the concepts of miniaturization, congruence, and tridimensionality derived from the structural and functional investigations conducted while defining the arcologies, the Novanoahs are still defined by a restricted concept of the power vested in the vertical dimension. The rules of buoyancy naturally have their part in this timidity. (See Noahbabel.)

2.Novanoah II





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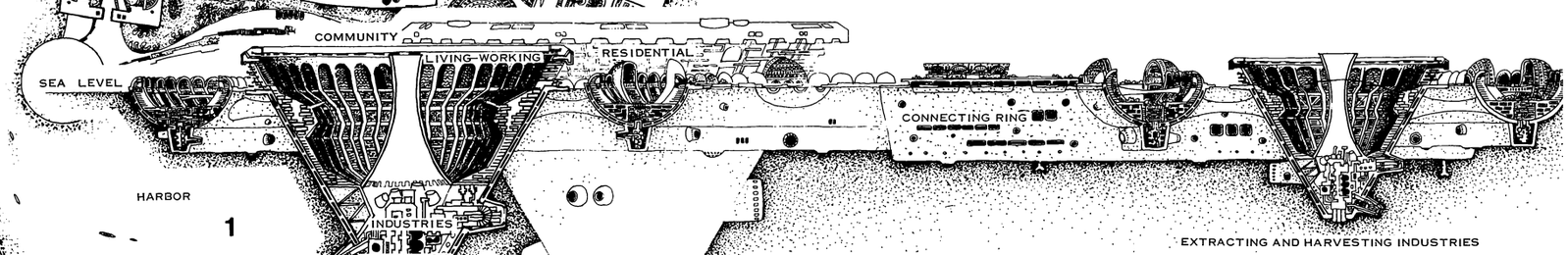
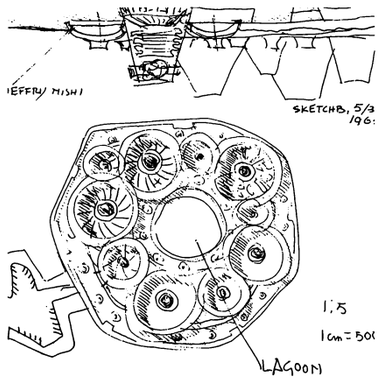


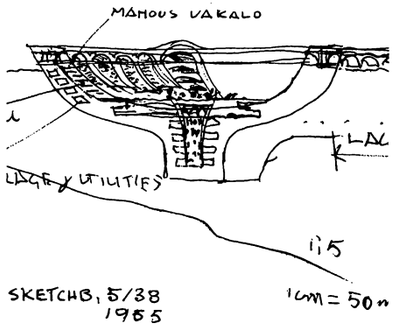
1. Novanoah II
(Continental shelf or open sea)

Population	2,400,000
Density	852/hectare; 345/acre
Height	400–1,600 meters
Surface covered	2,790 hectares; 6,900 acres
General plan: scale	1:20,000
Section: scale	1:20,000

2. Comparative Arcology
Logology

Population	900,000
Elevation: scale	1:20,000





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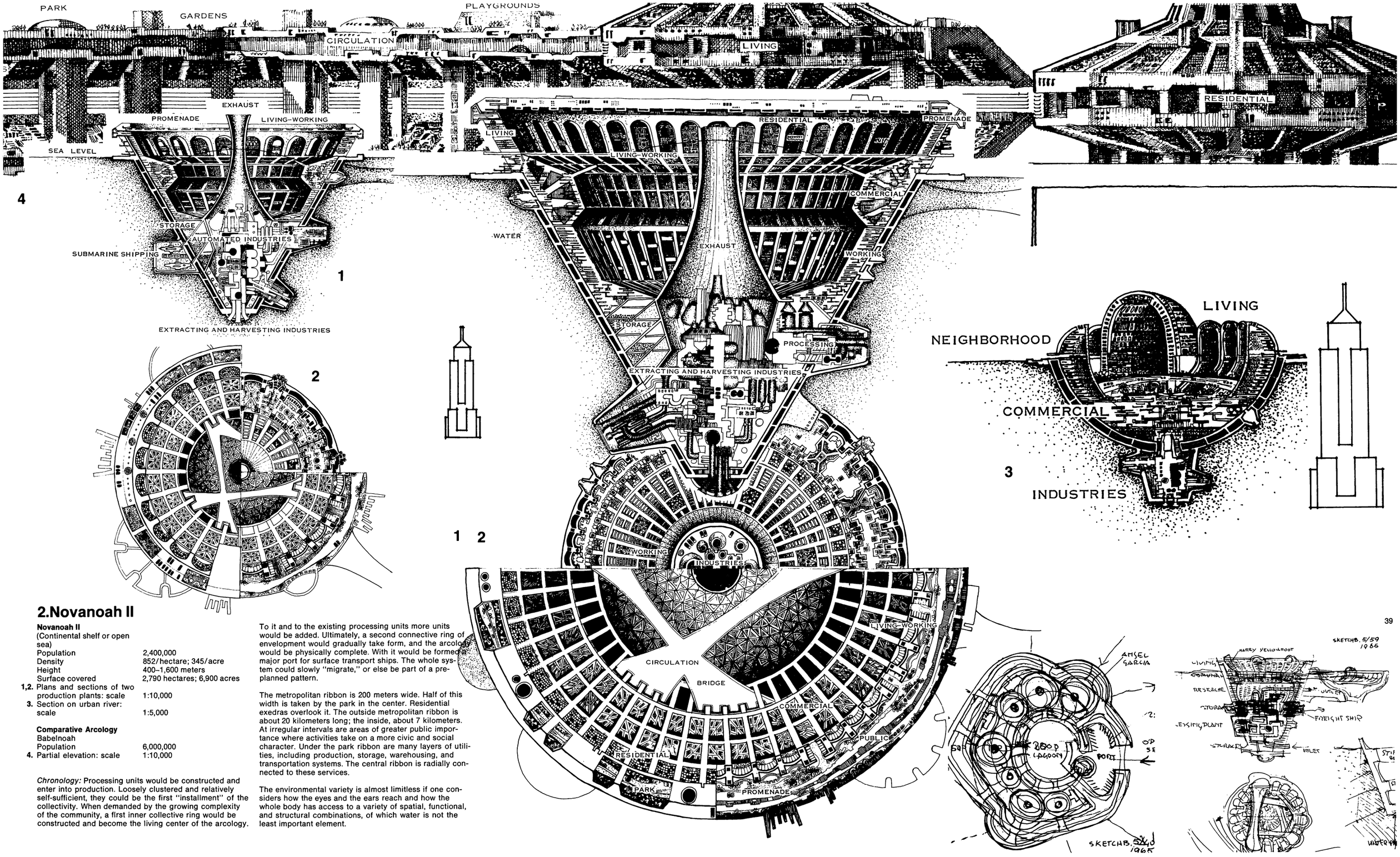


2.Novanoah II

Novanoah II
(Continental shelf or open sea)

Population	2,400,000
Density	852/hectare; 345/acre
Height	400–1,600 meters
Surface covered	2,790 hectares; 6,900 acres
1,2. Plans and sections of two production plants: scale	1:10,000
3. Section on urban river: scale	1:5,000

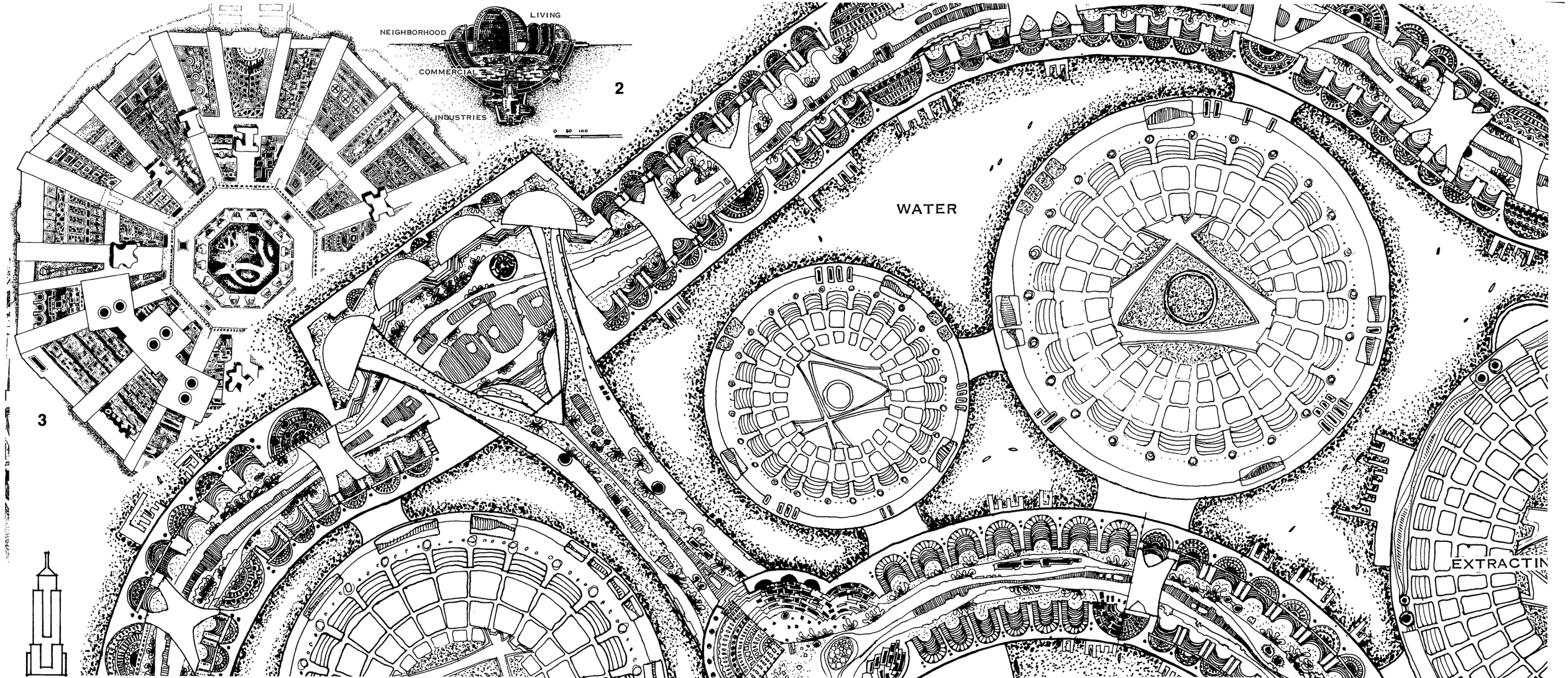
Comparative Arcology

Babelnoah	
Population	6,000,000
4. Partial elevation: scale	1:10,000

Chronology: Processing units would be constructed and enter into production. Loosely clustered and relatively self-sufficient, they could be the first "installment" of the collectivity. When demanded by the growing complexity of the community, a first inner collective ring would be constructed and become the living center of the arcology. To it and to the existing processing units more units would be added. Ultimately, a second connective ring of envelopment would gradually take form, and the arcology would be physically complete. With it would be formed a major port for surface transport ships. The whole system could slowly "migrate," or else be part of a preplanned pattern.

The metropolitan ribbon is 200 meters wide. Half of this width is taken by the park in the center. Residential exedras overlook it. The outside metropolitan ribbon is about 20 kilometers long; the inside, about 7 kilometers. At irregular intervals are areas of greater public importance where activities take on a more civic and social character. Under the park ribbon are many layers of utilities, including production, storage, warehousing, and transportation systems. The central ribbon is radially connected to these services.

The environmental variety is almost limitless if one considers how the eyes and the ears reach and how the whole body has access to a variety of spatial, functional, and structural combinations, of which water is not the least important element.



2.Novanoah II

Novanoah II
(Continental shelf or open sea)

Population	2,400,000
Density	852/hectare; 345/acre
Height	400–1,600 meters
Surface covered	2,790 hectares; 6,900 acres
1. Partial Plan: scale	10,000
2. Section of urban ribbon: scale	10,000

Comparative Arcology
Babel IIC

Population	340,000
3. Top view: scale	1:10,000

There are two kinds of organisms: (1) the processing units, and (2) the connective rings.

1. Processing Units
Function: (A) sea harvesting; (B) research; (C) residence.

A. Sea harvesting would proceed by layers following the most efficient method available for the exploitation of the riches found at different depths of the water mass. In general, organic materials would be found on the upper layers, the nonorganic throughout. The hydraulic pressure available could be used in the processing technique. The power plant may run on atomic energy or fuels available on the spot (gas, oil, or tide cycles).

B. Research in the field directly related to function and research in the field of oceanography and general science.

C. Residential and cultural facilities for the people involved in production and research.

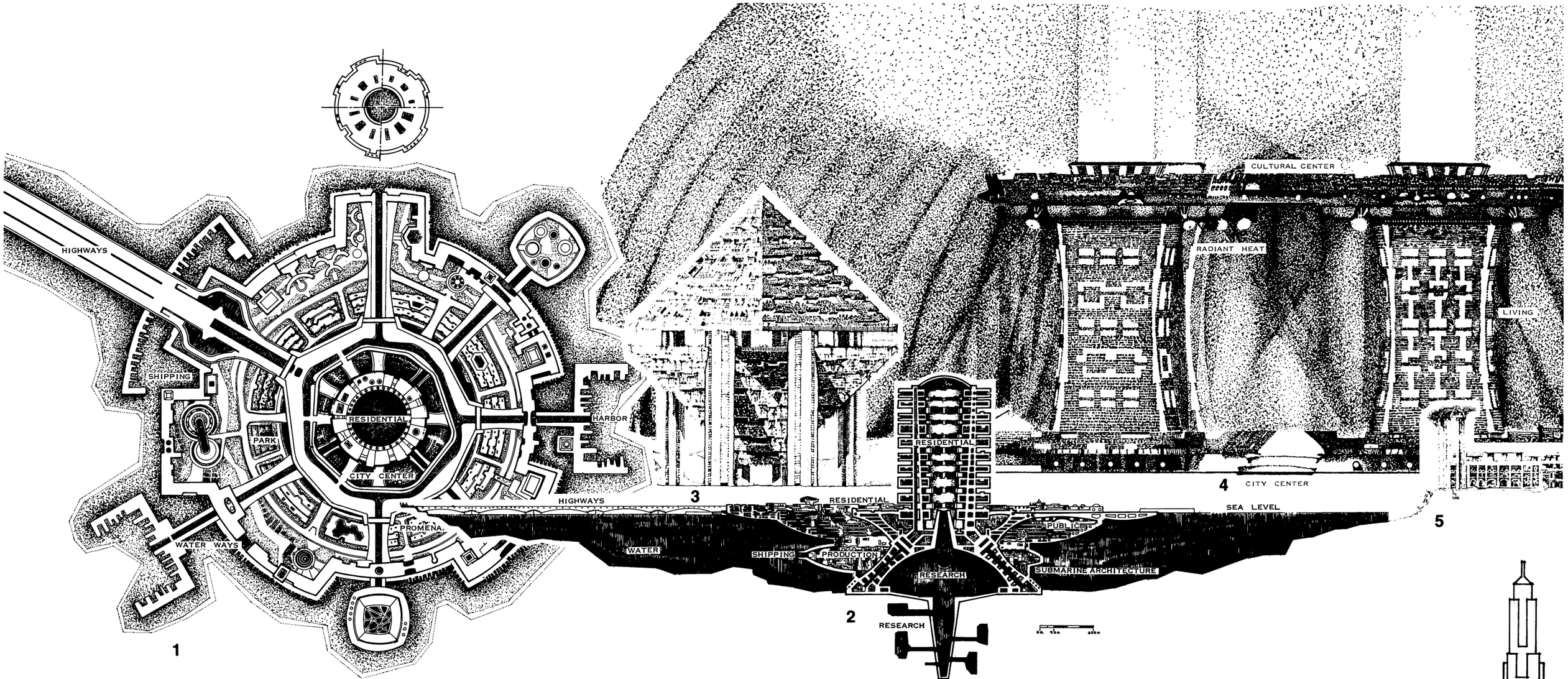
Structure and Organization High-buoyancy canisters (funnel-shaped) with meridian ribs and horizontal compression rings. Microcellular structure defining the microspaces for the different detailed activities. Macrostructure enveloping the large spaces where (1) extractive and processing plants develop spatially (three dimensionally) according to the rules of efficiency. (2) Social and collective activity can develop broadly and richly. Inside transportation can make use of conveyers, elevators, etc., outside transportation, water. (Heavy transportation can move underwater with direct plugs into silos and storage facilities.)

2. Connective Rings
Function: The "ground" for development of an uncluttered communal life: living, learning, communicating, playing, interacting.

Structure and Organization: Annular structures of semicircular section (buoyancy and pressure strong). The tubular (half) structure curves on the plain of the sea surface. The residences develop against the inner face of the tube on both sides. Most of these face the grounds stretching for the total length of the structure. Some also face the water. Crossroad bridges are unevenly positioned along the developing space. At ground level are the centers of exchange and culture, while the grounds themselves carry the main bulk of inside circulation (fuel-cell buses, bicycles, pedestrians, moving sidewalks, conveyors). Outside circulation takes advantage of the sea. Private and public water transportation are arranged in a fairly free, criss-crossing network of buoyed paths.

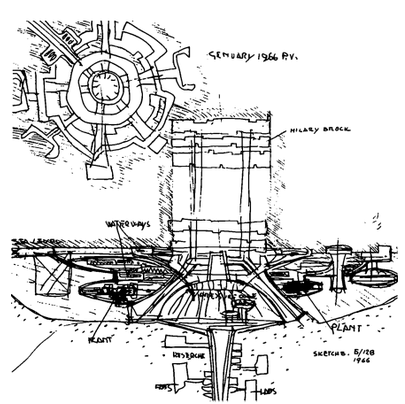
Materials: (For processing units and connective rings) Primary structures are in steel or equivalent corrosion-resistant metal; secondary structures, in light metal or noncombustible plastics.

Construction: (For processing units and connective rings) Prefabrication of standard units. Assemblage on water using its buoyancy as a building frame as soon as the structure becomes large enough to warrant the substitution of the structure itself for the ship-building yards.



3.Noahbabel

	Noahbabel	
	(Coastal waters)	
	Population	90,000
	Density	575/hectare; 233/acre
	Height	800 meters
	Surface covered	154 hectares; 380 acres
1.	Plan: scale	1:10,000
2.	Section: scale	1:10,000
	Comparative Arcologies	
	Hexahedron	
	Population	170,000
3.	Elevation: scale	1:10,000
	Babel IIA	
	Population	300,000
4.	Elevation: scale	1:10,000
	Arcoforte	
	Population	20,000
5.	Section: scale	1:10,000

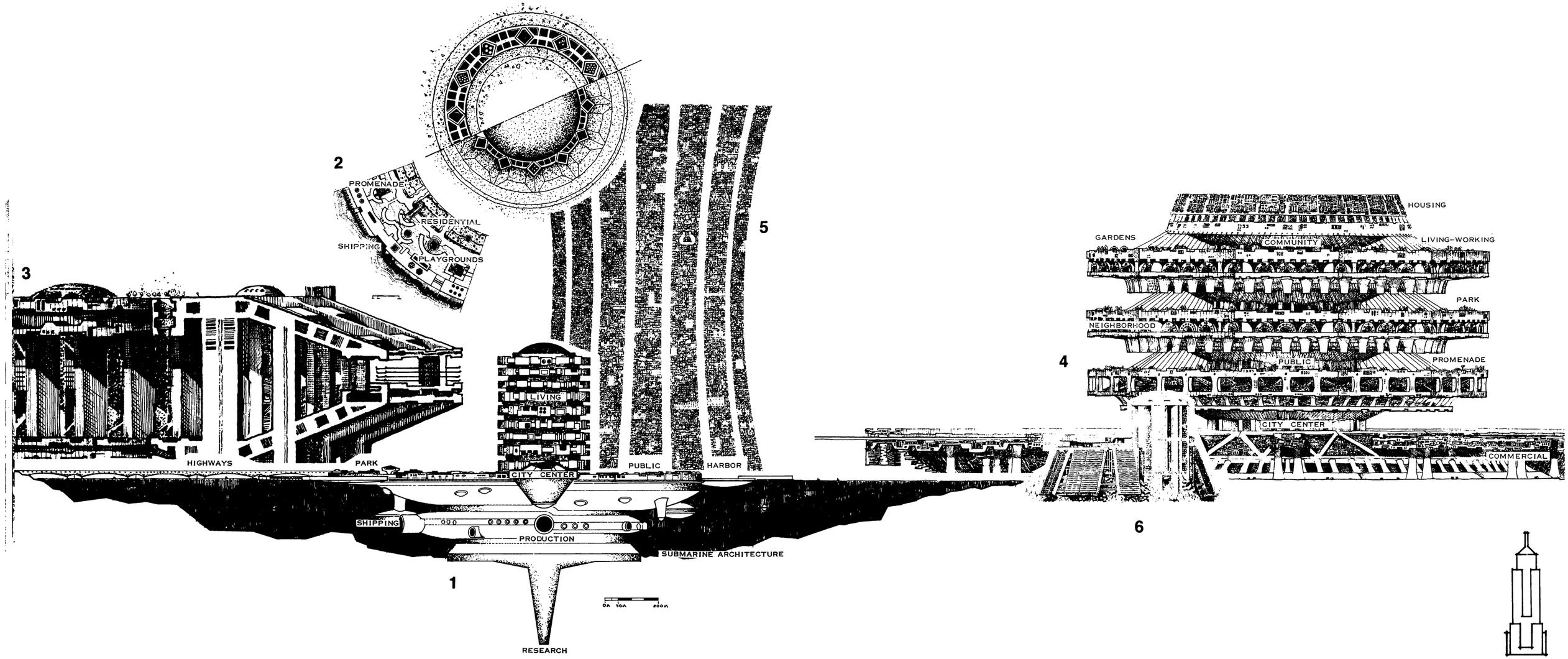


Noahbabel is not a floating system, but buoyancy is an integral part of its structural configuration.

In the expanse of the bowl are residential and public places. Its lower part is for production and storage. The central structure is subdivided into neighborhoods and is essentially residential. Located in the proximity of the shore line, systems such as this would have two direct effects: (1) relieve the population pressure (Japan), and (2) establish integrated productive plants that are economically self-sustaining.

Being rigidly anchored, the organism could make use of tide differentials for the production of electric power. The fringe benefits could be immeasurable in research, tourism, aquanautics, and a novelty of experiences, conceptual vision, and self-reliance.

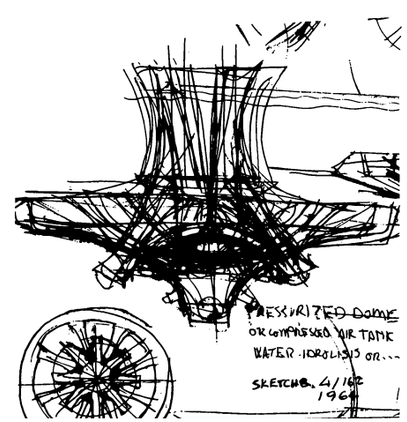
The definition of submarine architecture would be one of the important phenomena developing from the water arcologies. The "modified gravity" in such environments would in time cause a whole redimensioning and reordering of spaces and performances: ceilings and floors would be rather inconsequential, walls would serve for separation more than support, and so forth. A person's field of action would move from circular and flat territoriality to the spherical, centered on the emergency device.

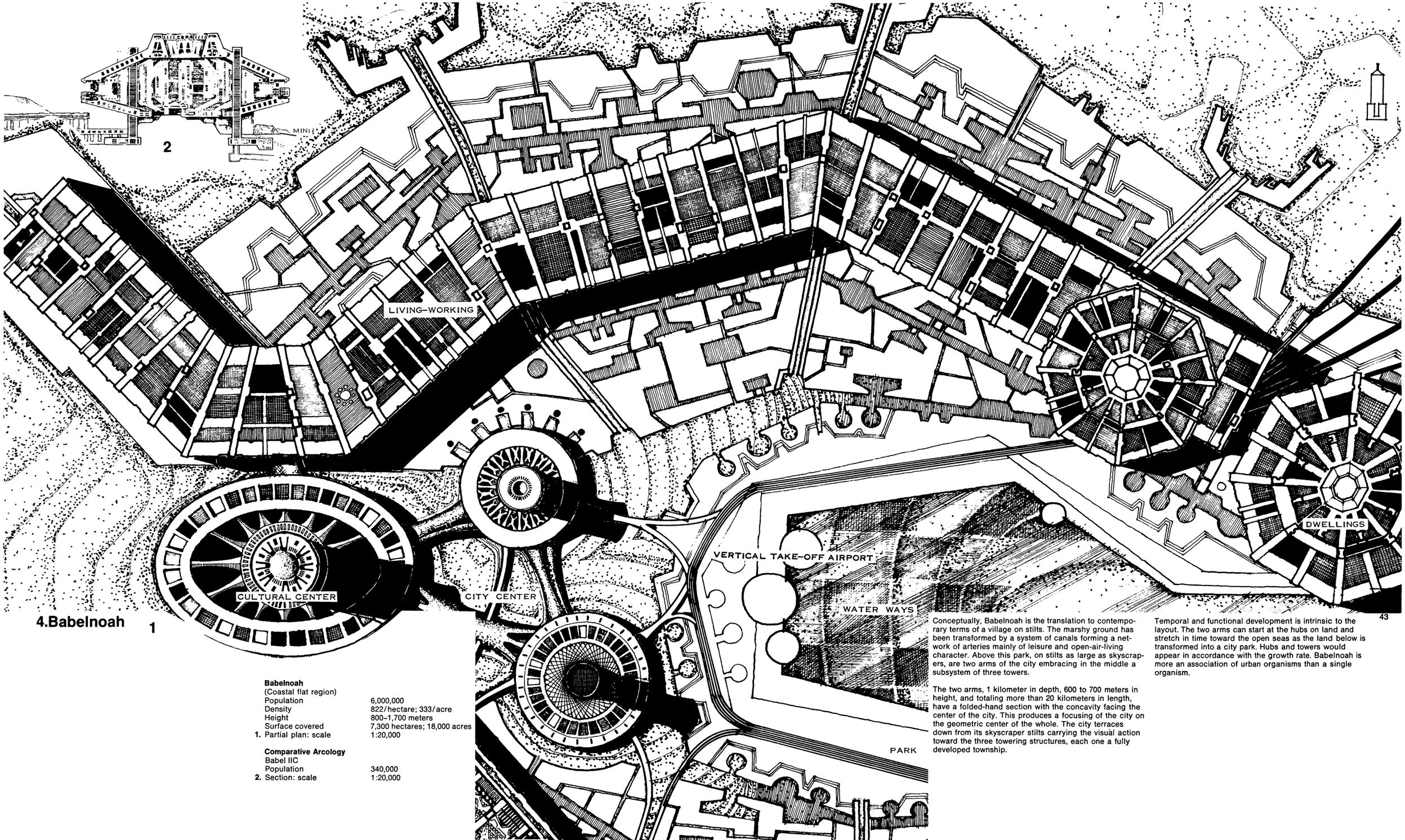


3.Noahbabel

	Noahbabel	
	(Coastal waters)	
	Population	90,000
	Density	575/hectare; 233/acre
	Height	300 meters
	Surface covered	154 hectares; 330 acres
1.	Partial plan: scale	1:10,000
2.	Elevation: scale	1:10,000
	Comparative Arcologies	
	Babelnoah	
	Population	6,000,000
3.	Partial section: scale	1:10,000
	Babel IIB	
	Population	550,000
4.	Partial elevation: scale	1:10,000
	Babel IID	
	Population	520,000
5.	Partial elevation: scale	1:10,000
	Arcoforte	
	Population	10,000
6.	Elevation: scale	1:10,000

Flight, space, and submarine exploration have given man a direct experience of the 3-dimensionality of space. This 3-D space is the reality we live in. We had better make use of it rather than glue ourselves onto the 2-dimensional surface of the earth. In the vertical dimension we will find that degree of efficiency that has escaped us till now. The routine patterns of each person are contained in a pancake 7 feet thick and many hundreds of feet wide. The efficient interaction of many thousands of such "behavior pancakes" will never be found in a flat configuration; it can be achieved only by stacking them up into solids of congruous proportions. This is really a fundamental biological law which clearly states that tenuity and life are inimical. Life is in the thick of things.





4.Babelnoah

1

Babelnoah
(Coastal flat region)

Population	6,000,000
Density	822/hectare; 333/acre
Height	800–1,700 meters
Surface covered	7,300 hectares; 18,000 acres
1. Partial plan: scale	1:20,000

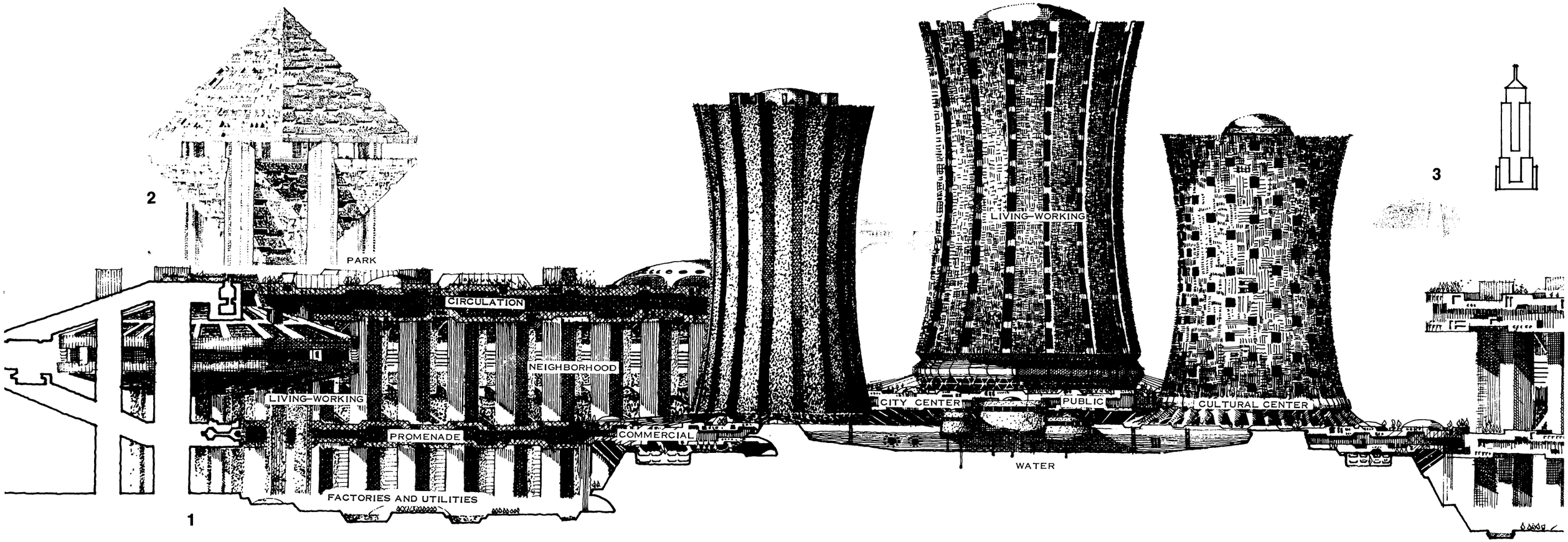
Comparative Arcology
Babel IIC

Population	340,000
2. Section: scale	1:20,000

Conceptually, Babelnoah is the translation to contemporary terms of a village on stilts. The marshy ground has been transformed by a system of canals forming a network of arteries mainly of leisure and open-air-living character. Above this park, on stilts as large as skyscrapers, are two arms of the city embracing in the middle a subsystem of three towers.

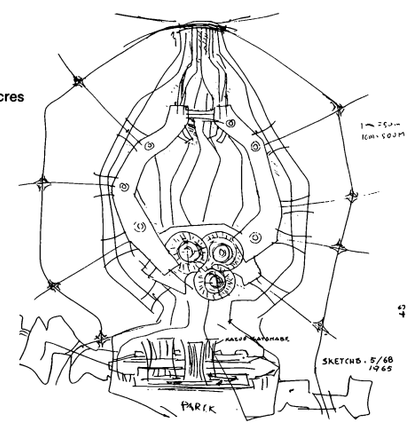
The two arms, 1 kilometer in depth, 600 to 700 meters in height, and totaling more than 20 kilometers in length, have a folded-hand section with the concavity facing the center of the city. This produces a focusing of the city on the geometric center of the whole. The city terraces down from its skyscraper stilts carrying the visual action toward the three towering structures, each one a fully developed township.

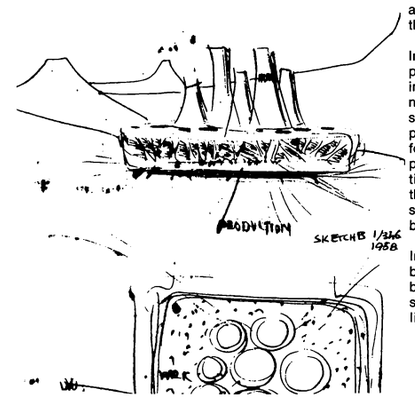
Temporal and functional development is intrinsic to the layout. The two arms can start at the hubs on land and stretch in time toward the open seas as the land below is transformed into a city park. Hubs and towers would appear in accordance with the growth rate. Babelnoah is more an association of urban organisms than a single organism.



4.Babelnoah

	Babelnoah	
	(Coastal flat region)	
	Population	6,000,000
	Density	822/hectare; 333/acre
	Height	800–1,700 meters
	Surface covered	7,300 hectares; 18,000 acres
1.	Partial section and elevation: scale	1:10,000
	Comparative Arcologies	
	Hexahedron	
	Population	170,000
2.	Elevation: scale	1:10,000
	Stonebow	
	Population	200,000
3.	Elevation: scale	1:10,000



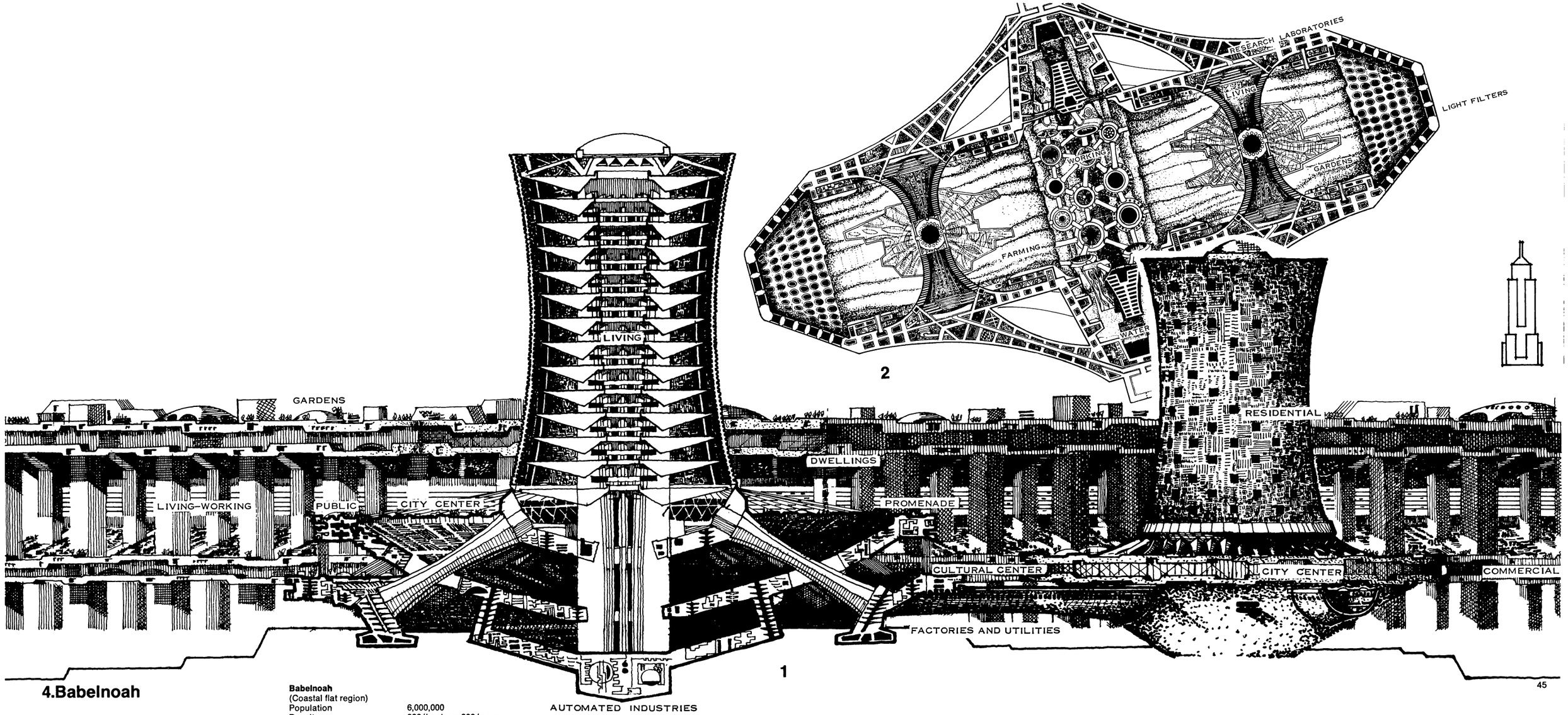


Arcologies are architectural organisms of such character and dimensions as to be ecologically relevant. They are that architecture which is the "ecology" of reflective life.

In the genesis of neomatter (technology), in the face of population growth, and because of the complexification inherent in life development, it has become an immediate necessity that the nodular nature of civilization, represented by the "city," move toward the hyperdensity made possible by a truly three-dimensional evolution—upward for the living, downward for automated services and production (in the seas the distinction will be less definitive): The city (the part occupied by man), in-nested on the automated instrument of production, using the large surplus of energy yielded by production plants for a total but open conditioning of soil, water, atmosphere.

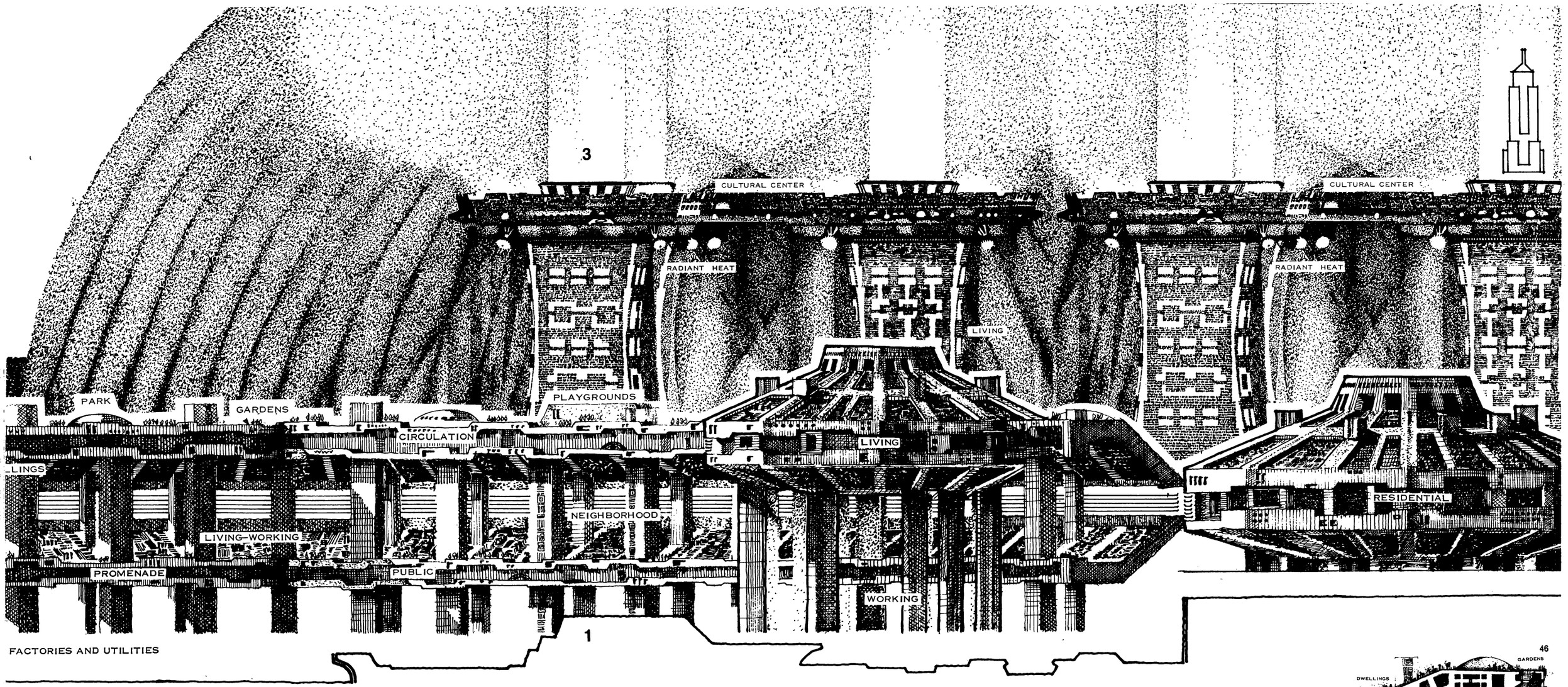
In such a city, open to the environment, the ecology will be determined by man. It will be an arcology, but it will be an arcology only at the condition of being hyperstructural, that is, being the "form" of the compassionate life developing within.

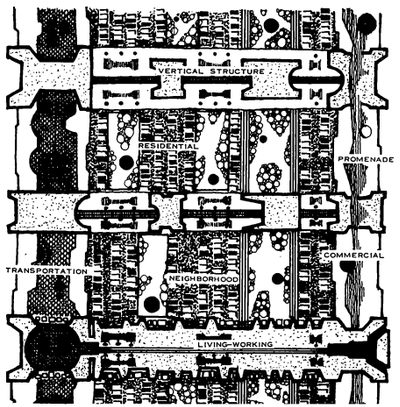
Structure is to biogenesis what form is to homogenesis. As the destiny of man is in hyperfunctionality and hyperstructuralization, the form thus sought is the aesthetic.



4.Babelnoah

Babelnoah	
(Coastal flat region)	
Population	6,000,000
Density	822/hectare; 333/acre
Height	800–1,700 meters
Surface covered	7,300 hectares; 18,000 acres
1. Partial section and elevation: scale	1:10,000
Comparative Arcology	
Asteromo	
Population	70,000
2. Longitudinal section: scale	1:10,000





4.Babelnoah

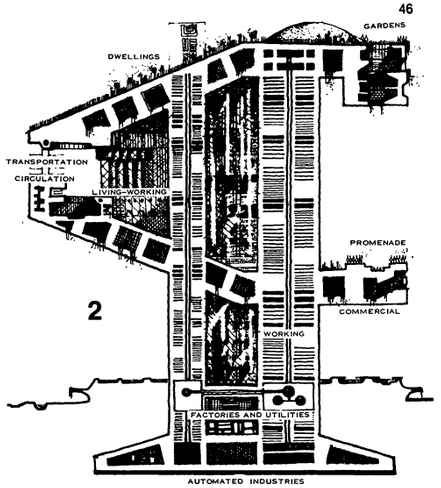
Babelnoah	
(Coastal flat region)	
Population	6,000,000
Density	822/hectare; 333/acre
Height	800–1,700 meters
Surface covered	7,300 hectares; 18,000 acres
1. Partial elevation: scale	1:10,000
2. Partial section and plan: scale	1:10,000
Comparative Arcology	
Babel IIA	
Population	800,000
3. Elevation: scale	1:10,000

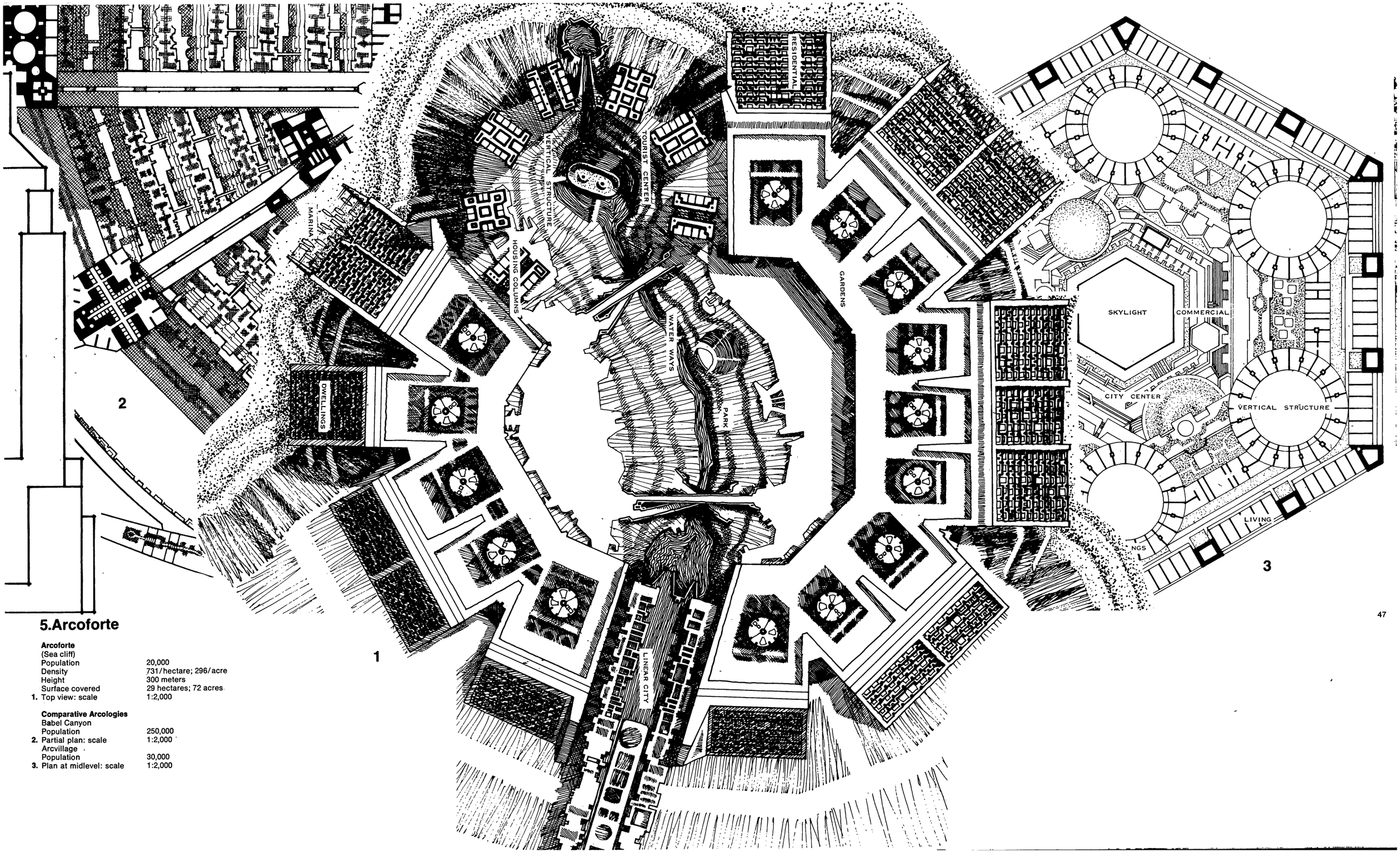
The first age of superpower over the inanimate will leave practically no trace of reverence for life and nature, no suggestion of engrossing sensitivity, but waste heaps, squalor, chaos, the curiously effeminate mark of the "free" plan and the wafer-thin colonies of suburbia. The true beat and the unforeseen scale of the technological appetite and its muscle have been muffled and duped by granular "thinking" and a thick blanket of hypocrisy; blind "convenience" imposed on "bleeding" needs; the most bleeding of them all, the need for harmony, for the hyperstructuration of our environment, "ecological" thinking; convergence must supersede scattering.

What man now borrows atomistically from neomatter and irreverently, if timidly, arranges in irrelevant shelters for living and working, he will demand and get, by bold synthesis, from the well-disciplined instruments of technology (neomatter). With it he will build complex organisms whose arcological character will allow the human to become more so: hyperrational, that is, aesthetic.

The aesthetic is to beauty what form is to structure, the difference being the presence of what I call compassion. Compassion, whose form is the aesthetic, is the character that truly and "originally" distinguishes man (and alike) from all that is (. . . rationality being no more, no less, than a perfectible organization of matter).

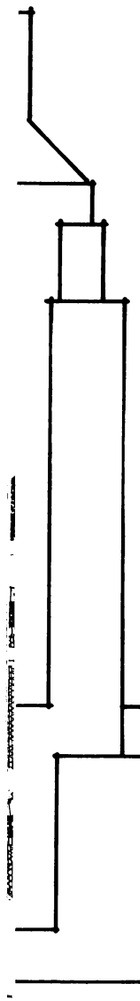
The neoromantic interlude of the organic plan, the open, the spread-out, thin definition of useful spaces is at its dawn. Crepuscular light was never totally absent from its products. History will forget its theoretical charts, its dogmas, and, sandwiched between the vacuity of the prerational era and the arcologies of the postrational, will be the few valid (artistic) examples of the broad-acre and garden-city "utopias." There, vision was gazing backward at an aged spirituality far too undercomplex for the revolutions in act. As for rationalism-functionalism-structuralism, their forward-gazing was and is directed at the impermanent aspects of evolution, its materialistic roars, its ritualism in pettiness and a lack of perspective.





5.Arcoforte

Arcoforte	
(Sea cliff)	
Population	20,000
Density	731/hectare; 296/acre
Height	300 meters
Surface covered	29 hectares; 72 acres
1. Top view: scale	1:2,000
Comparative Arcologies	
Babel Canyon	
Population	250,000
2. Partial plan: scale	1:2,000
Arcvillage	
Population	30,000
3. Plan at midlevel: scale	1:2,000



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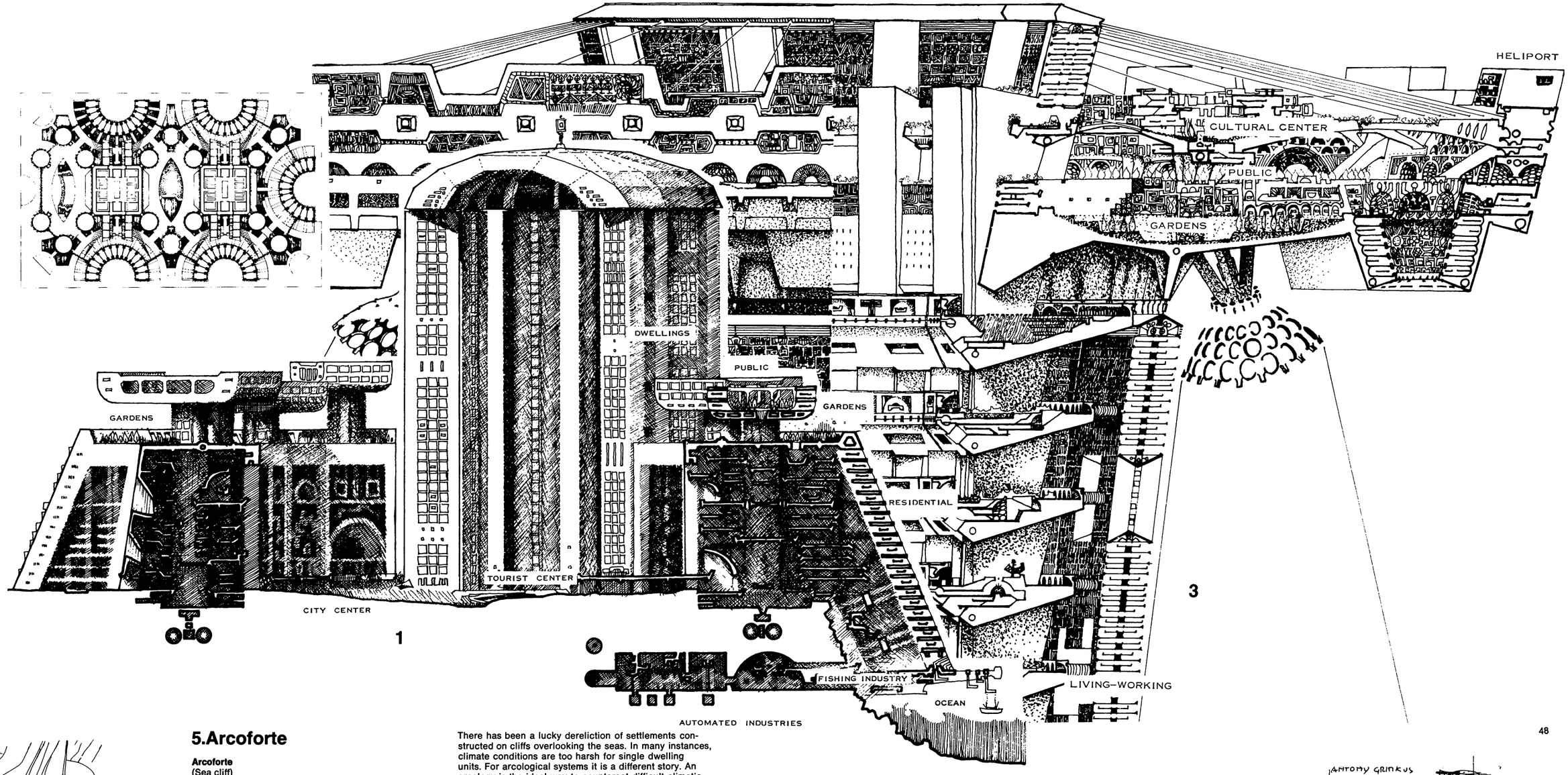

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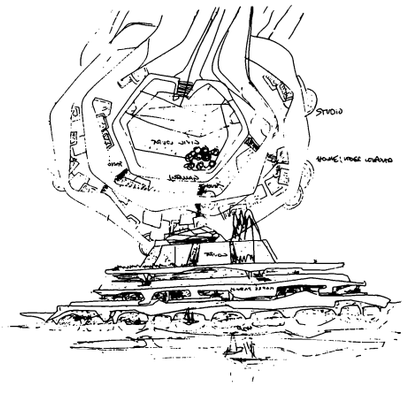
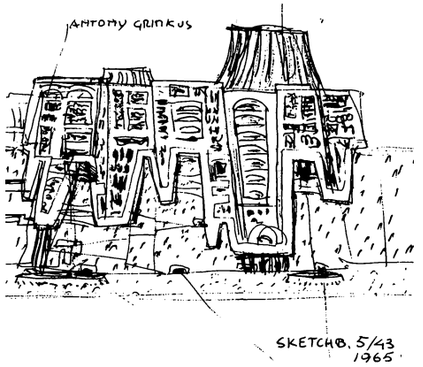


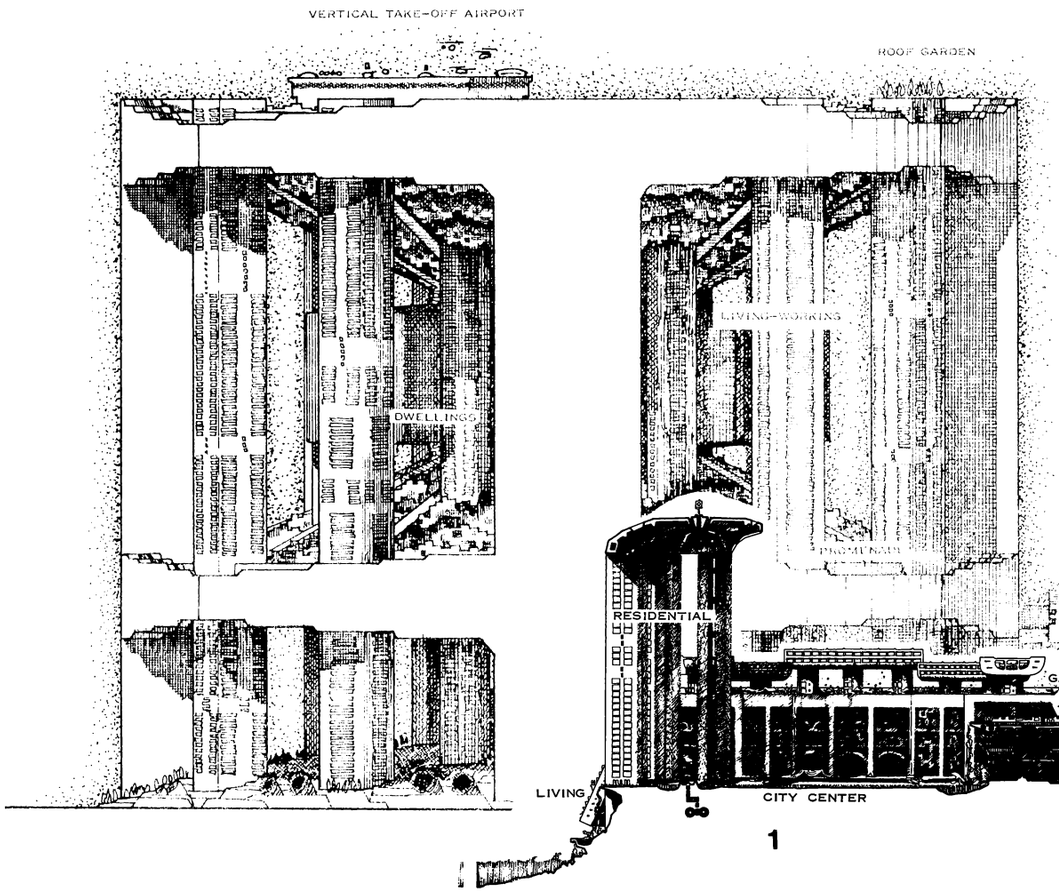
5.Arcoforte

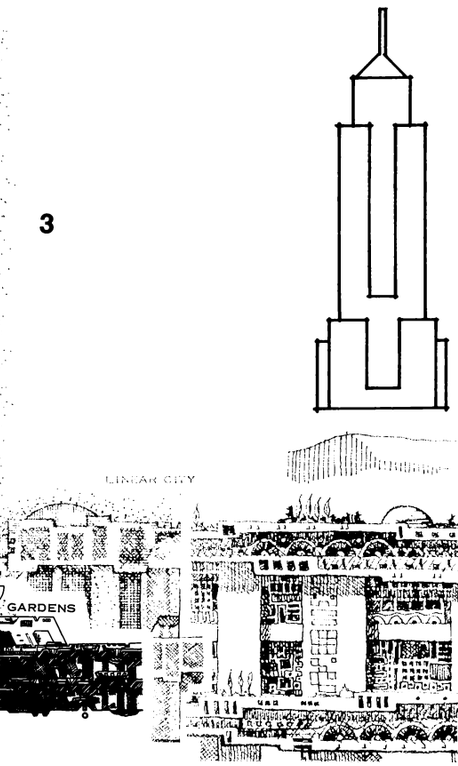
Arcoforte	
(Sea cliff)	
Population	20,000
Density	731/hectare; 296/acre
Height	300 meters
Surface covered	29 hectares; 72 acres
1. Section: scale	1:2,000
Comparative Arcologies	
Arcosanti	
Population	1,500
2. Plan at bridge level: scale	1:2,000
Babel IIA	
Population	800,000
3. Partial section of one tower: scale	1:2,000

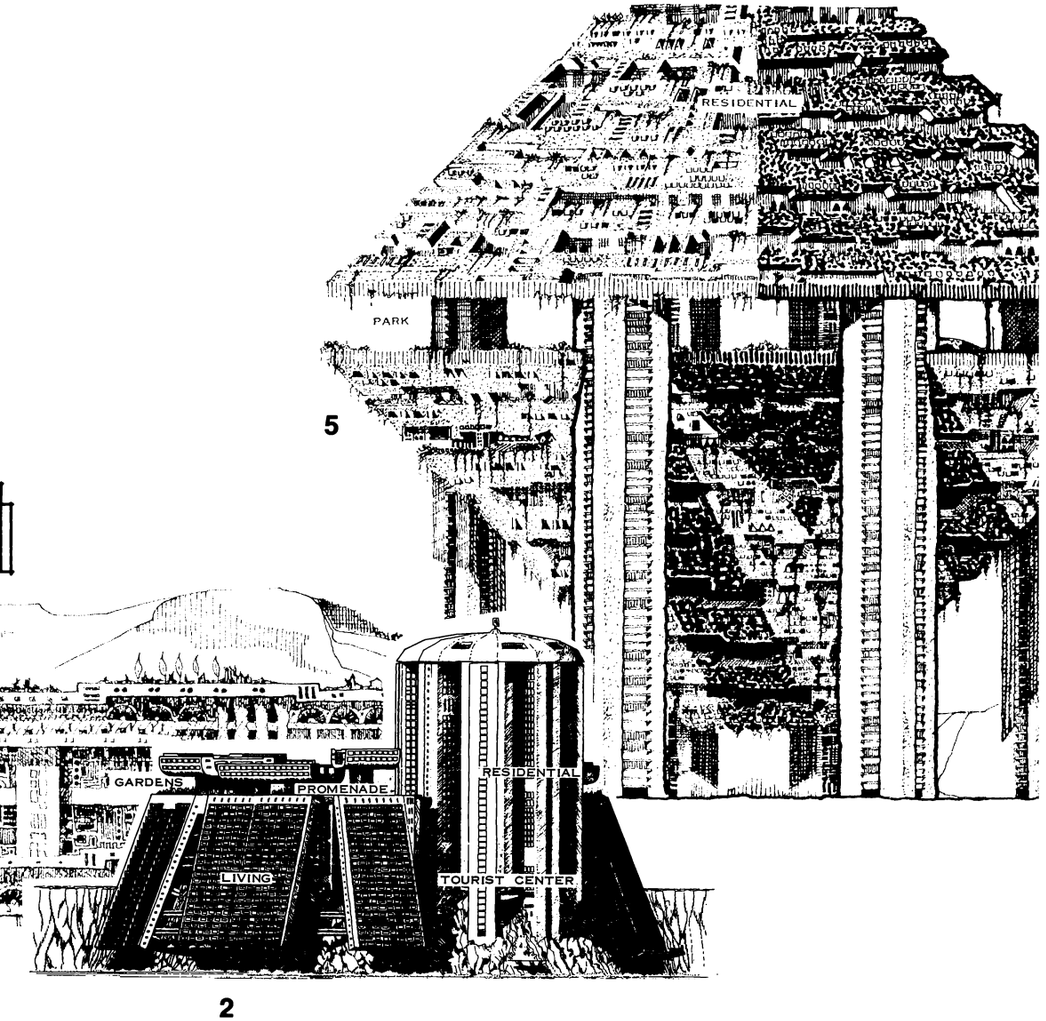
There has been a lucky dereliction of settlements constructed on cliffs overlooking the seas. In many instances, climate conditions are too harsh for single dwelling units. For arcological systems it is a different story. An arcology is the ideal way to counteract difficult climatic situations. In a way the arcology becomes a bigger cliff that has been vivified by the life established in its cellular structure. The "neocliff" has also been turned upon itself to encircle a central park and define a sheltered volume.

The seven towers (skyscrapers), almost 300 meters in height, form a vertical volume topped by a complex roof whose function is multiple: shelter, communication, public facilities, and so forth. The harbor has been superseded by a multilevel platform into which the fishing fleet is lifted and, after unloading, serviced and provisioned. Processing plants and cold storage are directly connected with the platform.

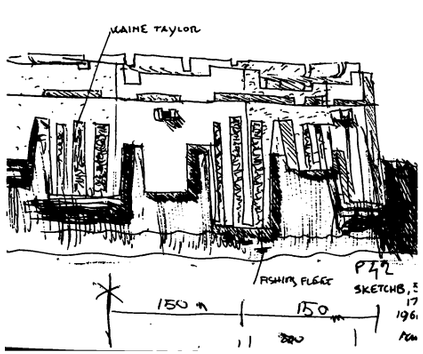








5.Arcoforte



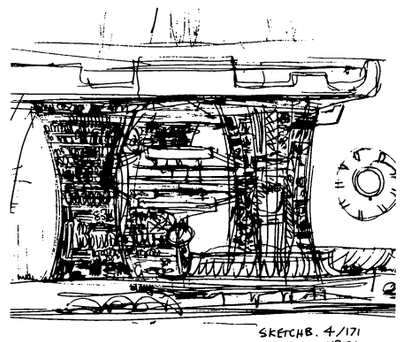
	Arcoforte	
	(Sea cliff)	
	Population	20,000
	Density	731/hectare; 296/acre
	Height	300 meters
	Surface covered	29 hectares; 72 acres
1.	Section: scale	1:5,000
2.	Elevation: scale	1:5,000
	Comparative Arcologies	
	Babel Canyon	
	Population	250,0000
3.	Elevation: scale	1:5,000
	Arcanyon	
	Population	40,000/kilometer
4.	Partial elevation: scale	1:5,000
	Hexahedron	
	Population	170,000
5.	Elevation: scale	1:5,000

CROP PROCESSING
FOOD STORAGE
FACTORIES AND UTILITIES
CITY CENTER
VERTICAL STRUCTURE
VERTICAL STRUCTURE
CULTURAL CENTER

6.Babel IIA

1

Babel IIA	
(Flat or marshy land)	
Population	800,000
Density	650/hectare; 263/acre
Height	1,150 meters
Surface covered	1,250 hectares; 3,085 acres
1. General site: scale	1:50,000
2. Partial top view: scale	1:10,000



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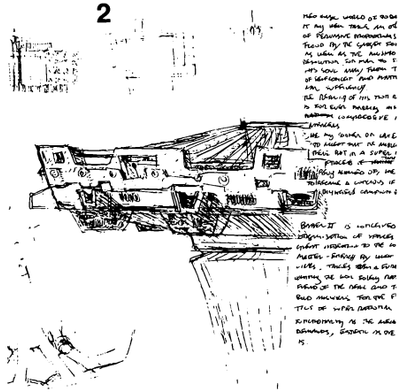


The envy of a crude and cruel God brought down Babel and the discomfort of specialized tongues to man. It is possible that even then man got to be too technical for his own well-being. Then the same technical jargon that afflicted him, selling models for real, is what is with us today.

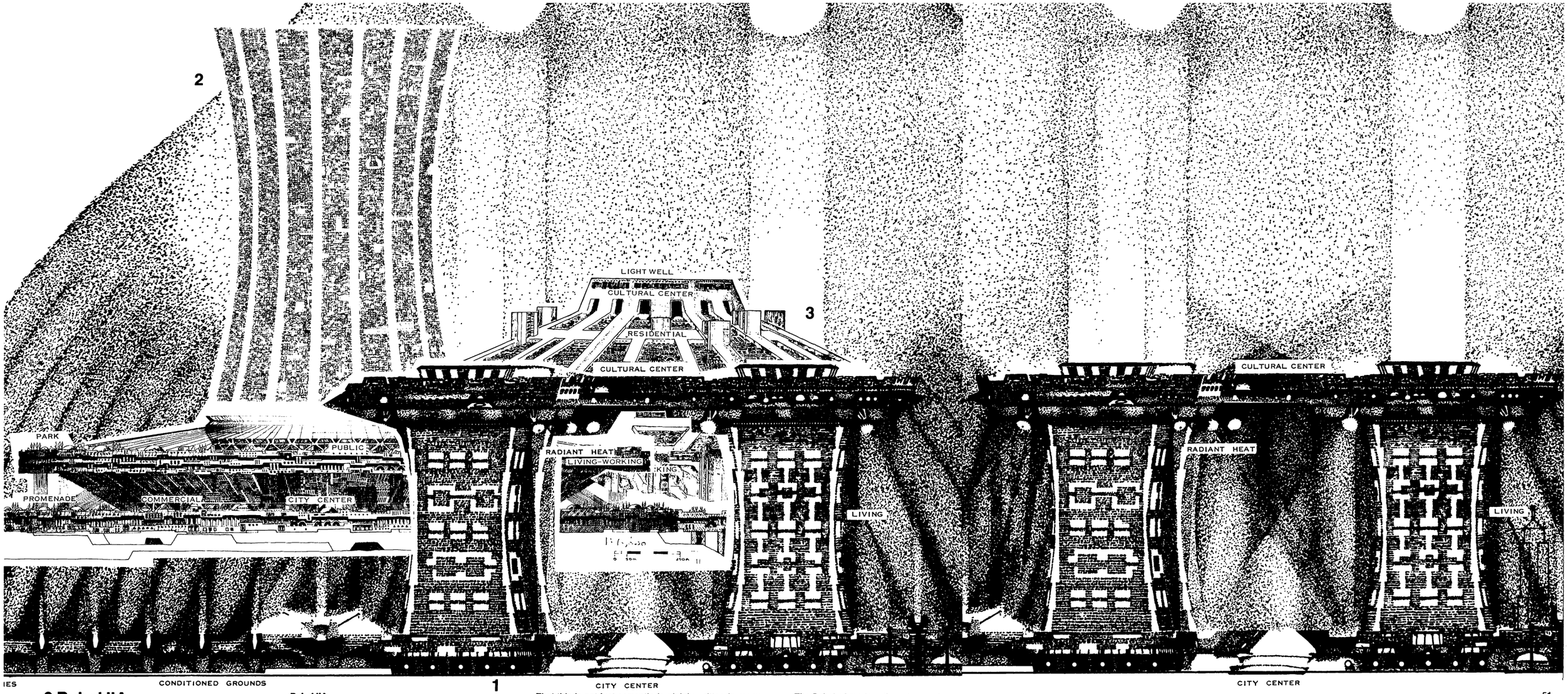
Abstract or not, good or evil, the countless new models with their courts of savoir faire are preparing man for the major babel that freedom from labor will mean. Preparation may not be the best word for the counterfeiting of things, thoughts, and emotions, ebulliently proposed and enforced by the quasi-automatism of business, gross national product, and so on—and the golden cage is not so golden yet.

The case here is that perhaps a metamorphosis of the protogilded encasement for an asphyxiating society may mean the uncovering of a different set of values, better aligned with the basic tenderness of the human constitution.

As such tenderness is backed by the infinite boldness of life itself, bold has to be the action reaching out to sustain and regroup the harassed members of the human species.

As the shelter for consciousness cannot be simply and solely a rational engine, the new Babel cannot be a machine for living.

If man can be called, in technical jargon, a seeking and suffering machine, the envelope of his seeking and suffering cannot be but a suffering, that is, a super-rational engine. I have called such entity an aesthetocompassionate phenomenon.



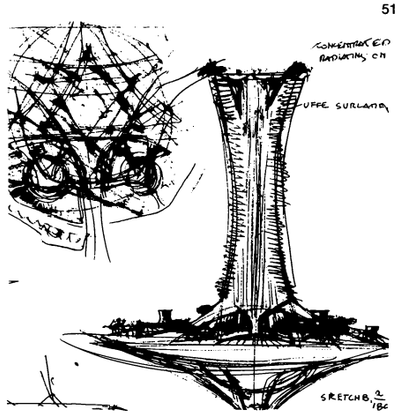
6.Babel IIA

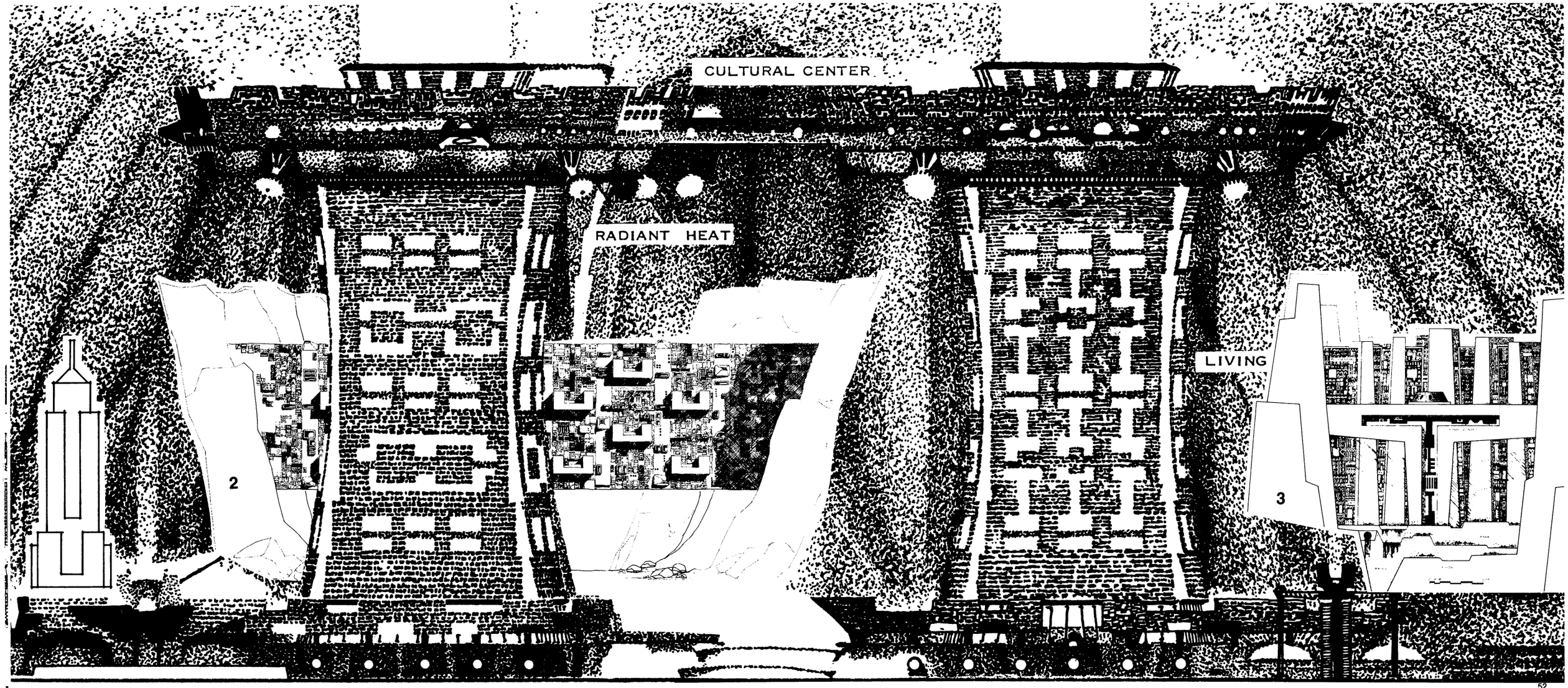
	Babel IIA	
	(Flat or marshy land)	
	Population	800,000
	Density	650/hectare; 263/acre
	Height	1,150 meters
	Surface covered	1,250 hectares; 3,085 acres
1.	Elevation: scale	1:10,000
	Comparative Arcologies	
	Babel IID	
	Population	550,000
2.	Elevation: scale	1:10,000
	Babel IIC	
	Population	340,000
3.	Elevation: scale	1:10,000

That this is not just semantic is plainly written in many languages. Beautiful is the evaluative and final judgment for any endeavor, be it in science, religion, philosophy, or morals. The ugliness, uniquely human, of the deed of reverent man is nothing but the failure of his not-less-unique trust in search of the aesthetic, the function of his manipulation of nature—a nature obviously neutral but, to the eyes of aesthetic man, now beautiful, now not so. Quite possibly then, it was not a hypothetical God who tore down Babel, but technical man himself. Unable to see beyond the instrumentality of his undertaking, he became a stranger to himself, foreclosing understanding and communication. His gasping in the proto-aesthetic world of the machine for living, procured him only loneliness and squalor, the same loneliness and squalor of the neomagic world of today.

It may well take another disaster of universal proportion, the flood of the gadget, for instance, or the mushroom-cloud resolution, for man to shake his soul away from the idols of matter-rational sufficiency and realize that rationality is only a partial answer.

The Babel of modern times is a technicality in search of purpose, a purpose it is destined not to find until the day when its subaltern position is understood and framed in the society technicality is meant to serve. This is, in turn, unachievable unless the credulity of man in the neomagic pose of technology is deflated to its proportion, a proportion to be found in coherent use for purposes that are real inasmuch as they are historically adequate to the position of man within nature.





6.Babel IIA

Babel IIA
(Flat or marshy land)

Population	800,000
Density	650/hectare; 263/acre
Height	1,150 meters
Surface covered	1,250 hectares; 3,085 acres
1. Elevation: scale	1:5,000

Comparative Arcologies

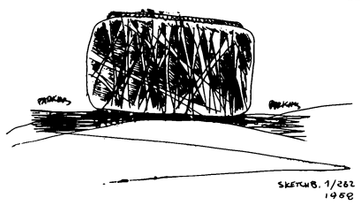
Arcbeam	
Population	65,000
2. Elevation: scale	1:5,000
Theodiga	
Population	20,000
3. Elevation: scale	1:5,000

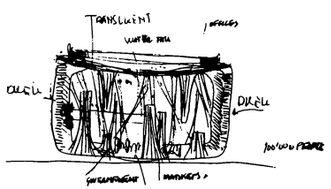
1

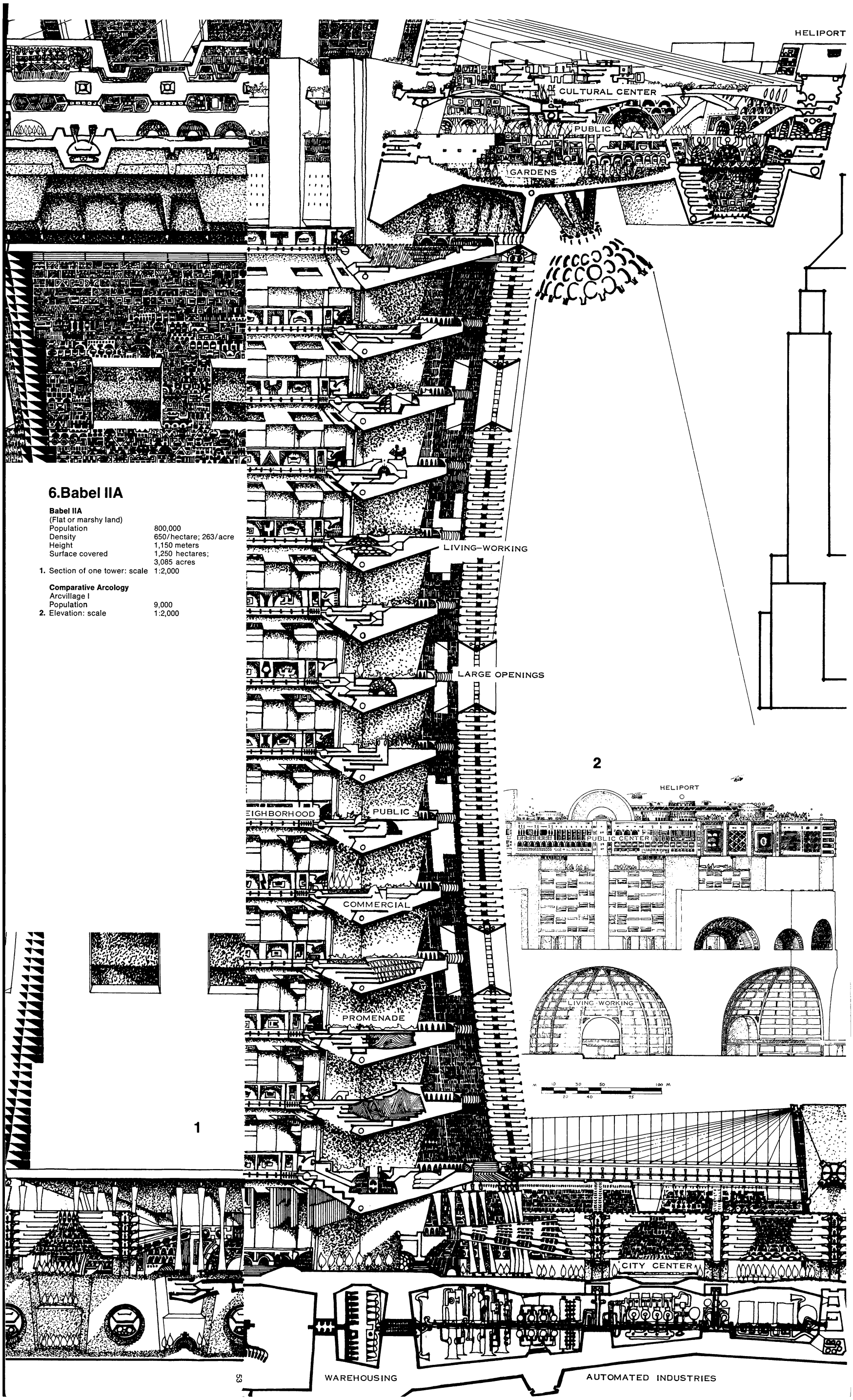
Eight towers are sandwiched between two plurilevel platforms. The towers are mainly composed of neighborhoods and residences. The lower platform is a composite of transportation networks, public places and facilities, work spaces, warehousing, shopping centers.

The upper platform is mainly viewed as the container of most of the cultural institutions of the city. Such an extensive umbrella, over 4 kilometers by 2 kilometers, projects an enormous shadow on the space below. The volume of shade is on the order of 10 to 12 cubic kilometers. A substantial climatic alteration is thus produced. The low winter sun still penetrates deep under the umbrella, and auxiliary radiant heat may be added to the conditioning of the space. The ground and garden level can be kept at any desired temperature, as it is the roof of the lower platform.

The energies derived from waste processing and from industrial surpluses can be used for a further conditioning of the land surrounding the city. In this way the city climate is a milder reflection of the regional climate.







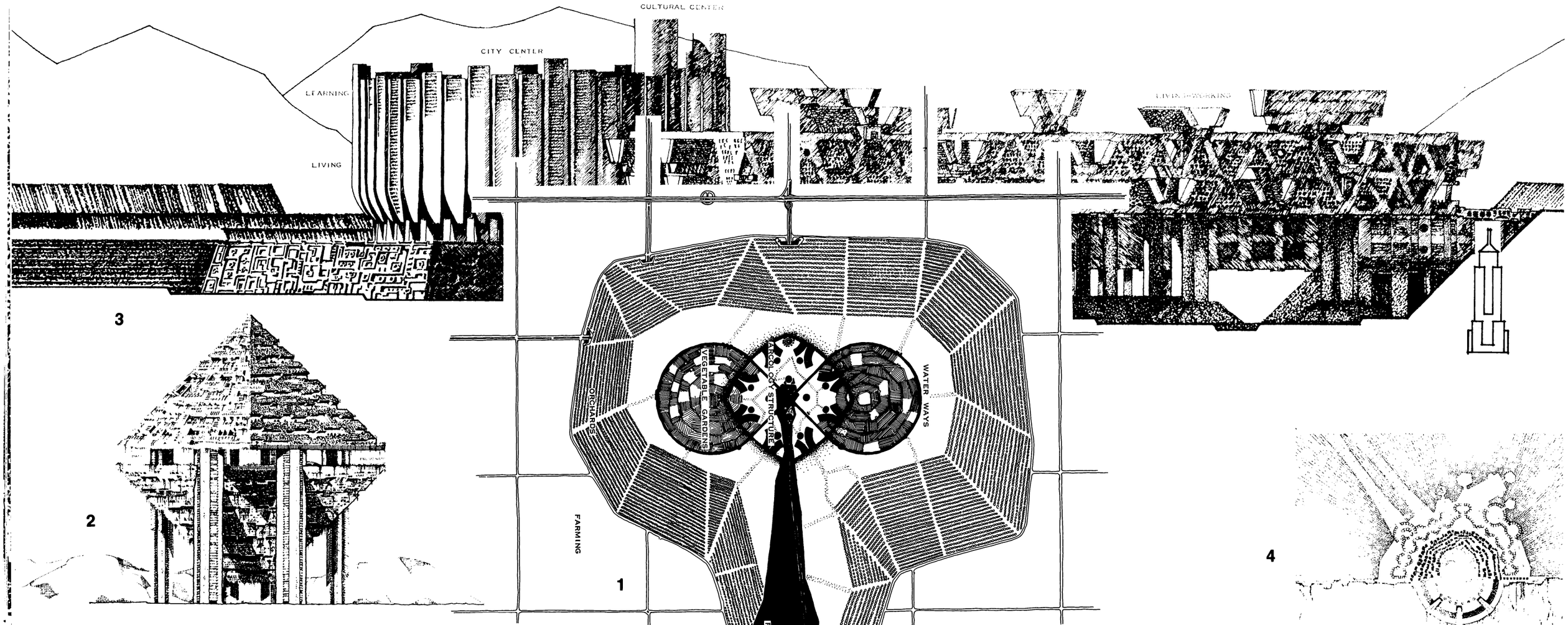
6.Babel IIA

Babel IIA
(Flat or marshy land)

Population	800,000
Density	650/hectare; 263/acre
Height	1,150 meters
Surface covered	1,250 hectares; 3,085 acres
1. Section of one tower: scale	1:2,000

Comparative Arcology
Arcvillage I

Population	9,000
2. Elevation: scale	1:2,000

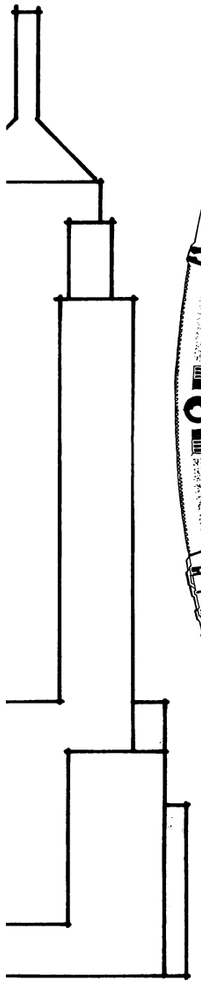


7.Arcvillage I

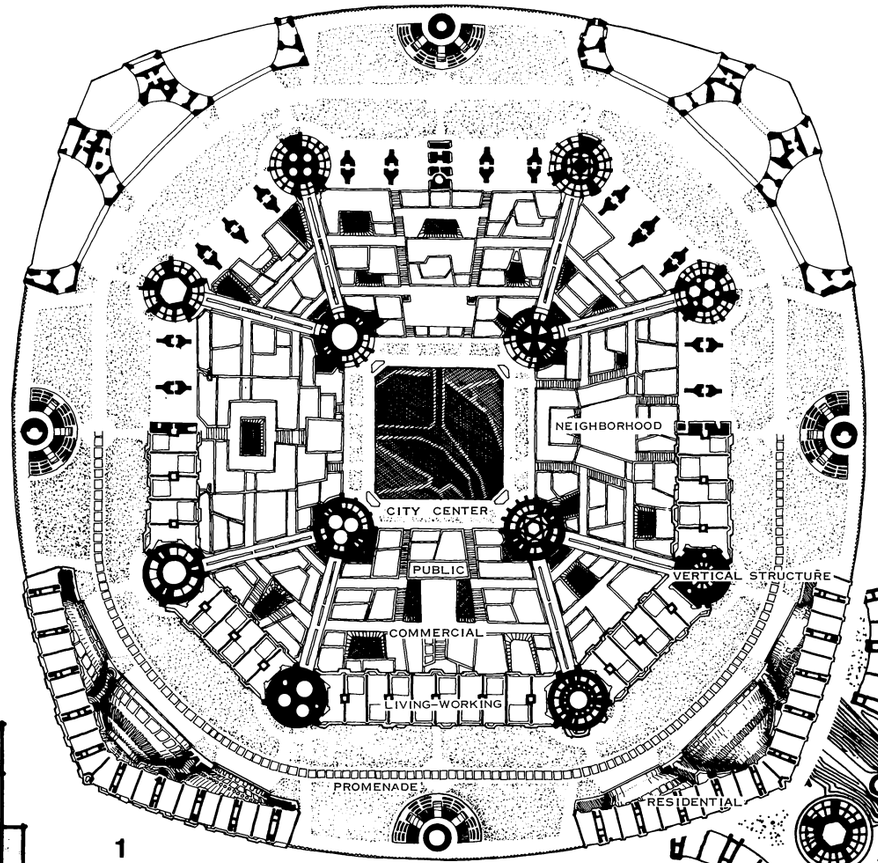
Arcvillage I	
(Farm land)	
Population	9,000
Density	741/hectare; 300/acre
Height	220 meters
Surface covered	12.25 hectares; 30 acres
1. Site plan: scale	1:10,000
Comparative Arcologies	
Hexahedron	
Population	170,000
2. Elevation: scale	1:10,000
Logology	
Population	900,000
3. Elevation: scale	1:10,000
Theology	
Population	13,000
4. Plan: scale	1:10,000

Our society has not even started to consider the farmer as an integral part of the social organism. The farmer, surrounded by a nature that is ever more identified with a sluggish machine for production, finds himself hostile toward it and less and less awed by its pervasiveness. Farming as industry is an extreme case of tenuity. Its deminiaturized performance is besetting the life of the farm people. While technological mystique has all but obliterated the reverential demeanor of the farmer toward nature, this same technology has not only given no solution to the farmer's loneliness and cultural pauperism (TV and radio) but has used efficiency as a way of scattering the society of the land tenant into ever more inaccessible community centers, centers nagged by rampant provincialism.

With the disappearance of the small farmer, the population has demultiplied, and the village has been replaced by the supermarket, a market for urban goods not for soil products. Of all men, the farmer is the most disenchanted toward nature, and at the same time his enchantment with progress is confined to those instruments that in growing numbers are encasing him in the megamachine of the industrial complex. A reversal of the farmer migration toward urban centers is not desirable unless the farmer is given a good alternative for the satisfaction of his longing for human and social intercourse.



7.Arcvillage I



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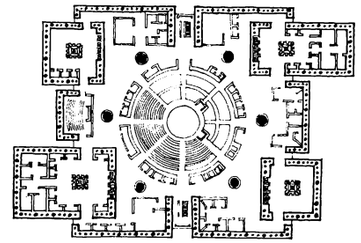

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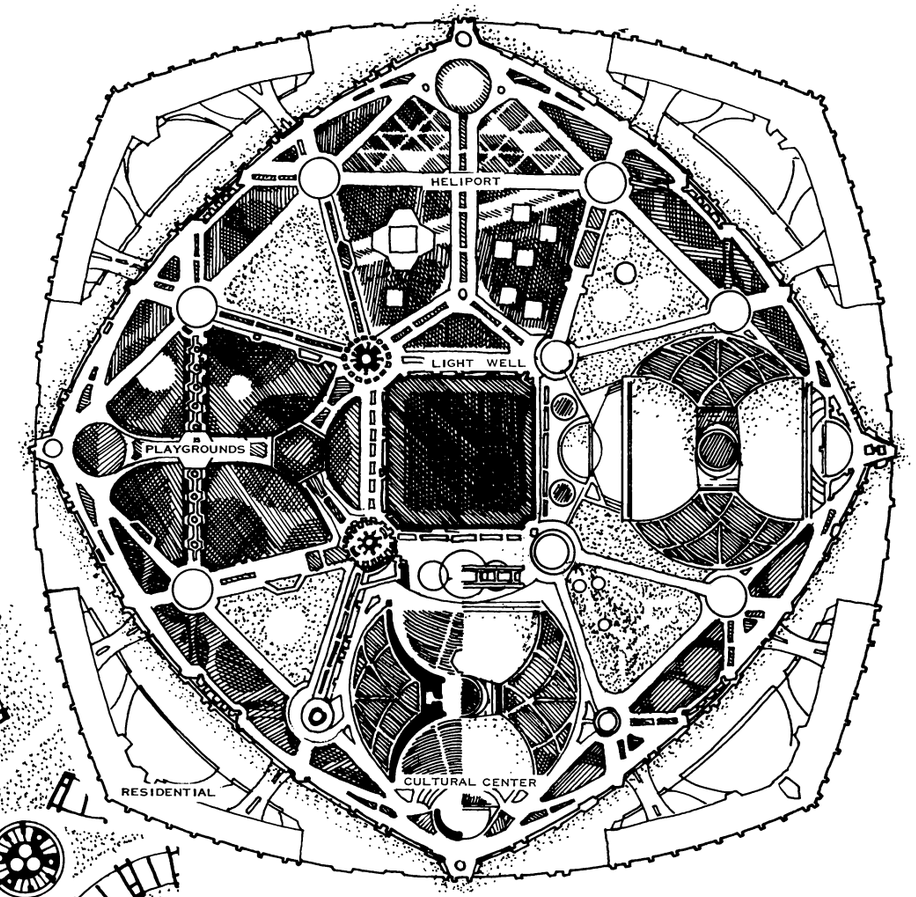

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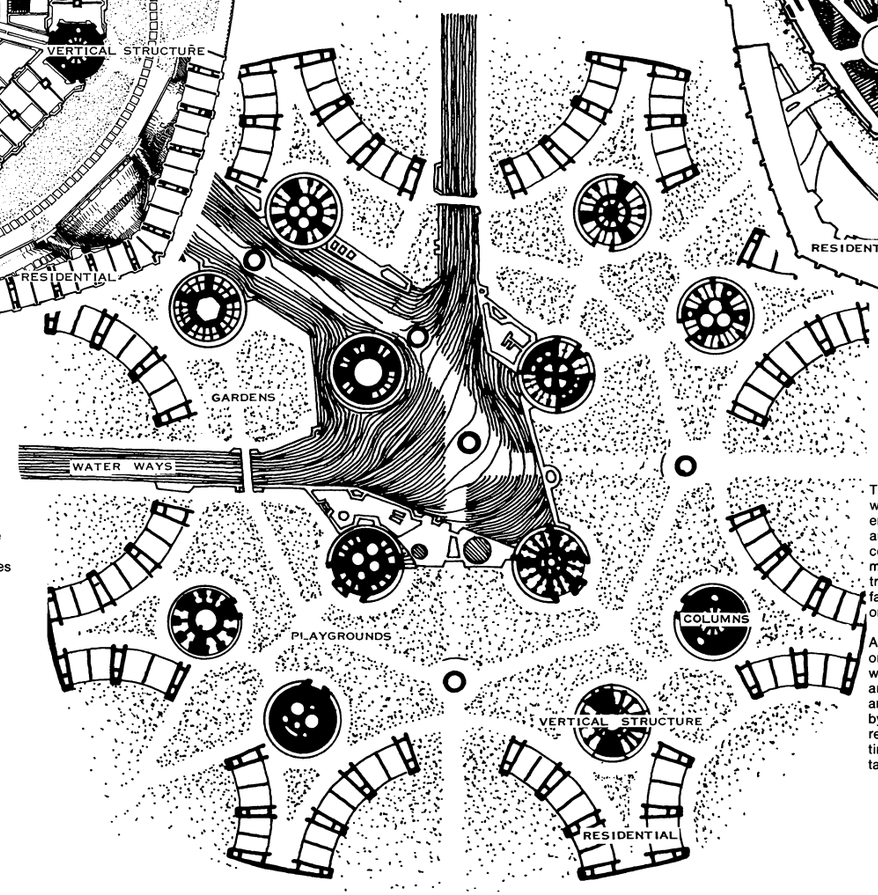
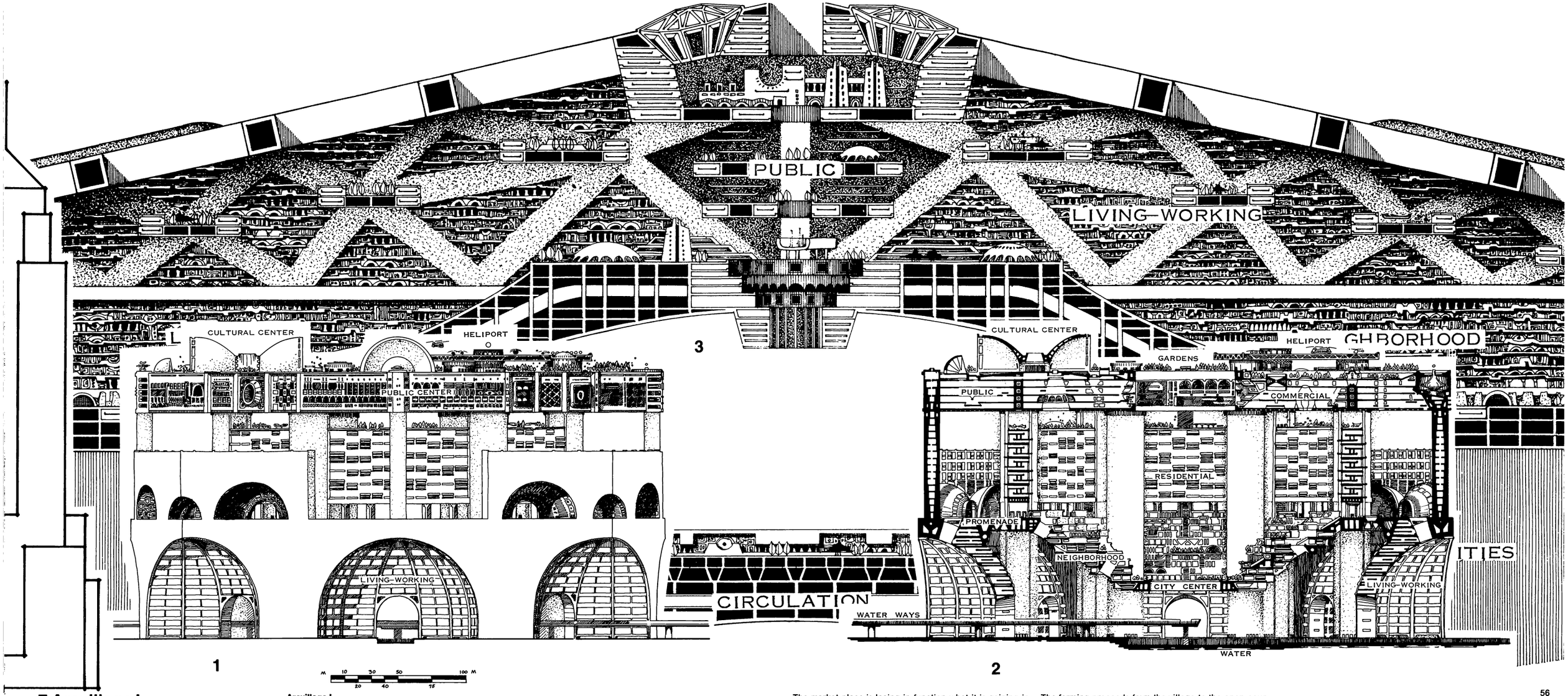


2

Arcvillage I	
(Farm land)	
Population	9,000
Density	741/hectare; 300/acre
Height	220 meters
Surface covered	12.25 hectares; 30 acres
1. Midlevel plan: scale	1:2,000
2. Ground plan: scale	1:2,000
3. Roof plan: scale	1:2,000
Comparative Arcology	
Arckibuz	
Population	2,500
4. City center plan: scale	1:2,000

The urban life must be brought to the farmer. The only way this is feasible is to maintain communities large enough to sustain and encourage urban institutions. An area of about 10,000 square miles could sustain an urban center of about 100,000, placing the city-farmer at no more than 50 miles away from his land. The center's attraction would have to be sufficient to engender in the farmer's family an irresistible desire to live there and not on the land under cultivation.

A town cannot sustain its life if it is only a market place or a recreation center. It has to be lived in. At a time when most of the utensils of domesticity and production are no longer made locally, by people, but in far places and anonymously, when food seems to be manufactured by witches, brought in from no place—and one cannot recognize a pea if it does not spill from Mother Box—in times such as these the life of a town cannot be sustained by warehouses and storage places.



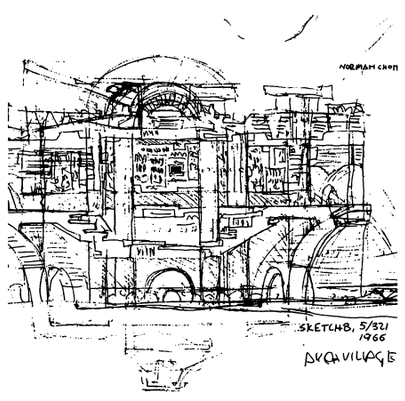
7.Arcvillage I

Arcvillage I
(Farm land)

Population	9,000
Density	741/hectare; 300/acre
Height	220 meters
Surface covered	12.25 hectares; 30 acres
1,2. Elevation and section: scale	1:2,000

Comparative Arcology

Stonebow	
Population	200,000
3. Longitudinal section: scale	1:2,000

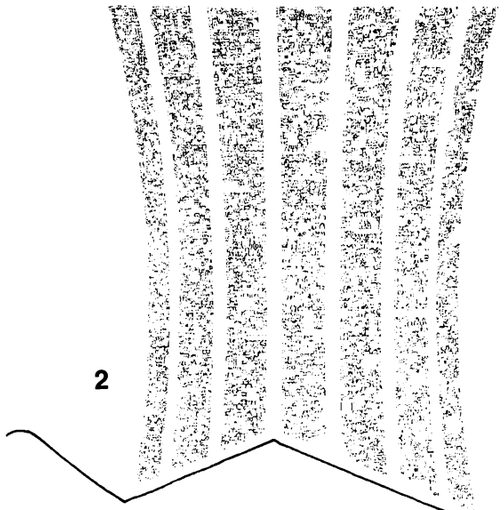


The market place is losing in function what it is gaining in size. The impersonal character invested in the market transaction is a reflection of the anonymity of the goods transacted. This anonymity is now so great as to penetrate even the school room. Thus the farmer and his family move from an often grim confrontation with nature to a no less grim confrontation with anonymous if shiny collectivism.

Humanization of the farm town can only be obtained by a healthy mixture of people, some living and working there, some living there and working their farms. For the single farmer wrestling with nature, staying on the farm might be right. If the farmer has a family, then he might find it desirable to live in the stream of the body-social. He has such a right. In any case, as things are now, this right is denied. It is worth notice that in the total ecology of the city and its farms, the car has a real place. There would be a daily pulsation as many people would fan out from the city to the farms and return in the evening without the road overloads caused by suburban sprawl.

The farming proceeds from the village to the open countryside with (1) vegetable gardens at the foot of the arcology, to (2) gardens, to (3) orchards, to (4) grain farming. Canals are fed by a water reservoir, and they loop inside the arcology, irrigating the vegetable gardens.

Eight major apses are carved into the polygon of the structure. The back of these eight apses and twelve cylindrical skyscrapers are the main structures supporting the inverted pyramid of the village center and supporting the many-layered roof of the whole organism. The village is the center of a rural community where the choice of the population has been for metropolitan life in a rural ecology.



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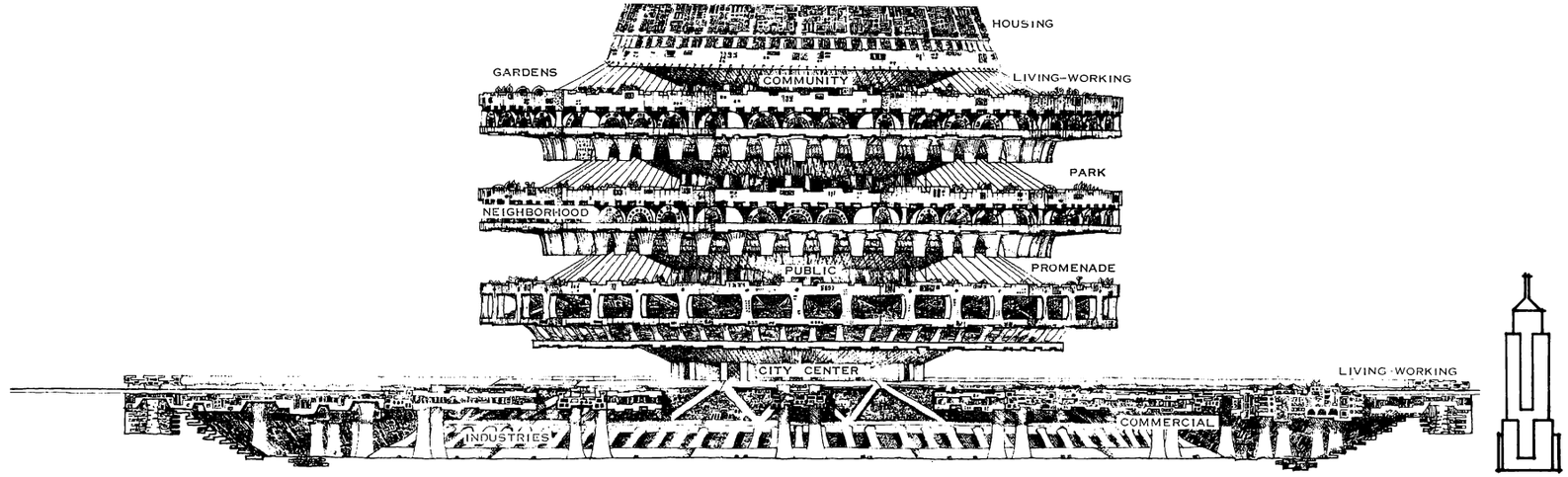

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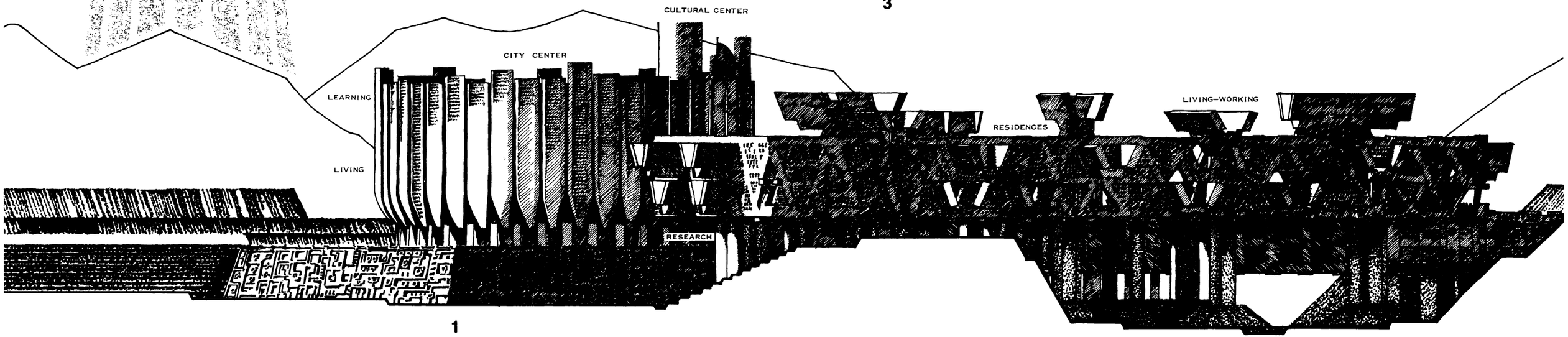

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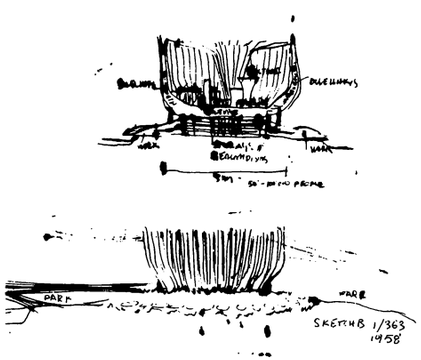
8.Logology



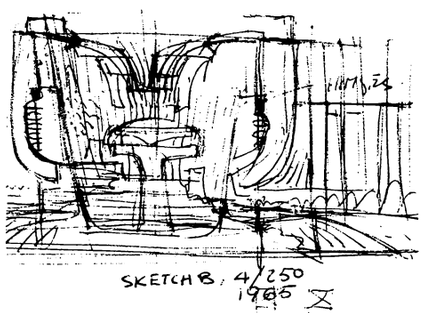
	Logology	
	(Hilly land, flood condition)	
	Population	900,000
	Density	950/hectare; 344/acre
	Height	900 meters
	Surface covered	1,034 hectares; 2,550 acres
1.	Elevation: scale	1:10,000
	Comparative Arcologies	
	Babel IID	
	Population	550,000
2.	Elevation: scale	1:10,000
	Babel IIB	
	Population	520,000
3.	Elevation: scale	1:10,000

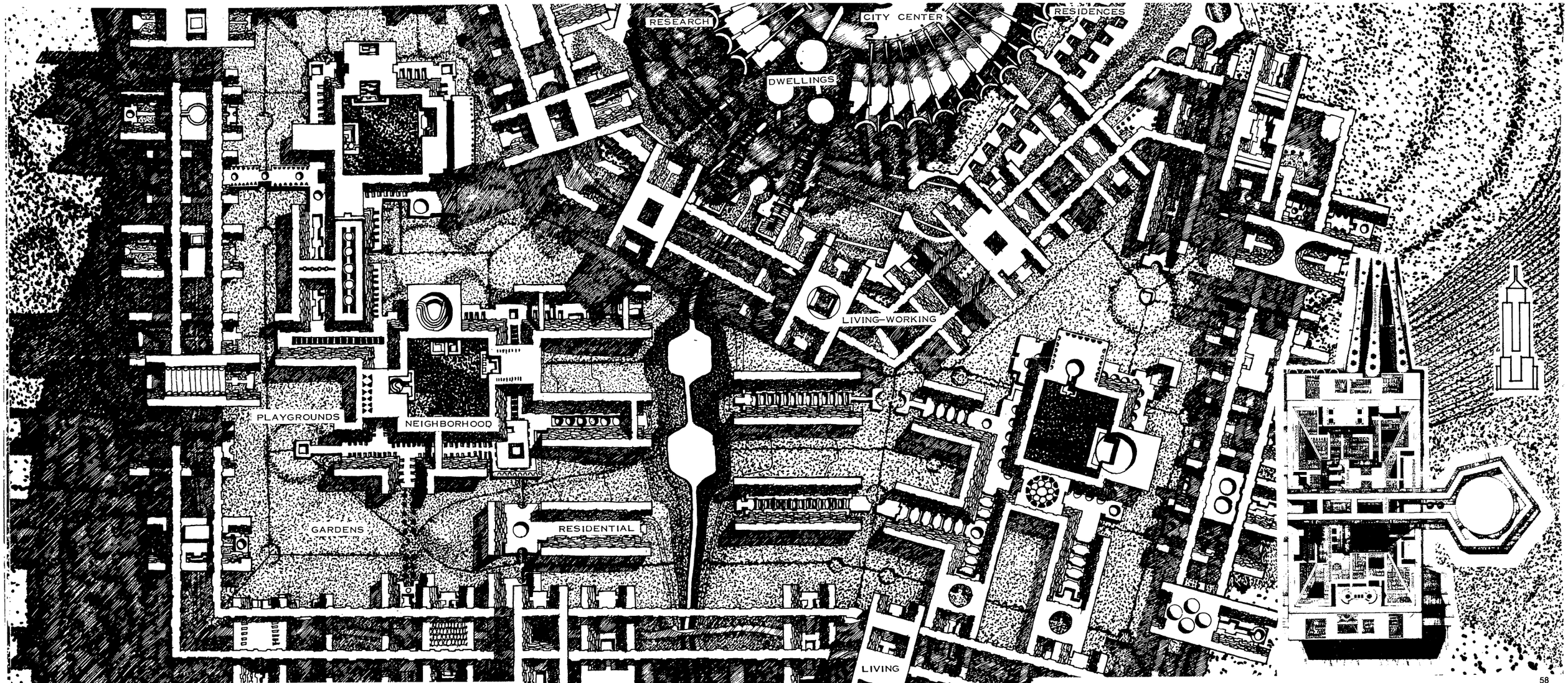
The main asset of Logology is the industry of the mind. For minds rightly turning, Logology would be the quintessence of urbanity, of worldliness, if to be of the world is to have an almost physical awareness of the universal battle put up by life to affirm its own staying power. If this industry of the mind is not also the industry of man, then Logology would be a neomonster organizing new mythological plays. In Logology the heavy industry section is absent. The industry of the mind is a light industry.

In a sense this arcology would be the least specialized, inasmuch as the spectrum of things covered by the working of the mind is potentially limitless. Another characteristic would be a flourishing of manual activities to balance the tendential abstractness of the mental processes. Artisan and craft occupations would be widespread, environmental, a labor of love, not on the level of toil by coercion and the occupational tedium of a therapeutic limbo.

Logology is a double organism, the slab and the bowl. The slab, a series of juxtaposed platforms, is linear, monosexual or asexual. The bowl, a complex cellular conocylinder, is curvilinear, bisexual. The curvilinear is quite clearly composed of radiating elements, the masculine, and enveloping elements, the feminine. When this bivalance is not spoken clearly, the curvilinear tends to be redundant because it becomes functionally ineffective. This is evident in small units, rooms or houses where the latitude demanded by the radial aspect is not present. The mating is contrived; the conception fails.

In the rectilinear this double aspect is absent. There is a singularity of definition that in a way adds order to the system and at times makes it appear stronger. The linear geometry is undoubtedly simpler, conceptually and constructionally. There are, however, goals that simplicity does not foster.





8.Logology

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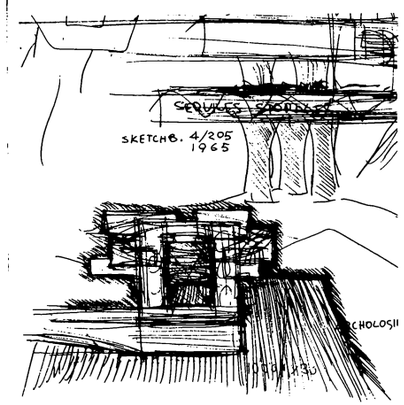
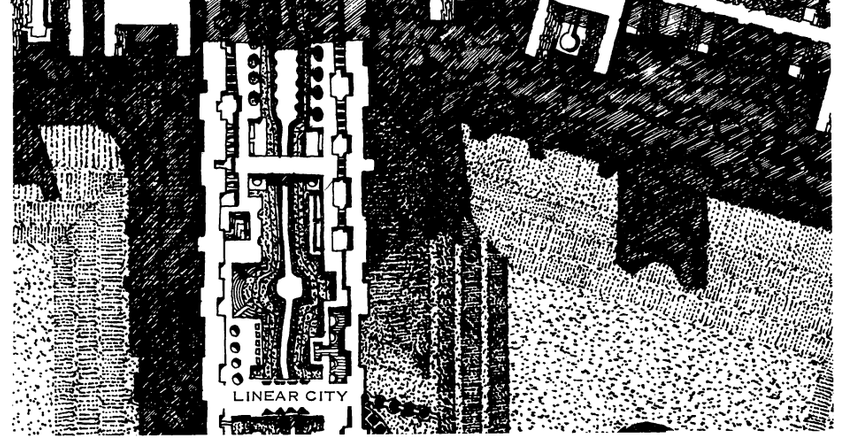




Logology
(Hilly land; flood condition)

Population	900,000
Density	950/hectare; 344/acre
Height	900 meters
Surface covered	1,034 hectares; 2,550 acres

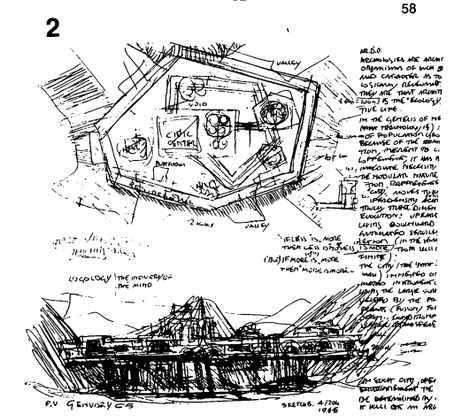
1. Top view of multiple slab portion: scale 1:10,000

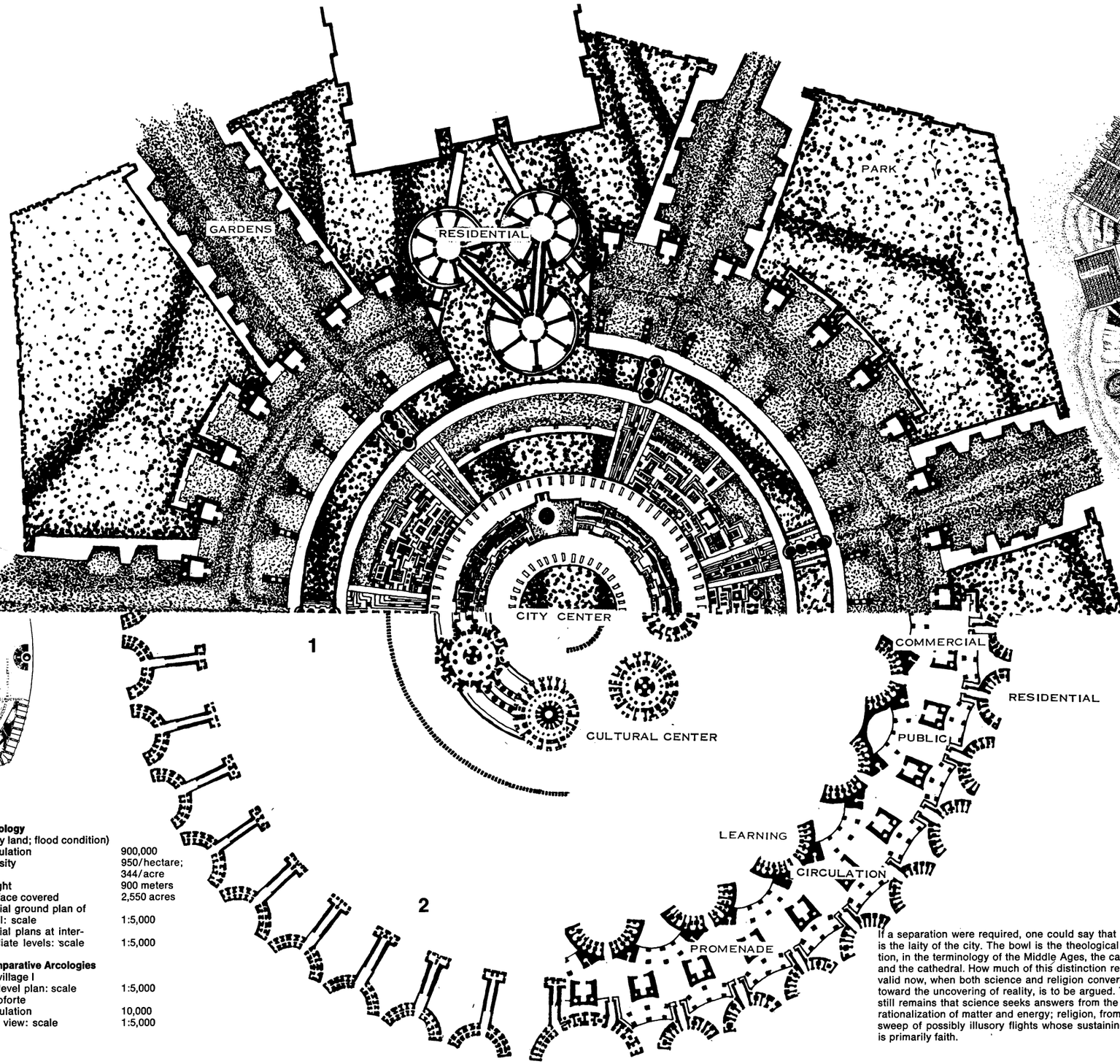
Comparative Arcology
Infrababel

Population	100,000

2. Roof plan: scale 1:10,000

2





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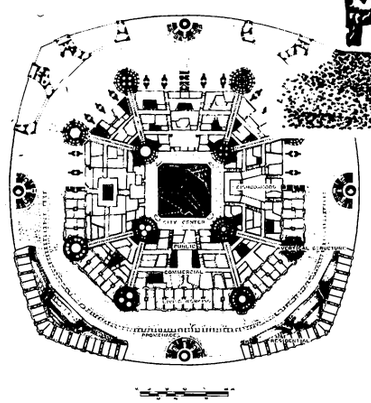

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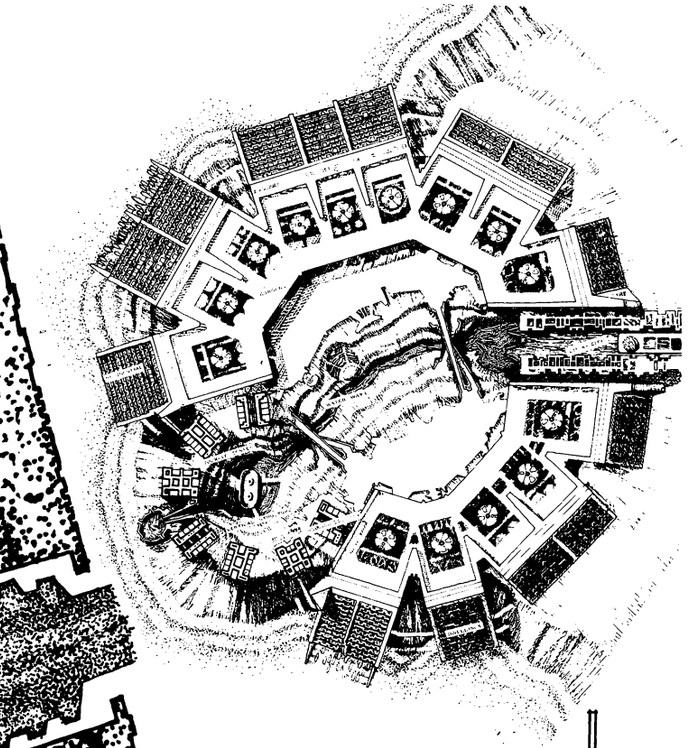

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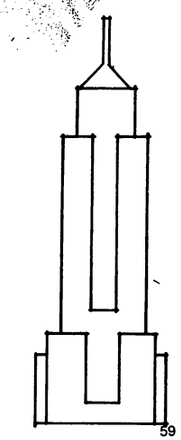

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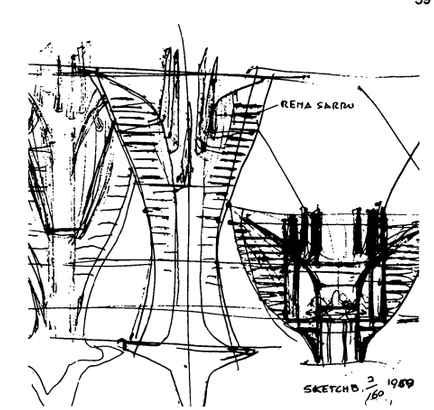
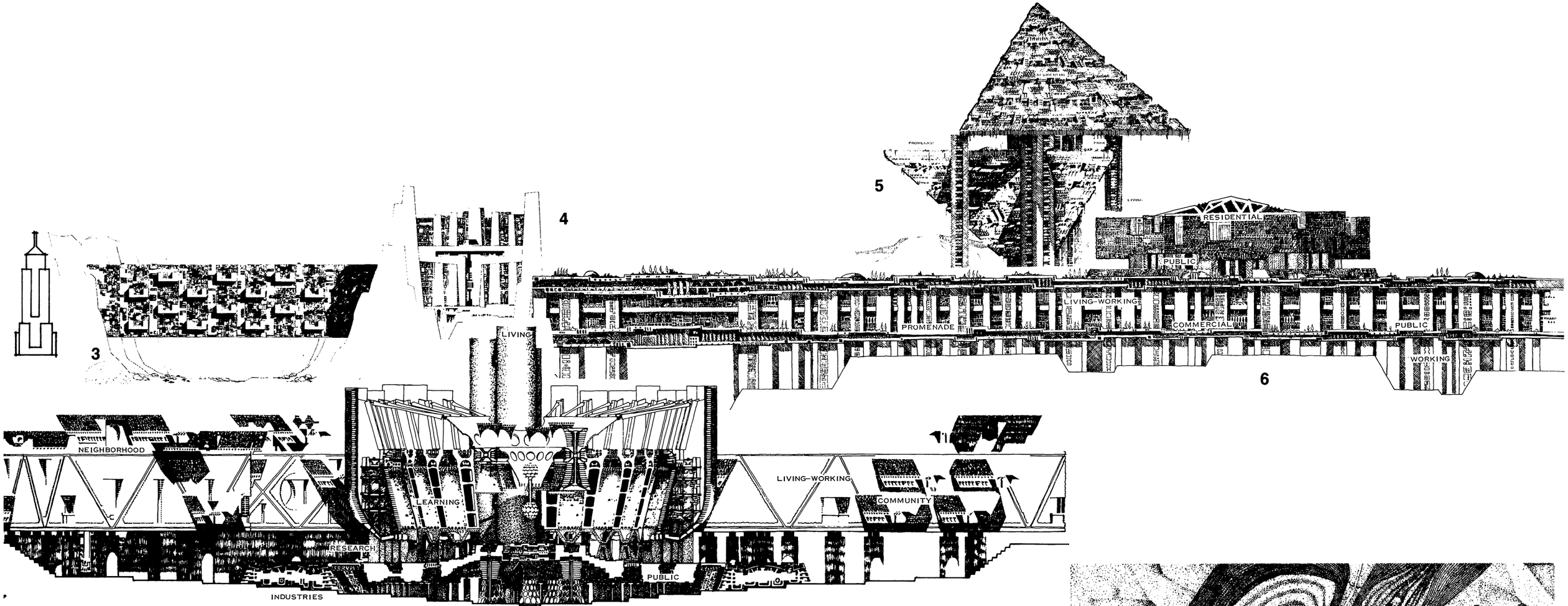
8.Logology

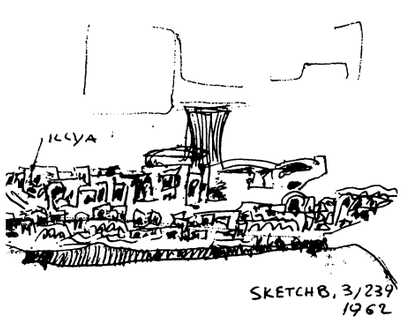
Logology	
(Hilly land; flood condition)	
Population	900,000
Density	950/hectare; 344/acre
Height	900 meters
Surface covered	2,550 acres
1. Partial ground plan of bowl: scale	1:5,000
2. Partial plans at intermediate levels: scale	1:5,000
Comparative Arcologies	
Arcvillage I	
3. Midlevel plan: scale	1:5,000
Arcoforte	
Population	10,000
4. Top view: scale	1:5,000

If a separation were required, one could say that the slab is the laity of the city. The bowl is the theological portion, in the terminology of the Middle Ages, the castle and the cathedral. How much of this distinction remains valid now, when both science and religion converge toward the uncovering of reality, is to be argued. The fact still remains that science seeks answers from the inside, rationalization of matter and energy; religion, from the sweep of possibly illusory flights whose sustaining fuel is primarily faith.

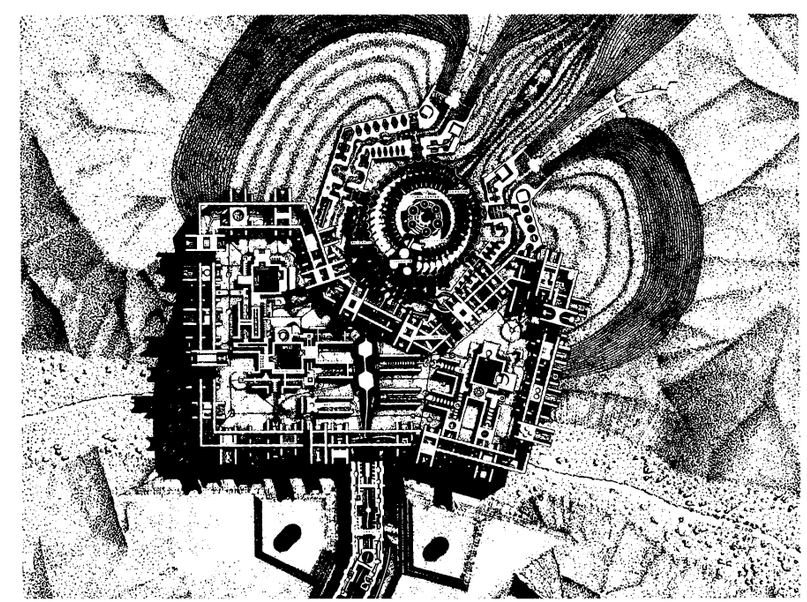




8.Logology



	Logology	
	(Hilly land; flood condition)	
	Population	900,000
	Density	950/hectare; 344/acre
	Height	900 meters
	Surface covered	1,034 hectares; 2,550 acres
1.	Section through bowl: scale	1:10,000
2.	General site plan: scale	1:50,000
	Comparative Arcologies	
	Arcbeam	
	Population	65,000
3.	Elevation: scale	1:10,000
	Theodiga	
	Population	20,000
4.	Elevation: scale	1:10,000
	Hexahedron	
	Population	170,000
5.	Elevation: scale	1:10,000
	Arcanyon	
	Population	40,000
6.	Elevation: scale	1:10,000



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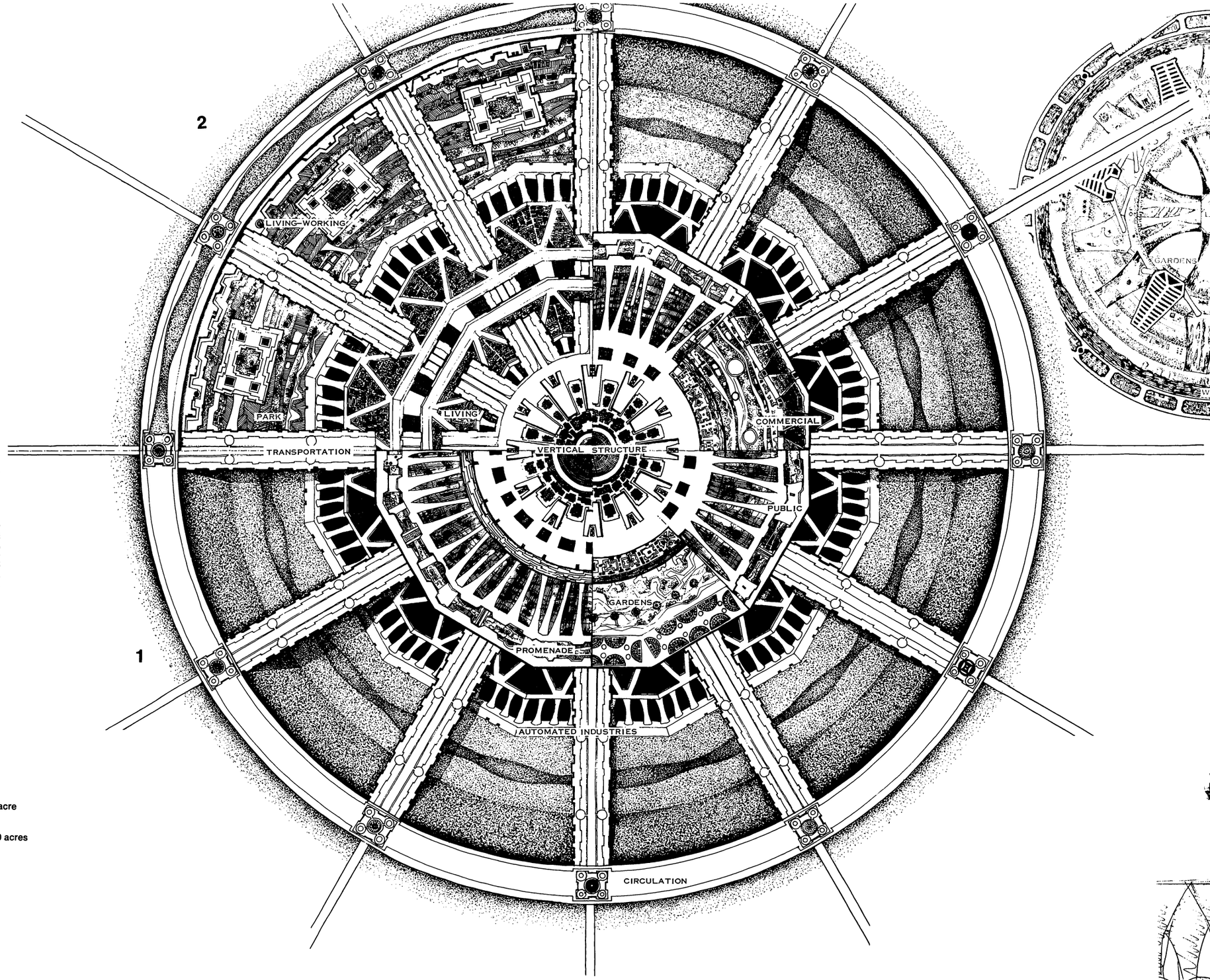

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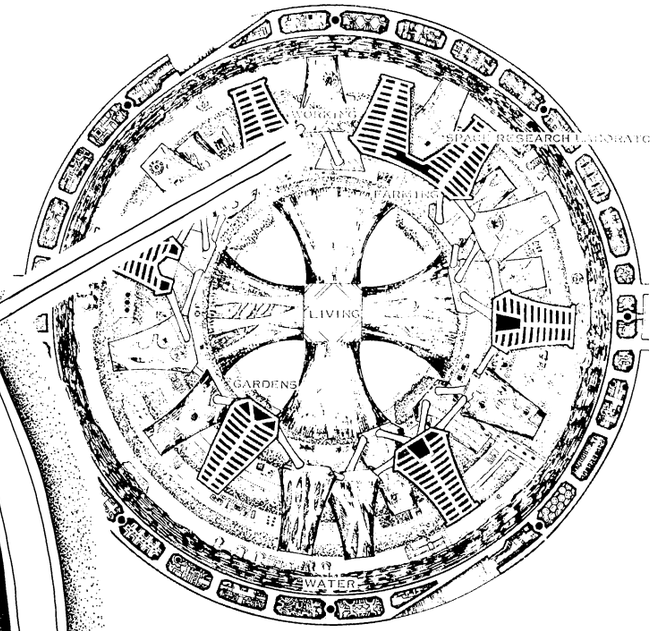

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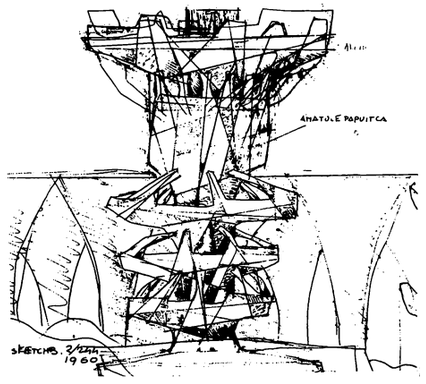
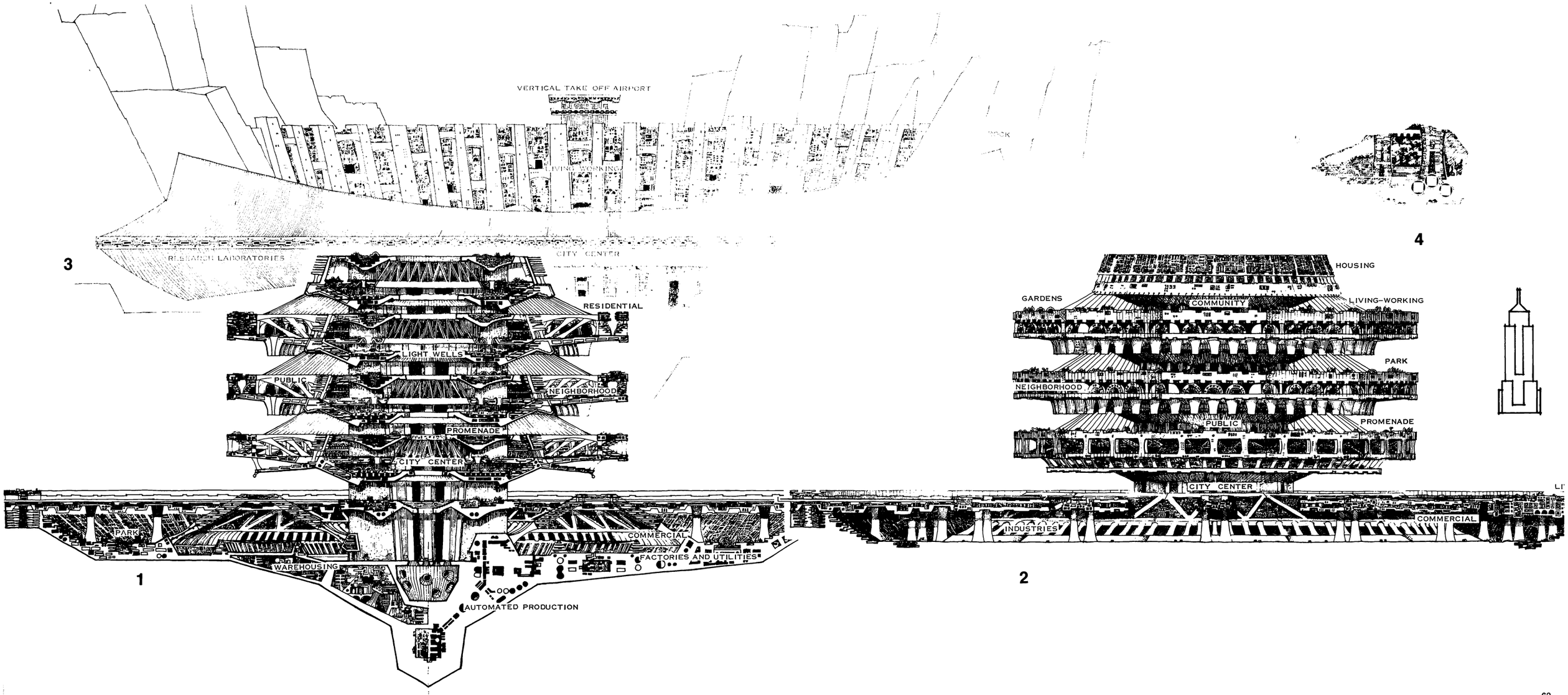
9.Babel IIB

Babel IIB	
(Flat land)	
Population	520,000
Density	662/hectare; 268/acre
Height	1,050 meters
Diameter of structure	3,160 meters
Surface covered	778 hectares; 1,920 acres
1. Ground plan: scale	1:10,000
2. Intermediate level plans: scale	1:10,000
Comparative Arcologies	
Arcoindian I	
Population	19,000
3. Plan: scale	1:10,000
Asteromo	
Population	75,000
4. Transverse section: scale	1:10,000





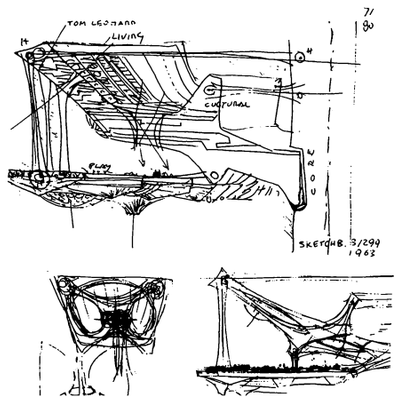
9.Babel IIB

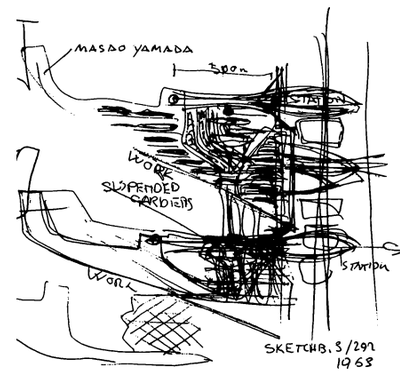
Babel IIB
(Flat land)

Population	520,000
Density	662/hectare; 268/acre
Height	1,050 meters
Diameter of structure	3,160 meters
Surface covered	778 hectares; 1,920 acres
1,2. Section and elevation: scale	1:10,000

Comparative Arcologies

Arcodiga	
Population	280,000
3. Elevation: scale	1:10,000
Arcoindian I	
Population	19,000
4. Elevation: scale	1:10,000





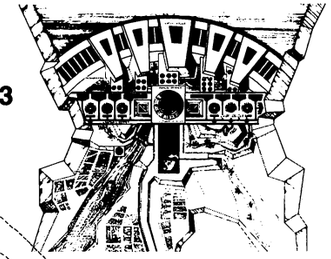
A hyperstructure over 1 kilometer high and 2 kilometers in diameter at the bowl base. Vertical shafts carry (1) the vertical transportation system, elevator batteries, and continental, transcontinental air transport "sleeves"; (2) services, exhausts. Anchored to the shafts are the platform-grounds of the city: (1) at the periphery, the residential spaces; (2) in the medial belt, the gardens and waste processing plants; (3) toward the center, civil facilities and work. The top platform-ground is for cultural institutions: schools, labs, studios, theaters, libraries.

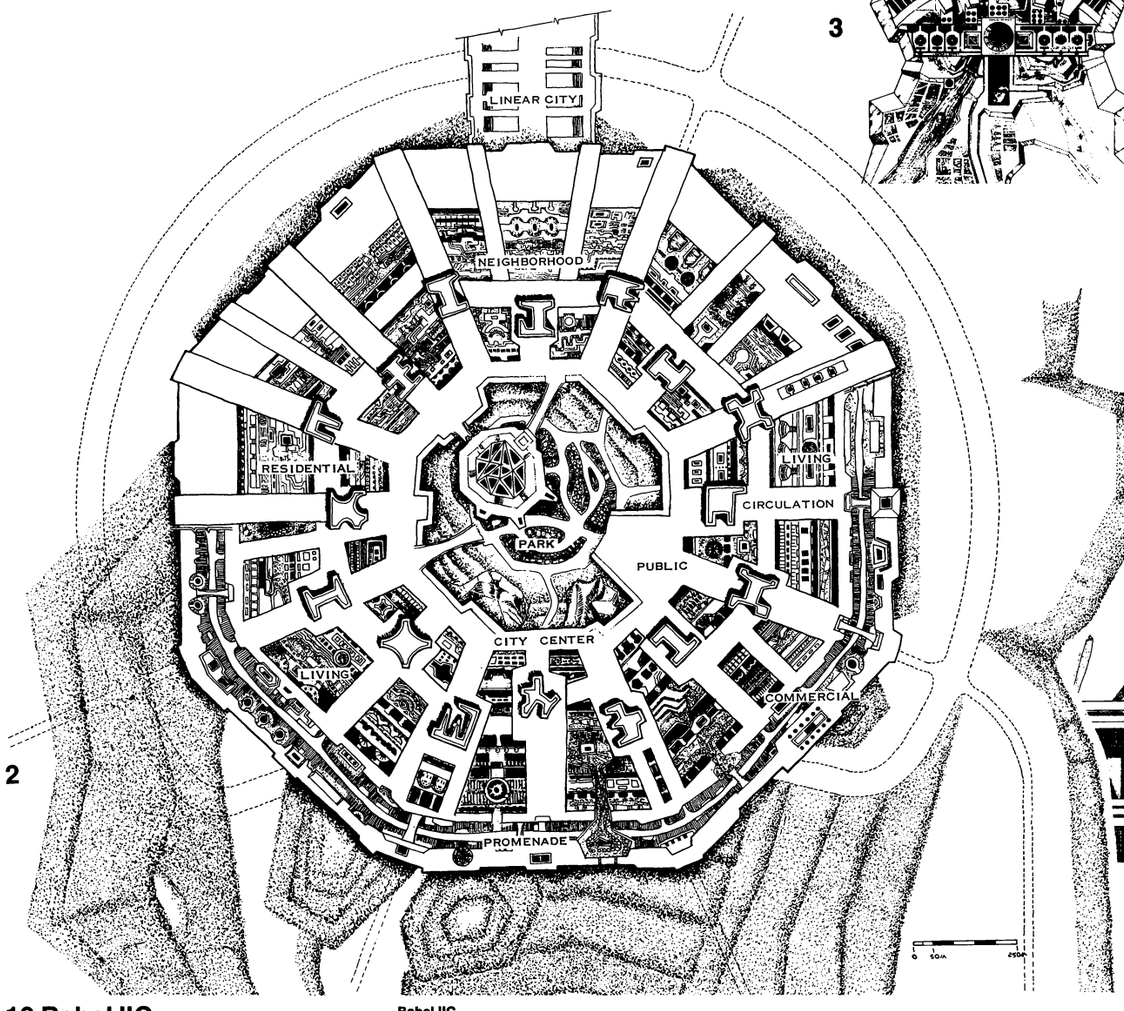
At the ground is a system of parks, gardens, and playgrounds. Under the ground level develops the automated world of production and maintenance with environmental conditions dictated by the functionality of each plant division: there will, or may, thus be production (and research) in an atmosphere of vacuum, fire, cold, gas, radiation, water, pressure . . . the fusion (or equivalent) power plant at the core. Energy is served radially to plants, to the technological "city" and to the totality of the arcology, including the grounds and the atmospheric dome in which the arcology is contained.

Babel IIB floats on a mineral bed. One third of it is scooped out of the ground. From the center the hollow trunk rises 1200 meters into the air. Four major topographies ring the trunk, partly suspended. On each topography (township) is an annular park separating the outer belt of residences and the inner belt of public facilities. The light reaches deep into the core of the city, vertically from the axial well and obliquely between the four topographies. The whole bowl could be weather-controlled by means of heat-sensitive screens.

For a structure of this size and structural organization, symmetry along the vertical axis is mandatory. The center of gravity of the whole system is located exactly on the axis of symmetry.

The city could well work as a major airport with aircraft taxiing on the outer rim of the bowl within minutes' time from anywhere in the city.





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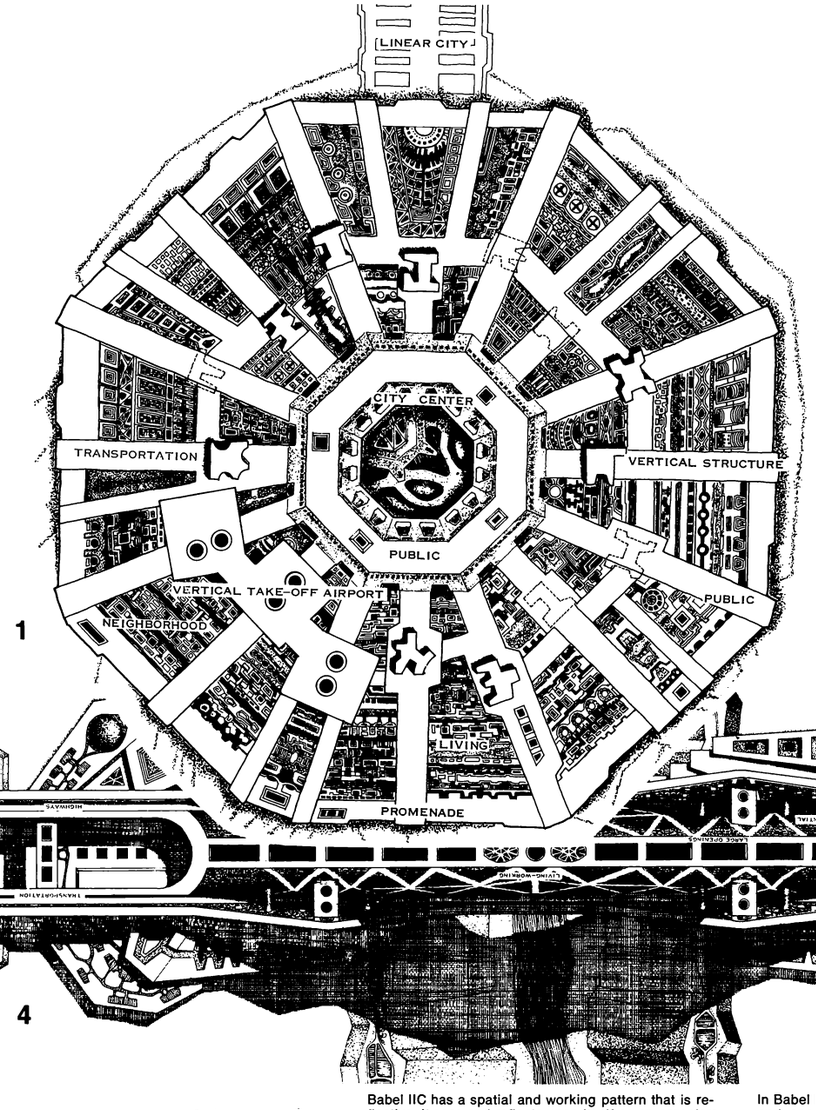

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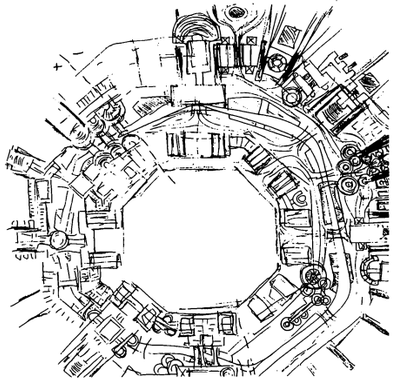
10.Babel IIC

Babel IIC
(On open mining pit)

Population	340,000
Density	1,396/hectare; 565/acre
Height	850 meters
Diameter	1,750 meters
Surface covered	240 hectares; 595 acres
1. Midlevel plan: scale	1:10,000
2. Top view: scale	1:10,000

Comparative Arcologies

Theodiga	
Population	20,000
3. Top view: scale	1:10,000
Stonebow	
Population	200,000
4. Top view: scale	1:10,000

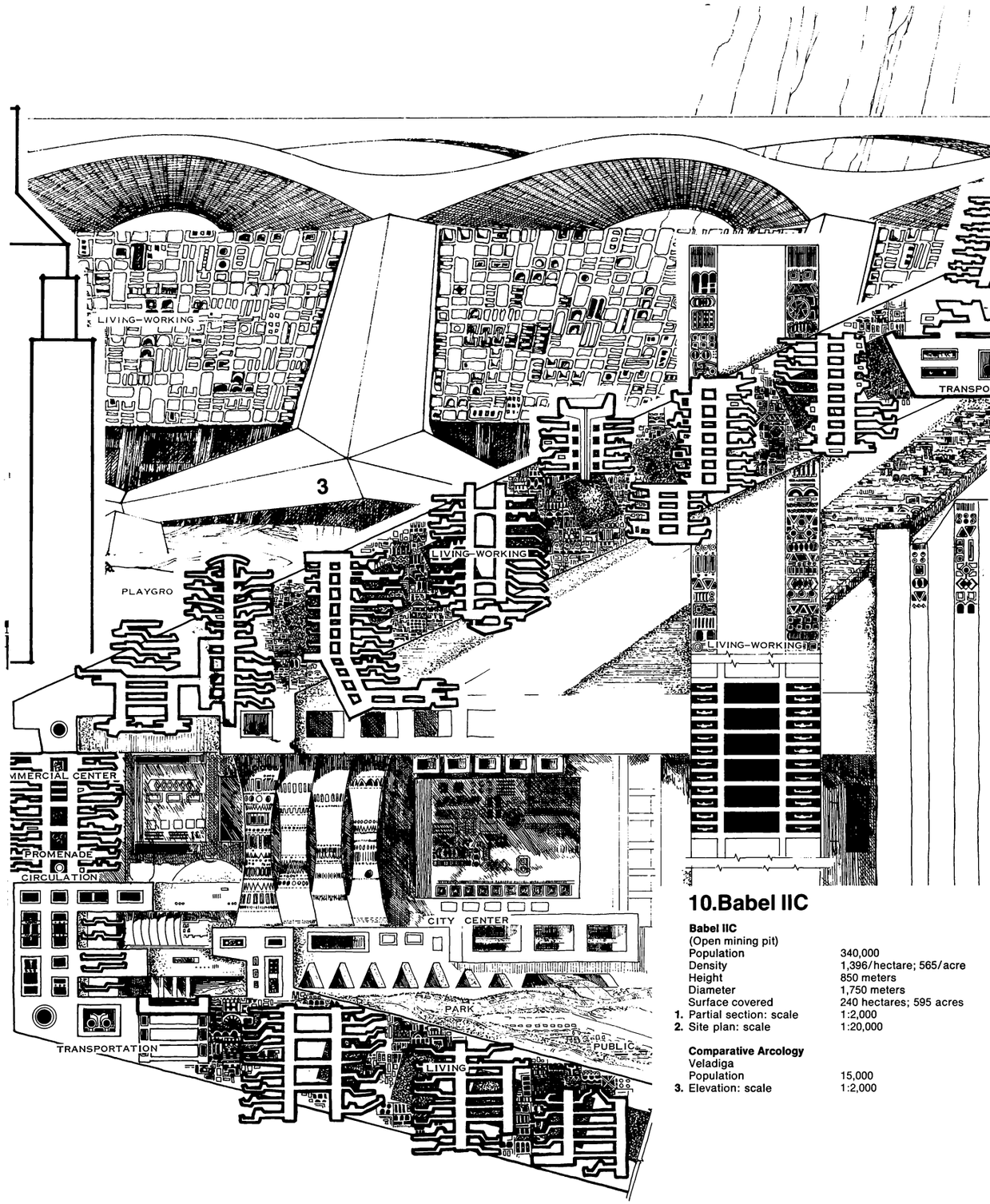


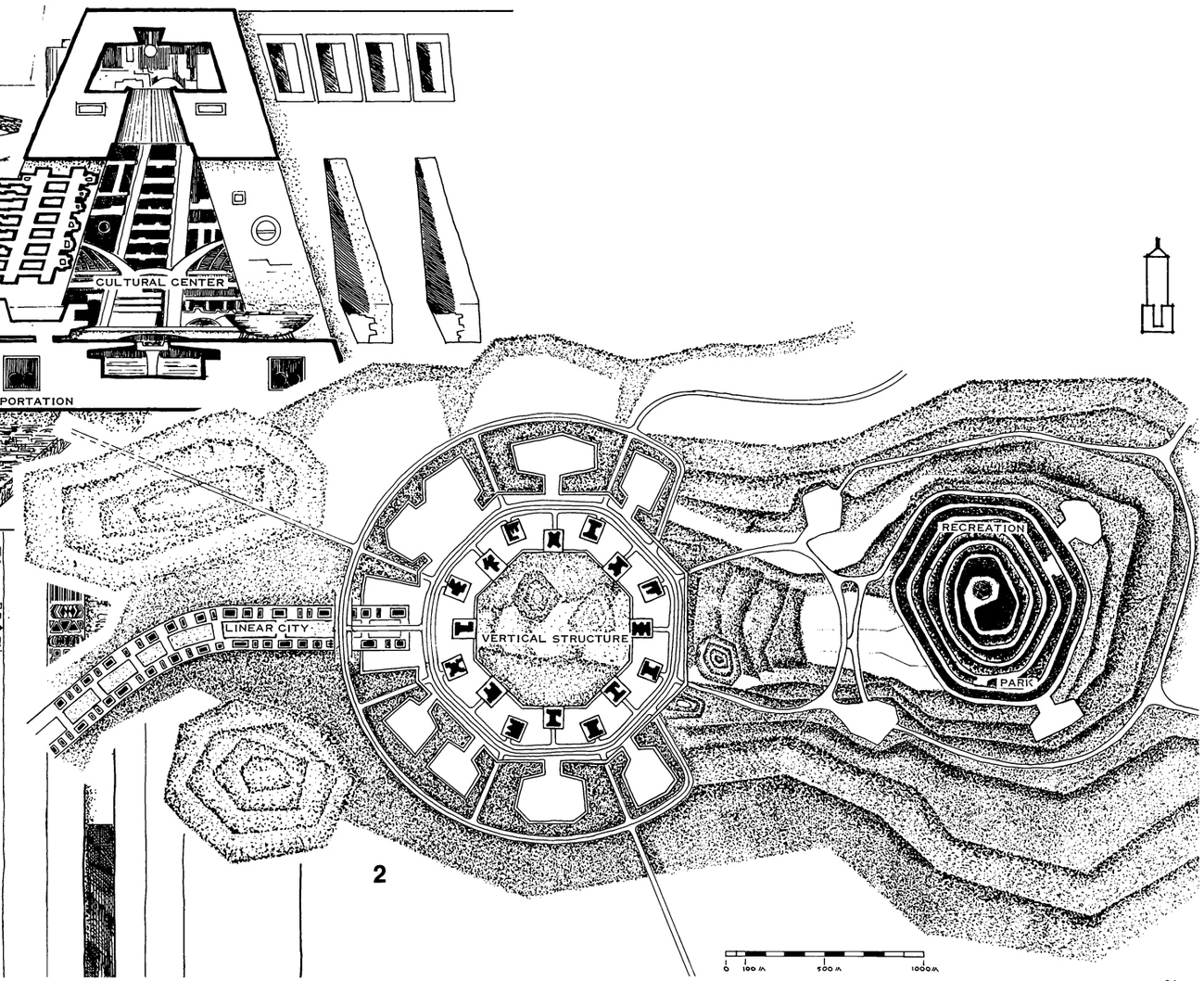
Babel IIC has a spatial and working pattern that is reflective. It sees and reflects upon itself as an organism could if conjunctly hollowed out and endowed with a capacity for inner observation. There is the passive reflection from a mirror or the engaged reflection from, for instance, the human face. The second is the kind of reflection that activates the living. That one sees what one does not like to see, demands far more reflection, not less of it. Nonplenitude, the reflection of scarcity, is the dissatisfaction which urges new deeds and the relative efforts that they demand.

The lack of reflection cancels one's own physiognomy. Man and society are more and more at a loss for lack of such physiognomy and the willingness to reflect on it. Cubism with its distraught rearrangements started to suggest that what we saw as wholes were possibly not only made up of parts but also that such parts might be ill-fitted for each other. After such disturbing reflection, refraction, and diffraction, followed the tearing and mutilating of the elements closer to every-day life. That which the artist sees, environment is. To find a coördination of the environment and to offer reflectivity, better reflection, is to reactivate a need for coherence.

In Babel IIC there is a recoördination of the landscape and, one hopes, a better grade of reflectivity.

This is, though, the kind of reflection that does not advocate a disemboweled organism. The novelty of seeing a person draped by his own 36 feet of digestive tract does not present much more than a vague recollection of things not yet well composed, and the jolt that such an apparition causes in an individual whose entrails are contained, stored away, in a more suitable place is only the natural reaction of coherence in the presence of non-coherence. For the "expose-all" functionalist here is a reminder that the entrails of our buildings, far from being sophisticated packages of functions, are gross, over-extended, overstated, inefficient pretentious, gadgets—very much like a swollen respiratory and digestive system whose structure and co-ordination may well be doomed in a short, very short, time.



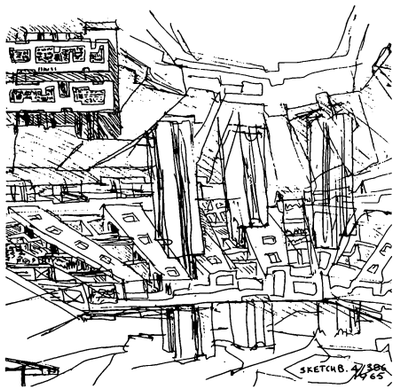


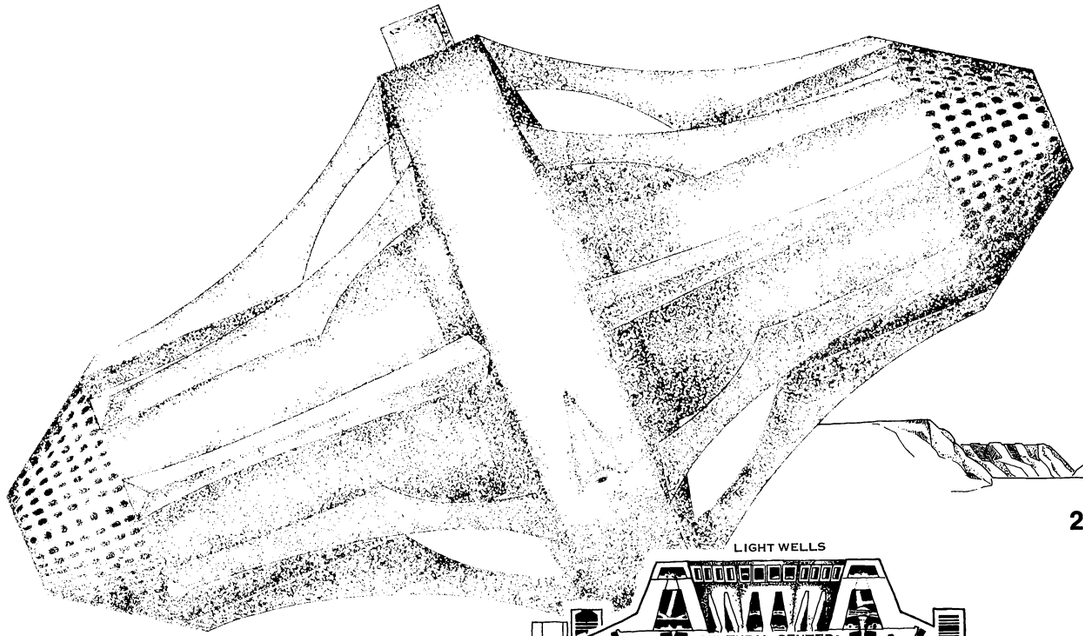
10.Babel IIC

Babel IIC	
(Open mining pit)	
Population	340,000
Density	1,396/hectare; 565/acre
Height	850 meters
Diameter	1,750 meters
Surface covered	240 hectares; 595 acres
1. Partial section: scale	1:2,000
2. Site plan: scale	1:20,000
Comparative Arcology	
Veladiga	
Population	15,000
3. Elevation: scale	1:2,000

Reflection on oneself is not thus and specifically the need for a "pictorial" disembowelment of man or society. It may be more appropriately the grasping of wholes in their significance. Physically speaking, in Babel IIC society sees and reflects upon itself. The whole of the city is constructed around a large volume so that as the citizen is or moves in and along one part of that city, all the rest of it displays itself at his feet around him, above him, in visual as well as in physical reach. This envelooping of a huge space by the megastructure and the "reflective" quality of the infrastructure are producing an inner "landscape" never before experienced by mankind; a premonition, one could say, of a man-made asteroid world where the living space is not on the surface of the planet but contained within the skin of the asteroid itself (see Asteromo).

The residential grounds built in the thickness of the floor and the rest of the arcology, so to speak, are positioning citizens on the border between this inner landscape and the "outside" world that, by the nature of the arcology, is not cluttered by housing and blight. Each vertical structure, the size of which is of the order of our largest skyscrapers, carries vertical circulation and transportation to its two main stations in the thickness of the aforementioned floor and roof of the arcology. From there, circulation and transportation develop on the slanting many layers to feed the numerous substructures of public and private life. Within the thickness (70 meters) and richness of such layers (floor and roof) are the neighborhoods. They number those people who for nearness, affinity, and common utilities tend to form a microcommunity contained with the other neighborhoods by the macrocommunity. Because of the very short time and space gaps between any two elements of the city, the neighborhoods do not need their own separate center of great complexity and sophistication.





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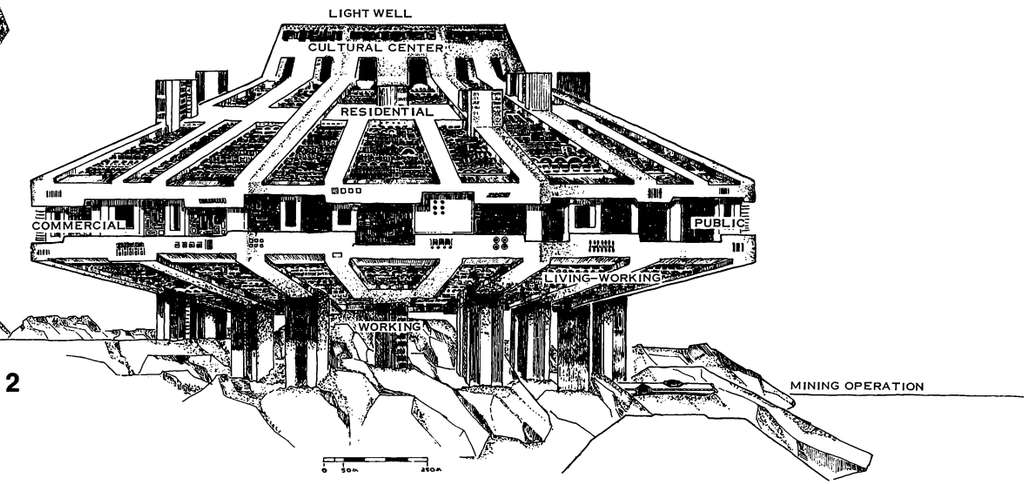

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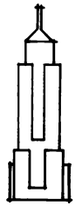

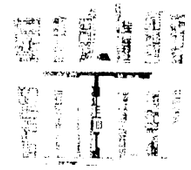

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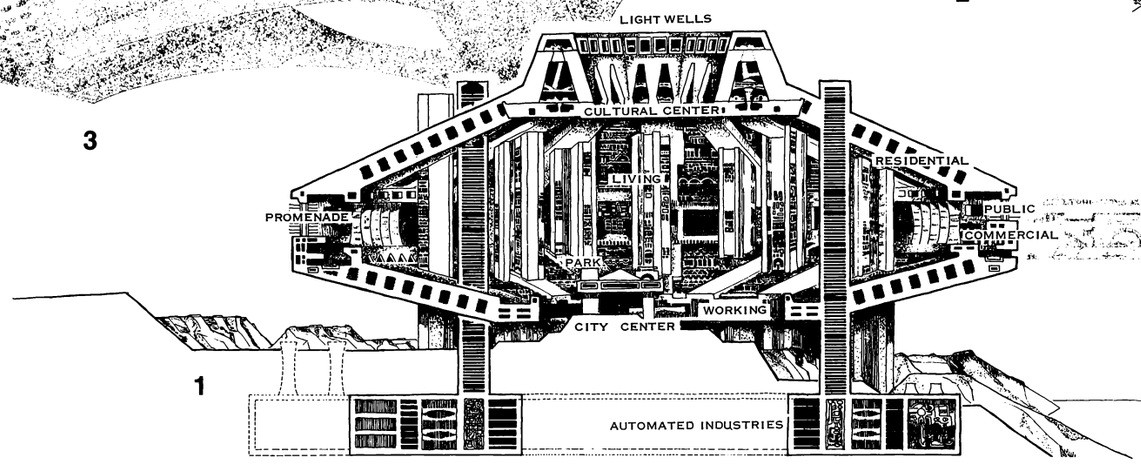

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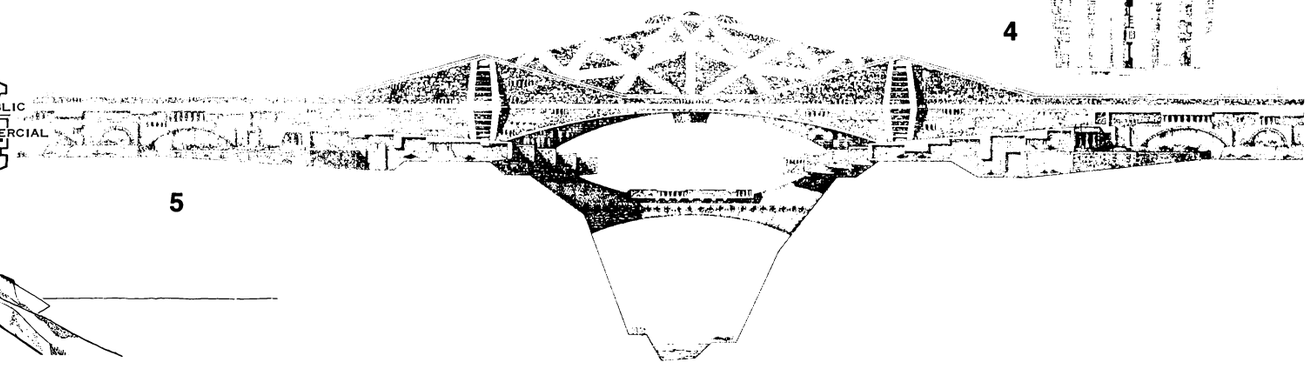

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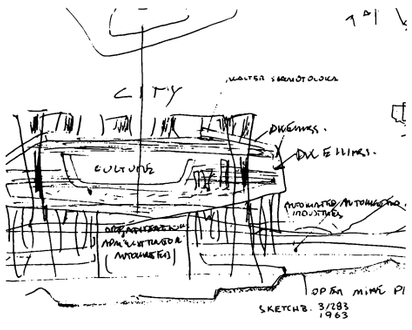
10.Babel IIC



	Babel IIC	
	Population	
	Density	340,000
	Height	1,396/hectare; 565/acre
	Diameter	850 meters
	Surface covered	1,750 meters
1.	Section and elevation	240.8 hectares; 595 acres
2.	Scale	1:10,000
	Comparative Arcologies	
	Asteromo	
	Population	75,000
3.	Elevation: scale	1:10,000
	Theodiga	
	Population	20,000
4.	Elevation: scale	1:10,000
	Stonebow	
	Population	200,000
5.	Elevation: scale	1:10,000

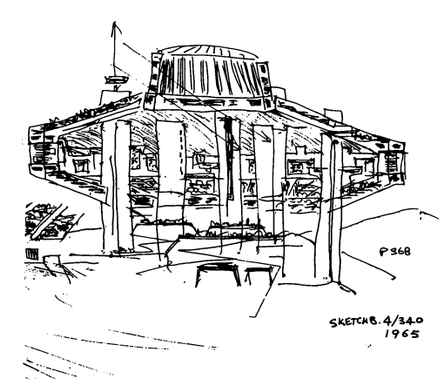
Any organism of such demand is designed for the service of the whole community. Let's exemplify this with the health service:

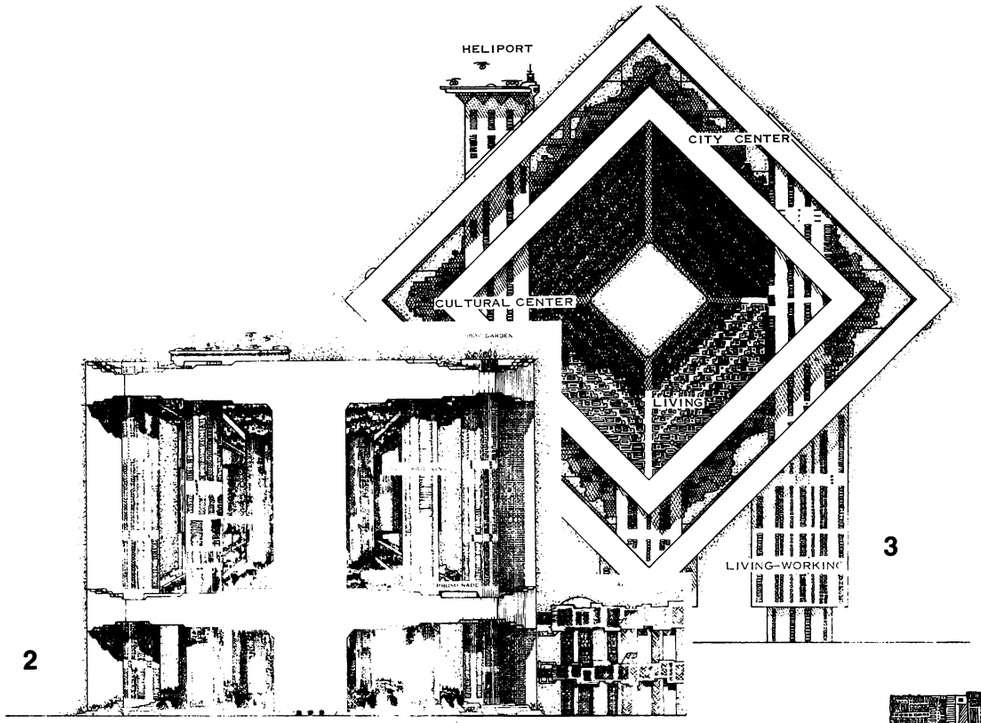
1. Home care of noncritical patients will not only be possible but preferable inasmuch as any specialized personnel, from doctors to nurses, can almost instantaneously be on the spot when they are needed. The family doctor may have his own comeback in functional terms. A nurse can care for many patients; instead of room to room, she moves from home to home without the intermediate obstacles of weather, traffic, cost, time . . . and exhaustion. This fact alone will cut into the mammoth size of general hospitals and specialized clinics.

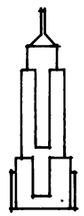
2. The possibility of quick interaction between separate institutions of health through the structural co-ordination of the city and the minimal distances so defined makes possible any amount of desirable decentralization.

In a real sense the location of the health facilities and the location of any other function will not be crucial. The intrinsic efficiency and quality of the institutions will be crucial, not their location in the community, inasmuch as the linkage between homes and institutions is axiomatic with the morphology of the city itself. There will not be such a thing as a home site poorly served by health or any other facility because of distance or obstacles. This constitutional flexibility is the fundamental dynamism that characterizes arcology.

Manufacturing will be mostly in the underground "universal spaces," administration and offices within the vertical structures. In the upper crown are grouped most of the high-learning facilities. The grounds below the city are given to playgrounds, promenades, parks, and gardens.







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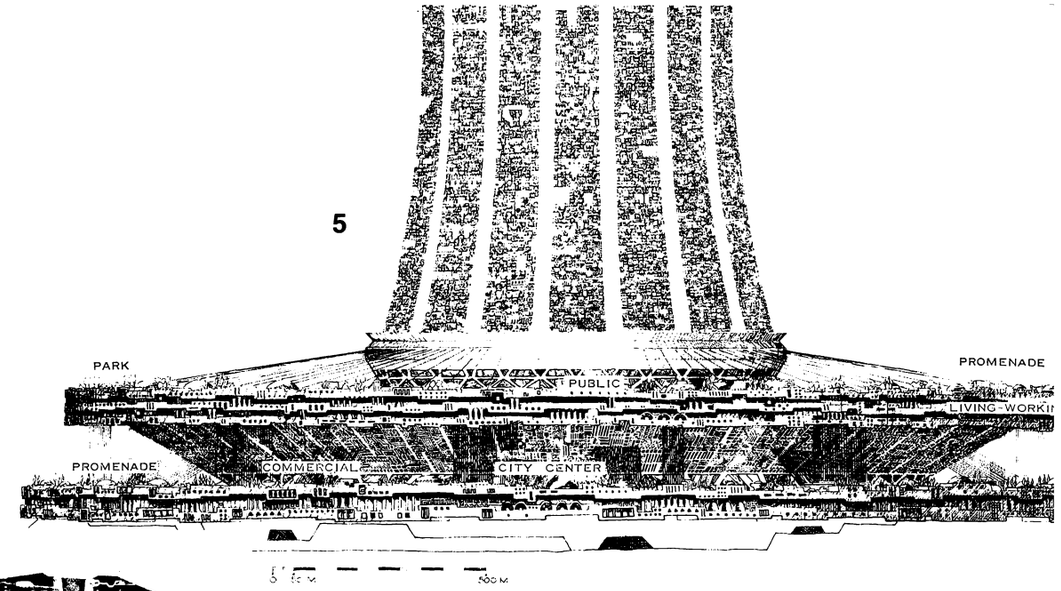
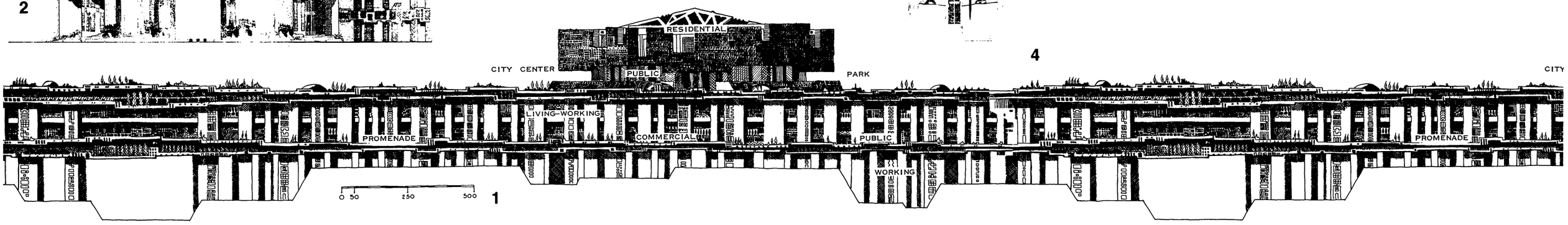




11.Arcanyon

Arcanyon	
(Any type of land structure)	
Population per kilometer	40,000
Density	864/hectare; 350/acre
Height	300–500 meters
Surface covered	46.5 hectares; 112 acres/ linear kilometer
1. Elevation: scale	1:10,000
Comparative Arcologies	
Babel Canyon	
Population	250,000
2. Elevation: scale	1:10,000
Arcube	
Population	400,000
3. Elevation: scale	1:10,000
Arcoindian I	
Population	4,600
4. Elevation: scale	1:10,000
Babel IID	
Population	550,000
5. Elevation: scale	1:10,000

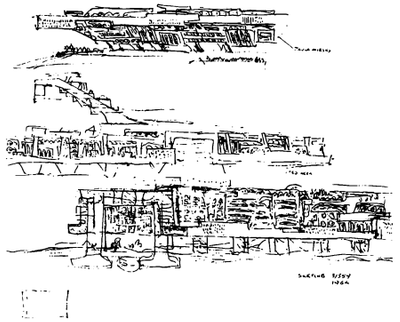
Of all motions, the flow of fluids is the most "uninterrupted." Of all motions of fluids, the gravity flow seems the most unavoidable. Only the vast energies of the sun can redeem the constant downflow of water (and energy) occurring on and in every parcel of land on the earth.

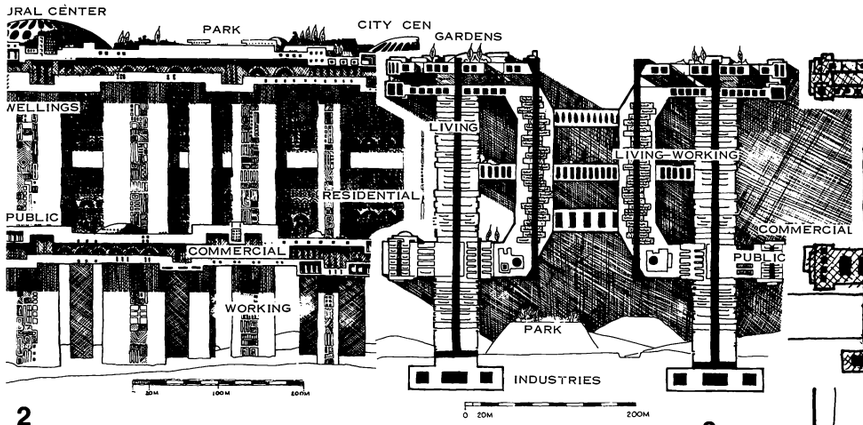
For centuries the aqueduct has on the one hand battled gravity and on the other has used it to give purpose to down-running water. The aqueduct, by gauging energy, makes of water the conveyer of life. In this lies the magic of guiding the flow of water along a dike or a canal. It is leashed entropy made to work every inch of the way for the purposefulness of life.

The aqueduct can feed in clusters or feed homogeneously. Homogeneous feeding gives to each energetic (down) step its own reward of life-giver, as each downstep will never see its own reversal in its own contained, isolated system. Then the guidance of the flow in its spreading over wholeness combined with the homogenous uninterrupted feeding of life seems to be an efficient, energetic system, granted enough water and meaningful display of living continuity.

In Arcanyon, the aqueduct is populated all the way. At intervals, nodular centers have a denser life on which would converge adjacent portions of activities from both the upper and the lower basins. Waterways at three different levels are incorporated in a macrostructure of constant organization but with sizes and arrangements varied to indicate possible flexibility and feasible differentiations. The head of Arcanyon is at a water reservoir (dam) where the intakes of the canals (waterways) are located. From Arcanyon along its deployment are branching-off aqueducts to feed the various arcologies.

Arcanyon is only the progenitor of a far more complex and powerful urban river on which a longitudinal axis would develop a multilevel transportation network topped by an endless airport. On the side of this flow system urbanization would develop on a square kilometer section on each side. (See Map of Despair.) With a strong hierarchy of neighborhood, local, regional, and continental transportation systems all welded or grafted into the flow system, a total mobility would be achieved without interfering with urban, biped life.





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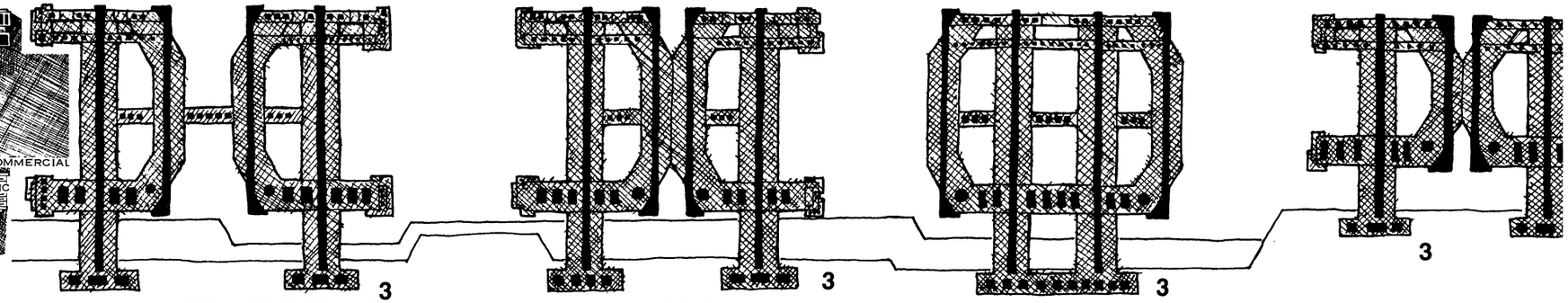

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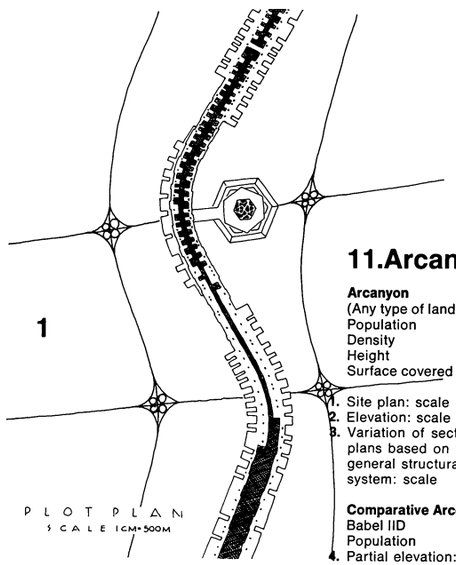


1

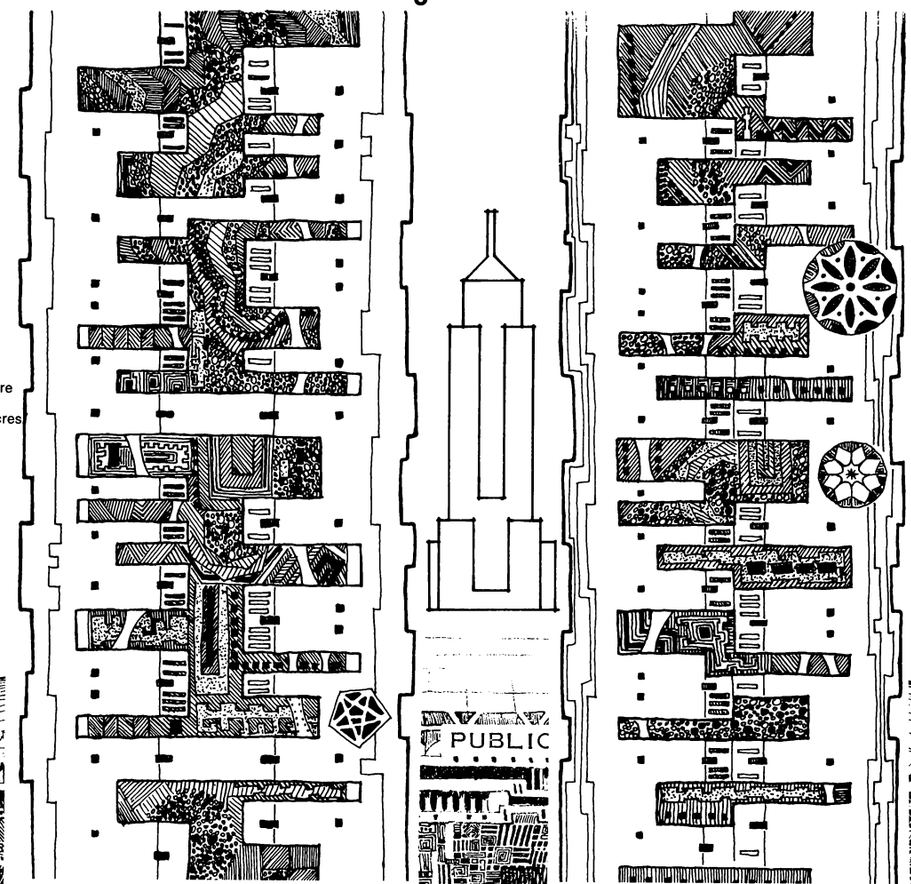
11.Arcanyon

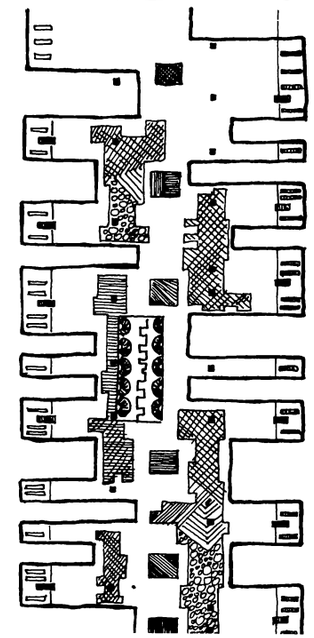
Arcanyon
(Any type of land structure)

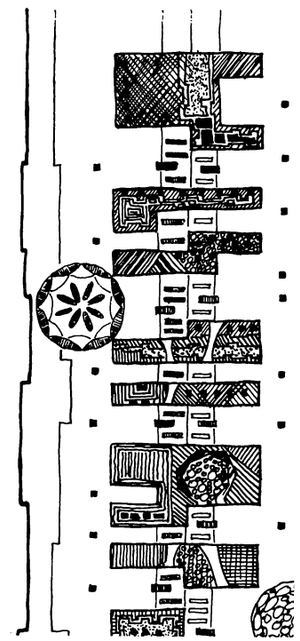
Population	40,000/kilometer
Density	864/hectare; 350/acre
Height	300–500 meters
Surface covered	46.5 hectares; 112 acres linear kilometer
1. Site plan: scale	1:50,000
2. Elevation: scale	1:5,000
3. Variation of sections and plans based on the same general structural system: scale	1:5,000

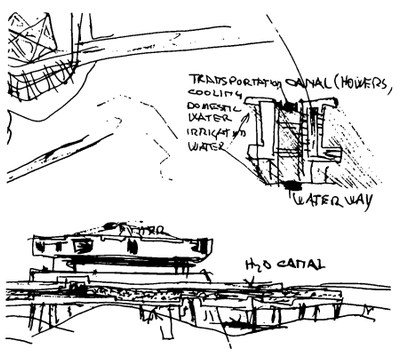
Comparative Arcology
Babel IID

Population	550,000
4. Partial elevation: scale	1:5,000

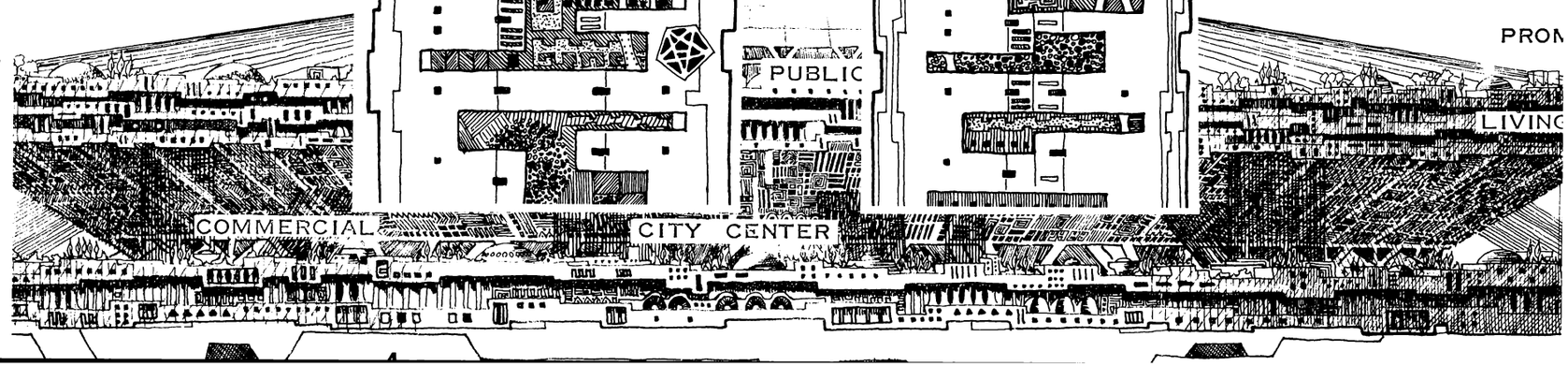


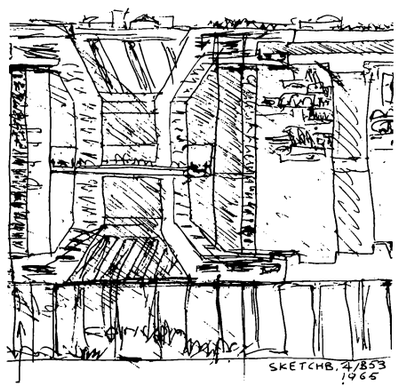






SKETCHB. 4/345
1965





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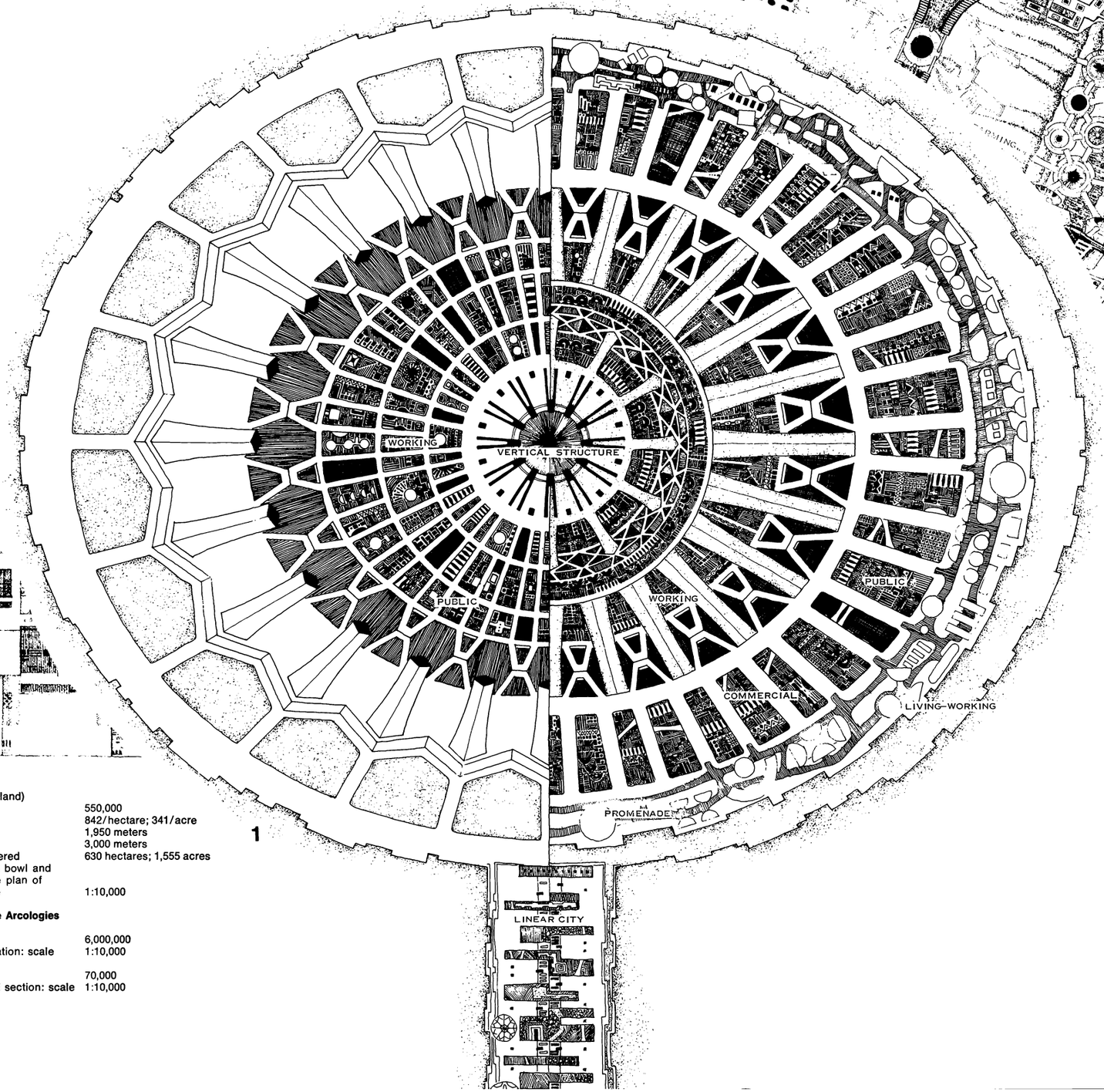

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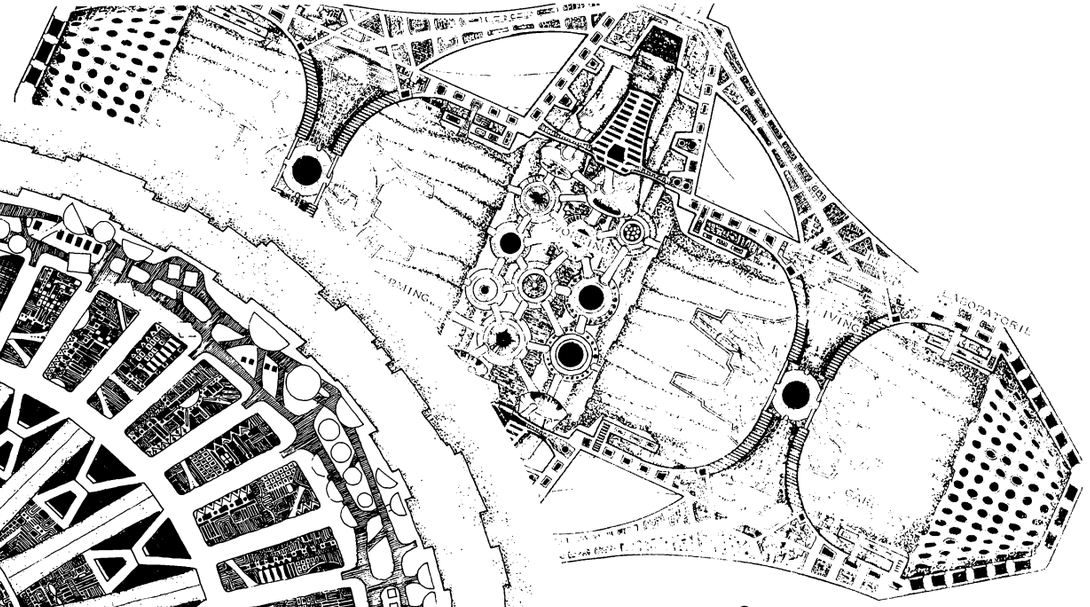

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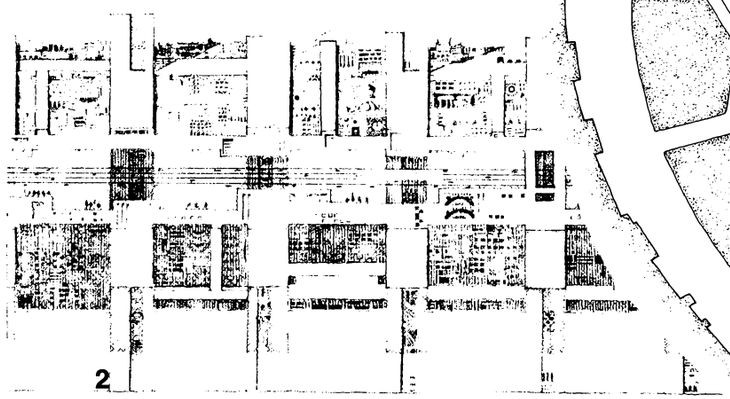

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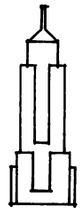
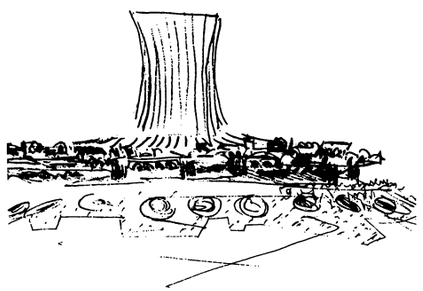


12.Babel IID



SKETCH B. 4/337
1965

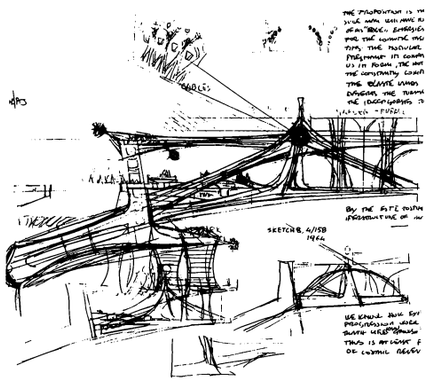
Babel IID
(Flat or hilly land)

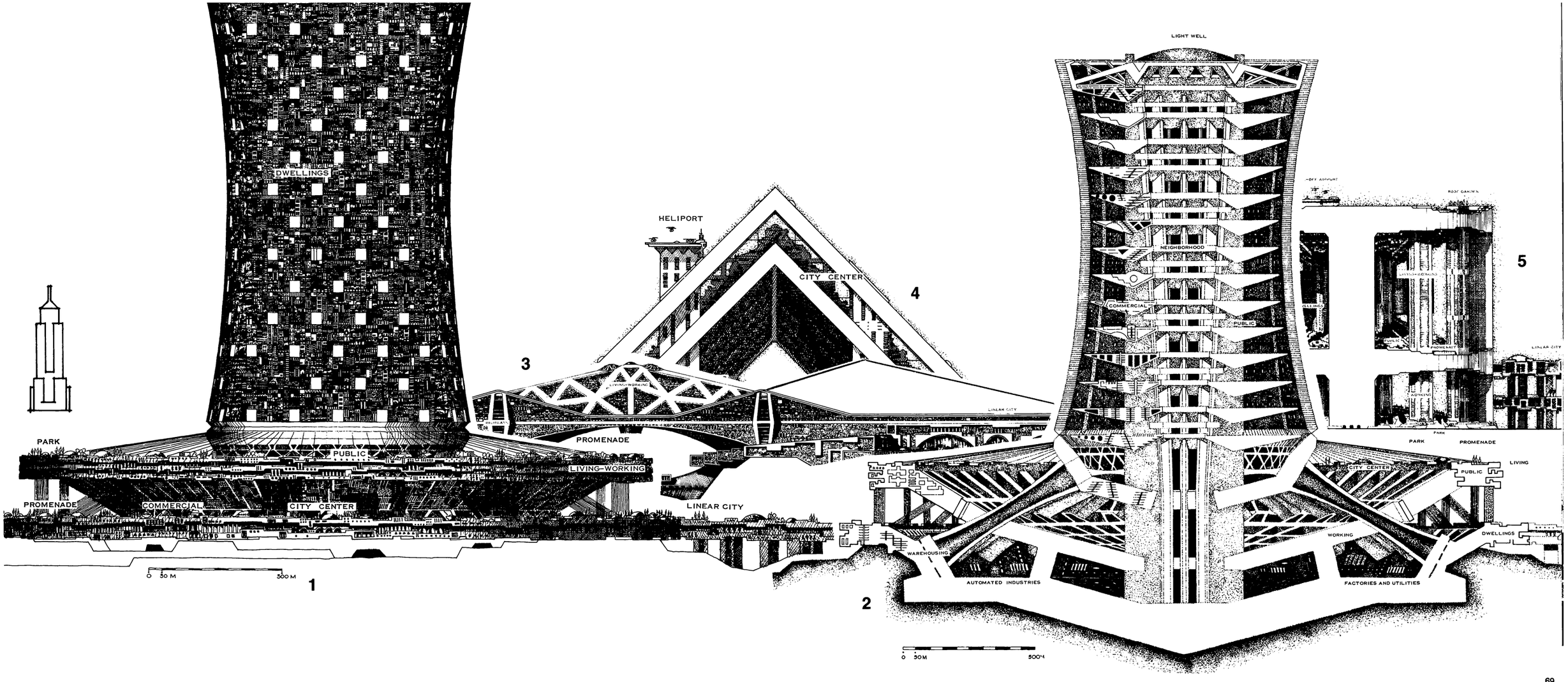
Population	550,000
Density	842/hectare; 341/acre
Height	1,950 meters
Diameter	3,000 meters
Surface covered	630 hectares; 1,555 acres

1. Top view of bowl and intermediate plan of tower: scale 1:10,000

Comparative Arcologies

Babelnoah	
Population	6,000,000
2. Partial elevation: scale	1:10,000
Asteromo	
Population	70,000
3. Longitudinal section: scale	1:10,000





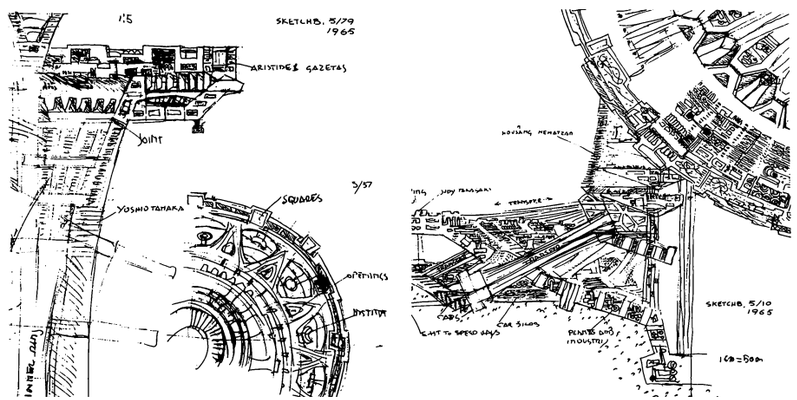
12.Babel IID

Babel IID
(Flat or hilly land)

	Population	550,000
	Density	842/hectare; 341/acre
	Height	1,950 meters
	Diameter	3,000 meters
	Surface covered	630 hectares; 1,555 acres
1,2.	Elevation and section: scale	1:10,000

Comparative Arcologies

	Stonebow	
	Population	200,000
3.	Elevation: scale	1:10,000
	Arcube	
	Population	400,000
4.	Elevation: scale	1:10,000
	Babel Canyon	
	Population	250,000
5.	Elevation: scale	1:10,000



The concept of an organism whose skin is a mosaic of thousands of minds, embodied in specific and different persons, is well illustrated here. The conocylinder of the tower structure, about 1500 meters high and almost 1 kilometer in diameter, is enveloped by a double membrane, a cable structure that is subdivided in modular volumes where homes would be fabricated.

The acquisition or lease of a fraction of a module, or of one or many, would establish different spatial and functional conditions for each single home or apartment. Location in height and orientation in one of the 360° directions would be the outside variant. Toward the inside the direct relation would be with neighboring ground spaced vertically every 100 meters.

The home is then positioned as connector between two environments, as participant to both—the outer a vast sweep of the land, the inner circumscribing the neighborhood, in this case developing into a flat cylinder, hollow toward the center where a big light well stretches from top to bottom.

Function of the Base

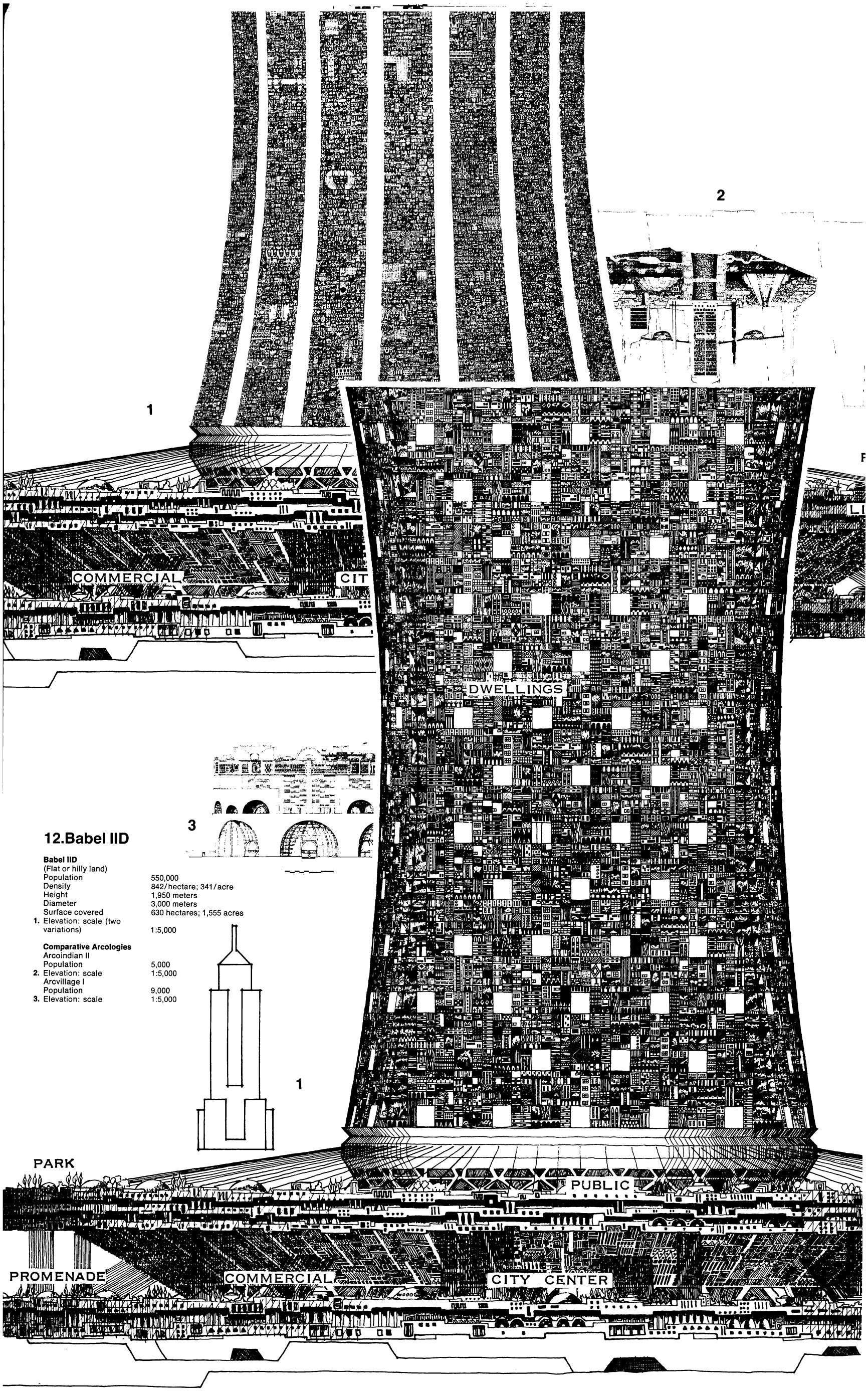
1. Receiving end of local and outside traffic

2. Organization of facilities
residential
production
exchange
cultural
leisure

3. Industrial plants (automated) and related laboratories for research

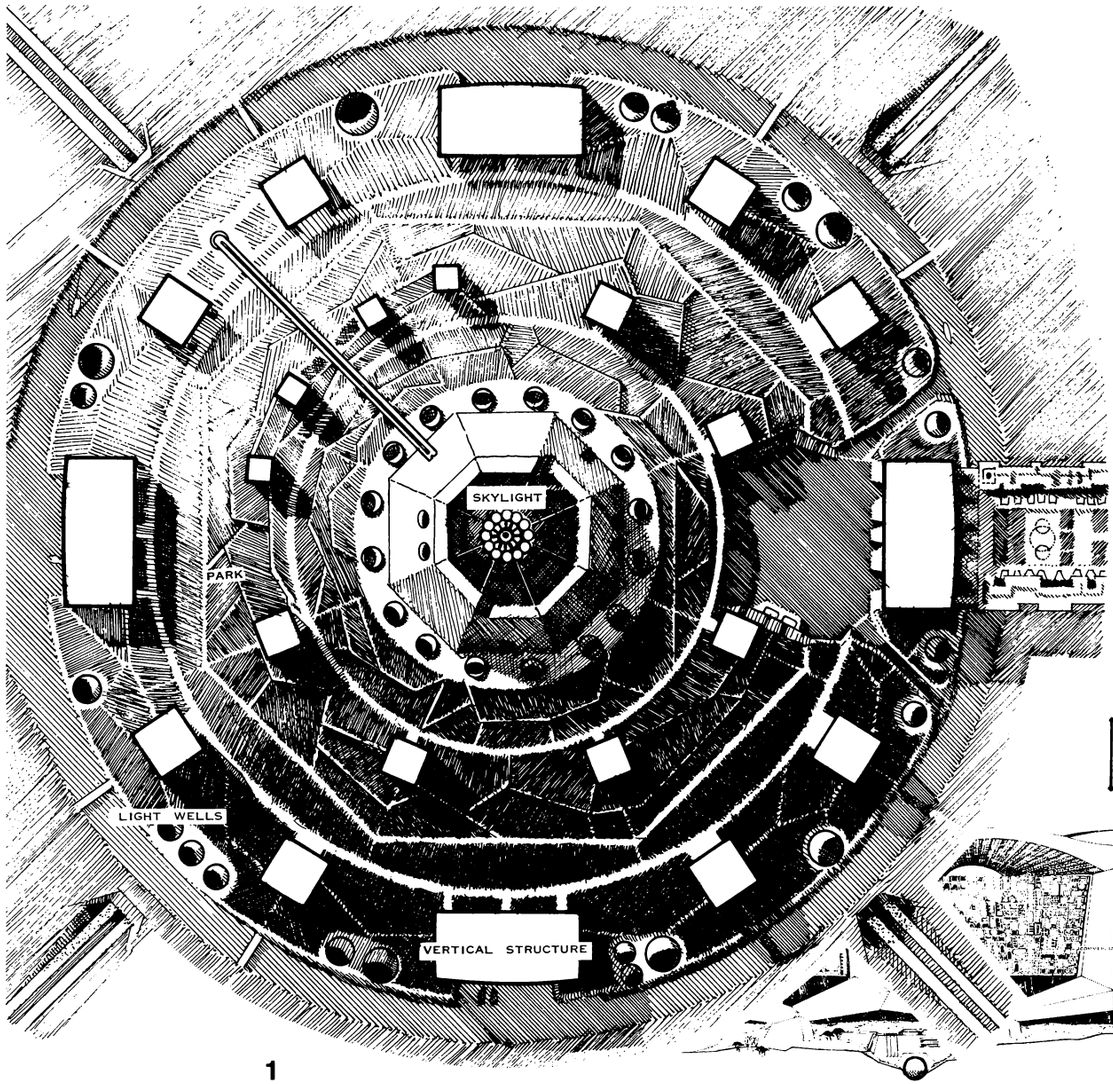
4. Storage of private transportation vehicles

5. Warehousing



12.Babel IID

Babel IID	
(Flat or hilly land)	
Population	550,000
Density	842/hectare; 341/acre
Height	1,950 meters
Diameter	3,000 meters
Surface covered	630 hectares; 1,555 acres
1. Elevation: scale (two variations)	1:5,000
Comparative Arcologies	
Arcoindian II	
Population	5,000
2. Elevation: scale	1:5,000
Arcvillage I	
Population	9,000
3. Elevation: scale	1:5,000



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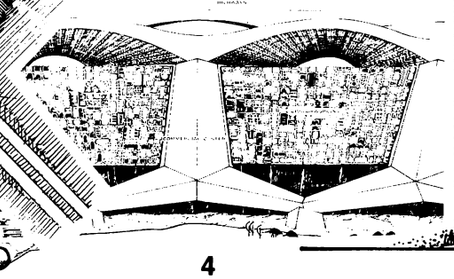

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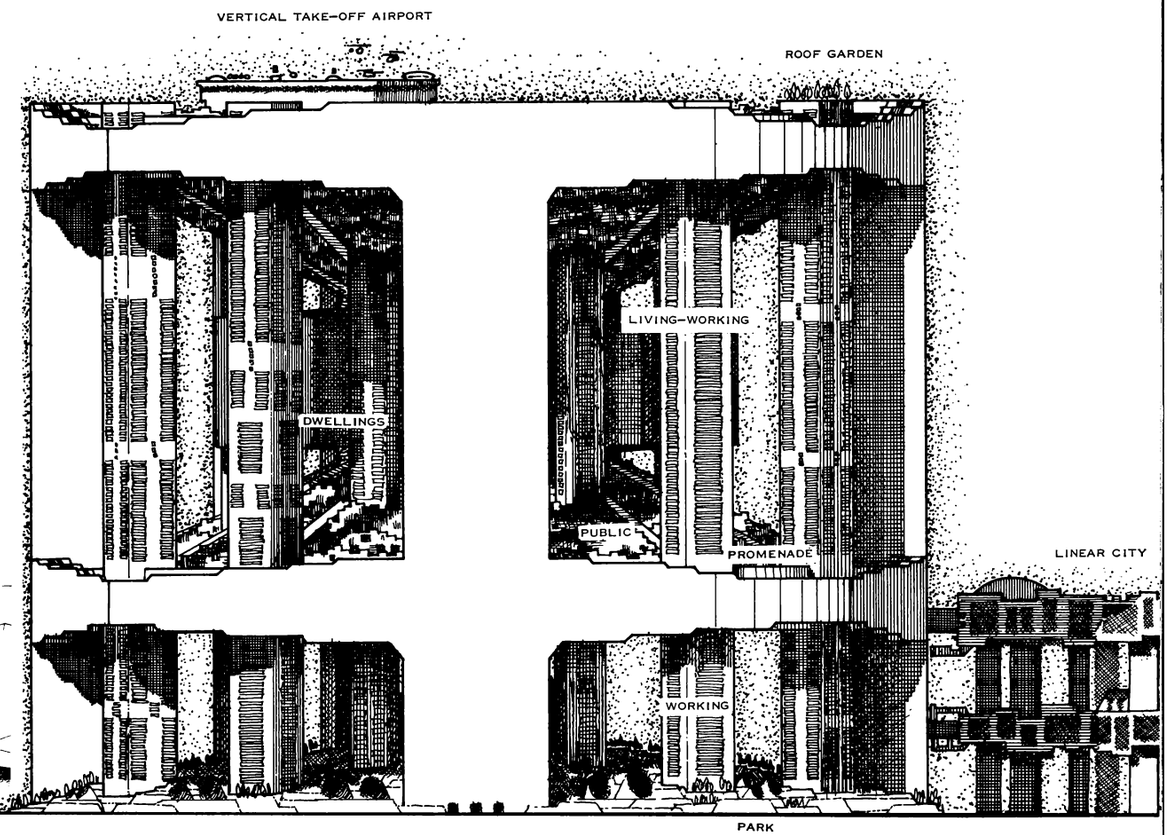

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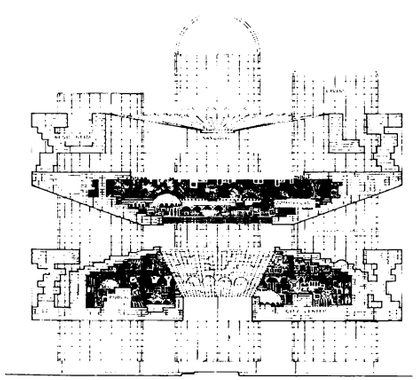
13.Babel Canyon



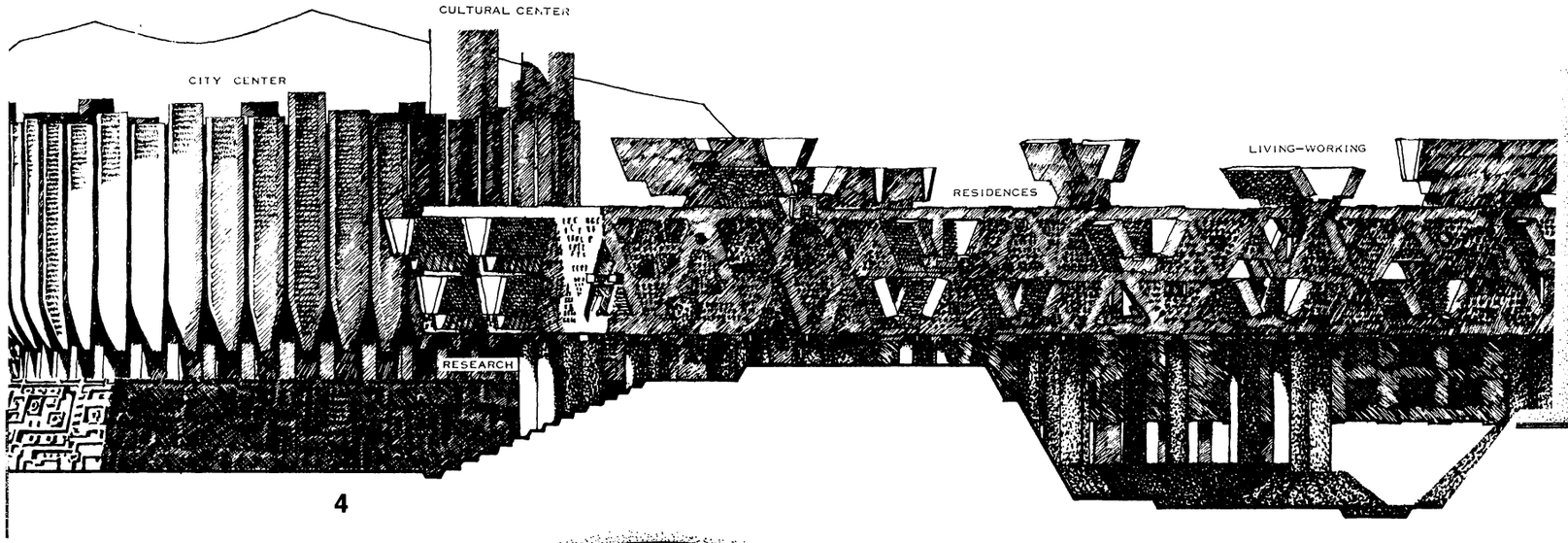
3

Babel Canyon
(Any nonmountainous land)

Population	250,000
Density	2,341/hectare; 948/acre
Height	800 meters
Width of structure	1,100 meters
1. Plan at ground level: scale	1:5,000
2. Elevation: scale	1:5,000

Comparative Arcologies

Arcvillage II	
Population	30,000
3. Section: scale	1:5,000
Veladiga	
Population	15,000
4. Partial elevation: scale	1:5,000



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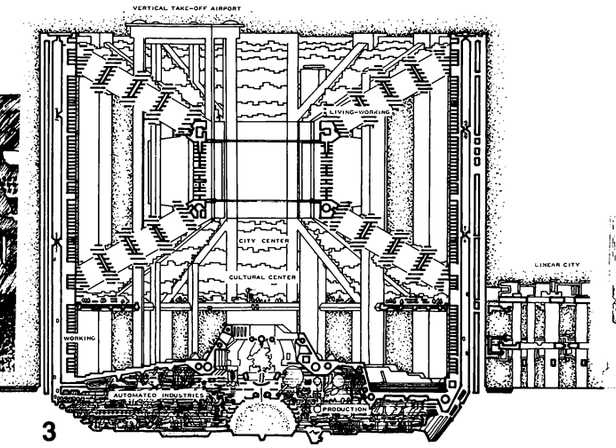

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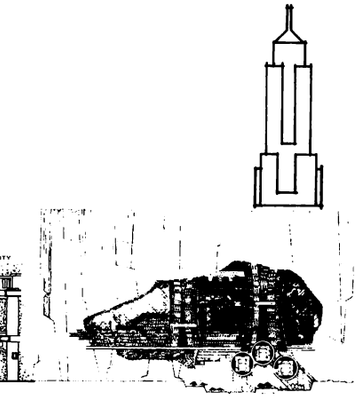

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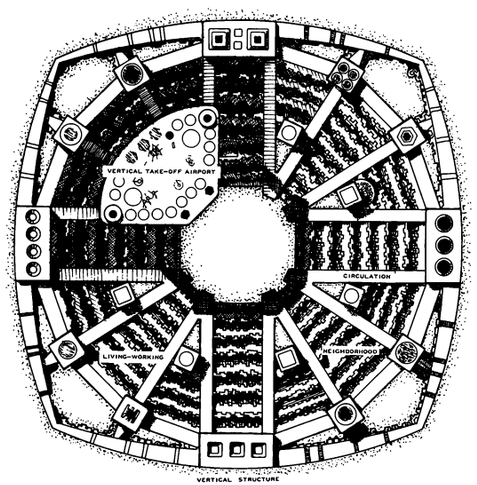

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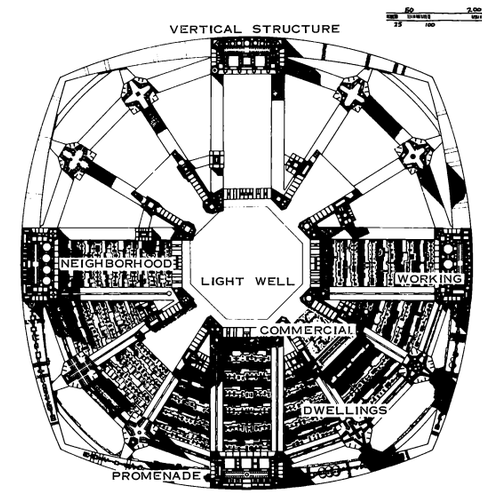

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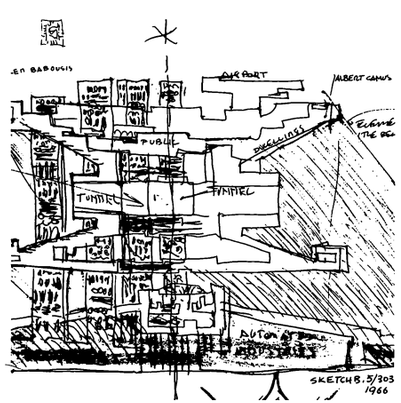
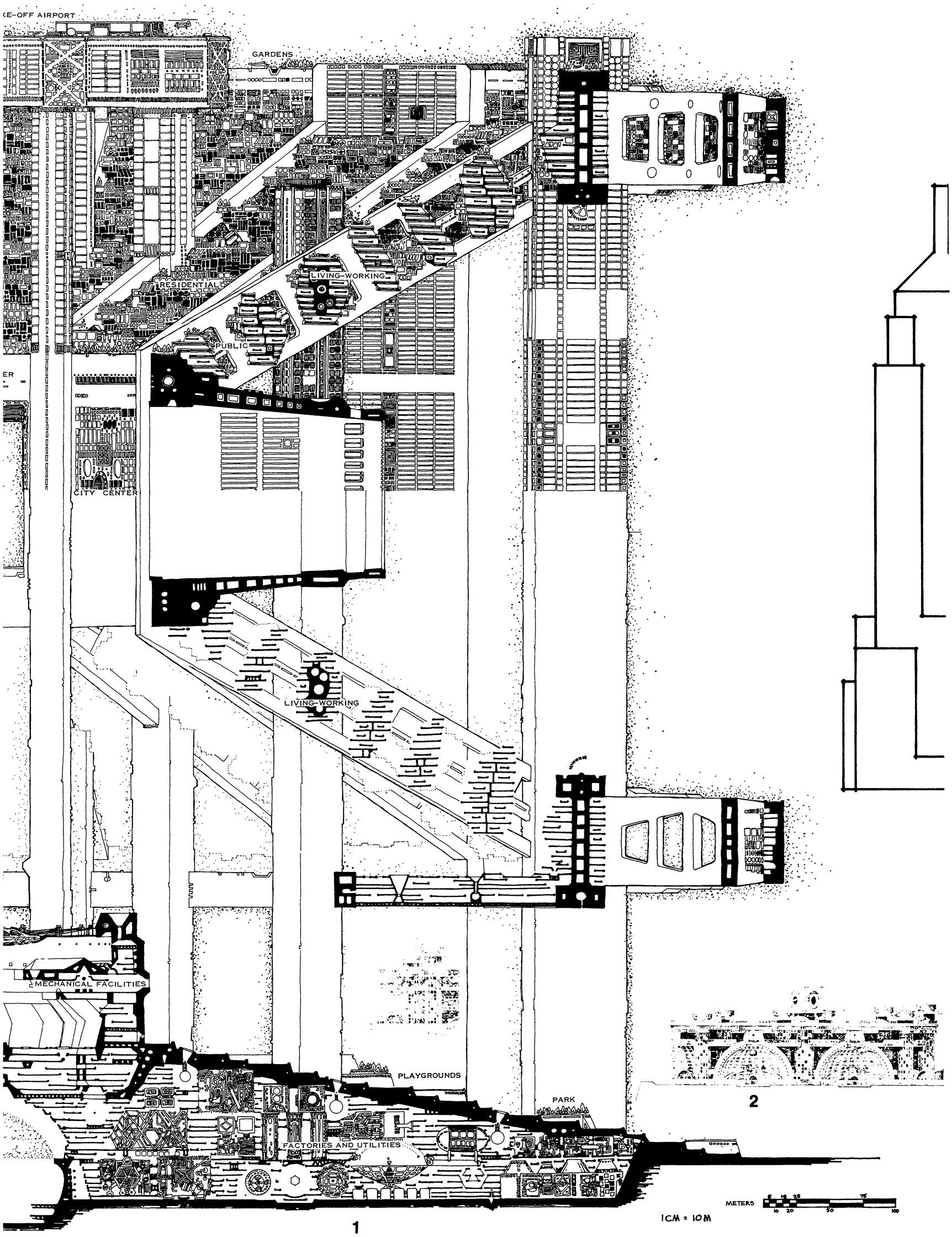


13.Babel Canyon

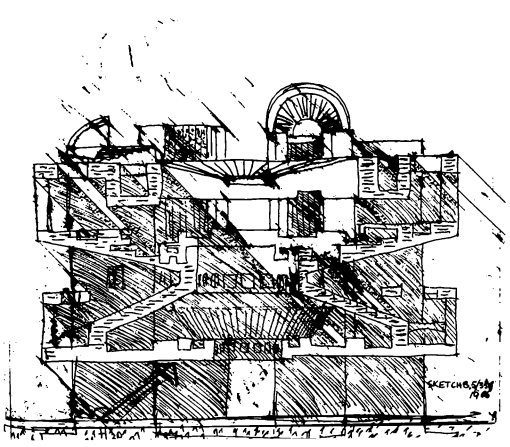
	Babel Canyon	
	(Any nonmountainous land)	
	Population	250,000
	Density	2,341/hectare; 948/acre
	Width of structure	1,100 meters
	Height	800 meters
	Surface covered	100 hectares; 247 acres
1.	Top view: scale	1:10,000
2.	Midlevel plan: scale	1:10,000
3.	Section: scale	1:10,000
	Comparative Arcologies	
	Logology	
	Population	900,000
4.	Elevation: scale	1:10,000
	Arcoindian I	
	Population	20,000
5.	Elevation: scale	1:10,000

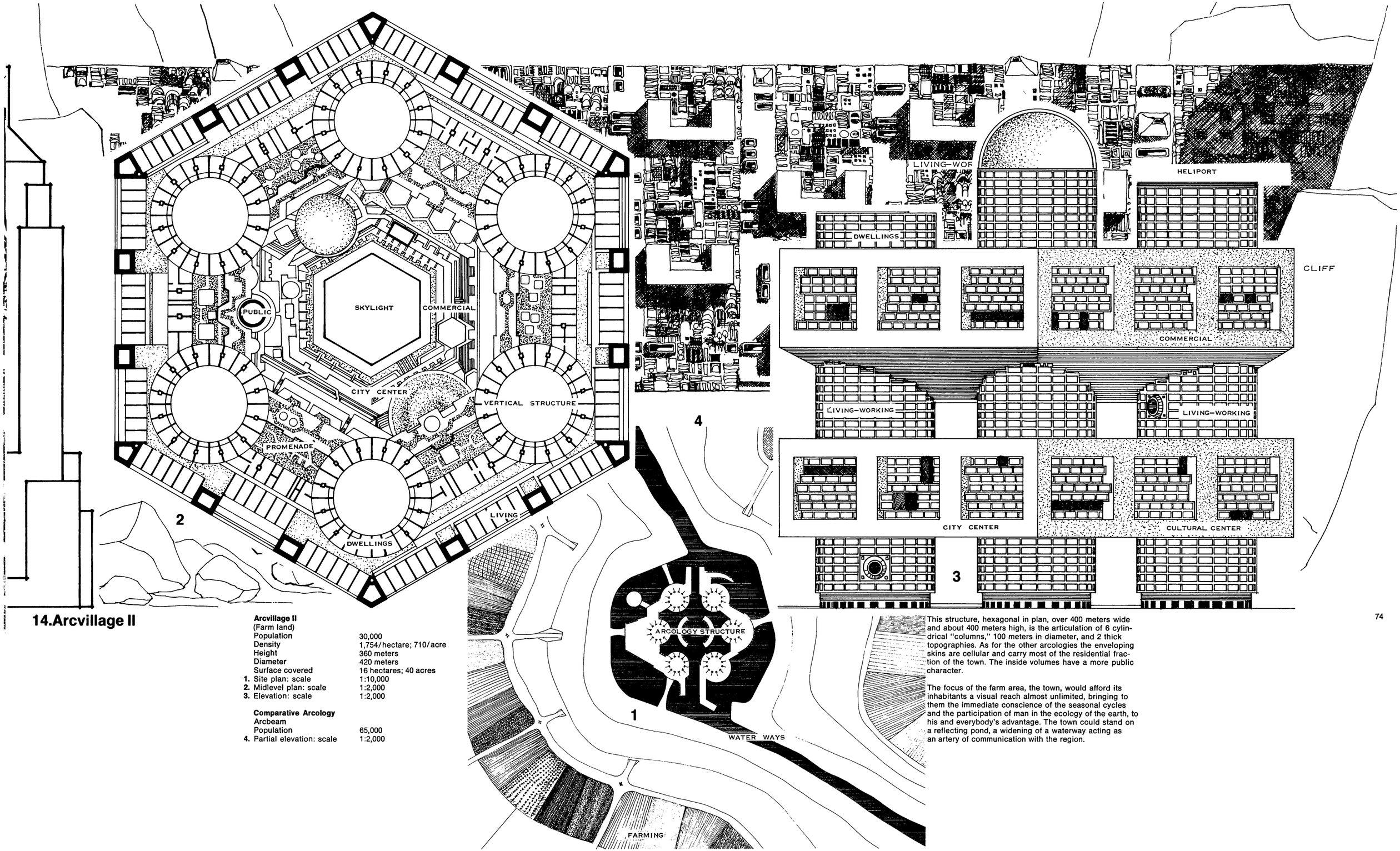
Designed on a curve-square plan of about 1 kilometer per side, Babel Canyon is like a series of skyscrapers perforating three pyramidal and multifunctional configurations. The lower one covers the servicing entrails of the city. The other two are the containers of residential and public functions. As for many of the arcologies there is a very large light-and-air well running on the vertical axis. The sloping configurations produce a variety of spatial systems of inward or outward character. The environmental characters would be very diverse, with almost opposite rhythms of space, light, and dimension.



13.Babel Canyon

	Babel Canyon	
	(Any nonmountainous land)	
	Population	250,000
	Density	2,341/hectare; 948/acre
	Height	800 meters
	Width of structure	1,100 meters
	Surface covered	100 hectares; 247 acres
1.	Section: scale (on diagonal axis)	1:2,000
	Comparative Arcology	
	Arcosanti	
	Population	1,500
2.	Elevation: scale	1:2,000



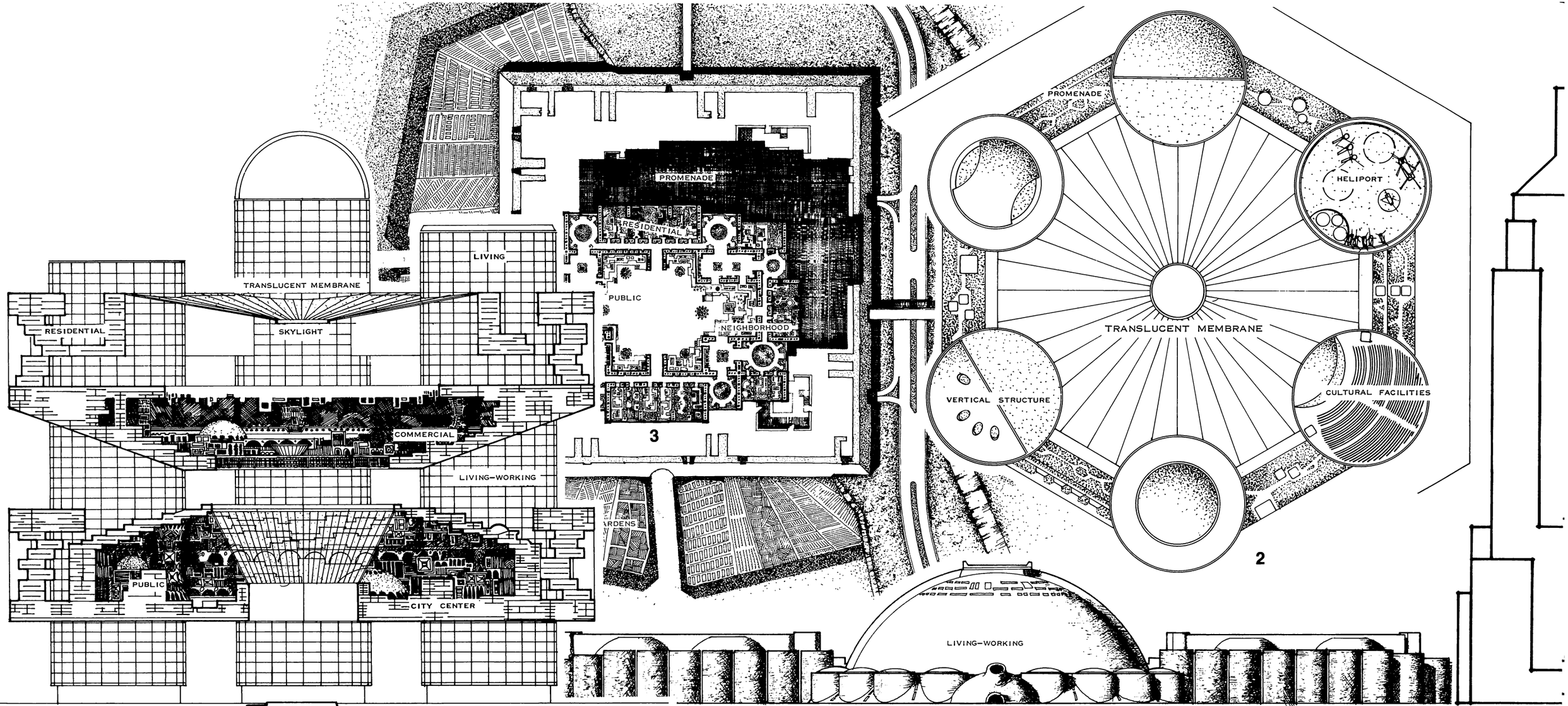


14.Arcvillage II

Arcvillage II	
(Farm land)	
Population	30,000
Density	1,754/hectare; 710/acre
Height	360 meters
Diameter	420 meters
Surface covered	16 hectares; 40 acres
1. Site plan: scale	1:10,000
2. Midlevel plan: scale	1:2,000
3. Elevation: scale	1:2,000
Comparative Arcology	
Arcbeam	
Population	65,000
4. Partial elevation: scale	1:2,000

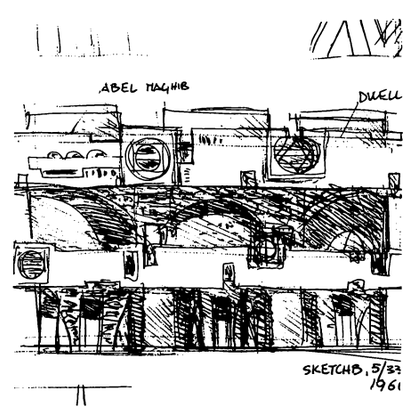
This structure, hexagonal in plan, over 400 meters wide and about 400 meters high, is the articulation of 6 cylindrical "columns," 100 meters in diameter, and 2 thick topographies. As for the other arcologies the enveloping skins are cellular and carry most of the residential fraction of the town. The inside volumes have a more public character.

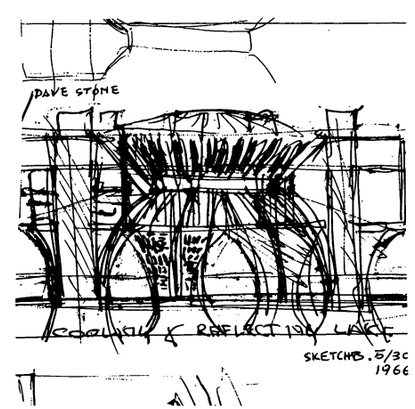
The focus of the farm area, the town, would afford its inhabitants a visual reach almost unlimited, bringing to them the immediate conscience of the seasonal cycles and the participation of man in the ecology of the earth, to his and everybody's advantage. The town could stand on a reflecting pond, a widening of a waterway acting as an artery of communication with the region.

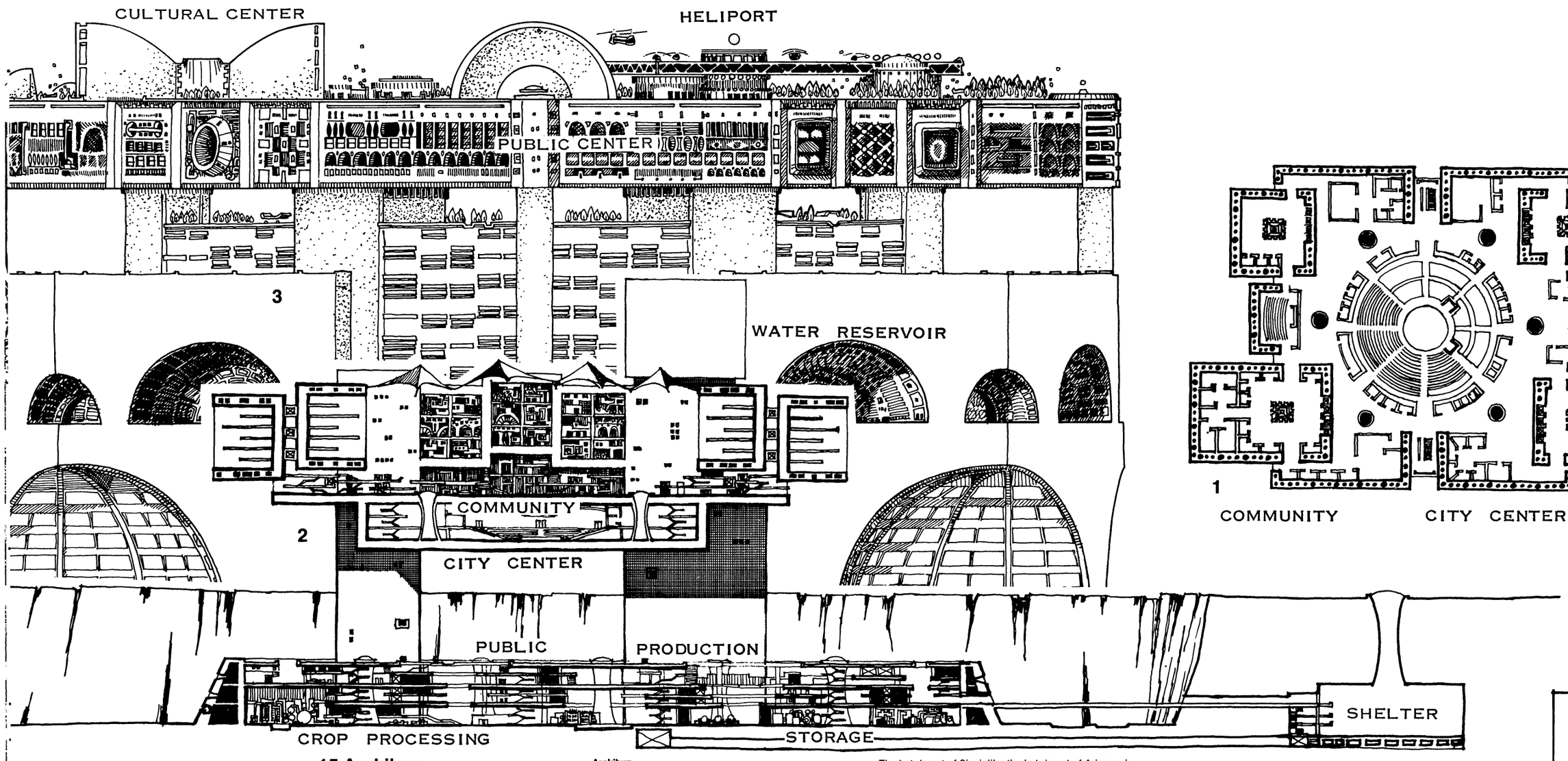


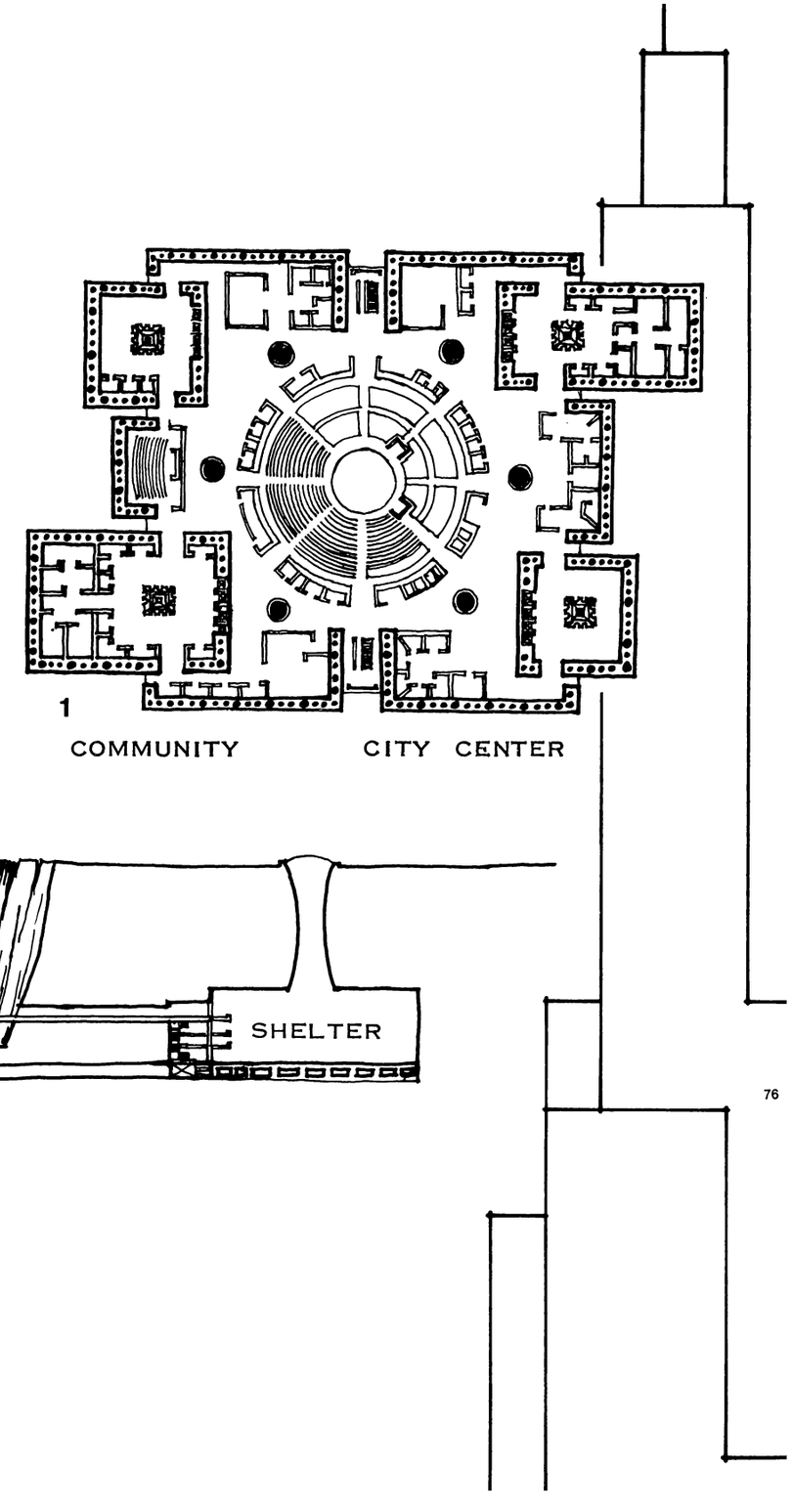
14.Arcvillage II

	Arcvillage II	
	(Farm land)	
	Population	30,000
	Density	1,754/hectare; 710/acre
	Height	360 meters
	Diameter	420 meters
	Surface covered	16 hectares; 40 acres
1.	Section: scale	1:2,000
2.	Top view: scale	1:2,000
	Comparative Arcologies	
	Arckibuz	
	Population	2,500
3.	Plan: scale	1:2,000
	Arcollective	
	Population	2,000
4.	North elevation: scale	1:2,000

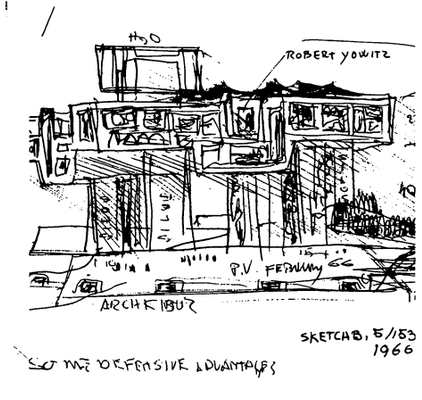








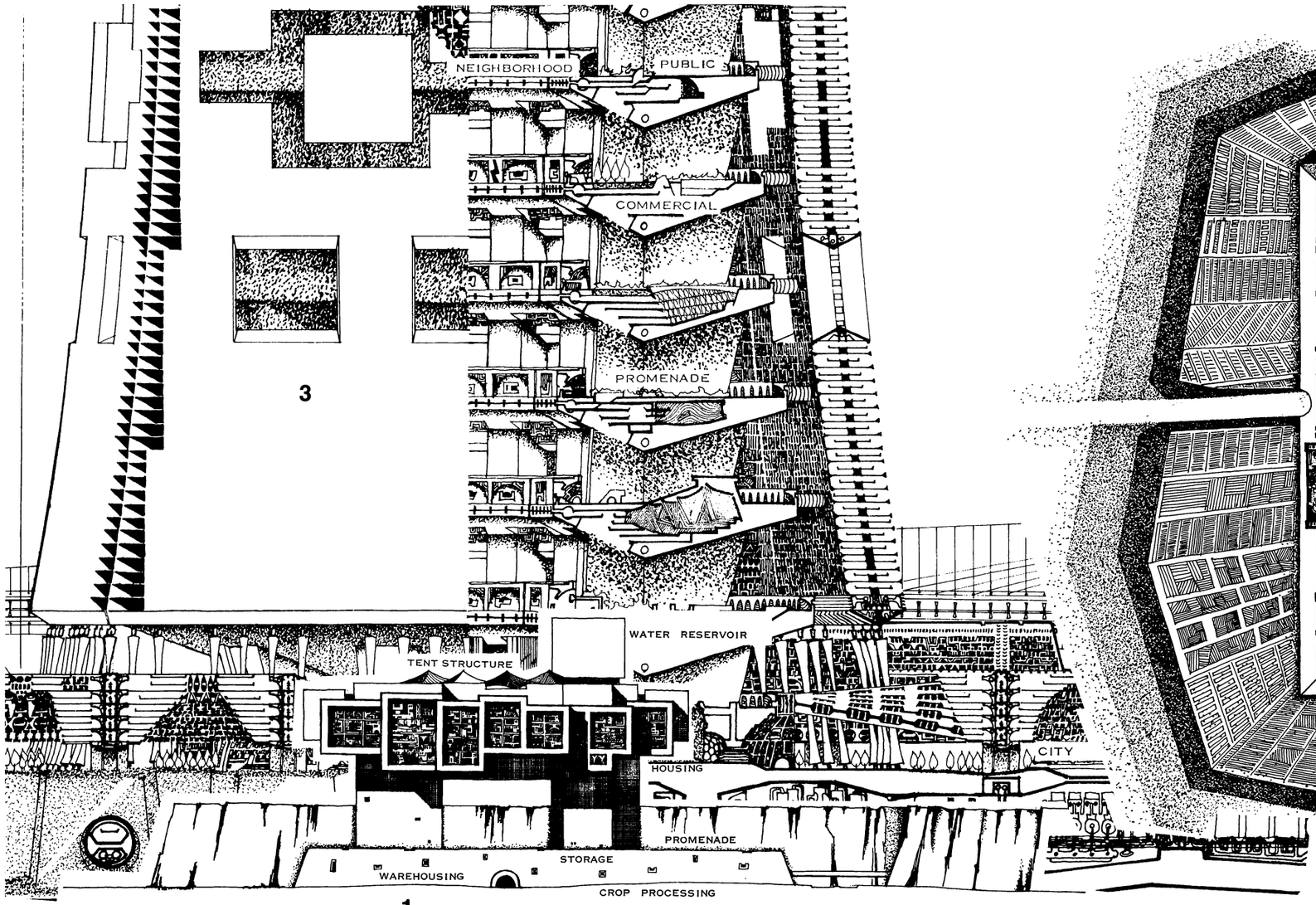
15.Arckibuz



	Arckibuz	
	(Desert land)	
	Population	2,500
	Density	319/hectare; 125/acre
	Height	120 meters
	Surface covered	8.25 hectares; 20 acres
1.	Plan at community center level: scale	1:1,000
2.	Section: scale	1:1,000
	Comparative Arcology	
	Arcvillage I	
	Population	9,000
3.	Elevation: scale	1:1,000

The hot desert of Sinai, like the hot desert of Arizona, is merciless toward anything or any space that cannot count on deep receptacles and great inertia mass. In the organic realm the cactus can face well the blast of hot and moisture-free air without drying into a crisp. The cactus is composed of parts that have three congruous dimensions with a minimal ratio of surface to volume, an essential condition for survival. Techniques of survival point the way for techniques of comfort. The greater the mass, the more balance available from hot days and cool or cold nights.

Hot deserts like frozen tundras are places where man cannot pretend to be physically disengaged from his fellow man. In the instance of the Navajo versus the Pueblo, the Navajo fought the weather in countless battles and lost not so much to comfort as to isolation. Harsh weather cut into the social body of the Navajo like a cruel knife, whereas the Pueblo found in the temperate microclimate of their own making a stimulus and a contriver of social interaction. What plagued the Pueblo might have been a poor auxiliary system of heating and cooling. The instrument was well advised for the Pueblo, ill advised for the Navajo.



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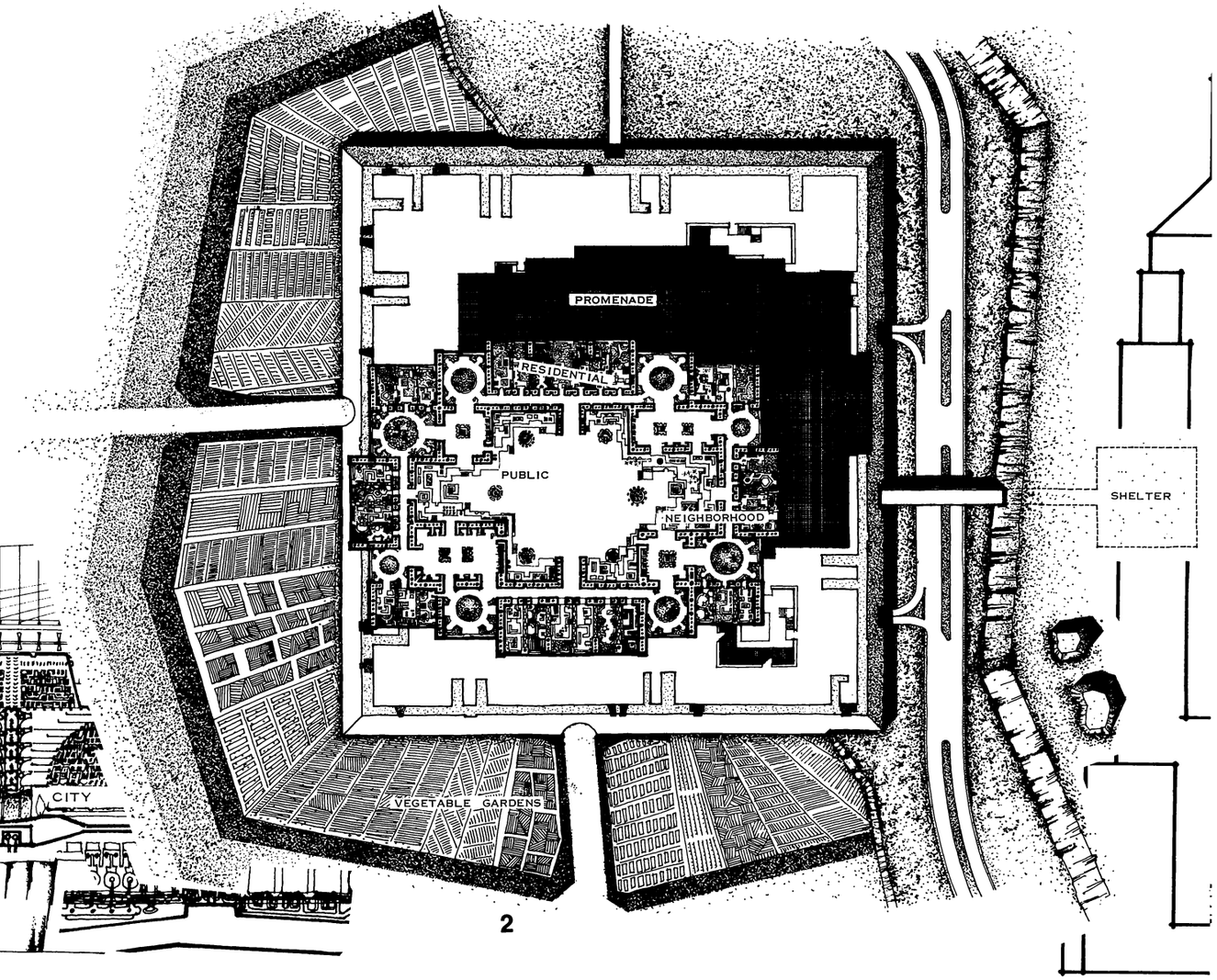

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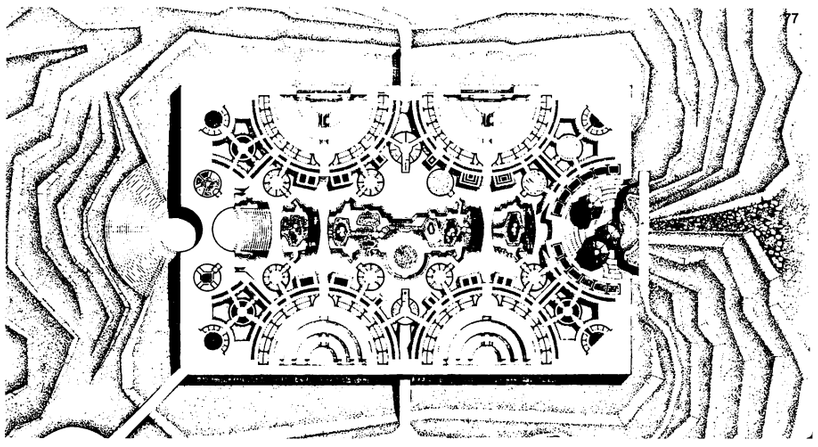
15.Arckibuz

Arckibuz	
(Desert land)	
Population	2,500
Density	319/hectare; 125/acre
Height	120 meters
Surface covered	8.25 hectares; 20 acres
1. Elevation: scale	1:2,000
2. General plan: scale	1:2,000
Comparative Arcologies	
Babel IIA	
Population	80,000
3. Partial section through one tower: scale	1:2,000
Arcosanti	
Population	1,500
4. General plan: scale	1:2,000

Today's technology of air conditioning might attenuate the handicaps of a strong climate. It does not do away with them, principally because (1) air conditioning does not have an ecological roundness, that is to say, it is segregative by its very nature; (2) by failing to demand from the building itself those elements of congruence with the climate that would render total conditioning redundant, it does not work with the positive aspects of the climate; (3) air conditioning is a large figure in the cost of a building, the compensatory economy being a cut into other and possibly more important aspects of the total configuration.

Auxiliarity of the natural and the man-produced must be observed. This ecological complementarity is in the long run the only position that might let man prevail over things. Great mass and profound shadows procure relief from the extremes of temperature. Any sheltering shape that can accept the low winter sun and intercept the high hot summer sun functions similarly; the most typical of such shapes is an apse open toward the south. (See Arcosanti.)



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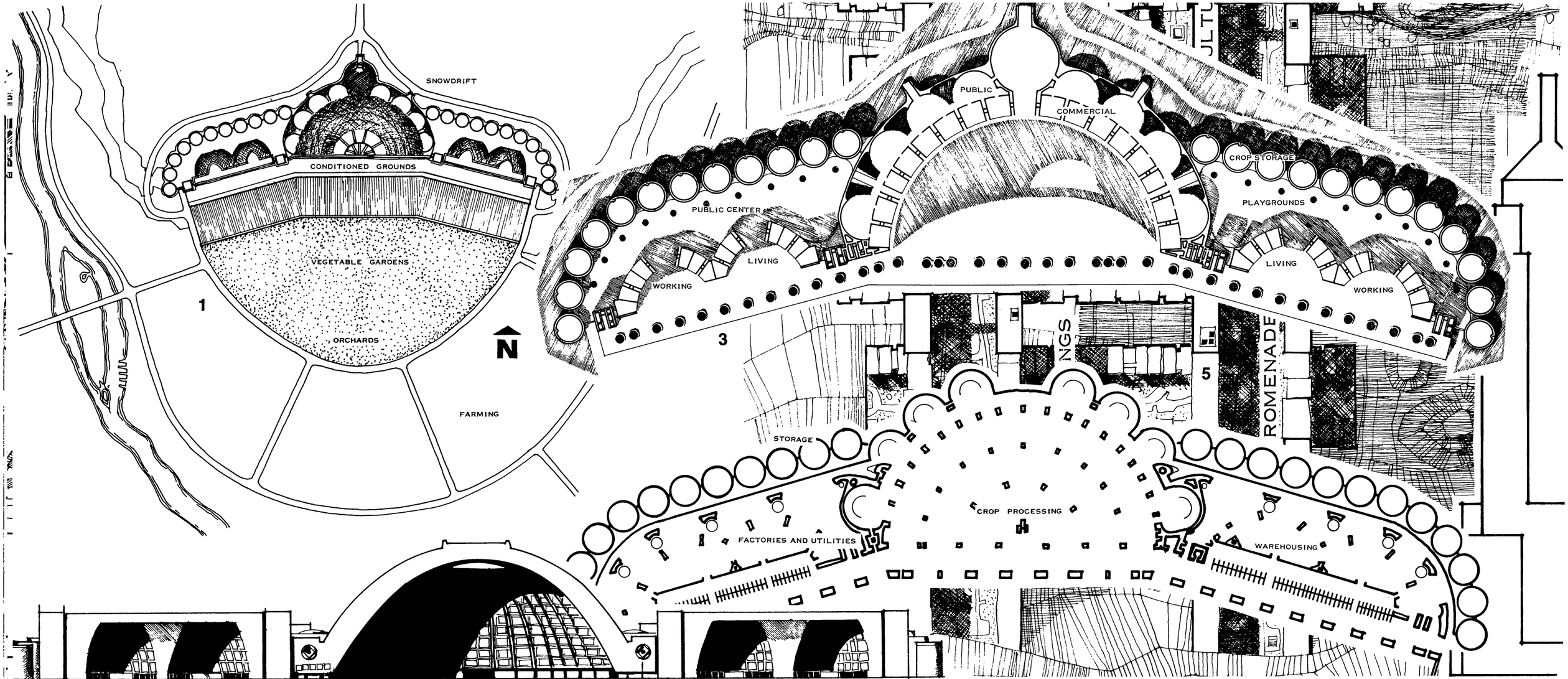
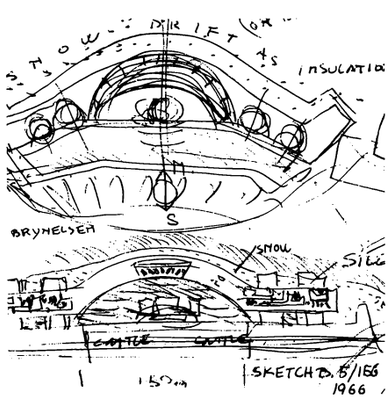


16.Arcollective

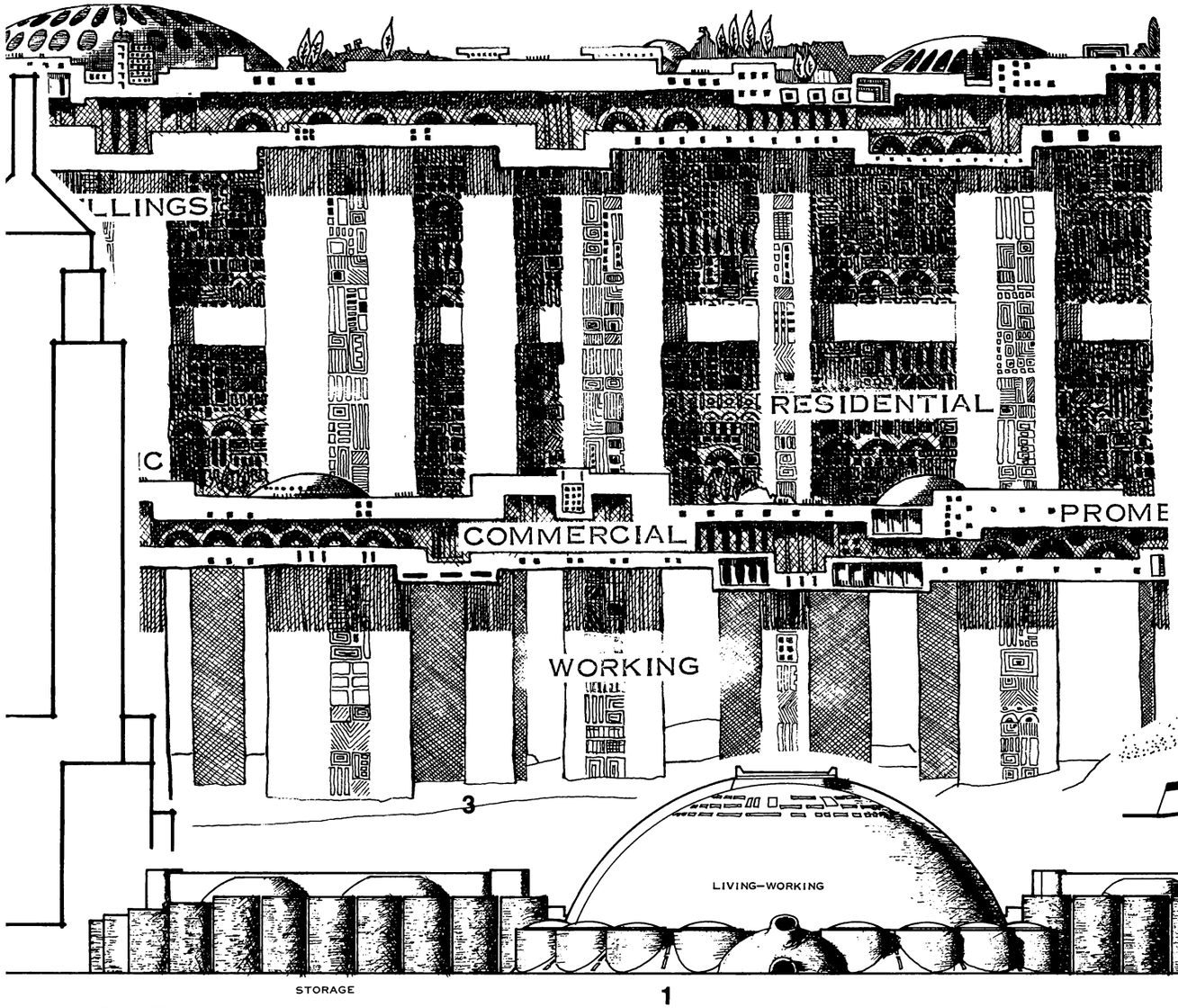


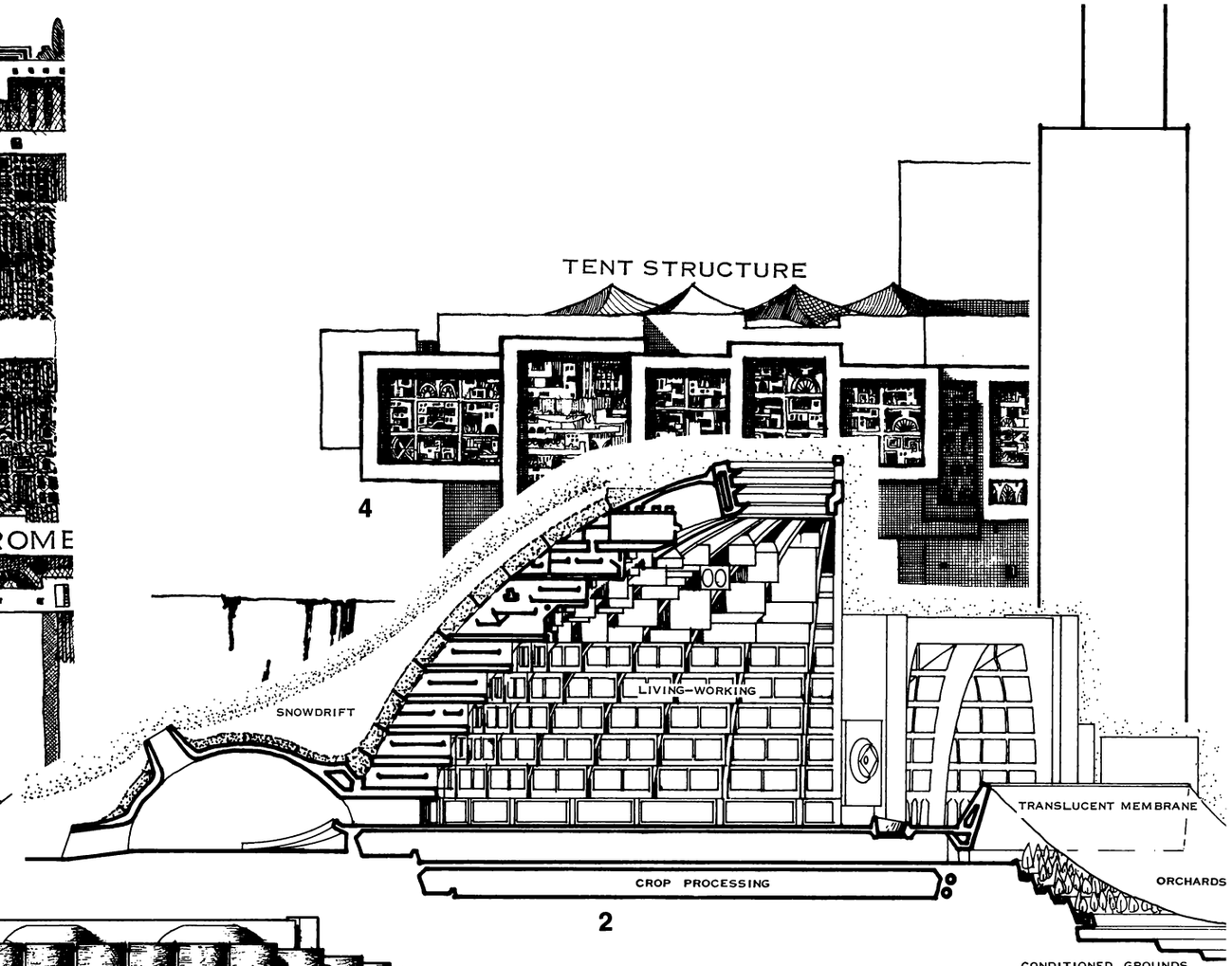
Arcollective
(Cold region)

Population	2,000
Density	207/hectare; 84/acre
Height	50–100 meters
Surface covered	8.5 hectares; 21 acres
1. Site plan: scale	1:4,000
2. South elevation: scale	1:2,000
3. Ground level plan: scale	1:2,000
4. Underground plan: scale	1:2,000

Comparative Arcology
Arcbeam

Population	65,000
5. Partial plan: scale	1:2,000





16.Arcollective

Arcollective
(Cold region)

Population	2,000
Density	207/hectare; 84/acre
Height	50–100 meters
Surface covered	8.5 hectares; 21 acres
Scale	1:2,000
1. North elevation: scale	
2. Transverse through axis section: scale	1:1,000

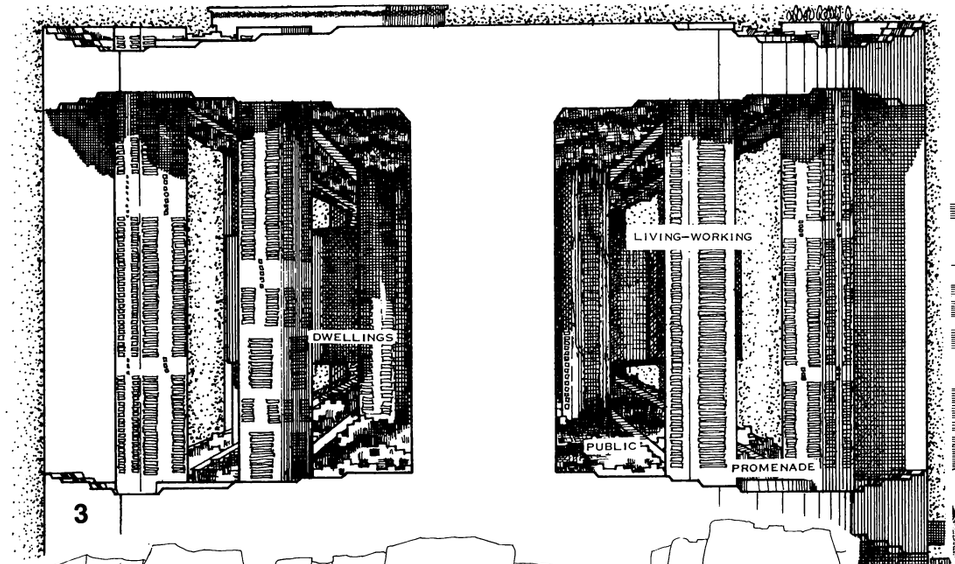
Comparative Arcologies

Arcanyon	
Population	40,000/kilometer
3. Partial elevation: scale	1:2,000
Arckibuz	
Population	2,500
4. Partial elevation: scale	1:1,000

The organization of Arcollective is worked around the concept of the sun trap: the apse (one quarter of a sphere) opens toward the south. It is a configuration that reflects the reciprocal interworking of sun and earth from the particular position man stands for in it. The apse is in other words that topography that serves man well in his own cosmic pattern. The low elliptical path of the sun in winter makes its rays penetrate the spherical space of the apse. The high elliptical path of the summer sun causes the apse to project a large volume of shade within its spherical space. This dual function, a sun trap in winter and sun shade in summer, is the reason for the use of the apse in a climate with a long and harsh winter.

The central apse in Arcollective is 200 meters in diameter. On the north side a snow drift, natural or induced, would work as insulation against the very low winter temperatures. The north envelope of silos would also serve the same purpose. The areas sheltered by the large apse and the four smaller pseudo-apses would in sunny winter days be relatively comfortable grounds for outdoor activities, not the least of which is play.

For a larger community, the use of more inner spaces would tend to reduce the significance of the apse as a climate producer. The organism would count more on its mass inertia and the generation and use of endogenous energy.



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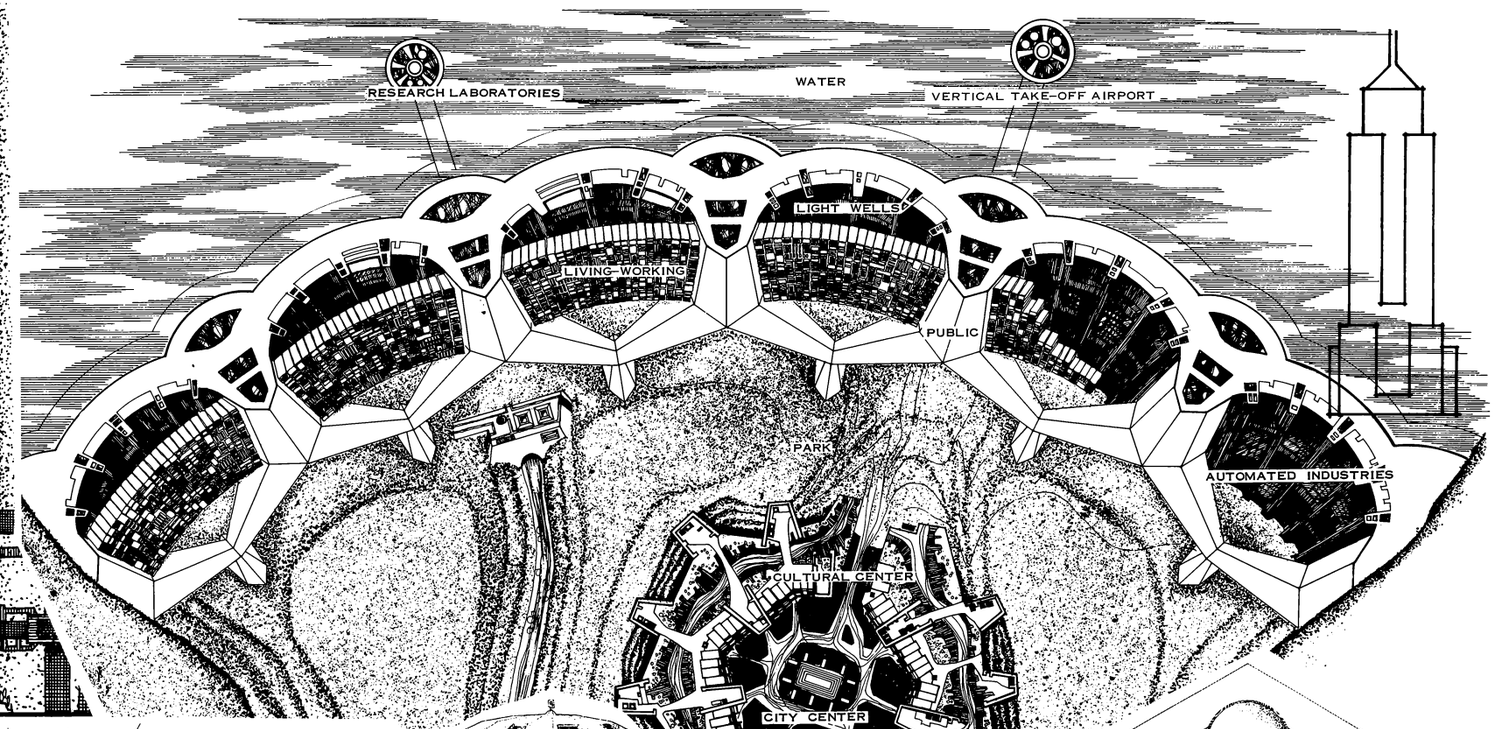

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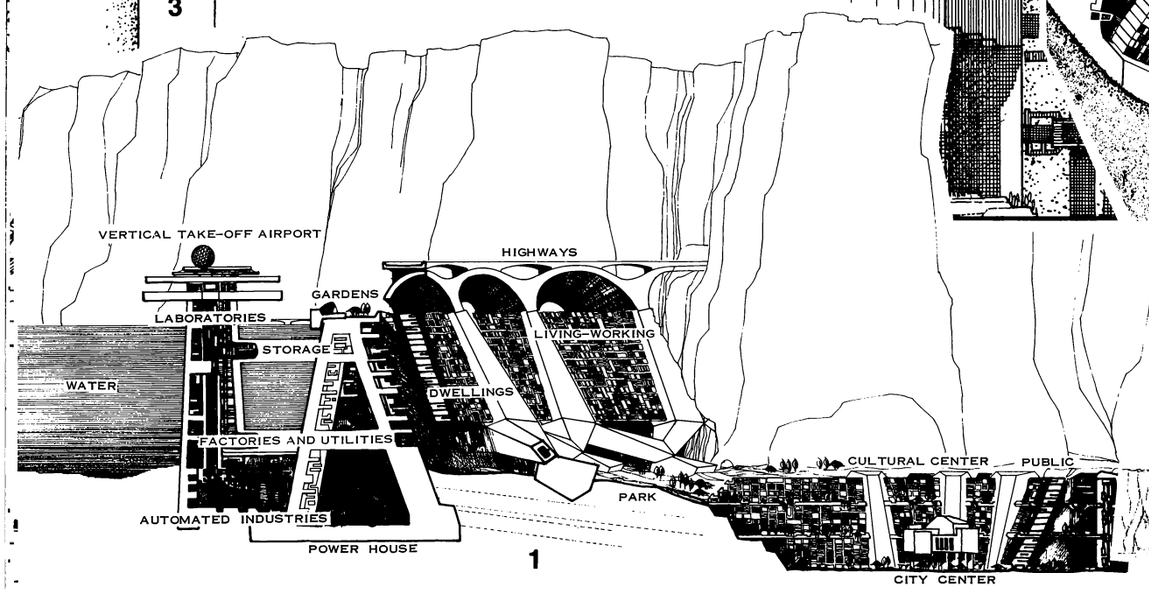

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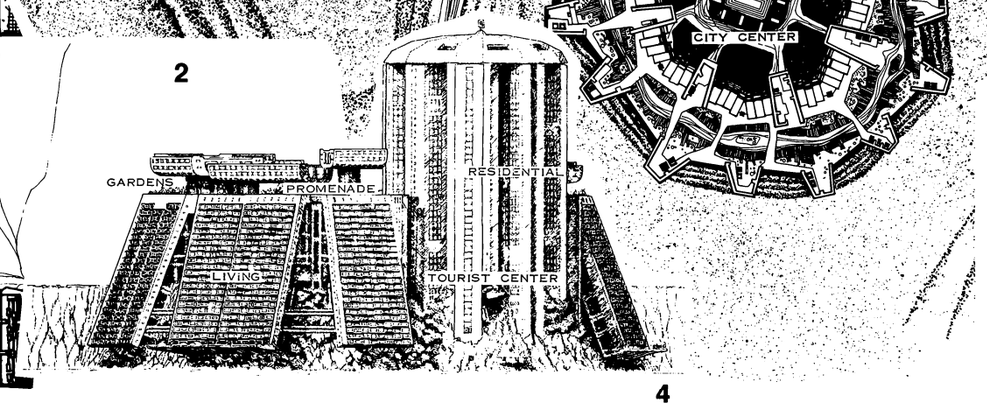

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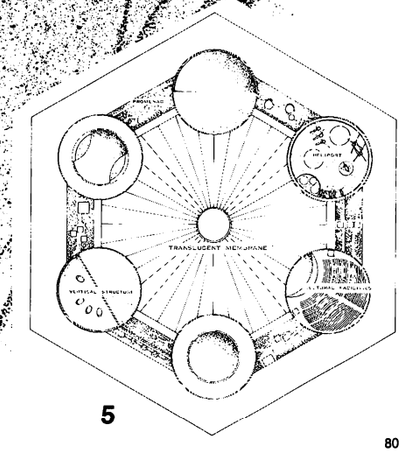

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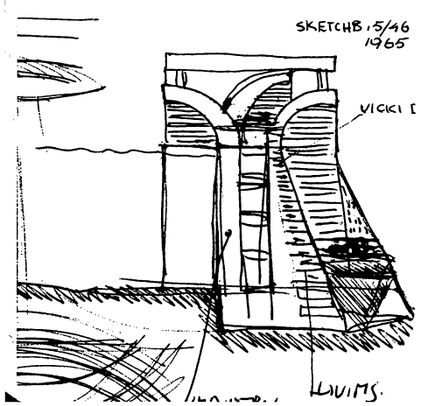
17.Veladiga

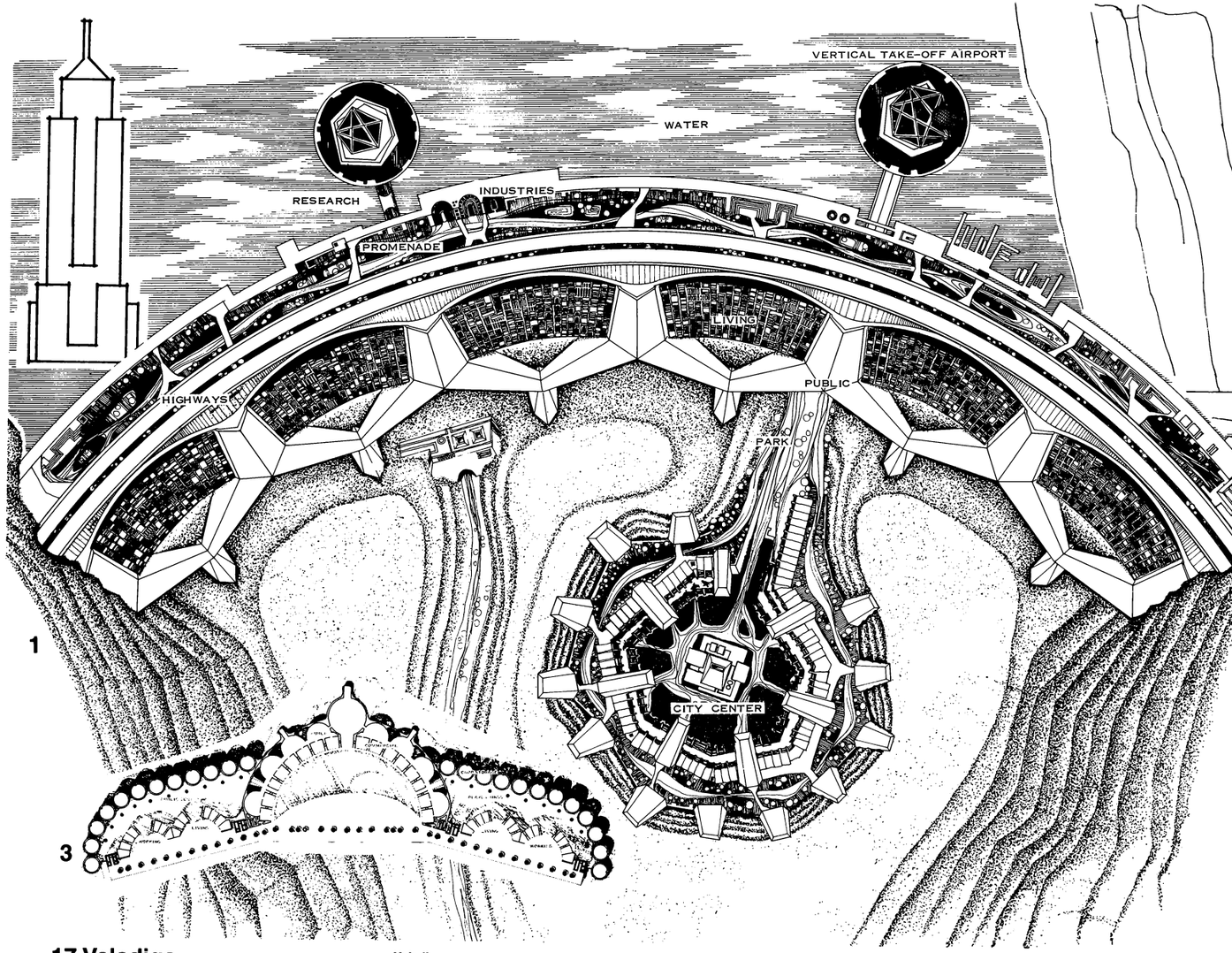


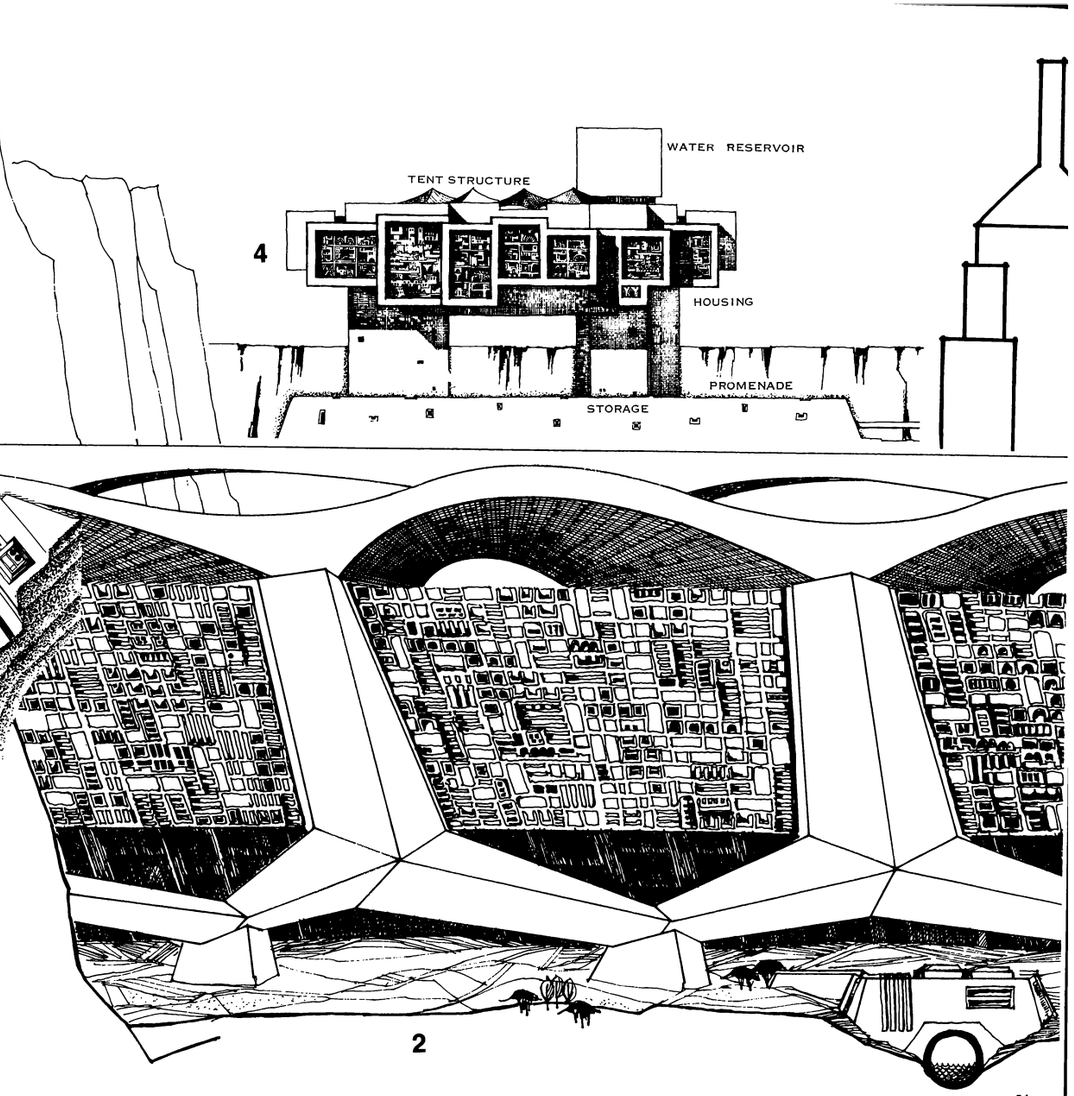
Veladiga	
(Dam site)	
Population	15,000
Density	309/hectare; 125/acre
Height	250 meters
Surface covered	48 hectares; 120 acres
1. Section: scale	1:5,000
2. Plans from top of dam: scale	1:5,000
Comparative Arcologies	
Babel Canyon	
Population	250,000
3. Elevation: scale	1:5,000
Arcoforte	
Population	10,000
4. Elevation: scale	1:5,000
Arcvillage II	
Population	30,000
5. Top view: scale	1:5,000

The order that man puts or imposes on nature, nature herself has self-imposed for countless centuries. Sudden upheaval or gradual phenomena have created rivers and watersheds, changed the course of rivers, reversed watersheds throughout the life of the earth. Purposeless as the process might have been in itself, the results were and are portentously part of, and definers of, what man has done with himself and his species. We, the latecomers, are then part and result of this geocosmic phenomenon. Coherence to nature and man demands then that geocosmic action be enriched by man into a geocosmic-reflective intervention.

To be abrupt: our dams are geocosmic dwarfs and reflective abortions. They may well feed cities and industries with power, irrigate lands and fields, swell the pride of corporate images of technicians and contractors. What they do not do is to project themselves, as they should, as living and awesome organisms.

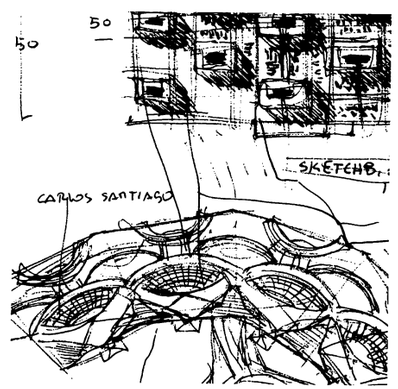
The "success" of the obscure, mineral planet, earth, is and will be measured by the substance of the civilizations enveloping it, this substance given in turn by the measure of wholeness (congruence) each undertaking carries with it.

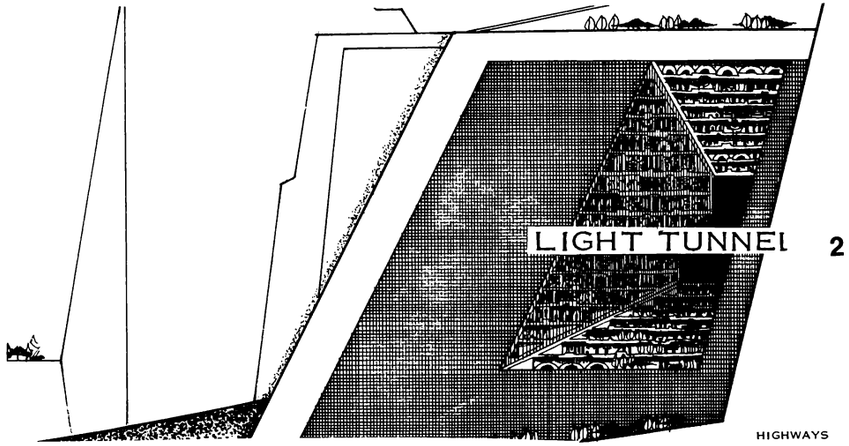


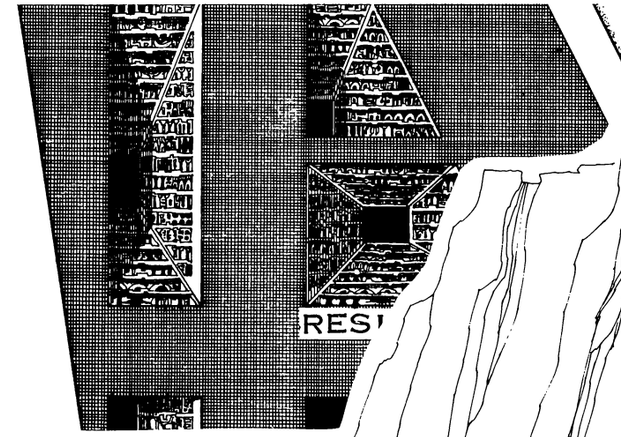


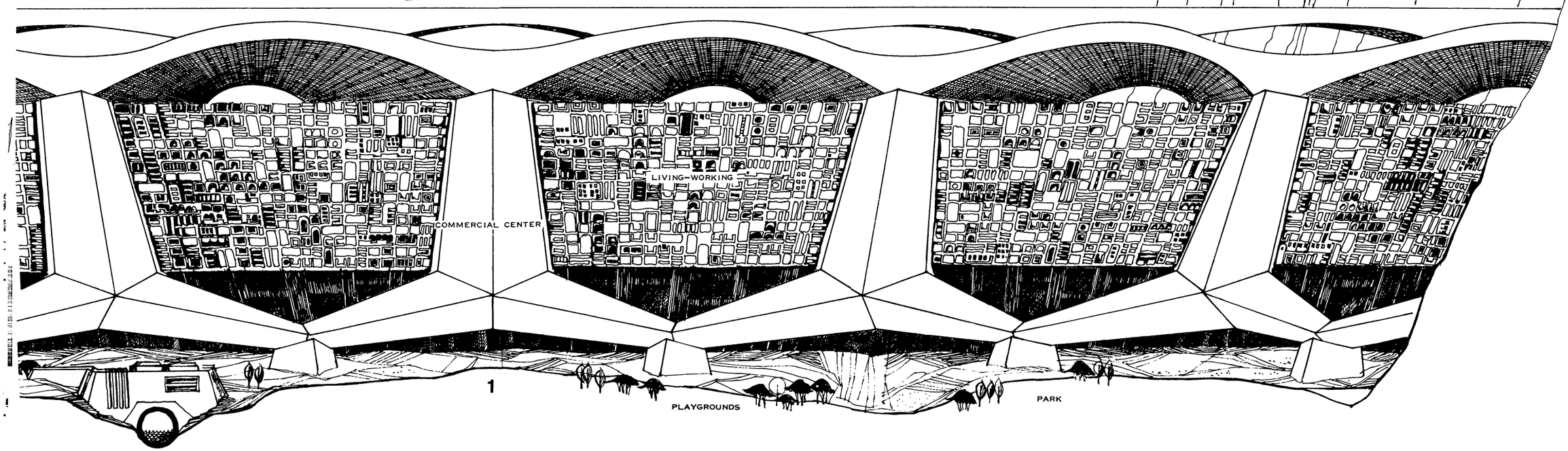
17.Veladiga

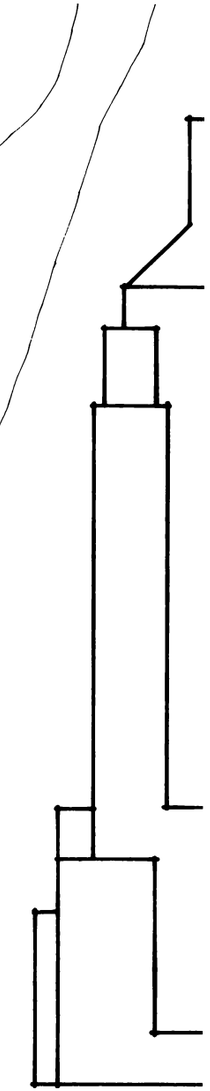
	Veladiga	
	(Dam site)	
	Population	15,000
	Density	309/hectare; 125/acre
	Height	250 meters
	Surface covered	48 hectares; 120 acres
1.	Top view: scale	1:5,000
2.	Partial elevation: scale	1:2,000
	Comparative Arcologies	
	Arcollective	
	Population	2,000
3.	Plan: scale	1:5,000
	Arckibuz	
	Population	2,500
4.	Elevation: scale	1:2,000



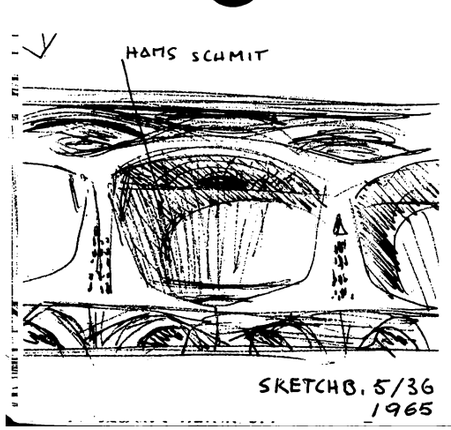








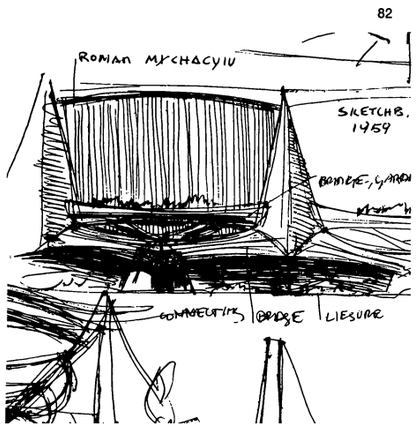
17.Veladiga

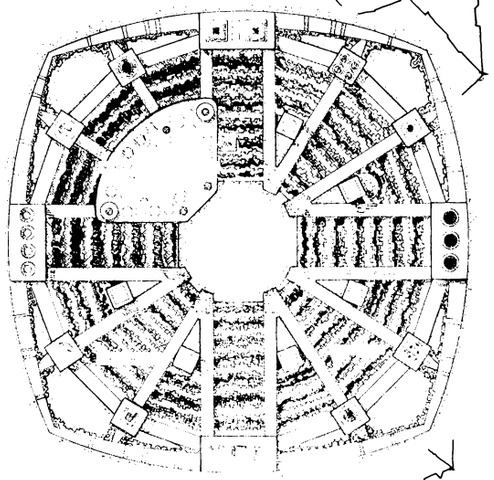


Veladiga	
(Dam site)	
Population	15,000
Density	309/hectare; 125/acre
Height	250 meters
Surface covered	48 hectares; 120 acres
1. Partial elevation: scale	1:2,000
Comparative Arcology	
Infrababel	
Population	100,000
2. Partial elevation: scale	1:2,000

On the geocosmic scale in which a dam can act, the right speck in the right crack and its apparent out-of-proportion effects, one cannot but wish a proportionate degree of liveliness and participation of man himself, directly and immanently. The focal point and energetic center of such a scale seems to warrant a limitless variety of occasions for a rich, intense life, if one adds the colossal masonry, the concentration of facilities, the site, one has all the premises for a fully displayed metropolitan life.

In a dam one has more than an instrument, one has a phenomenon cutting its way into the ecological balance of vast areas. A dam is as large as the transformations it produces. The sense of focality and useful coercion that springs from it need to be lived by man because they are essentially transfigurative. What else in construction beside bridges and other water-retaining structures can compare in forcefulness, size, purpose, grandeur? Certainly not our offices, palaces, theaters, libraries—why should not those characters be lived by society and take, whenever possible, the place of petty redundance or diffused chaos?





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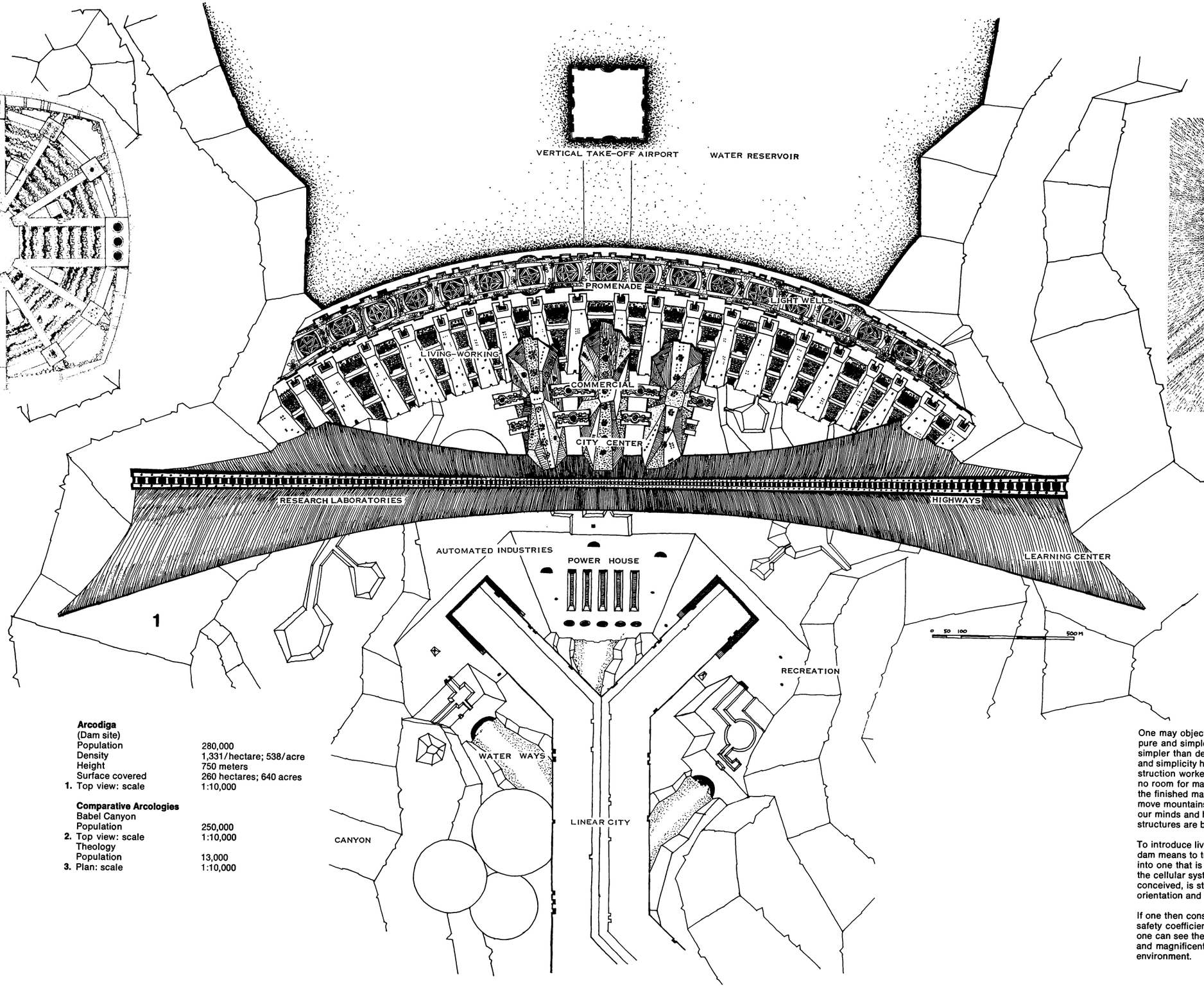

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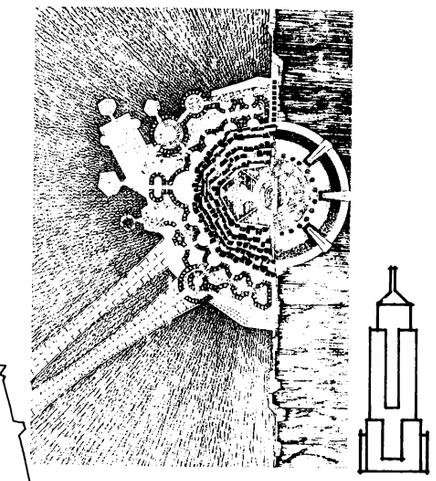


3

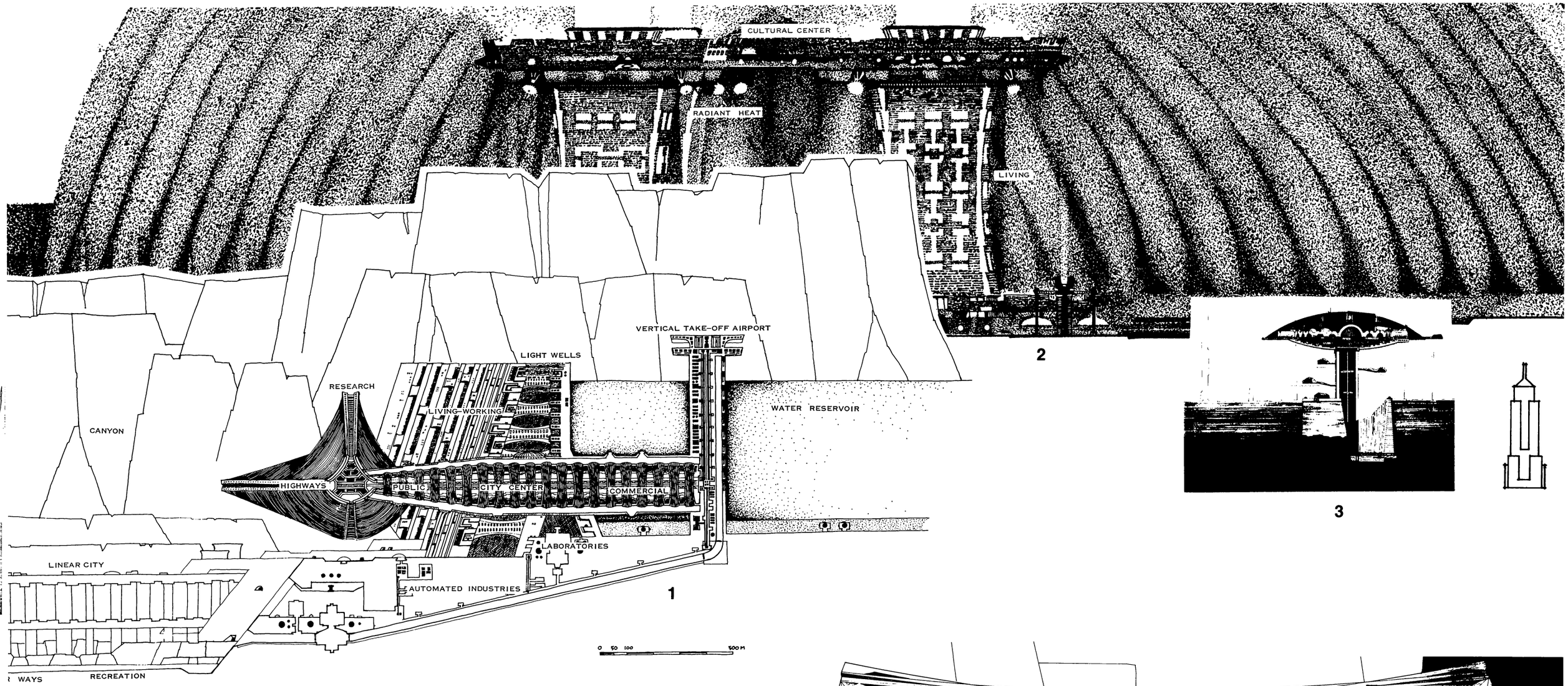
18.Arcodiga

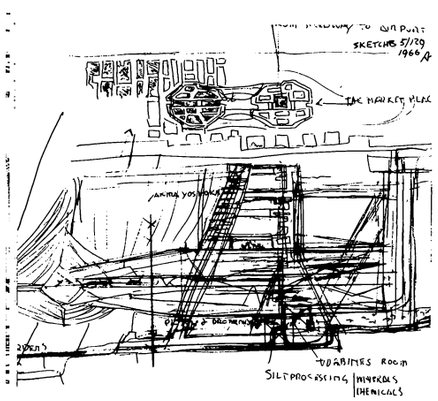
Arcodiga	
(Dam site)	
Population	280,000
Density	1,331/hectare; 538/acre
Height	750 meters
Surface covered	260 hectares; 640 acres
1. Top view: scale	1:10,000
Comparative Arcologies	
Babel Canyon	
Population	250,000
2. Top view: scale	1:10,000
Theology	
Population	13,000
3. Plan: scale	1:10,000

One may object: if the dam is all of this, why not let it be, pure and simple? Nothing is purer than sterility and simpler than death. The dam is a case in point. Purity and simplicity have caged designers, engineers, and construction workers in an isolation box where there is really no room for man, as there will be no room for him in the finished masonry. We do divert rivers, move and remove mountains with our hands. Why should we not put our minds and hearts in it and live by it also? These structures are begging for life.

To introduce living and working into the masonry of the dam means to transform a monolithic, noncellular system into one that is articulated and cellular. For equal mass the cellular system, not randomly given but structurally conceived, is stronger because it allows selectivity of orientation and dimensionality.

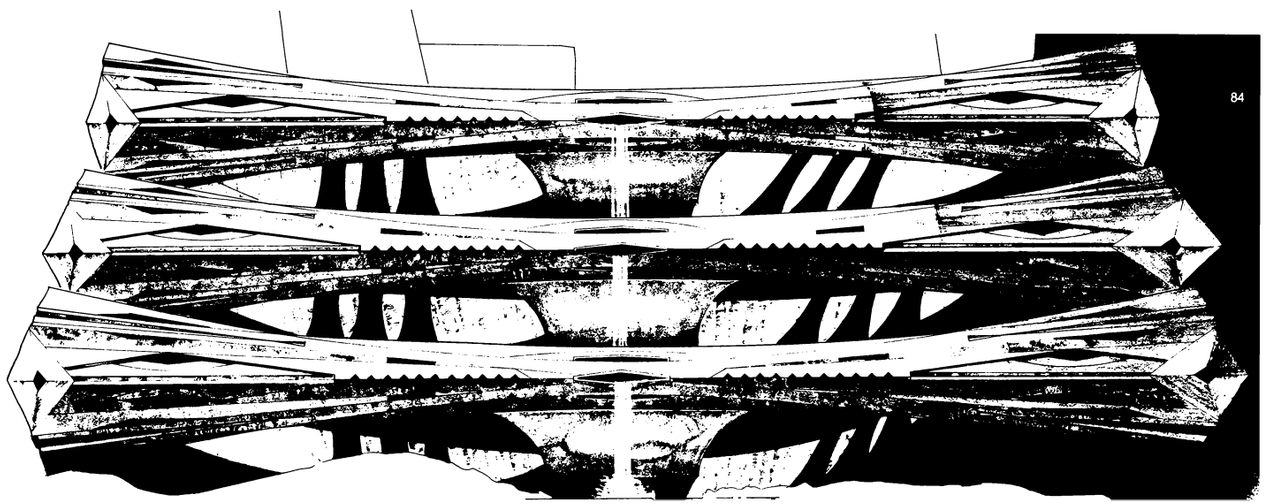
If one then considers the 1:7 ratio of redundance in the safety coefficient in the dams built in the United States, one can see the wealth of schemes that can effectively and magnificently transform the blind mass into a singing environment.

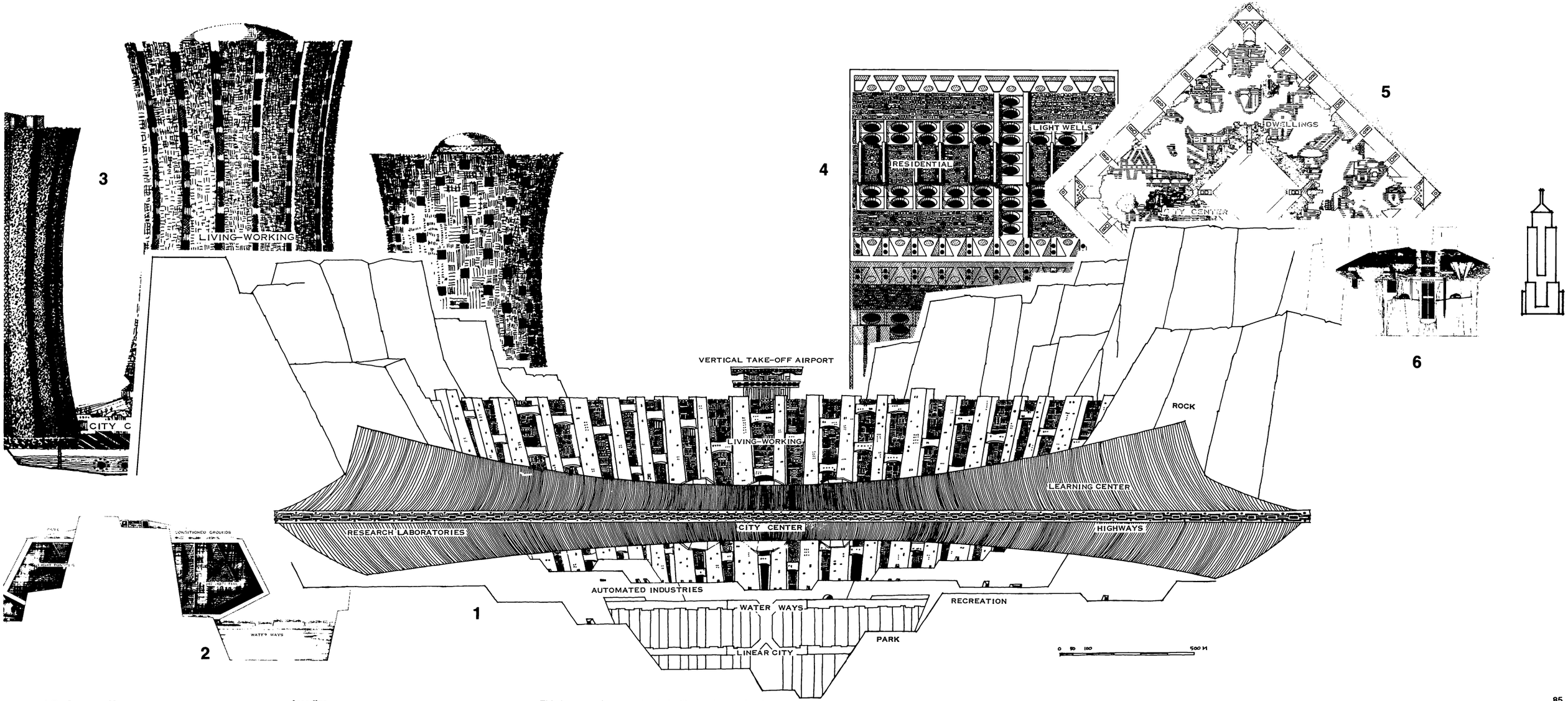




18.Arcodiga

Arcodiga	
(Dam site)	
Population	280,000
Density	1,331/hectare; 538/acre
Height	750 meters
Surface covered	260 hectares; 640 acres
1. Transverse section: scale	1:10,000
Comparative Arcologies	
Babel IIA	
Population	800,000
2. Side elevation: scale	1:10,000
Theology	
Population	13,000
3. Elevation: scale	1:10,000





18.Arcodiga

Arcodiga
(Dam site)

	Population	280,000
	Density	1,331/hectare; 538/acre
	Height	750 meters
	Surface covered	260 hectares; 640 acres
1.	Elevation: scale	1:10,000

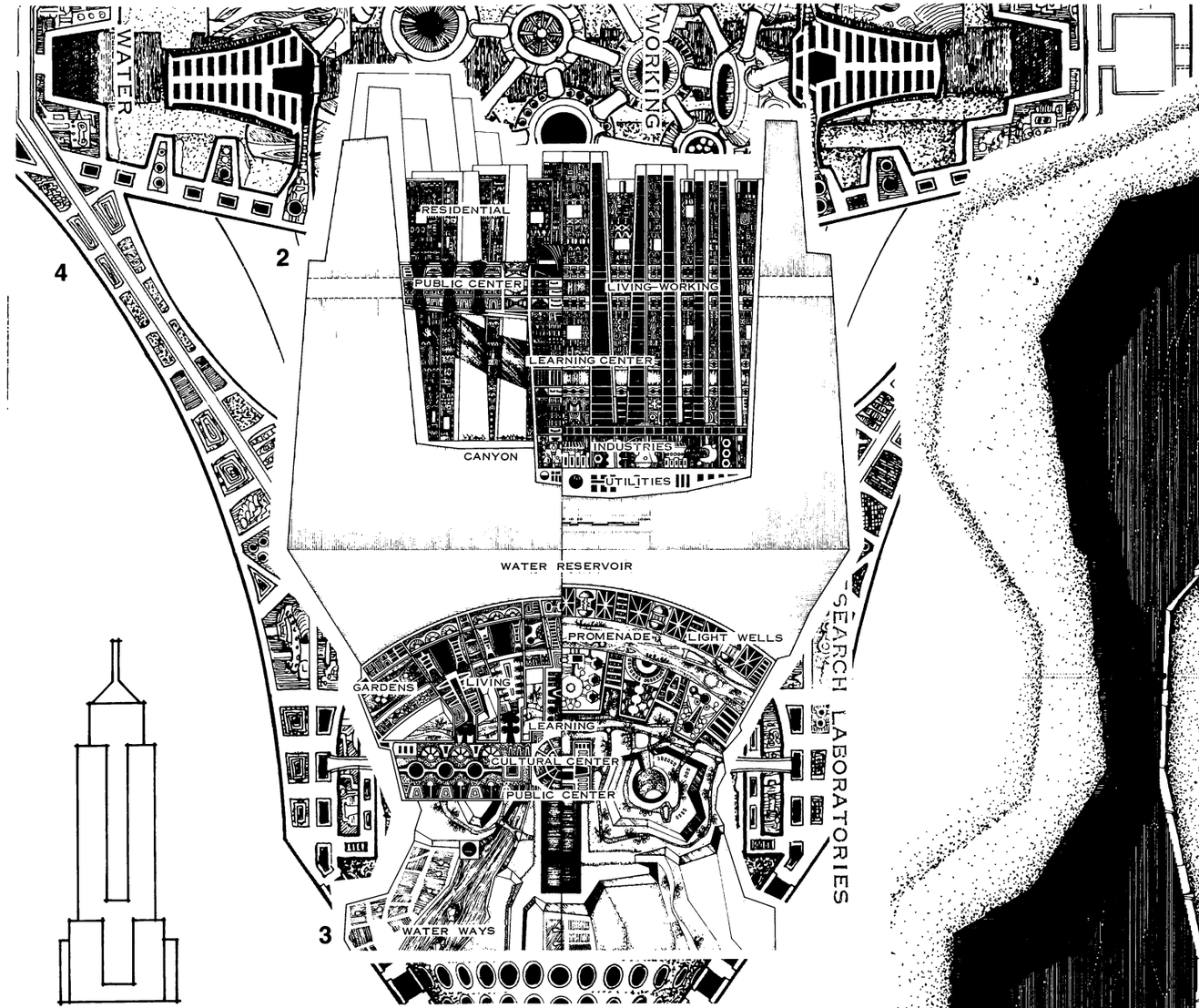
Comparative Arcologies

	Infrababel	
	Population	100,000
2.	Side elevation: scale	1:10,000
	Babelnoah	
	Population	6,000,000
3.	Partial elevation: scale	1:10,000
	Arcube	
	Population	400,000
4,5.	Partial elevation and section: scale	1:10,000
	Arcoindian II	
	Population	5,000
6.	Elevation: scale	1:10,000

This is an arcology constructed within and around a dam, a natural and ideal location for the development of a large community. Because of the nature of the dam, there would be water, power, communication, roads, sport and leisure possibilities, powerful geologies—and the bulk of the giant "wall" desperately in quest of further meaning, a relevant example of a "condition" inviting complexification.

The horizontal rib stiffening the dam's wall contains roads and institutions for research and study.

The silt-in would be particularly exploited by pumping silt from the water basin into farms or park beds that would progressively extend from the dam downstream, producing a constant change in the ecological landscape and also producing revenues in farming produce and leisure facilities. This transfer of silt from the upper basin, where it constitutes a negative voice, to the downstream basin will be a great asset and should be built into the design of the organism.



19.Theodiga

Theodiga
(Dam site)

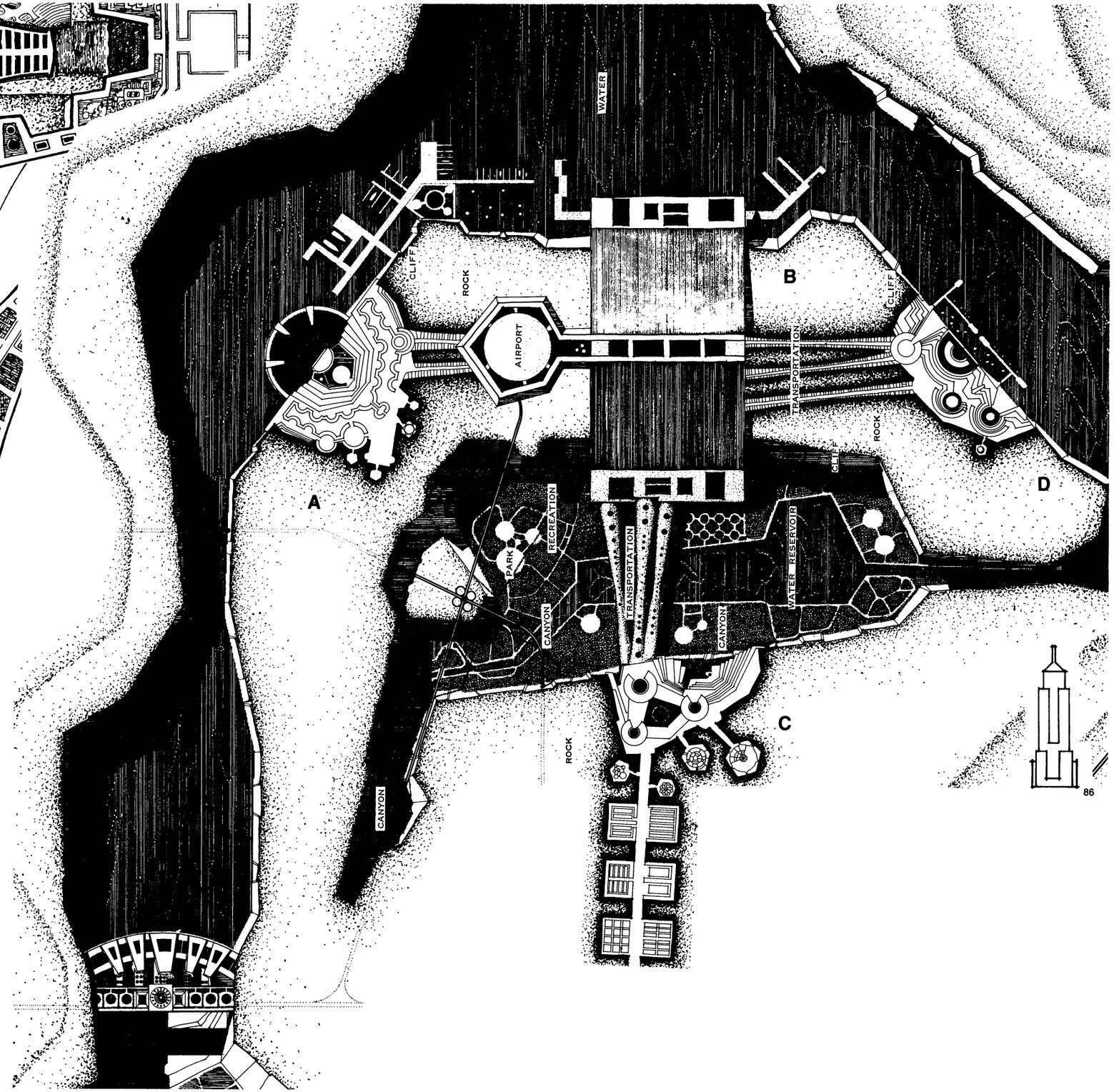
Population	20,000
Density	1,717/hectare; 695/acre
Height	400 meters
Surface covered	11.5 hectares; 29 acres

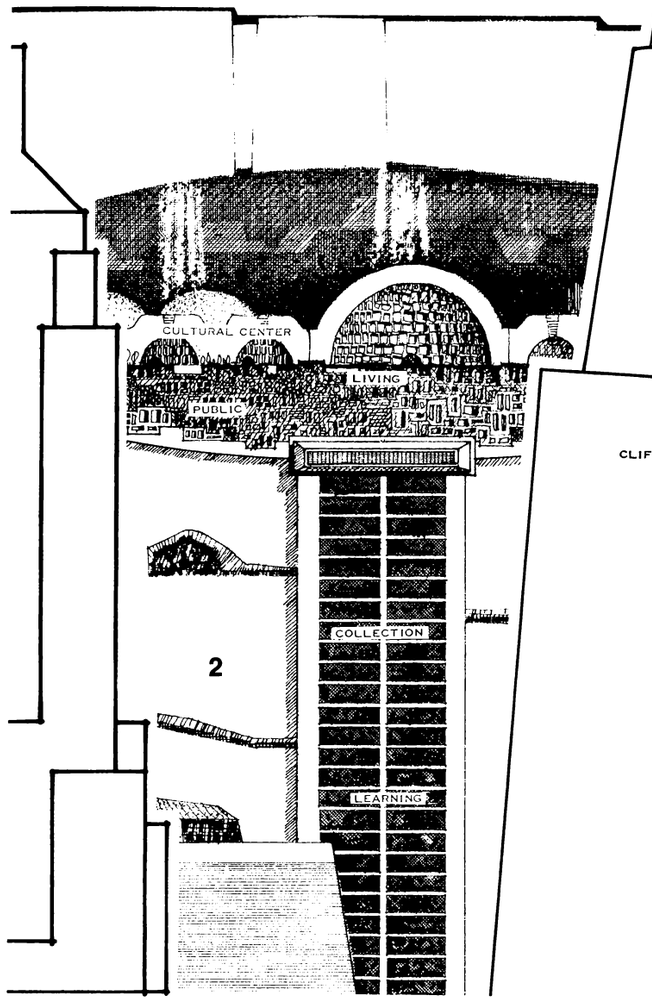
1. Site plan with four other arcologies: Theology (A), Infrababel (B), Arcoindian I (C), Arcoindian II (D): scale 1:10,000
2. Vertical sections: scale 1:5,000
3. Plans and intermediate levels: scale 1:5,000

Comparative Arcology
Asteromo

Population	70,000

4. Longitudinal section: scale 1:5,000





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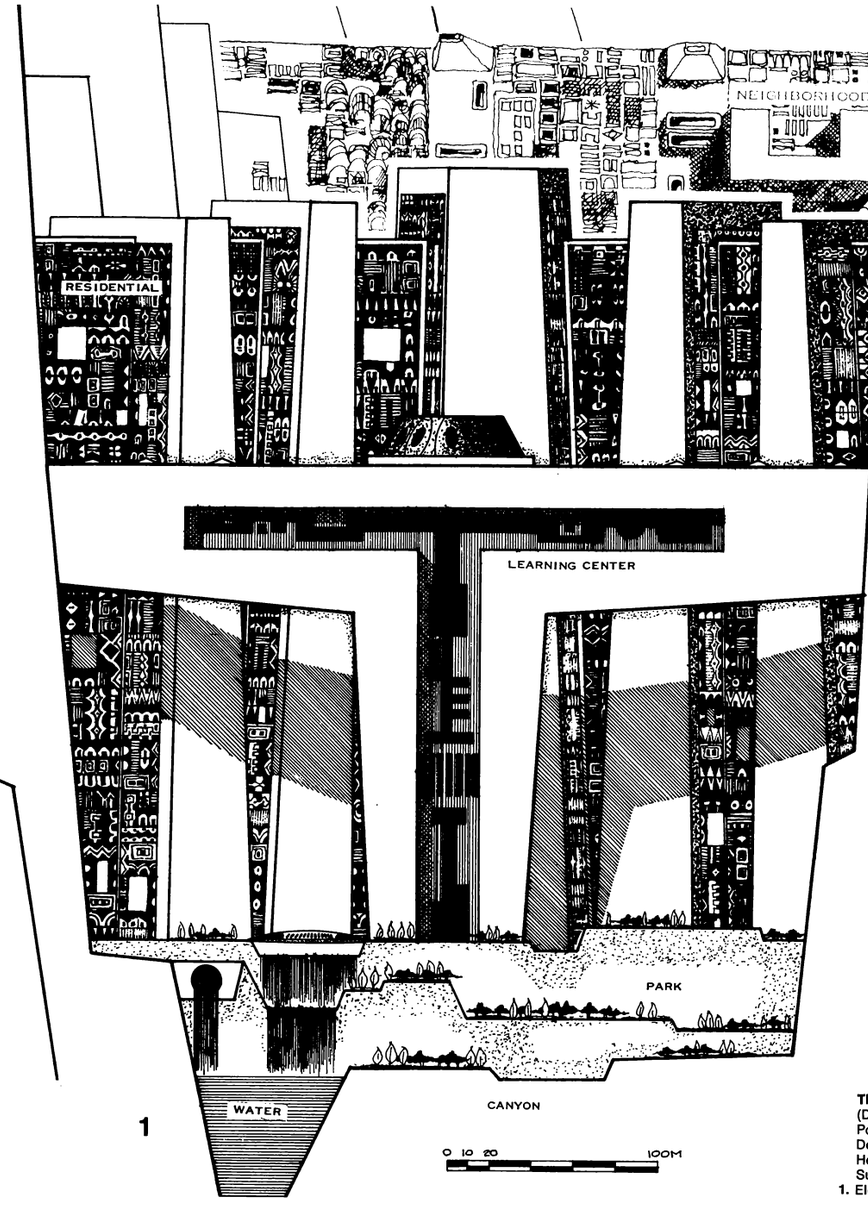

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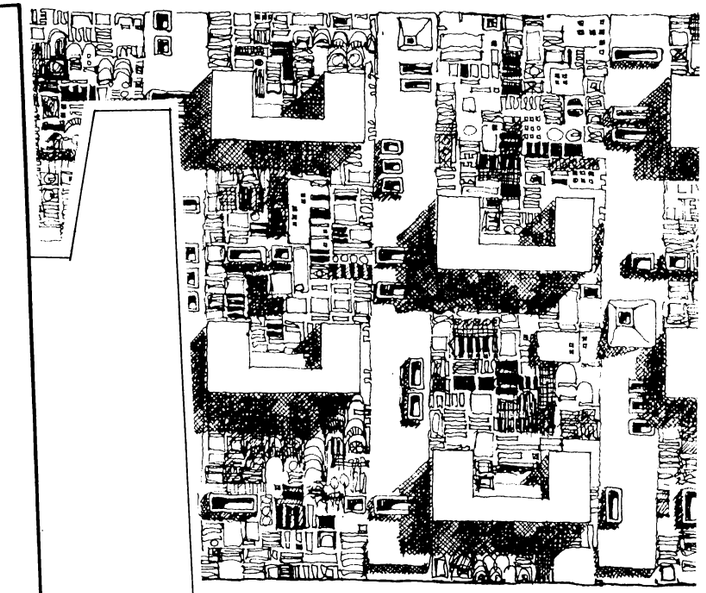

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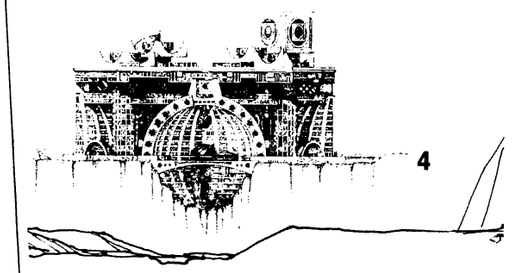
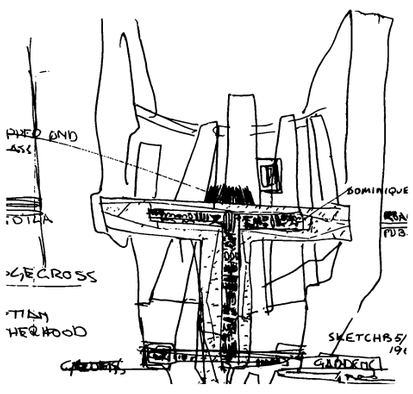
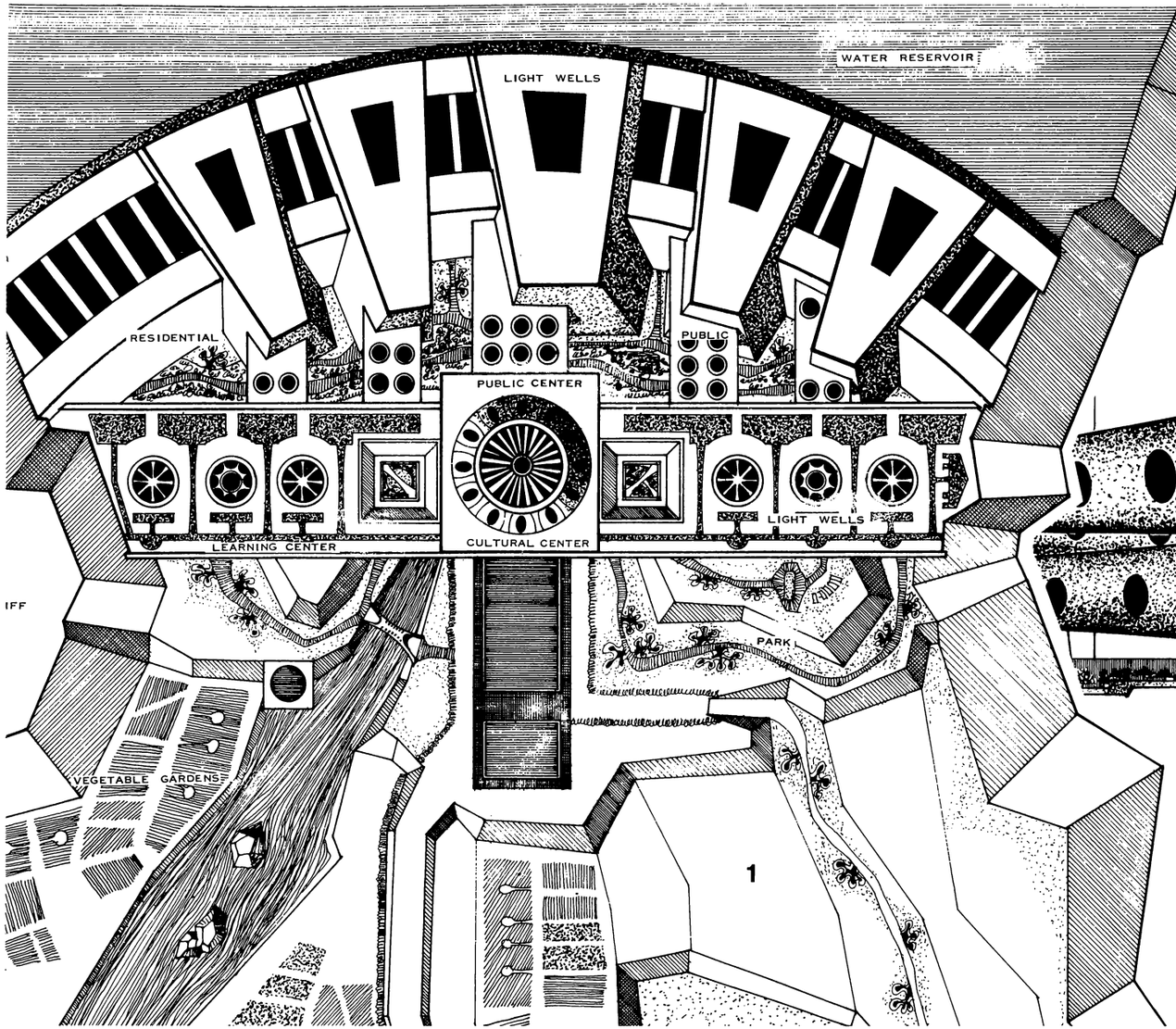


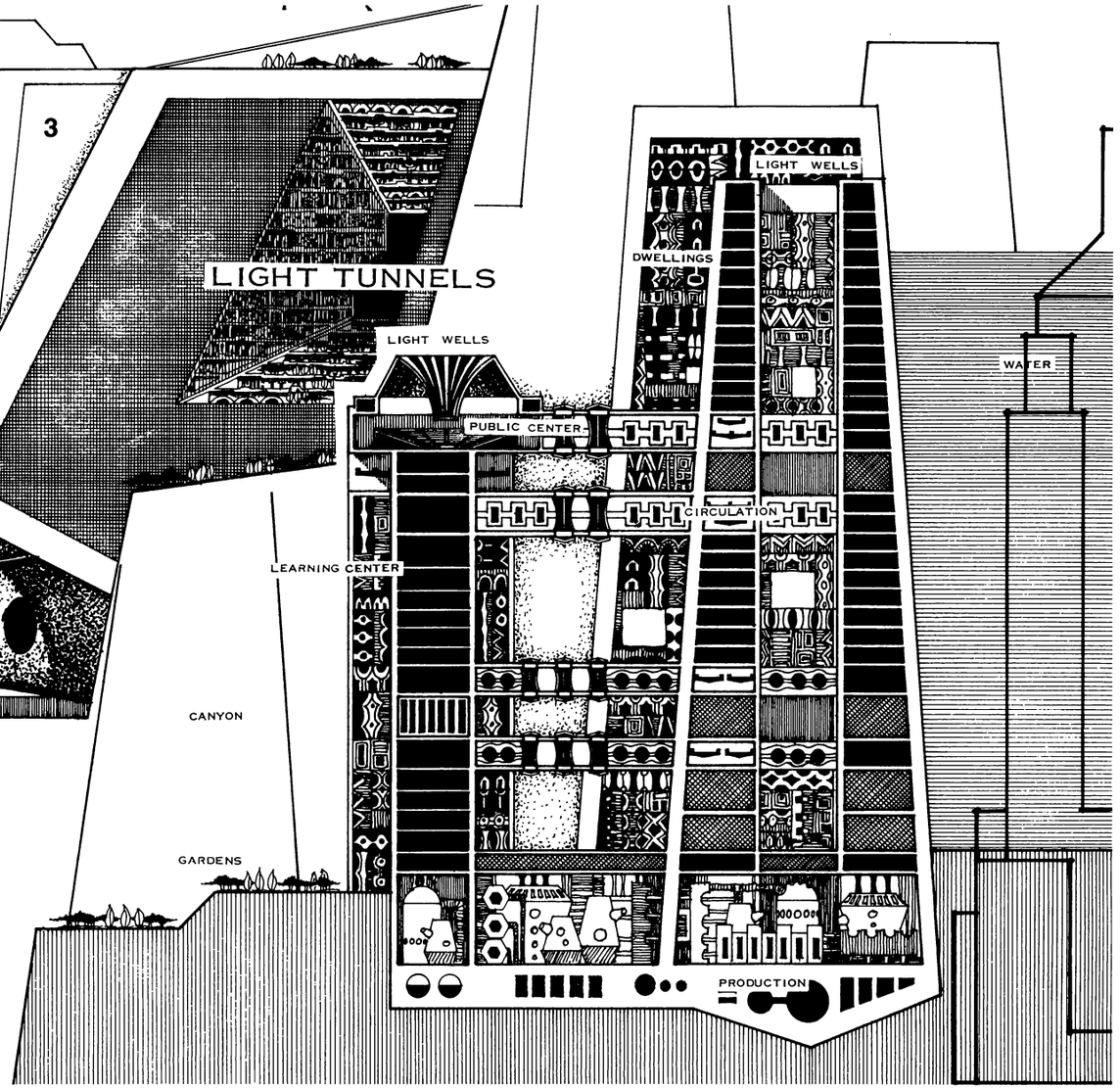
4

19.Theodiga



	Theodiga	
	(Dam site)	
	Population	20,000
	Density	1,717/hectare; 695/acre
	Height	400 meters
	Surface covered	11.5 hectares; 29 acres
1.	Elevation: scale	1:2,000
	Comparative Arcologies	
	Theology	
	Population	13,000
2.	Partial elevation: scale	1:2,000
	Arcbeam	
	Population	65,000
3.	Partial elevation: scale	1:2,000
	Arcosanti	
	Population	1,500
4.	Side elevation: scale	1:2,000





2

19.Theodiga

Theodiga
(Dam site)

Population	20,000
Density	1,717/hectare; 695/acre
Height	400 meters
Surface covered	11.5 hectares; 29 acres
1. Top view: scale	1:2,000
2. Transverse section: scale	1:2,000

Comparative Arcology
Infrababel

Population	100,000
3. Partial side elevation: scale	1:2,000

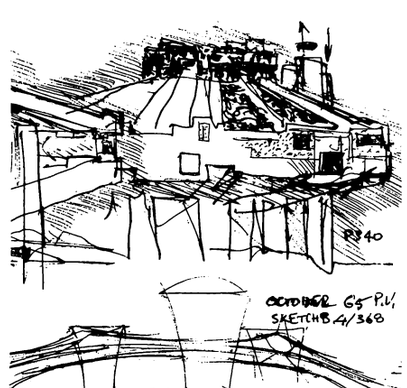
The convergence of energy, mental power, isolation, sharp definition, high walls, uncommon performance, extraroutine intervention into the affairs of the earth, and a metaphysical goal of sorts conjures up the combination of conventional life and the capability for life within a dam site. In this particular case the cruciform structure, an integral part of the dam, is only a lesser aspect of the organism, though it could be a powerful image maker (about 300 meters high and 400 meters wide).

The community, laity and religious, would find income from cultural institutions and from the dam revenue in water control and power production.

LARGE OPENING
DWELLINGS
LIVING–WORKING
COMMERCIAL
PROMENADE
2
DWELLINGS
CITY CENTER
CULTURAL CENTER
CITY CENTER
WATER RESERVOIR
ACQUEDUCT
DAM
LIVING–WORKING
LINEAR CITY
DWELLINGS
PARK
AUTOMATED INDUSTRIES
1
0 100M 1 KM

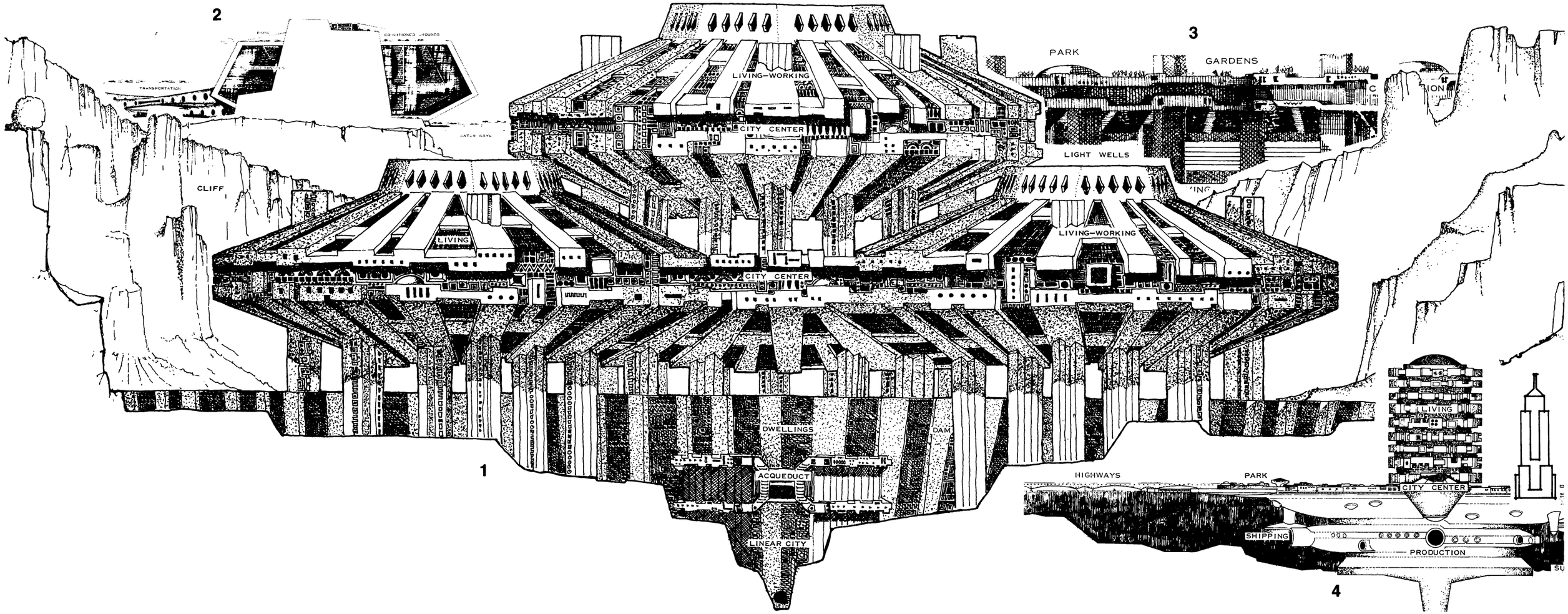
20.Babeldiga

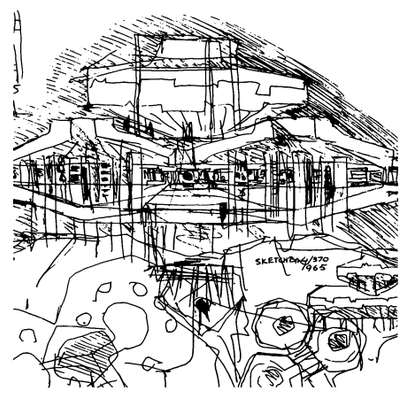
	Babeldiga	
	(Dam site)	
	Population	1,200,000
	Density	1,643/hectare; 665/acre
	Height	1,400–2,100 meters
	Surface covered	725 hectares; 1,800 acres
1.	Section on axis: scale	1:10,000
	Comparative Arcology	
	Arcvillage II	
	Population	30,000
2.	Elevation: scale	1:10,000

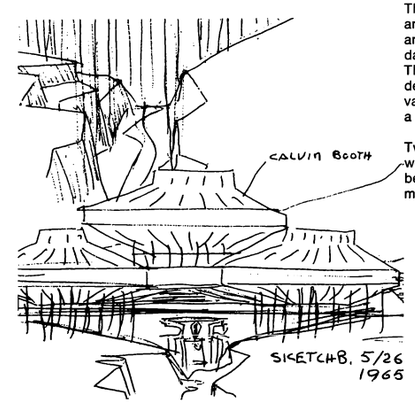


20.Babeldiga

	Babeldiga	
	(Dam site)	
	Population	1,200,000
	Density	1,643/hectare; 665/acre
	Height	1,400–2,100 meters
	Surface covered	725 hectares; 1,800 acres
1.	Elevation: scale	1:10,000
	Comparative Arcologies	
	Infrababel	
	Population	100,000
2.	Side elevation: scale	1:10,000
	Babelnoah	
	Population	6,000,000
3.	Partial elevation: scale	1:10,000
	Noahbabel D	
	Population	90,000
4.	Elevation: scale	1:10,000

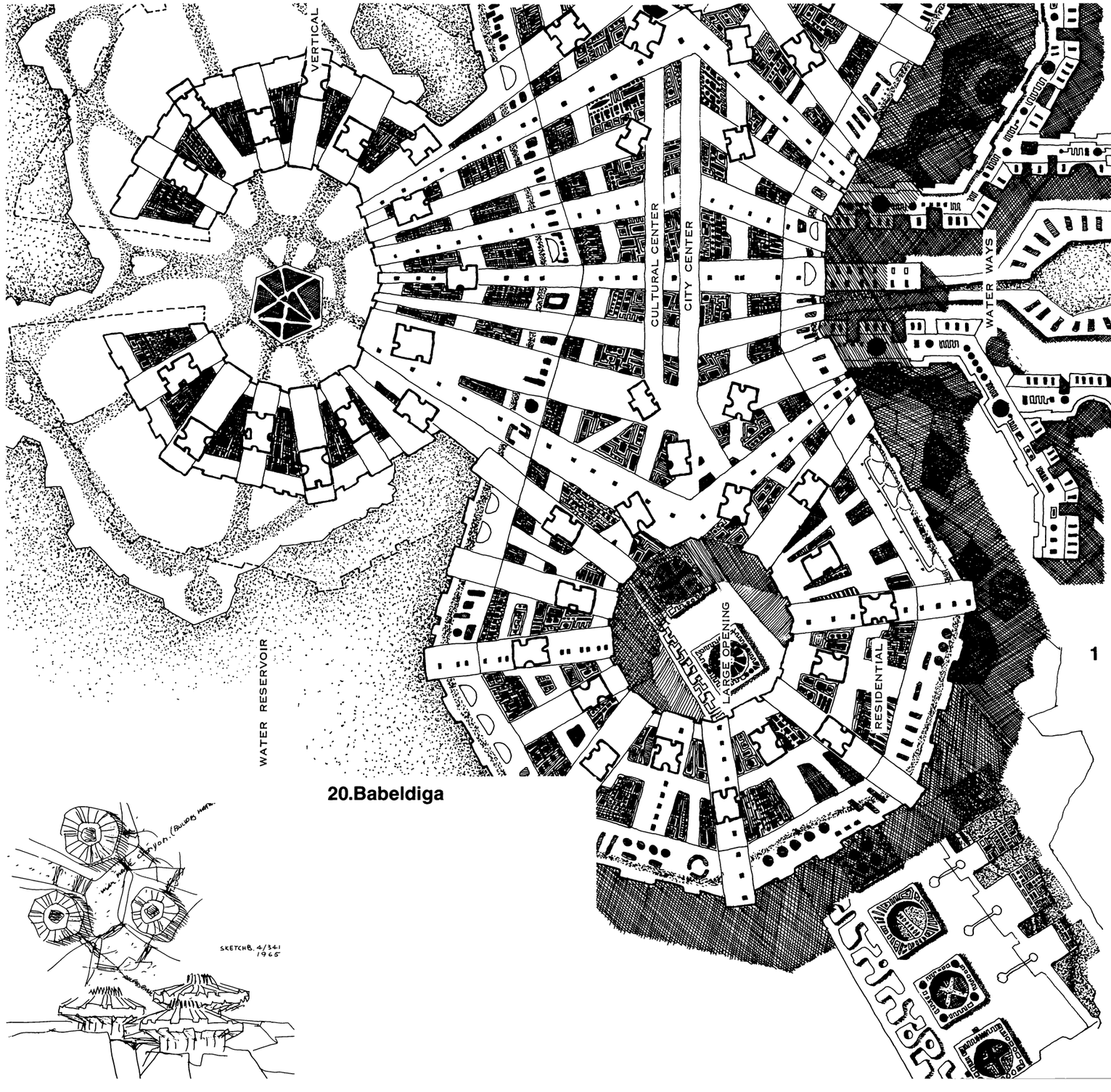






This complex is a combination of three, Babel IIC, a dam, and Arcanyon. Close to 6 cubic kilometers of sheltered and shaded space is deployed above and around the dam. This by itself is an ecological factor of relevance. The multiplicity of grounds, the man-made topographies developing on layers at different levels and within a great variety of boundaries and reciprocal position produce a large variety of environments.

Two of the Babels bear directly into the dam, adding weight and stability to its structure. The total complex can be said to be a city in the water where it is nested in the mountain.



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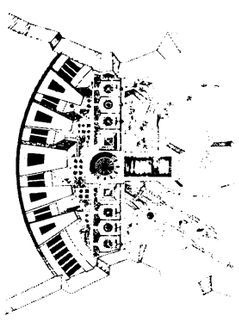


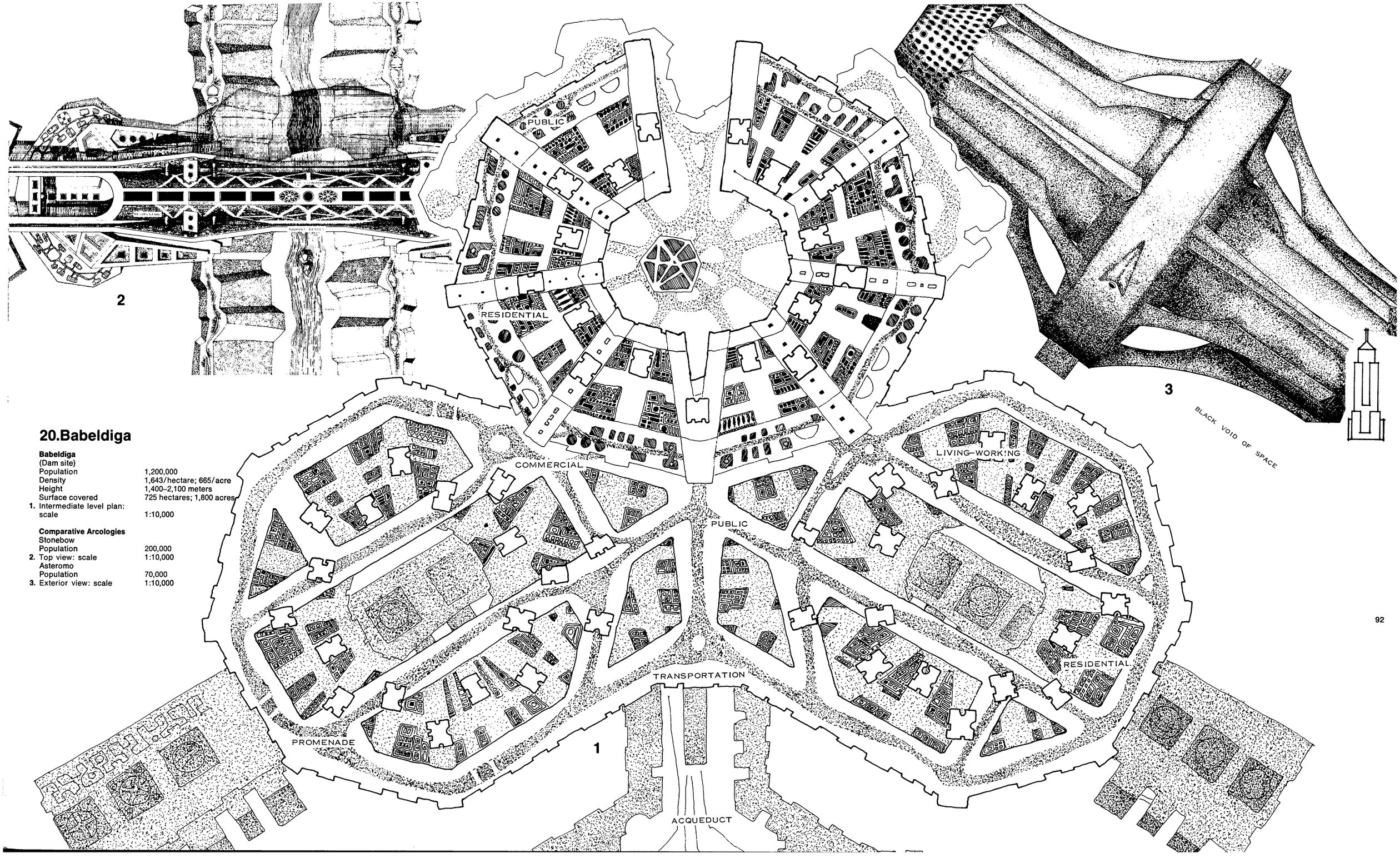
2

20.Babeldiga

Babeldiga	
(Dam site)	
Population	1,200,000
Density	1,643/hectare; 665/acre
Height	1,400–2,100 meters
Surface covered	725 hectares; 1,800 acres
1. Top view: scale	1:10,000
Comparative Arcology	
Theodiga	
Population	20,000
2. Top view: scale	1:10,000

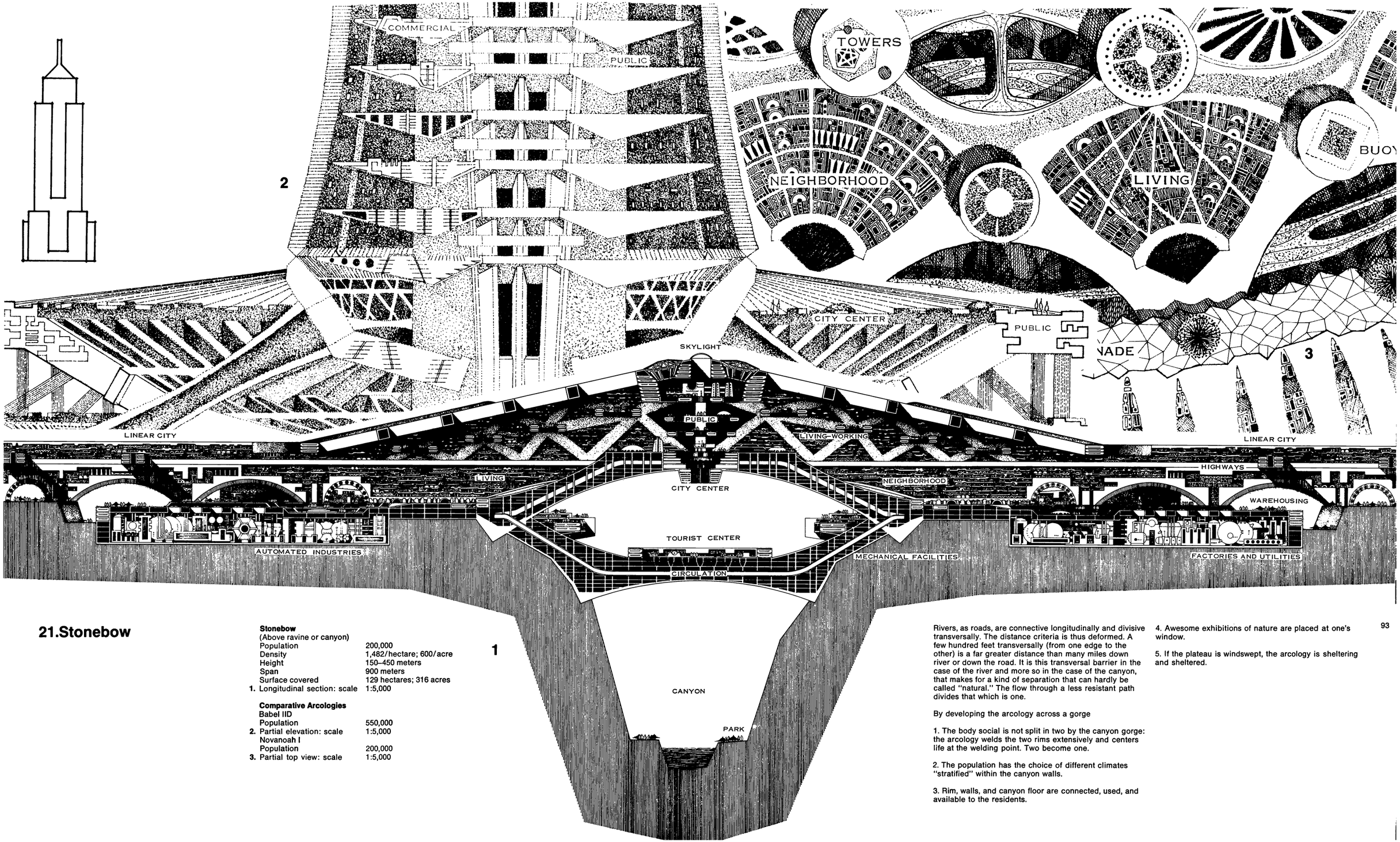
The dam revenues, water basin, and power are part of the city's economy. The dam is the main horizontal access. The three Babels have also STOL and VTOL facilities on the upper parts of their structures.

Obsolescence is built into a dam function by the continual silt-in process taking place in the water basin. The hyper-function of the dam as an urban center would not necessarily have a coincidental obsolescence clock, even with a silt-in basin. A not-too-shallow water body would still be there so that enough electric energy for the city itself and the inefficiency of the dam would reflect on the reduced or terminated capability for water control and irrigation and power export. It would not really reflect on the life of the city as such (reduction of revenue).



20.Babeldiga

Babeldiga	
(Dam site)	
Population	1,200,000
Density	1,643/hectare; 665/acre
Height	1,400–2,100 meters
Surface covered	725 hectares; 1,800 acres
1. Intermediate level plan: scale	1:10,000
Comparative Arcologies	
Stonebow	
Population	200,000
2. Top view: scale	1:10,000
Asteromo	
Population	70,000
3. Exterior view: scale	1:10,000



21.Stonebow

Stonebow	
(Above ravine or canyon)	
Population	200,000
Density	1,482/hectare; 600/acre
Height	150–450 meters
Span	900 meters
Surface covered	129 hectares; 316 acres
1. Longitudinal section: scale	1:5,000
Comparative Arcologies	
Babel IID	
Population	550,000
2. Partial elevation: scale	1:5,000
Novanoah I	
Population	200,000
3. Partial top view: scale	1:5,000

Rivers, as roads, are connective longitudinally and divisive transversally. The distance criteria is thus deformed. A few hundred feet transversally (from one edge to the other) is a far greater distance than many miles down river or down the road. It is this transversal barrier in the case of the river and more so in the case of the canyon, that makes for a kind of separation that can hardly be called "natural." The flow through a less resistant path divides that which is one.

By developing the arcology across a gorge

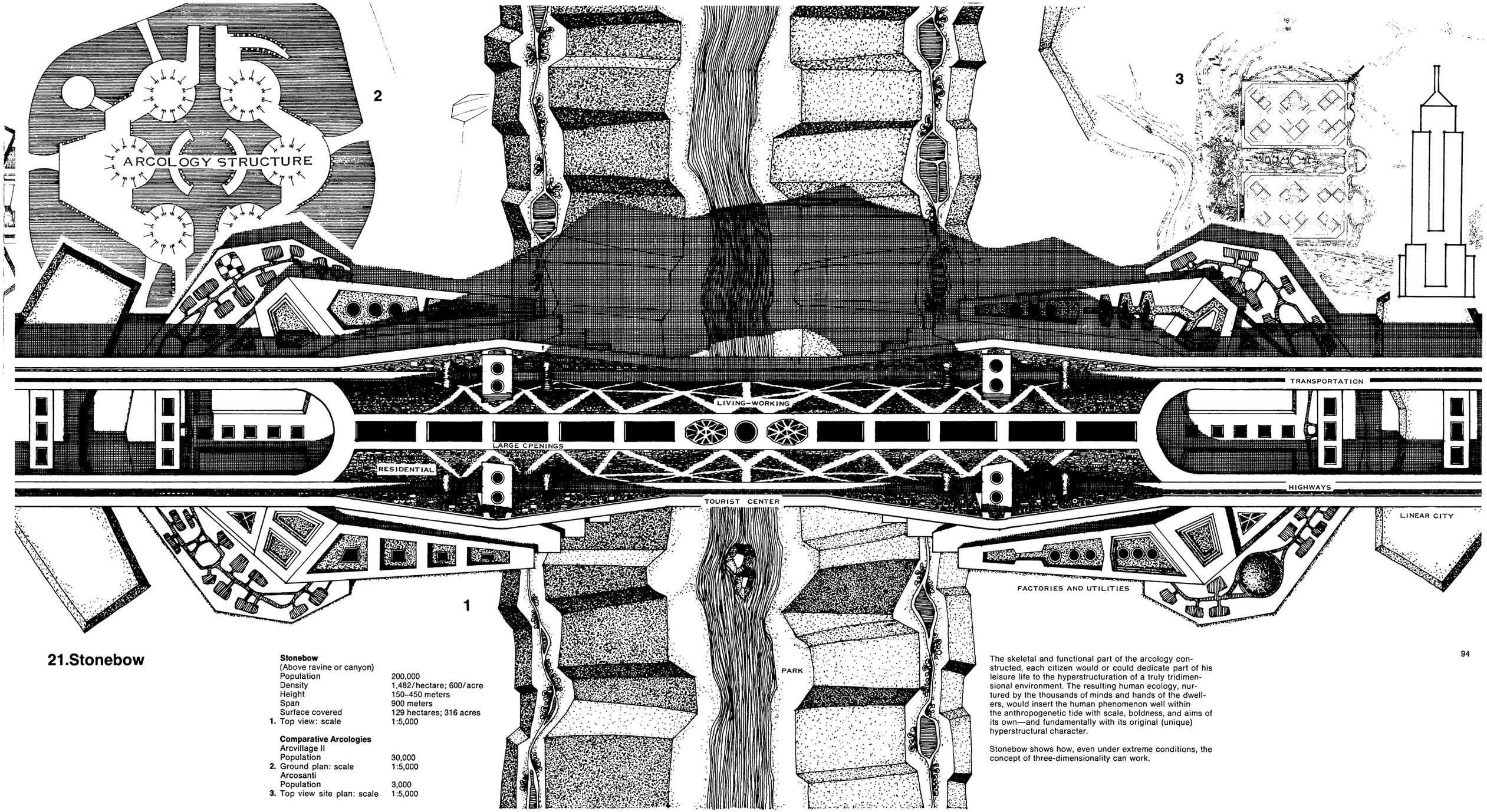
1. The body social is not split in two by the canyon gorge: the arcology welds the two rims extensively and centers life at the welding point. Two become one.

2. The population has the choice of different climates "stratified" within the canyon walls.

3. Rim, walls, and canyon floor are connected, used, and available to the residents.

4. Awesome exhibitions of nature are placed at one's window.

5. If the plateau is windswept, the arcology is sheltering and sheltered.



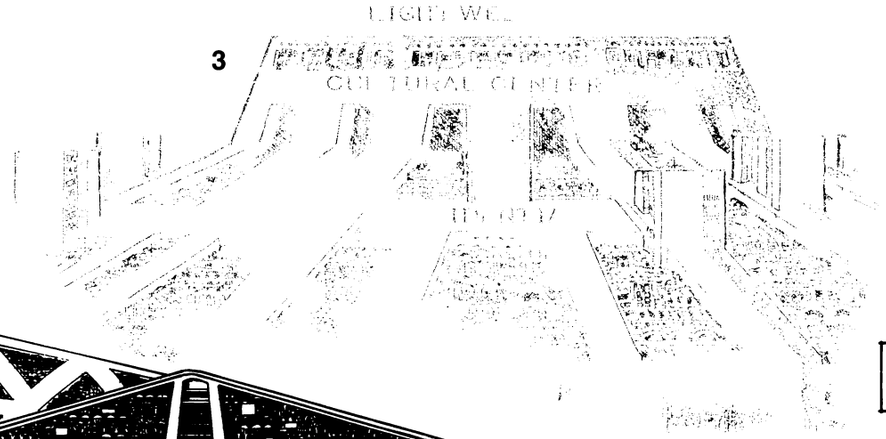
21.Stonebow

	Stonebow	
	(Above ravine or canyon)	
	Population	200,000
	Density	1,482/hectare; 600/acre
	Height	150–450 meters
	Span	900 meters
	Surface covered	129 hectares; 316 acres
1.	Top view: scale	1:5,000
	Comparative Arcologies	
	Arcvillage II	
	Population	30,000
2.	Ground plan: scale	1:5,000
	Arcosanti	
	Population	3,000
3.	Top view site plan: scale	1:5,000

The skeletal and functional part of the arcology constructed, each citizen would or could dedicate part of his leisure life to the hyperstructuration of a truly tridimensional environment. The resulting human ecology, nurtured by the thousands of minds and hands of the dwellers, would insert the human phenomenon well within the anthropogenetic tide with scale, boldness, and aims of its own—and fundamentally with its original (unique) hyperstructural character.

Stonebow shows how, even under extreme conditions, the concept of three-dimensionality can work.

2



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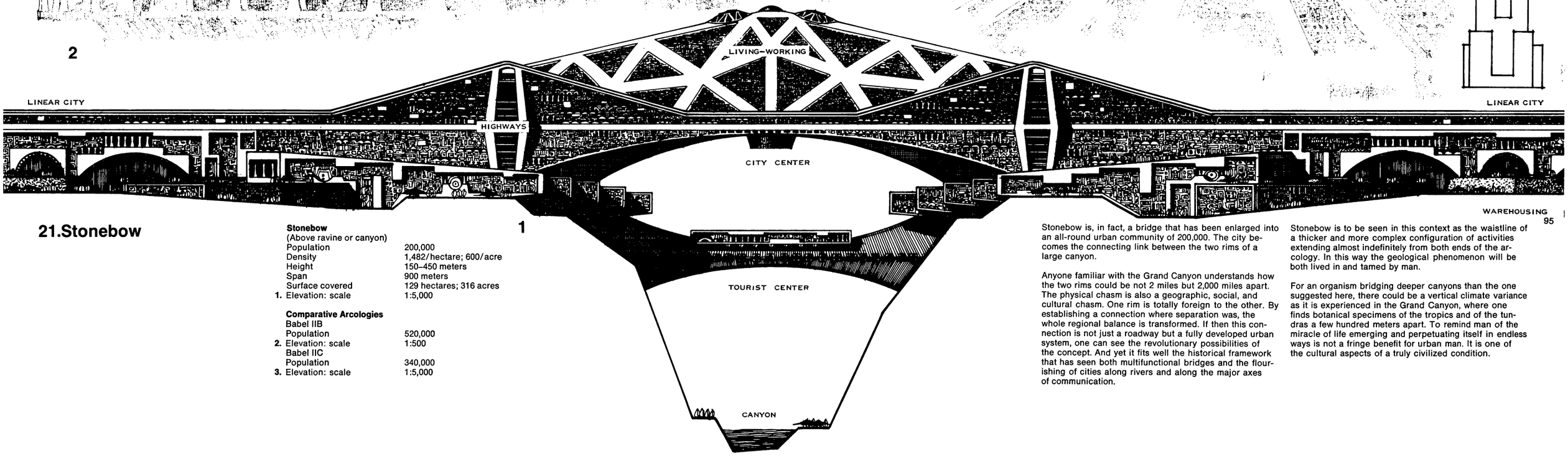


1

21.Stonebow

	Stonebow	
	(Above ravine or canyon)	
	Population	200,000
	Density	1,482/hectare; 600/acre
	Height	150–450 meters
	Span	900 meters
	Surface covered	129 hectares; 316 acres
1.	Elevation: scale	1:5,000
	Comparative Arcologies	
	Babel IIB	
	Population	520,000
2.	Elevation: scale	1:500
	Babel IIC	
	Population	340,000
3.	Elevation: scale	1:5,000

Stonebow is, in fact, a bridge that has been enlarged into an all-round urban community of 200,000. The city becomes the connecting link between the two rims of a large canyon.

Anyone familiar with the Grand Canyon understands how the two rims could be not 2 miles but 2,000 miles apart. The physical chasm is also a geographic, social, and cultural chasm. One rim is totally foreign to the other. By establishing a connection where separation was, the whole regional balance is transformed. If then this connection is not just a roadway but a fully developed urban system, one can see the revolutionary possibilities of the concept. And yet it fits well the historical framework that has seen both multifunctional bridges and the flourishing of cities along rivers and along the major axes of communication.

Stonebow is to be seen in this context as the waistline of a thicker and more complex configuration of activities extending almost indefinitely from both ends of the arcology. In this way the geological phenomenon will be both lived in and tamed by man.

For an organism bridging deeper canyons than the one suggested here, there could be a vertical climate variance as it is experienced in the Grand Canyon, where one finds botanical specimens of the tropics and of the tundras a few hundred meters apart. To remind man of the miracle of life emerging and perpetuating itself in endless ways is not a fringe benefit for urban man. It is one of the cultural aspects of a truly civilized condition.

LIGHT WELLS

HIGHWAYS

LIVING

LIVING–WORKING

CULTURAL CENTER

HIGHWAYS

TRANSPORTATION

CITY CENTER

FACTORIES AND UTILITIES

PUBLIC

COMMERCIAL

PARK

RESIDENTIAL

3

2

1

TOURIST CENTER

CLIFF

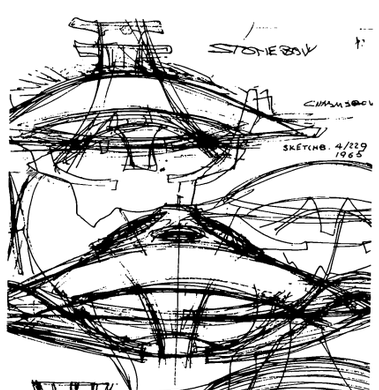
21.Stonebow

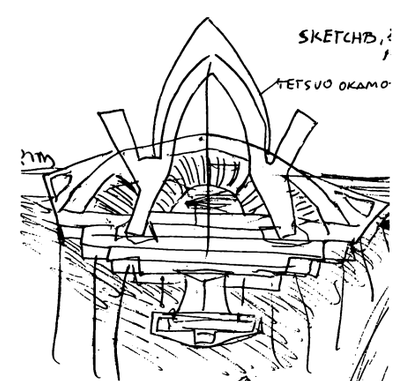
Stonebow
(Above ravine or canyon)

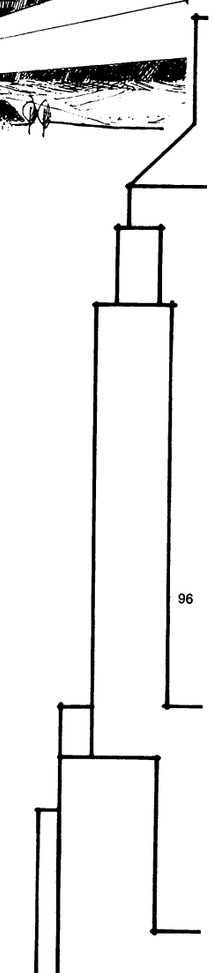
Population	200,000
Density	1,482/hectare; 600/acre
Height	150–450 meters
Span	900 meters
Surface covered	129 hectares; 316 acres
1. Transverse section: scale	1:2,000

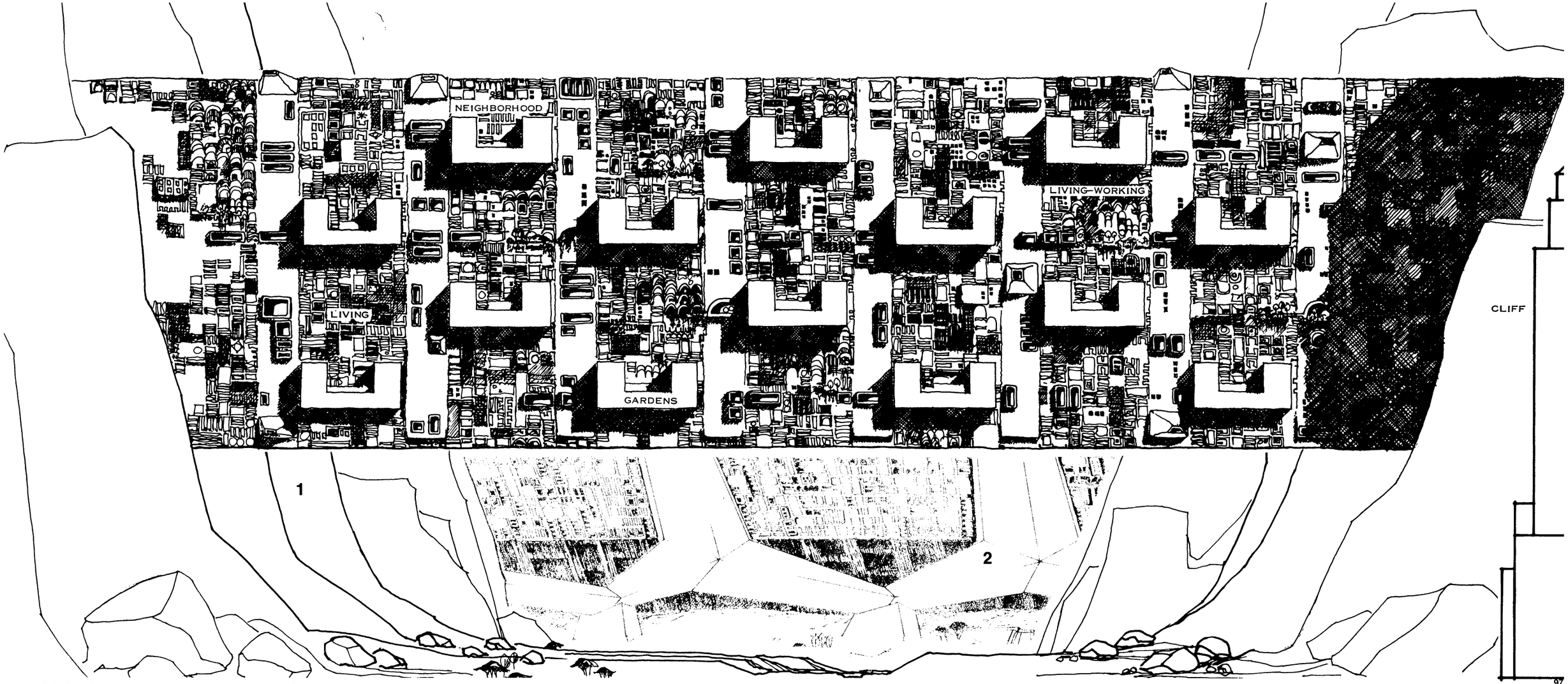
Comparative Arcologies

Infrababel	
Population	100,000
2. Partial side elevation: scale	1:2,000
Veladiga	
Population	15,000
3. Elevation: scale	1:2,000









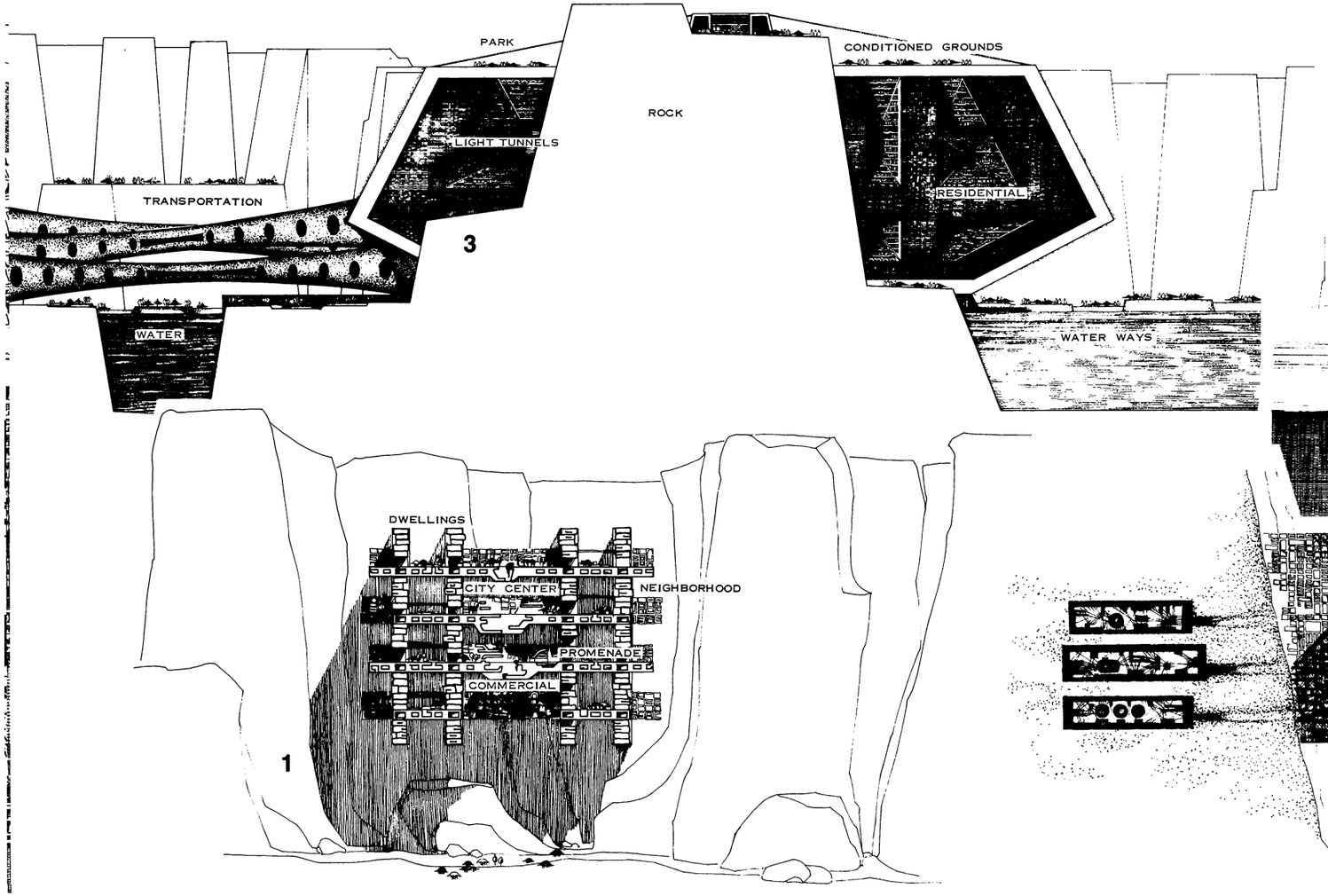
22.Arcbeam

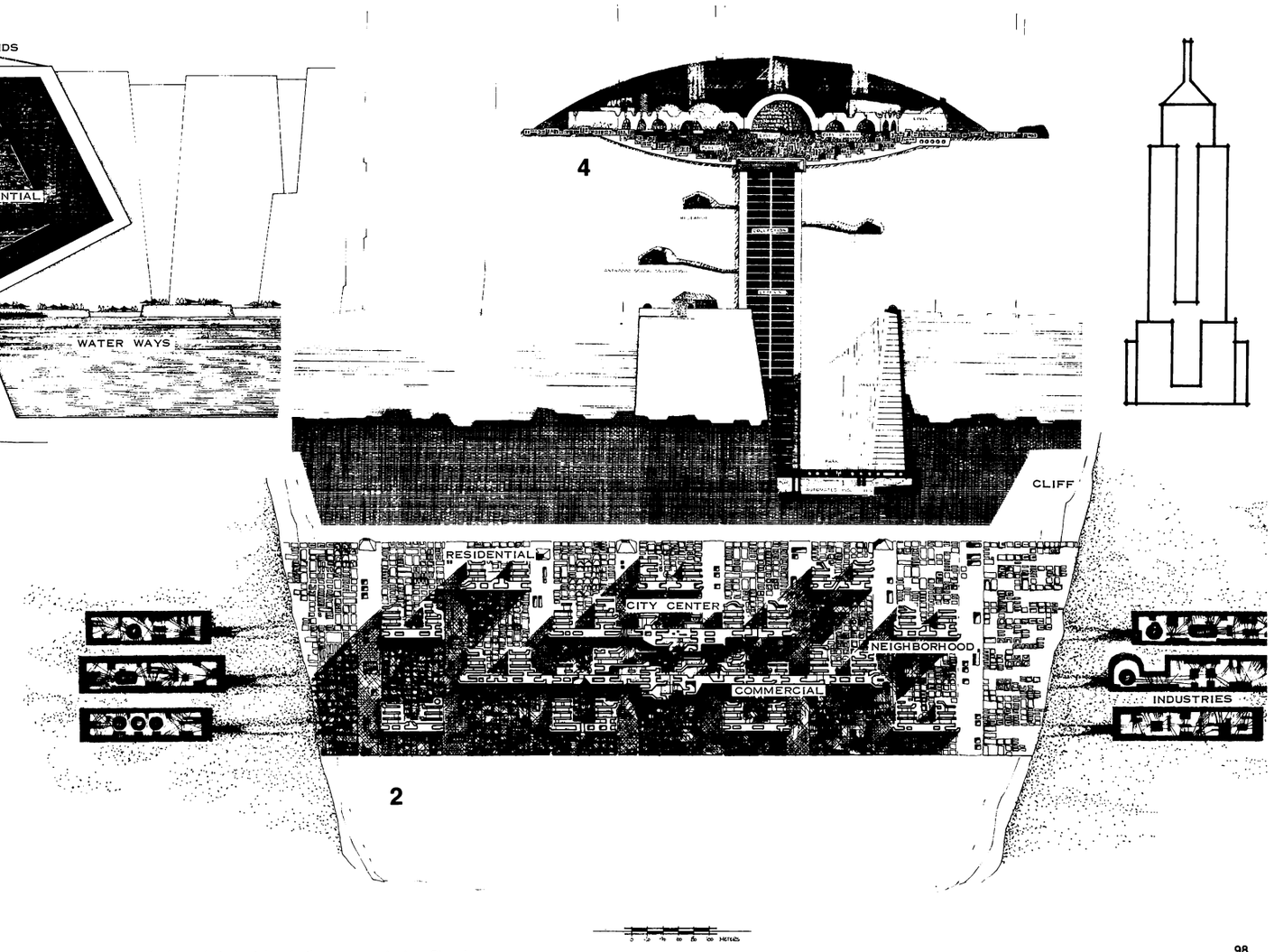
Arcbeam
(Above ravine or canyon)

Population	65,000
Density	2,119/hectare; 858/acre
Height	270 meters
Span	960 meters
Surface covered	30.5 hectares; 75 acres
1. Elevation: scale	1:2,000

Comparative Arcology
Veladiga

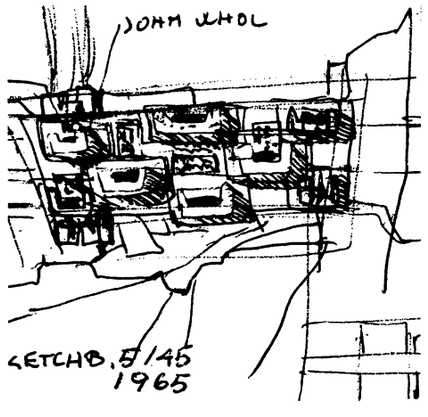
Population	15,000
2. Partial elevation: scale	1:2,000





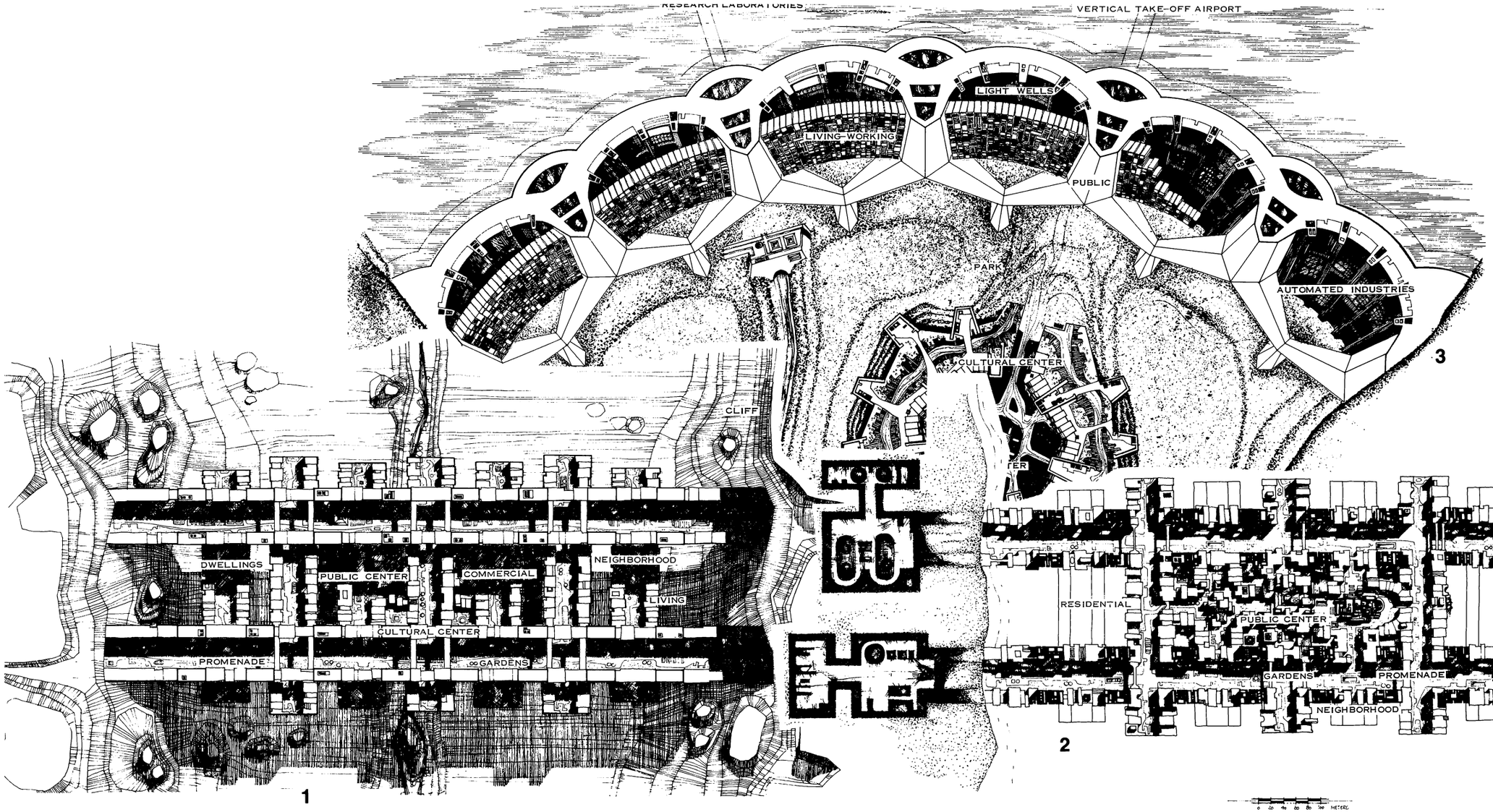
22.Arcbeam

	Arcbeam	
	(Above ravine or canyon)	
	Population	65,000
	Density	2,119/hectare; 858/acre
	Height	270 meters
	Span	960 meters
	Surface covered	30.5 hectares; 75 acres
1.	Transverse section: scale	1:5,000
2.	Longitudinal section: scale	1:5,000
	Comparative Arcologies	
	Infrababel	
	Population	100,000
3.	Elevation: scale	1:5,000
	Theology	
	Population	13,000
4.	Elevation: scale	1:500



Arcbeam is to be taken in the same context as Stonebow, as one of the nonweakening links in the urban river stretching across continents, respectful of nature while not intimidated by its vastness and strength.

In the orthogonal frame of main and secondary beams, the main beam is almost 300 meters deep and 800 meters long. The flow of things and performances are set in an awesome geology and almost composes another of its own—refined, rarefied, and controlled. We might remind ourselves that, wrong or not, for good or for bad, we are remineralizing the earth, recrystalizing it to respond more swiftly to our human condition. The god, or gods, we nurture inside might come to suffer from the bloated landscape and its mounting paraphernalias. Under the fat of our diaspora there is hardly any structure, as if inside of our collectivity despair evenly partakes of all things, all times.



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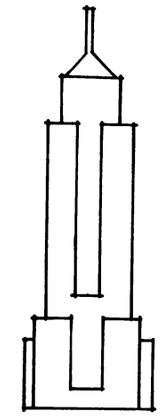


22.Arcbeam

Arcbeam
(Above ravine or canyon)

Population	65,000
Density	2,119/hectare; 858/acre
Height	270 meters
Span	960 meters
Surface covered	30.4 hectares; 75 acres
1. Top view: scale	1:5,000
2. Midlevel plan: scale	1:5,000

Comparative Arcologies

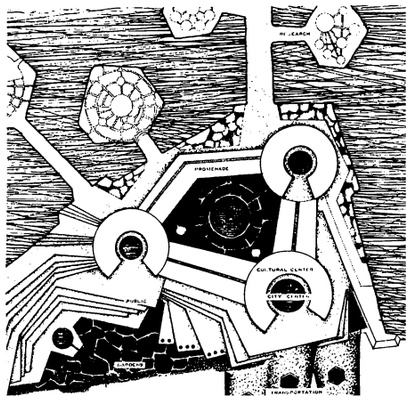
Veladiga	
Population	15,000
3. Plan: scale	1:5,000
4. Arcoindian I	2,000
Plan: scale	1:5,000

Our strength will ultimately be found in a universe that, unmerciful as it is, has a structure speaking to us of unbelievable poignancy, projecting itself in unending participation and expectation.

If the pattern of rivers of performance should prevail on random ecumenopoly, those rivers will run in, on, and above the geology they confront such as railroads or canals have to do. The connection between two rims of a canyon or ravine would then not be made by single-road ribbons. It would be of a far more substantial nature.

We see now how divisive on communities otherwise close knit is the crosscutting of rivers, railroad tracks, freeways and, in fact, roads. The interruption of flow is not redeemed by the few tenuous connecting links of bridges, even when closely spaced.

4



23.Infrababel

1

Infrababel
(In a stone quarry)

Population	100,000
Density	1,343/hectare; 495/acre
Height	400 meters
Surface covered	60 hectares; 148 acres
1. Top view: scale	1:5,000
2. Midlevel plan: scale	1:5,000

Comparative Arcologies
Arckibuz

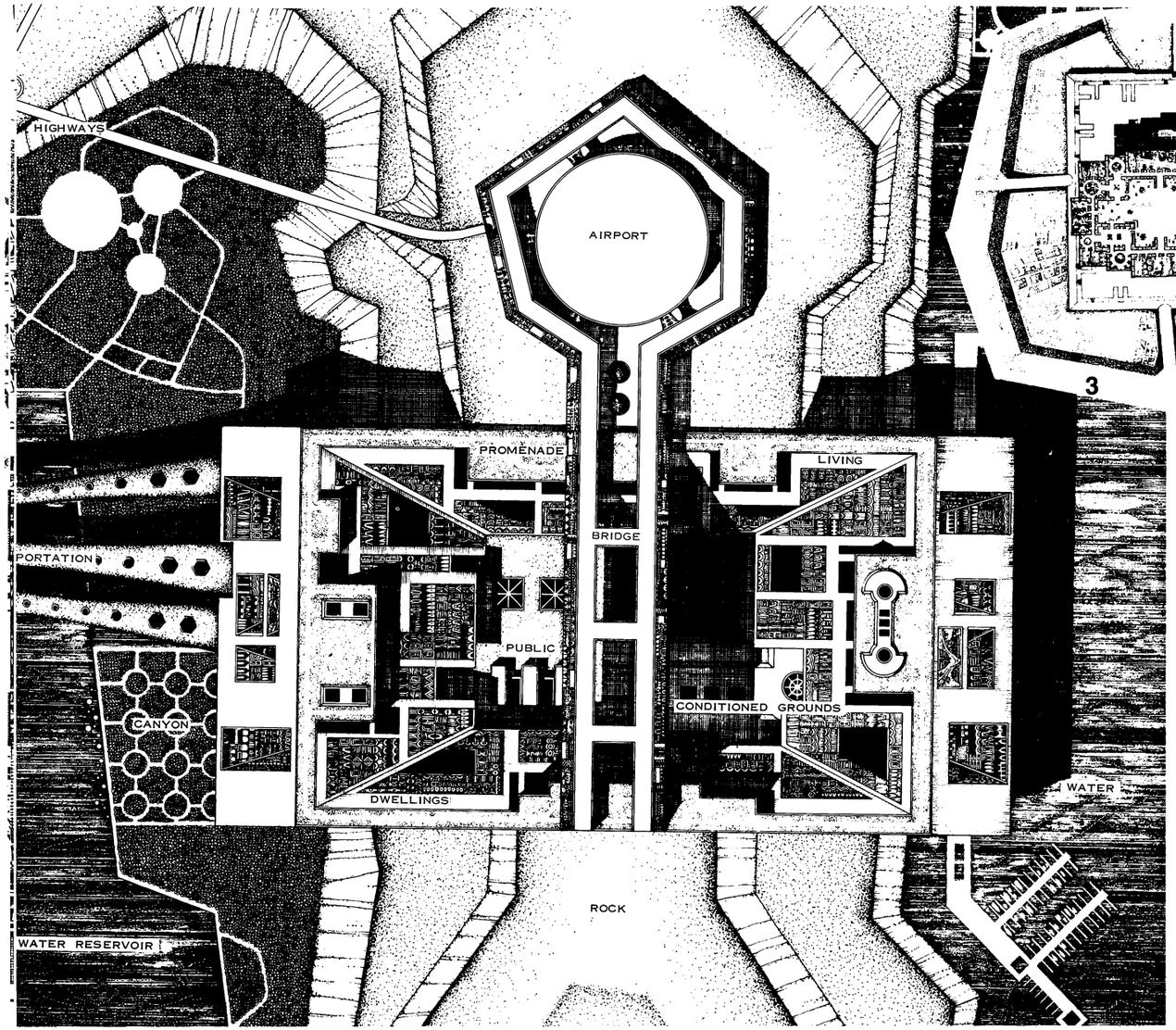
Population	2,500
3. General plan: scale	1:5,000

Arcoindian I

Population	20,000
4. Elevation: scale	1:5,000

In the marble quarries of Tuscany whole mountains have been manipulated and moved to the four corners of the earth, most of them before the earth itself lost its slab-corner believability. On a spherical earth, technology is now gouging out mammoth chunks of mineral stuff to be refined and made spare and highly specialized—metals, chemicals, plastics, fertilizers, and building materials.

Infrababel is set in one of these gaping fissures. It is not an underground city. It is not even a below-ground-level city, inasmuch as two short sides of the rectangular plan (500 by 1,000 meters) overlook the water body of a large lake reservoir. The outer skin of the city is translucent and deeply carved by light tunnels that are diversely oriented to telescope onto different areas of geological landscape.



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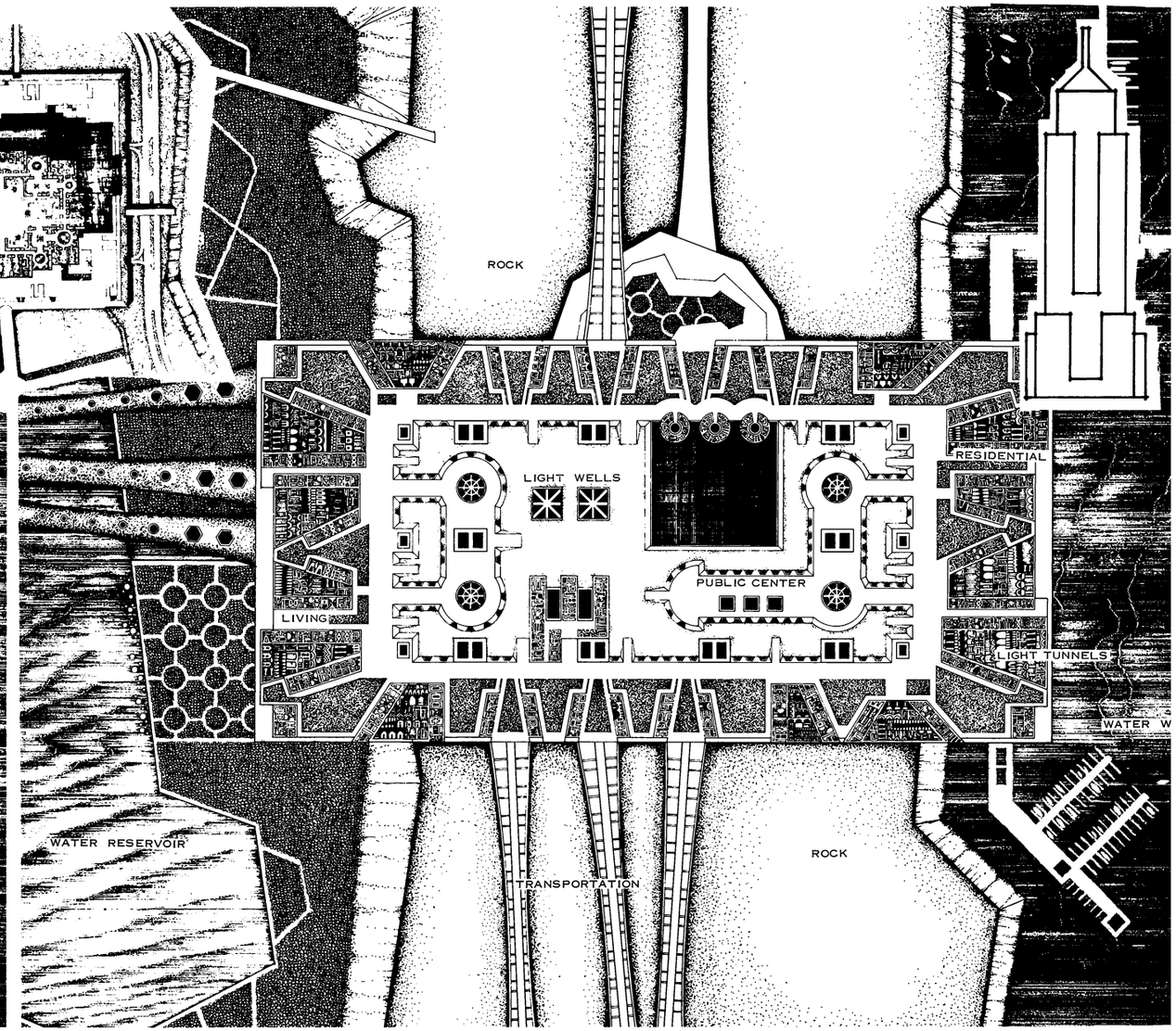

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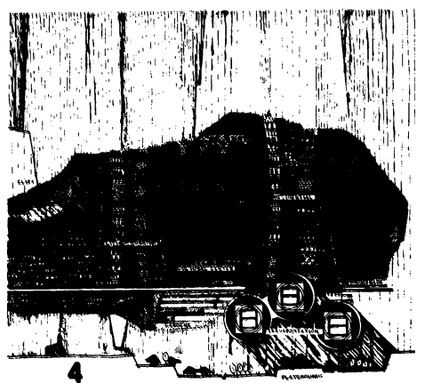

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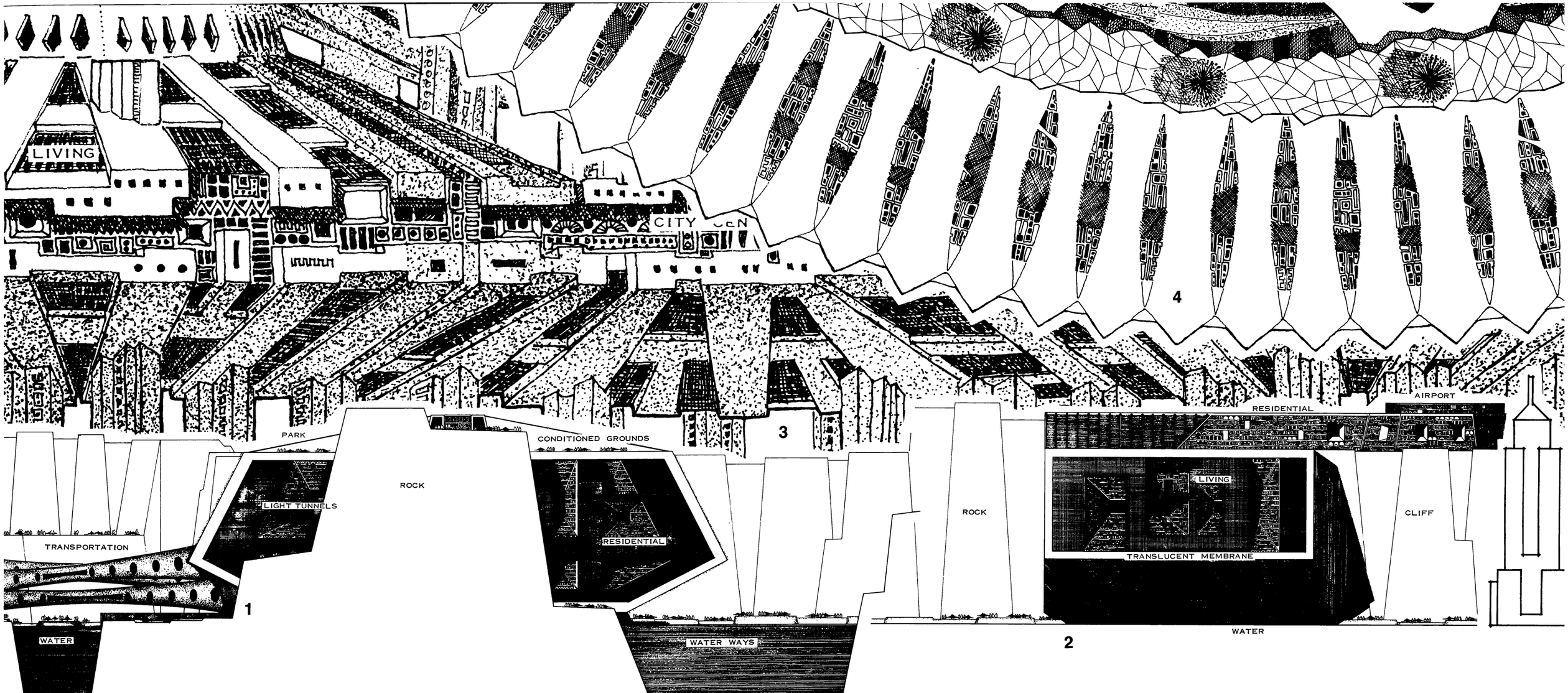


23.Infrababel

Infrababel
(In a stone quarry)

Population	100,000
Density	1,343/hectare; 495/acre
Height	400 meters
Surface covered	60 hectares; 148 acres
1. Side elevation: scale	1:5,000
2. North elevation: scale	1:5,000

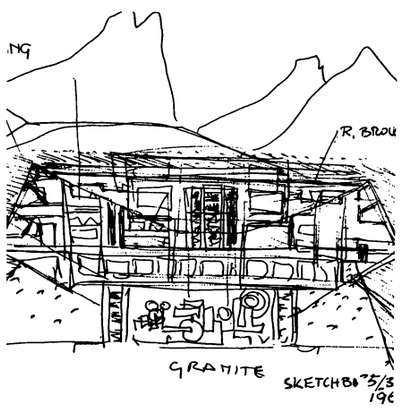
Comparative Arcologies

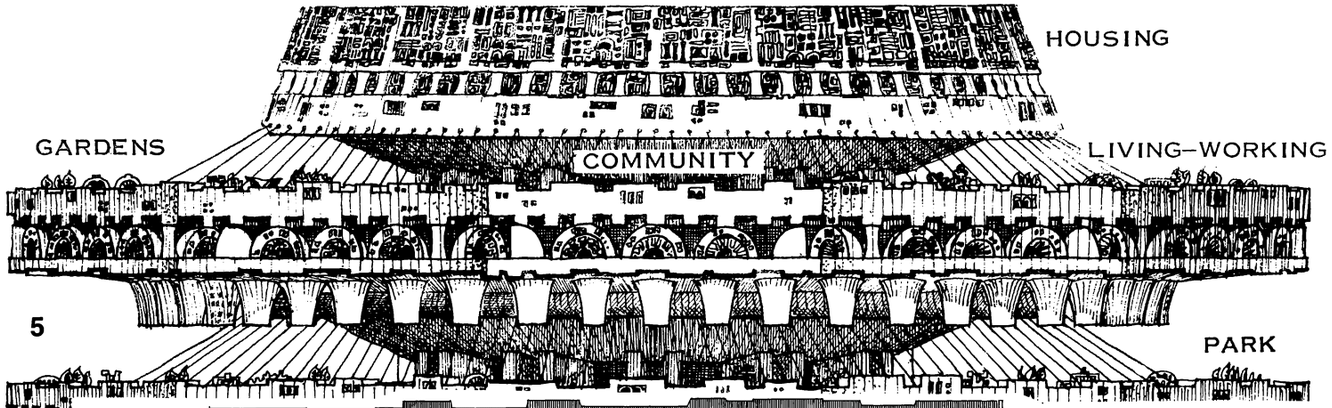
Babeldiga	
Population	1,200,000
3. Partial elevation: scale	1:5,000
Novanoah I	
Population	200,000
4. Partial plan: scale	1:5,000

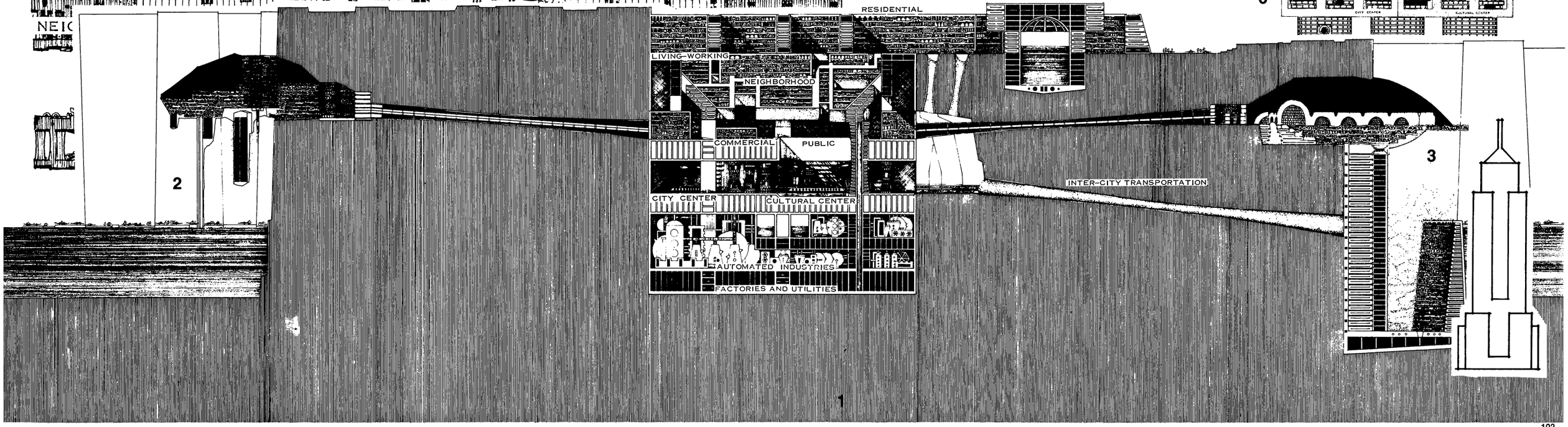
Infrababel is connected with three other smaller communities situated in cavernlike spaces on the cliffs of the canyon. This will make sense to those who have visited the West or possibly some places in the Far East. The four communities are connected by tunnels, bridges, and waterways.

The city is built in the gap between two cliffs; it is turned inward as a defense against harsh climate. A space comparable to an enormous courtyard is the focus of the city. Numberless urban facets develop and open into it by substructural and spatial details. Private life also terraces into it or telescopes toward the outside within deep sockets diversely oriented.

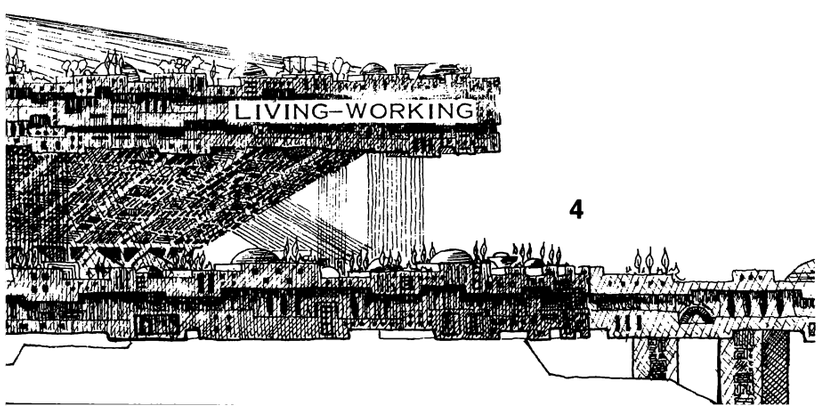
Infrababel is somewhat of an answer to geology in geological terms, but naturally geological denseness has been replaced by a denseness of duration-performance.



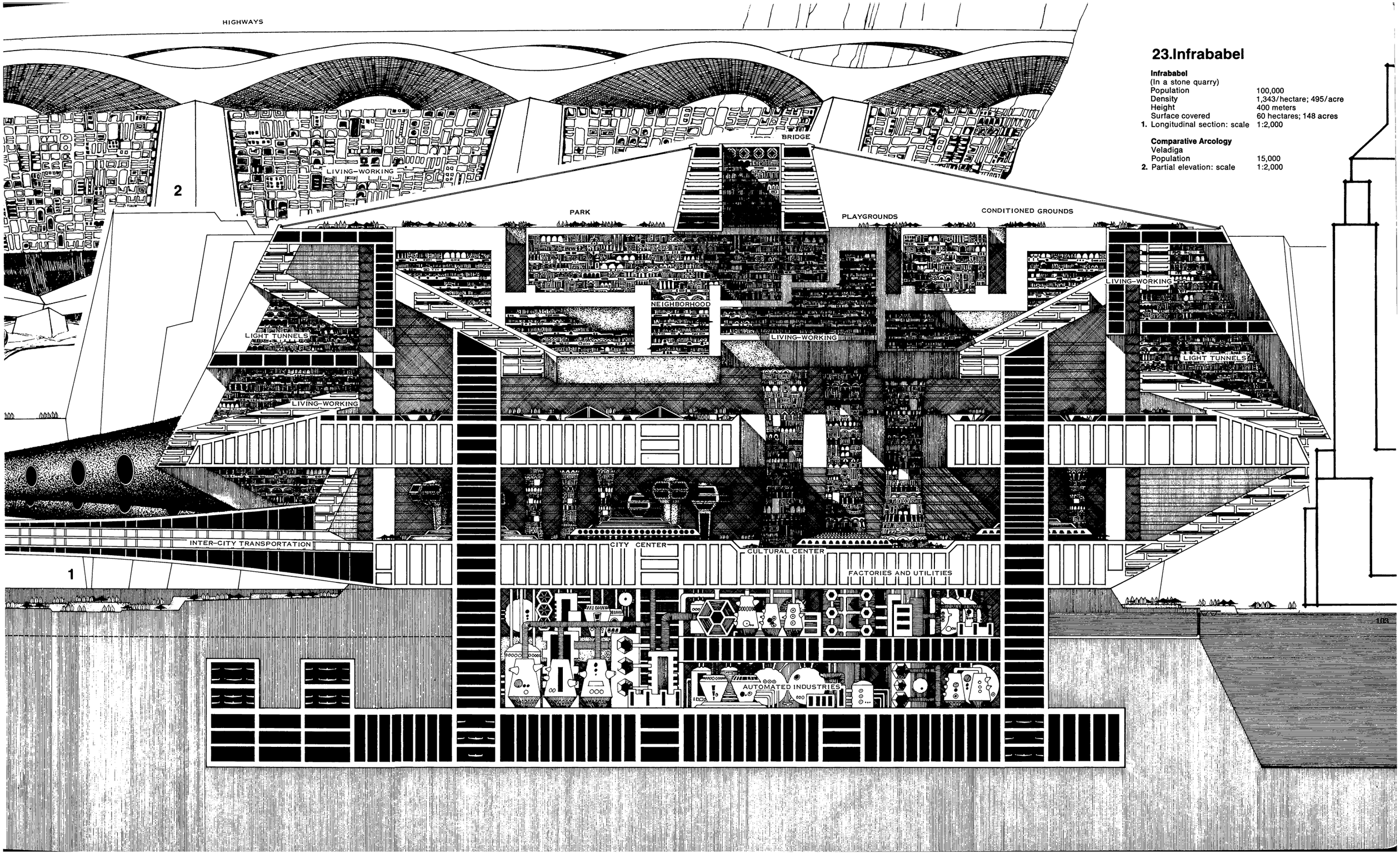




23.Infrababel



	Infrababel	
	(In a stone quarry)	
	Population	100,000
	Density	1,343/hectare; 495/acre
	Height	400 meters
	Surface covered	60 hectares; 148 acres
1.	Transverse section: scale	1:5,000
	Arcoindian II	
	Population	5,000
2.	Section and projection: scale	1:5,000
	Theology	
	Population	13,000
3.	Section and projection: scale	1:5,000
	Comparative Arcologies	
	Babel IID	
	Population	550,000
4.	Partial elevation: scale	1:5,000
	Babel IIB	
	Population	520,000
5.	Partial elevation: scale	1:5,000
	Arcvillage II	
	Population	30,000
6.	Elevation: scale	1:5,000



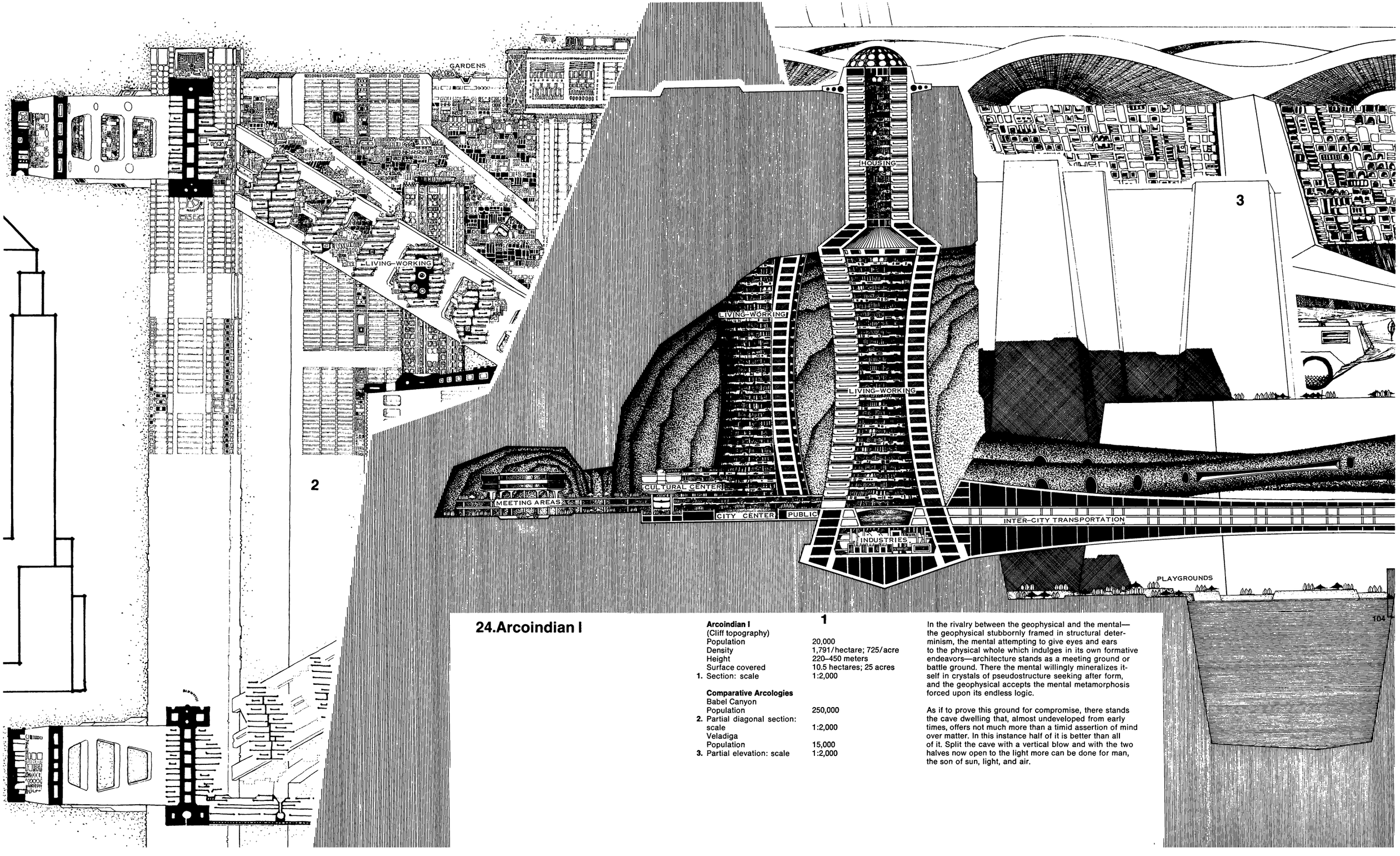
23.Infrababel

Infrababel
(In a stone quarry)

Population	100,000
Density	1,343/hectare; 495/acre
Height	400 meters
Surface covered	60 hectares; 148 acres
1. Longitudinal section: scale	1:2,000

Comparative Arcology
Veladiga

Population	15,000
2. Partial elevation: scale	1:2,000

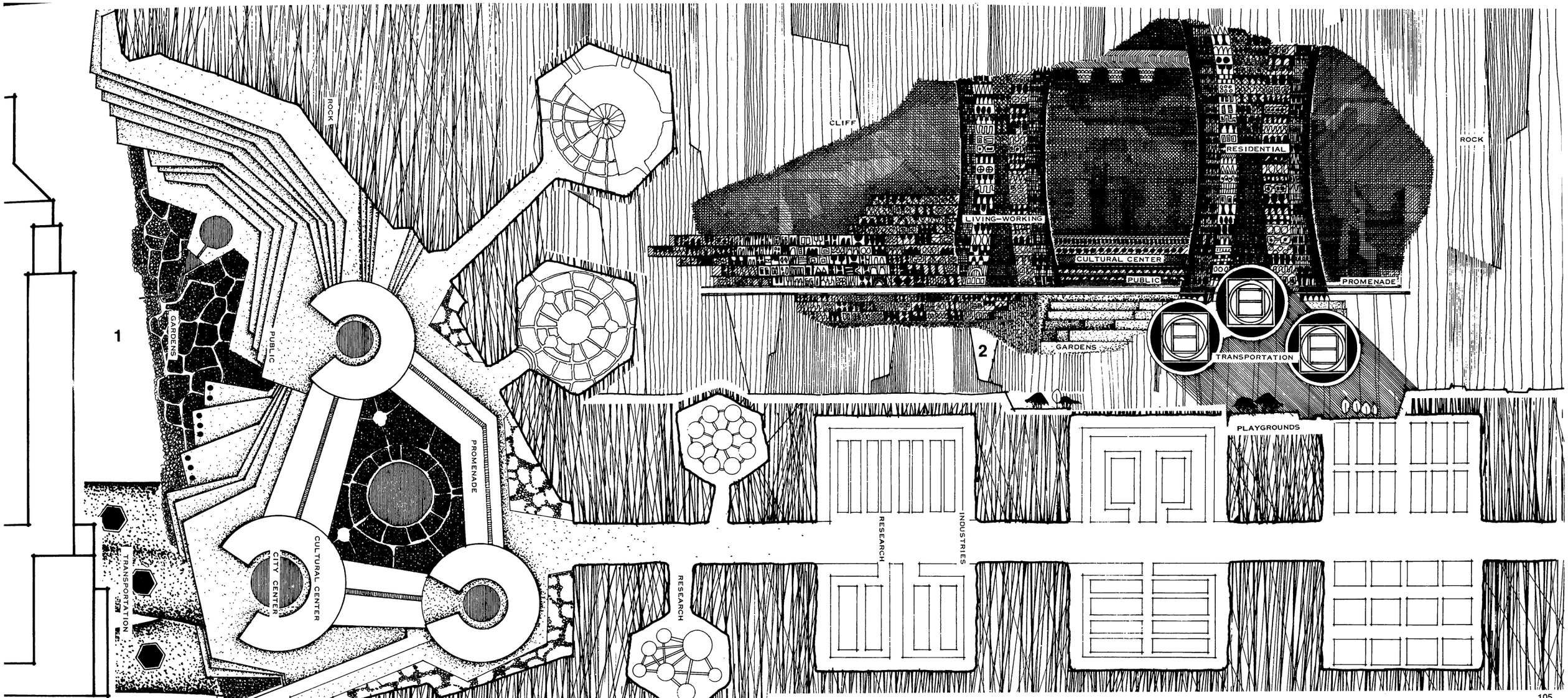


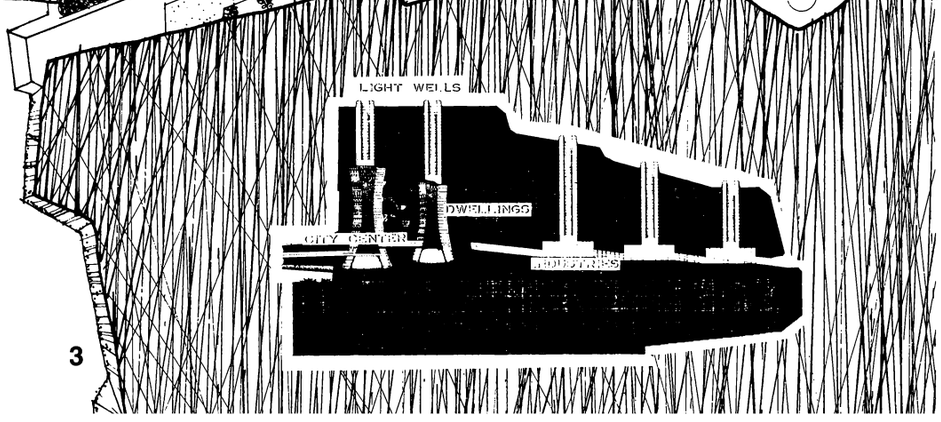
24.Arcoindian I

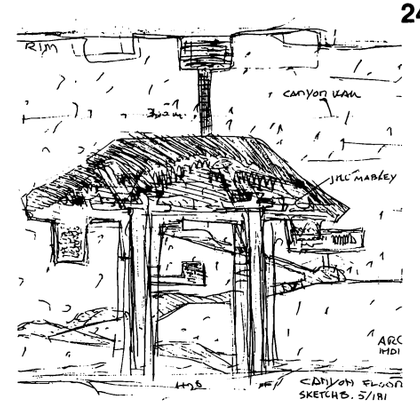
	Arcoindian I	
	(Cliff topography)	
	Population	20,000
	Density	1,791/hectare; 725/acre
	Height	220–450 meters
	Surface covered	10.5 hectares; 25 acres
1.	Section: scale	1:2,000
	Comparative Arcologies	
	Babel Canyon	
	Population	250,000
2.	Partial diagonal section: scale	1:2,000
	Veladiga	
	Population	15,000
3.	Partial elevation: scale	1:2,000

In the rivalry between the geophysical and the mental—the geophysical stubbornly framed in structural determinism, the mental attempting to give eyes and ears to the physical whole which indulges in its own formative endeavors—architecture stands as a meeting ground or battle ground. There the mental willingly mineralizes itself in crystals of pseudostructure seeking after form, and the geophysical accepts the mental metamorphosis forced upon its endless logic.

As if to prove this ground for compromise, there stands the cave dwelling that, almost undeveloped from early times, offers not much more than a timid assertion of mind over matter. In this instance half of it is better than all of it. Split the cave with a vertical blow and with the two halves now open to the light more can be done for man, the son of sun, light, and air.



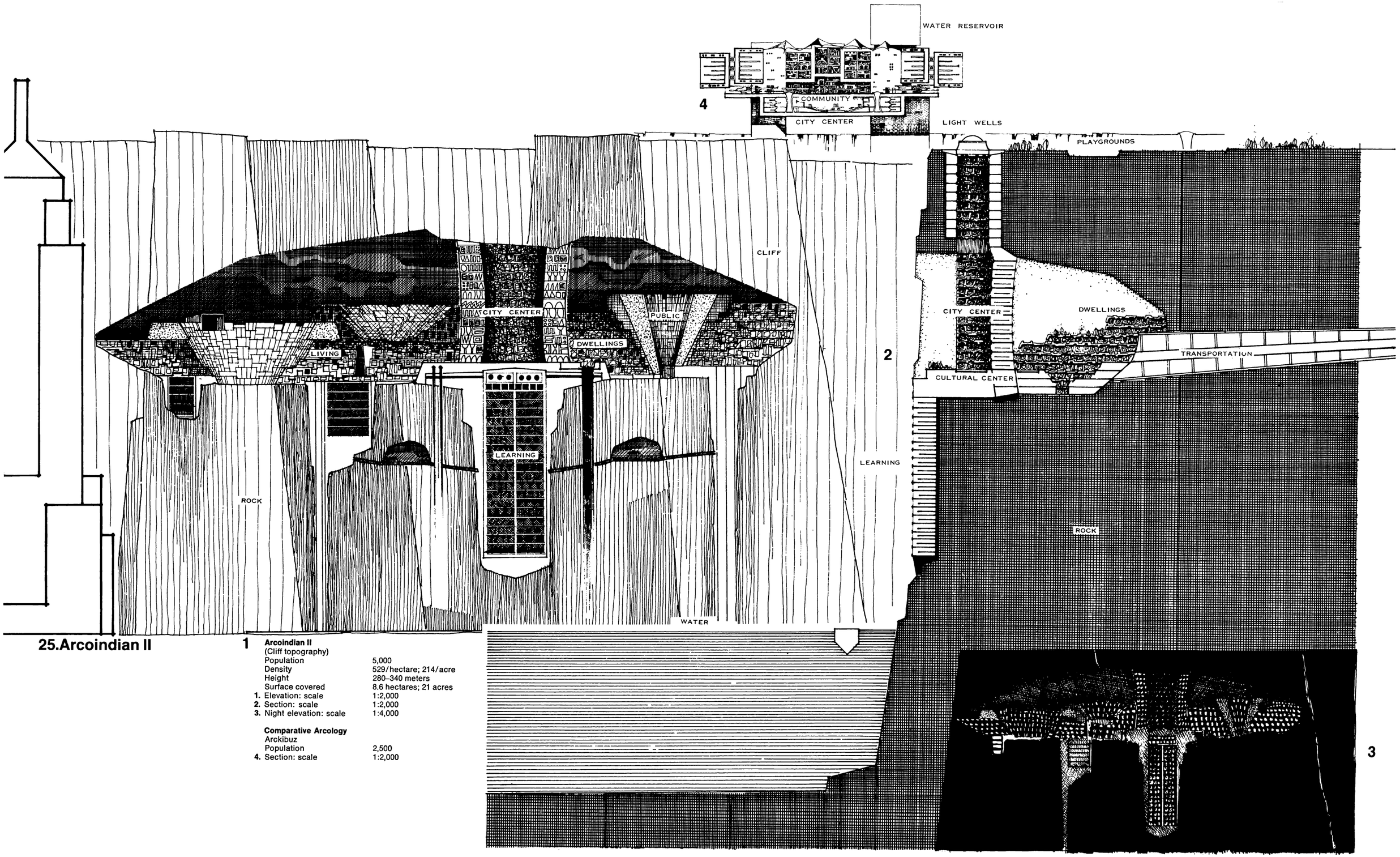




24.Arcoindian I

Arcoindian I
(Cliff topography)

Population	20,000
Density	1,791/hectare; 725/acre
Height	220–450 meters
Surface covered	10.5 hectares; 25 acres
1. Plan: scale	1:2,000
2. Elevation: scale	1:2,000
3. Section: scale	1:10,000



25.Arcoindian II

1

Arcoindian II
(Cliff topography)

Population	5,000
Density	529/hectare; 214/acre
Height	280–340 meters
Surface covered	8.6 hectares; 21 acres
1. Elevation: scale	1:2,000
2. Section: scale	1:2,000
3. Night elevation: scale	1:4,000

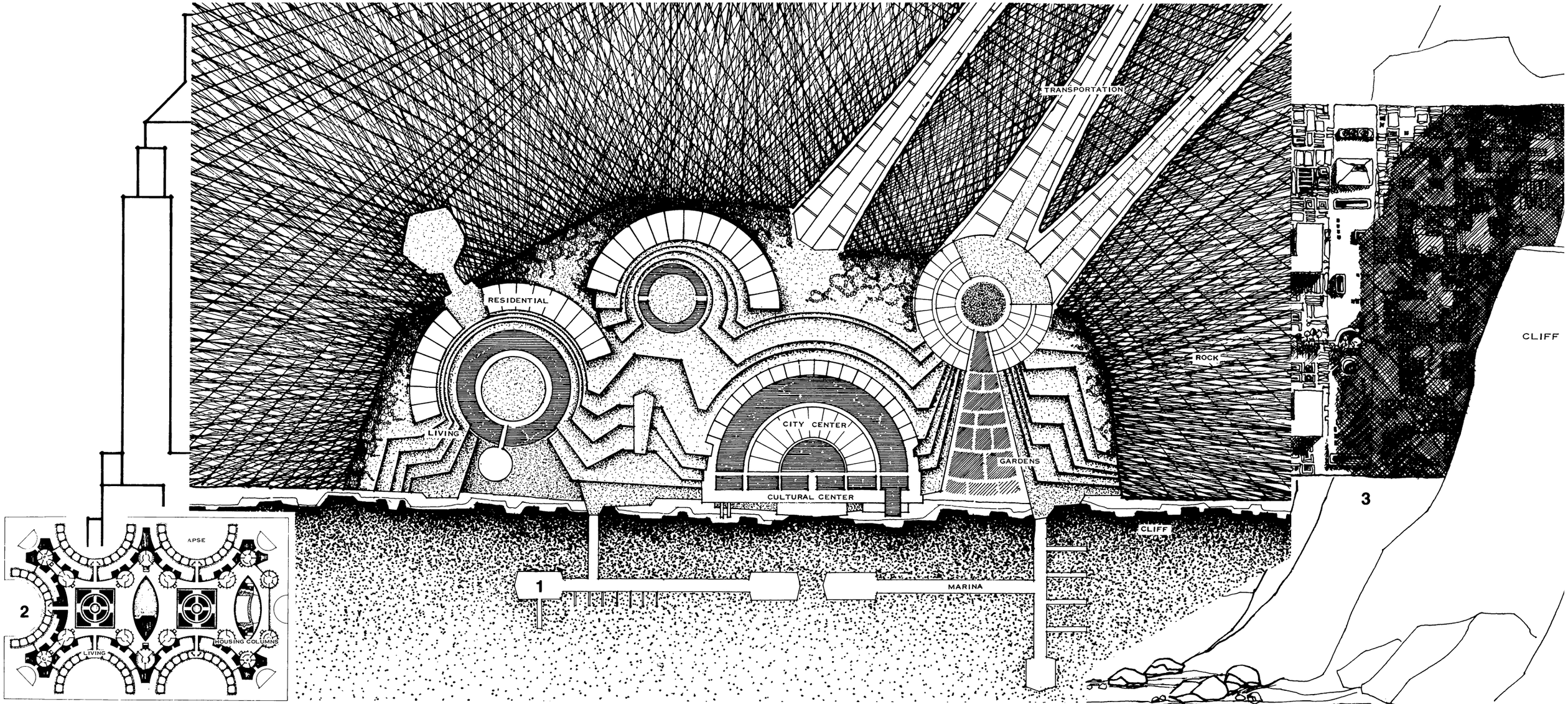
Comparative Arcology
Arckibuz

Population	2,500
4. Section: scale	1:2,000

2

3

4



25.Arcoindian II

Arcoindian II	
(Cliff topography)	
Population	5,000
Density	529/hectare; 214/acre
Height	280–340 meters
Surface covered	8.6 hectares; 21 acres
1. Plan: scale	1:2,000
Comparative Arcologies	
Arcosanti	
Population	1,500
2. Intermediate plan: scale	1:2,000
Arcbeam	
Population	65,000
3. Partial elevation: scale	1:2,000

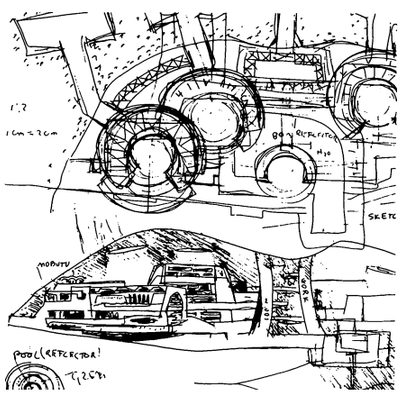
Cave dwelling is as old and as uninterrupted as the history of man. If one considers that wind, rain, cold, and heat do not change, one might see the advantage of cave dwelling for some particular group of man, even today. The combination of cave dwelling and metropolitan sophistication could be fruitful. The actual sheltering device,-an impressive roof for the whole community, is there —a gaping hollow in the side of the cliff. The combination of good layout, mouth preferably open to the south, good coordination of material and artificial light, good radiant and convection heat systems can make the whole cave a most exciting place to live and work in. Industrial plants could be carved into the rock along with housing and storage. A number of shafts from the rim plateau are for access and light and air control, shafts that drop down to the floor of the valley connecting the city to gardens, parks, or water bodies.

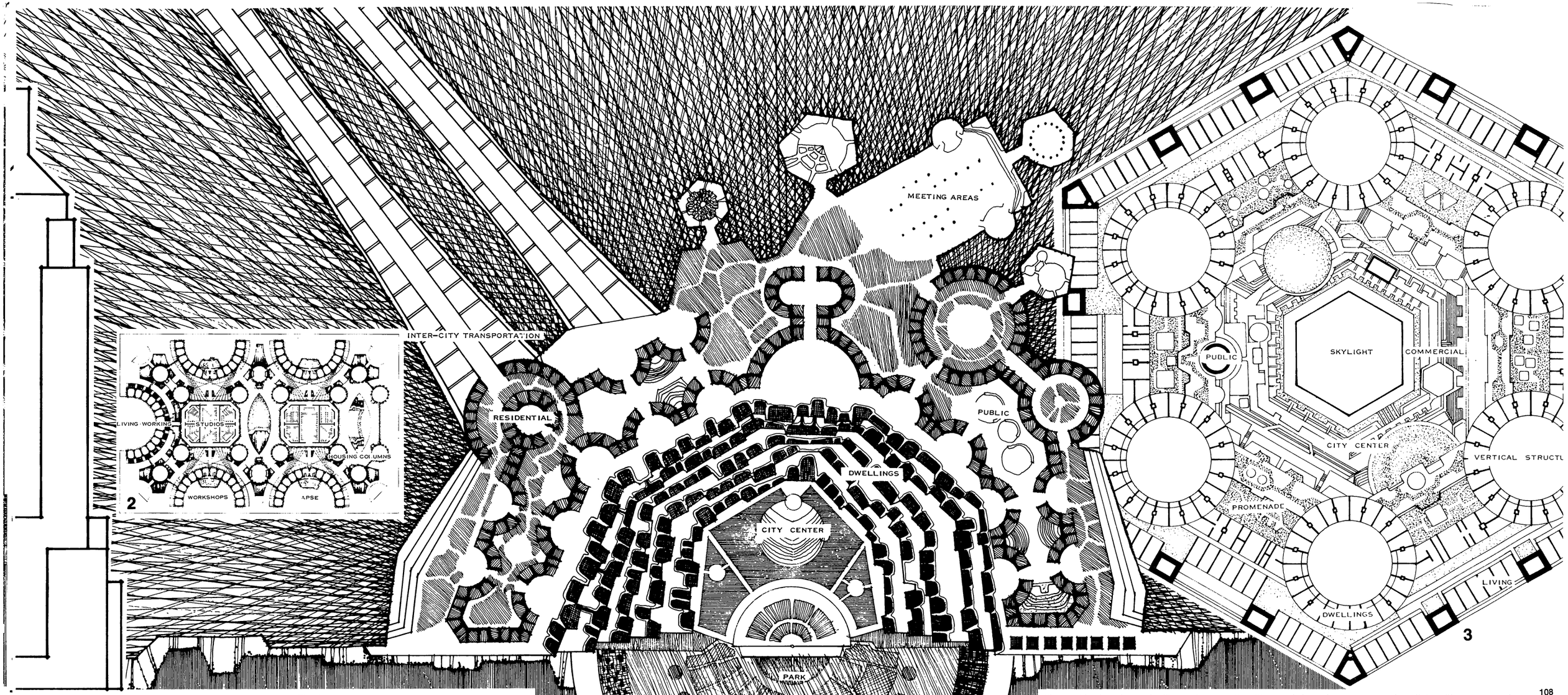
Of all man's activities, it is automated production that will move inside the earth's crust. Efficiency, safety, compactness (miniaturization), and the use of the surface of the earth for other things will force automated production under the ground. Large systems are already set in many functional layers of different kinds, most of them for communication, transportation, and storage. Production will join them and then oust the transportation system, as this will move to various levels of the city.

The critical aspect of cave dwelling is the strong orientation that the mouth of the cave defines. The morning and the afternoon have far more specific meaning than is usually the case; in general, there is a quasi-symmetry defined by the noon hour so that to every morning hour corresponds an afternoon hour. This symmetry is lowest in the cave configuration almost as a reflection of the absence of the hypothetical half of the cave cut away to open the remaining half to light, air, and view.

Cave dwelling is as old and as constant as the history of mankind. I am considering that cave dwelling which has been made famous on this continent by the Indians, what may be called the open- or half-cave dwelling communities; that is to say, not a sequence of underground spaces but the use of a deep shelf on the wall of a canyon.

Such topography is the free gift of (1) a collective umbrella; the ceiling of the half cave is the roof above the roofs; (2) a temperature control device for optimum orientation; directly south, the cave is a winter sun trap and a summer parasol; (3) a wind- and air-flow device; (4) an all-embracing space of very inspiring character; something of a concrete and acting symbol of the historical process that has made stone and flesh in one.





26.Theology

1

Theology	
(Cliff topography)	
Population	13,000
Density	378/hectare; 153/acre
Height	100–560 meters
Surface covered	34 hectares; 83 acres
1. Plan: scale	1:2,000
Comparative Arcologies	
Arcosanti	
Population	1,500
2. Suspended floor plan: scale	1:2,000
Arcvillage II	
Population	30,000
3. Midlevel plan: scale	1:2,000

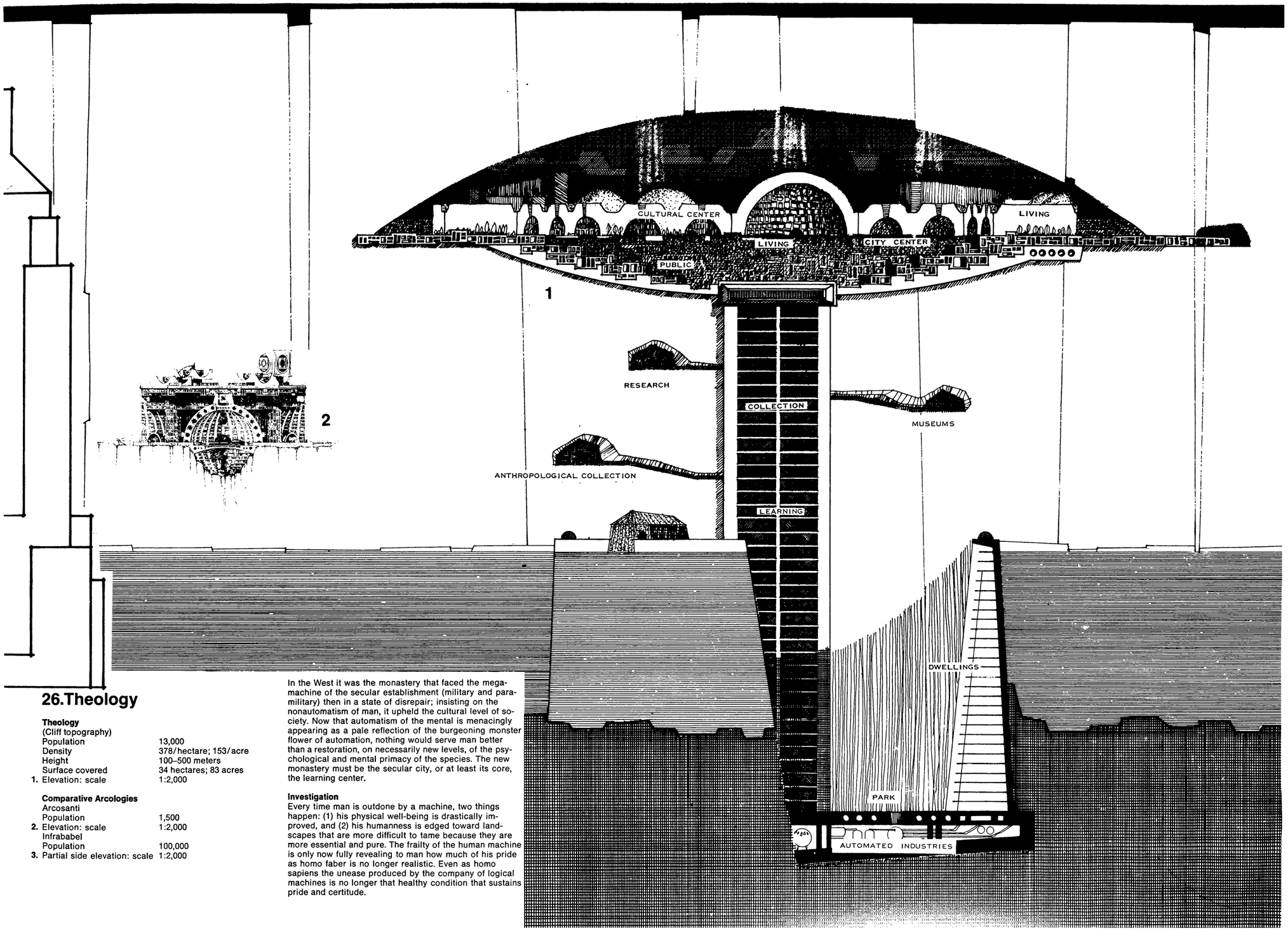
The combination of cave dwelling and metropolitan life could be excellent. Good lay-out, the coordination of natural and artificial light, the use of radiant heat for the cold season, the production and control of mounting and descending air drafts would make this a very exciting and efficient place to live and work. Such urban communities would be linked to the rim and the canyon floor by elevators, escalators, and pathways. Inside the rock itself at various depths could be carved the spaces for industrial and automated production in air-tight and atmosphere-controllable conditions.

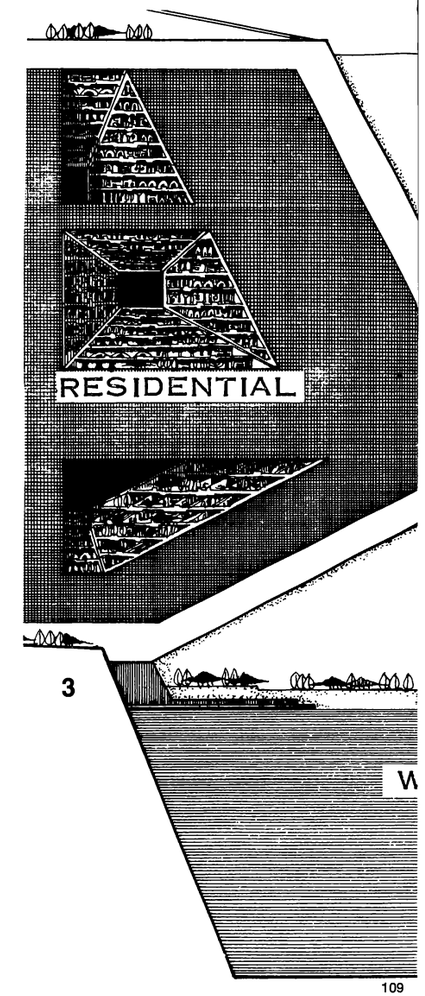
Mineralized history found in a cross section of time in the fossil specimens and in the successive geological stratas would seem to be telling enough to warrant inspections not limited solely to specimens in the field. A museum of the history of the world with history documented by its own happening has great pedagogical potential and would serve as a relevant tool for research.

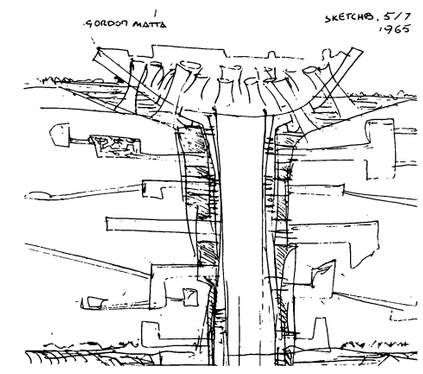
At least three aspects of the religious life are very real—ecumenism, investigation (ontological insight), and secularism—a trinity of one, essential to the reconstitution of priorities, giving to science and technology their due but no more.

Ecumenism

Hostility among religious bodies cannot but foster divisiveness among cultural and ethnic groups. Taoism, Buddhism, Hinduism, Mohammedism, Christianity, and Judaism are only large quilts covering smaller fragments of anguish and hope. If quiet flow or synthesis has any validity, it may well be that a physical or territorial interdependence might be the first step into a practicable ecumenism. Reciprocal understanding at such a lofty, if not compassionate, level could trickle down to harassed man and with it a little more hope, a little more grace, and a little less bigotry.







26. Theology

Theology
(Cliff topography)

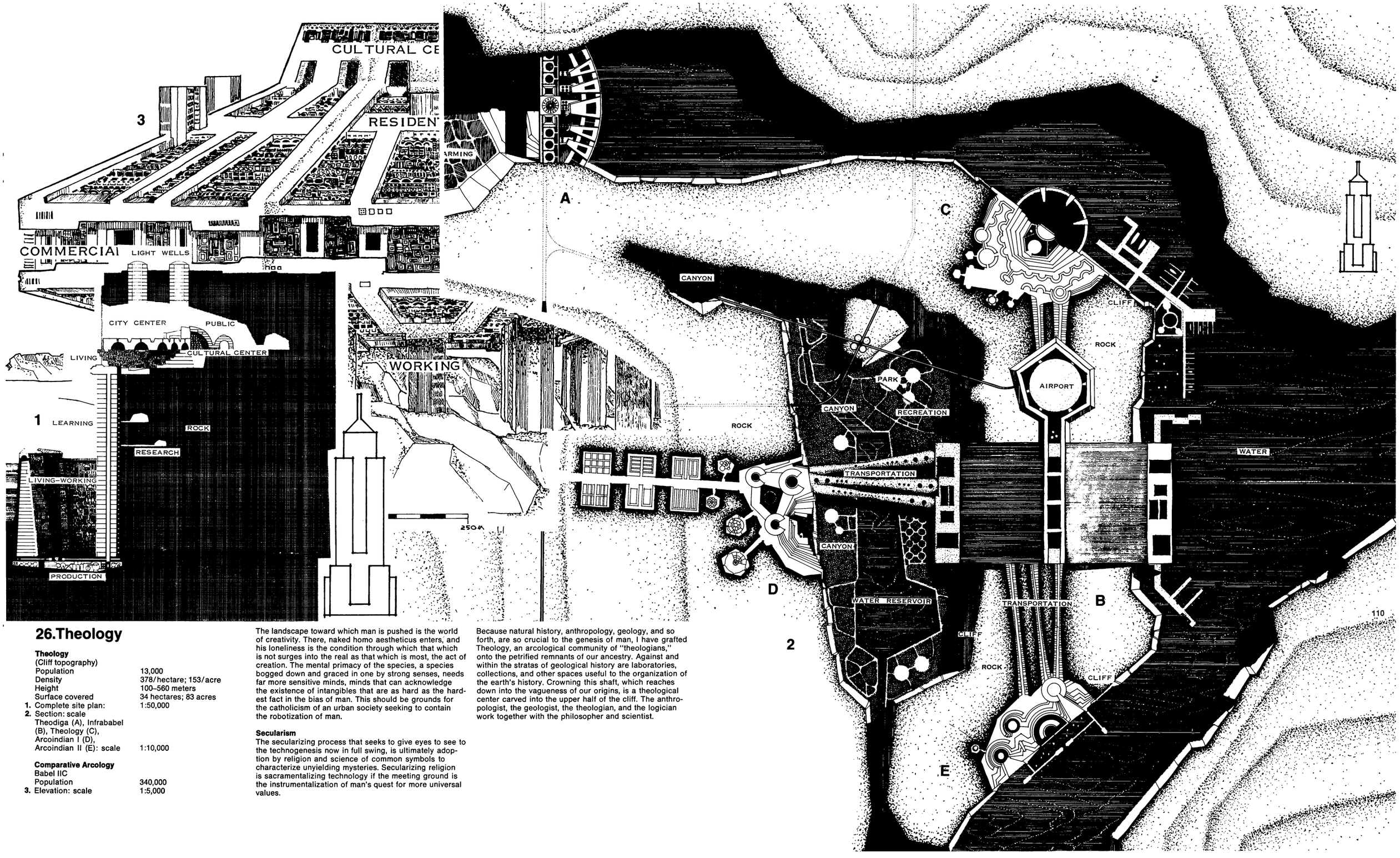
Population	13,000
Density	378/hectare; 153/acre
Height	100–500 meters
Surface covered	34 hectares; 83 acres
1. Elevation: scale	1:2,000

Comparative Arcologies

Arcosanti	
Population	1,500
2. Elevation: scale	1:2,000
Infrababel	
Population	100,000
3. Partial side elevation: scale	1:2,000

In the West it was the monastery that faced the megamachine of the secular establishment (military and paramilitary) then in a state of disrepair; insisting on the nonautomatism of man, it upheld the cultural level of society. Now that automatism of the mental is menacingly appearing as a pale reflection of the burgeoning monster flower of automation, nothing would serve man better than a restoration, on necessarily new levels, of the psychological and mental primacy of the species. The new monastery must be the secular city, or at least its core, the learning center.

Investigation
Every time man is outdone by a machine, two things happen: (1) his physical well-being is drastically improved, and (2) his humanness is edged toward landscapes that are more difficult to tame because they are more essential and pure. The frailty of the human machine is only now fully revealing to man how much of his pride as homo faber is no longer realistic. Even as homo sapiens the unease produced by the company of logical machines is no longer that healthy condition that sustains pride and certitude.



26. Theology

Theology
(Cliff topography)

Population	13,000
Density	378/hectare; 153/acre
Height	100–560 meters
Surface covered	34 hectares; 83 acres
1. Complete site plan:	1:50,000
2. Section: scale Theodiga (A), Infrababel (B), Theology (C), Arcoindian I (D), Arcoindian II (E): scale	1:10,000

Comparative Arcology
Babel IIC

Population	340,000
3. Elevation: scale	1:5,000

The landscape toward which man is pushed is the world of creativity. There, naked homo aestheticus enters, and his loneliness is the condition through which that which is not surges into the real as that which is most, the act of creation. The mental primacy of the species, a species bogged down and graced in one by strong senses, needs far more sensitive minds, minds that can acknowledge the existence of intangibles that are as hard as the hardest fact in the bias of man. This should be grounds for the catholicism of an urban society seeking to contain the robotization of man.

Secularism
The secularizing process that seeks to give eyes to see to the technogenesis now in full swing, is ultimately adoption by religion and science of common symbols to characterize unyielding mysteries. Secularizing religion is sacramentalizing technology if the meeting ground is the instrumentalization of man's quest for more universal values.

Because natural history, anthropology, geology, and so forth, are so crucial to the genesis of man, I have grafted Theology, an arcological community of "theologians," onto the petrified remnants of our ancestry. Against and within the stratas of geological history are laboratories, collections, and other spaces useful to the organization of the earth's history. Crowning this shaft, which reaches down into the vagueness of our origins, is a theological center carved into the upper half of the cliff. The anthropologist, the geologist, the theologian, and the logician work together with the philosopher and scientist.

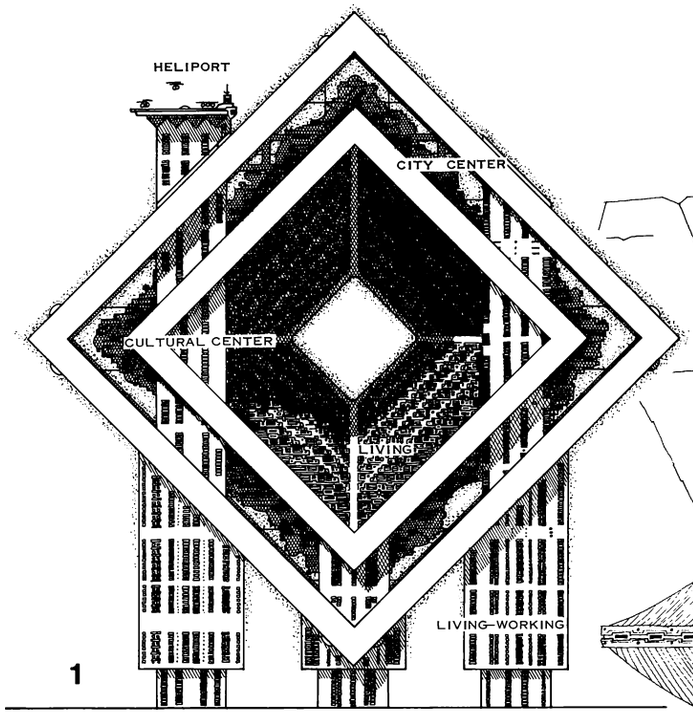
27.Arcube

Arcube
(Flat or hilly land)

Population	400,000
Density	2,717/hectare; 1,100/acre
Height	1,500 meters
Side	1 kilometer
Surface covered	140 hectares; 346 acres
1. Elevation: scale	1:10,000
2. Midlevel plan: scale	1:10,000
3. Side elevation: scale	1:10,000
4. Studies of natural and artificial light: no scale	

Comparative Arcology
Arcodiga

Population	280,000
5. Elevation: scale	1:10,000



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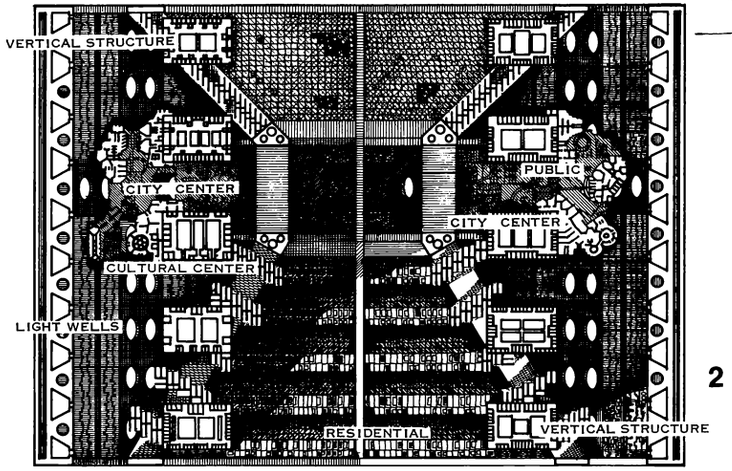

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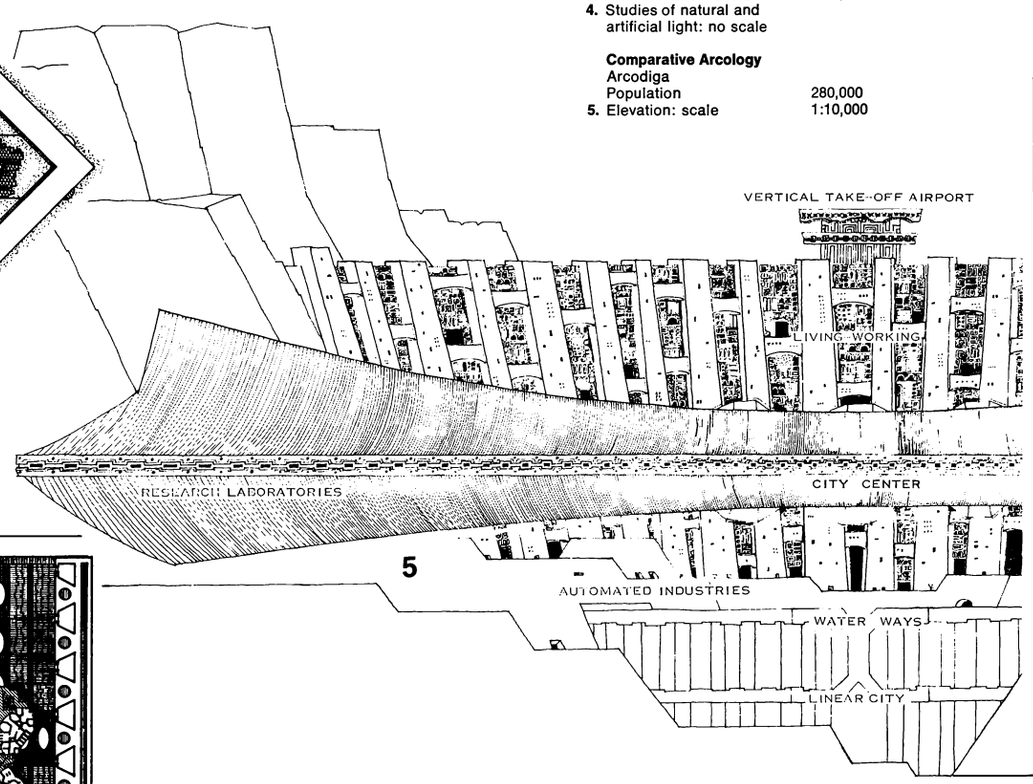

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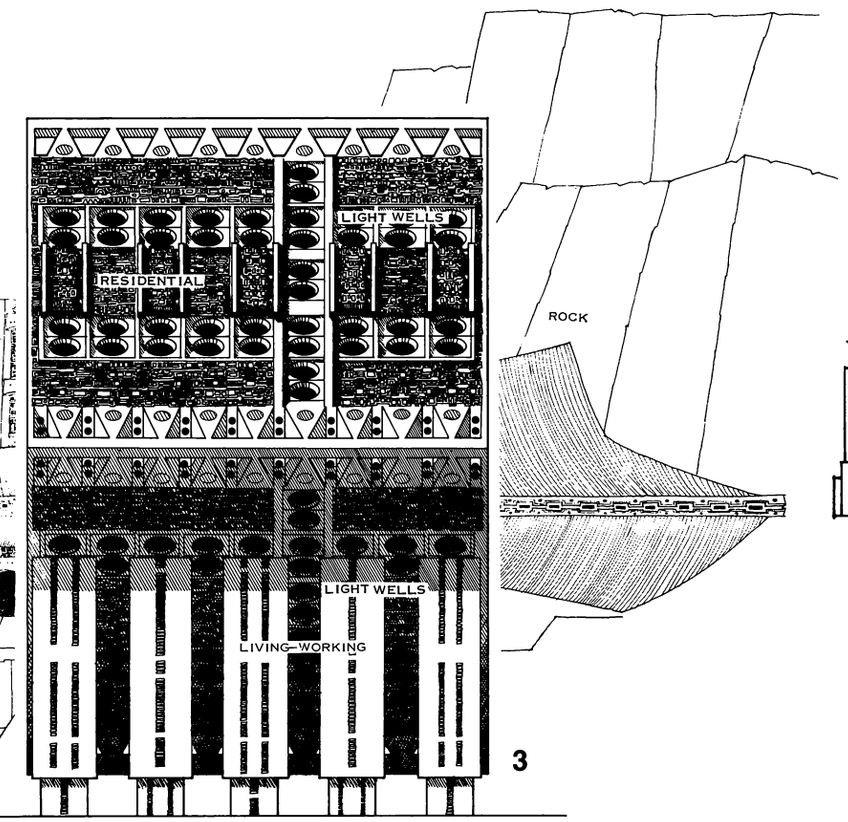

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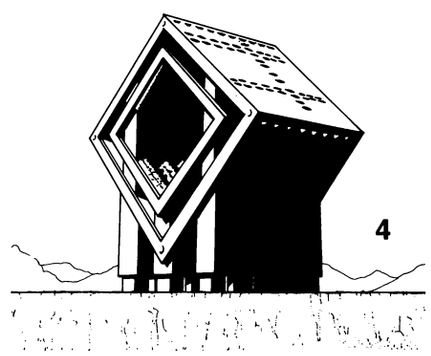
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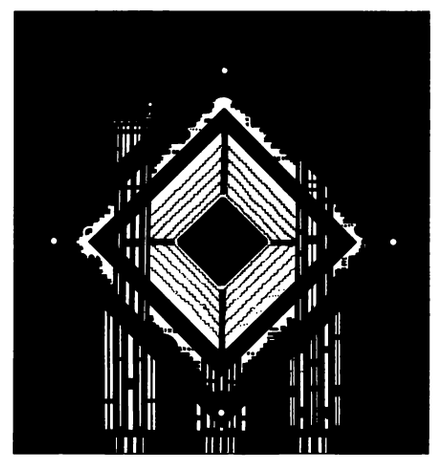

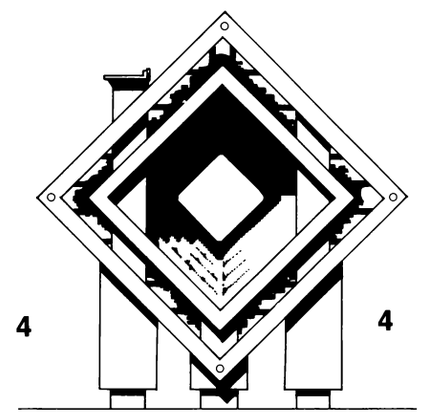
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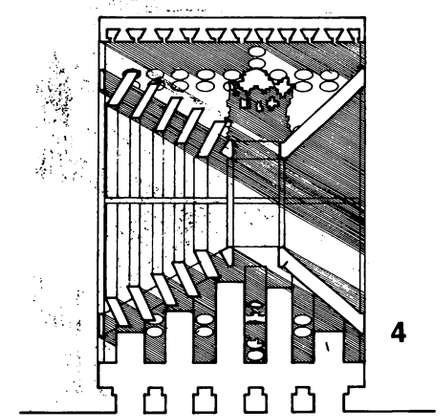
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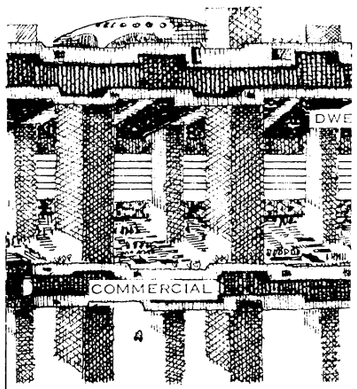

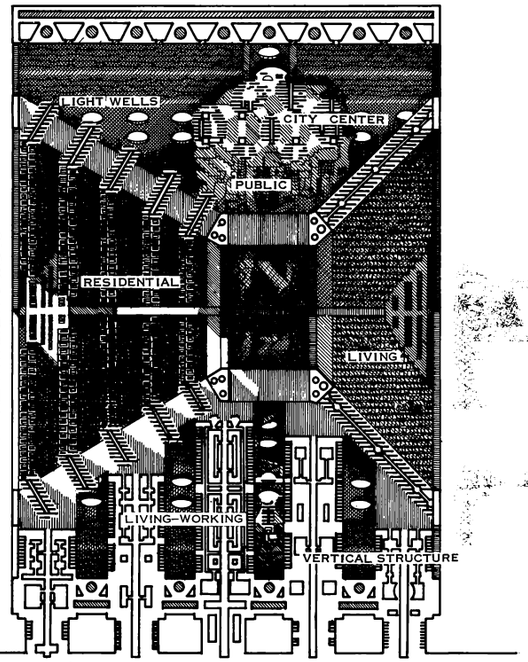

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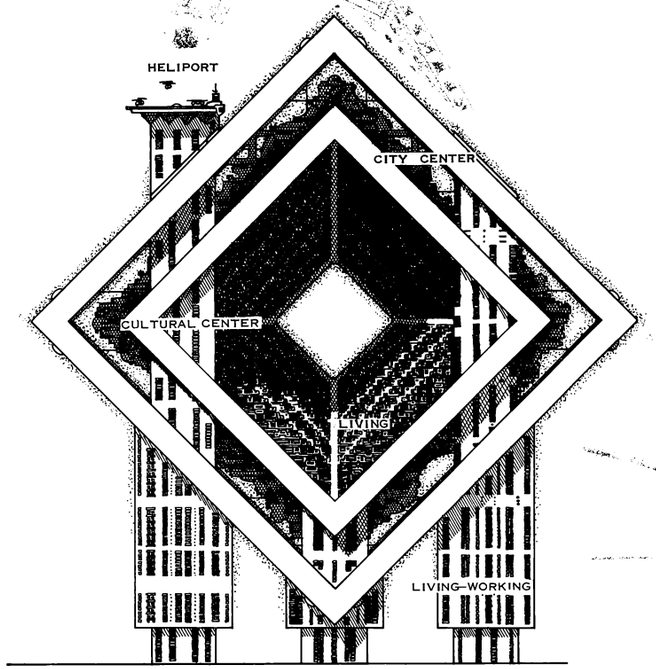

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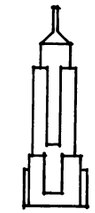
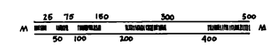




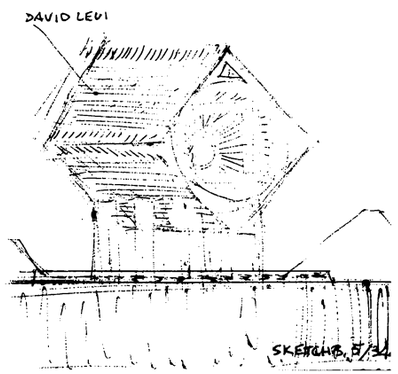
27.Arcube

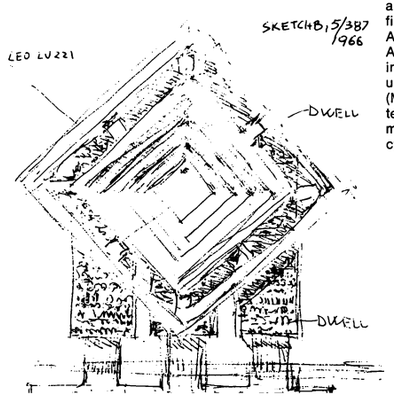
Arcube
(Flat or hilly land)

	Population	400,000
	Density	2,717/hectare; 1,100/acre
	Height	1,500 meters
	Side	1 kilometer
	Surface covered	140 hectares; 346 acres
1.	Section: scale	1:10,000
2.	Elevation: scale	1:10,000

Comparative Arcologies

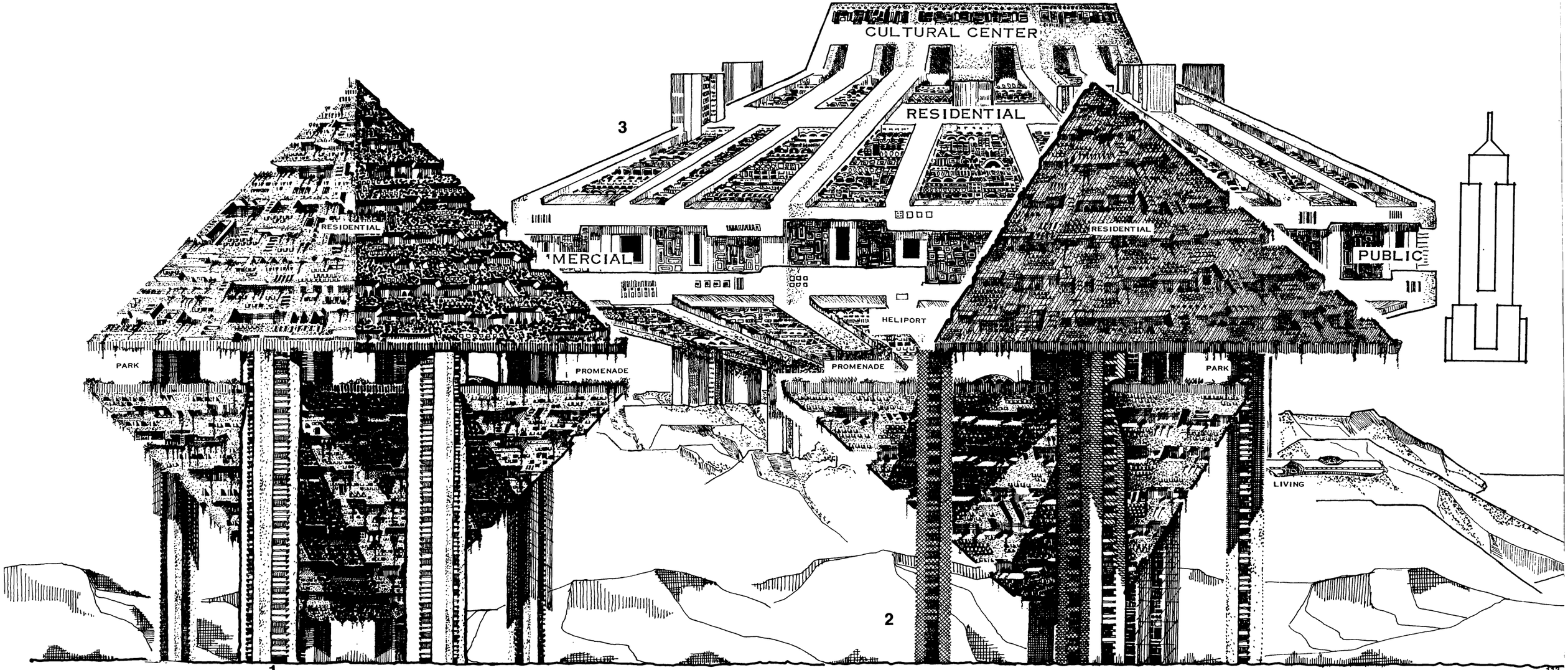
	Babelnoah	
	Population	6,000,000
3.	Partial elevation: scale	1:10,000
	Theodiga	
	Population	20,000
4.	Elevation: scale	1:10,000
	Asteromo	
	Population	80,000
5.	Longitudinal section: scale	1:10,000





Arcube and Hexahedron are in a way a second-generation arcology. To distinguish grossly the two generations, the first one would be the Dionysian kind, the second, the Apollonian. Of the fifteen or so schemes I have of the Apollonian kind, I am including Arcube and Hexahedron in this volume as the overture to a possible second volume. That would include the urban river referred to before (Map of Despair). The Apollonian generation is characterized by the envelope which is substantially an elementary geometry: cube, sphere, pyramid, hexahedron, cylinder, etc.

In the Dionysian generation, filiation of Mesa City, are configurations of a more "free form" character. Functionally speaking, it might be hard to put one in front of the other. The so-called free form has definite dangers: there is the danger of unbalance and the danger of the pseudo-organic. Unbalance results whenever for the sake of nonsymmetry there is a lopsided density of action that will soon result in hyperfunctions in some places and atrophy in others. In nature symmetry is used to balance uneven conditions, for instance, a tree growing against a wall so as to reproduce a symmetry of performances inclusive of the unbalancing cause.



28.Hexahedron

1

Hexahedron
(Any topography)

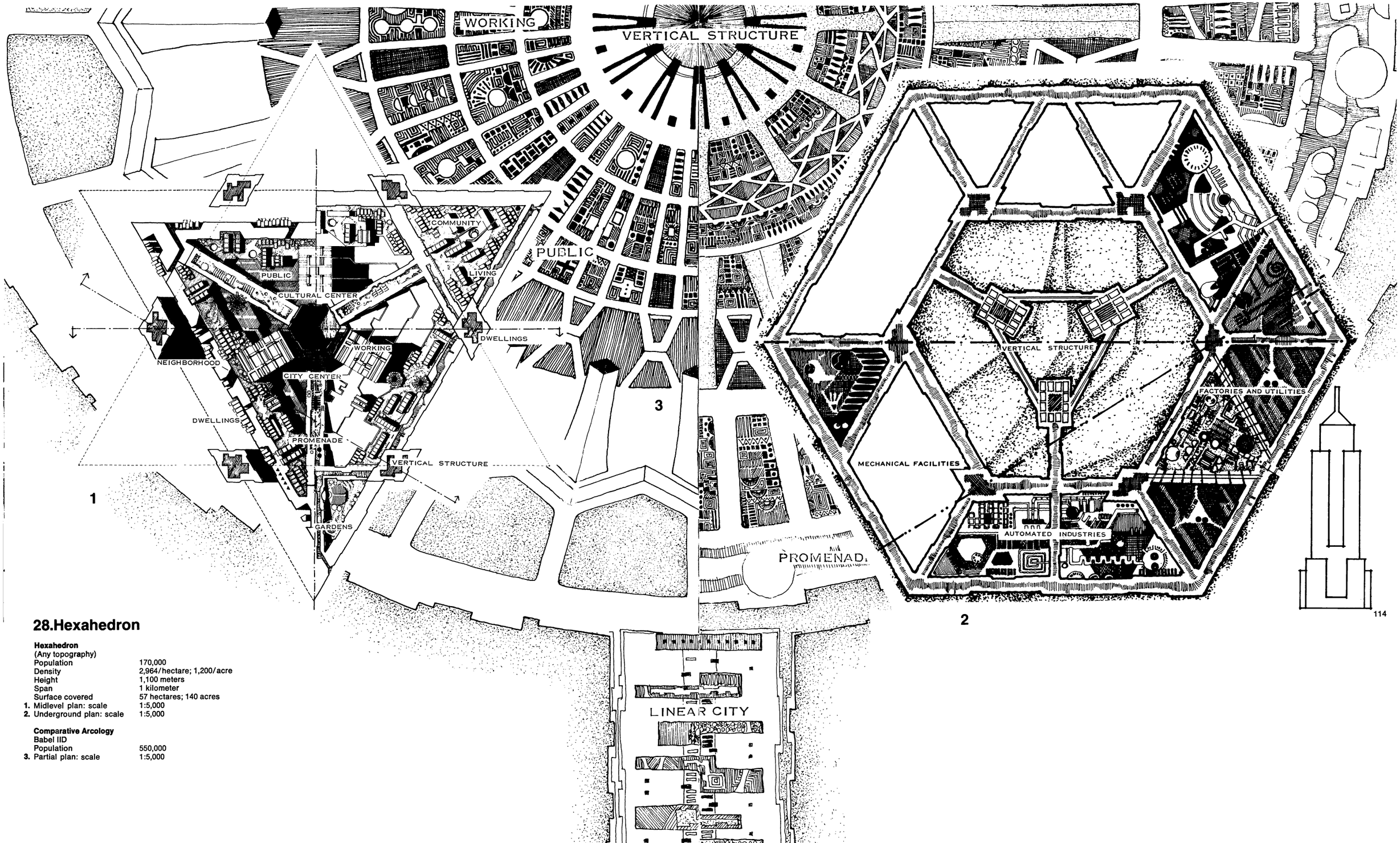
Population	170,000
Density	2,964/hectare; 1,200/acre
Height	1,100 meters
Side	1 kilometer
Surface covered	57 hectares; 140 acres
1. Elevation: scale	1:5,000
2. Side elevation: scale	1:500

Comparative Arcology
Babel IIC

Population	340,000
3. Elevation: scale	1:5,000

The danger of the pseudo-organic is that man can only metaphysically be defined as one of the many cells combining in the social body because man is not morphologically, seasonally, functionally like a biological cell. The micro-environment that allows the cell to act is a reflection on and a determinant of the cell's own structural and functional characteristics. Exclusive of these characteristics are sight, hearing, smelling, feeling, unpredictability, and so on. It is not that a cell has none of these characteristics but that those that it has are only approximately comparable to the corresponding ones in a complex organism. Then, for instance, to blow up an artery and pretend to run people in it as if they were blood cells is not very logical. It is to take form at face value and miss the substance of the problem and its predicaments.

The organic has defined itself in the long interim between the mineral and the mental, and the beauty of its power is somehow contained there. The organization of the inorganic to construct a container to the condition of man is thus turned upon a specific and not organic structurality, a postorganic structure and indeed a pseudostructure compared with the miraculous order of the mineral and of the living. This is why such pseudostructures, purely functional and always on the threshold of obsolescence, must find redemption in form, the aesthetic side of compassionate man. Morphologically and structurally, Hexahedron is, like Arcube, a pseudocrystal. Its validity would be in the high human and emotional standard texturing it.



28.Hexahedron

Hexahedron
(Any topography)

Population	170,000
Density	2,964/hectare; 1,200/acre
Height	1,100 meters
Span	1 kilometer
Surface covered	57 hectares; 140 acres
1. Midlevel plan: scale	1:5,000
2. Underground plan: scale	1:5,000

Comparative Arcology
Babel IID

Population	550,000
3. Partial plan: scale	1:5,000

28.Hexahedron

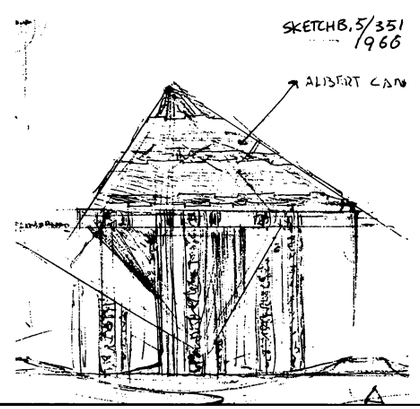
1

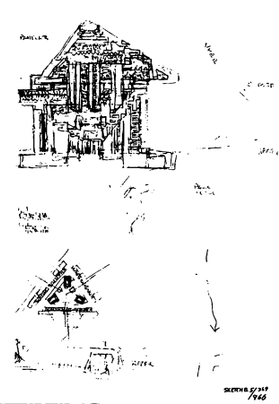
Hexahedron
(Any topography)

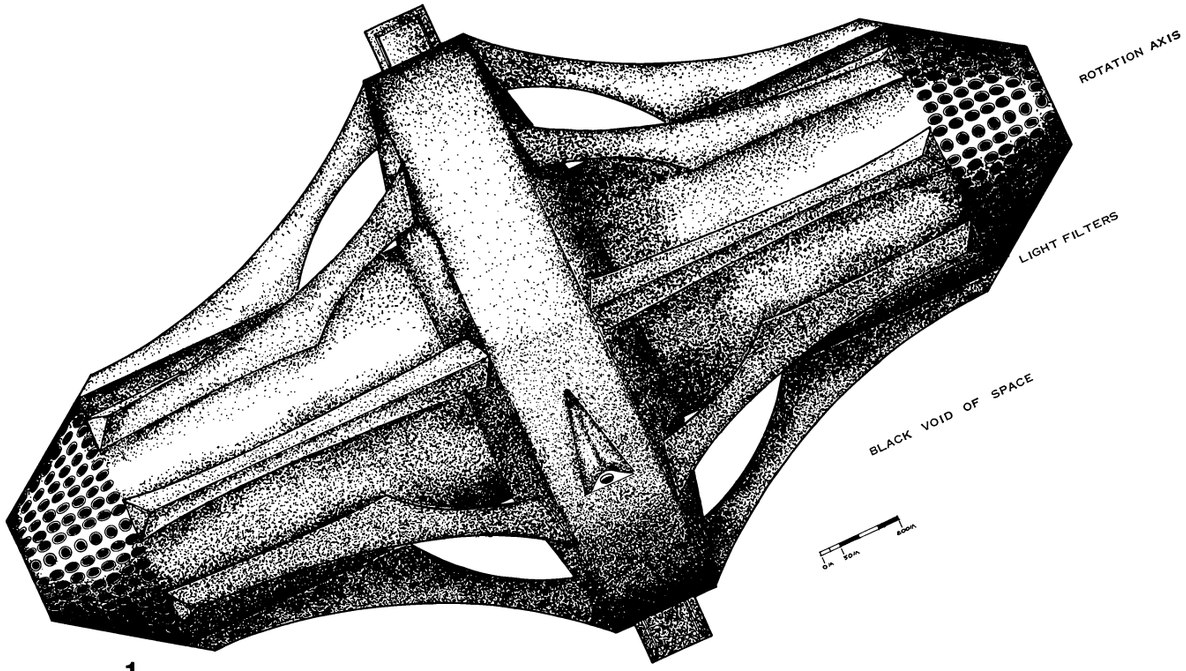
Population	170,000
Density	2,964/hectare; 1,200/acre
Height	1,100 meters
Span	1 kilometer
Surface covered	57 hectares; 140 acres
1. Sections: scale	1:5,000

Comparative Arcology
Arcanyon

Population	40,000/kilometer
2. Partial elevation: scale	1:5,000







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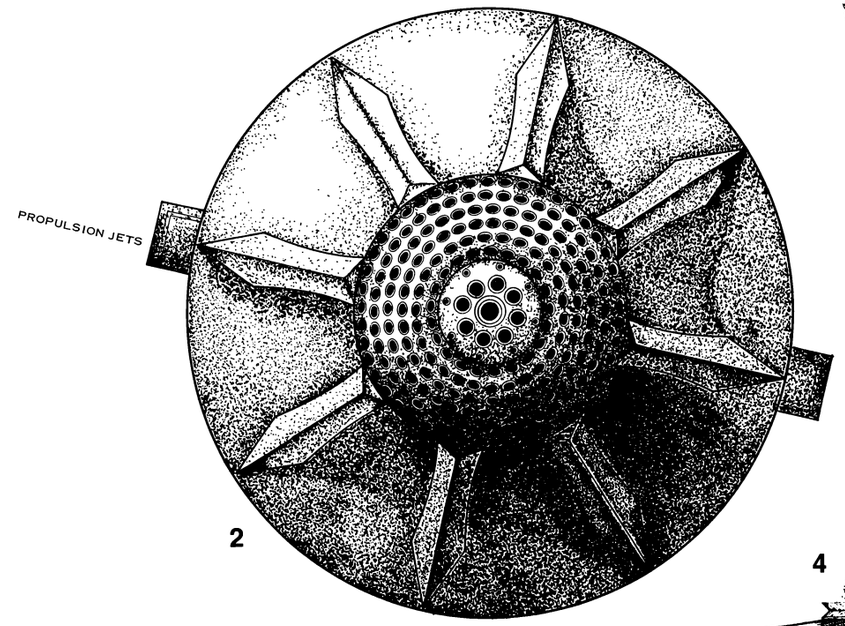

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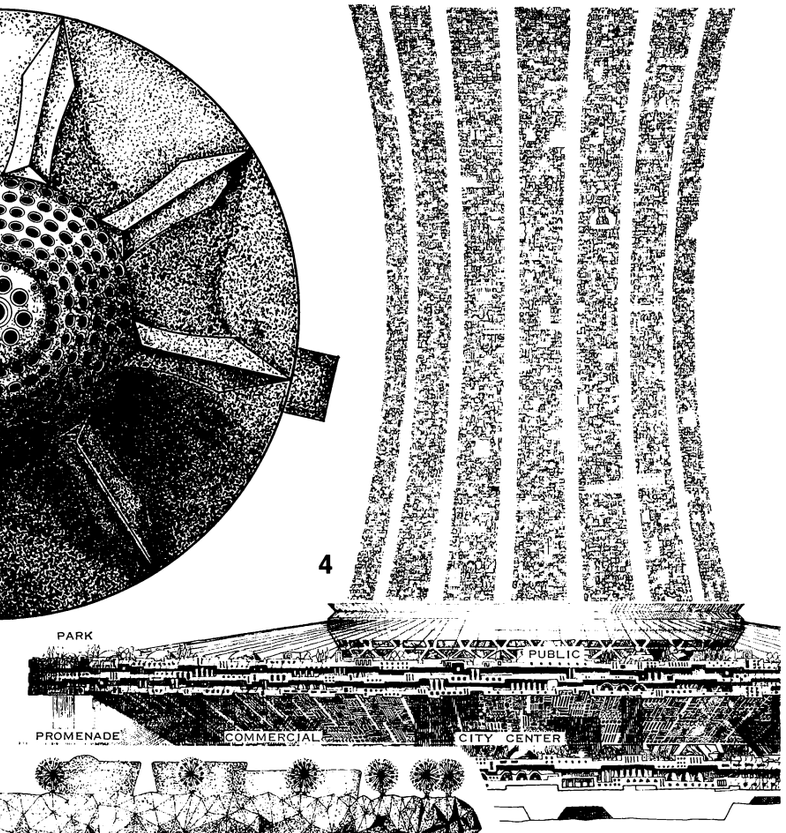

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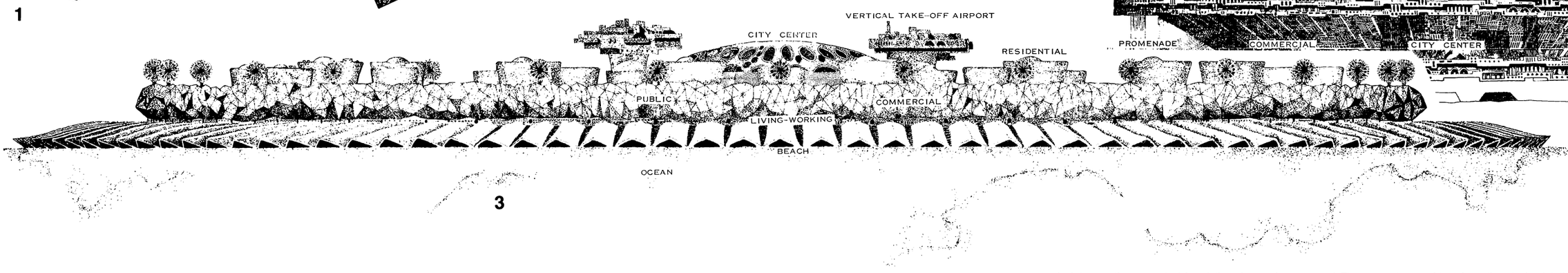
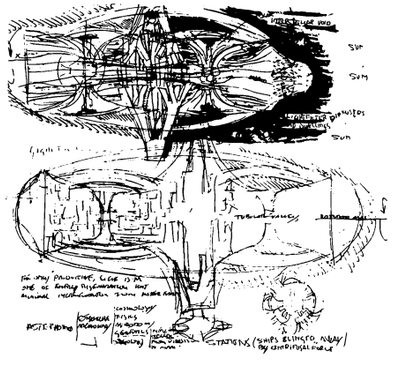
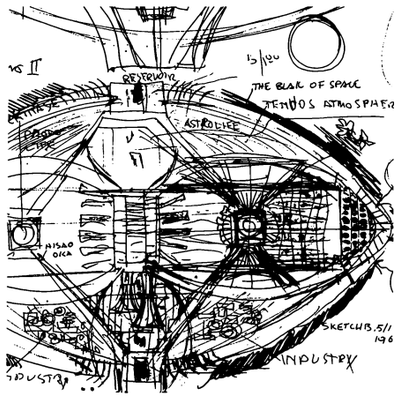


3

29.Asteromo

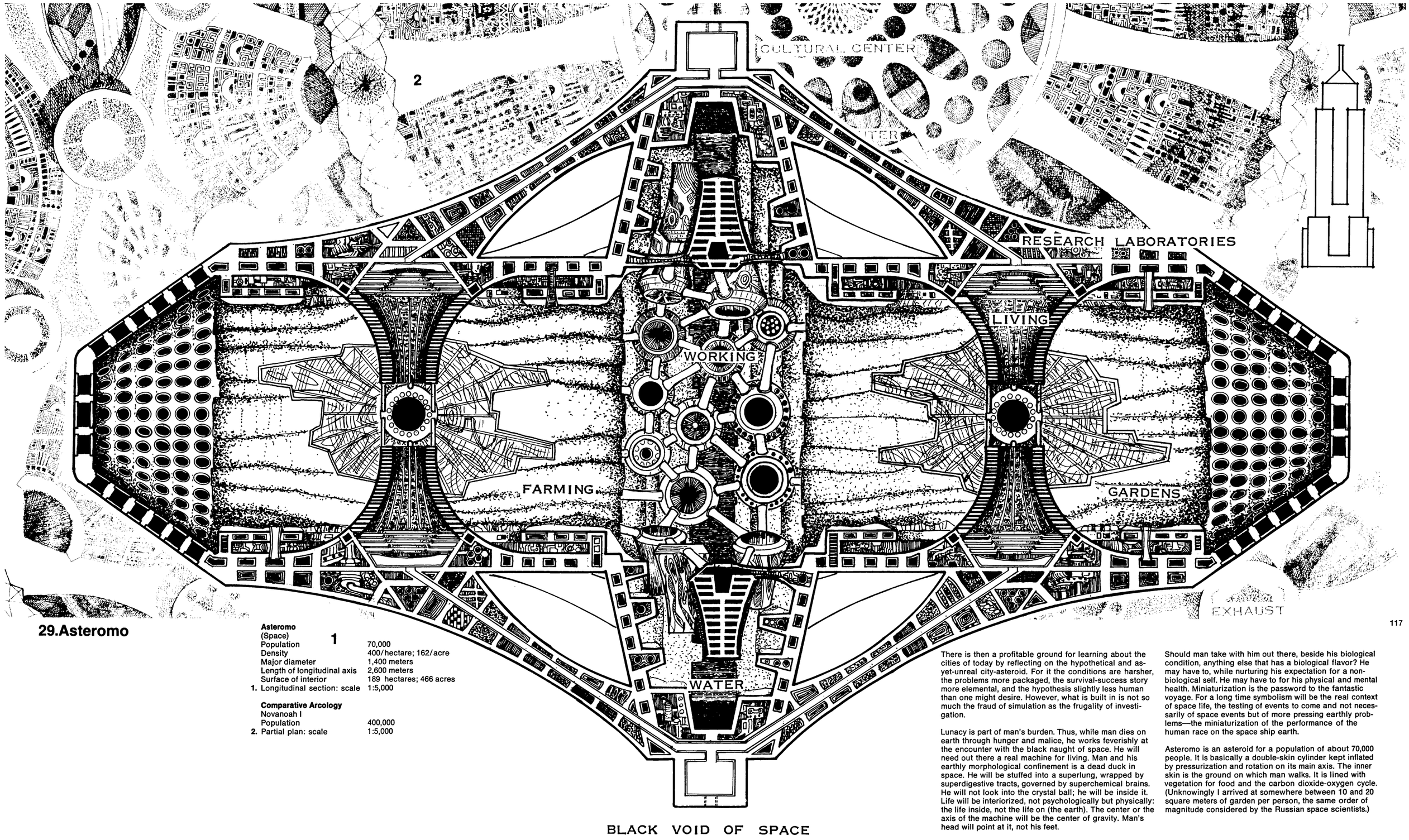
Asteromo	
(Space)	
Population	70,000
Density	400/hectare; 162/acre
Major diameter	1,400 meters
Length of longitudinal axis	2,600 meters
Surface of interior	189 hectares; 466 acres
1. Side elevation: scale	1:10,000
2. Front elevation: scale	1:10,000
Comparative Arcologies	
Novanoah I	
Population	400,000
3. Elevation: scale	1:10,000
Babel IID	
Population	550,000
4. Elevation: scale	1:10,000





In Asteromo the conceptual foundations for arcology are put to test almost as if in a simulation. Simulation is fraudulent by nature. It deals with the substitution for the real stuff, a stuff that more than often has no substitute. Technology, medicine, social sciences, planning, and so forth all make use of simulation procedure, and often that which is simulated is then required to match the laboratory orderliness and its aseptic synthesism—wherefrom the fraudulence.

In Asteromo all characteristics are sharpened to the same degree as the differences in space between light and shade, heat and cold. . . . Here are some, in haphazard order:
1. Rigorous confinement within a membrane separating being from nonbeing.
2. The inward orientation of a community physically standing head to head along the axis of rotation.
3. The coincidence of emptiness with death, the loneliness of the living lost in the solid black of the universal megamachine.
4. The constant pace of transformations in the details of the system within a given and generally unchanging macrosystem (the asteroid).
5. The transformation of instrumentality to accommodate different functions.
6. The definition of its own ecology and the balance of the general performance in it.
7. The self-reliance necessary for a system almost abandoned to its own resources in a hostile environment (the absence of one).
8. The roundness of the tasks to perform energetically, biologically, mentally.
9. The evident dependence of everyone on everyone else, making the whole unmistakably an organism whose organs perform given but "fluid" tasks.
10. The coincidence of equity and congruence on a microcosmos where to be a free agent coincides with complete responsibility.
11. Finally the rigor of the rules of complexity—miniaturization reflected by all of those characteristics.



29.Asteromo

Asteromo
(Space) **1**

Population	70,000
Density	400/hectare; 162/acre
Major diameter	1,400 meters
Length of longitudinal axis	2,600 meters
Surface of interior	189 hectares; 466 acres
1. Longitudinal section: scale	1:5,000

Comparative Arcology
Novanoah I

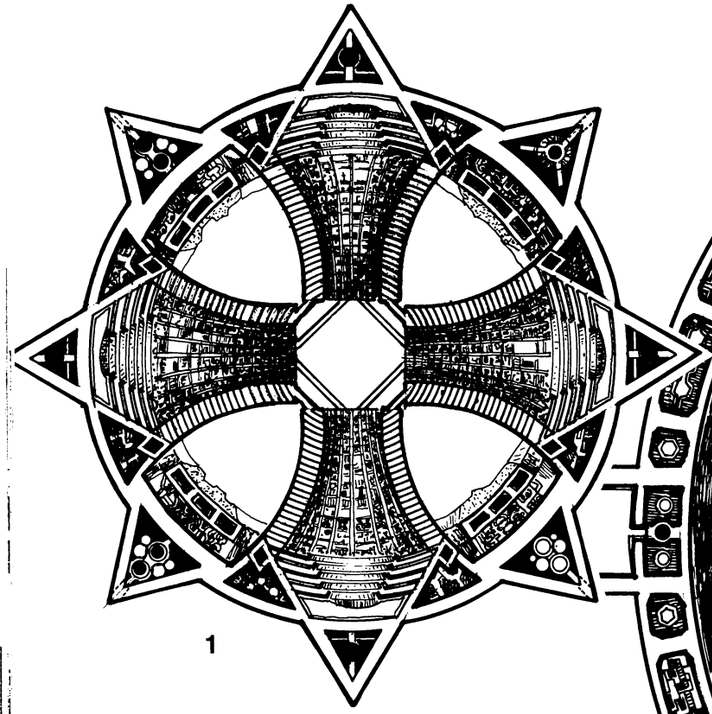
Population	400,000
2. Partial plan: scale	1:5,000

There is then a profitable ground for learning about the cities of today by reflecting on the hypothetical and as-yet-unreal city-asteroid. For it the conditions are harsher, the problems more packaged, the survival-success story more elemental, and the hypothesis slightly less human than one might desire. However, what is built in is not so much the fraud of simulation as the frugality of investigation.

Lunacy is part of man's burden. Thus, while man dies on earth through hunger and malice, he works feverishly at the encounter with the black naught of space. He will need out there a real machine for living. Man and his earthly morphological confinement is a dead duck in space. He will be stuffed into a superlung, wrapped by superdigestive tracts, governed by superchemical brains. He will not look into the crystal ball; he will be inside it. Life will be interiorized, not psychologically but physically: the life inside, not the life on (the earth). The center or the axis of the machine will be the center of gravity. Man's head will point at it, not his feet.

Should man take with him out there, beside his biological condition, anything else that has a biological flavor? He may have to, while nurturing his expectation for a non-biological self. He may have to for his physical and mental health. Miniaturization is the password to the fantastic voyage. For a long time symbolism will be the real context of space life, the testing of events to come and not necessarily of space events but of more pressing earthly problems—the miniaturization of the performance of the human race on the space ship earth.

Asteromo is an asteroid for a population of about 70,000 people. It is basically a double-skin cylinder kept inflated by pressurization and rotation on its main axis. The inner skin is the ground on which man walks. It is lined with vegetation for food and the carbon dioxide-oxygen cycle. (Unknowingly I arrived at somewhere between 10 and 20 square meters of garden per person, the same order of magnitude considered by the Russian space scientists.)



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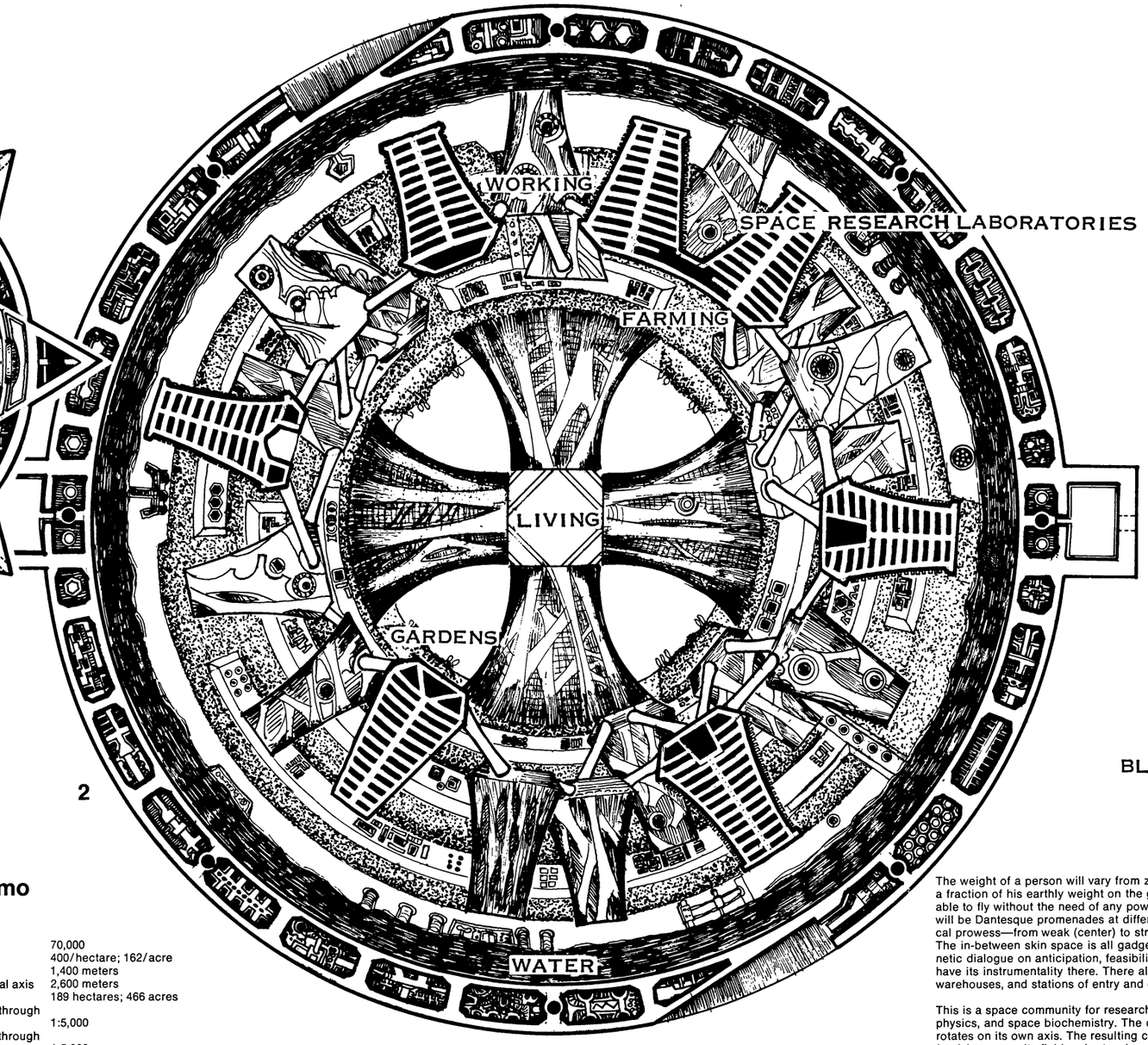

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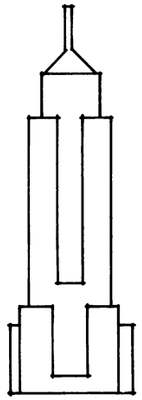
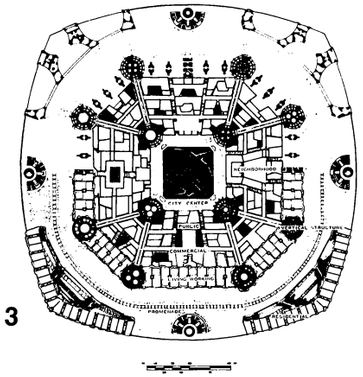
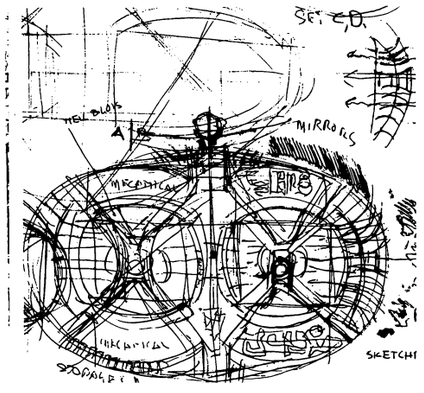




3

BLACK VOID OF SPACE



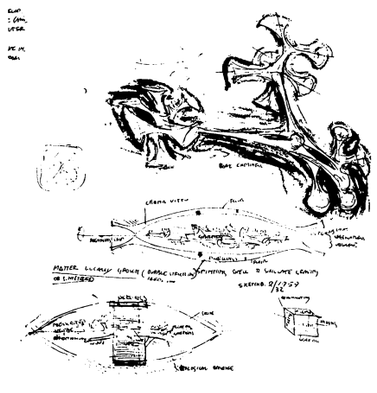
29.Asteromo

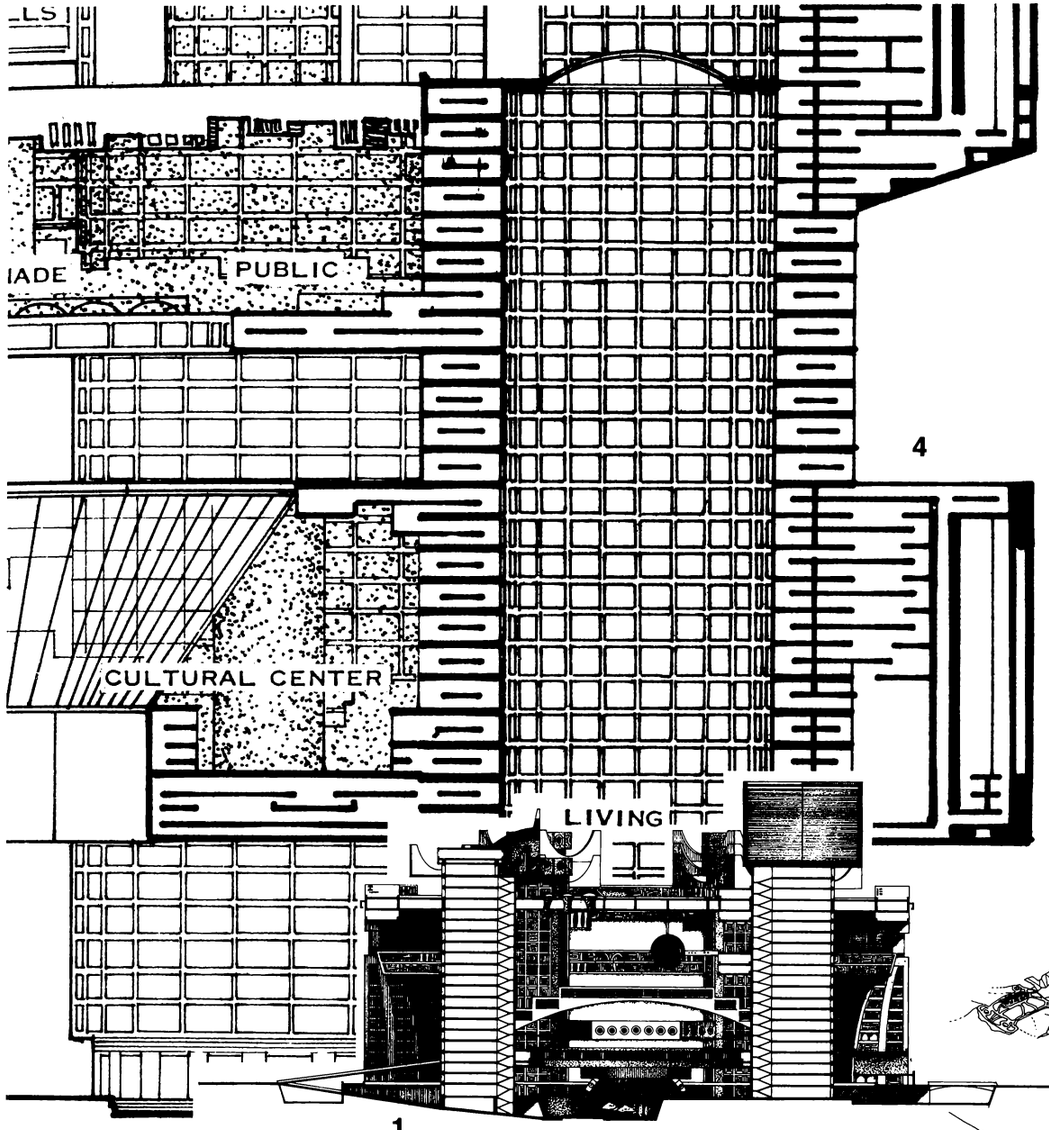
Asteromo	
(Space)	
Population	70,000
Density	400/hectare; 162/acre
Major diameter	1,400 meters
Length of longitudinal axis	2,600 meters
Surface of interior	189 hectares; 466 acres
1. Transverse section through housing area: scale	1:5,000
2. Transverse section through city center: scale	1:5,000
Comparative Arcology	
Arcvillage I	
Population	9,000
3. Midlevel plan: scale	1:5,000

The weight of a person will vary from zero at the axis to a a fraction of his earthly weight on the ground. He will be able to fly without the need of any power devices. There will be Dantesque promenades at different levels of physical prowess—from weak (center) to strong (periphery). The in-between skin space is all gadgetry, and the cybernetic dialogue on anticipation, feasibility, and survival will have its instrumentality there. There also are storage, warehouses, and stations of entry and departure.

This is a space community for research in astronomy, physics, and space biochemistry. The cylindrical structure rotates on its own axis. The resulting centrifugal force furnishes a gravity field and a tension pull on a membranelike structure. Man, in different degrees of weightlessness, will, as I said, physically fly from place to place. Man, standing head toward the axis of rotation, will be enveloped in a solid ecology.

The black sky is visible through filtering devices that shield the inside from the direct sun rays.





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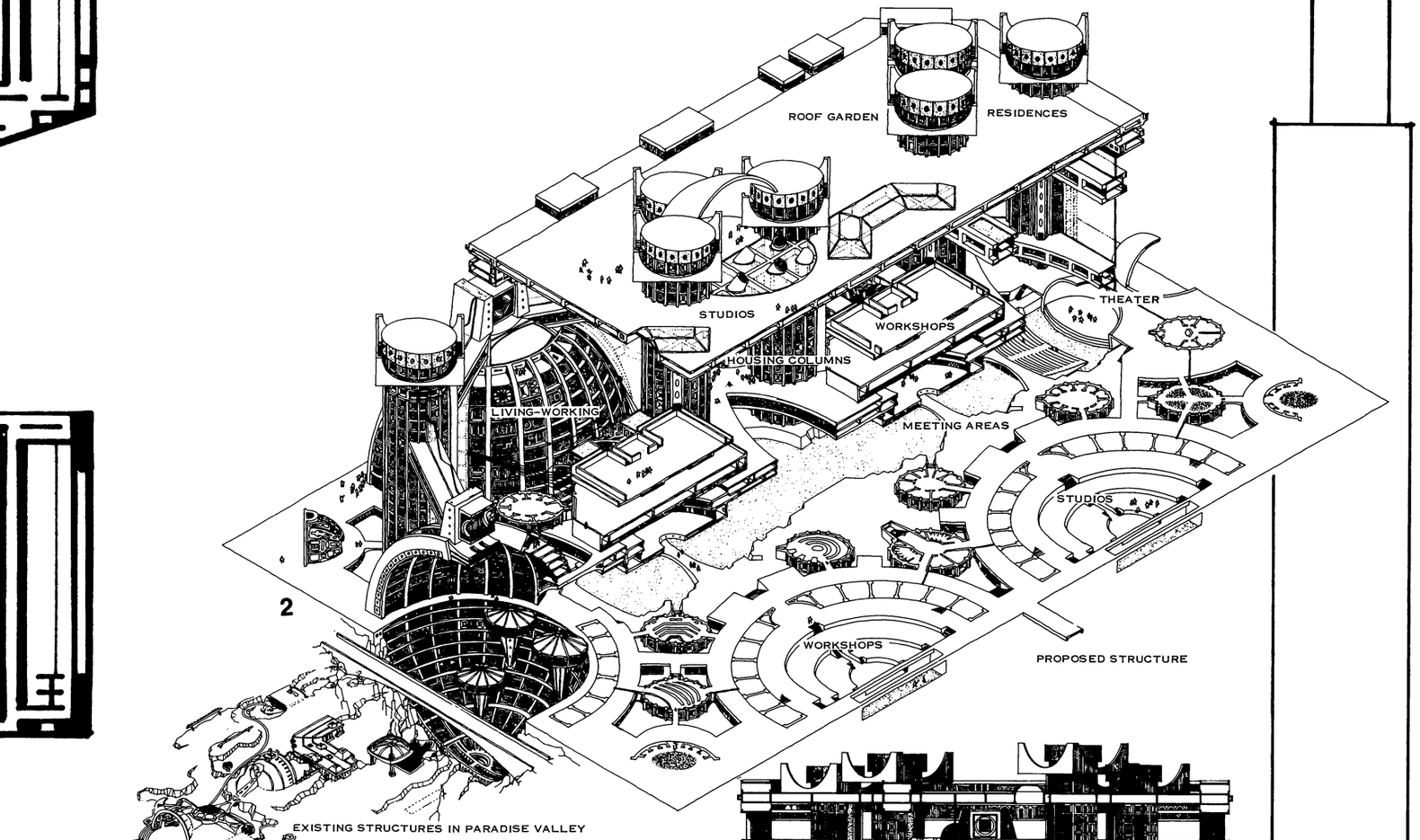

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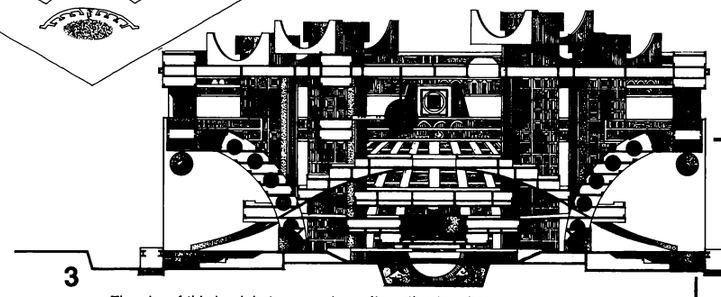
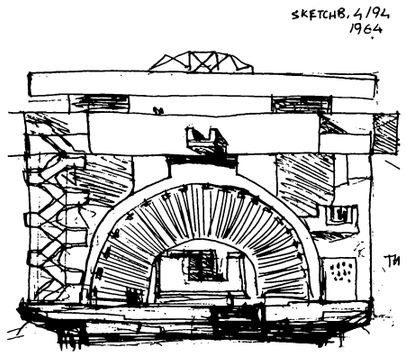


3

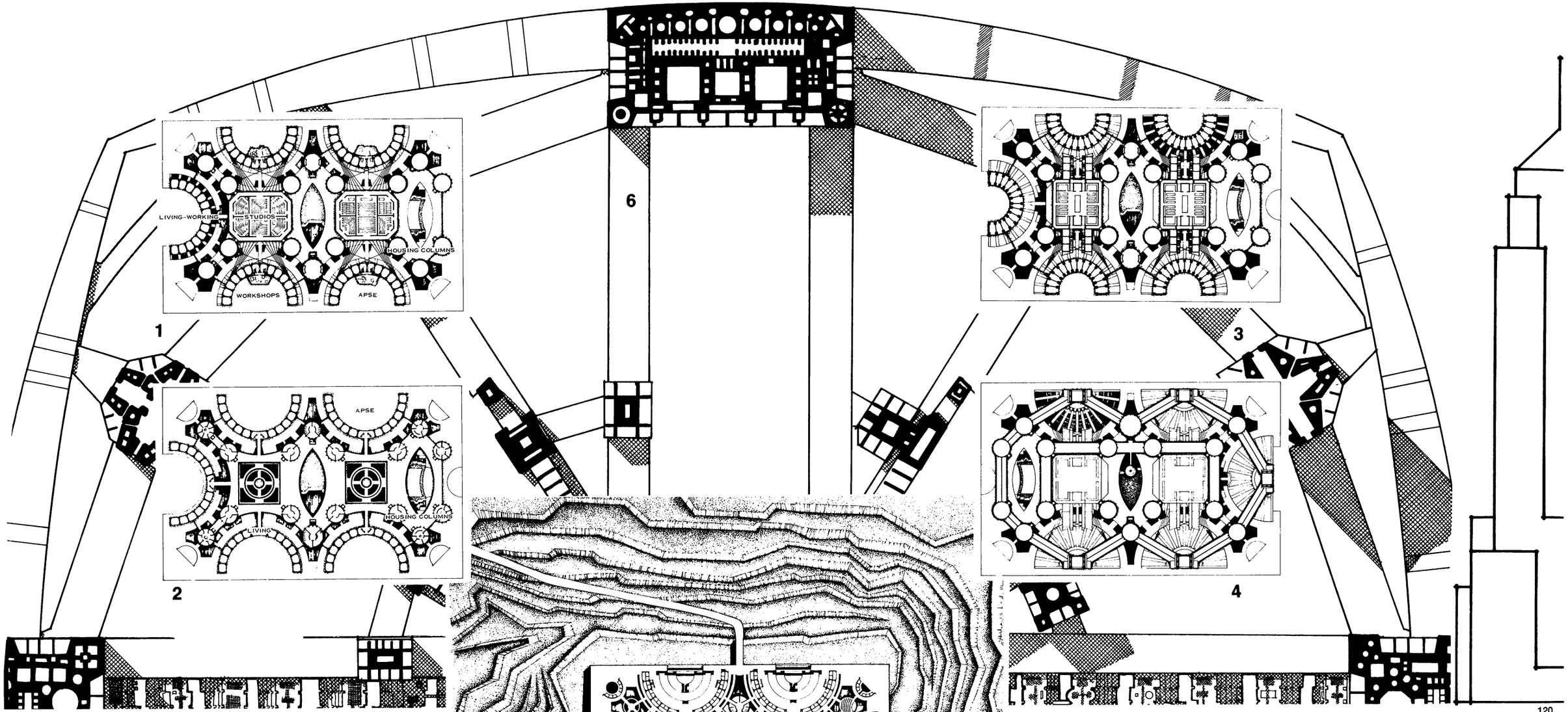
30.Arcosanti

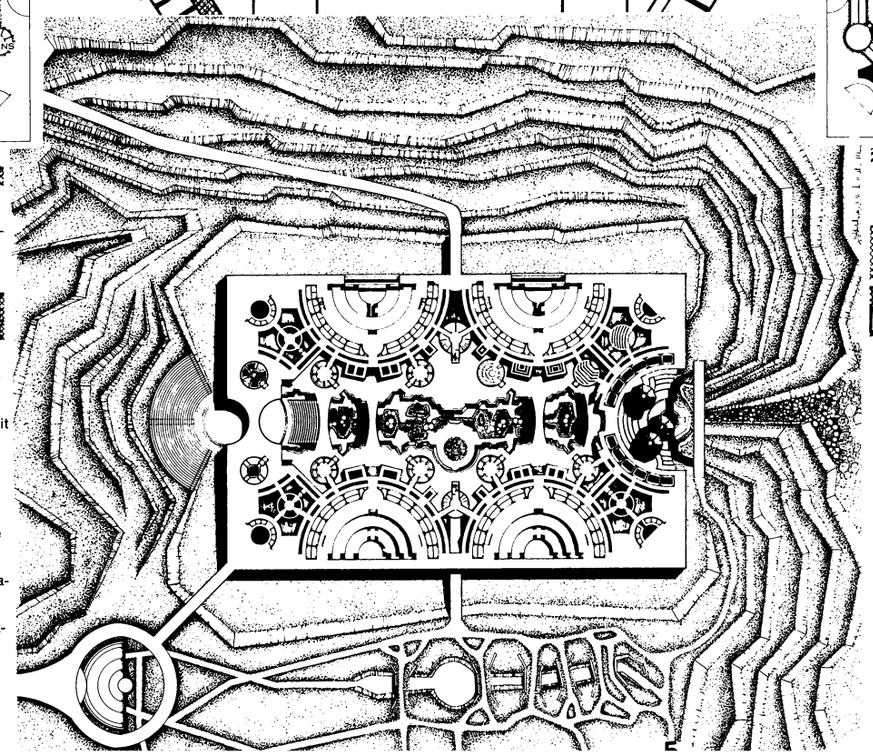


Arcosanti	
(Mesa topography)	
Population	1,500
Density	531/hectare; 215/acre
Height	50 meters
Surface covered	2.8 hectares; 7 acres
1. Transverse section at axis: scale	1:1,000
2. Comparative isometric views of Cosanti Foundation and Arcosanti at same scale	1:1,000
3. Transverse section through axis of apses: scale	1:1,000
Comparative Arcology	
Arcvillage II	
Population	30,000
4. Section: scale	1:1,000

The aim of this book is to present an alternative to urban disaster, and I am presenting here the Cosanti Foundation program. The foundation is engaged in the betterment of man's condition and in conservation of nature, inasmuch as they both depend on the creation of efficient and humane cities. The foundation is investigating new urban patterns and the structural system necessary to their existence. In moving to the second part of the program, the foundation intends to begin the construction of a new complex that will apply and test elements of such patterns and structures at the small end, so to speak, of the urban scale. Because of the physical, cultural, and ethical impasse man has arrived at, I consider this undertaking as necessary, essential, and urgent as any program concerning man.

By going into this second phase, the foundation moves from a micro to a macro scale. Micro-Cosanti has established its own validity by the process of growth that has





30.Arcosanti

taken place in the last six years and by the influence of its work. The activities that have occupied tens of people are now to be developed in such a way as to involve hundreds. This tenfold increase is not arbitrary. It is the congruous step from a concern directed at the family unit to a concern for a social group. I am urbanizing the Cosanti Foundation. It will be a Macro-Cosanti. Then in the larger design that I have been developing, Cosanti will fit as a fiber of direct feasibility.

This fiber is by definition experimental. (Indeed nothing in the urban dilemma is anything but experimental. We are groping, groping or dying, a thing that must enter the minds of policymakers, powerholders, planners, and architects.) It will be experimental but not haphazard; in fact, there is an overriding discipline. The valid foundation for urban life is the open acceptance of the same tenets guiding any other form of a supercomplex interworking of purposes and functions, the extreme compactness of the physical system that sustains and supports them.

There is a structure of things that must be sought in a degree directly proportional to the degree of complexity of such things. The avalanche of life and "goods" that is cascading on us is begging for a structure. Meaningfulness is not something that extravagantly comes into being. Nothing in the universe has such kindness in store for man, nor can we seriously desire such casual demiurgy.

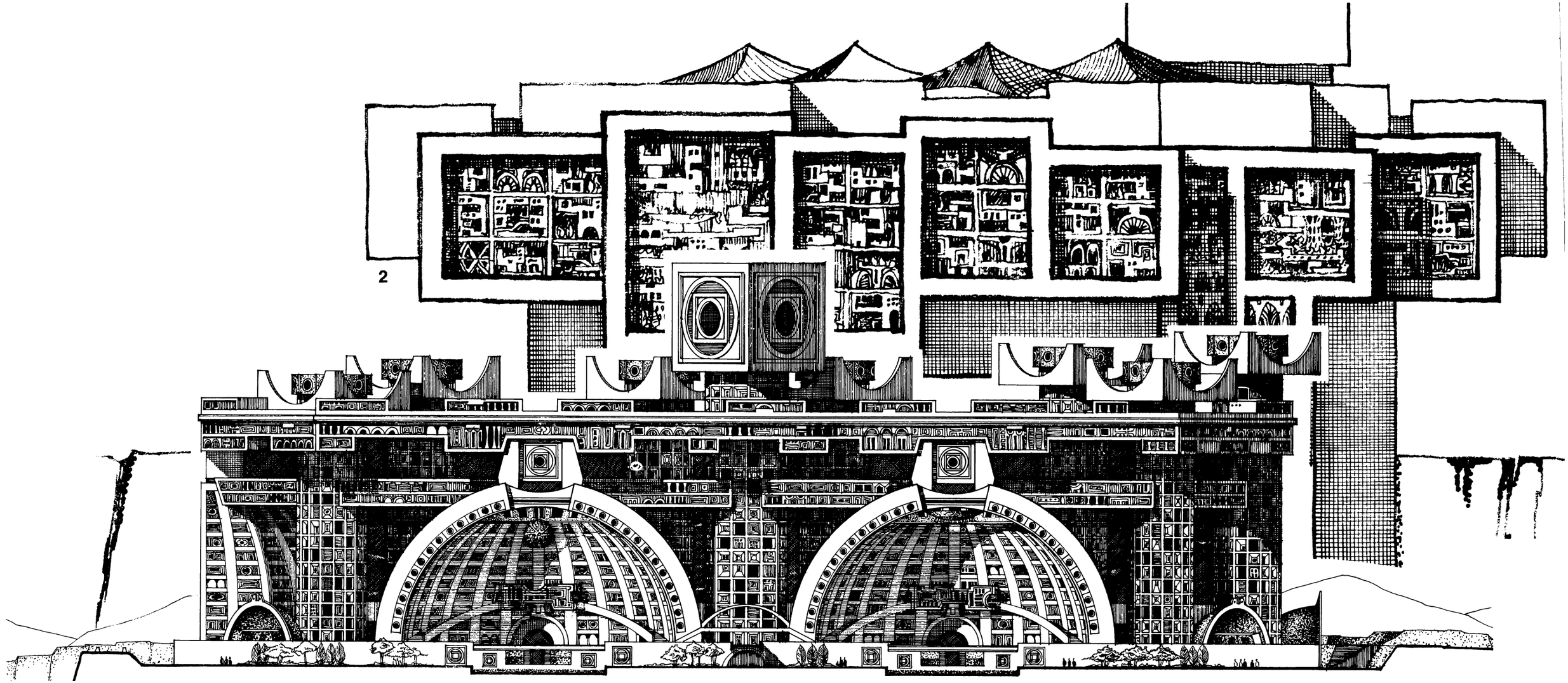
If it is true that there are structural priorities that every civilization must define for itself, then to make sense out of our physical environment has a very urgent call for priority. Macro-Cosanti will be a testing ground for environmental concepts that seek coherence between aims and ends. Macro-Cosanti will apply arcological concepts. I call it Arcosanti, and we are now actively working at the initial phase.

Arcosanti
(Mesa topography)

Population	1,500
Density	531/hectare; 215/acre
Height	50 meters
Surface covered	2.8 hectares; 7 acres
1. Plan of suspended floor level: scale	1:2,000
2. Plan of concrete floor level: scale	1:2,000
3. Plan of top bridge floor level: scale	1:2,000
4. Plan of beam dwelling level: scale	1:2,000
5. Ground floor plan and layout: scale	1:2,000

Comparative Arcology
Babel Canyon

Population	250,000
6. Partial midlevel plan: scale	1:2,000



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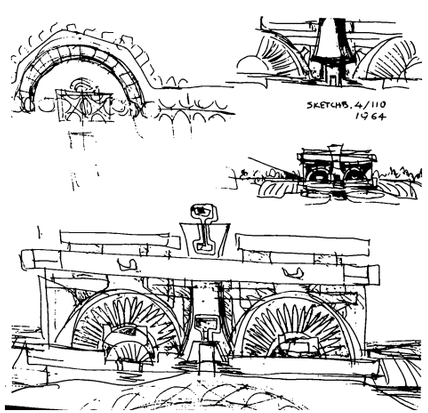


30.Arcosanti

1

Arcosanti
(Mesa topography)

Population	1,500
Density	531/hectare; 215/acre
Height	50 meters
Surface covered	2.8 hectares; 7 acres
1. Elevation: scale	1:500

Comparative Arcology
Arckibuz

Population	2,500
2. Elevation: scale	1:500

This project is designed as the new environment for the Cosanti Foundation, and we hope it may be initiated soon with the help of scores of students from schools of this and other countries. The main concern of the community-school is investigation of and experimentation with arcological concepts. This design is for a community of about 1,500 people. It covers 6 acres and is about 150 feet high. Its module is the individual rather than the family because a high percentage of the population would be students and apprentices. Working, learning, living, and playing are all "under" one roof, with a density of about 200 persons per acre.

The "heavenly" determinant: if the cosmography governing the land were square, that is, if a square sun rising vertically on the straight horizon were to describe a square orbit in the cubical sky, the scheme of the structure and its parts would be square. For our spherical (elliptical) cosmography the structural morphology (parts of it) is spherical (curved). The reason for making this dependence is not farfetched because in the Cosanti Foundation many of the activities are to be developed in sheltered-but-open spaces. To succeed in this, the main problem is to tame the sun by selecting those radiations that are "kind" and rejecting those that are "unkind." Its curve trajectory demands curved "traps."

In any given system the most complex quantum is also the liveliest one. In any given system the liveliest quantum is also the most miniaturized.

A. Life proceeds by countless performances of ever-increasing complexity.
B. Such performances take place in proportionally shrinking spaces.
Then
C. To any increment of complexity inevitably corresponds a contraction or miniaturization of the performing system.

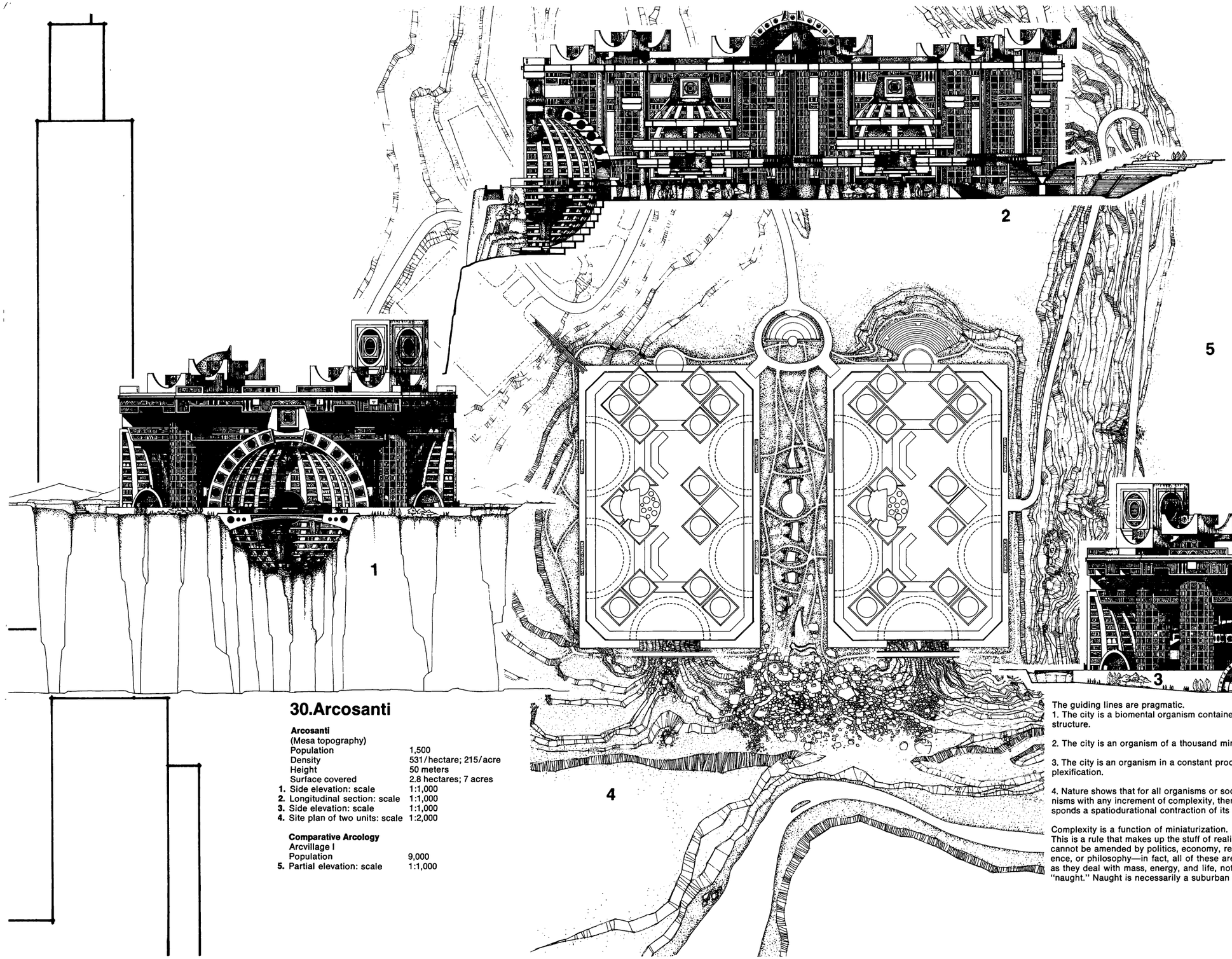
The urban phenomenon is
A¹. A process of increasing complexity,
B¹. A process that must take place in proportionally shrinking spaces.
Then
C¹. As the incremental complexity of urban society is irreversible, a miniaturization of its structure becomes indispensable.
That is to say
D. Urban obscurantism will not resolve itself in favor of man outside the elementary and universal rules of complexity miniaturization.
E. The Cosanti program is the only thrust into the urban dilemma that consciously and unreservedly abides by these rules.

The subject is the city.
The aim is
1. A historically sound concept of the morphology of the city as an evolving organism.

2. A testing of the conception by a verification process, transferring ideas into the actual construction of a micro-city.

3. To proceed from beginning to end of the program, already under way, in the manner of an open-ended process to be lived in and experienced by some thousands of apprentices and students.

Priority
The definition of the physical structure which is indispensable for the social organism that will inhabit it.



30.Arcosanti

Arcosanti
(Mesa topography)

Population	1,500
Density	531/hectare; 215/acre
Height	50 meters
Surface covered	2.8 hectares; 7 acres
1. Side elevation: scale	1:1,000
2. Longitudinal section: scale	1:1,000
3. Side elevation: scale	1:1,000
4. Site plan of two units: scale	1:2,000

Comparative Arcology
Arcvillage I

Population	9,000
5. Partial elevation: scale	1:1,000

The guiding lines are pragmatic.
1. The city is a biomental organism contained in a mineral structure.

2. The city is an organism of a thousand minds.

3. The city is an organism in a constant process of complexification.

4. Nature shows that for all organisms or society of organisms with any increment of complexity, there corresponds a spatiodurational contraction of its functions.

Complexity is a function of miniaturization.
This is a rule that makes up the stuff of reality itself and cannot be amended by politics, economy, religion, science, or philosophy—in fact, all of these are of it as long as they deal with mass, energy, and life, not with "naught." Naught is necessarily a suburban melancholy.

5. The enormous complexification working itself into the social organism makes mandatory a correspondingly enormous contraction of its urban container.

6. It is then evident and inevitable that this scatterization, tearing apart our towns and cities, is a degenerative process, not a growth process. It is necessary to have instead a miniaturizing contraction.

7. The miniaturization rule, a direct injunction of the logistics of matter-energy, must be respected universally. It must be observed by any system offering a physical modicum that will afford a sound and swift logistic for society and thus set the premises for the physical freedom and exuberance needed.

Structure comes before performance.