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A Forming System for Concrete Components

John J. Johnson IV

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FORMING SYSTEM FOR CONCRETE COMPONENTS

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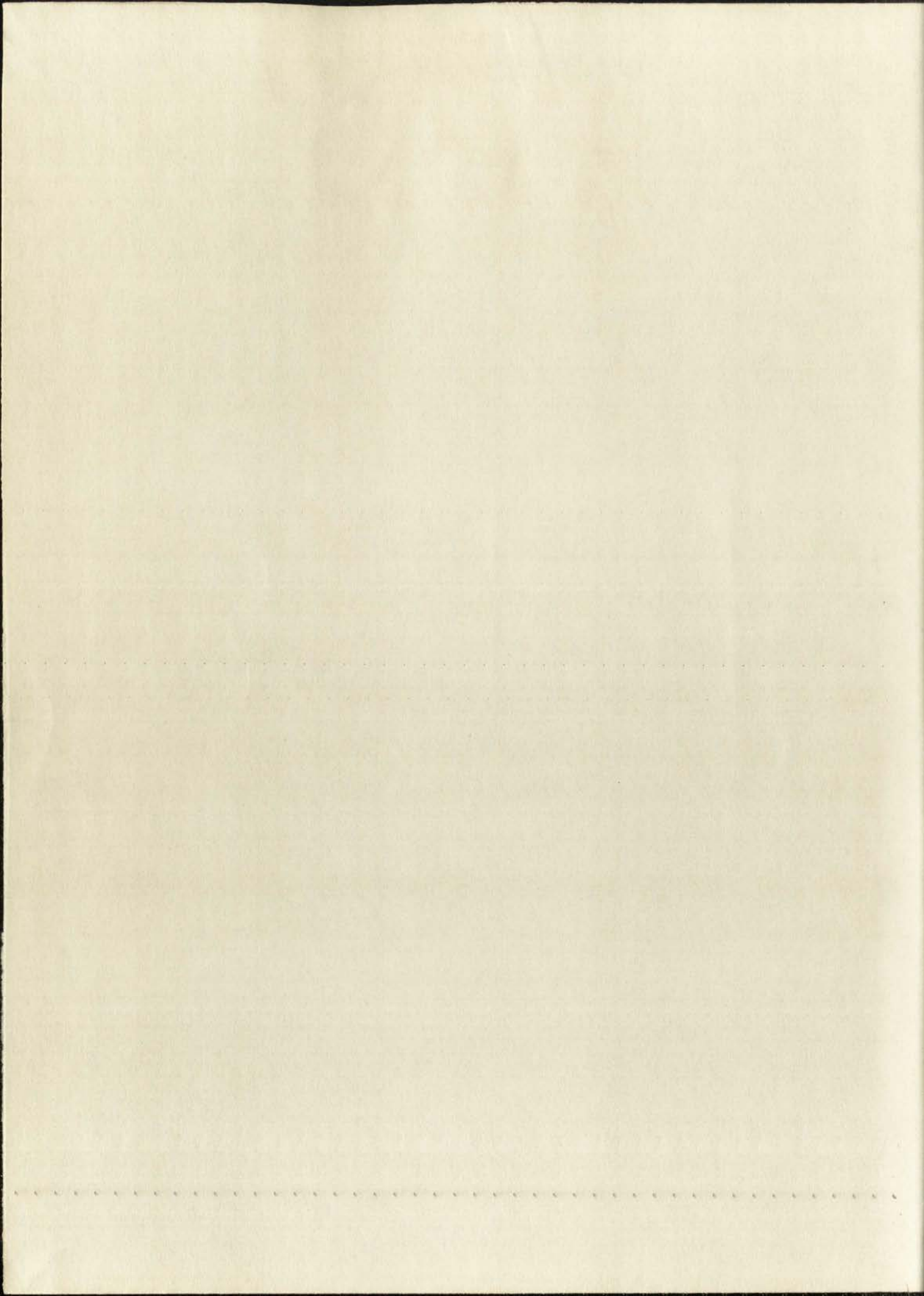
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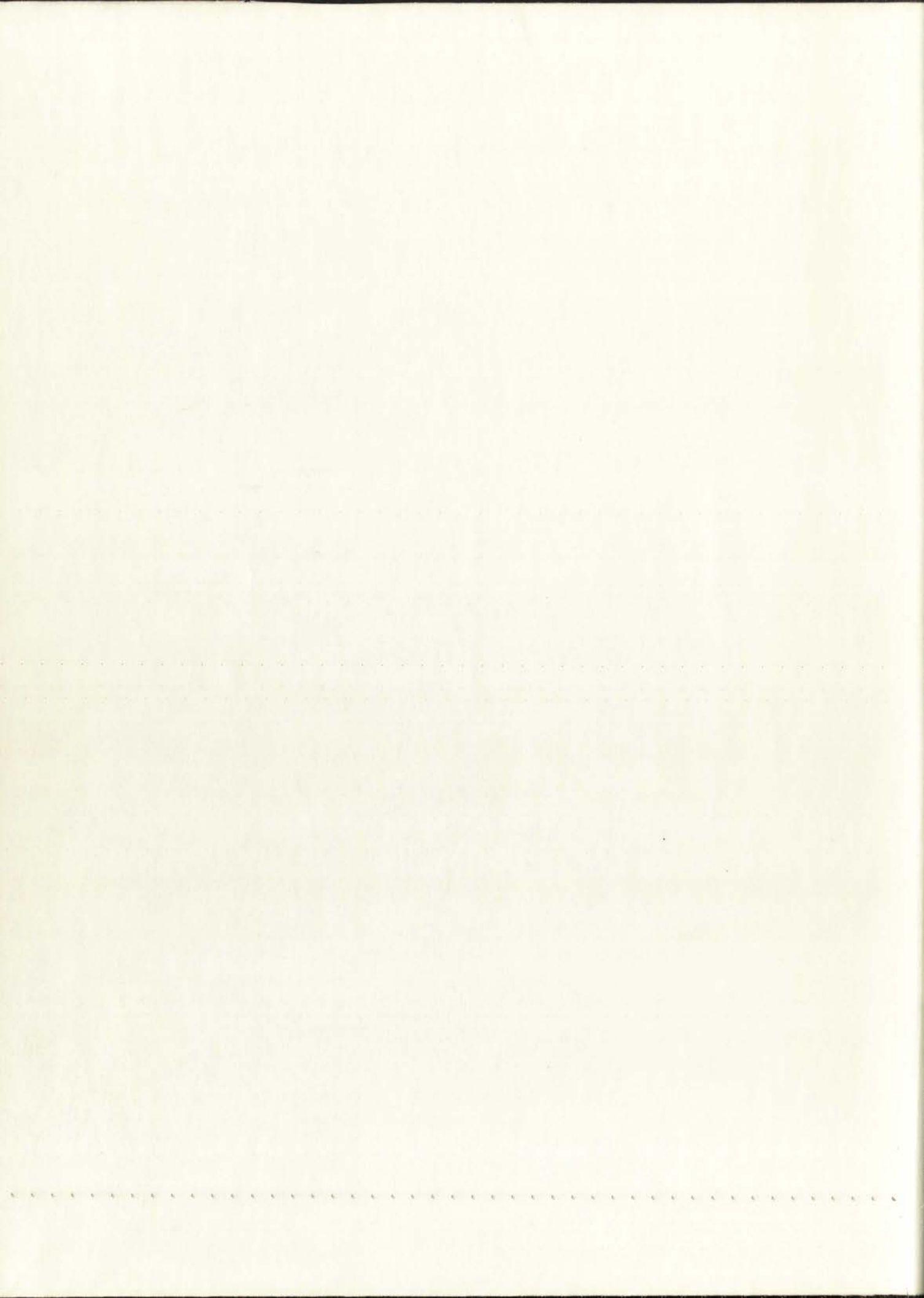
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A FORMING SYSTEM FOR CONCRETE COMPONENTS

John J. Johnson, IV

May 1969

In partial completion of the requirements for the degree
of Bachelor of Architecture at the University of New Mexico.

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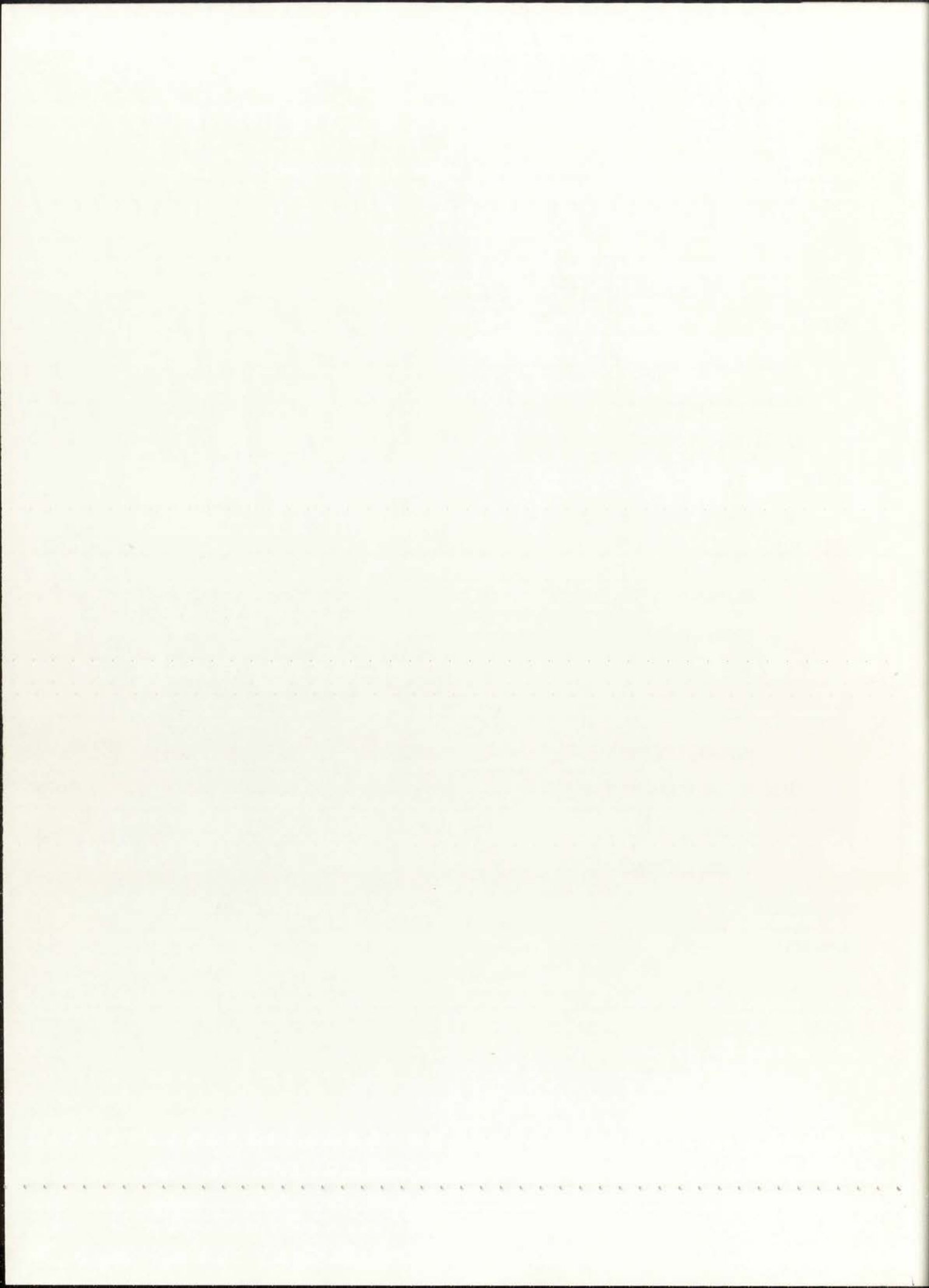
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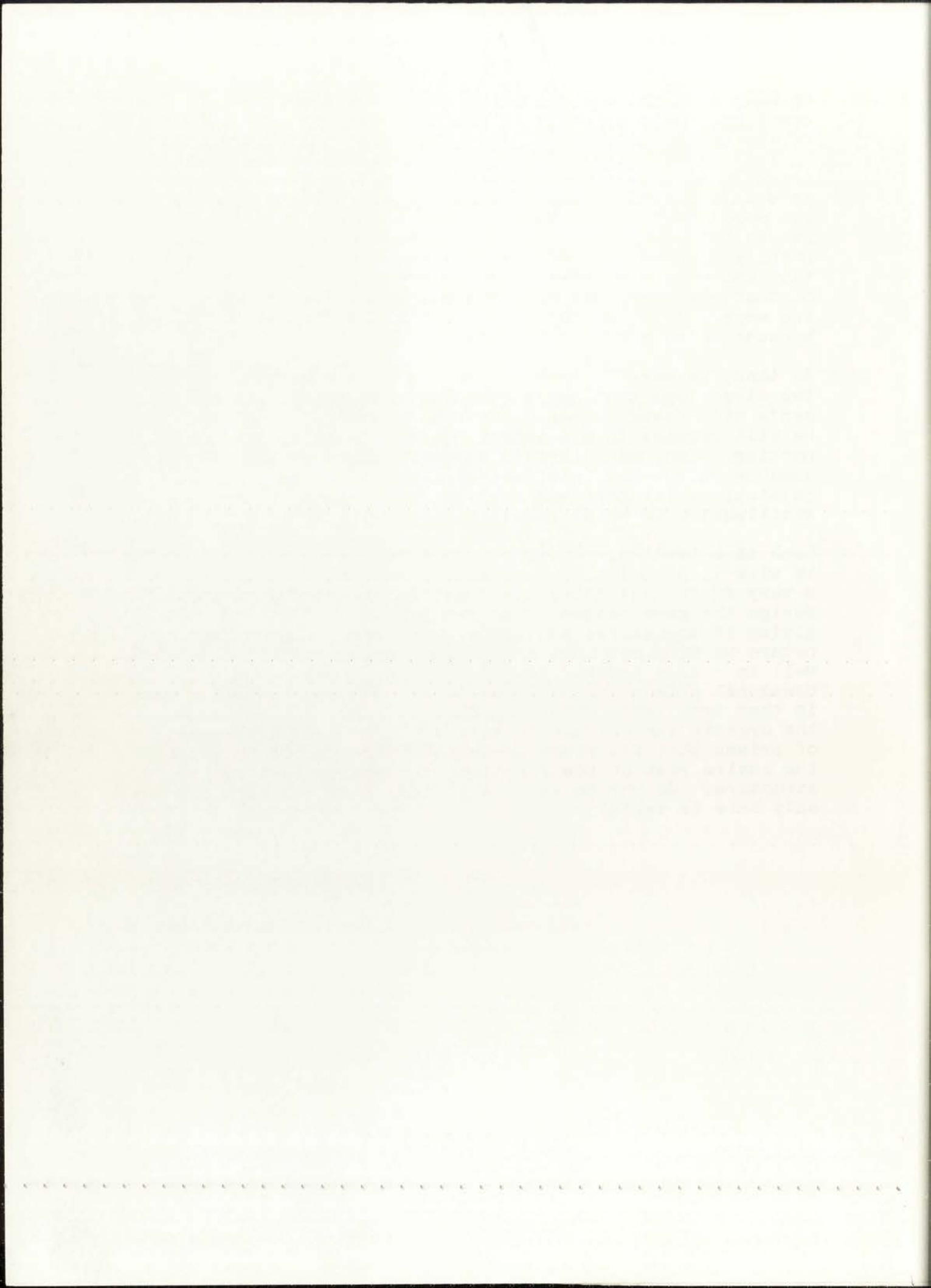


On styles and systems of Architecture

We have a direct correlation between the complexity of the organism, the complexity of the structure and the complexity of the social structure. This is to say that there exists an inverse function between the complexity of the living organism and the simplification and sublimation of the structure in which that organism lives. We are getting more and more specialized, but as the technology advances, we get to the point where the person or organism that does nothing becomes much more important, purely and simply so that there is some reason to produce. And if the quantity of that organism goes up, we start something that says that the more complex we become, actually the simpler we become, because we've got less and less to do.

So then, we have to become more and more concerned with the two directions that man's social structure can go: one, if man's mind doesn't keep up with his physical progress, then he will regress to his animal state. Total energy -- total nothing. Two, man, through megastructures or whatever, somehow raises his intellectual achievement to equal his physical achievement and society then becomes a true civilization in which megastructures will truly function.

Look at a beehive. There is a module. The hexagonal prism. We view it as being an essentially aesthetic thing. It's a very functional thing. And yet in everything that we design the game becomes find the system or find the module, giving it structural integrity. And when we draw from nature we find out that a hexagonal prism doesn't fit very well in a tree trunk. You've got many thousands of hexagonal prisms in that tree trunk, but you have also got in that tree trunk something that is a transition between the organic and the manufactured. It is the little parts of prisms that fit right against the tree trunk to support the entire rest of the function, the entire rest of the structure. So why do we have to take just one part and say only this is valid?



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The divisions evidenced within the field of architecture are becoming more and more apparent, and more rapid in their occurrence.

It is difficult to conceive that in a profession which must attempt a total involvement with and thereby understanding of people can have so little cohesion and/or communication within itself.

One aspect of the problems eminently facing the profession of architecture is the question of the future role of the architect, and the definition of the term "architect".

This question might not find answers in debates or philosophical theorizing, it may; however, be partially answered by the existence of many voids heretofore untrespassed by members of the profession.

The pressing need for trained problem solvers, knowledgeable in many areas, to act as interpreters; as interdisciplinary cohesive agents seems to make the question not so much "why" as "why not?".

There are members of the profession, trained in architecture who then specialize and become landscape architects; but I question the validity of the title within the frame of reference of regional planning and/or architecture. What of plant ecology, of agronomy, of genetics and of many other facets of the study of plants normally left to the biologist or farmer?

The first of these is the question of the validity of the question itself. It is not clear that the question is well-posed or that it has a unique answer.

It is also not clear that the question is well-posed or that it has a unique answer. The question is too vague and the answer is too subjective.

The second of these is the question of the validity of the question itself. It is not clear that the question is well-posed or that it has a unique answer.

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The southwest is just beginning to feel the problems long experienced in the eastern parts of the country. The vast empty wastelands are acquiring value to developers and planners as the more valuable cultivated land is covered with concrete and asphalt. In this context, if the landscape architect is truly to be of value as someone beyond a planter of pretty bushes, he must possess a working knowledge of his field beyond the picking of plants for color and shape.

The situation that exists for the landscape architect exists for the technically inclined person trained as an architect; but in a more abstract form, since in the realm of the "technologist", aesthetics do not generally seem to be considered as a function of the field.

Most people tend to correlate, directly and specifically, technology and machines; and I feel this is a drastic error. Technology is no more than the study and knowledge of technical information. Since almost any field of human endeavor encounters the need for, and the use of technical information; the equating of technical information or technology to machines alone could imply that a painter of the most anti-machinistic bent is nothing more than a technician or mechanic. I prefer to define technology as applied knowledge within a field or fields. This then relieves the painter of his role as technician and returns him to the



more comfortable position of being able to use his technical knowledge as a tool, just as he might use a brush or pallate knife.

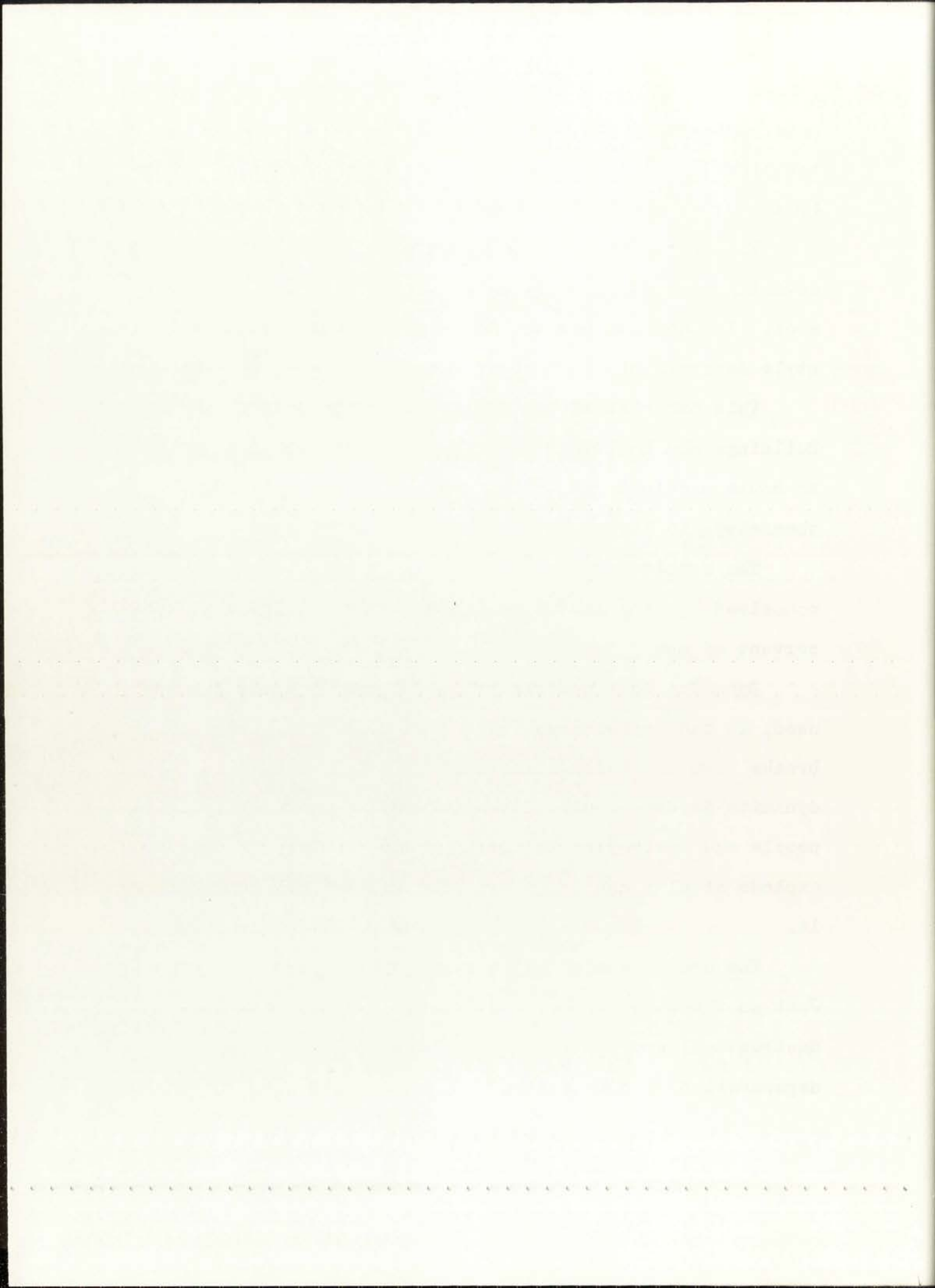
With rare exceptions, in the use of machines, for every advantage gained, some concession must be made in another area. If machines become the only consideration as a life-style determinant, then truly the machine will rule man.

This has been reflected in much contremporary architecture. Buildings and building complexes have been designed solely to house machines and tools. People have had to adapt themselves to living in warehouses and tool sheds.

The machine, regardless of complexity, is a tool conceived by man; and is relegated to the position of the servant of man.

Dynamite is a powerful tool. Properly cared for and used, it can be constructive. When neglected, the content breaks down and becomes unstable. In this unstable state, dynamite is dangerous. It may explode prematurely, killing people and destroying things in a wide radius; or it may not explode at all, causing extra work and expense in replacing it.

The creative mind is in some ways analagous to dynamite. Just as the mind can be creative, so the mind can be destructive; and destruction follows the stagnation and degeneration of creativity.



In his cities, man, in general, has come to think of machines in terms of equality and even superiority. In such instances, creativity is degenerating, and destruction will follow because man is no longer designing for himself-- he is designing for the machine; and ignorantly accepting the scraps that "technology" is deign to throw his way.

The need for tools and machines is very real, and the many advantages available through the use of these tools is more than evident; but that the structures that house men and their emotions and spirit should be basically machinistic rather than humanistic is the fault of the architect. Perhaps the "architect" does not exist anymore in the historical sense of builder, but it can be assumed that no entity will cease to exist unless it is useless.

History can perhaps imply the successes or failures of architecture; but a complete history of anything has never been written, for to be complete, the conversations and even the thoughts of the participants would have to be recorded.

The task of connecting transpired events falls to the historian; and through his training he objectively and logically attempts to connect social conditions, economics, technology and politics to these events.

An evaluation of products that have emerged from various cultures or periods of time can only be valid if the critic logically and objectively considers the elements of the society which produced the objects of his study.



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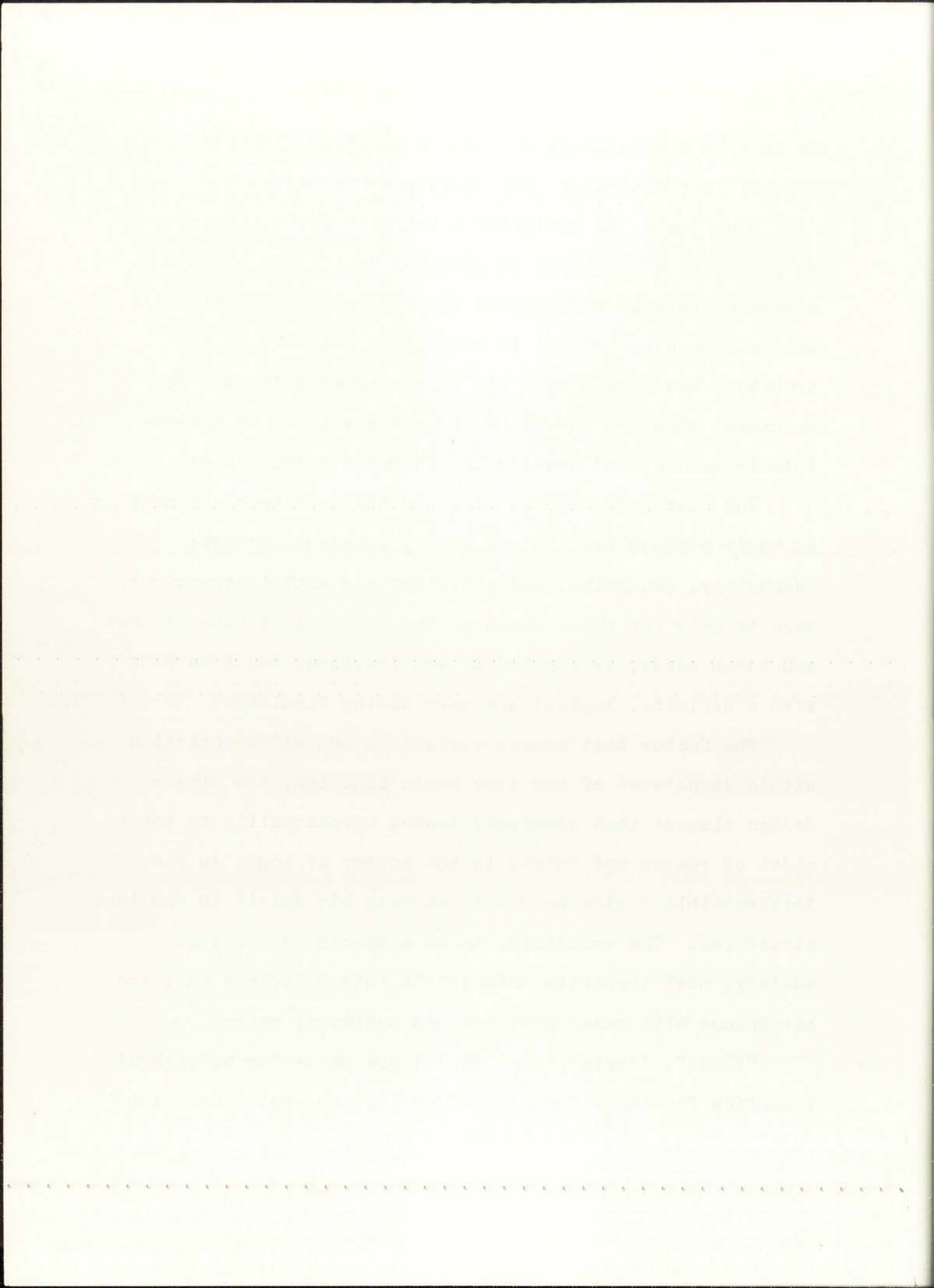
It is from the rational connection of these elements to the product that his value judgements must be made.

Architects, in designing a building for a client, can only produce a structure as pleasing to the client as the architect is able to evaluate the elements of the client's nature. When the client is society in general, if the architect has prostituted his values by equating men to machines, then the resultant structure will be of a machinistic nature, and hostile to the human spirit of man.

The historian, the critic, and the architect all have at their command certain relatively constant factors; technology, economics, and political and social structures. Were it only for these factors, the connections between them and human needs, as applied to architecture, could be made with a definite, logical and very boring finality.

The factor that causes variations and differentiation within structures of the same basic function, the single design element that seemingly causes irrationality in the midst of reason and whimsy in the center of logic is the irrepressible desire by man to express his spirit in physical structures. The architect, to be a meaningful part of society, must translate this spirit into buildings that are harmonious with man's physical and spiritual needs.

"Vogue", "taste", and "style" are bases for battles of semantics for those "designers" of limited vision who wish

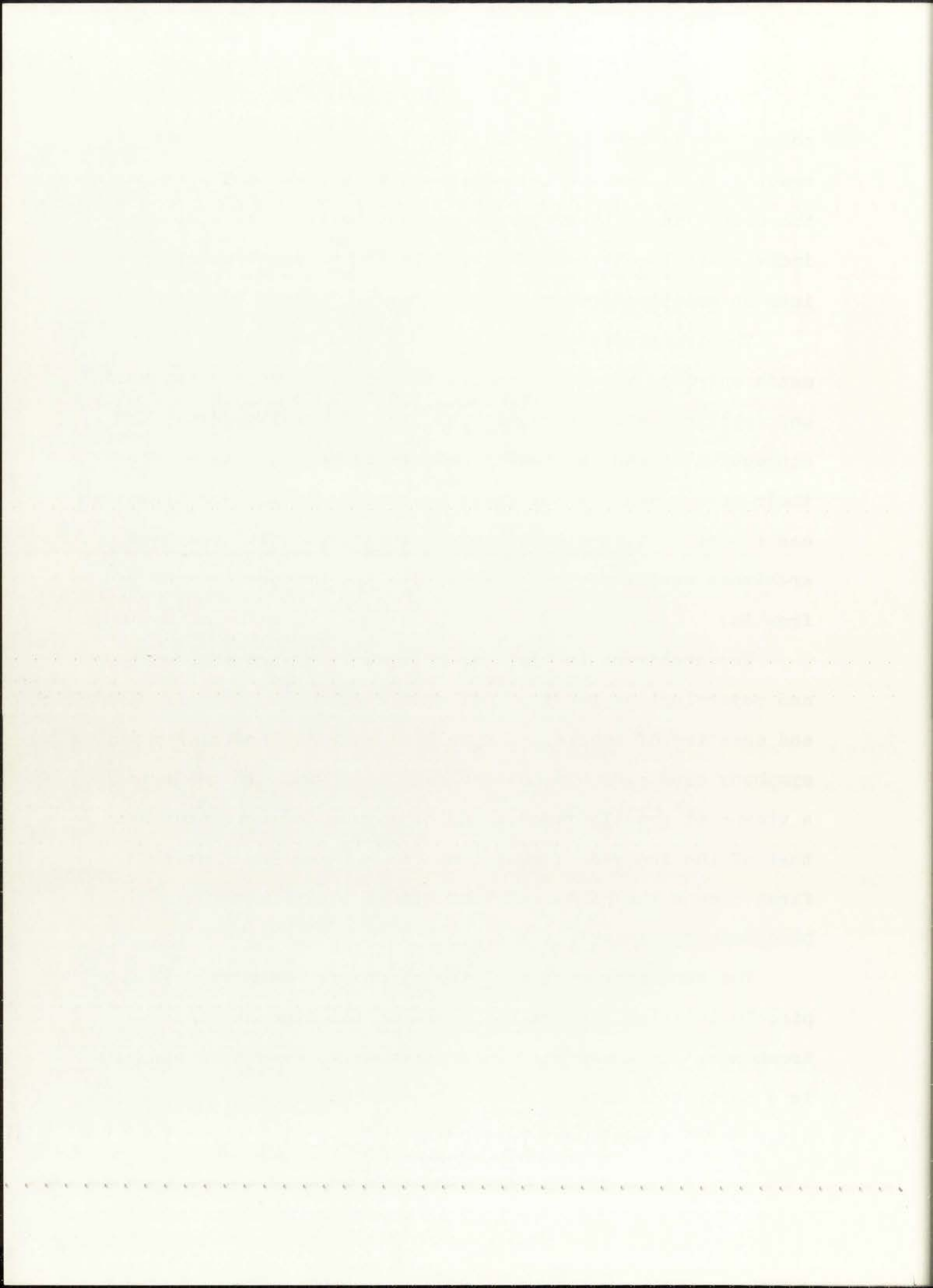


to achieve personal, myopic goals. The further evolution of creative man, and thereby man's creative environment, demands the cessation of these bounds imposed by creatively stagnant individuals involved in the translation of the human spirit into an architectural vacuum.

The translation of the variable (the expression of man's spirit), to the constants (technology, economics, social and political structure), is the base of architecture. The connection of man to himself, of men to men, and of men to their environment is the creative human spirit. The historian can theorize it, the critic must consider it; but only the architect must live in it, work with it, and design anew from it.

The architect in his task of satisfying the environmental and psychological needs of man must remain the most far-sighted and creative of people. His role is akin to that of the symphony conductor who must consider the whole theme from a viewpoint greatly removed and of a much larger scale than that of the individual musician. He must be the flux that first cleans the parts and then guides their flow into a homogeneous, compatible whole.

The conductor must feel the symphony. He must feel the piccolo trilling against the blare of the trumpets and trombones. He knows that each instrument, each measured beat is a part; that without the counter-melody, the melody loses a part of its sense of place. The syncopation, the point

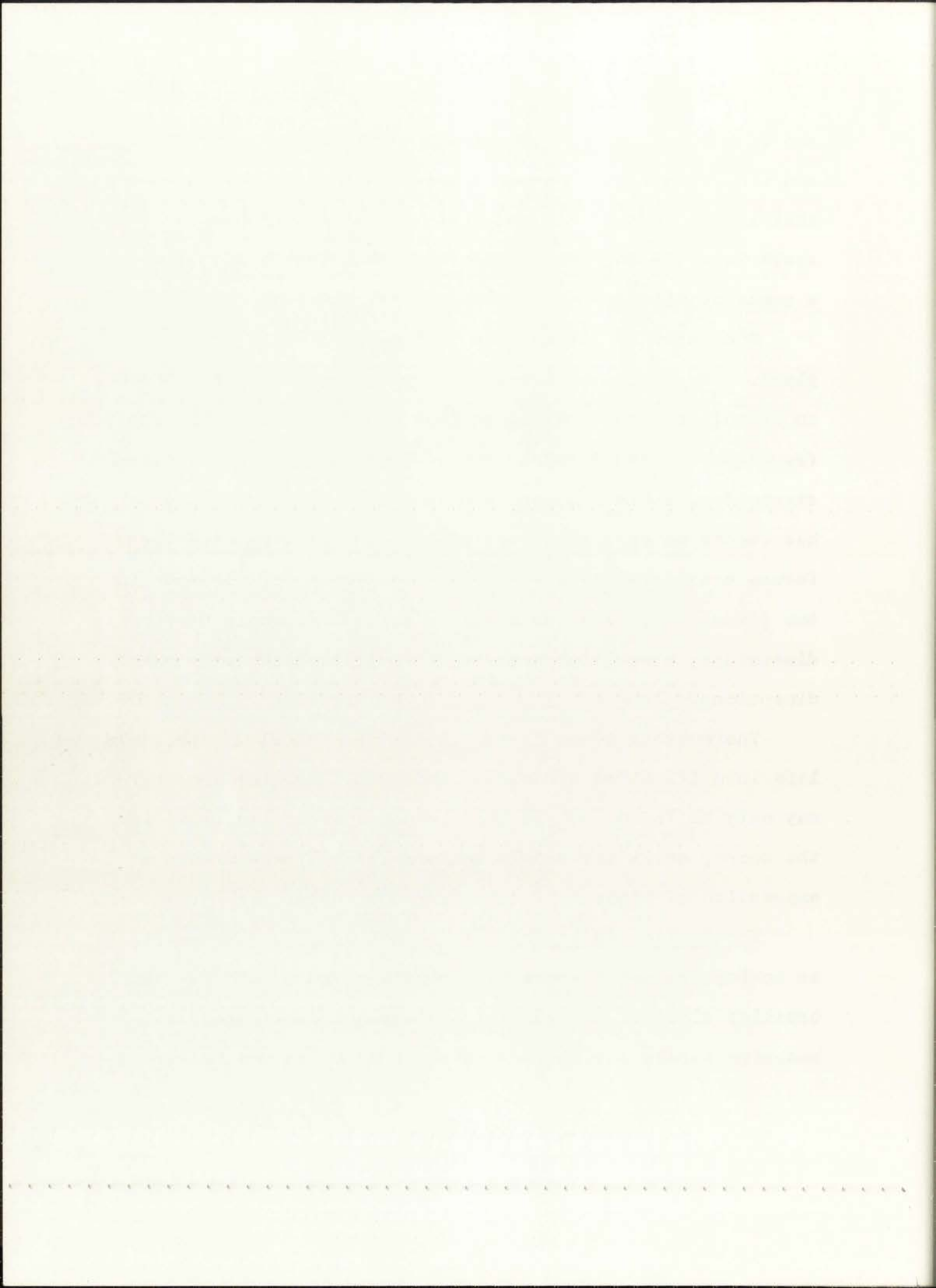


and counter-point play of the piccolo against the trumpets and trombones gives to each instrument a scale and a value that is not lost in the monumentality of the symphony. This scale is valid only when directed with a feeling for time and a sense of place.

Contemporary cities have lost part of their sense of place. The whole has areas of atrophy, and place has become an expedient with a resulting loss of cohesion and thereby a fragmentation and displacement of human spirit into dead, segregated, isolated, concrete and steel containers. Time has become an entangling net of past and present with the future considered as a mere juxtapositioning of elements in two dimensions. Just as man is a volumetric whole of three dimensions, his cities must be volumetric wholes of three dimensions.

The musical score is two dimensional until man breathes life into its third dimension; and even then, the symphony may only be "adequate" if the conductor mechanically follows the score, or it may become a living, vital part of man's expression of himself if the conductor feels.

The feeling is living. It is not only involvement it is an acute, trained awareness, perception and empathy -- the creative minds of men remaining clear and fully used, not becoming purely rational calculators that can sum the past,



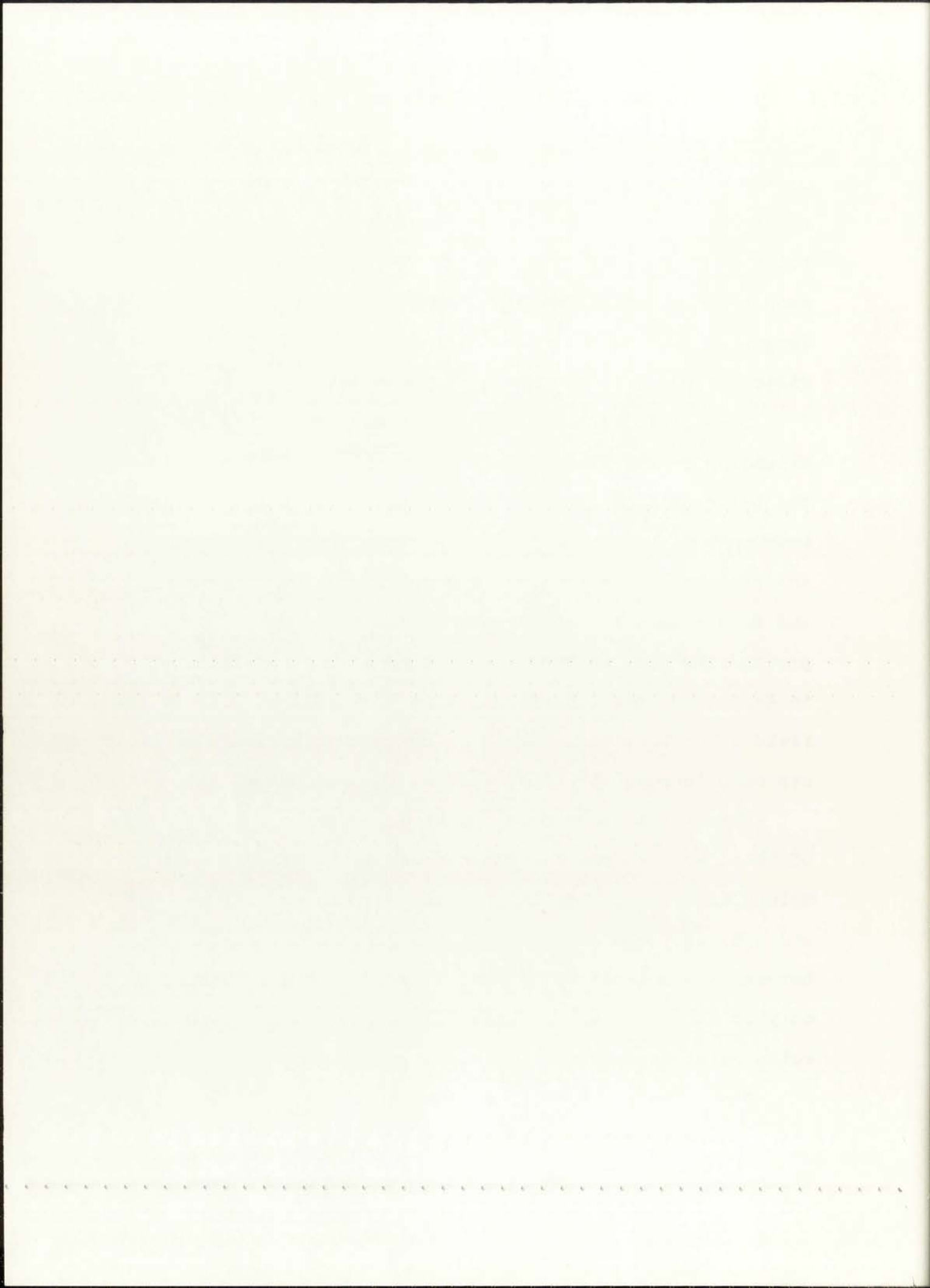
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subtract assumed mistakes, obtain a sub-total, add technological advances to produce a calculated, up-dated, empty repetition of history. This openness and creativity of mind builds for the architect an irreplaceable vocabulary, for even the most brilliant of minds cannot translate from one language (the spirit of man) into another language (the cities of man) if the words do not exist.

Some professions seem to delineate themselves spherically, expanding in all directions; for example, medicine. Although the basic unit of study is the human, this unit is variable from unit to unit, and not fully known; therefore knowledge and research emanating from the basic unit, the human can and does extend in all directions simultaneously. Other professions grow cylindrically, lengthening and increasing in depth, but not expanding. A good example of this is the field of mathematics. Based on the number system, the field can only increase in depth because the foundation is constant.

Many times there seems to be an order to the grouping of these spheres and cylinders, much as in the grouping of molecules of some chemical compound. Between these cylinders and spheres there must exist a bond, and since the contact between two spheres or between a sphere and a cylinder, is only at one point unless they intersect; it must hold that voids exist between the individual units.

Since the consideration is of professions of men, then the bonds that hold the professions together would tend to be in the form of communication. The number of bonds per



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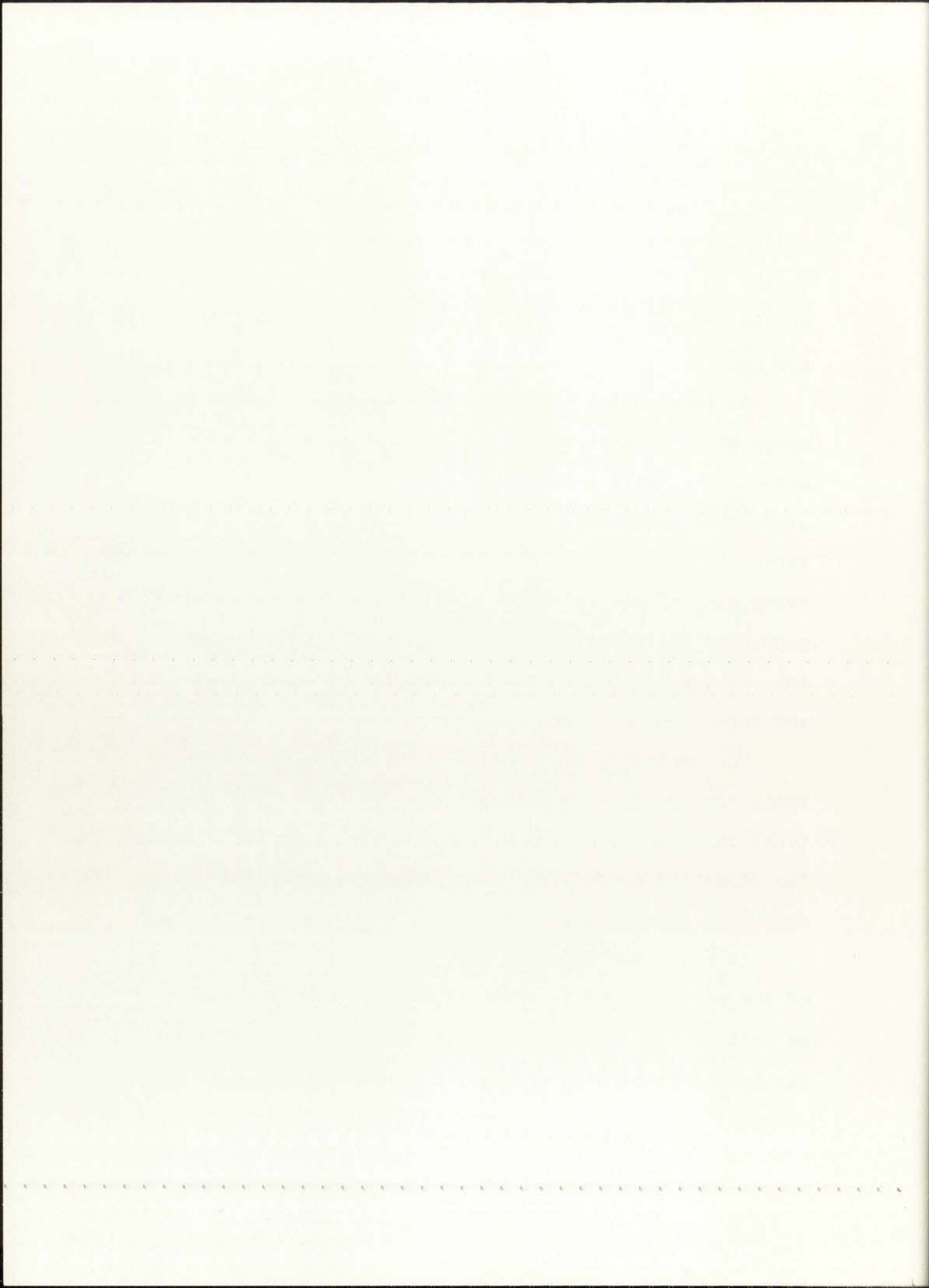
profession is directly related to its size, scope and shape.

Basically, a language is the beginning of communication, and whether that language is visual, olfactory, tactile, smell, or taste makes little difference. The point is that within each of these senses we use for communication, there are inherent obstacles and voids.

As long as the various professions are limited by their means of communication the problems of inter-relation between them will remain difficult. The physical and structural isolation of one profession from another only serves to compound the communication problem, therefore, the overcoming of obstacles and the filling in of the voids is made more difficult simply through the lack of proximity to the problem. The result as in chemistry is the breakdown and degeneration of the compound.

The societies of men, and their states of existence today are in direct relation to the attitudes that men have taken in determining the manner in which they train themselves. The direction of mankind in the next few generations will determine the direction of man for many centuries to come.

It has taken 24 years for the impact and a realization of the scope of atomic power to begin to reach a large majority of the world's population. The result of this partial comprehension of power has been unreasoning fear



which has served as the motivating force for most of the chaotic events we are able to observe today, and which are termed "social revolution".

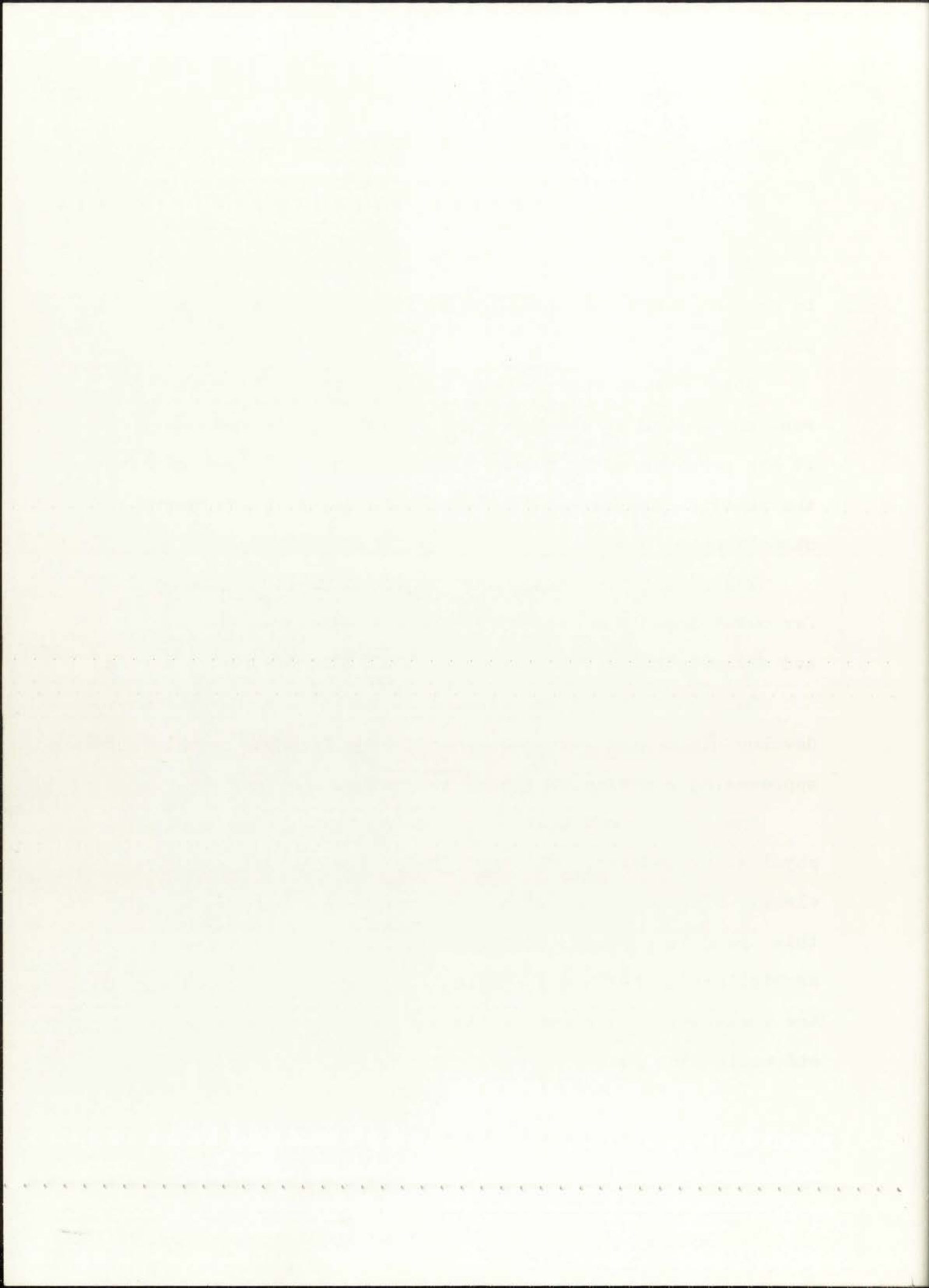
There is nothing new in what is happening today. Fear is as old as mankind, and fear of the unknown is the most powerful drive in humans.

Governments, wars, and religions have all been started, run, and fallen or changed based on fear of the unknown. It has remained until recent times; however, for man to have the power to change and even eradicate not only his social structure but himself in a period of a few hours.

The realization that mans' physical developments have far outstripped his mental developments dictates the need and determines the future role of the architect.

Man must have an environment in which he can begin to develop his mental awareness, because he (man) is rapidly approaching a choice of one of two paths.

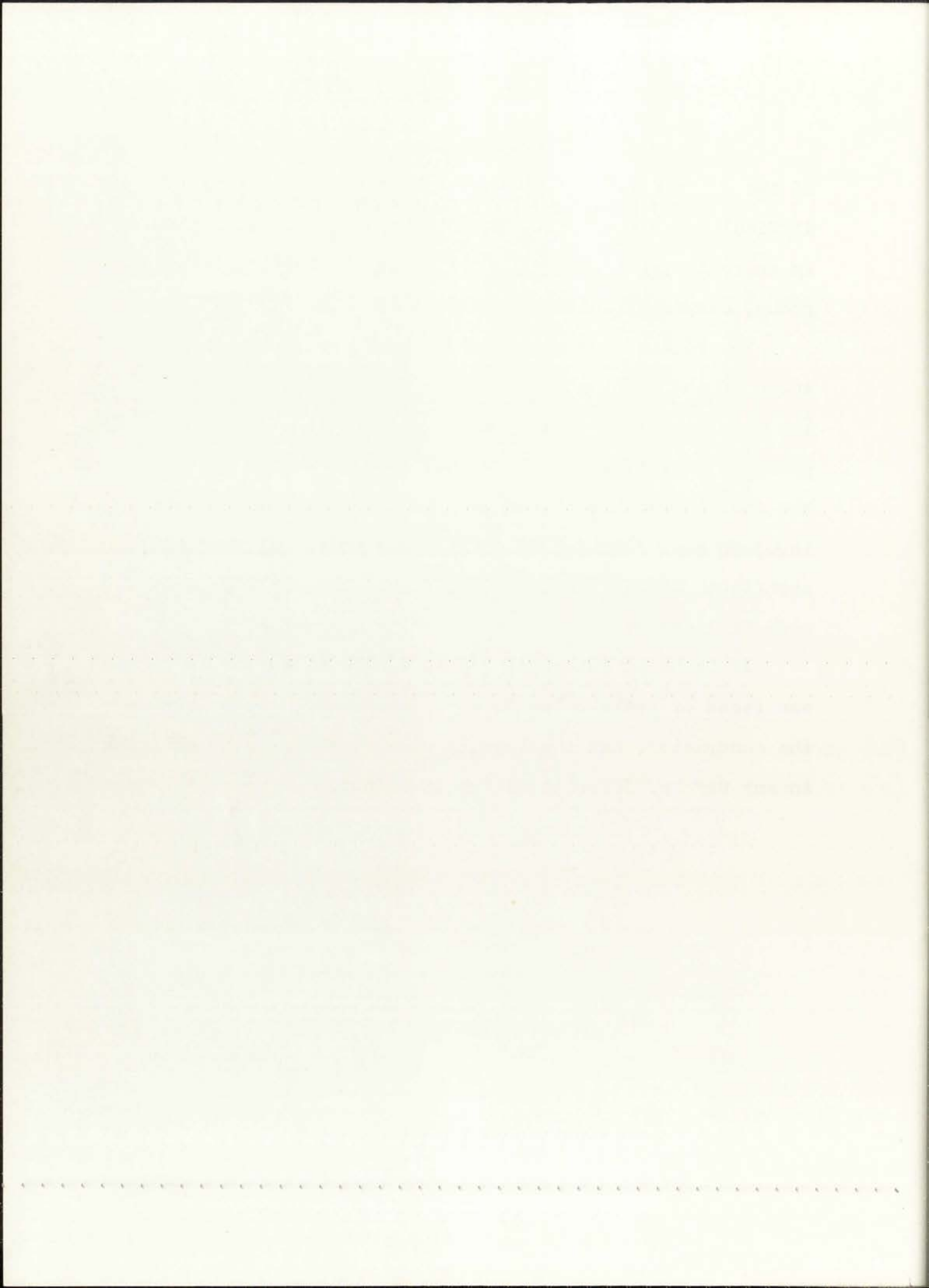
One is the continuation of his present trend, that of physical precedence. This will lead to universal and more clearly visable animalistic behaviour. The viciousness of this trend is perhaps incomprehensible now because the sophistication of future physical developments may allow the implementation of animalistic thoughts on an immediate and world-wide scale.



The other path is that of mental awareness and development of the whole man. This path is obviously manifold more difficult than the first, because it necessitates not only an awareness, but a responsibility at all levels; individual, group, community, nation, world.

The role of the architect is more apparent when the scope of the problem is viewed in the following manner. The problems of a building are miniscule in comparison to the problems of a city. When the problems of a city are considered, and the interaction of the many professional disciplines involved must function to solve those problems; then the architect, trained in many fields, knowledgeable in many more will evolve as an interpreter, a conductor.

It is as an interpreter that I have attempted to connect one facet of Paolo Soleri's city, Arcosanti, to the engineer, the contractor, and the layman; without changing or altering in any way Mr. Soleri's design or intent.



STATEMENT OF PROBLEM

To investigate the compatibility of integrating mass production technology into the city designs of Paolo Soleri.

LIMITS

City -- ARCOSANTI

Aspect -- Apses

Within the conceptual design; investigate, analyze, synthesize, and implement solutions to construction problems without affecting any change in the designed; function, circulation or flexibility and intent of the spaces.

Specific:

Pre-fabricated structural panels

Services to and from units

Order of construction

The major design concept of Arcosanti has been done by Paolo Soleri. I was given by Mr. Soleri the option of:

1. Using the designs as a basis for designs of my own. In this respect, freedom and permission to change the designs in any way I saw fit was given by Mr. Soleri.

2. Using the designs as they exist, to attempt to design, structure, and utilize technology to solve problems of building within a given framework.

I chose the second of the two because I felt that the problems encountered would be more relevant to the actual



fields of building technology and construction.

The problem is one of two pivot points: the flexibility of technology, and the intricacies of Paolo Soleri's designs.



PAOLO SOLERI

IN EARLY 1970 THE CORCORAN GALLERY IN WASHINGTON, D.C. WILL HOLD A MAJOR EXHIBIT OF THE WORK OF PAOLO SOLERI. AFTER A 3 MONTHS' STAY AT THE CORCORAN, THE EXHIBITION WILL THEN TRAVEL TO SEVERAL LARGE MUSEUMS IN BOTH THE U.S. AND ABROAD. IN CONJUNCTION WITH THIS LARGE EXHIBIT, A COMPREHENSIVE PHOTOGRAPHIC EXHIBIT IS BEING ASSEMBLED FOR DISPLAY IN SMALLER MUSEUMS, ART GALLERIES, AND AT UNIVERSITIES.

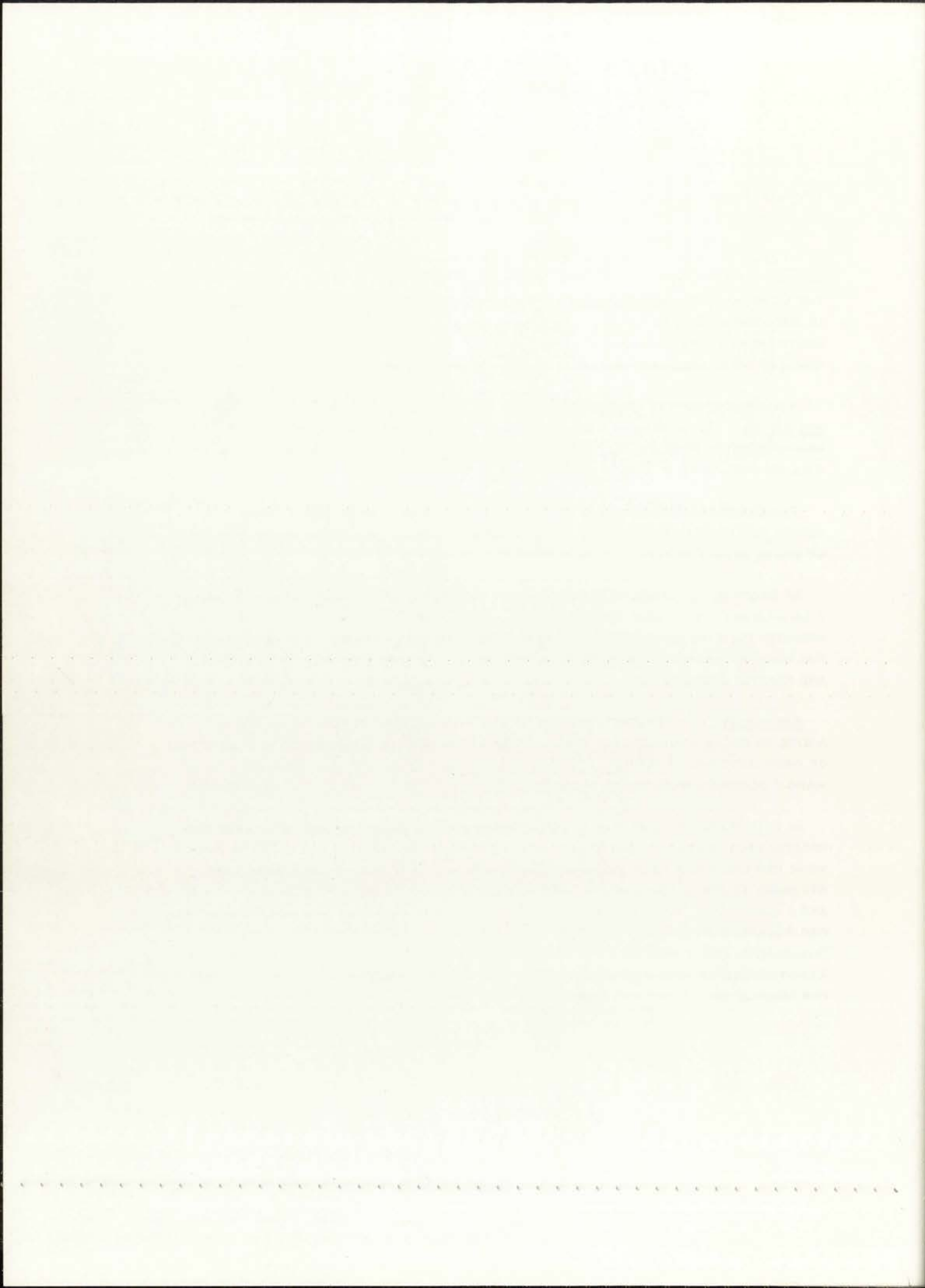
A HIGHLIGHT OF THE CORCORAN EXHIBIT WILL BE SOLERI'S CONCEPTS OF TOWNS AND CITIES. THIS WORK IN URBAN RESEARCH HAS BEEN COMPILED INTO A COMPREHENSIVE BOOK BY SOLERI. "ARCOLOGY: THE CITY IN THE IMAGE OF MAN" WILL BE PUBLISHED BY THE M.I.T. PRESS IN THE FALL OF 1969.

THE CORCORAN EXHIBIT WILL TRACE THE DEVELOPMENT OF SOLERI'S IDEAS DURING THE LAST 20 YEARS WITH PARTICULAR EMPHASIS ON HIS WORK IN THE FIELD OF URBAN DEVELOPMENT.

IN SCOTTSDALE, ARIZONA PAOLO SOLERI HAS ESTABLISHED THE COSANTI FOUNDATION, A NON-PROFIT EDUCATIONAL FOUNDATION, A CENTER OF LEARNING AND TRAINING FOR ARCHITECTS, FINE ARTS STUDENTS, CRAFTSMEN AND INSTRUCTORS. TO PARTICIPATE IN THE FOUNDATION PROJECTS THERE HAVE BEEN OVER 200 YOUNG PEOPLE FROM THE U.S. AND FOREIGN COUNTRIES.

ARCOSANTI, AN EXPANDED PROGRAM OF THE FOUNDATION, IS NOW BEING INITIATED ON A SITE 70 MILES NORTH OF THE COSANTI FOUNDATION. THE SELF-CONSTRUCTING TOWN OF ARCOSANTI WILL EVENTUALLY HAVE A POPULATION OF ABOUT 2000 INHABITANTS MAINLY OCCUPIED WITH URBAN PROBLEMS.

IN 1919 PAOLO SOLERI WAS BORN IN TORINO, ITALY WHERE HE WAS EDUCATED AND RECEIVED HIS DEGREE AS DOCTOR OF ARCHITECTURE. HE CAME TO THE U.S. IN 1947 TO WORK FOR ONE AND A HALF YEARS AT THE FRANK LLOYD WRIGHT FELLOWSHIP. HE RETURNED TO ITALY FOR 5 YEARS, AND HAS LIVED SINCE 1955 IN ARIZONA WITH HIS WIFE AND 2 DAUGHTERS. IN 1962 SOLERI RECEIVED A GRANT FROM THE GRAHAM FOUNDATION FOR ADVANCED STUDIES IN THE FINE ARTS FOR WORK ON HIS MESA CITY PROJECT. A GUGGENHEIM GRANT FOR 1964 - 1965 PERMITTED FURTHER RESEARCH IN THE FIELD OF ARCHITECTURE AS HUMAN ECOLOGY. IN 1967 A SECOND GUGGENHEIM GRANT WAS RECEIVED FOR COMPLETION OF THE MATERIAL.



LEARNING & UNDERSTANDING & SOLUTIONS

ARCOSANTI

DESIGN

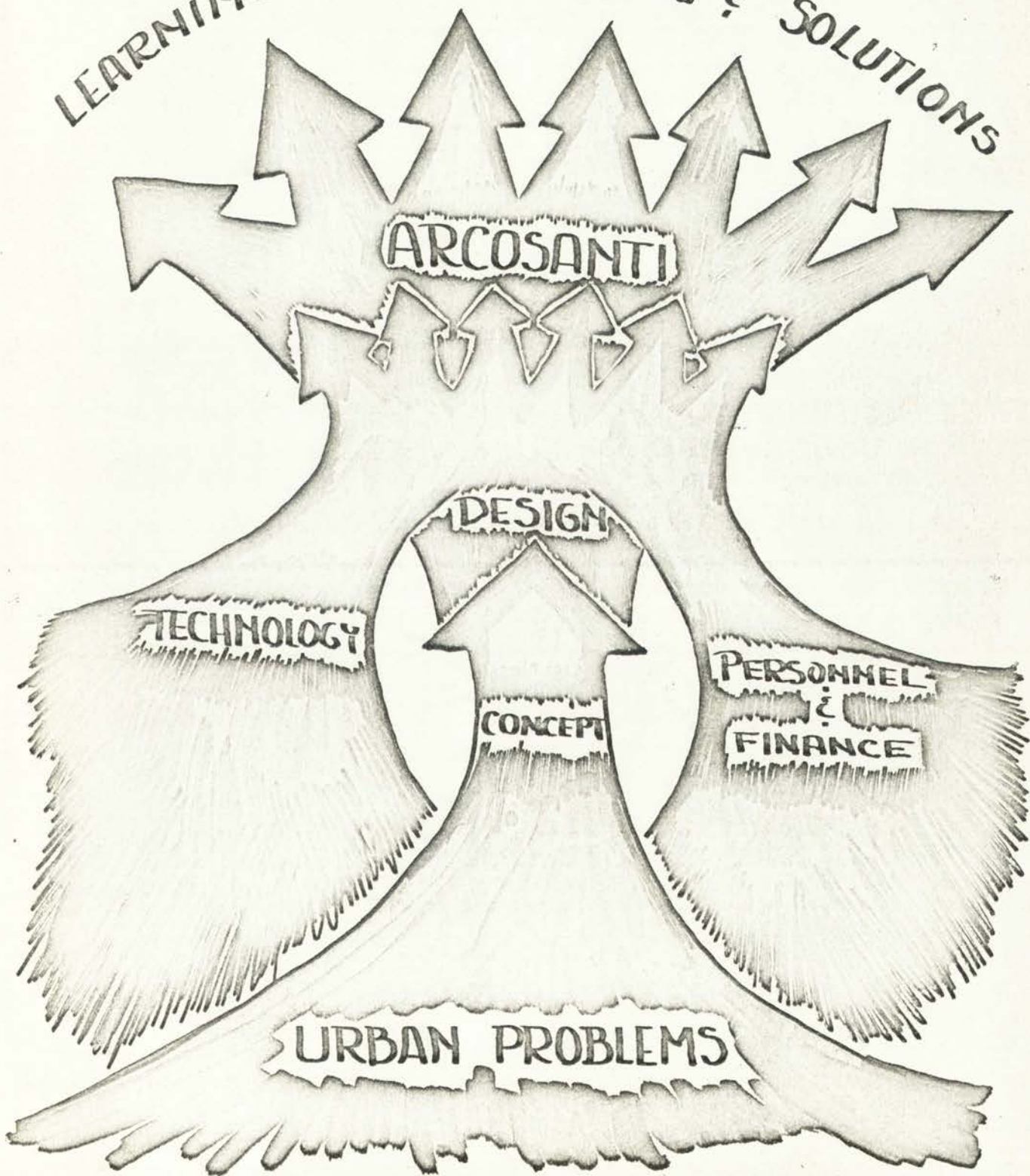
TECHNOLOGY

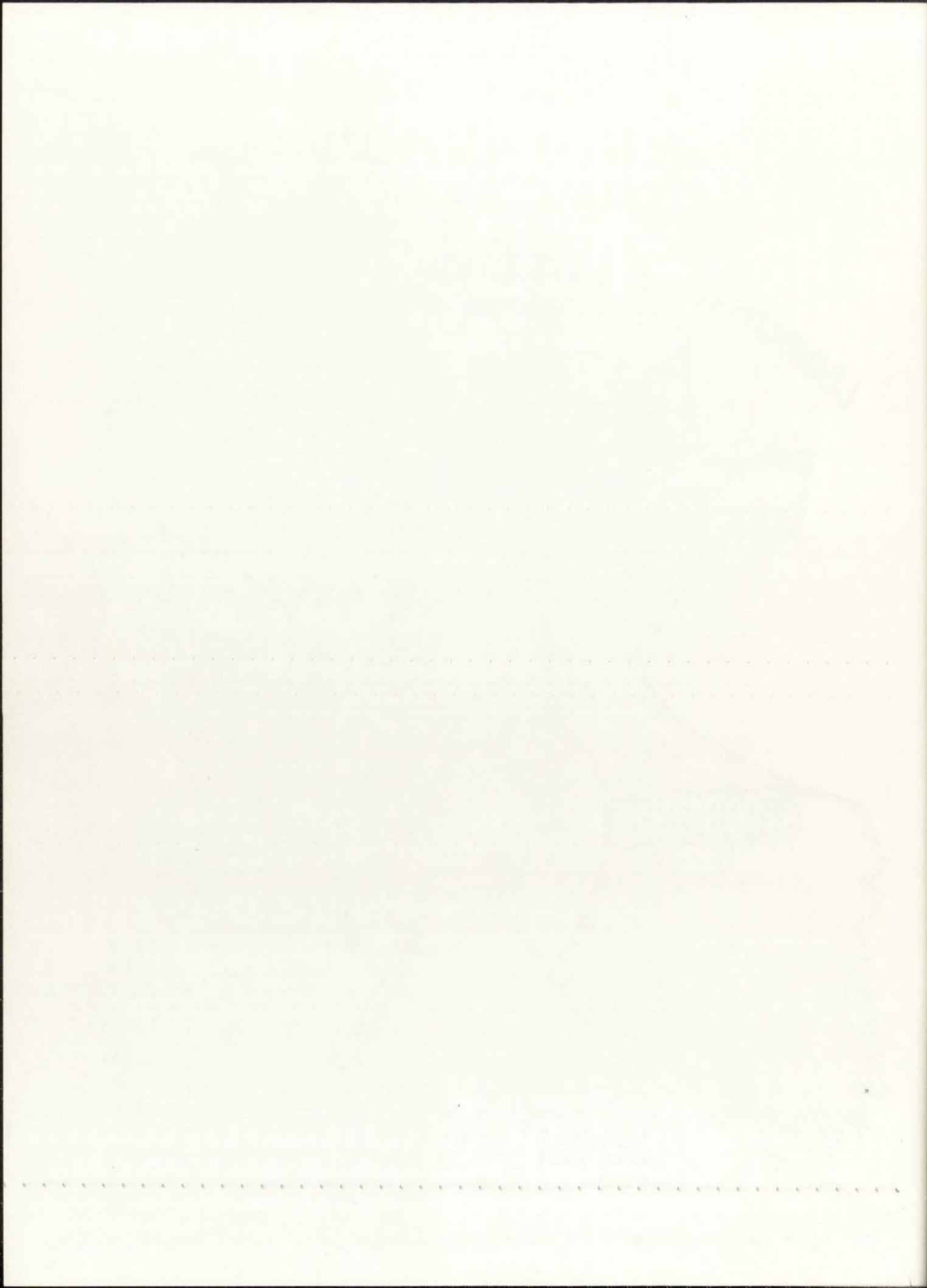
PERSONNEL

CONCEPT

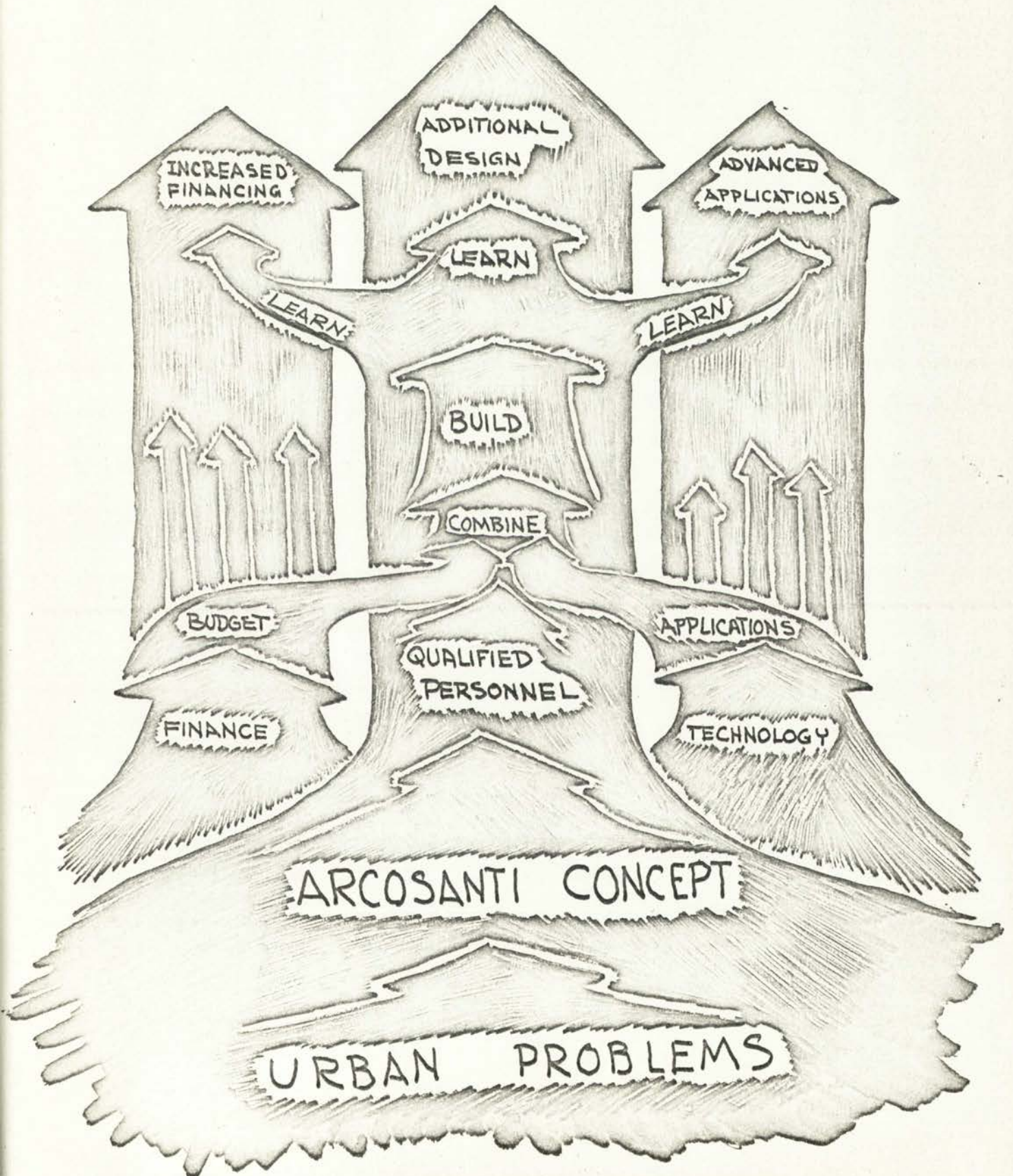
FINANCE

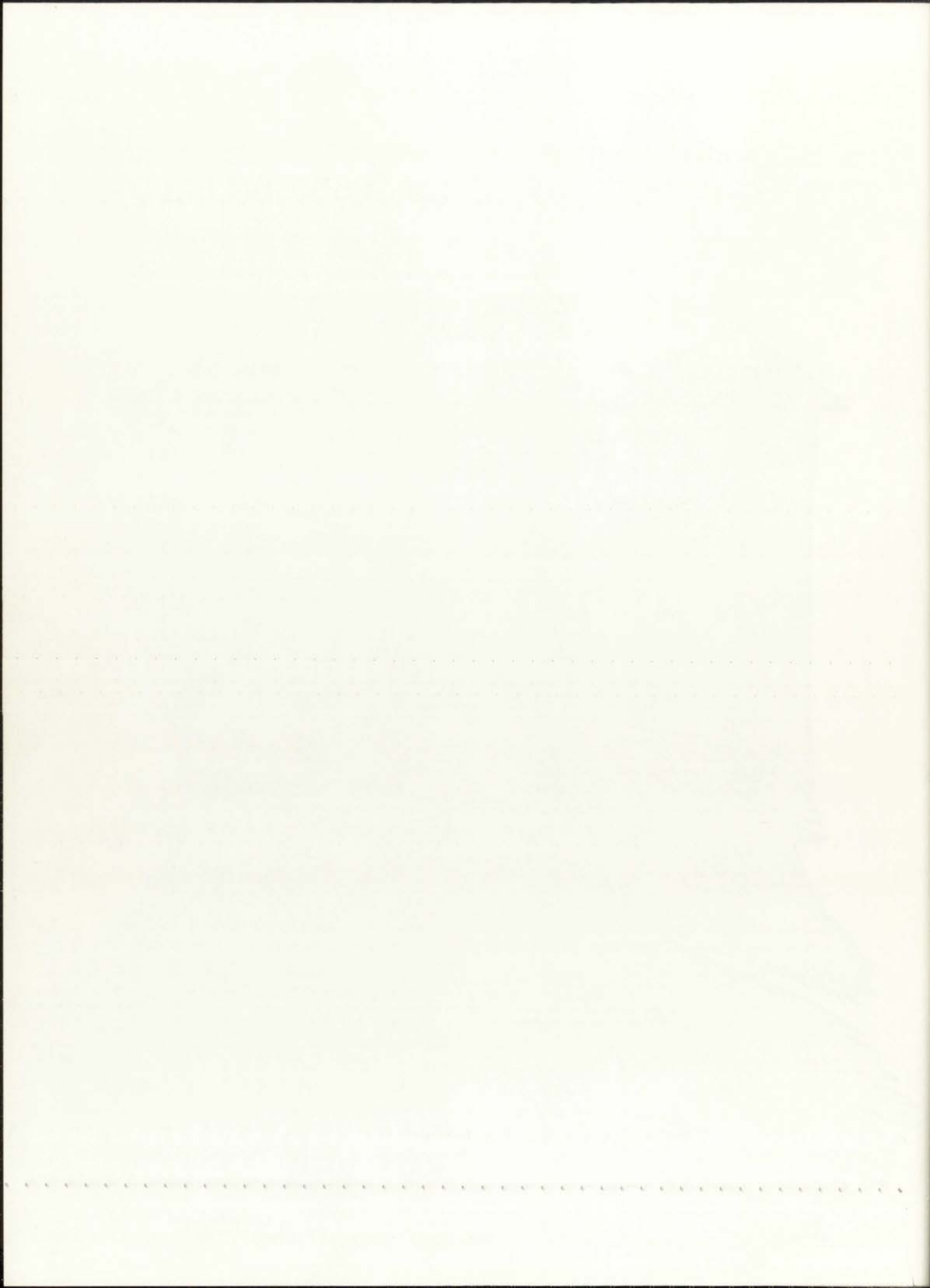
URBAN PROBLEMS





SOLUTIONS TO URBAN PROBLEMS





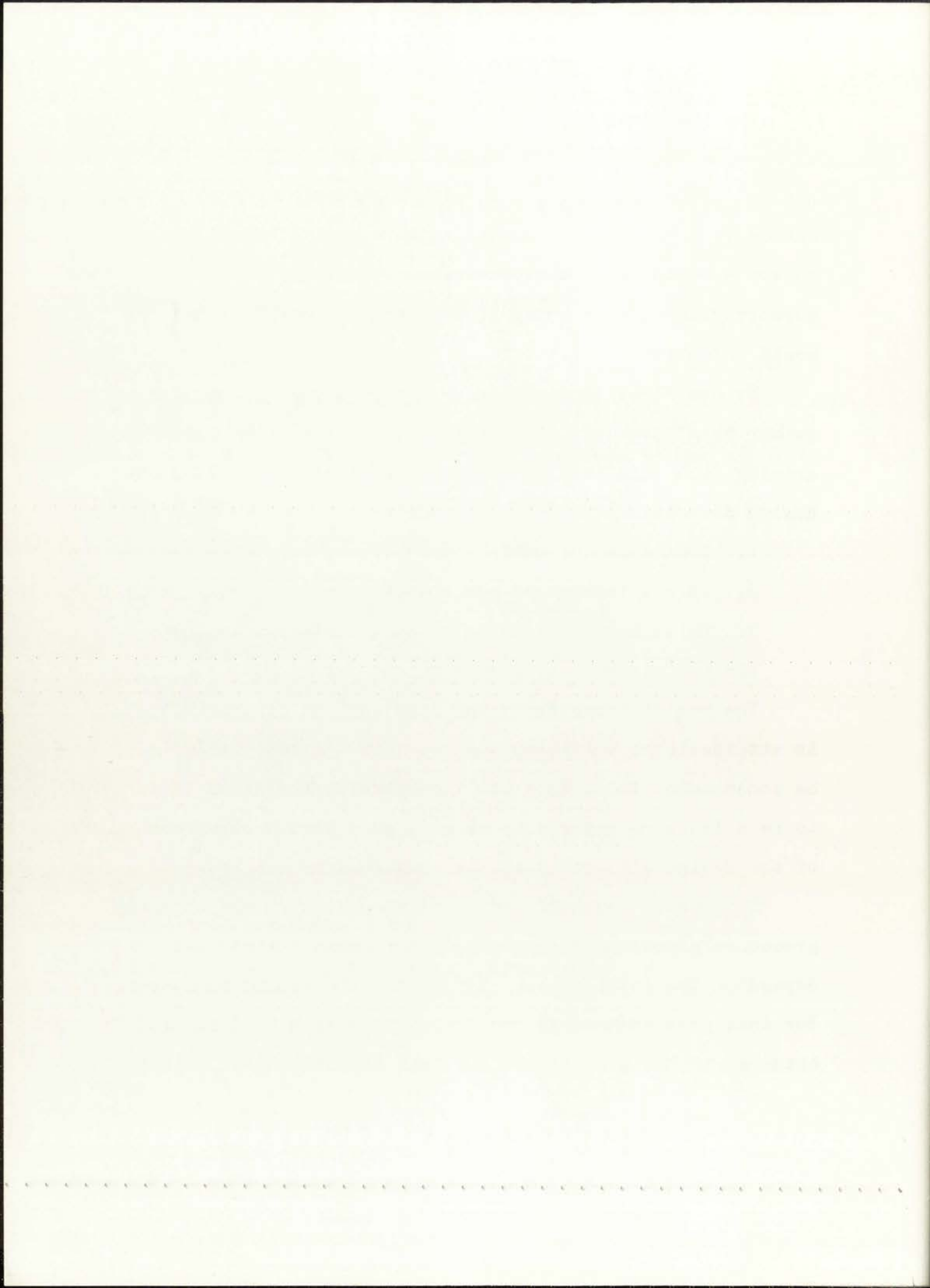
The immediate reactions to Arcosanti are those of endless complexity and the awe-stricken impression that it could not possibly hope to be built with contemporary construction methods. Both of these reactions have merit, and if a person were to leave the drawings of the city with only a cursory glance, then those first, partial observations would undoubtedly remain.

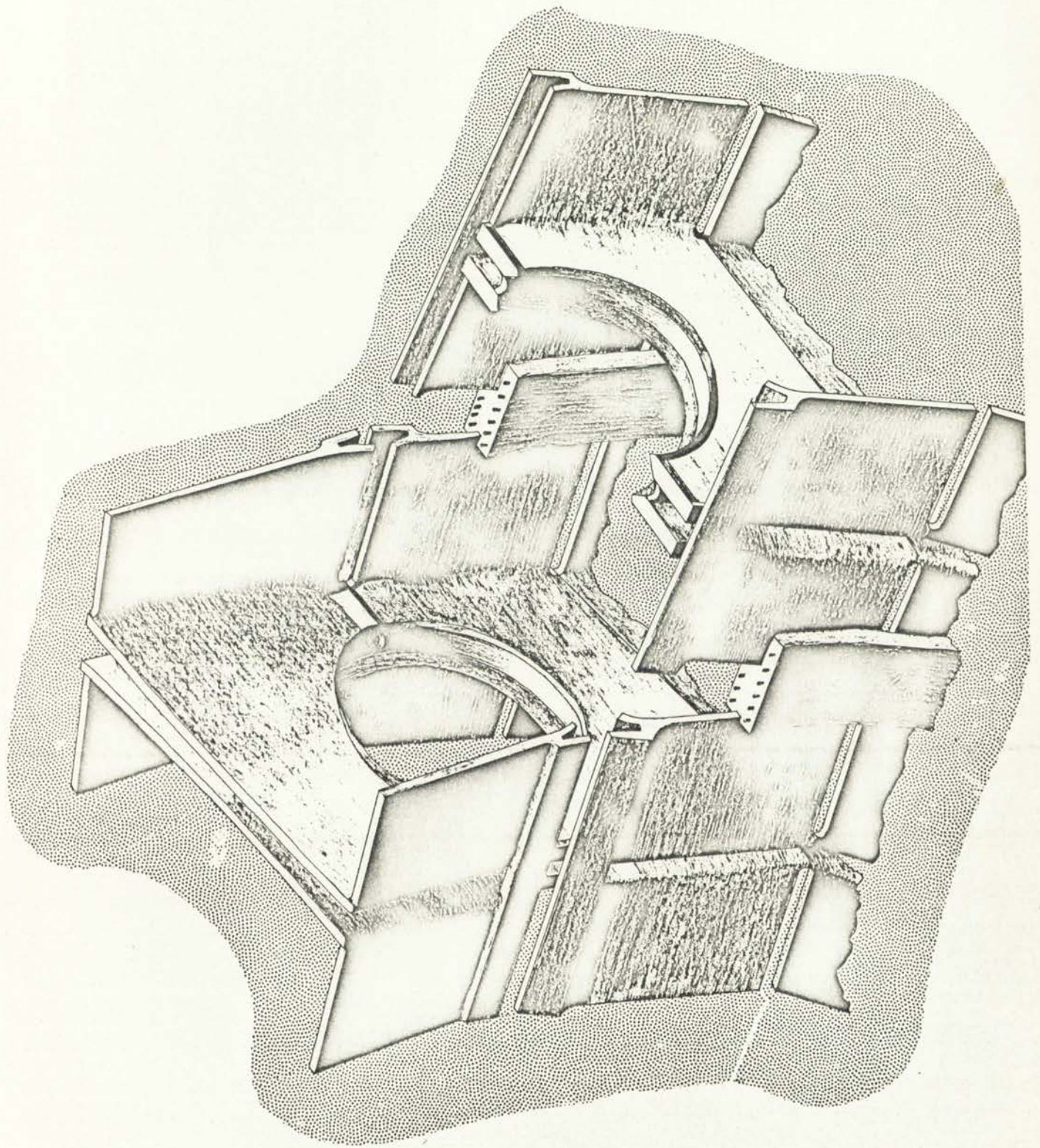
My own first impressions were more those of intrigue rather than those of being overcome, and the primary problem arising from this initial interest was that of breaking the design down into manageable units for:

1. Cognizance of design concepts
2. Identification of components
3. Units small enough to be manageable within the limited scope of my knowledge and experience.

The design concepts of the Arcology³ in its entirety is attainable to a limited degree. Since Arcosanti is to be constructed in part by its inhabitants, and since it is to be a learning experience as well as a living site; much of the design will occur as the construction progresses.

This makes identification of components a step-by-step procedure since the design of a later component may well depend on the total feasibility of the preceding component. For this problem(thesis) the following breakdown (Fig. 1.) occurred in the area of the physical structuring of Arcosanti.







This breakdown proved only partially valuable since, as can be seen in the floor plans (Pg. Appendix), the major levels interlock not only with each other through the columns, but with the apses as well.

Since column design and the structuring and construction of the Arcosanti columns is relatively straight forward, the next major component of Arcosanti at ground level is the apses.

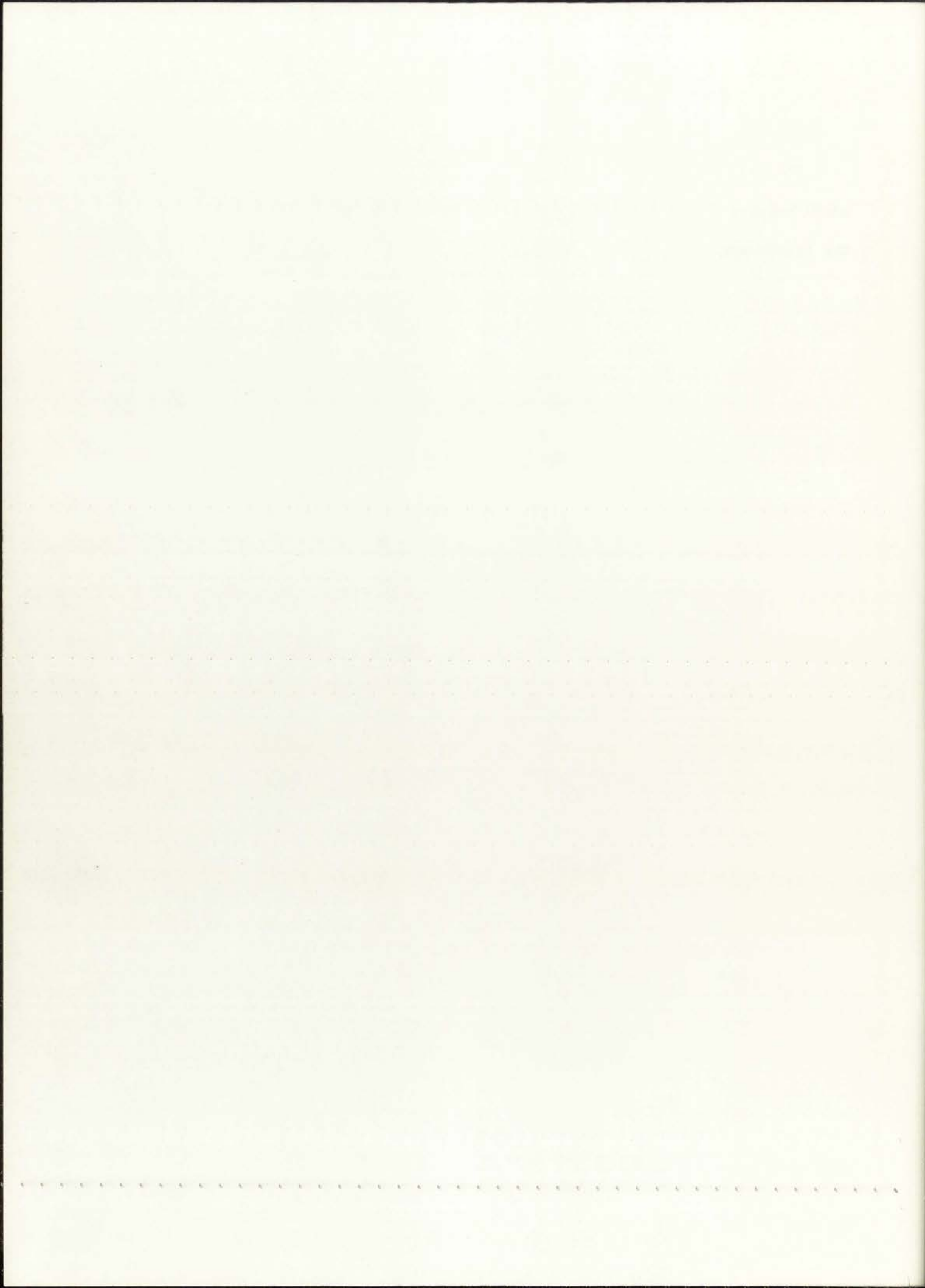
The design of the apses is such that by stacking tapered concrete modules in a prescribed pattern, an apse will be partially formed. (Pg. Appendix) The top cap of the apse acts essentially as a key-stone and is poured in place.

The design of the module is such that utilities, and structural ribbing may be put into them; and the module actually becomes a concrete forming system that is left in place.

The modular stacking system as shown in Fig. 2 presents some problems in placement which are covered in the section on Forming, Pg. The accurate holding of these modules once they are placed presented some problems as did the forming of the keystone. These problems are covered in the sections on Shoring and Forming respectively.



The methodology used is simply to break the whole problem down into small manageable units, and then solve problems in the reverse order of the breakdown.



SYSTEMS

I. SOCIAL

A. Construction

- 1. Professional
 - a. Relation to Foundation
 - b. Management structure
 - c. On-site quarters
 - d. Time on site

- 2. Staff
 - a. Composition
 - b. Structure within Foundation
 - c. On-site quarters

- 3. Student
 - a. Composition
 - b. Ability
 - c. On-site quarters

- 4. Management and supervision

B. Completed city

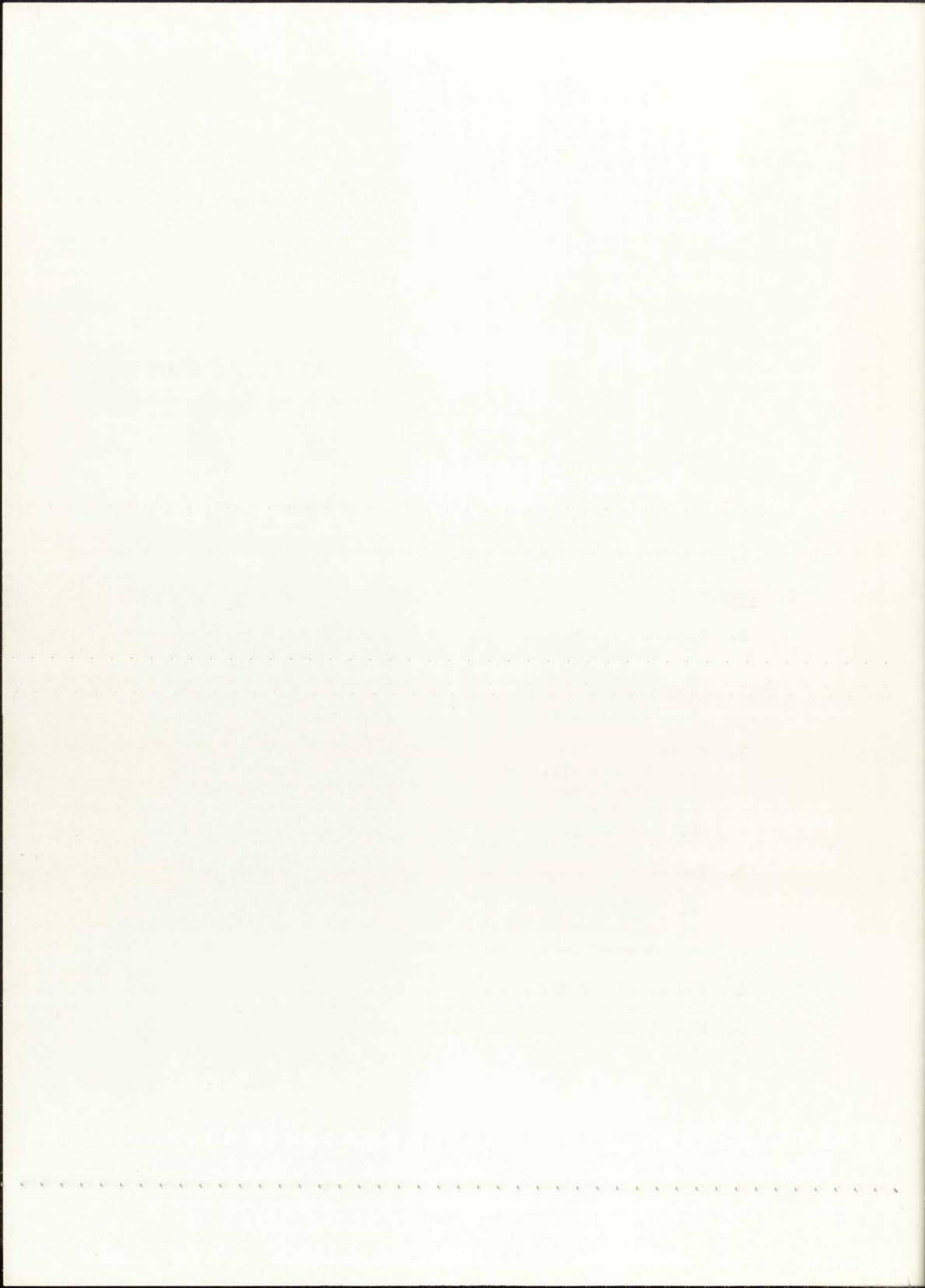
- 1. Resident
 - a. Responsibilities
 - b. Privileges
 - c. Assets
 - d. Liabilities

- 2. Staff
 - a. Responsibilities
 - b. Privileges
 - c. Assets
 - d. Liabilities

- 3. Transient
 - a. Performing
 - b. Touring
 - c. Academic
 - d. Student

- 4. Pediatric and Geriatric

- 5. Health and Education



II. ECONOMIC

A. Planning

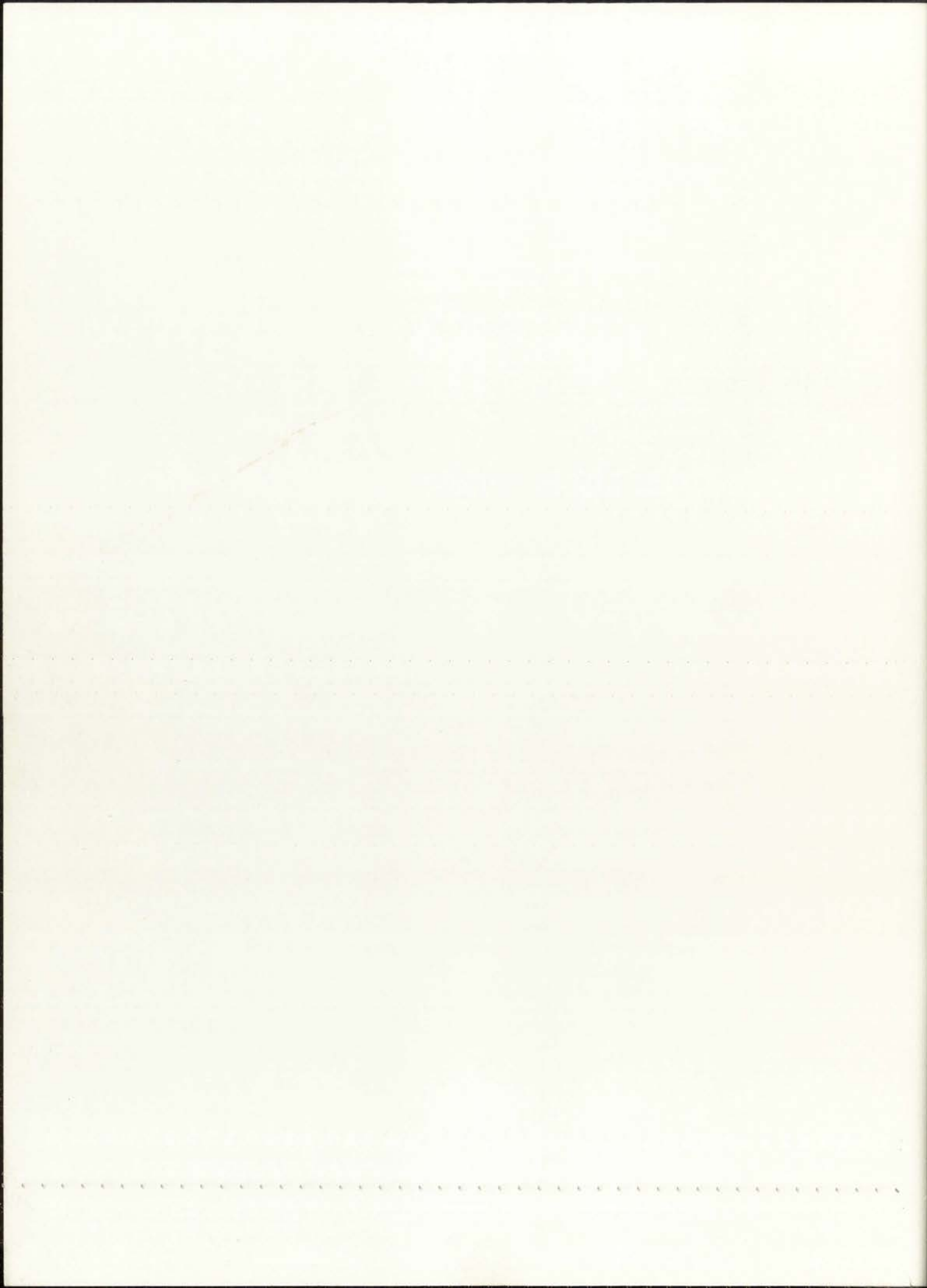
- 1. Sources of income
- 2. Expenditures

B. Construction

- 1. Professional services
- 2. Manufacturing
- 3. Staff and Student services
- 4. Logistics

C. Completion

- 1. Maintenance
- 2. Growth
- 3. Division of income
 - a. Services
 - b. Products
 - (a) Foundation
 - (b) Individual



III. TECHNOLOGICAL

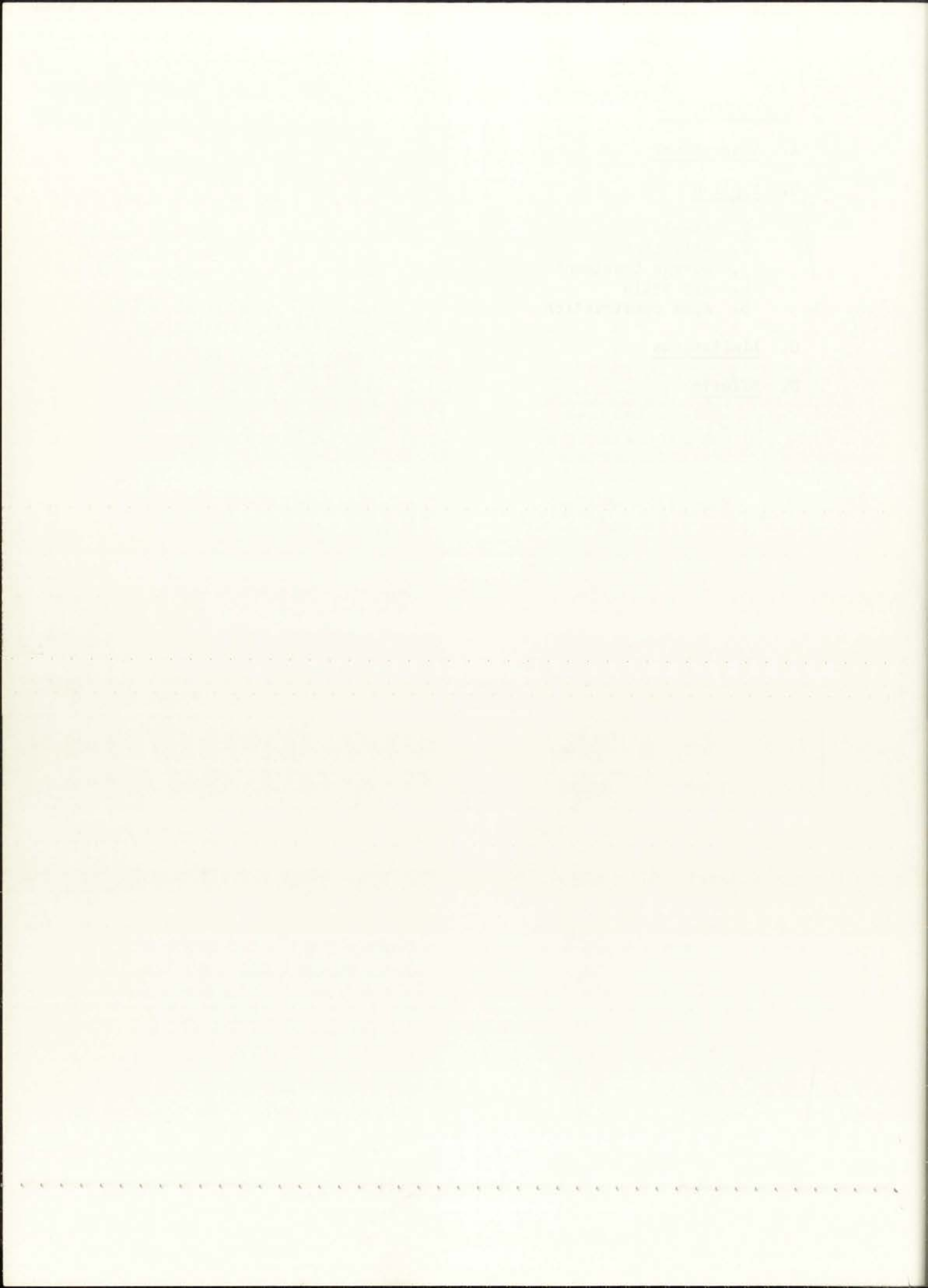
A. Theoretical

B. Applied

1. Panels
2. Utilities
3. Sewage treatment
4. Air wells
5. Apse construction

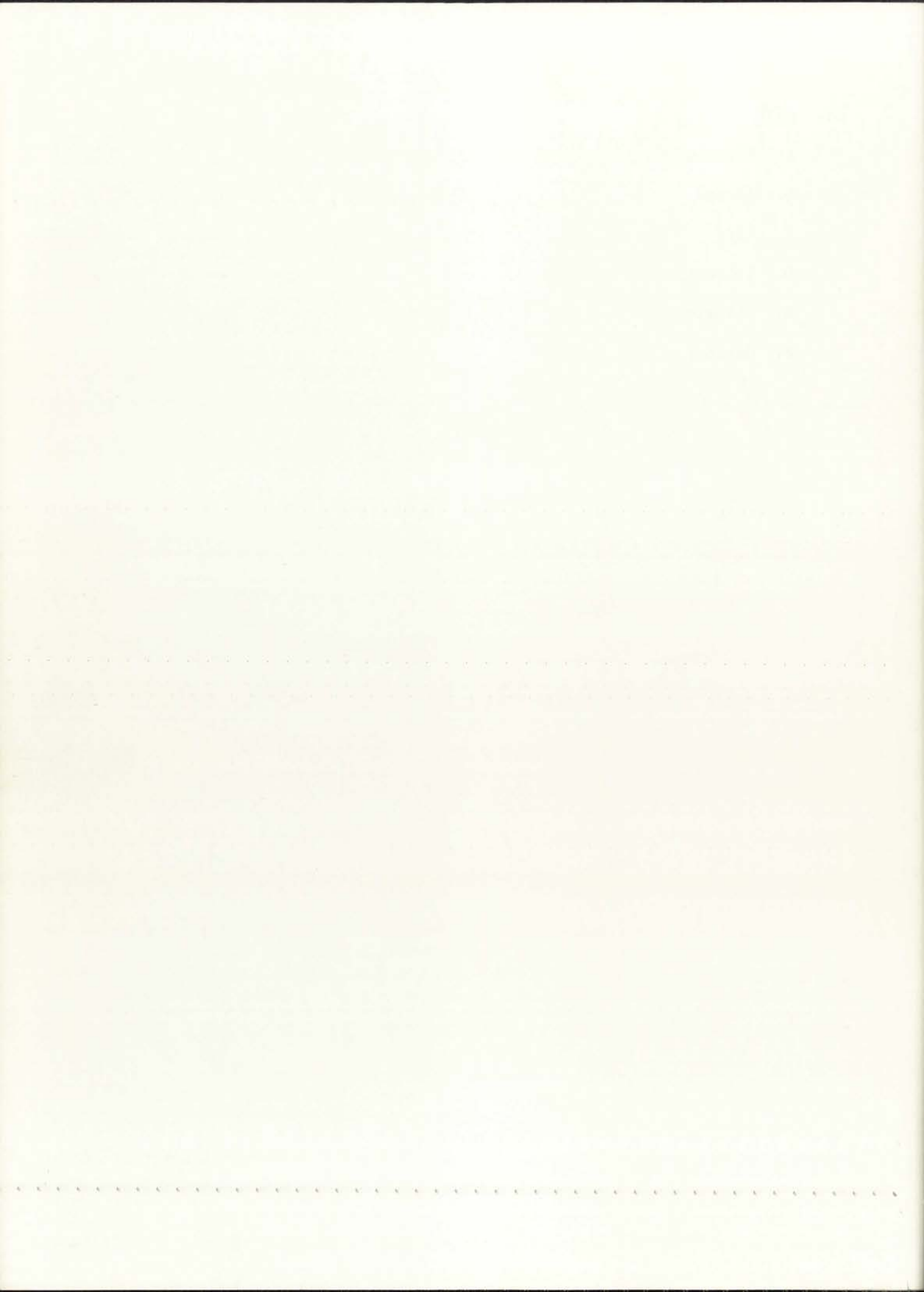
C. Limitations

D. Effects



IV. SITE

- A. Location
- B. Access
- C. Size
- D. Topography
- E. Climate
- F. Geology



V. CONSTRUCTION

A. Professional

1. Type of contractor
2. Method of contracting
3. Specialization and diversification of trades
4. Scheduling (logistics)
5. Management
6. Climatic contingencies
7. Legal documents
8. Insurance responsibilities

B. Foundation

1. Distinction between staff and students
2. Division of labor
3. Management, supervision and coordination

C. Types of construction

1. On-site, standard
2. On-site, innovative
3. Pre-fab, standard
4. Pre-fab, innovative
5. Speculative
6. Joint-venture
7. Partnership
8. Corporate

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- 2. ...
- 3. ...
- 4. ...
- 5. ...
- 6. ...
- 7. ...
- 8. ...

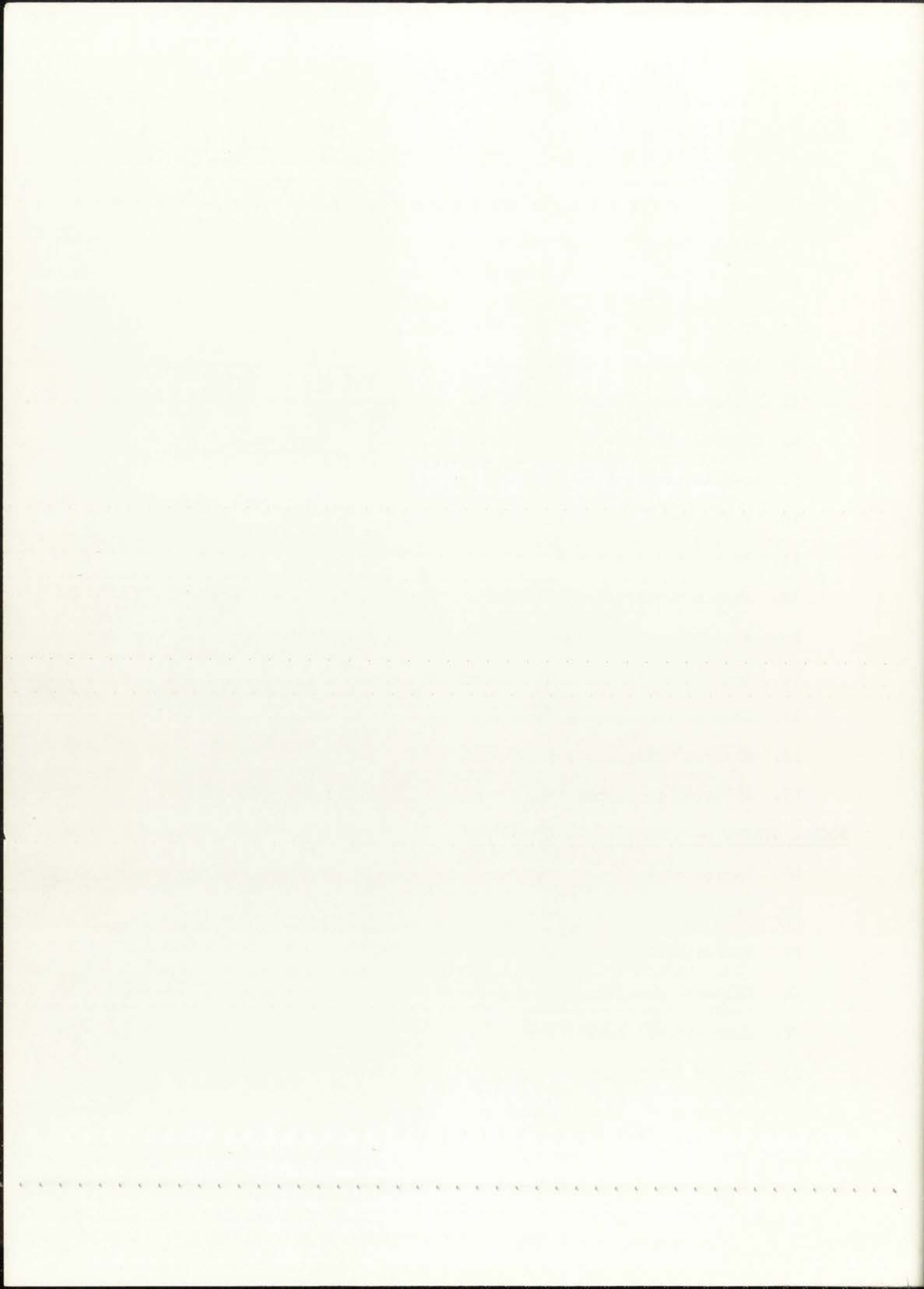


SOCIAL SYSTEM -- DURING CONSTRUCTION

1. What is the relation of the professional to the student?
2. What organizational structure is most practical?
3. Effect of professional quarters on building progress
4. Effect of building on professional quarters
5. Duration of professional crew on site
6. Composition of Cosanti staff
7. Structure of Cosanti staff
8. On-site quarters of staff
9. On-site quarters of students
10. Safety precautions for all personnell
11. Visiting regulations
12. Health facilities, all persons
13. Education facilities for children
14. Recreation facilities, all persons
15. Student body composition
16. Student activities; work/study
17. Division and scheduling of labor: skilled/unskilled

SOCIAL SYSTEM -- CONSTRUCTION COMPLETED

18. Social structure
19. Requisites for residence
20. Educational facilities
21. Cultural facilities
22. Recreational facilities
23. Health facilities



24. Pediatric and Geriatric considerations
25. Transient population
26. Normal student residence period
27. Student financing

ECONOMIC SYSTEM -- PLANNING STAGE

28. Economic base
29. Projected income
30. Projected expenditures

ECONOMIC SYSTEM -- CONSTRUCTION PHASE

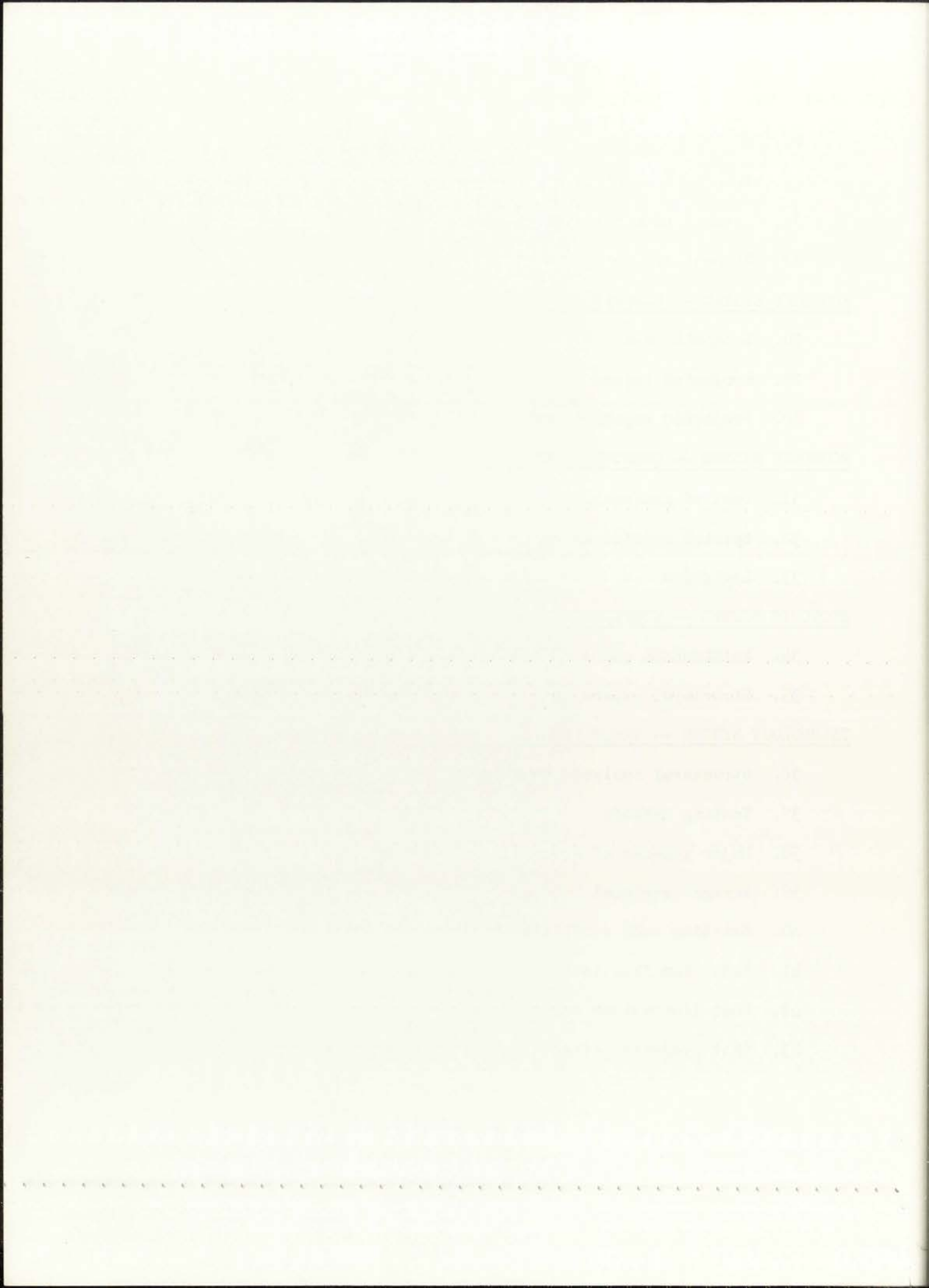
31. Cost of professional services
32. Special manufacturing
33. Logistics

ECONOMIC SYSTEM -- COMPLETION

34. Maintenance costs
35. Structural expansion

TECHNOLOGY SYSTEM -- THEORETICAL

36. Structural analysis techniques
37. Testing methods
38. Major aspects of Arcosanti in question
39. Sewage treatment
40. Existing code conflicts
41. Labor ramifications
42. What limitations exist
43. What projected effects on the building industry



11 0

SITE SYSTEM

44. Terrain (topography)
45. Utilities
46. Fire protection
47. Geological studies
48. Surveys (plat maps)
49. Topographical maps available (drainage, etc.)
50. Climatological data

CONSTRUCTION SYSTEM

51. Types of contractors
52. Available labor force
53. Working drawings available
54. Materials to be used
55. Working drawings needed
56. What units are standard
57. Contract letting
58. How much typical construction (CONVENTIONAL)
59. Specialization and diversification of trades
60. Construction equipment access
61. Time schedule
62. Order of construction
63. Student instruction
64. Coordination and verification
65. Budget
66. On-site or pre-fab
67. Legal documents
68. Communications systems
69. Insurance responsibilities

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- 70. Irrigation systems
- 71. Traffic and parking
- 72. Staff and student responsibilities
- 73. Heavy equipment
- 74. Staff and student function
- 75. Types of construction

PRESENTATION SYSTEM

- 76. Scope
- 77. Format
- 78.. Sources of information
- 79. Budget
- 80. Time schedule
- 81. Architectural implications



RESEARCH AND SYNTHESIS OUTLINE



I. INVESTIGATION AND ANALYSIS

A. ACTIVITIES

B. OPERATIONS

(following information common to A and B)

1. Environment

a. Character

b. Sensory

- (1) input
 - (a) visual
 - (b) acoustical
 - (c) olfactory
 - (d) tactile
 - (e) extra-sensory

c. Space generation

- (1) Physical
- (2) Psychological

d. Equipment

- (1) Operational
- (2) Support

2. Interaction

a. Communication

- (1) Direct
- (2) Indirect

b. Circulation

- (1) Active
- (2) Passive

c. Utilities

Orientation

a. Climate

- (1) Solar
- (2) Prevailing winds
- (3) Precipitation

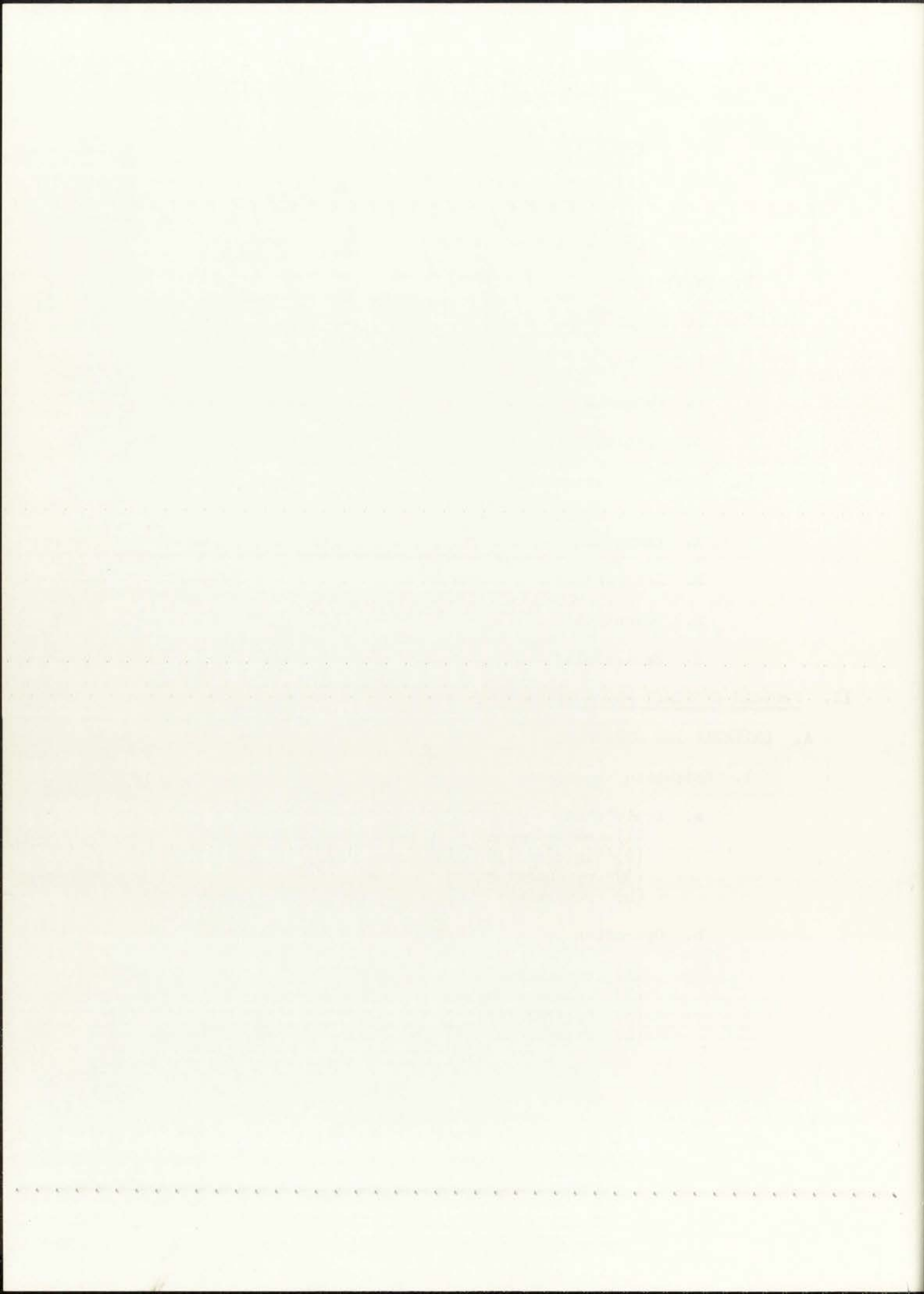


- b. Topography
 - (1) View
 - (2) Land forms
 - (3) Vegetation
 - (4) Circulation
 - (5) Utilitiew
- 4. Restraints
 - a. Legal
 - b. Safety
 - c. Economic
 - d. Special
- 5. Consequent research (publications, consultants, basic research)
 - a. Environment
 - b. Interactions
 - c. Orientation
 - d. Restraints

II. PROGRAM ABSTRACT AND CONFIRMATION

A. CRITERIA FOR SYNTHESIS

- 1. Establish hirearchy
 - a. Activities
 - (1) environment
 - (2) interaction
 - (3) orientation
 - (4) restraints
 - b. Operation
 - (1) environment
 - (2) interaction
 - (3) orientation
 - (4) restraints



2. Initial concept

- a. Geography
- b. Culture
- c. Function
- d. Economics

B. CONFIRM CRITERIA

- 1. Initial concept
- 2. Research conclusions
- 3. Priorities
- 4. Economic restraints

III. SYNTHESIS AND DEVELOPMENT

A. SCHEMATIC DIAGRAMING

- 1. Hierarchy criteria
- 2. Initial concept
(following information common to 1 and 2)
 - a. Independent groupings
 - (1) Environment
 - (2) Orientation
 - (3) Interaction
 - (4) Restraints
 - b. Composite groupings
 - (1) Correlate independent groupings
 - (2) Establish barriers
 - (3) Examine volumetric implications
 - c. Optimum arrangements

B. SCALED DIAGRAMING

- 1. Geometric ordering - modular to non-modular
- 2. Definitive space assignments
 - a. Activities
 - b. Operations
 - c. Support elements

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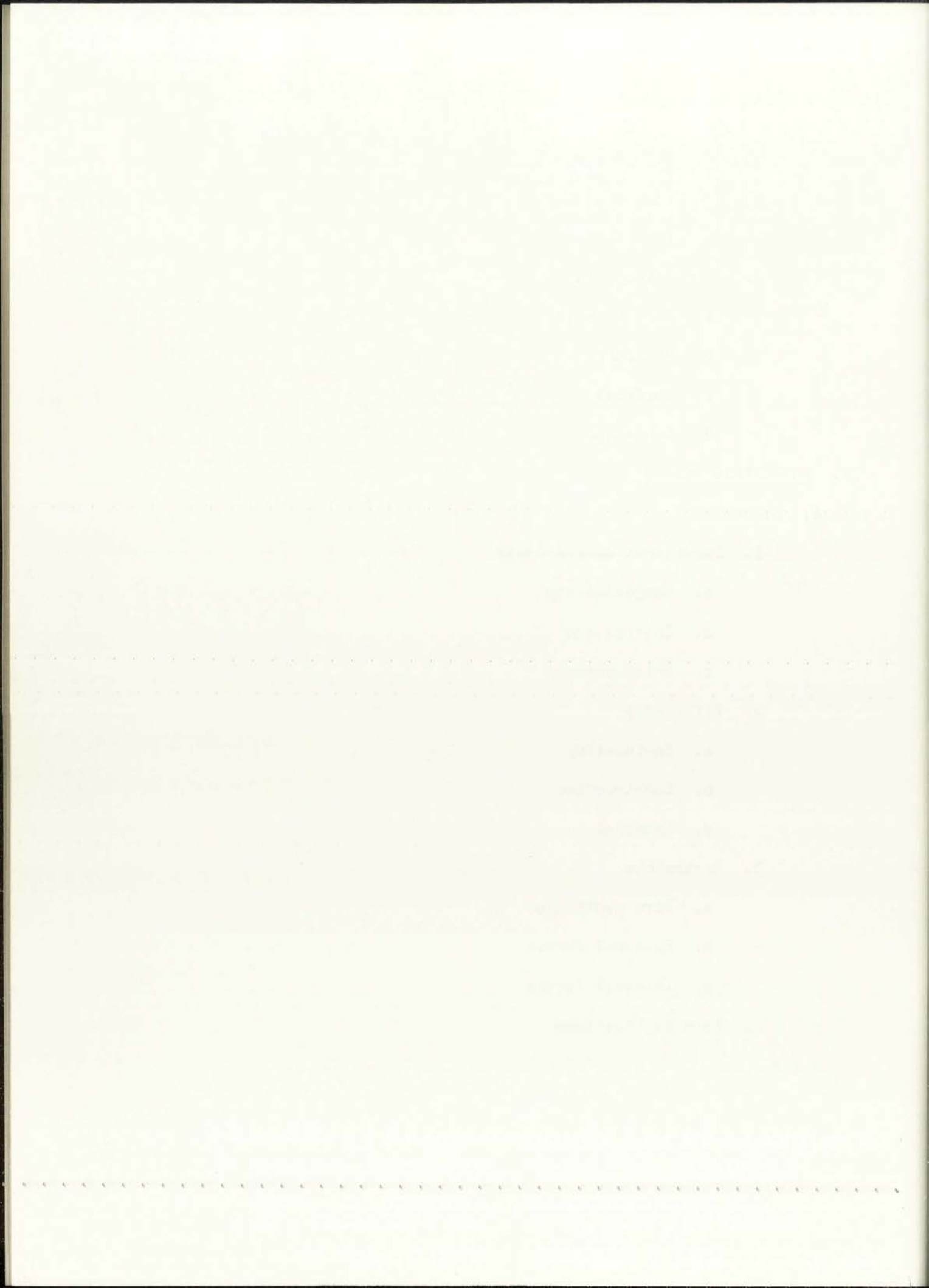
- (1) equipment
- (2) circulation
- (3) auxiliary
- (4) storage
- (5) site

- 3. Site development
 - a. Structure (s)
 - b. Utilities
 - c. Surfaces
 - d. Landscape

IV. VOLUMETRIC DESIGN

A. STRUCTURE

- 1. Functional determinants
 - a. Compatibility
 - b. Interaction
 - c. Reinforcement
- 2. Efficiency
 - a. Engineering
 - b. Construction
 - c. Material
- 3. Restraints
 - a. Fire protection
 - b. External forces
 - c. Internal forces
- 4. Form implications



B. SURFACES

1. Functional requirements
 - a. Solids and voids
 - b. Flexibility
 - c. Environmental control
2. Compatibility with structure
 - a. Physical
 - b. Aesthetic
3. Materials
 - a. Durability
 - b. Character
 - c. Construction
 - d. Maintenance
4. Code restraints
 - a. Fire
 - b. Loadings

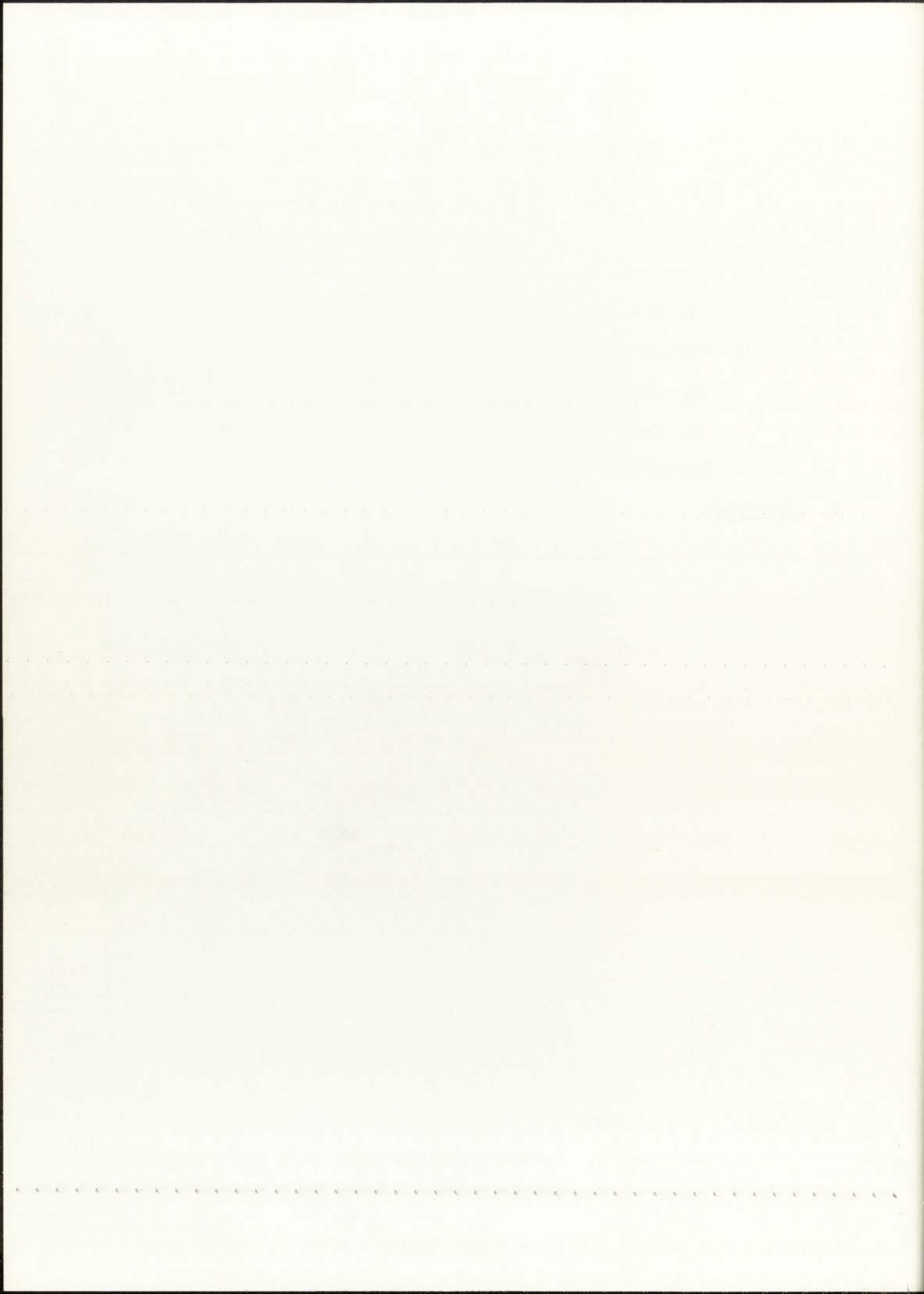
C. EQUIPMENT AND DISTRIBUTION

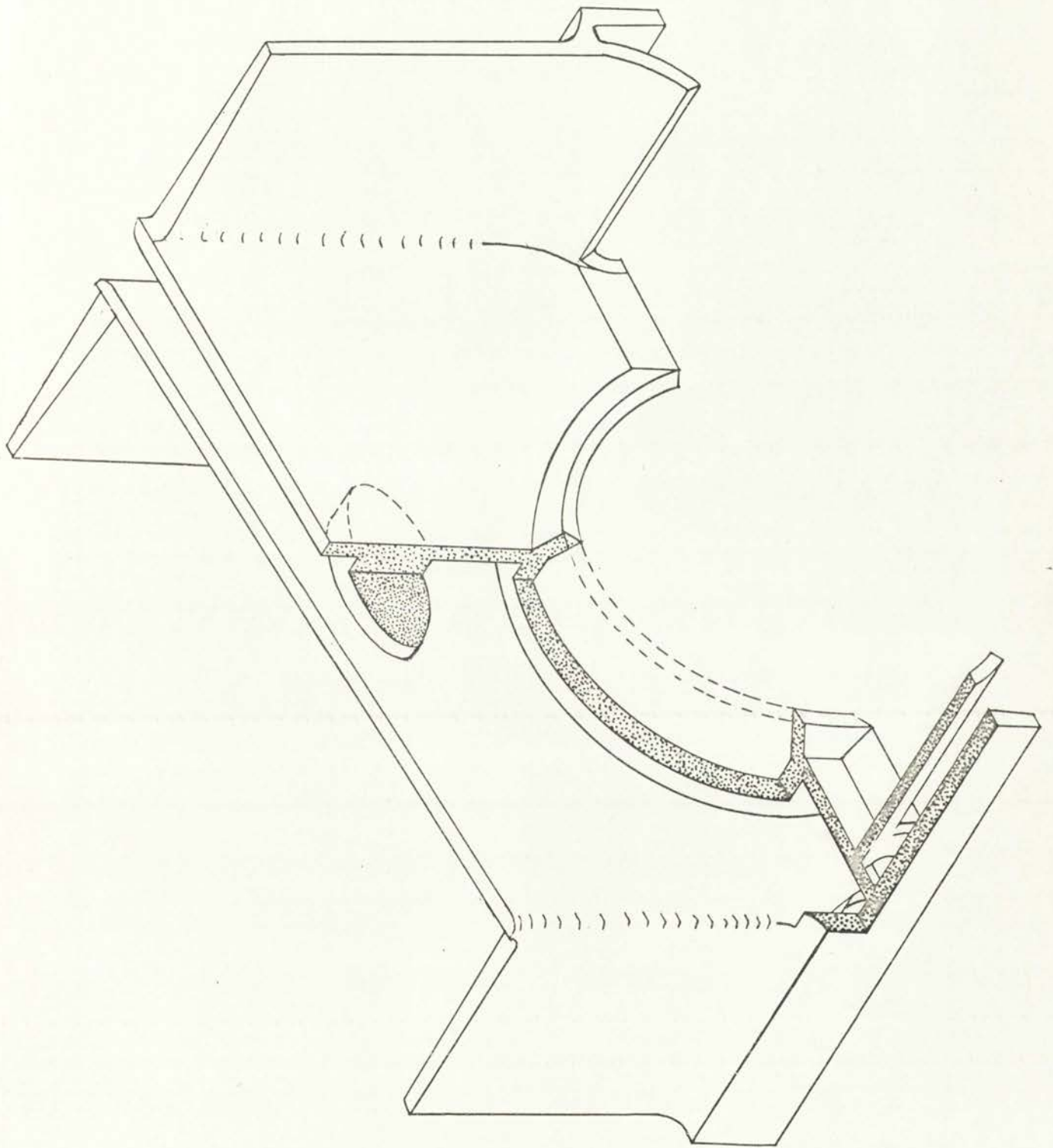
1. Mechanical
 - a. Heating
 - b. Cooling
 - c. Ventilating
 - d. Special equipment
2. Electrical
 - a. Power
 - b. Illumination
 - c.

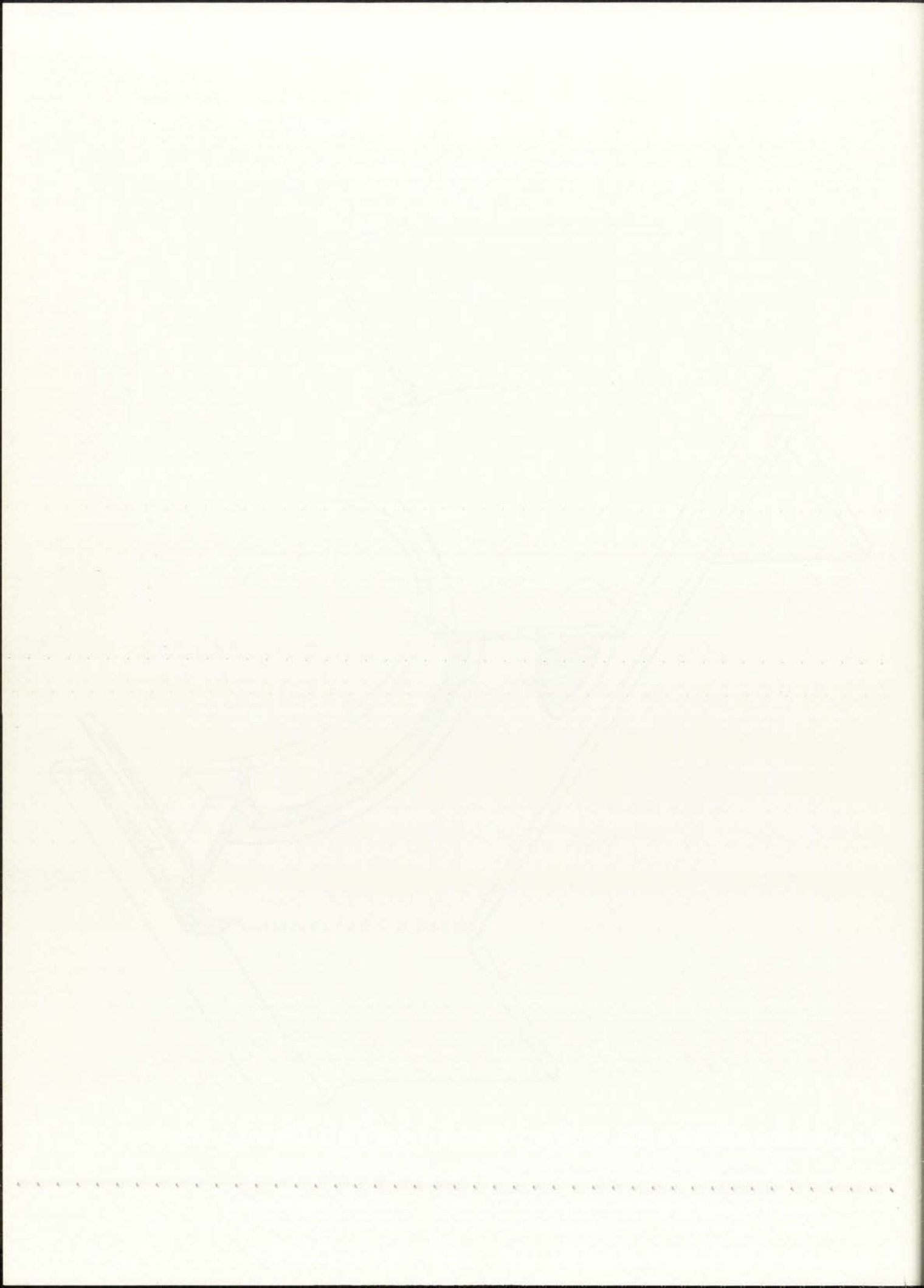


- c. Communication
- d. Special equipment
- 3. Plumbing
 - a. Service
 - b. Disposal
- 4. Transportation
 - a. Horizontal
 - b. Vertical
- 5. Specialized

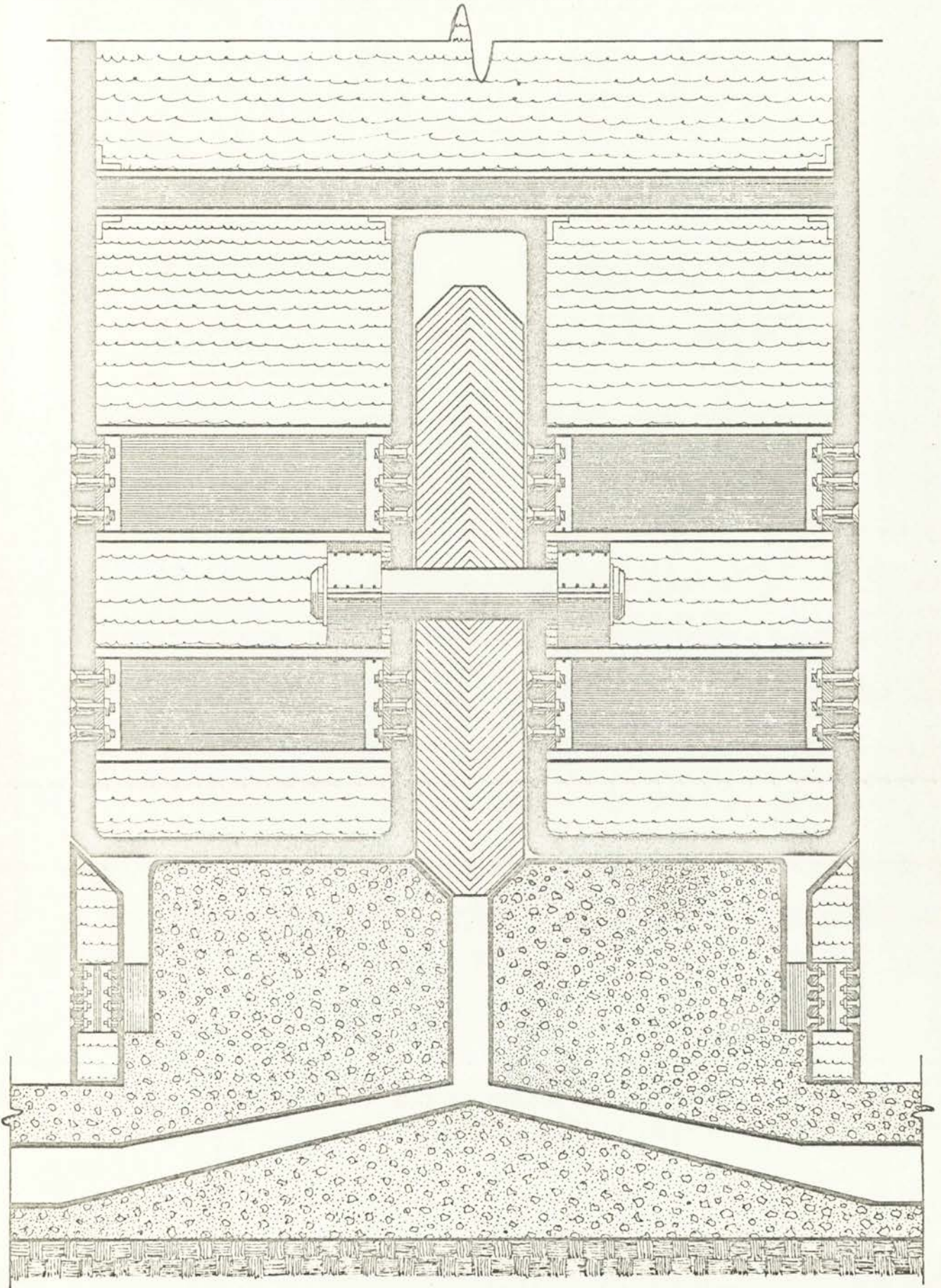
V. PROPOSALS



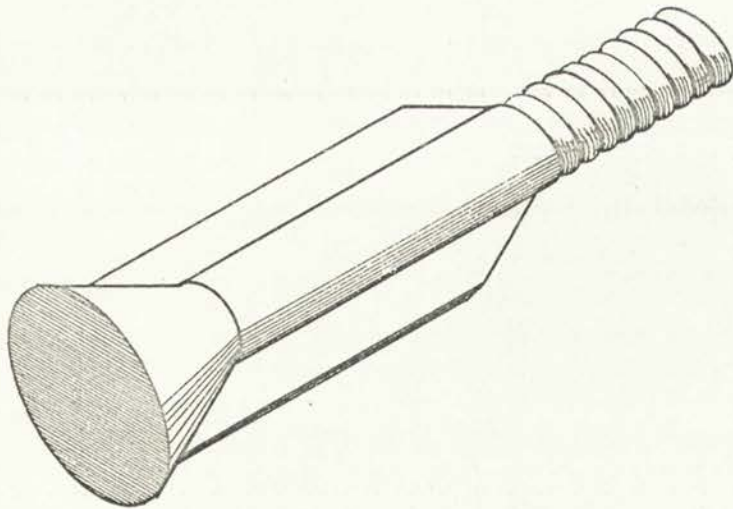
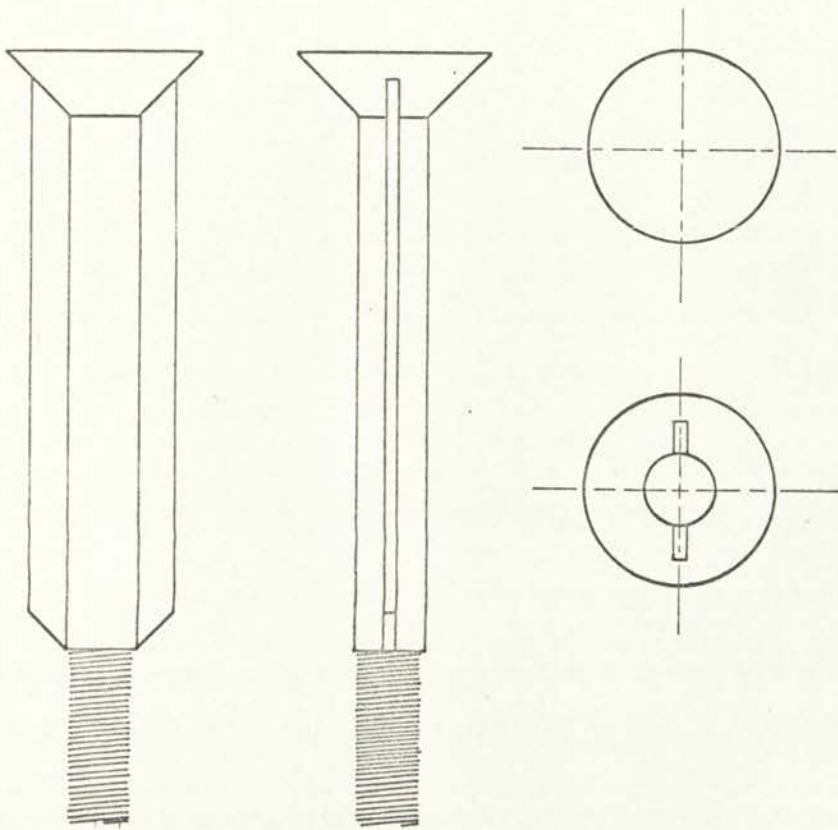




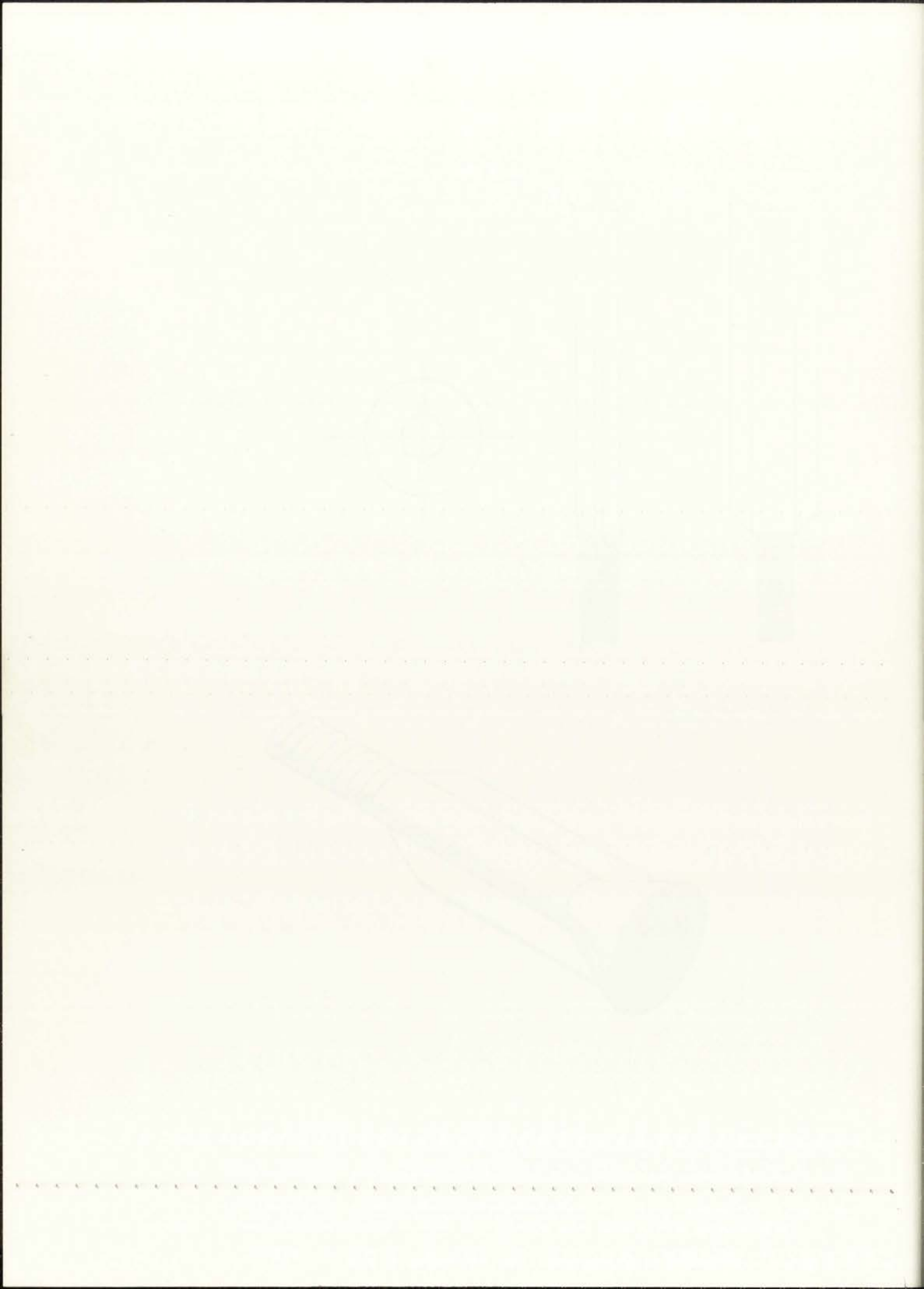
FORM SECTION - Tracking & Alignment

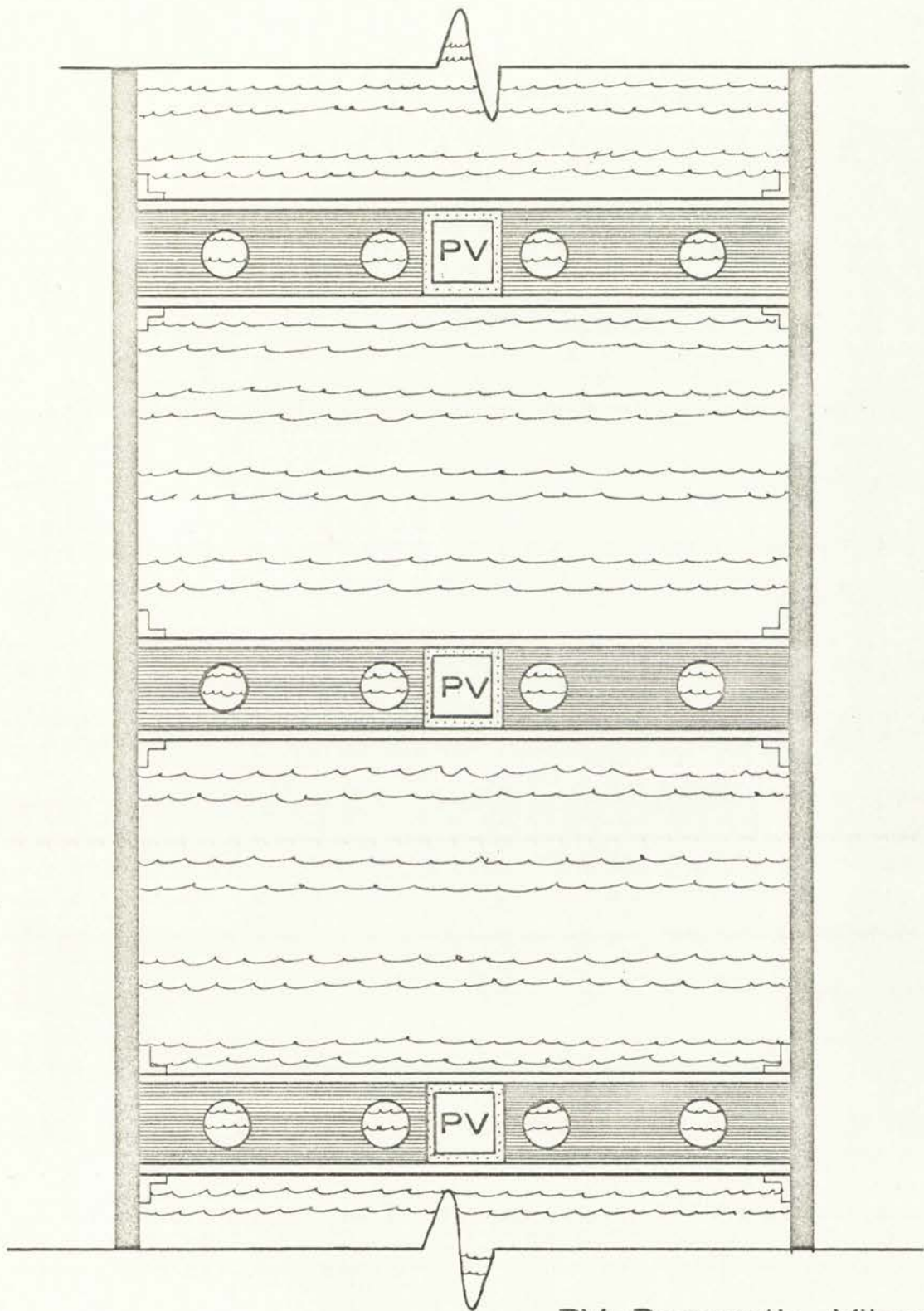






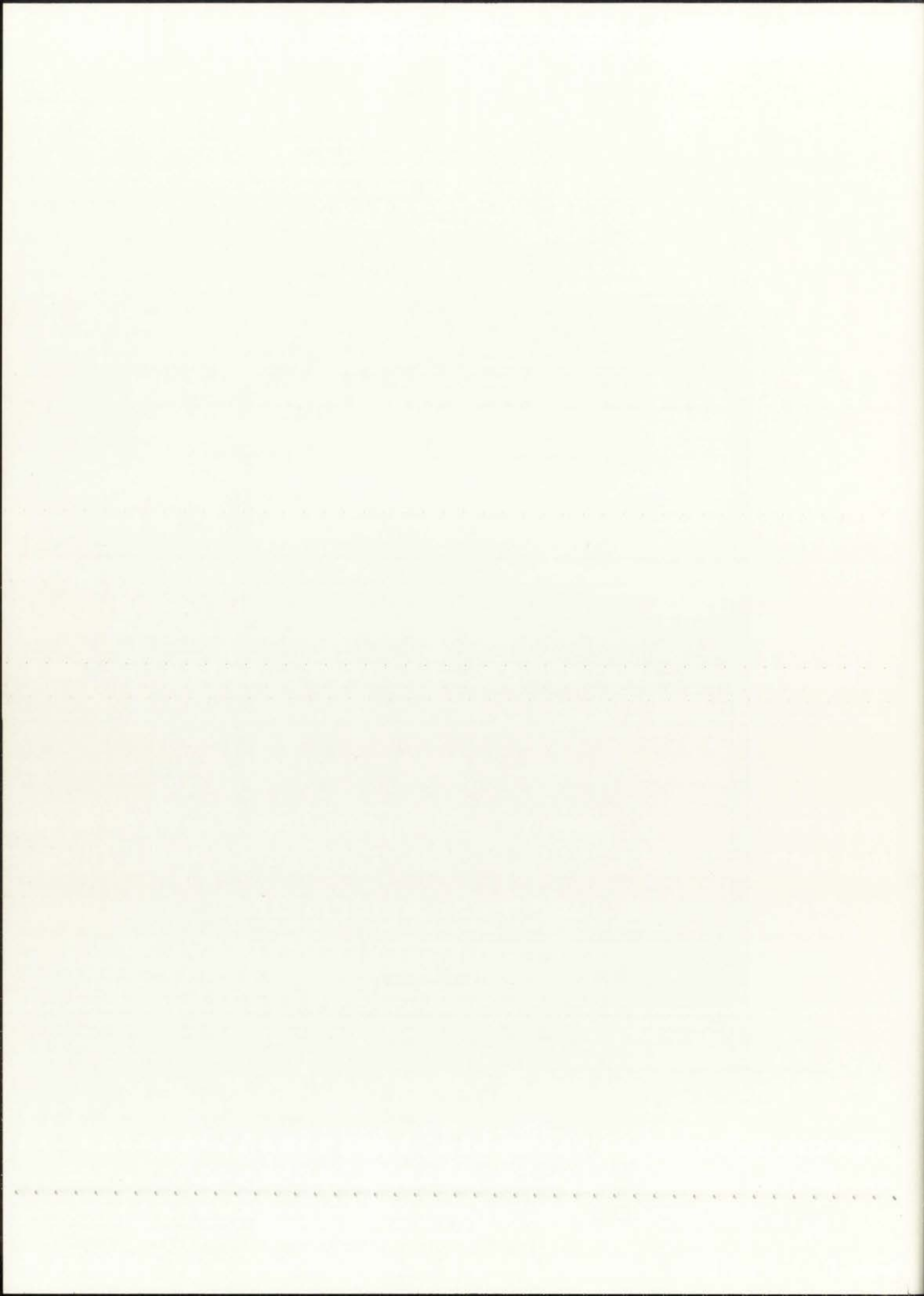
FLUSH - HEAD BOLT

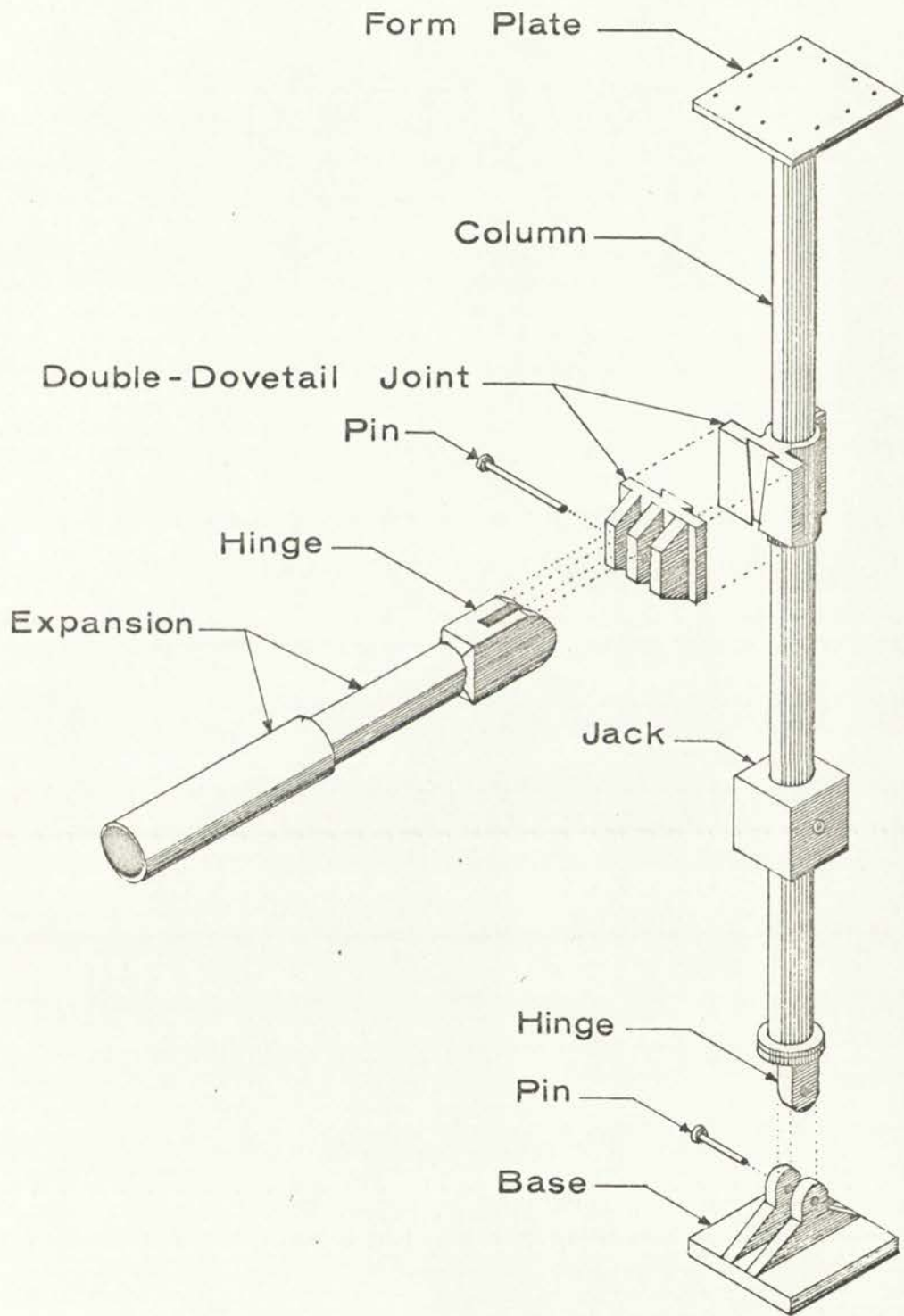




PV=Pneumatic Vibrator

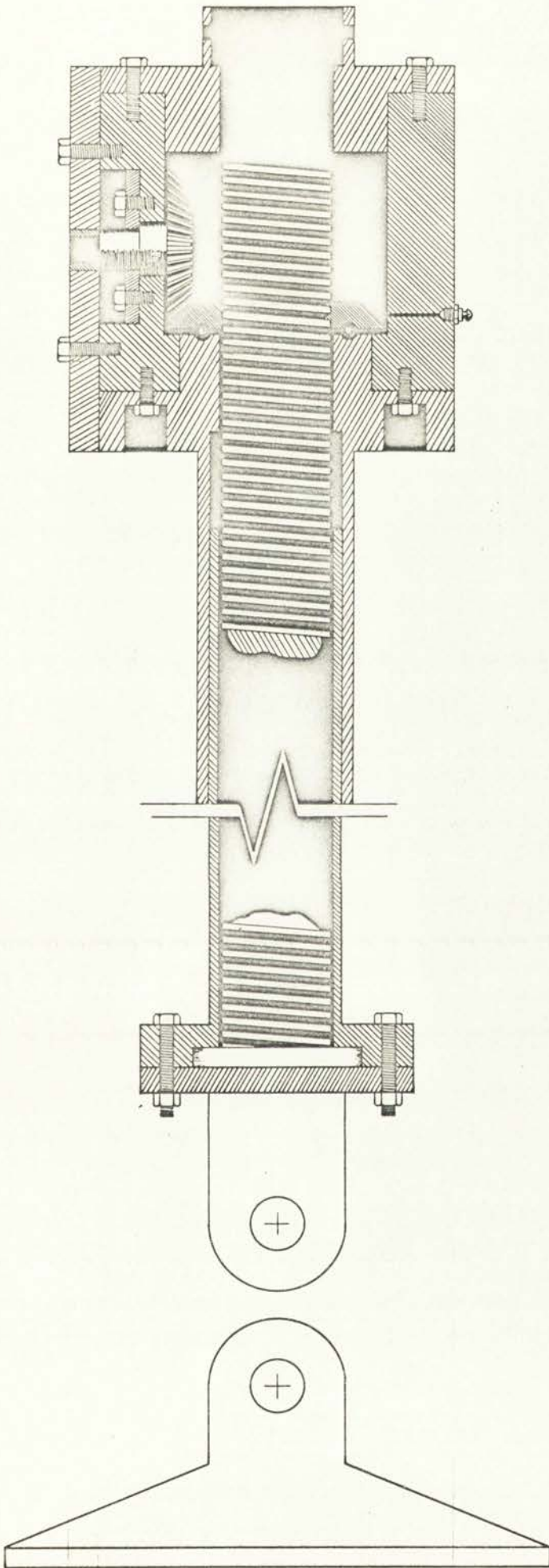
FORM SECTION

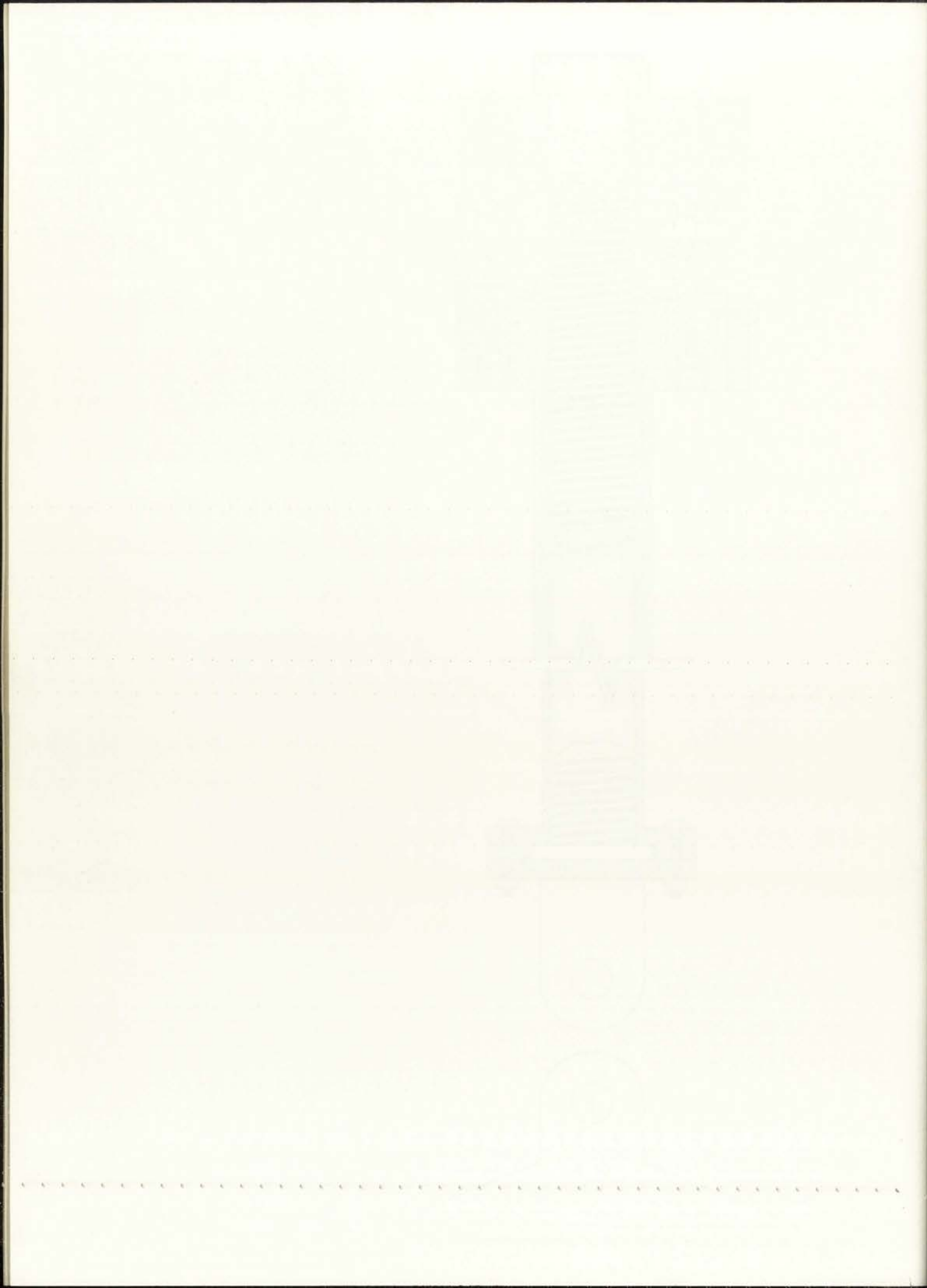




INTERLOCKING SHORING







Structural analysis using a method known as "Microconcrete" is now in the final pre-pouring stage. Microconcrete is essentially scaled down concrete poured to scale and tested to scale with standard testing methods and equipment.

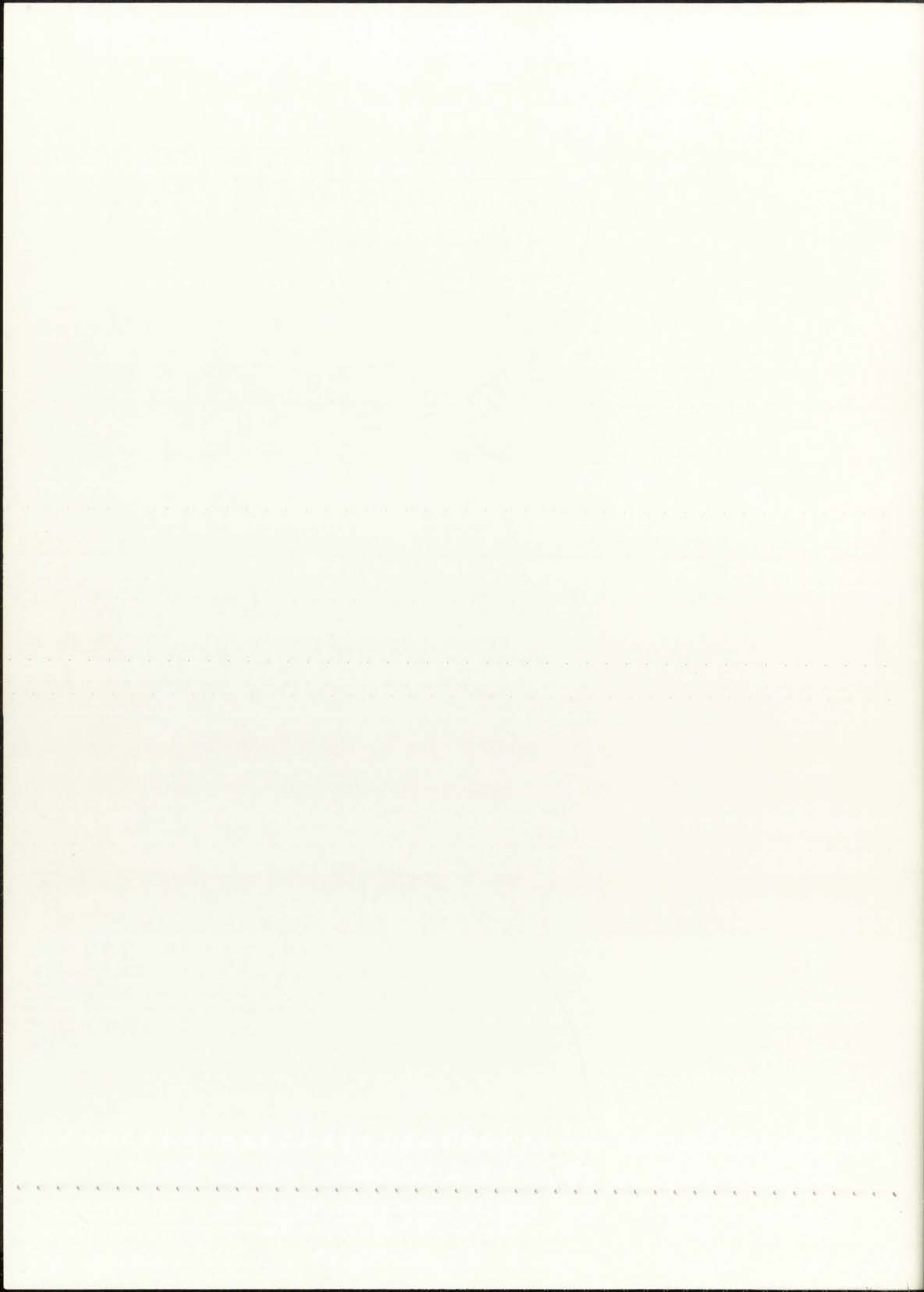
The entire procedure is much too complicated and involved to be dealt with in this thesis, and anyone desiring further information on the subject should look in the many civil engineering journals under structural model analysis.

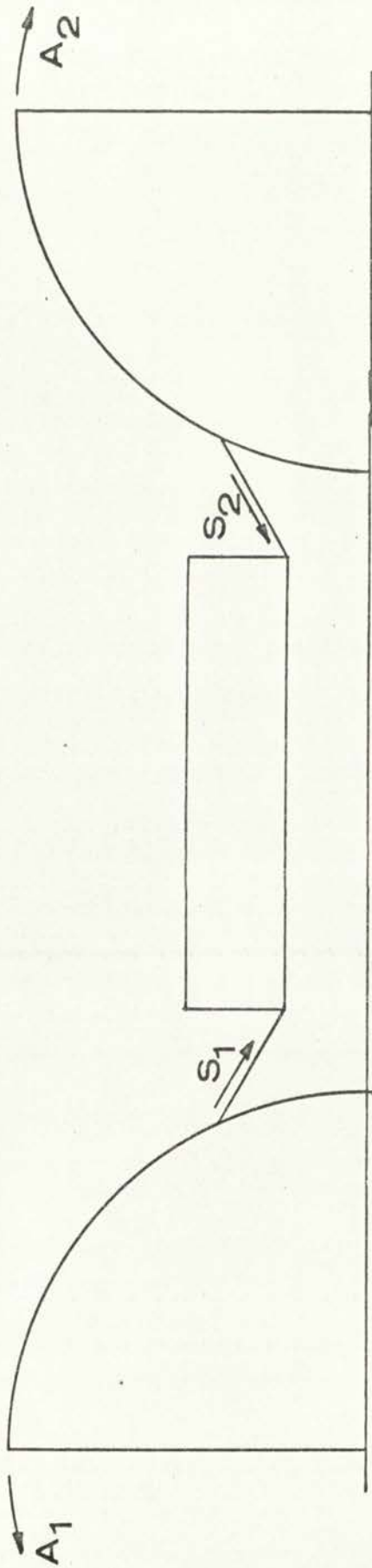




A2

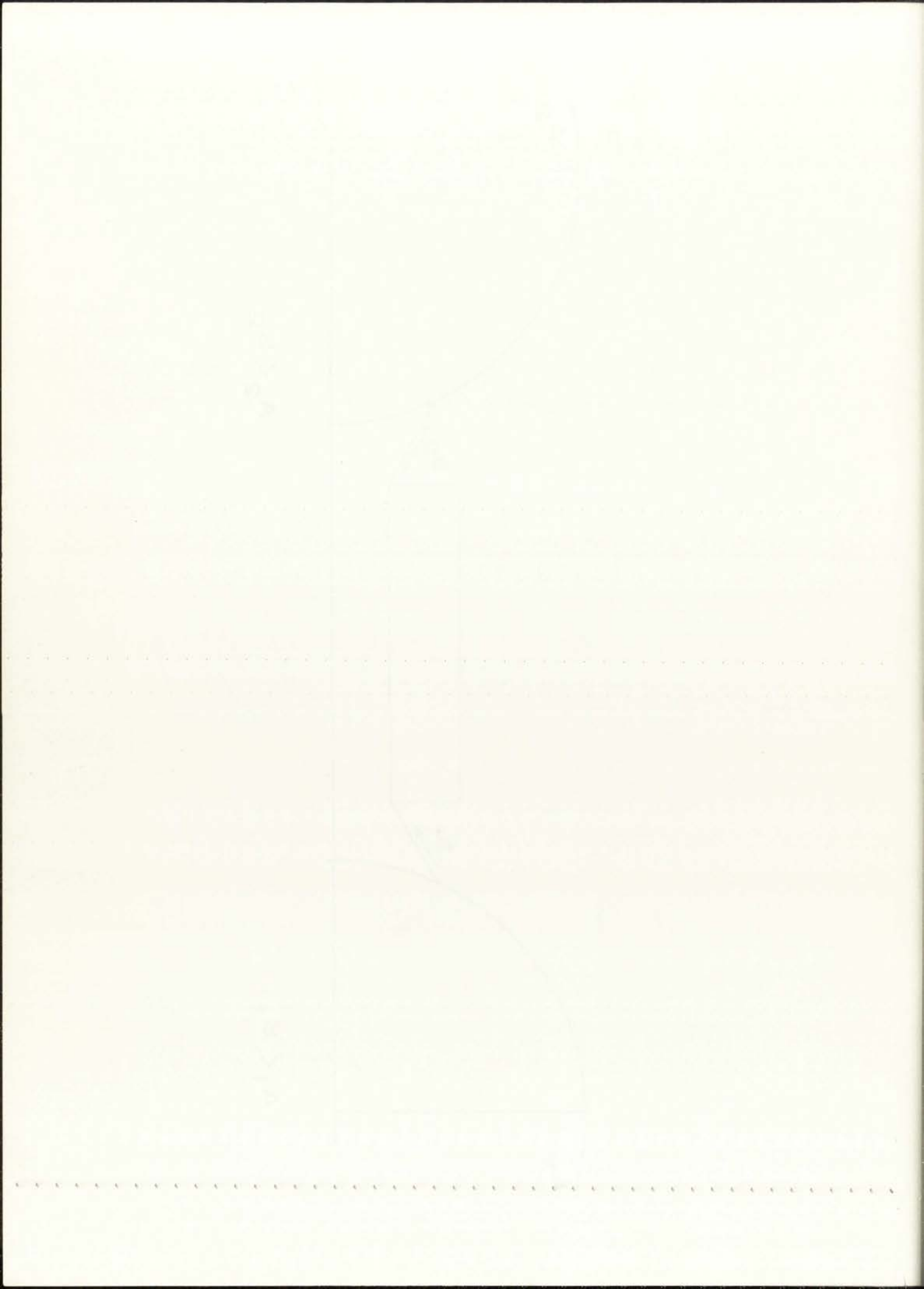
A1

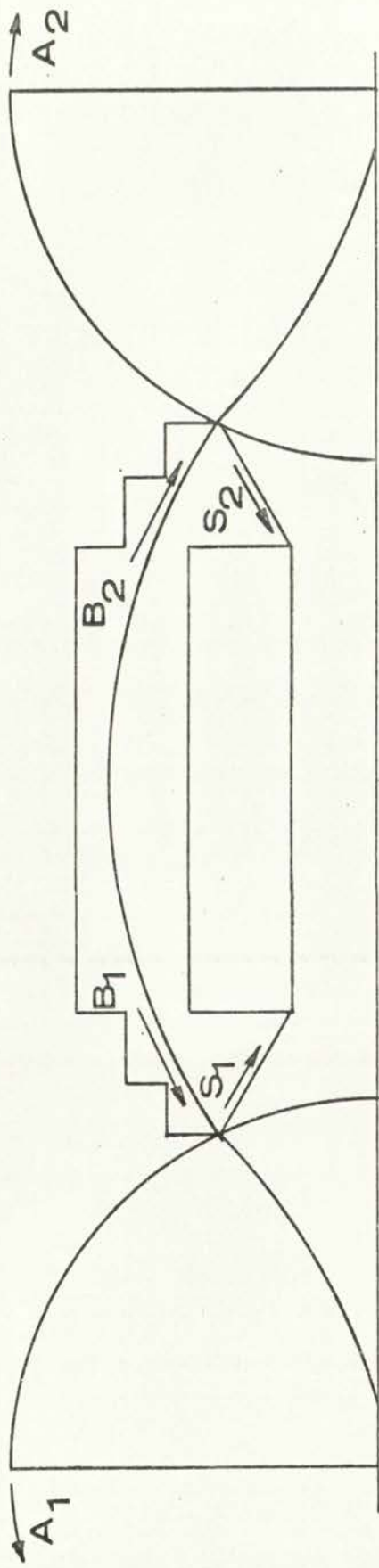




$A_1 < S_1$

$A_2 < S_2$

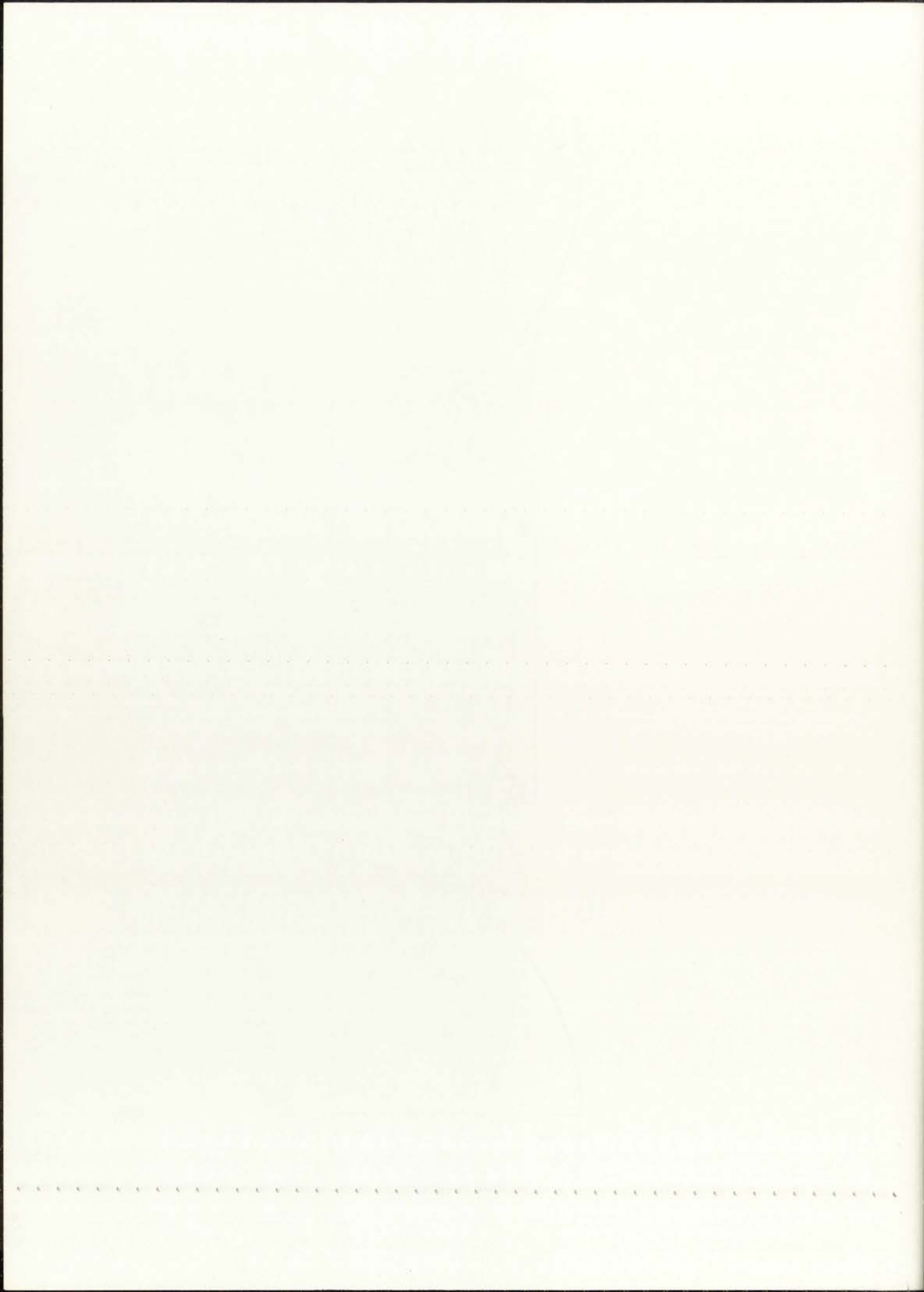


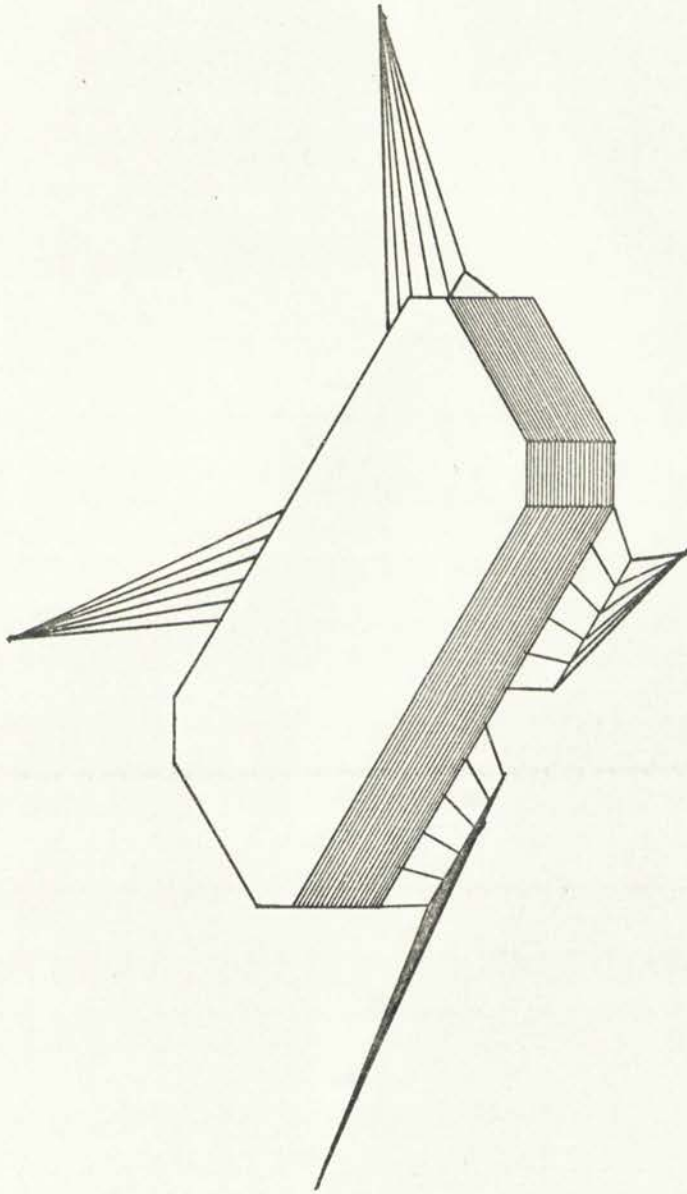


$$A_2 + B_2 = S_2$$

$$A_1 + B_1 = S_1$$

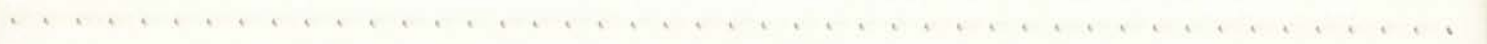
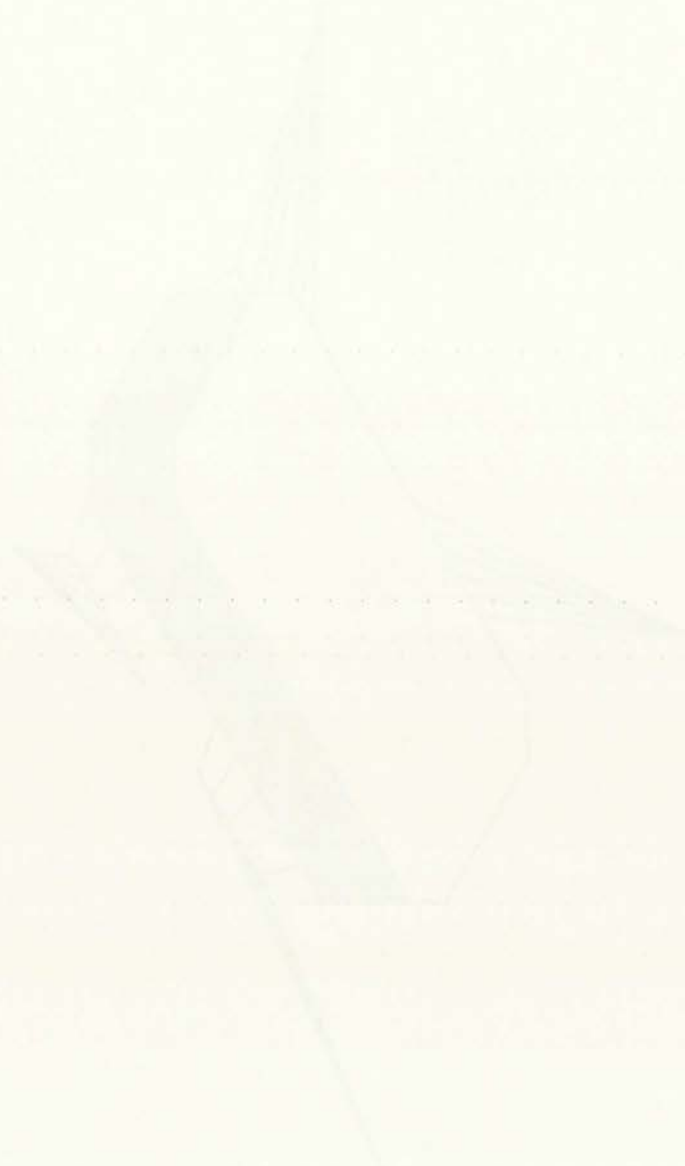
$$\Sigma_1 = \Sigma_2$$





SUSPENSION STRUCTURE

ЗАУТОЧНА МОРИНА



APPENDIX

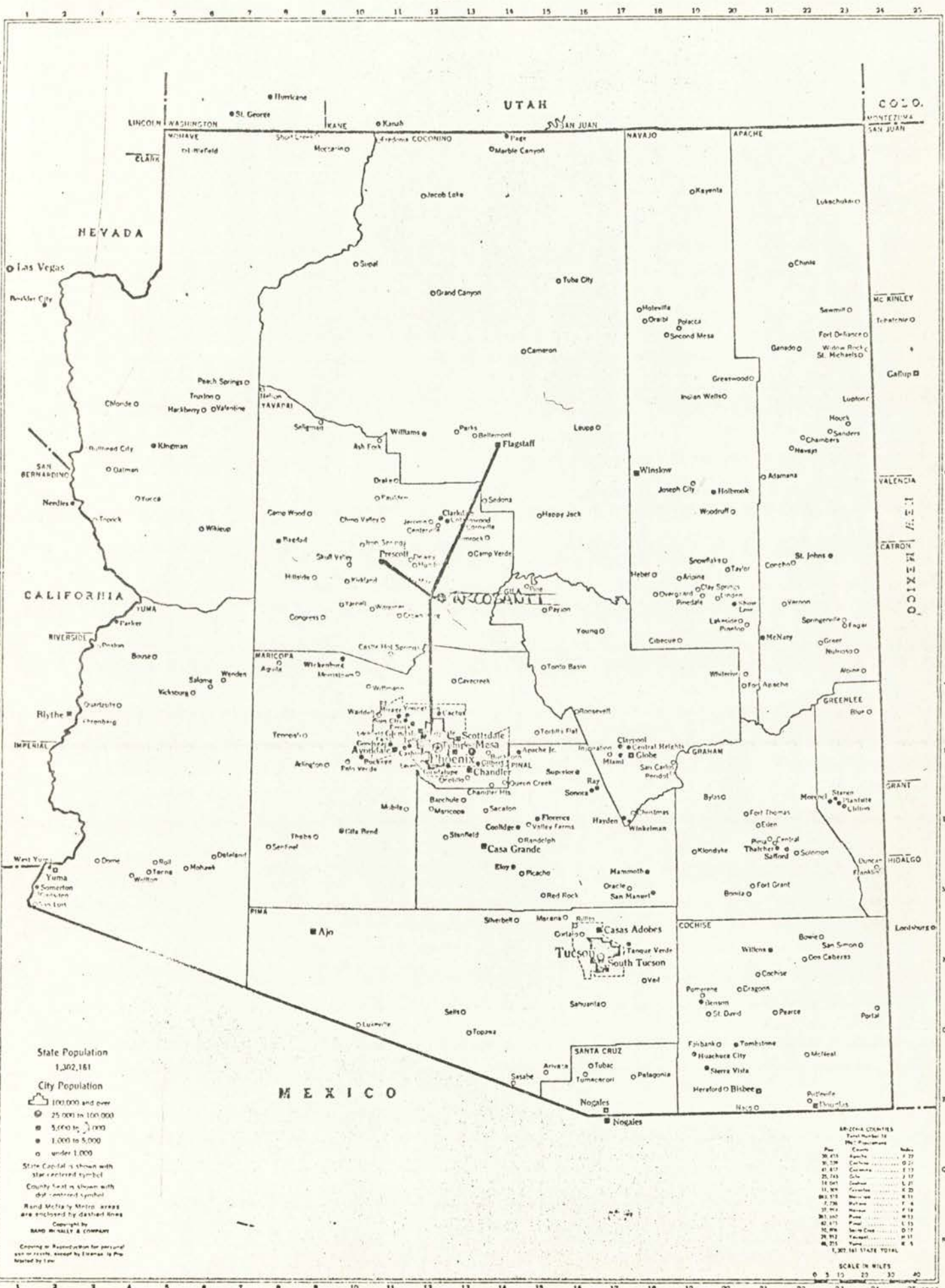


RAND McNALLY STATE COUNTY CITY MAP

ARIZONA

SIZE 8 1/2 x 11

JOHNSON: THESIS SITE: 11-4-68



State Population
1,302,161

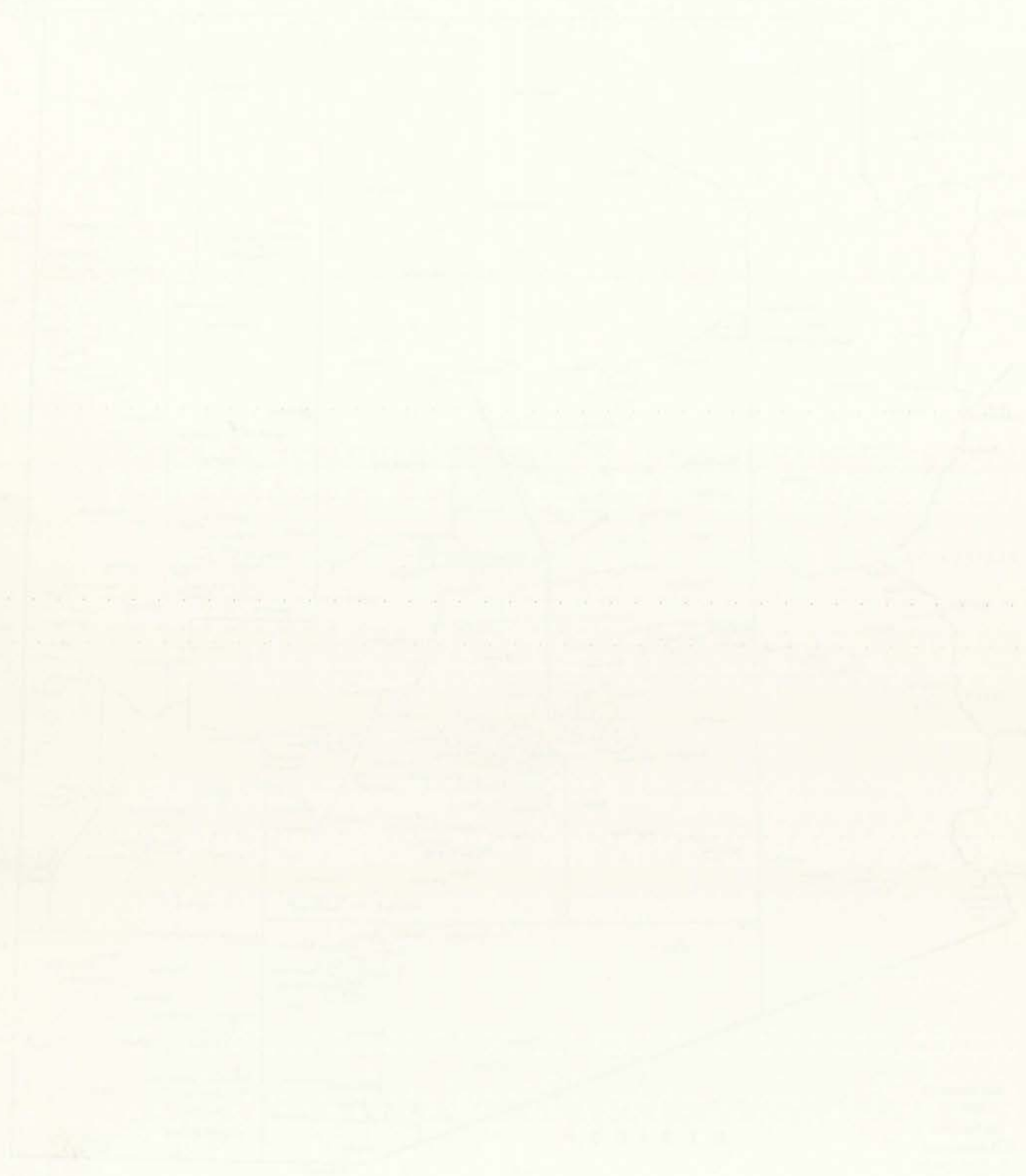
- City Population
- 100,000 and over
 - 25,000 to 100,000
 - 5,000 to 25,000
 - 1,000 to 5,000
 - under 1,000

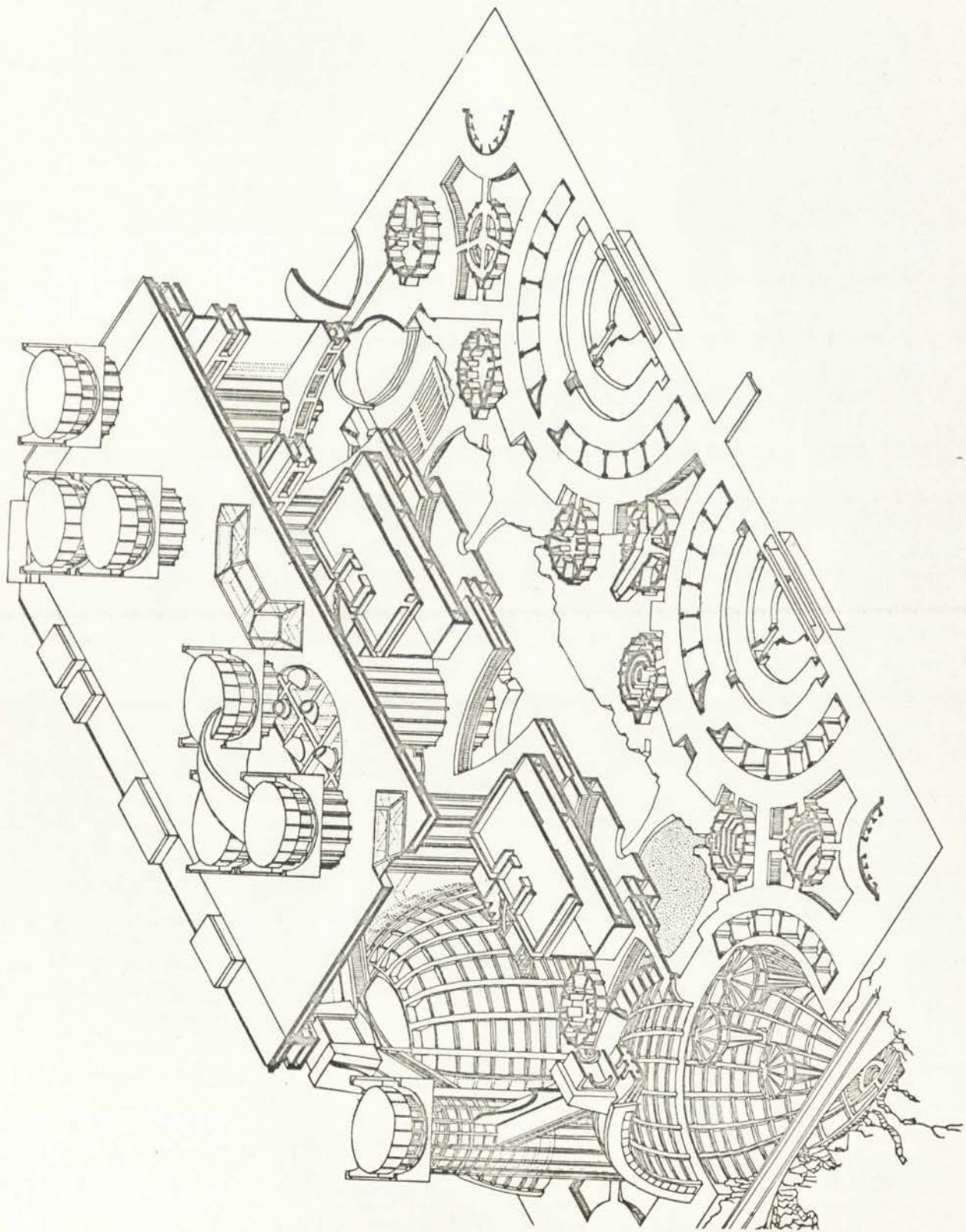
State Capital is shown with star centered symbol
County Seat is shown with dot centered symbol
Rand McNally Metro areas are enclosed by dashed lines
Copyright by RAND McNALLY & COMPANY

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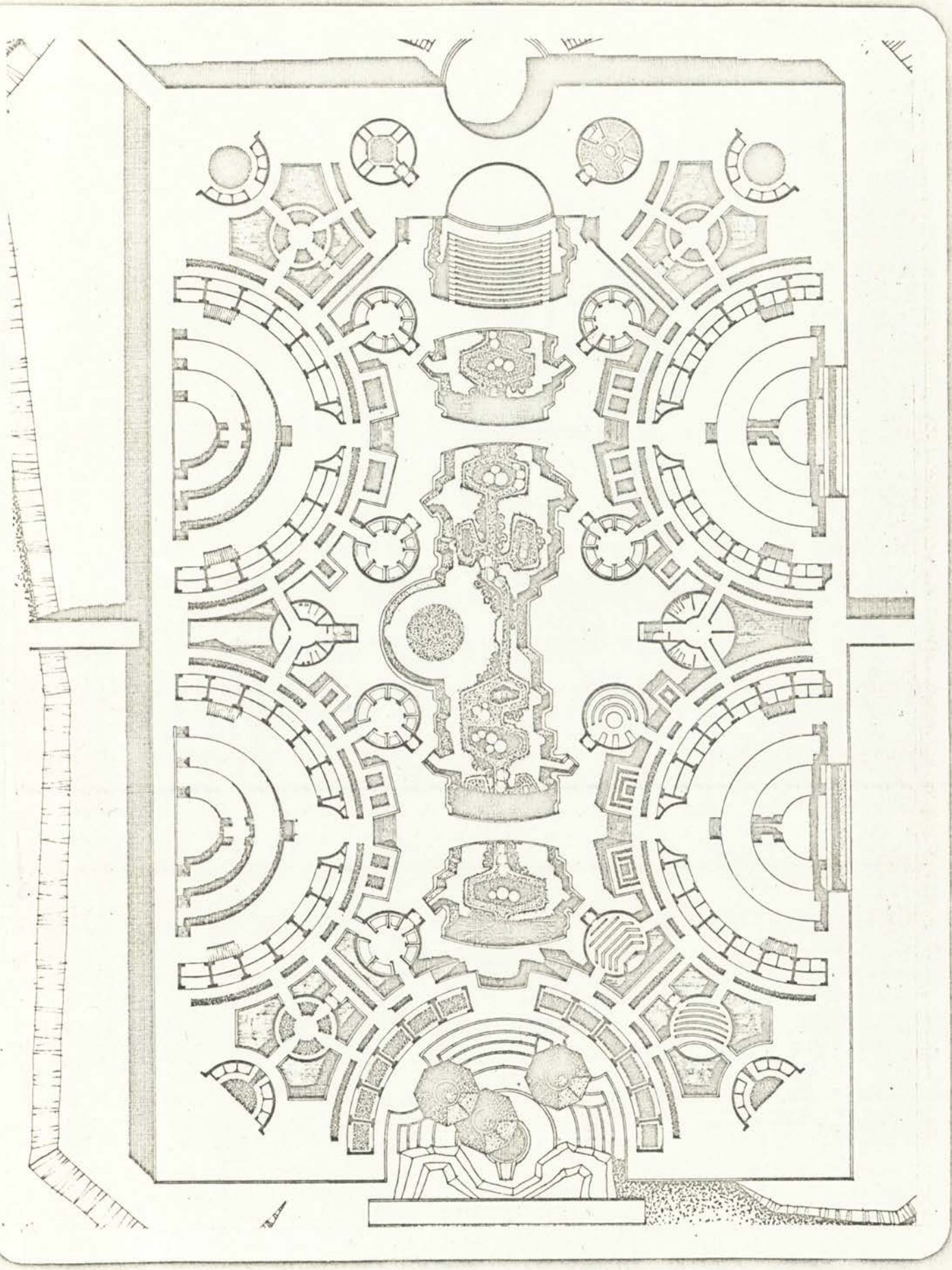
ARIZONA COUNTIES			
County	Pop.	Area (sq. miles)	Pop. Density
Apache	36,473	10,100	3.6
Cochise	36,378	11,460	3.2
Coconino	41,817	18,350	2.3
Graham	25,748	11,460	2.3
Greenlee	18,041	11,460	1.6
Maricopa	11,309	9,000	1.3
Mohave	88,113	23,000	3.8
Navajo	7,736	11,460	0.7
Pinal	37,964	11,460	3.3
Pima	261,667	9,000	29.1
Santa Cruz	42,473	11,460	3.7
Yavapai	16,806	11,460	1.5
Yuma	24,912	11,460	2.2
Total	1,302,161	113,840	11.4

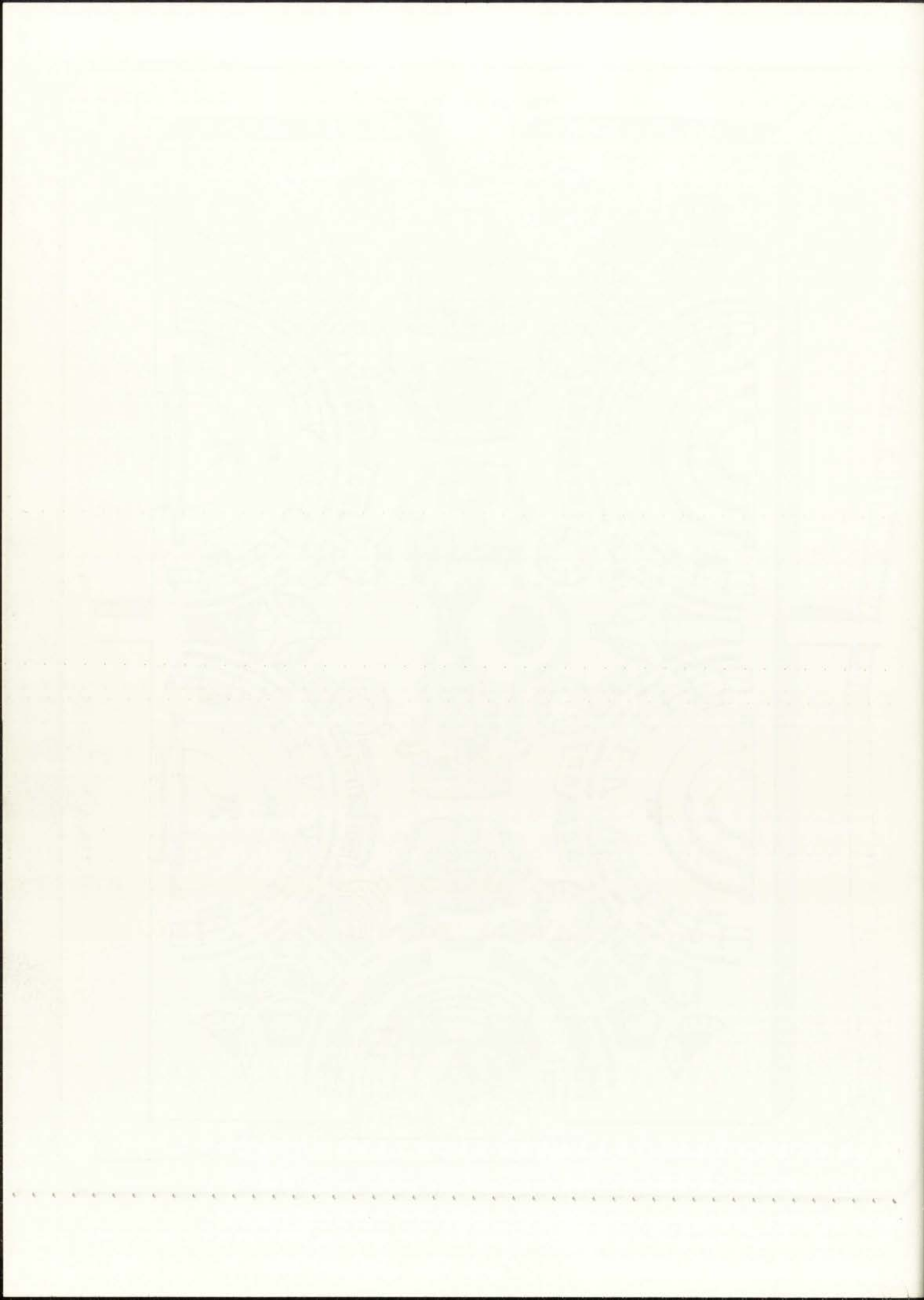
SCALE IN MILES
0 5 10 20 30 40

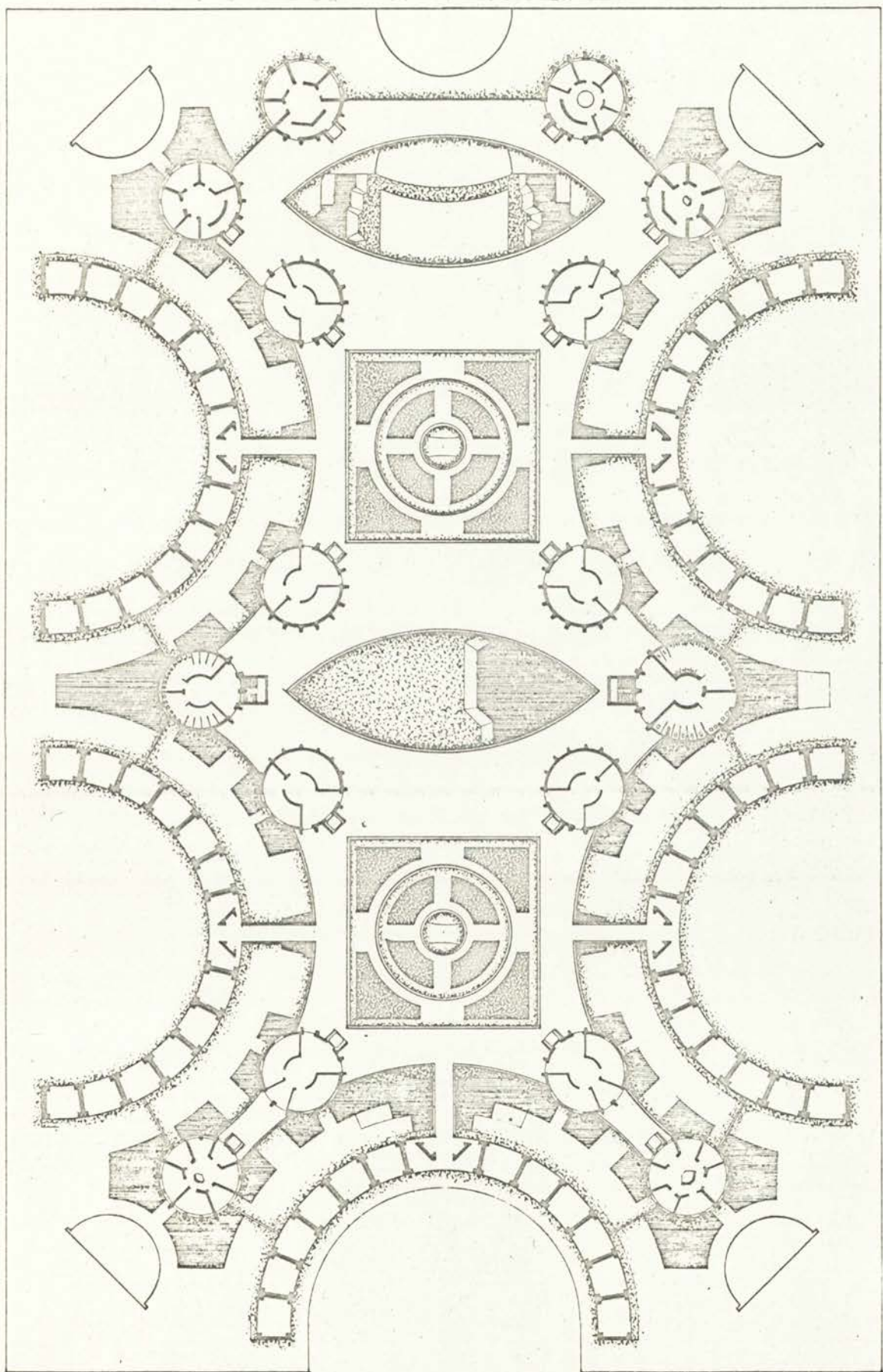


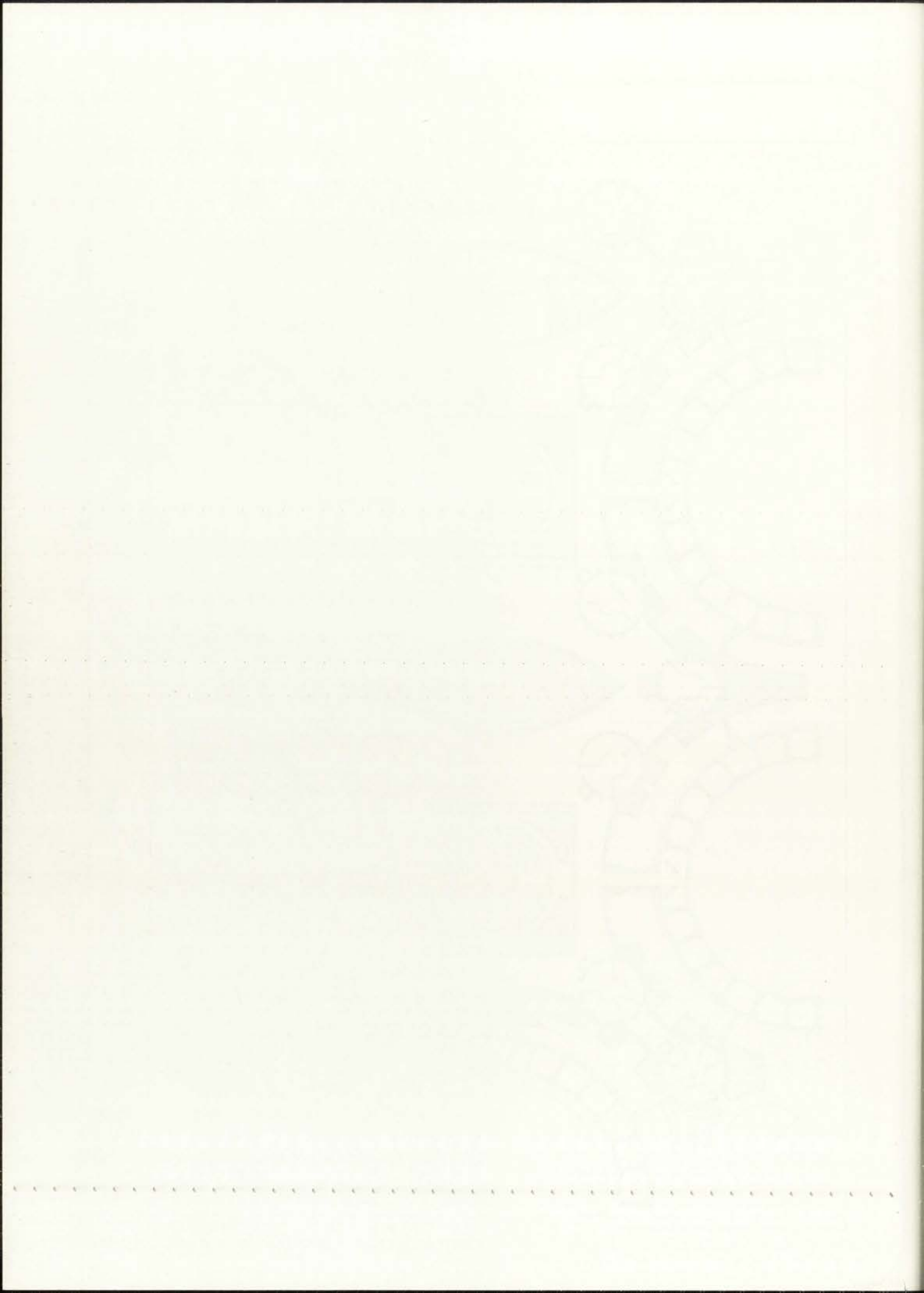


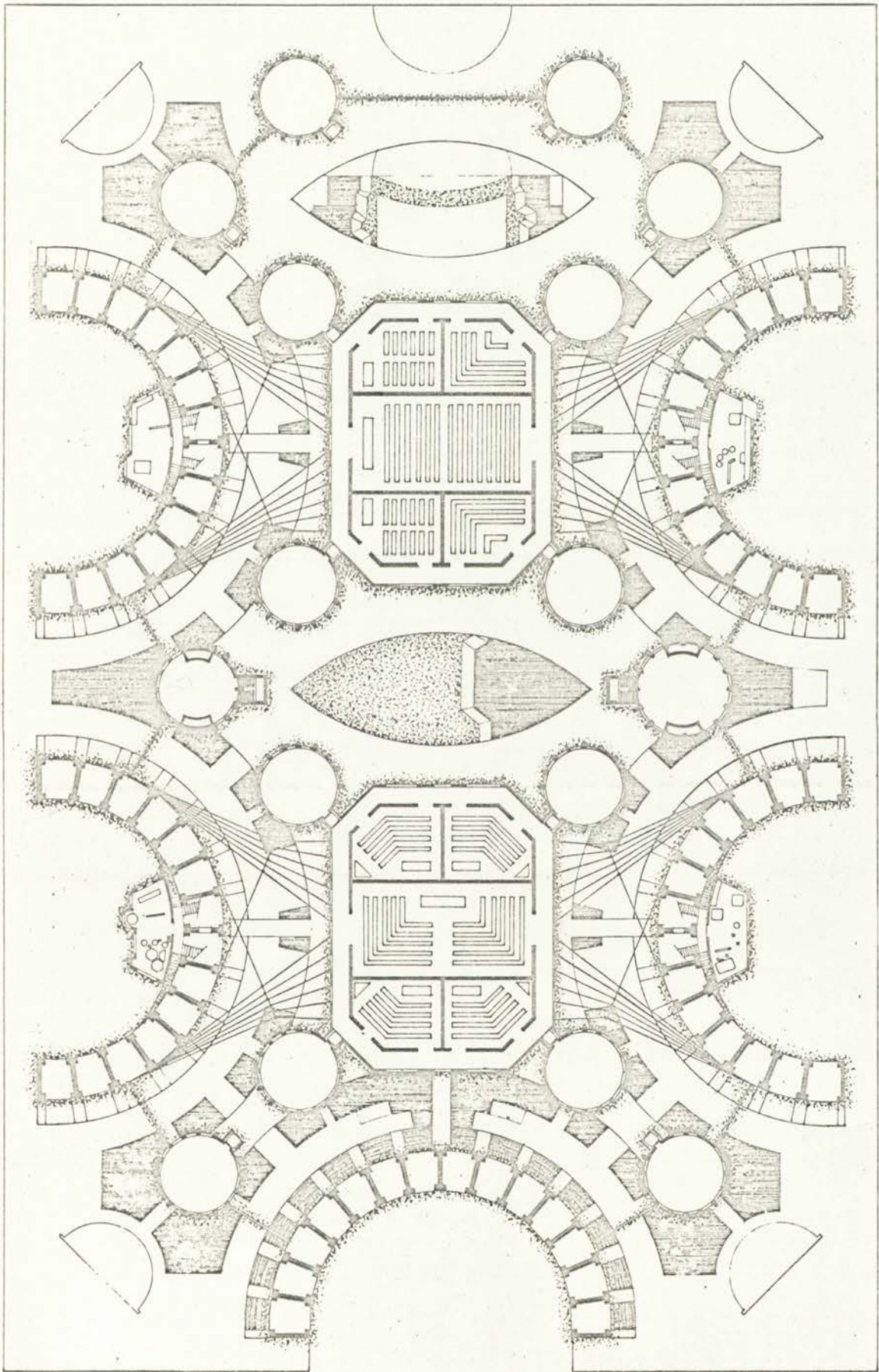




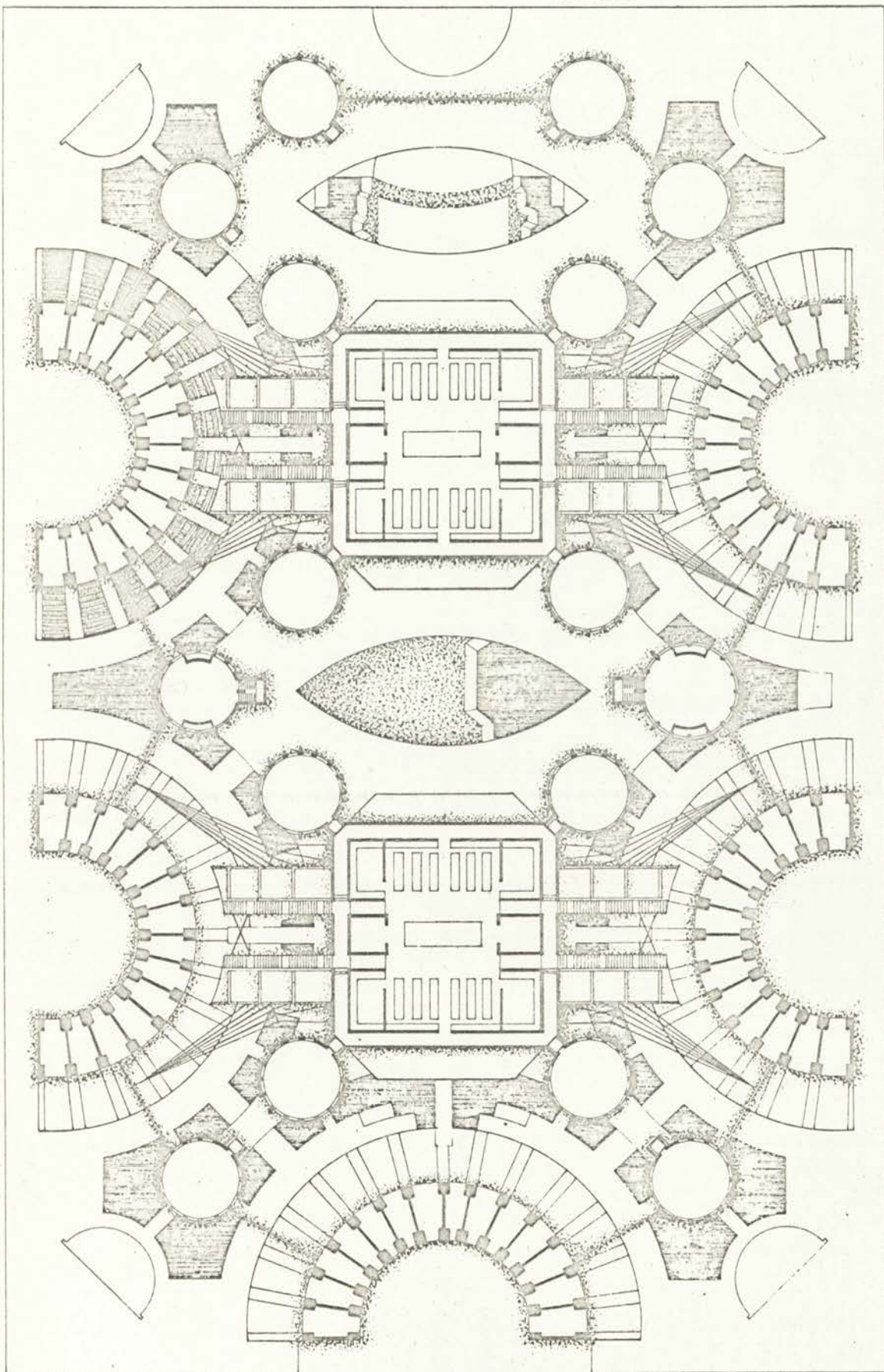




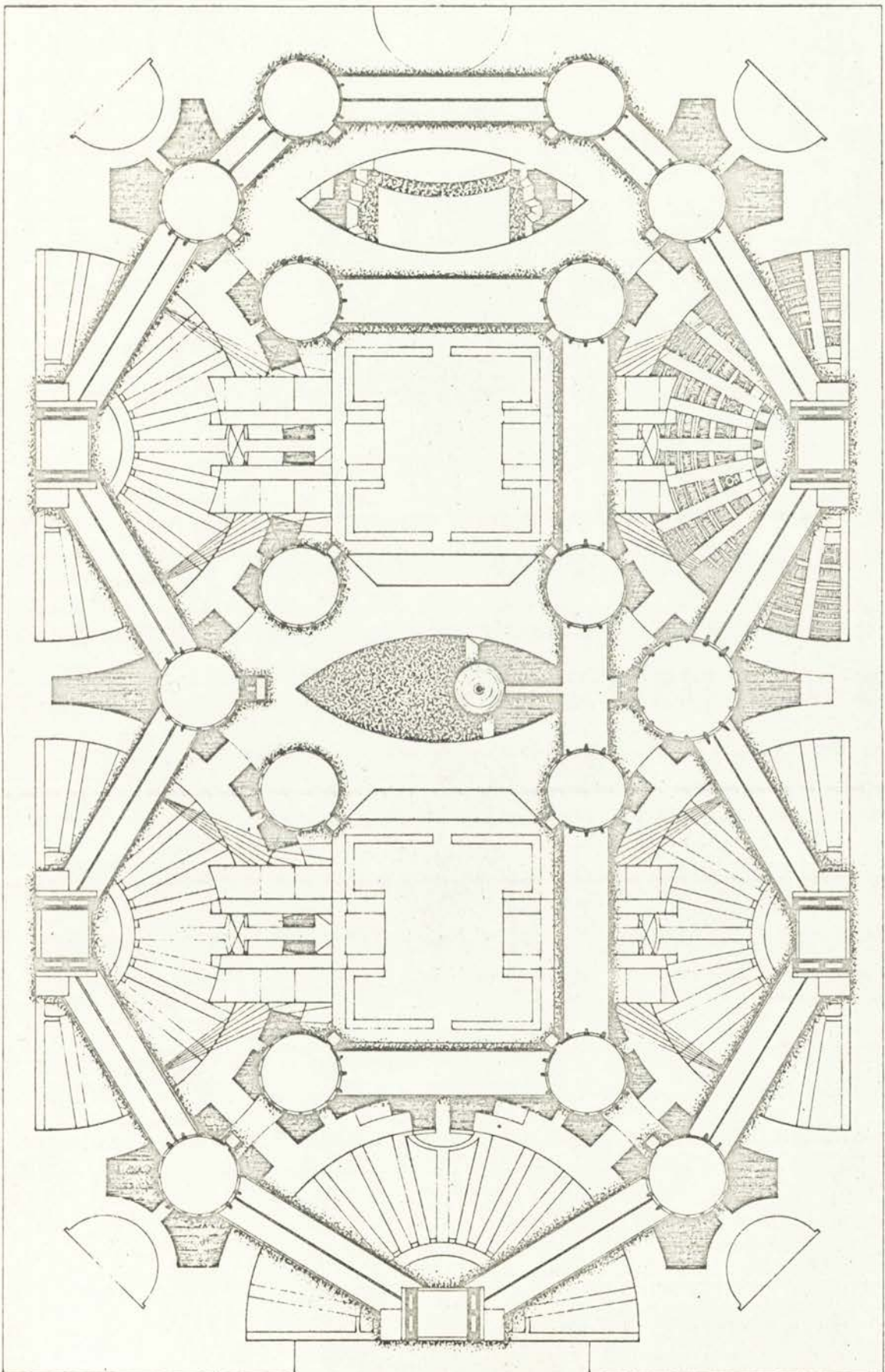














ARCHITECTURE IS BECOMING THE PHYSICAL DEFINITION OF A MULTI-LEVEL, HUMAN ECOLOGY. IT WILL BE ARC - OLOGY. ARCOLOGY, INSTRUMENTED BY SCIENCE AND TECHNOLOGY, WILL BE AN ESTHETO-COMPASSIONATE PHENOMENON. ITS ADVENT WILL BE THE IMPLOSION OF THE FLAT MEGALOPOLIS OF TODAY INTO AN URBAN SOLID OF SUPER-DENSE 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 UP TO 400,000 PEOPLE PER SQUARE MILE. THE WEAK VENEER OF LIFE RIDDEN WITH BLIGHT AND STILLNESS, WHICH MEGALOPOLIS AND SUBURBIA ARE, IS THUS TRANSFORMED 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 FINGER TIPS. 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 EFFORTS WILL GO ON IMPROVING WHAT WE HAVE, GREAT AND PERSISTENT EFFORT MUST GO TO DEVELOP, PARALLELLY TO THE CONDEMNED PATTERNS, THE NEW SYSTEMS COHERENT WITH MAN'S NEEDS. ARCOLOGY IS, IN BARE TERMS, THE EFFICIENT PLUMBING SYSTEM FOR CONTEMPORARY SOCIETY.

4) ARCOLOGY AND DIMENSION.

THE SQUANDERING IN LAND, TIME, ENERGY AND WEALTH OF MEGALOPOLIS AND SUBURBIA, NOW WELL ENTANGLED IN THEIR INCREASING CONTRADICTIONS, IS REJECTED AS OBSOLETE. WITH ARCOLOGY THERE ARE: A) THE IMMENSE NATURE; EXTENSIVE, KIND AND BRUTAL, THE RESERVOIR OF LIFE. B) THE MANMADE; DENSE, ORGANIZED, POWERFUL AND WELL SERVING MAN.

WITH THE THIRD DIMENSION, THE VERTICAL, NO MORE THE LIMITLESS SEA OF HOUSING AND DIM VITALITY OF A CHOKED SYSTEM. MAN IS REINSTATED AS A MEASURE OF THINGS AND PRIMARILY OF A 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 IMPOSSIBLE FOR THE HUNGRY MAN TO SEAT AT THE BOUNTIFUL TABLE IS A CONFIGURATION WHICH 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 TO PERFORM ARE PUT OUT OF THE REALM OF THE POSSIBLE.

ARCOLOGY IS BOTH DIMENSIONALLY (1 CUBIC KM AS AGAINST 400 SQUARE MILES) AND FUNCTIONALLY OF A HUMAN SCALE WITHOUT LOSING ITS AWESOME FORCE, INDEED RATHER 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 SLUGISHNESS AND ANTI-SWIFTNES INHERENT TO SCATTERIZATION MAKE THE HIGH SPEED URBAN TRANSPORTATION A PERPETUAL ILLUSION.

IN ARCOLOGY, DISTANCES ARE MEASURED AGAIN BY WALKS AND IN MINUTES. WITHIN IT THE CAR IS NON-SENSICAL. IT HAS NOWHERE TO GO.

7) ARCOLOGY AND LAND CONSERVATION.

A) THE COMPACTNESS OF ARCOLOGY GIVES BACK TO FARMING AND TO LAND CONSERVATION 90 PERCENT OR MORE OF THE LAND THAT THE MEGALOPOLIS AND THE SUBURBIA ARE ENGULFING BY THEIR SPRAWL.

B) TO BE A CITY DWELLER AND A COUNTRY MAN IN ONE AND THE SAME, TO BE ABLE TO PARTAKE FULLY OF BOTH CITY AND COUNTRY LIFE, WILL MAKE THE ARCOLOGY A PLACE IN WHICH ONE 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 IN ORES AND FUELS ARE NOT INFINITE. THE SQUANDERING OF SUCH COLLECTIVE CAPITAL WEALTH, WHILE PROCLAIMING THE SACREDNESS OF EXCLUSIVE AND PERSONAL POSSESSION THROUGH MONEY, IS IRRATIONAL, TO SAY THE LEAST. CHEMISTRY AND BIO-CHEMISTRY 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 THE GREED OF MAN. THE FRUGAL CHARACTER OF ARCOLOGY MOVES CONSUMPTION TOWARD THE USE OF THE EARTH'S INCOMES RATHER THAN THE EXHAUSTION OF ITS CAPITAL.



9) ARCOLOGY AND INDUSTRY.

- A) THE DESTRUCTIVE BITE OF THE CAR ON U.S.A. ECONOMY AND LIFE WILL NOT LAST ANOTHER 15 YEARS, NOR WILL THE PENTAGON'S RAVENOUS HUNGER FOR WAR HARDWARE. THE CAR WILL FOLLOW THE HORSE TO THE PASTURES OF SPORT AND ECCENTRICITY. THE WAR HARDWARE WILL DESTROY US OR WILL BE DESTROYED BY US.
- B) THERE IS THE COLOSSAL AND CHALLENGING TASK OF PUNCTUATING THE EARTH'S LANDSCAPE WITH A HUMANE, BEAUTIFUL CULTURE-SCAPE. EACH ARCOLOGY WILL BE AN INDUSTRY IN ITSELF WITH ITS ORIGINAL STANDARDIZATIONS, ITS AUTOMATED SYSTEMS; A CYBERNETIC ORGANISM GROWING ON ITS OWN VOLITION. 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 IN THE TOTAL GEOPHYSICAL AND BIO-CHEMICAL 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 IS THE MOST FAVORABLE SYSTEM. INSTEAD OF SEALING THE OUTSIDE OUT, CONDITIONING WILL EXTEND TO THE GROUND, THE 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 2000 SQUARE FEET IN AREA AND 3 INCHES TALL CAN ONLY WORK ON PAPER, IF HE CAN, SO POSSIBLY CAN OUR MEGALOPOLY AND SUBURBIAS WORK ONLY ON PAPER. THEY WILL NEVER REALLY AND SUBSTANTIALLY WORK FOR REAL. THEY ARE JUST NOT REAL. THEY ARE UTOPIAN. ARCOLOGY CAN BE A CONGRUOUS SYSTEM, AND AS SUCH AN OPTIMUM SYSTEM FOR THE FULL AND COMPLEX LOGISTIC OF INDIVIDUAL AND SOCIAL LIFE.



13) ARCOLOGY AND COST.

THE INITIAL COST OF RESEARCH AND EXPERIMENTATION IS BY NECESSITY HIGH. EVOLUTION 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 IN HOW WELL THE FULL FLOW OF LIFE CAN RUN THROUGHOUT A STRUCTURE. IF THE TEMPO OF OBSOLESCENCE IS IN THE SAME BEAT OF INDIVIDUAL GROWTH; CHILDHOOD, YOUTH, MATURITY, AGE, THE INDIVIDUAL HIMSELF IS OBSOLETE. THE PRECARIOUSNESS OF HIS SIGNIFICANCE WILL DESTROY HIM.

15) ARCOLOGY AND UNDERDEVELOPED COUNTRIES.

WITH ARCOLOGY IS THE POSSIBILITY OF LEAPING BEYOND THE MECHANICAL AGE INTO THE CYBERNETIC CULTURE. 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.

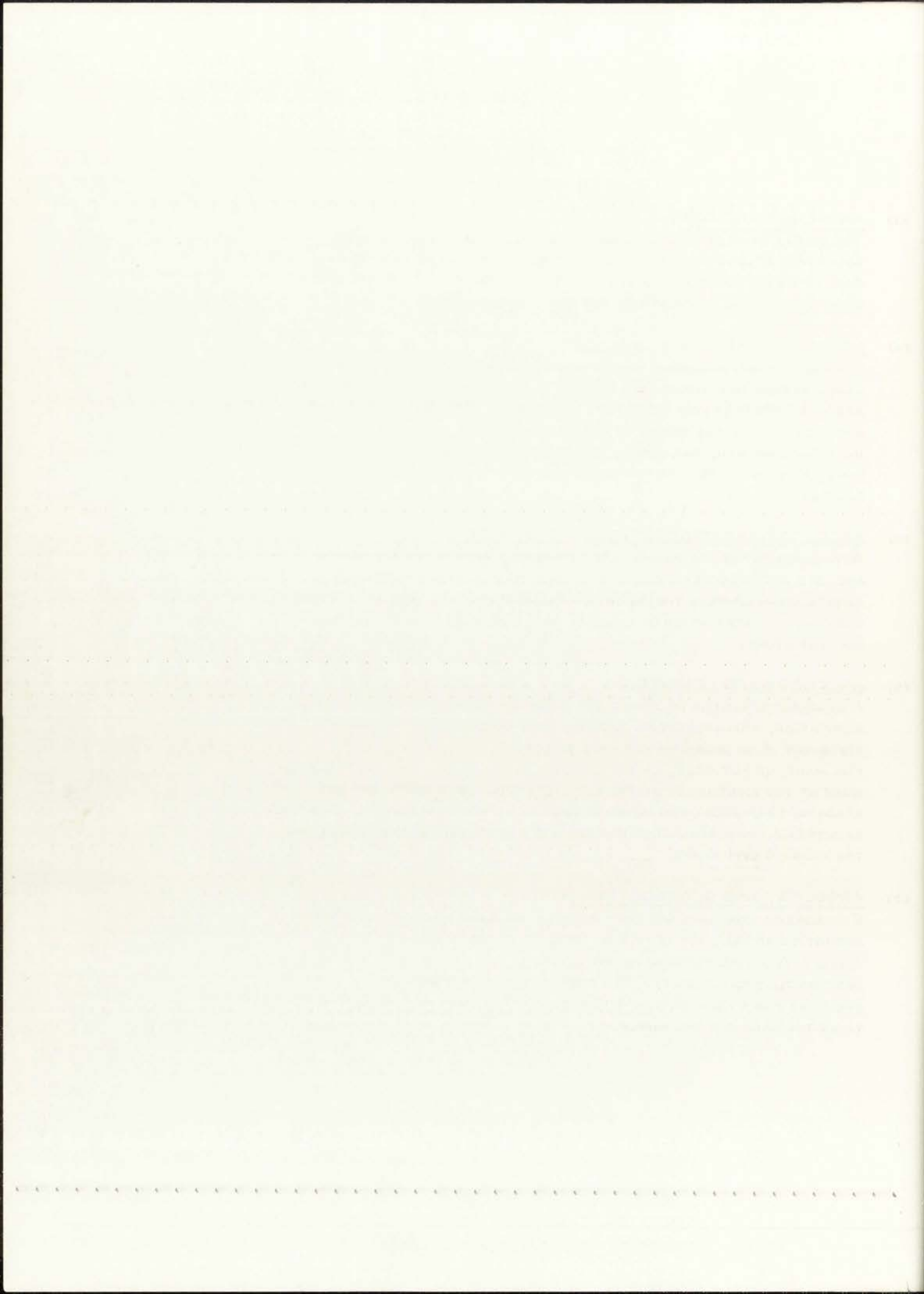
16) ARCOLOGY AND LEISURE.

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 INTRA-STRUCTURE 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 NON-SEGREGATED CULTURE. THE CARE FOR ONESELF WILL TEND TO BE THE CARE FOR THE WHOLE.



18) ARCOLOGY, AGRESSION AND GUILT.

AGRESSION 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 ASUNDER SOCIETY, THEN THE AWESOMENESS OF ARCOLOGY AND THE COMPLEXITY OF ITS CONSTRUCTION ARE THE POSITIVE ALTERNATIVES TO DESTRUCTION BY WAR 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 MARKET PLACE, 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 WARDS TO WARDS, MAKING THE FAMILY DOCTOR REAL AGAIN. INFIRMARIES, CLINICS AND HOSPITALS ARE ALWAYS AT WALKING DISTANCE, LEAVING NO POCKETS OF INDIFFERENCE THAT MIGHT NOT BE MALICIOUSLY WANTED.

20) ARCOLOGY AND SURVIVAL.

- A) TO PIN-POINT AN ORBITAL WAR-HEAD ON A SQUARE MILE OR SO IS A FEAT FOR A DISTANT FUTURE.
- B) EVACUATION IN ARCOLOGY CAN BE ALMOST INSTANTANEOUS.
- C) ITS VAST UNDERGROUND STRUCTURE FOR FOUNDATIONS, ANCHORAGES AND AUTOMATED INDUSTRIES WILL BE GOOD EMERGENCY SYSTEMS.
- D) ARCOLOGY IS THE COHERENT EXPRESSION OF THE FAITH IN MAN, AND AS SUCH, IT IS BEYOND THE SURVIVAL PLATFORM.

21) ARCOLOGY AND THE UNDERGROUND.

MAN MUST REFUTE UNDERGROUND LIVING.

- A) HE IS A BIOLOGICAL ANIMAL OF SUN, AIR, LIGHT AND SEASONS.
- B) HE IS AN ESTHETIC ANIMAL AND HIS SENSES ARE MORE AND MORE ORIENTED TOWARDS A USEFULNESS OF PURELY ESTHETIC WORTH.

THE UNDERGROUND IS IDEAL FOR AUTOMATIZED PRODUCTION IN NEED OF TECHNOLOGICALLY SOPHISTICATED ENVIRONMENTS; PRESSURE, VACUUM, RADIATION, HEAT, COLD, RARE ATMOSPHERES, ETC. (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 OF COMPACT NATURE BY NECESSITY. IN ARCOLOGY ARE BOTH 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 IS TO MAKE TIGHT BUNDLES OF THAT MINIMAL PORTION OF THEM ALLOWED TO HIM SO THAT HIS OWN INFINITY MIGHT BLOSSOM; THE INFINITE COMPLEXITY OF HIS COMPASSIONATE AND ESTHETIC UNIVERSE.

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 GENERAL SCATTERIZATION OF THINGS AND THOUGHTS, THE FAMILY HAS BROKEN DOWN IN 4 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 THE SOCIAL SECURITY WILL NEVER DO LEST MAN BECOMES OR REMAINS A MARKETABLE GOOD.

THE IMPLICATIONS OF "ARCOLOGICAL LIFE" ARE THE MOST FAVORABLE FOR THE REINTEGRATION OF THE DIFFERENT AGE GROUPS AND THUS FOR THE REGROUPING OF THE FAMILY STRANDS.



26) ARCOLOGY AND PLAY.

THE PLAYGROUND IS THE ACT OF CONDESCENDENCE TO PLAYFULNESS IN A HABITAT WHERE GRIMNESS, UGLINESS AND DANGER ARE ENDEMIC AND OFFER THE LAST MEASURE OF UNCONCERN OF 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 HOLDER OF POWER, FROM THE HOME UP TO THE NATION'S POLICY-MAKERS, IS MOLDED ON THE CHASM 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 HAS TO BE SUGGESTED OF THINGS TO COME THAT WILL NOT MELT AND TOTALLY CONFOUND ITSELF WITHIN 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 MOST NEED.

ARCOLOGY IS A CONTAINER WHERE IDEAS AND VISION CAN MEET MAN IN QUEST FOR A STRUCTURE FOR LIVING AND NOT JUST AN AMORPHOUS CONTAINER FOR A DEPERSONALIZED SURVIVAL.

28) ARCOLOGY, THE PRACTICAL AND THE REAL.

THE FUNCTION OF THE PRACTICAL IS TO INSTRUMENTALIZE THE REAL. THE REAL IS TO DICTATE WHY, WHAT, WHERE AND WHEN THE PRACTICAL IS TO DO. THIS ANTI-MATERIALISTIC 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 IS NOT CONVERGENT WITH THE AIMS OF FREE MAN. THE PRACTICAL IS THUS NO MORE THE ESPECIALLY TEMPERED TIP OF A WILLFULLY-DRIVEN UTENSIL, BUT INSTEAD A VAIN, AIMLESS AND SQUALID DECORATION HOOKED ON THE WELL-BURDENED TRAIN OF THE REAL.

THE REAL IS TO BE SOUGHT BY THE SKILL OF THE PRACTICAL. THE PRACTICAL IS A SUB-SKILL WHENEVER ENTHRONED ON THE IDOL'S CHAIR. ARCOLOGY REJECTS AS TOTALLY UNREAL THE PRACTICALITY OF SUCH BIGOTED A POSITION.

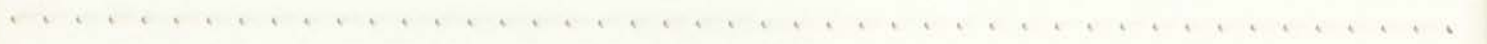
The first part of the report deals with the general conditions of the country and the progress of the work during the year. It is followed by a detailed account of the various expeditions and the results obtained. The report concludes with a summary of the work done and the prospects for the future.

THE RESULTS OF THE EXPEDITIONS

The first expedition was to the mountains of the north. It was led by Mr. A. B. C. and consisted of ten men. They were accompanied by a pack of mules and a herd of cattle. They spent several weeks in the mountains, exploring the valleys and the peaks. They discovered many new plants and animals, and they collected a large amount of material for the museum. The second expedition was to the mountains of the south. It was led by Mr. D. E. F. and consisted of eight men. They were accompanied by a pack of mules and a herd of cattle. They spent several weeks in the mountains, exploring the valleys and the peaks. They discovered many new plants and animals, and they collected a large amount of material for the museum.

THE MOUNTAINS OF THE NORTH

The mountains of the north are a range of high peaks and deep valleys. They are covered with dense forests of evergreen trees. The climate is cool and moist. The mountains are rich in minerals and are a source of many valuable products. The first expedition to the mountains of the north was in 1910. It was led by Mr. A. B. C. and consisted of ten men. They were accompanied by a pack of mules and a herd of cattle. They spent several weeks in the mountains, exploring the valleys and the peaks. They discovered many new plants and animals, and they collected a large amount of material for the museum.



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; 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.

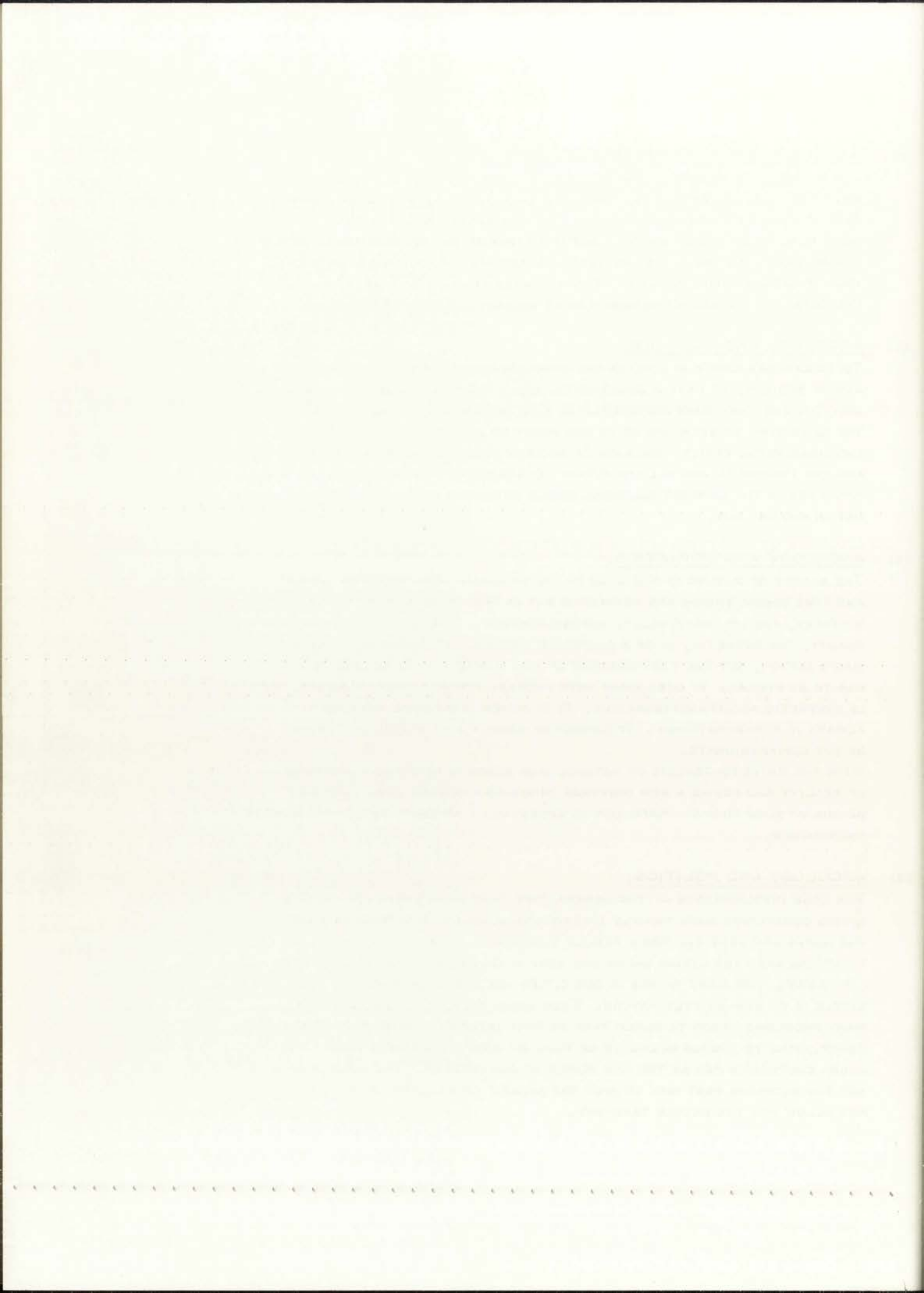
31) ARCOLOGY AND ESTHETICS.

THE BEAUTY OF NATURE IS ACHIEVED IN THE AWESOME RESERVOIRS OF SPACE AND TIME WHERE THINGS ARE HAMMERED OUT IN THE ORDER WHICH PROBABILITY DICTATES, JUSTLY, RATIONALLY, IMPASSIONATELY. THE GENESIS OF MANMADE BEAUTY, THE ESTHETIC, IS OF A DIFFERENT NATURE. IT IS NOT INCIDENTAL TO MAN'S ACTION, BUT 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 ALWAYS IS SUPER-RATIONAL. IT CANNOT BE SIMPLY JUST BECAUSE IT CANNOT BE BUT COMPASSIONATE.

WITH THE ESTHETO-GENESIS OF NATURE, MAN REACHES INTO THE STRUCTURE OF REALITY AND FORMS A NEW UNIVERSE IN HIS OWN IMAGE. ARCOLOGY CAN BE ONE OF SUCH FORMS. ARCOLOGY IS ESSENTIALLY AN ESTHETO-COMPASSIONATE PHENOMENON.

32) ARCOLOGY AND POLITICS.

THE LONG INVOLVEMENTS OF THE GENERATIONS THAT HAVE PRODUCED TODAY'S CITIES CONSTITUTE SUCH TIGHTLY INTERWOVEN BUNDLES OF INTERESTS THAT THE HOPES ARE VERY DIM FOR A REALLY PURPOSEFUL RENEWAL. WHAT HAS BEEN THE LIVING CAUSE HAS VERY MUCH BECOME THAT WHICH TAKES LIFE AWAY. TOO MANY THINGS IN OUR CITIES ARE SPENT CARTRIDGES, TOO LITTLE IS OF NON-BRITTLE NATURE. EVEN DOODLING AROUND ANY OF THEIR MANY PROBLEMS TENDS TO BLEED THIS OR THAT INTEREST, OR THIS OR THAT GROUP. AND TO DOODLE SEEMS TO BE WHAT AT BEST WE DO WITH THEM. AN URBAN CULTURE IS PER SE THE NTH POWER OF COMPLEXITY. THE BURDEN OF A NOT TOO GLORIOUS PAST MAY BE JUST THE AMOUNT OF BALLAST THAT WILL NOT ALLOW FOR THE NEEDED 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 IN LESS SPACES AND IN LESSER TIMES. THIS PROCESS, FROM HAPHAZARDNESS AND DISLOCATION TO COORDINATION 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 SUPER-ORGANISM, 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 ON THE SEAS AND ON ORBITAL LANDS. THE ORBITAL LANDS WILL ALSO FUNCTION AS TRANSFORMERS OF THE EARTH'S CLIMATE. THE POPULATION EXPLOSION WILL THEN HAVE DIFFERENT MEANINGS. BOTH TERRESTRIAL AND EXTRA-TERRESTRIAL TOWNS AND CITIES WILL BE ARCOLOGICAL.

34) ARCOLOGY AND SYMMETRY.

THERE ARE, AMONG OTHERS, THE FOLLOWING THREE KINDS OF SYMMETRY:

- 1) STRUCTURAL SYMMETRY
- 2) FUNCTIONAL SYMMETRY
- 3) 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 MONO-CELLULAR OR HIGHLY COMPOSITE. FUNCTIONAL SYMMETRY IS THE DIRECT SOLUTION TO THE CONSTANT WAVERING OF THE ENERGY BALANCES COMPOSING THE LIVING ORGANISM AND ITS NON-SYMMETRICAL BEHAVIOUR. WITH OUT SUCH SYMMETRY THE ORGANISM WOULD BE CONSTANTLY LOPSIDED, THAT IS TO SAY, UNFITTED FOR LIFE. FORMAL SYMMETRY MIGHT WELL BE THE IMPRINT OF ALL OTHER KINDS OF SYMMETRY INTO THE MIND AND THE SENSITIVITY OF MAN. SO THAT 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 IS THE SYMMETRY, THE GREATER IS 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. THE BULK OF 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. THIS IS THE KIND OF MOBILITY, COMMUTING FOR INSTANCE, THAT ORDERS AND PUSHES PEOPLE AND THINGS AROUND. THE PENALTY IS THE LOSS OF THE SOURCE OF LIVELIHOOD. UNBURDENED OF THE COERCIVE MOBILITY, THE 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 ESSENTIAL DIFFERENCE BETWEEN A BIOLOGICAL ORGANISM AND THE CITY. FURTHERMORE, THOSE THOUSAND MINDS DO NOT STAY PUT. THEY ARE EMINENTLY PERIPATETIC, BUT IN CLUSTERS OF 3 - 4 OR SO (THE FAMILY), THEY TEND TO DEFINE A TERRITORIALITY FAIRLY 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 BIOLOGICALLY AN INNER CENTER, THE BRAIN, IS THE CENTER TO WHICH THE BODY RENDERS SERVICE, URBANISTICALLY THE EPIDERMIS MADE UP OF A THOUSAND BRAINS IS SUCH "CENTER" TO WHICH THE BODY IS DEDICATED.

THE MENTAL PROCESSES OF THE BIOLOGICAL ENTITY IS CENTRALIZED AND INTERIORIZED. THE MENTAL PROCESSES OF THE CITY ARE DIFFUSED AND EPIDERMAL. THEN WHILE FOR THE ANIMAL BODY THE SKIN IS PREVALENTLY A DEFENSIVE AND CONTAINING DEVICE, FOR THE CITY IT IS EMINENTLY A CAUSAL, 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 MANMADE MINIATURIZATION OF THE INNER.

THIS IS A DESCRIPTION OF ARCOLOGY.

Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is arranged in several paragraphs and appears to be a formal document or report.

37) ARCOLOGY AND CYBERNATION.

THE URBAN ORGANISM HAS A NEW TOOL ON HAND. IT CAN DELEGATE TO A NON-BIOLOGICAL BRAIN SOME OF ITS LABORS. THIS NON-BIOLOGICAL 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 NON-BIOLOGICAL 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 THEN 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 FUNCTIONS WHILE THE INDIVIDUAL MINDS GOVERN THE PLURALISM INHERENT TO THE WHOLE ORGANISM. ARCOLOGY IS SUCH AN ORGANISM.

B) ARCOLOGY AND INFORMATION.

OF ALL THE DANGERS ASSOCIATED WITH CONTEMPORARY LIFE, THE PERIL OF ABSTRACTNESS AND THE VOID OF DULLNESS ARE WELL APPARENT AND VERY CENTRAL. THEY BOTH THRIVE ON THE KIND OF INFORMATION THAT IS COMMUNICATED BY REMOTE PROCEDURE. THE ELECTRONIC INFORMATION IS A SYNTHETIC INFORMATION. SYNTHETIC INFORMATION IS A NON-ENVIRONMENTAL INFORMATION. IF LEARNING IS LEFT EXCLUSIVELY TO SYNTHETIC INFORMATION, AS IS THE CASE IN SUBURBIA, THEN ABSTRACTNESS AND DULLNESS WILL GO RAMPANT WHILE THE ENVIRONMENT WILL GROW MORE AND MORE UNHINGED AND INEFFECTUAL. MAN, THE ENVIRONMENTAL ANIMAL, WILL DEVELOP AN INCREASING ALIENATION FROM WHAT SURROUNDS HIM AND ALSO FROM HIS OWN SENSES, INCREASINGLY USELESS AND COARSE. SYNTHETIC INFORMATION WILL PRODUCE SYNTHETIC MAN. ARCOLOGY EXISTS ON THE PREMISES OF ORGANIC MAN REMAINING SO FOR MANY GENERATIONS TO COME AND THUS DEMANDING A LEARNING PROCESS WHICH COVERS THE FULL SPECTRUM OF MEDIAS, AMONG THOSE, AND PECULIARLY HUMAN, THE ENVIRONMENTAL MEDIA. THE ENDLESS VARIETY ACHIEVABLE IN THE COMPLEX AND THREE-DIMENSIONAL ENVIRONMENT OF THE ARCOLOGY IS A GRANTOR OF A WEALTH OF ENVIRONMENTAL INFORMATIONS, ALL OF THEM IN REACH OF THE CITY DWELLER.

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- 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 CORRESPONDS FATALLY AND INEVITABLY A CONTRACTION OR MINIATURIZATION OF THE PERFORMING SYSTEM.

THE URBAN PHENOMENON IS

- A') A PROCESS OF INCREASING COMPLEXITY.
- B') A PROCESS THAT MUST TAKE PLACE IN PROPORTIONALLY SHRINKING SPACES.
- THEN
- C') AS THE INCREMENTAL COMPLEXITY OF THE URBAN SOCIETY IS IRREVERSIBLE, A MINIATURIZATION OF ITS STRUCTURE BECOMES INDESPENSIBLE.
- THAT IS TO SAY
- D) THE 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 THOSE RULES.



THE COSANTI FOUNDATION PROGRAM

THE SUBJECT IS THE CITY.

THE AIM IS:

- 1) AN 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.

THE GUIDING LINES ARE PRAGMATIC:

- 1) THE CITY IS A BIO-MENTAL 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 SPATIO-DURATIONAL 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 POLITIC, 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 FORCIBLY A SUBURBAN MELANCHOLY.

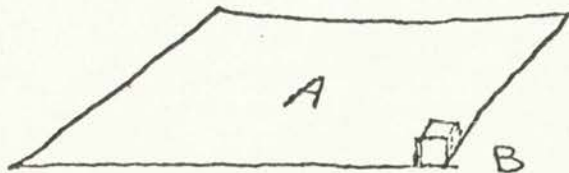
- 5) THE ENORMOUS COMPLEXIFICATION WORKING ITSELF INTO THE SOCIAL ORGANISM MAKES MANDATORY A CORRESPONDINGLY ENORMOUS CONTRACTION OF ITS URBAN CONTAINER.
- 6) IT IS THEN EVIDENT AND FATAL THAT THIS SCATTERIZATION, TEARING APART OUR TOWNS AND CITIES, IS A DEGENERATIVE PROCESS, NOT A GROWTH PROCESS. IT 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.



THE COSANTI FOUNDATION PROGRAM

IIA/B



- 8) MINIATURIZATION CAN BE ACHIEVED IF MAN'S PERFORMANCE IS UNCHAINED FROM THE ONE-LEVEL PATTERN OF THE EXISTING CITY. THE TWO-DIMENSIONAL CITY IS UTTERLY OBSOLETE AS WOULD BE OBSOLETE ANY FLAT ORGANISM, UNFIT FOR LIVING THAT IS.
- WE LIVE AND SURVIVE IN UTOPIA "A".
- WE MUST COME TO TERMS WITH PHYSICS AND BIOLOGY. WE MUST PRODUCE THE ORGANISM "B" OF THREE CONGRUOUS DIMENSIONS. "B" DOES ALL THAT "A" CAN POORLY DO, AND CAN DO ALL THAT "A" CANNOT DO AND SHOULD DO.
- 9) FURTHERMORE, "A" IS ECOLOGICALLY CALAMITOUS BECAUSE IT IS EMINENTLY WASTEFUL.
- "B" IS ECOLOGICALLY RELEVANT BECAUSE IT IS EMINENTLY EFFICIENT. IF LIFE IS A COSMIC PERFORMANCE, AS IT MUST EVENTUALLY BE REGARDED, THE PHYSICAL REORDERING OF THE PLANETARY SKIN AGREEABLE TO THE NEEDS OF COMPLEXITY AND IN FULL AGREEMENT WITH LAND, AIR, WATER, AND NATURAL RESOURCES CONSERVATION, WOULD BE EXACTLY WHAT A PRAGMATIC SPECIES SHOULD PUT AS THE HIGHEST OF PRIORITIES. IT IS A PRIORITY FOR SURVIVAL AND AS SUCH COULD HARDLY HAVE ROOM OR SYMPATHY FOR THE NOSTALGIC UTTERANCES OF OUR URBAN PLANNERS.
- 10) THE PROGRAM IS AXIAL AS IT CUTS THROUGH THE RHETORICS OF ALL THE DRIFTING HEADLESS DETAILS OF A BODY (THE CITY) THAT DISINTEGRATED TIME AGO. IT IS A REVERENTIAL CALL FOR THE FEASIBLE THAT IS ALSO DESIRABLE, NECESSARY, THAT IS.

SITE

SIXTY ACRES OF LAND HAVE BEEN PURCHASED BY THE COSANTI FOUNDATION FOR THE SITE OF ARCOSANTI. IF THE CAPITAL BECOMES AVAILABLE, WE INTEND TO PURCHASE TWO MORE ADJACENT AREAS, FOR A TOTAL OF ABOUT ONE THOUSAND ACRES. (PLUS TWENTY-THREE HUNDRED ACRES OF LEASED LAND). THIS WOULD COME TO ABOUT 0.7 TO 0.8 ACRES PER PERSON, COMPLETELY DESIGNED FOR GARDENS, PLAYGROUNDS, ORCHARDS, PONDS, AND UNTOUCHED GRASS WASTELAND. ARCOSANTI ITSELF WOULD COVER LESS THAN TEN ACRES.

THE LAND IS IN ARIZONA, U. S. A., SEVENTY MILES FROM PHOENIX, THIRTY-SIX MILES FROM PRESCOTT, SEVENTY MILES FROM FLAGSTAFF, TWO MILES FROM THE JUNCTION OF THREE MAJOR HIGHWAYS. THE ALTITUDE IS 3700 FEET ABOVE SEA LEVEL. ONE THOUSAND ACRES WOULD COME WITH ABOUT TWO MILES OF THE AGUA FRIA RIVER, THE MAIN WATER-SHED OF THE AREA, ROCKY CLIFFS, LARGE COTTONWOOD GROWTH AND MORE THAN ONE-HUNDRED ACRES OF FARMLAND.

FOR A GROWTH IN THE VALUE OF IMPROVED LAND, BASED ON THE LAST TEN YEARS' TREND, THE LAND BY ITSELF COULD COVER A HIGH PERCENTAGE OF THE COST OF THE ARCOSANTI INVESTMENT.

THE HISTORY OF THE UNITED STATES



The first part of the history of the United States is the period of discovery and exploration. This period is marked by the arrival of Christopher Columbus in 1492 and the subsequent voyages of other explorers.

The second part of the history is the period of settlement and the growth of the colonies. This period is marked by the arrival of the first permanent English colony in 1607 and the subsequent growth of other colonies.

The third part of the history is the period of the American Revolution. This period is marked by the Declaration of Independence in 1776 and the subsequent war with Great Britain.

The fourth part of the history is the period of the early republic. This period is marked by the establishment of the Constitution in 1787 and the subsequent development of the federal government.

The fifth part of the history is the period of the westward expansion. This period is marked by the Louisiana Purchase in 1803 and the subsequent settlement of the western territories.

The sixth part of the history is the period of the Civil War. This period is marked by the outbreak of the war in 1861 and the subsequent conflict between the Union and the Confederacy.

The seventh part of the history is the period of Reconstruction. This period is marked by the Reconstruction Act of 1867 and the subsequent efforts to rebuild the South.

The eighth part of the history is the period of the Gilded Age. This period is marked by the rapid industrialization and the rise of the industrial revolution.

The ninth part of the history is the period of the Progressive Era. This period is marked by the efforts to reform society and the government.

The tenth part of the history is the period of the New Deal. This period is marked by the policies of Franklin D. Roosevelt in response to the Great Depression.

THE COSANTI FOUNDATION PROGRAM HAS FOUR SCHEDULES

A.RCOSANTI

ARCOS

VERIFICATION LEARNING

1965

3 DIMENSION JERSEY

3-D.J.

FEASIBILITY

1967

ARCONTINUUM

ARC.

INVESTIGATION PROJECTION

1968

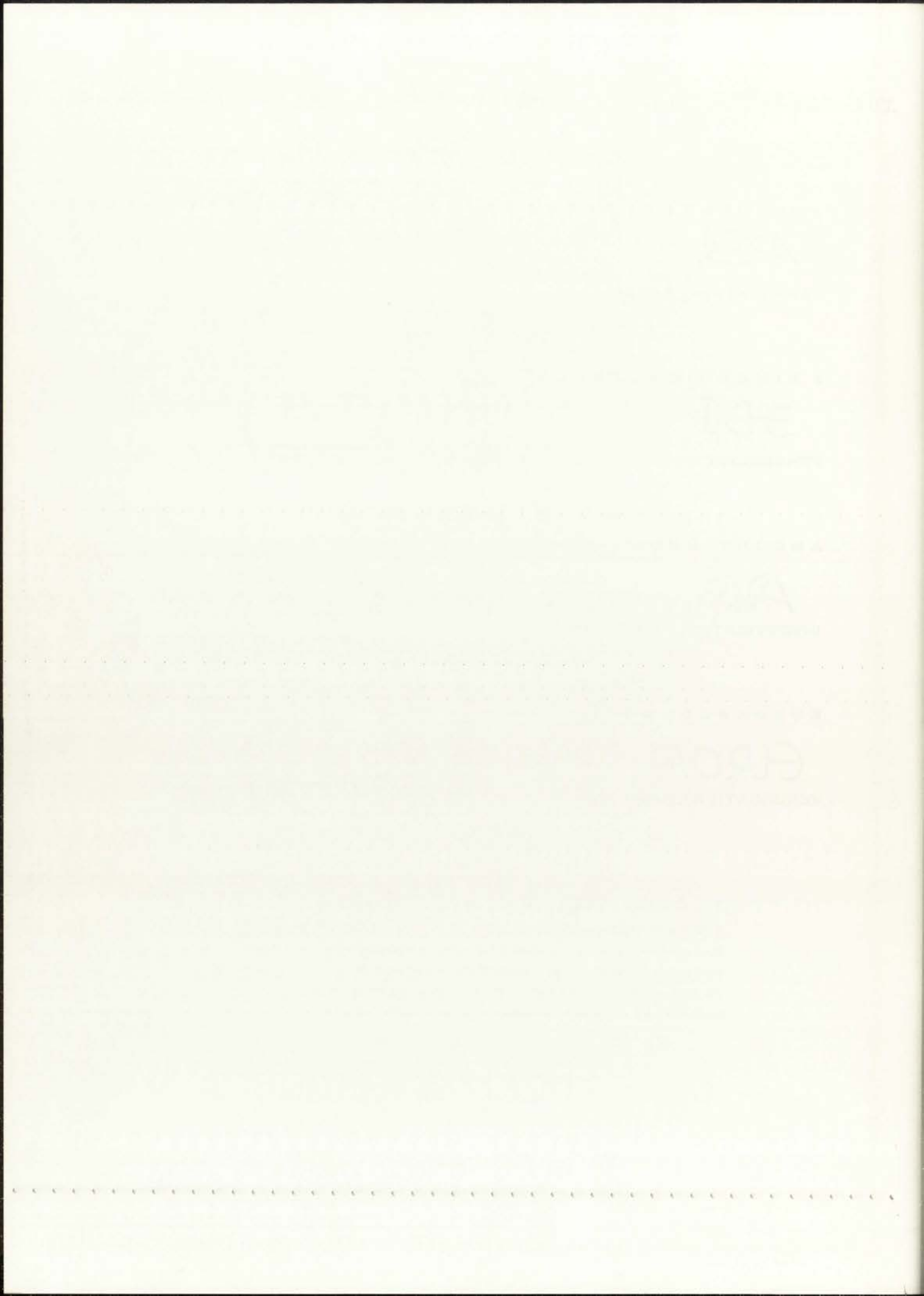
EUROARCOSANTI

EUROAR

VERIFICATION LEARNING

19--

THE COSANTI FOUNDATION HAS AN INCLUSIVE PROGRAM, C.I.P. AND A FRACTIONAL PROGRAM, C.F.P. THE INCLUSIVE PROGRAM (C.I.P.) WILL GO INTO EFFECT WHEN LARGE ENDOWMENTS BECOME AVAILABLE. THE FRACTIONAL PROGRAM (C.F.P.) IS GEARED TO THE NUMBER OF GRANTS THE FOUNDATION WILL BE ABLE TO OFFER YEAR BY YEAR TO STUDENTS AND APPRENTICES.



THE COSANTI FOUNDATION PROGRAM

SCHEDULE ARCOSANTI

AROS

A SELF-GENERATING CENTER OF URBAN STUDIES, STRUCTURALLY CONGRUOUS WITH THE RULES OF COMPLEXITY MINIATURIZATION. COHERENT THEN IN ITS PHYSICAL PERFORMANCES WITH THE SUBJECT MATTER INVESTIGATED WITHIN IT.

A CENTER GENERATING ITSELF FROM THE WORK OF THOUSANDS OF APPRENTICES AND STUDENTS WITH THE GUIDANCE OF PROFESSIONAL INSTRUCTORS. ①

IN A VOLUME ROUGHLY EQUIVALENT TO SAINT PETER'S IN THE VATICAN, WE WILL GRADUALLY BUILD A "LEARNING TOWN" FOR A FINAL POPULATION OF 1200-1500 PEOPLE. IN IT WILL BE THE LIVING, WORKING, INVESTIGATING, LEARNING, PLAYING, PERFORMING, AND PRODUCING FOR A SEMI-TRANS-IENT COMMUNITY ENGAGED IN A WHOLE IF LIMITED URBANO-ECOLOGICAL EXPERIENCE. 16,

FOR THE FIRST FIVE YEARS, (CONSTRUCTION OF THE LARGE FRAMEWORK) THE BASIC STAYING MODULE WILL BE A TRIMESTER. THE ACTIVITIES, PREVELANTLY IN CONSTRUCTION AND CONNECTED WORK INTEGRATED BY WEEKLY SEMINARS, WILL IN TIME TURN TO THE AS YET VIRGIN FIELD OF A PLANNED HOMOSPHERE CONGRUOUS WITH THE RULES DESCRIBED ABOVE. ①, 16, 24

THE STUDENT BODY, NATIONAL AND INTERNATIONAL, DIVIDED INTO PAYING, NON-PAYING, AND PAID, STUDENTS, DEPENDING UPON ECONOMICS, ETHNICS, SKILLS, AND OTHER DETERMINANTS, WILL LIVE FROM THE BEGINNING ON THE PREMISES, (THANKS TO A FAVORABLE CLIMATE), AND WILL CONFRONT DIRECTLY AND IN A PARTICIPATORY WAY, THE PHYSICAL, SOCIAL, TECHNOLOGICAL, AND CONCEPTUAL DILEMMAS OF PLANNING AND PERFORMING. ①, 9, 15, +

class

AN EXPERIENCE NOWHERE AVAILABLE IN THE WORLD. I REPEAT, AN EXPERIENCE NOWHERE ELSE AVAILABLE IN THE WORLD.

WE ALL KNOW THE ONTOLOGICAL-HUMANISTIC VACUUM OF OUR INSTITUTES OF ARCHITECTURE, ENGINEERING AND PLANNING. TECHNOLOGY HAS THEM BY THE TAIL, AND TECHNOLOGY IS A BLIND FURY TO BE WIGGLED BY. I INTEND TO TELL THE BEAST WHAT TO DO, NOT TO BE WIGGLED BY IT, WHILE ASKING THE SUPPORT OF THE TECHNOLOGIST IN DOING IT.

PRELIMINARY DESIGNS HAVE BEEN MADE. A LARGE MODEL IS IN THE MAKING. THE INVESTIGATION OF THE STRUCTURAL CAPABILITY OF A PRE-CAST MODULE FOR ARCOSANTI AND A GENERAL CRITIQUE AND PRESENTATION OF THE ENTIRE PROJECT IS BEING UNDERTAKEN AS THE GRADUATE THESIS OF A STUDENT AT THE UNIVERSITY OF NEW MEXICO. WE HAVE IN PROGRAM FOR THE SUMMER WORKSHOP OF 1969 SOME PRELIMINARY WORK ON THE SITE.

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THE COSANTI FOUNDATION PROGRAM

TENTATIVE AND HYPOTHETICAL BUDGET

<u>1969</u>	ADDITIONAL LAND	\$310,000
	ROAD, POWER, WATER	80,000
	SALARIES OF CORE STAFF AND RECRUITING	100,000
	CONSTRUCTION EQUIPMENT	<u>500,000</u>
		\$990,000

<u>1970</u> (FIRST YEAR OF CONSTRUCTION--SCHOOL)		
	STAFF (20 PERSONS, AVERAGE \$12,000)	\$240,000
	STUDENTS (ADMINISTRATIVE COST)	10,000
	50 PAYING	
	100 NON-PAYING	
	50 PAID BY ARCOSANTI	
	TEMPORARY SHELTER AND SERVICES	20,000
	BUILDING MATERIALS	400,000
	EQUIPMENT	50,000
	LANDSCAPING MAINTENANCE	50,000
	(SEMINARS) SCHOLARS (100 X \$1000)	<u>100,000</u>
		\$970,000

WORKING TIME (IN YEARS)		
STAFF	20 PERSONS X ONE YEAR =	20 Y. W. T.
STUDENTS	200 PERSONS X ONE-THIRD YEAR (TRIMESTER) =	<u>60 Y. W. T.</u>
		80 Y. W. T.

DEDUCTING THE BUILDING MATERIALS AND EQUIPMENT COST FROM THE TOTAL EXPENDITURES THE COST PER YEAR OF WORK TIME OF EACH PERSON IS \$6500. ONE INSTRUCTOR PER FIVE STUDENTS

<u>1971</u>	STAFF	\$240,000
	STUDENTS (ADMINISTRATIVE COST)	10,000
	100 PAYING	
	100 NON-PAYING	
	100 PAID	
	TEMPORARY LODGING	10,000
	BUILDING MATERIALS	500,000
	LANDSCAPING MAINTENANCE	50,000
	SEMINARS	
	100 SCHOLARS X \$1000	<u>100,000</u>
		\$910,000

WORKING TIME (IN YEARS)		
STAFF	20 PERSONS X ONE YEAR	20 Y. W. T.
STUDENTS	300 PERSONS X ONE-THIRD YEAR (TRIMESTER)	<u>100 Y. W. T.</u>
		120 Y. W. T.

DEDUCTING THE BUILDING MATERIALS AND EQUIPMENT COST FROM THE TOTAL EXPENDITURES THE COST PER YEAR OF WORK TIME OF EACH PERSON IS \$3600. ONE INSTRUCTOR PER SIX STUDENTS.



THE COSANTI FOUNDATION PROGRAM

<u>1972</u>	STAFF (20 PERSONS X \$12,000)	\$240,000
	STUDENTS	NO EXPENSES
	200 PAYING FEES	
	100 NOT PAYING FEES	
	100 PAID	
	BUILDING MATERIALS AND EQUIPMENT	700,000
	LANDSCAPING AND MATERIALS	50,000
	SEMINARS	
	100 SCHOLARS X \$1000	100,000
	INCOME FROM FACILITIES	<u>+100,000</u>
		\$990,000

WORKING TIME (IN YEARS)

STAFF	20 PERSONS X ONE YEAR =	20 Y.W.T.
STUDENTS	400 PERSONS X ONE-THIRD YEAR (TRIMESTER) =	<u>130 Y.W.T.</u>
		150 Y.W.T.

DEDUCTING THE BUILDING MATERIALS AND EQUIPMENT COST FROM THE TOTAL EXPENDITURES, THE COST PER YEAR OF WORK TIME OF EACH PERSON IS \$2000. ONE INSTRUCTOR PER SEVEN STUDENTS.

<u>1973</u>	STAFF (20 PERSONS X \$12,000)	\$240,000
	STUDENTS	NO EXPENSES
	250 PAYING FEES	
	150 NOT PAYING FEES	
	100 PAID	
	BUILDING MATERIALS AND EQUIPMENT	800,000
	LANDSCAPING AND MAINTENANCE	50,000
	INCOME FROM FACILITIES	<u>+150,000</u>
	SEMINARS (100 X \$1000)	100,000
		<u>\$1,030,000</u>

WORKING TIME (IN YEARS)

STAFF	20 PERSONS X ONE YEAR =	20 Y.W.T.
STUDENTS	500 PERSONS X ONE-THIRD YEAR (TRIMESTER) =	<u>160 Y.W.T.</u>
		180 Y.W.T.

DEDUCTING THE BUILDING MATERIALS AND EQUIPMENT COST FROM THE TOTAL EXPENDITURES THE COST PER YEAR OF WORK TIME OF EACH PERSON IS \$1100. ONE INSTRUCTOR PER EIGHT STUDENTS.

BY THEN, ARCOSANTI WILL BE AN ESTABLISHED CENTER OF CULTURE OF INTERNATIONAL FAME, AND, WHAT IS MORE, WILL BE A PERFORMING URBAN EXPERIMENT, AVAILABLE FOR DISSECTION AND ANALYSIS BY POLITICIANS, SOCIOLOGISTS, ANTHROPOLOGISTS, HISTORIANS, PHILOSOPHERS, RELIGIOUS MEN, AND ALL THE WITCH MEN EAGER FOR THE MALIGNANT. EVEN THE ARCHITECT AND THE PLANNER } MIGHT WAKE UP TO IT.



THE COSANTI FOUNDATION PROGRAM

SCHEDULE 3 DIMENSION JERSEY

3DJ

3DJ IN PROGRESS FOR 18 MONTHS. "3DJ", A THREE-DIMENSIONAL CITY FOR THE STATE OF NEW JERSEY, IS ONE OF OVER 40 DIAGRAMS DEVELOPED IN THE LAST THREE YEARS AND CARRIED OUT IN GREATER DETAILS. 3DJ IS A FEASIBILITY STUDY FOR A SPECIFIC CITY. BEGINNING WITH FEW DATA AND REFERENCES ON THE URRANIZING OF THE STATE OF NEW JERSEY AND THE ACKNOWLEDGED NEED FOR A NEW JET AIRPORT SERVING THE NEW YORK-PHILADELPHIA COMPLEX.

I DEFINED A CONCEPTUAL SYSTEM FOR A MILLION POPULATION THAT WOULD FUSE AIR TERMINAL AND CITY INTO ONE INSTITUTION: AN AIR TERMINAL CITY. SOMETHING AGAIN UNAVOIDABLY REAL, EVEN IF INEXPLICABLY IGNORED.

NOW THAT THE SKELETON SYSTEM HAS BEEN DEFINED AND FUNCTIONS HAVE BEEN INVESTIGATED, I INTEND TO CONSTRUCT A LARGE SIZE MODEL THAT WILL WORK AS A DEPARTING POINT FOR ALL THE MODIFICATIONS, CORRECTIONS, ADAPPTIONS, REVISIONS, ETC. THAT THE PROGRESSIVE INPUT OF PERTINENT AND SPECIFIC INFORMATION DEMANDS. WE WILL THUS MOVE FROM ABSTRACT TO CONCRETE WITHOUT LOSING SIGHT OF THE FUNDAMENTAL PREMISES. (SEE INTRODUCTION)

PARTICIPANTS IN THIS PROJECT ARE: RUTGERS UNIVERSITY, FORD MOTOR COMPANY, ARIZONA STATE UNIVERSITY, AND SOON THE CORCORAN GALLERY OF WASHINGTON. UNFORTUNATELY, IT IS A LIMITED PARTICIPATION, ONE THAT CANNOT AFFORD THE COSANTI FOUNDATION MORE THAN A SLOW AND INTERRUPTED PROGRESSION OF WORK. WE SEEK TO INCORPORATE THIS SCHEDULE WITHIN THE ARCOSANTI SCHEDULE AS PART OF THE LEARNING MECHANISM.

SCHEDULE ARCONTINUUM—

ARCO

ARCONTINUUM CONCEPTIONS ON PAPER FOR ONE YEAR.

THE MENACE OF AN ECUMENOPOLY PHYSICALLY SUFFOCATING THE EARTH'S BIOSPHERE IS NEAR ENOUGH. ARCONTINUUM IS AN ALTERNATIVE OFFERED BY THE PRINCIPLE OF COMPLEXITY MINIATURIZATION. A MIDDLE OF THE WAY ROAD IS ILLUSORY. ONCE SUBURBAN SPRAWL IS ENCOURAGED AND GIVEN TO THE TRAFFICANT ON REAL ESTATE, NOTHING WILL HOLD BACK CHAOS AND ULTIMATELY SOCIAL DISINTEGRATION.

ARCONTINUUM IS THE ELABORATION OF URBAN RIVERS, TWO TO THREE SQUARE MILES IN SECTION, WORKING AS DORSAL RIBS OF A CONTINENT ESTABLISHING POWERFUL URBAN FLOWS WHERE, TO AN ORDERLY AND SUPREMELY EFFICIENT LOGISTICS WOULD CORRESPOND THE LIBERATION OF THE URBAN POPULATION FROM THE EVILS OF OUR DECAYING CITIES. THERE IS NOTHING MESSIANIC OR APOCALYPTIC ABOUT ALL OF THIS. IT IS THE SIMPLE FACT THAT MATTER HAS WEIGHT AND THE MIND IS CONDITIONED BY THE WEIGHT OF MATTER.

THE STUDY OF ARCONTINUUM WOULD BE THE THIRD SCHEDULE, INCORPORATING ITSELF INTO ARCOSANTI FOR EXTENSIVE AND VERY COMPLEX ANALYSIS AND TESTS.

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THE COSANTI FOUNDATION PROGRAM

SCHEDULE EUROARCOSANTI **EUROAR**

EUROARCOSANTI IS A SECOND ARCOLOGY (ARCHITECTURE AND ECOLOGY) TO BE ESTABLISHED IN EUROPE, PROBABLY IN THE RELATIVELY MILD CLIMATE OF CENTRAL ITALY.

IT WOULD PROFIT FROM THE EXPERIENCES MADE IN ARCOSANTI AND THE THEORETICAL WORK ON 3DJ AND ARCONTINUUM.

THE EXPERIMENTATION AND VERIFICATORY PROCESS WOULD GO ON IN THIS LARGER AND MORE COMPLEX ORGANISM. THE EURASIAN CONTINENT HAS HIGHLY DIFFERENTIATED CHARACTERISTICS, PHYSICAL, ANTHROPOLOGICAL, POLITICAL, AND CULTURAL. THE STUDENT BODY WOULD BE TRULY INTERNATIONAL, MULTILINGUAL, AND FREE FROM NATIONALISTIC MALAISE. A MINIATURE BABEL WILLING TO DARE THE LESS BENEVOLENT GODS.

I WILL NOT REFRAIN FROM PROCEEDING ON ARCOSANTI BECAUSE THE FUNCTIONS THAT THE ORGANISM WILL PERFORM ARE NOT ALTOGETHER SET. MAN HIMSELF WAS MORPHOLOGICALLY DEFINED CON-
 TINUOUSLY TO BIO-PHYSICAL LAWS BEFORE ANY PLATO, BUDDHA, WAGNER, EINSTEIN CAME TO BE. I STAND BY THE RULE THAT STRUCTURE COMES BEFORE PERFORMANCE. I WILL NOT BE DETERRED BY THE DOSSIPS OF RATIONALISTS, FUNCTIONALISTS, STRUCTURALISTS, DETERMINISTS. THEIR SEGREGATED WORLD IS STERILE. THIS WILL BY NO MEANS SUGGEST THAT ARCOSANTI WILL BE A FULLY SUCCESSFUL EXPERIMENT. BUT IT MEANS THAT ARCOSANTI IS AN URGENT, NECESSARY "BOTTLENECK" SELECTING THE VALID FROM THE EXTRAVAGANT AND THE INCONSEQUENTIAL. IT WILL STAY TO THE FUTURE ORGANISMS AS THE WRIGHT AIRPLANE STAYS TO THE S. S. T. BUT NO S. S. T. WOULD BE FEASIBLE WITHOUT THE INNOCENT, NAIVE CONTRACTIONS OF THE PIONEERS OF FLIGHT. THE ONE IS BECAUSE THE OTHERS WERE. WRIGHT'S PLANE WAS TO FLY THE "HEAVIER THAN AIR", IT WAS NOT CONCERNED WITH SWIFT AND SAFE TRANSPORTATION OF PEOPLE AND THINGS.

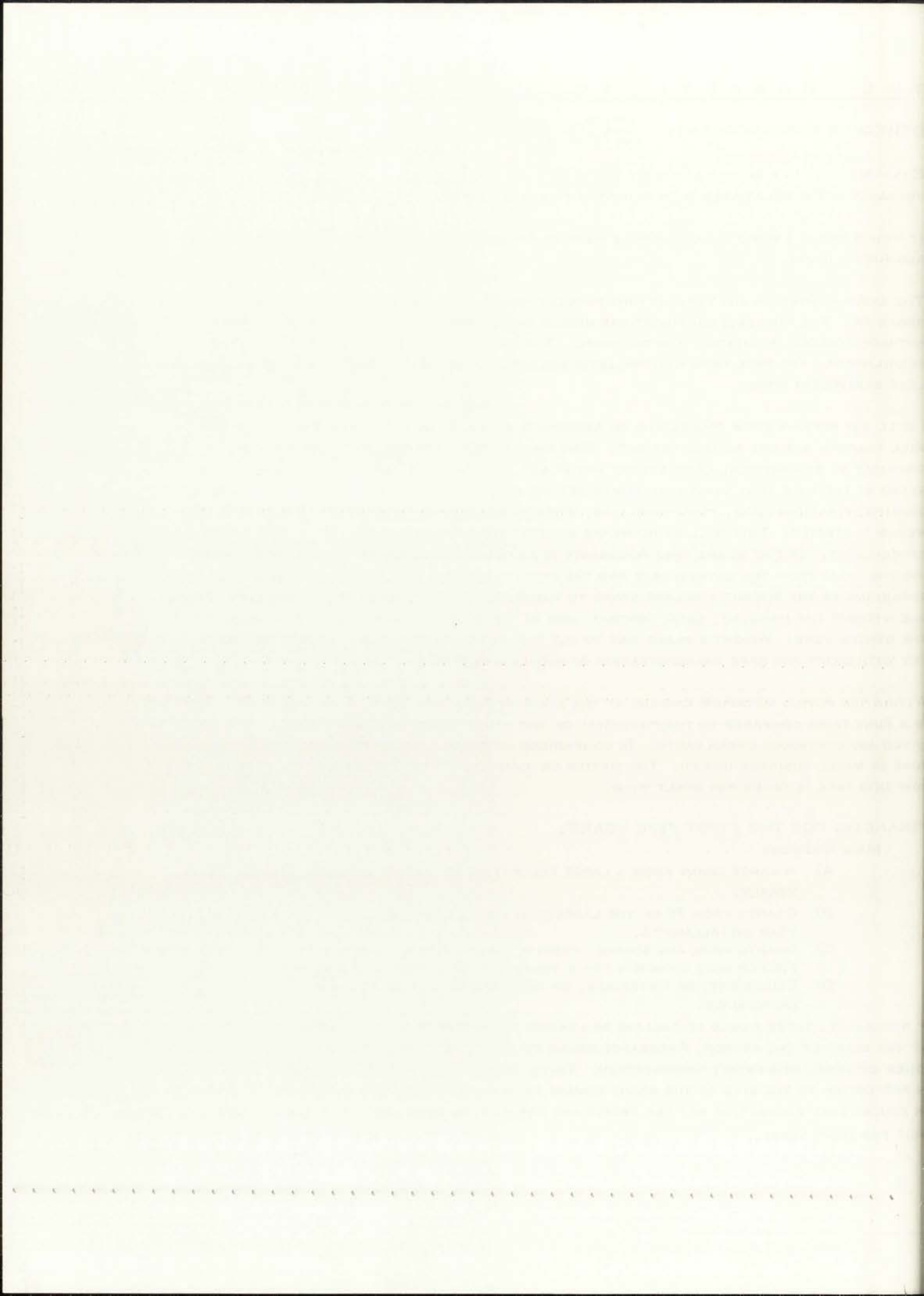
WITHIN THE FLYING METAPHOR LOOKING AT THE ECONOMY SIDE, THE BOOM IN THE AIRCRAFT INDUSTRIES IS A PUNY THING COMPARED TO THE POTENTIAL OF THE IMMENSE AND UNTOUCHED WORLD OF A SOPHISTICATED AND CONGRUOUS URBAN EARTH. IN COMPARISON ANYTHING ELSE OF PHYSICAL AND ECONOMIC NATURE IS SMALL BUSINESS INDEED. THE MAKING OR UNMAKING OF THE HUMAN SPECIES DEPENDS UPON HOW THIS TASK IS FACED AND DEALT WITH.

FINANCING FOR THE FIRST FIVE YEARS:

MAIN SOURCES:

- A) A LARGE GRANT FROM A LARGE FOUNDATION IN FIVE-YEAR INSTALLMENTS, PAYABLE YEARLY.
- B) GRANTS FROM 20 OF THE LARGEST BUSINESS CORPORATIONS OF THE WORLD IN FIVE-YEAR INSTALLMENTS.
- C) GRANTS FROM ANY SOURCE, PRIVATE, INSTITUTION, CORPORATION, ETC. TO (SPECIFIED OR NOT) STUDENTS FOR A TRIMESTER OR LONGER AT ARCOSANTI.
- D) EQUIPMENT, OR MATERIALS, OR PERFORMANCES PLEDGED FROM CORPORATIONS OR INDIVIDUALS.

IF NECESSARY, THERE WOULD BE SELLING OR LEASING OF PART OF THE LAND PROPERTY OF ARCOSANTI. AT THE DEATH OF THE AUTHOR, ARCOSANTI WOULD BELONG TO ARIZONA STATE UNIVERSITY OR TO SOME OTHER CULTURAL NON-PROFIT ORGANIZATION. THERE WOULD BE A PARTICIPATION OF FOREIGN STUDENTS IN PROPORTION TO THE SIZE OF THE GRANT COMING FROM EACH COUNTRY. THE COSANTI FOUNDATION IS AN EDUCATIONAL FOUNDATION NOT FOR PROFIT AND HAS BEEN RUNNING AN APPRENTICE AND STUDENT WORKSHOP FOR EIGHT YEARS.



THE COSANTI FOUNDATION PROGRAM

PLEDGES: GIFTS, DISCOUNTS, PARTICIPATION, SCHOLARSHIPS

CONSTRUCTION MATERIALS

- CEMENT-GYPSUM
- STEEL
- ALUMINUM
- PLASTICS
- WOOD

EQUIPMENT

- EARTH MOVERS
- CONCRETE EQUIPMENT
- CRANES
- POWER TOOLS
- OFFICE EQUIPMENT
- DRAFTING EQUIPMENT
- UTILITIES
- MECHANICAL AND ELECTRICAL EQUIPMENT

FARM EQUIPMENT

- POWER MACHINES
- NURSERY STOCK
- TOOLS

SCIENTIFIC AND TECHNICAL EQUIPMENT

- COMPUTERS
- PROGRAMMING MACHINES

GREY MATTER AND PERFORMANCES

- SCHOLARS
- POLITICIANS
- TECHNICIANS
- COMPOSERS
- ARTISTS
- ARTISIAN
- PERFORMERS
 - PLAYERS
 - DANCERS
 - ACTORS

INSTITUTES OF LEARNING

- WORK
- SCHOLARSHIPS
- MATERIALS
- MONEY

INDIVIDUALS

- WORK
- SCHOLARSHIPS
- EQUIPMENT

COSANTI STAFF AFTER THE FIRST YEAR

CONSTRUCTION

- | | | |
|---------------|--------------|---------------|
| ARCHITECT | MACHINIST | PLUMBER |
| ENGINEER | CARPENTER | ELECTRICIAN |
| CONTRACTOR | CONCRETE MAN | CABINET MAKER |
| ADMINISTRATOR | STEEL MAN | MODEL MAKER |
| | MASON | |

TEACHING

- | | |
|----------------|----------|
| ARCHITECT | CLASSES |
| PLANNER | SEMINARS |
| HISTORIAN | |
| TECHNICIANS | |
| GUEST SCHOLARS | |

DWELLERS

- | | | |
|-------------------|-------------|----------|
| FAMILIES OF STAFF | MAINTENANCE | GARDENER |
| APPRENTICES | | JANITORS |
| RESIDENT SPONSORS | | MANAGER |

1. Name of the person
2. Address
3. City
4. State
5. Zip

6. Telephone number
7. Date of birth
8. Sex

9. Education
10. Occupation
11. Marital status
12. Number of children
13. Name of children

14. Date of last contact
15. Reason for last contact
16. Date of next contact
17. Reason for next contact

18. Date of death
19. Cause of death
20. Place of death

21. Date of burial
22. Place of burial
23. Name of cemetery

24. Name of funeral home
25. Date of funeral
26. Time of funeral

44

BUDGETARY PRIORITIES

SEED MONEY:

FOUR SALARIES FOR ONE YEAR.

- 1) WORK TO RAISE CAPITAL FROM LARGE CORPORATIONS.
- 2) WORK TO OBTAIN PLEDGES FROM INSTITUTES OF LEARNING.
- 3) WORK FOR CAPITAL AND PLEDGES FROM PRIVATE SECTORS,
NATIONAL AND INTERNATIONAL INSTITUTIONS.
- 4) WORK ON THE PROJECT ITSELF.

PLEDGES FOR A DOLLAR FOR DOLLAR MATCH FROM SPONSORING FOUNDATION. (FORD)

FUNDS FOR THE ACQUISITION OF ADJACENT LAND.

(1000 ACRES PLUS 2300 ACRES OF LEASED LAND)



OCTOBER 1968.

THE COSANTI FOUNDATION, FRACTIONAL PROGRAM, C. F. P.

- 1) THE COSANTI FOUNDATION IS ENGAGED IN THE BETTERMENT OF THE CONDITION OF MAN AND IN NATURE CONSERVATION, 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 FOR 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 IS IN, I CONSIDER THIS UNDERTAKING AS NECESSARY, ESSENTIAL AND URGENT AS ANY PROGRAM CONCERNING MAN.
- 2) 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 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.
- 3) THIS FIBER IS BY DEFINITION EXPERIMENTAL. INDEED NOTHING IN THE URBAN DILEMMA IS BUT EXPERIMENTAL. WE ARE GROPING, GROPING OR DYING; A THING THAT MUST ENTER THE MINDS OF POLICY-MAKERS, POWER-HOLDERS AND OF THAT BREED OF OUTCASTS, THE 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 SUPER-COMPLEX INTER-WORK OF PURPOSES AND FUNCTIONS:
- THE EXTREME COMPACTNESS OF THE PHYSICAL SYSTEM THAT SUSTAINS AND SUPPORTS THEM.
- 4) 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.
- 5) 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.
- IN MACRO-COSANTI WILL BE A TESTING GROUND FOR ENVIRONMENTAL CONCEPTS THAT SEEK COHERENCE BETWEEN AIMS AND ENDS. MACRO-COSANTI WILL APPLY ARCOLOGICAL CONCEPTS. (ARCHITECTURE - ECOLOGY) I WILL CALL IT ARCOSANTI.

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It is in this that the structure...
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It is in this that the structure...

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PROCEDURE

- 6) AS THE UNDERTAKING 1) IS TO BE A PROCESS, NOT A ONE-SHOT ACCOMPLISHMENT, 2) IS NOT BASED ON A PROFIT ECONOMY, 3) IS EXPERIMENTAL BY DEFINITION, IT MIGHT BE HARD TO FIND SYMPATHETIC EARS FOR AN ALL-OUT FINANCING PLAN. INSTEAD OF PRODUCING A COST ESTIMATE OF THE PROJECT AND THEN TRYING TO RAISE THE MONEY, WE WILL LET THE AVAILABLE MEANS DEFINE THE PACE.
- 7) THE CONSTRUCTION OF ARCOSANTI WILL PROCEED ACCORDING TO THE MEANS AVAILABLE: MANPOWER, MATERIALS, EQUIPMENT, UTILITIES.

MANPOWER ^{17, 19,}

- 8) THE KEY IF NOT THE REASON FOR A LIVELY DEVELOPMENT IS THE PARTICIPATION OF STUDENTS IN THE PHYSICAL CONSTRUCTION OF ARCOSANTI, NOT ONLY BECAUSE THEIR WORK WILL BE THE MAIN VOICE IN THE PROJECT BUT BECAUSE THE AIM OF THE PROJECT IS TO MAKE THE ARCOLOGICAL CONCEPT TANGIBLE, PHYSICAL, AND INFLUENTIAL IN THE STUDENT BODY OF THIS AND OTHER COUNTRIES. WITHIN 10 TO 15 YEARS THEY WILL BE THE PLANNERS.
- 9) CONSIDERING ONLY THE THREE DISCIPLINES OF ARCHITECTURE, CIVIL ENGINEERING AND FINE ARTS, THERE ARE IN THIS COUNTRY ALONE A MINIMUM OF 50,000 YOUNG MEN AND WOMEN POTENTIALLY INVOLVED. IF ONLY ONE PERCENT OF THEM WERE TO BECOME ENGAGED EVERY YEAR AT THE FOUNDATION FOR ONE MONTH, THAT WOULD MAKE FOR 2000 WORK WEEKS PER YEAR.
- 10) MY OBJECTIVE IS:
- A) INDUCE SUCH SCHOOLS TO ENLIST AT LEAST ONE PERCENT OF THEIR STUDENTS FOR A TWO TO FOUR MONTH WORKSHOP AT THE FOUNDATION AND GIVE CREDIT FOR SUCH WORK AS IS NOW DONE BY THE COLLEGE OF ARCHITECTURE, ARIZONA STATE UNIVERSITY, BY THE UNIVERSITY OF OKLAHOMA AND ON AN INDIVIDUAL BASIS BY MANY OTHER SCHOOLS. (THE WORKSHOP WILL THEN RUN UNINTERRUPTEDLY).
- B) HAVE THE SCHOOLS, THROUGH THE MEANS THEY CHOOSE, PAY A \$200 FEE OR FRACTION OF IT FOR EACH STUDENT. THIS MAY BE A BURDEN ON THE SCHOOL BUDGET OF ABOUT ONE-HALF OF ONE PERCENT. THIS FEE WILL BE POOLED FOR THE ACQUISITION OF MATERIALS, EQUIPMENT, UTILITIES AND FOR THE SALARIES OF A FEW PERMANENT INSTRUCTORS AND CONSTRUCTION CREW.
- 11) NOWHERE IN THE WORLD IS THERE NOR HAS THERE BEEN THIS KIND OF EXPERIENCE AVAILABLE. EVEN FROM THE MOST CRITICAL AND ANTAGONISTIC POSITION, OR POSSIBLY BECAUSE OF IT, IT MIGHT BE IMPORTANT TO BE MORE THAN ON AN OPEN DIALOGUE WITH THE PROJECT.
- ONE OF THE DISSIPATING HANDICAPS IN ARCHITECTURE IS THE LACK OF THE EQUIVALENT OF A TEST TUBE. MUCH THE WORSE IN PLANNING. ARCOSANTI WILL BE AN OPEN-END TEST TUBE ABOUT WHICH THE CRITICAL WORK AS WELL AS THE INVESTIGATIVE AND EXPERIMENTAL WILL BE NECESSARY AND WELCOME.



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MATERIALS

- 12) CONSTRUCTION MATERIALS WILL BE OBTAINED. . .
- A) BY PURCHASE
 - B) BY CONTRIBUTIONS, DONATIONS AND PLEDGES THAT MANUFACTURERS AND FIRMS WILL MAKE AVAILABLE. (THIS HAS BEEN SO IN THE LAST FIVE YEARS AT MICRO-COSANTI).

IT MAY BE OF INTEREST TO KNOW THAT ARCOSANTI WILL BE NO MORE THAN 50 MILES FROM A CEMENT PLANT AND LUMBER MILLS.

EQUIPMENT

- 13) THE COLLEGE OF ARCHITECTURE, ARIZONA STATE UNIVERSITY AND PRIVATE FIRMS HAVE BEEN GIVING EQUIPMENT, POWER TOOLS, EXPERIMENTAL MATERIALS AND PROCEDURES FOR THE LAST FIVE WORKSHOPS, AND ON THE BASES AS WELL AS RENTALS AND PURCHASE WE WILL EQUIP OURSELVES.

UTILITIES

- 14) THE CLIMATE OF THE NEW LOCATION IS SUCH THAT ONLY AUXILIARY EQUIPMENT FOR HEATING WILL BE NEEDED. THIS WILL MEAN A SUBSTANTIAL CUT INTO THE COST OF CLIMATE CONTROL APPLIANCES AND UPKEEP.
- 15) A RESIDENT CONTRACTOR WILL CARRY ON THE ORGANIZATION OF THE CONSTRUCTION WORK. WITH HIM WILL BE SOME PROFESSIONALLY TRAINED PERSONNEL TO FOLLOW THROUGH ON EACH ASPECT OF THE PROJECT.
- 16) THIS CHAIN REACTION PROCESS NEEDS TO BE STARTED IN ORDER TO EXPAND IN FORCE AND PURPOSE. ARCOSANTI'S FIRST MOVE WILL BE THE CONSTRUCTION OF MINIMAL FACILITIES FOR THE NUCLEUS FORCE. THOSE WILL NOT BE TEMPORARY STRUCTURES BUT THE FIRST STRUCTURAL ELEMENT, AN INTEGRAL AND PERMANENT PART OF THE WHOLE TO COME.
- 17) THE PROJECT ITSELF IS ONE OF THE URBAN SCHEMES THAT I HAVE DEVELOPED. THIRTY OF SUCH SCHEMES AND THEIR CONCEPTUAL JUSTIFICATION ARE TO BE PUBLISHED BY THE M. I. T. PRESS IN THE BOOK, "ARCOLOGY, THE CITY IN THE IMAGE OF MAN".

PAOLO SOLERI
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 SCOTTSDALE, ARIZONA
 OCTOBER, 1968

THE HISTORY OF THE UNITED STATES OF AMERICA

CHAPTER I
THE DISCOVERY OF AMERICA

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