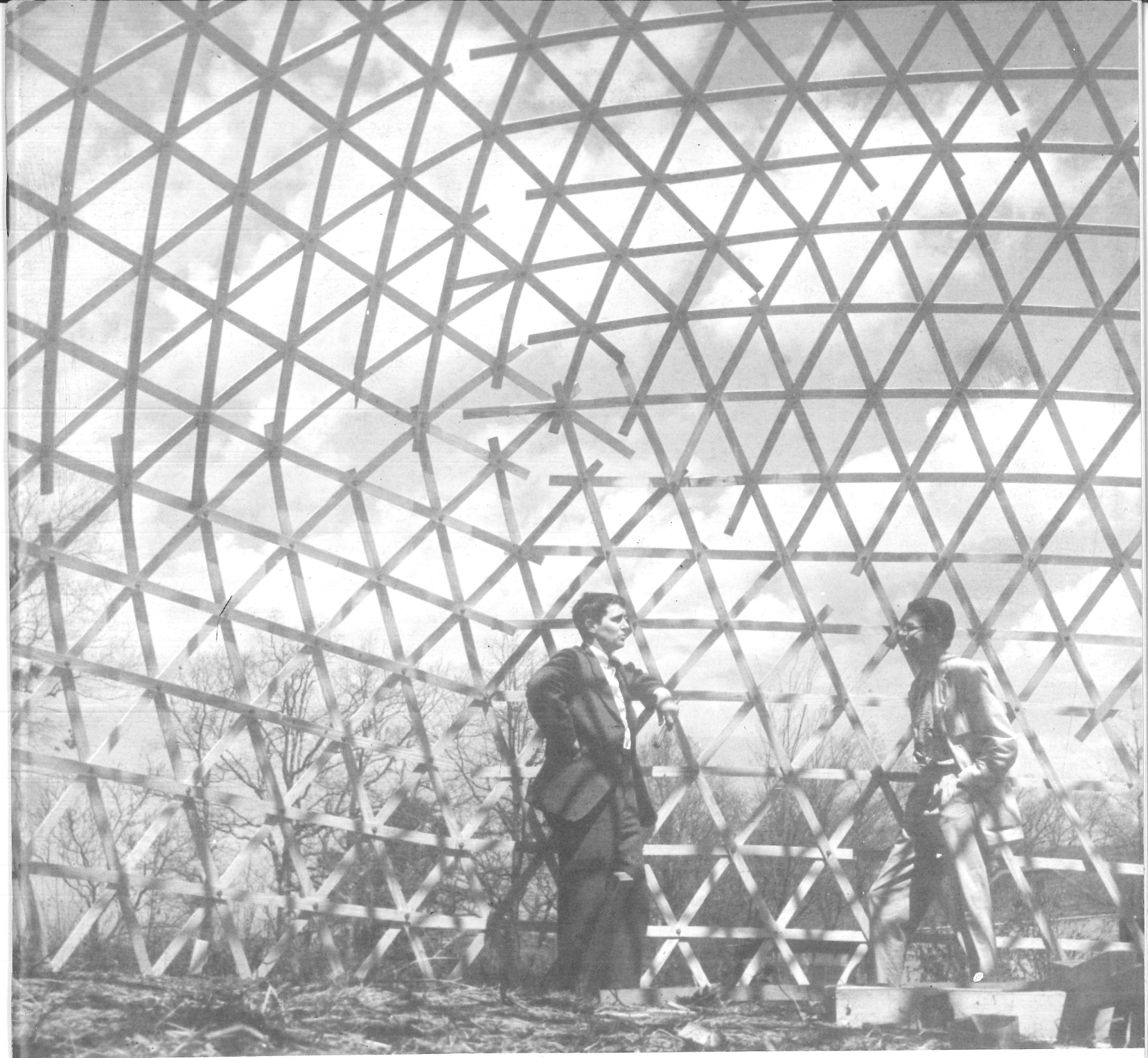


STUDENT PUBLICATIONS OF THE SCHOOL OF DESIGN, NORTH CAROLINA STATE COLLEGE
volume 1 number 3 fall 1952 raleigh, north carolina

fall 1952 raleigh, n. c.
volume 3 number 1

this magazine was originated by the students of the school of design and is maintained as an independent student project.

published three times a year.

patron subscriptions $10.00 year
regular subscriptions $6.00 year
individual copies $2.00

STUDENT PUBLICATIONS OF THE SCHOOL OF DESIGN, NORTH CAROLINA STATE COLLEGE

cover by ralph mills is a photograph of the interior of the geodesic dome built of wood lattice by students of the school of design under the direction of r. buckminster fuller, james w. fitzgibbon, manuel bromberg, duncan stuart, all of the fuller research foundation. mr. fuller is a visiting faculty member of the school of design. the rest are full time members of the faculty of the school of design.

student publications of the school of design cannot pay for manuscripts or other contributions but will gladly consider for publication all material sent us.

Contents

Acknowledgement is made to the Designing Wives who are graciously helping in the publication of this work.

This year Student Publications of the School of Design organized the first annual **art auction** a project which will be continued each year. This year the auction was held in the green room of the Raleigh Littel Theater. We are indebted to Mr. Ainslie Pryor, Director of the Little Theater, and Mr. Philip Whitley of Wendell who kindly donated his services as auctioneer.

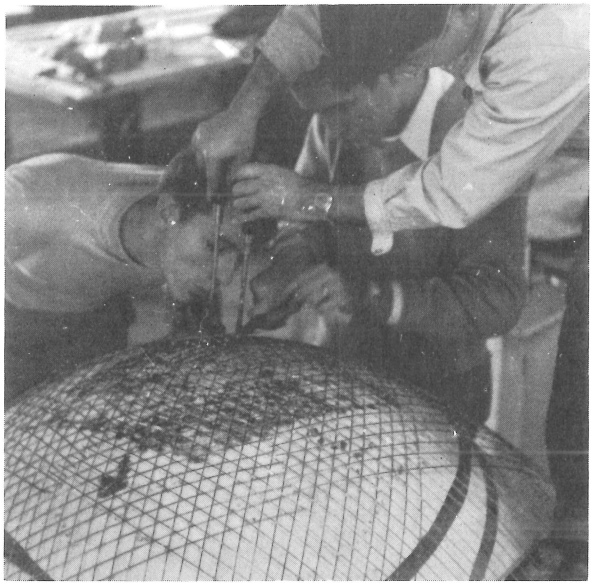
volume 3 number 1 fall 1952 raleigh, north carolina

RALPH MILLS

The School of Design

is a community of people working. It is the people in it who are important. The contribution of each person in terms of what he gets out of it is no more or less important than is another's contribution in terms of what he gets out of it. But this is not the only consideration. If it were each of us could get along nicely without the others. The rest benefit from the efforts of each of us. Each person is valuable to the group, not because he is here, but because he is here working.

This magazine is representative of this community. For some it is the representative of this community. This year in addition to thoughts and attitudes coincident with our own we will try to present this community and the work it is doing. The new school is different from the old in that it no longer merely

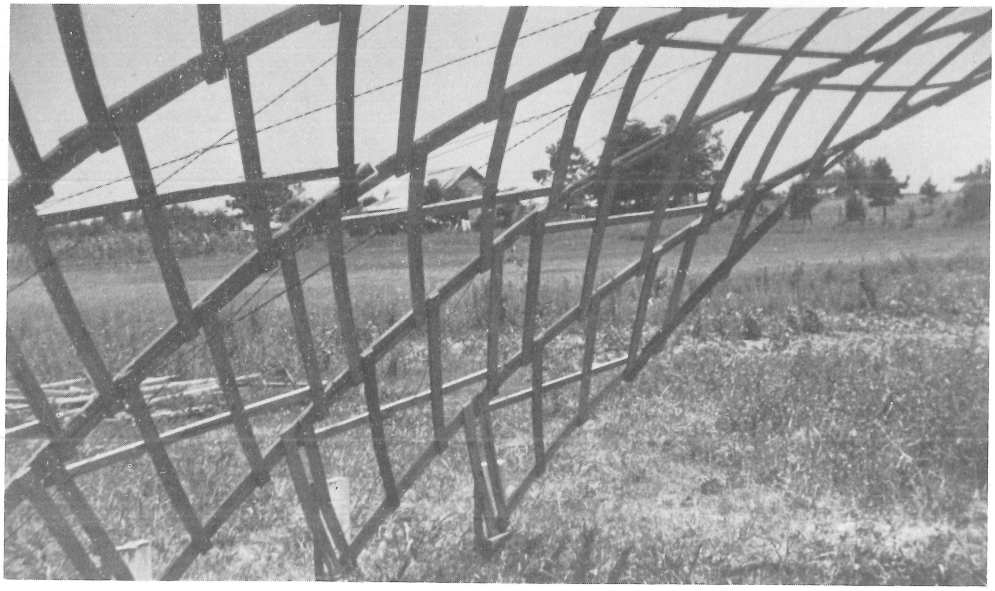


trains men for future work but gives them the opportunity to find out why they work now. The drafting board is no longer the means and the end of the problem. Wherever possible the structure in the field is our aim.

The School of Design helps its members formulate new principles by the experimental application of accepted principles to new situations. This is basicly self reliance, self taught. The aim of each of us is to exceed his grasp, to think big in order to do big.

The new school is, we feel, important to the profession. It is the product of new thought and provides the way for the continuance of unrestricted thinking. We know, however, that our ideas are no more important than the experience and ability possessed by men already in the profession. Just as those in the profession promise us their best work we promise them our best ideas carried to the limits of our facilities.

THE EDITOR

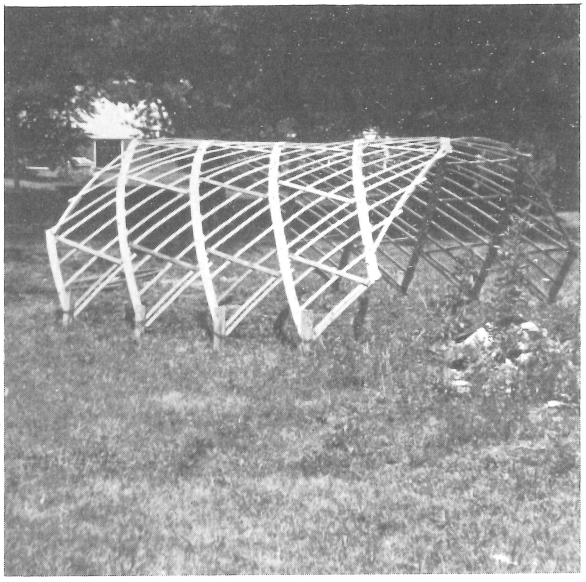


T. C. HOWARD

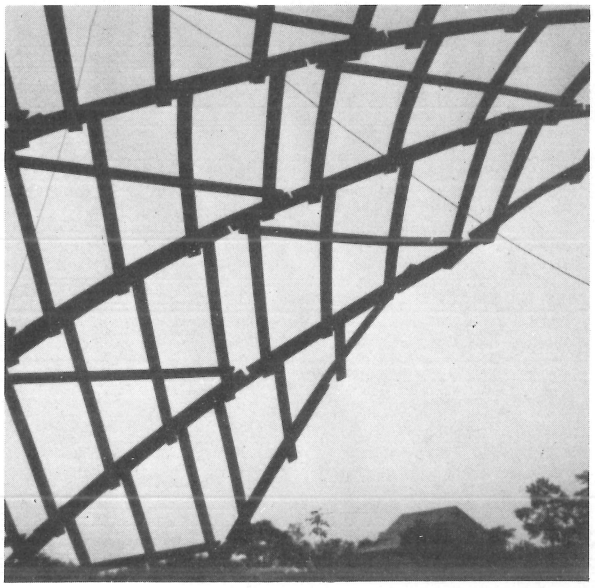
1 3 structures

T. C. HOWARD

In an attempt to arrive at an economical structural system applicable to any farm region in the United States the given design resulted. Fundamental restrictions dealt with were these: standardization of parts, ease of erection, and use of local building materials. Basically the structure is made up of repeating rafts that lock one into another eliminating the need of any fasteners. As a result of the interlocking design the system is expandable in all directions. These rafts are made of stock sawn lumber which need not be end trimmed and are held secure with nails. The rafts are easily assembled by farm labor, locked together on the ground, and pulled into the arched position by a prime mover such as a team of horses or a tractor. This position is maintained by the buttress effect of wooden stakes. In large spans sway bracing is introduced by interlacing chordal tension mem-



T. C. HOWARD



T. C. HOWARD

bers. As a skinning material either canvass, sheet metal, or plastic can be used; and for the more romantic type farmer even hewn clapboards could be applied.

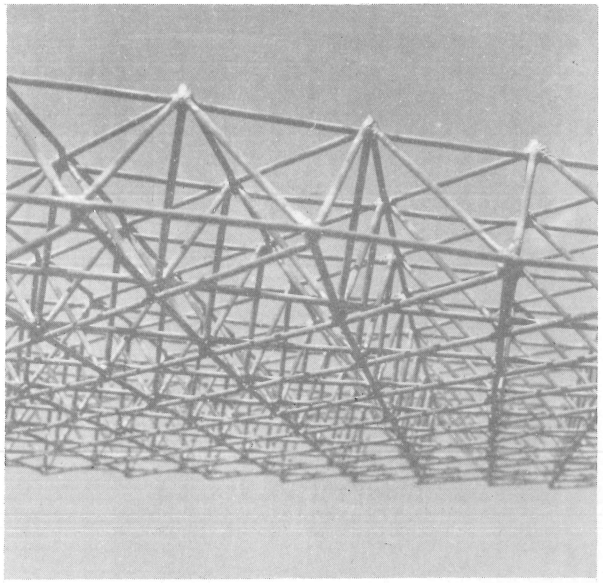
Full size test structures have shown that radii as low as 12 feet can be reached using 1″ x 4″ x 8′ (the smallest stock sawn lumber available throughout the United States). The preliminary models illustrated show that a man's weight can be carried at any point on the structure. The materials used in the erecetion of a full size section of the structure included: eight 1″ x 4″ x 8's plus 1 pound of 10d resin coated nails per raft, and 1 post (buttress) for each vertex contacting the ground. Working alone it took approximately one man hour per raft from lumber "hack" to arched position.

Compared to conventional farm structures and also to the latest developments in "Pole Barn" construction this system seems far superior. In the most recently developed farm buildings $1.00 per foot of enclosed space is the minimum cost, whereas with this system $.40 per square foot of enclosed space has been reached—and without columns in larger enclosures. This figure was achieved using corrugated sheet metal as the enclosing material. Even less expensive were poultry wire and rolled roofing. Neither figure above includes labor. Additional advantages of this system exist in erection costs where here the work and time are reduced to almost ⅓ that required for other structures.

T. C. HOWARD
4th year student

2

RALPH MILLS



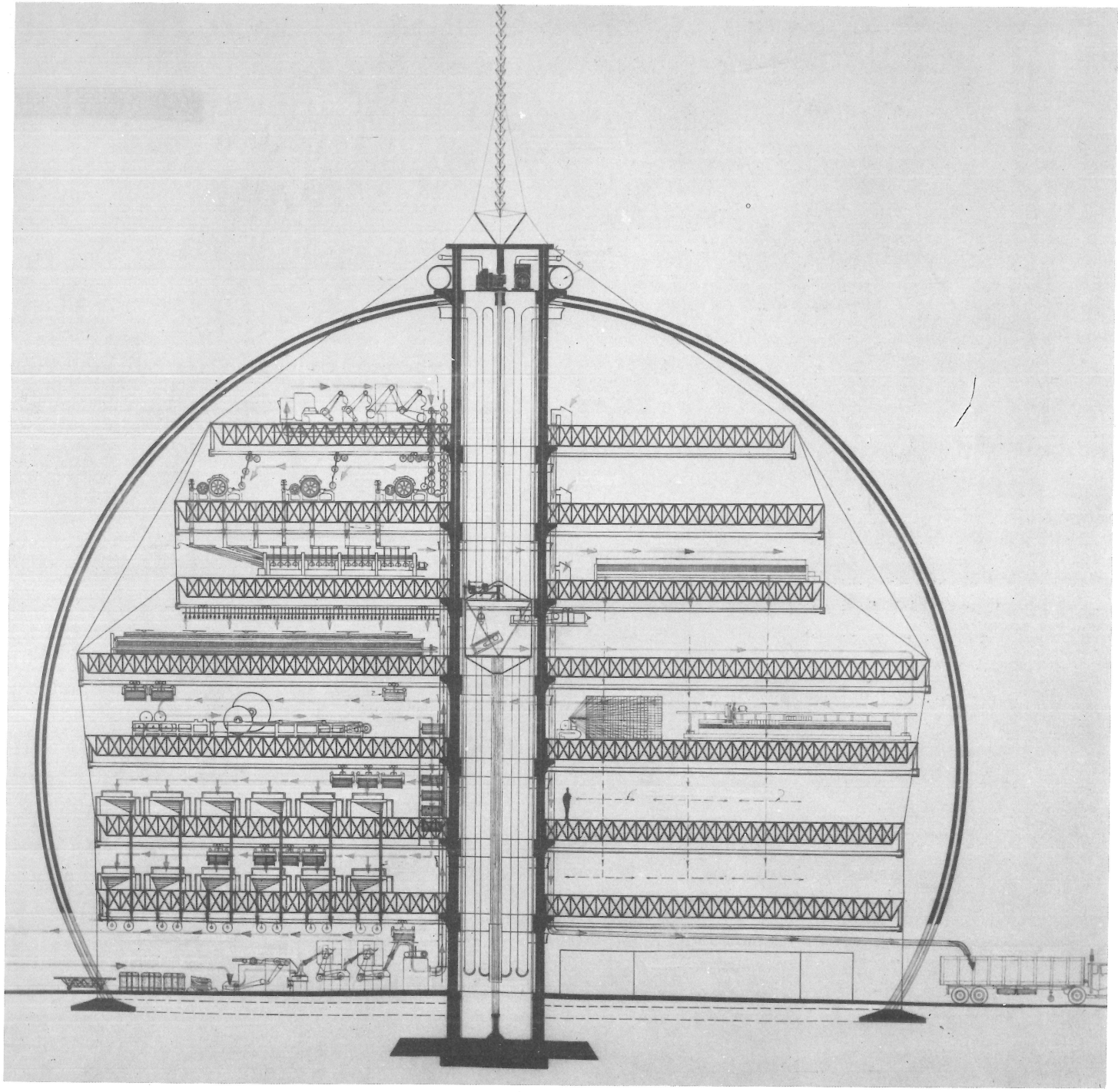
RALPH MILLS

The isotropic vector matrix or the tetrahedron truss was built as a side line to the work done under the direction of R. Buckminster Fuller by the twelve students of the School of Design who completed the Textile Mill. In the fall issue last year we presented the program for the Textile Mill project as it was suggested to us by Bucky. What resulted from the one month problem we promised to publish in a later issue. The **Architectural Forum-Magazine of Building, Art News,** and other publications have given it a generous and much appreciated coverage, and because of this fact we will not attempt to present the project again.

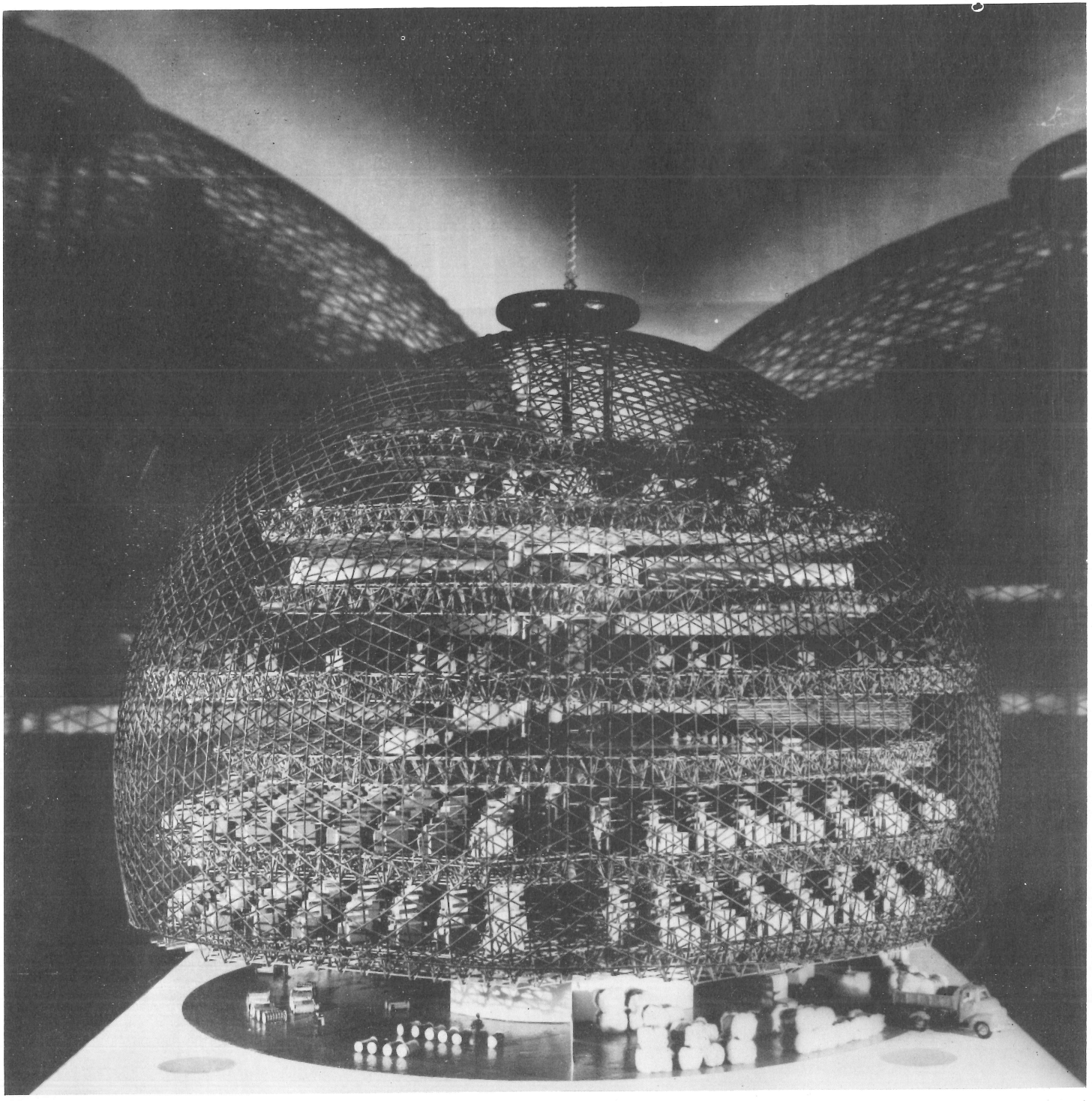
The truss, however, is important to us because it is a full size structure and the first of its kind ever to be built, although it has existed in the drawing stage for over ten years. The basic unit of the truss is the four sided tetrahedron, each side being an equalateral triangle. This being the only unit in the truss, all members are of equal length. The stresses are equally distributed to all members in relationship to their proximity to the point load and are distributed consequently in concentric circles. This being the case all members can be designed to take equal loads and when under maximum loads all are stressed to their ultimate. Under these conditions the design affords the maximum utilization of the materials involved.

In building this truss the members were designed as individual columns since only imperical judgements were available at the time. Quarter inch round hot rolled rods were welded together in continuous lengths where possible. The unit length was fixed at 6″ giving an 1/r of 24 for each column, making the resultant depth of the truss about 5½″. Fifty square feet of truss was built as a suitable section for testing. Informal tests have shown a distributed load of 100 lbs. per square foot with no deflection on a span of ten feet. A 500 lb. load was supported on a cantelevered section three feet from the support with no measurable deflection. The truss weighs three pounds per square foot, and the prototype model cost us about $.75 per square foot to fabricate. Work is continuing here and in New York on the possibilities of the structure and means of fabrication.

SHERMAN PARDUE, JR.
5th year student



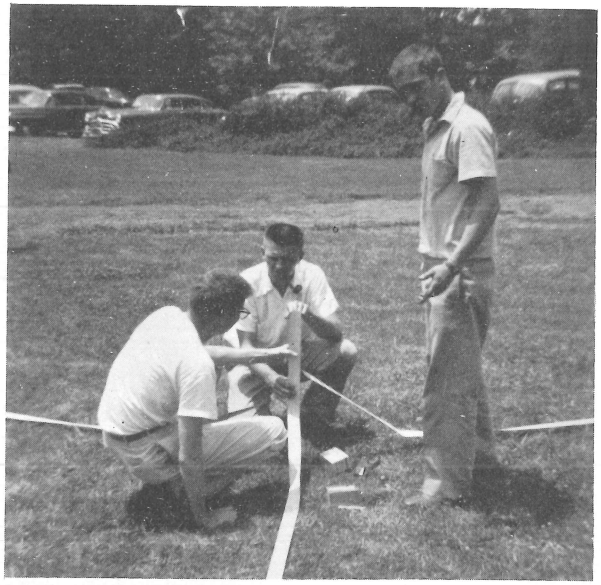
RALPH MILLS



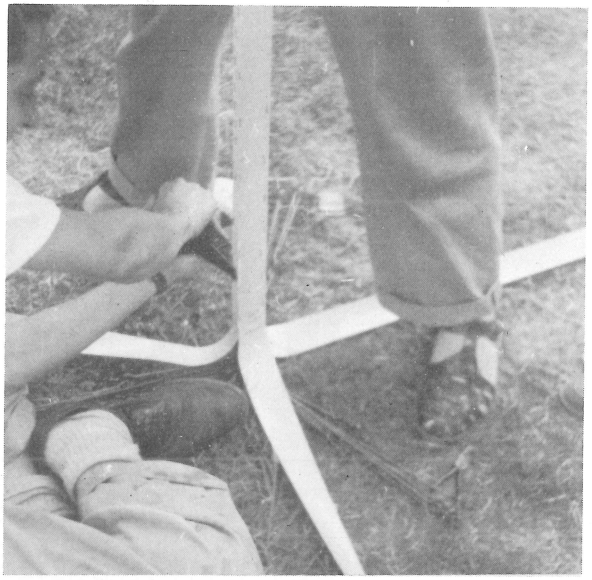
RALPH MILL'S

3

EDWIN EGAN



JEFF BROOKS

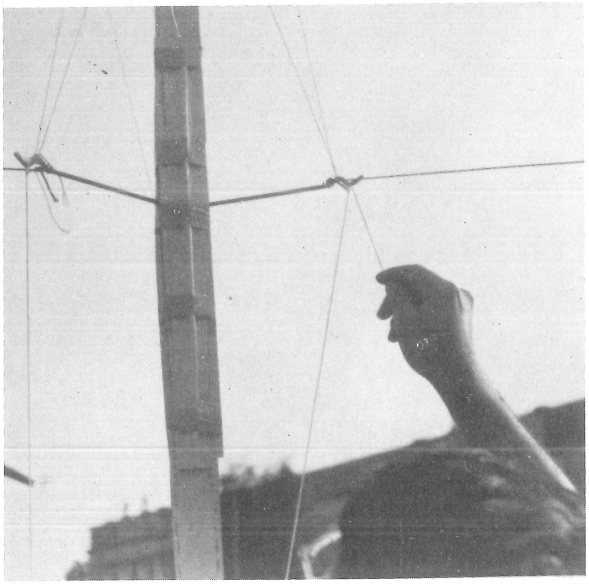


EDWIN EGAN

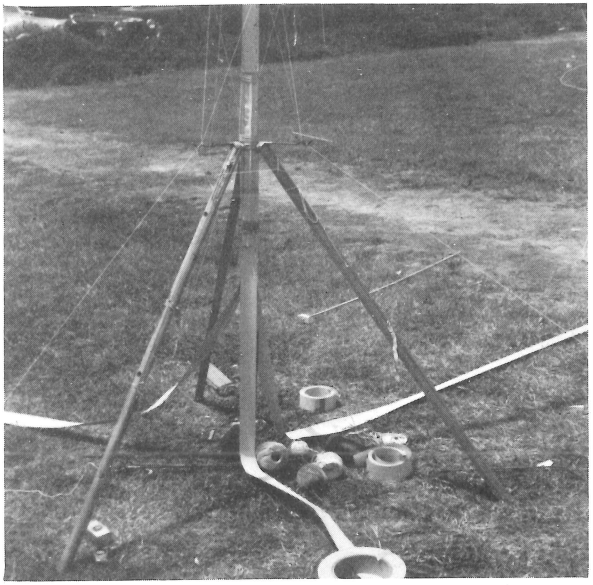
Four third year students of the School of Design using metal venetian blind tape, wire, and a stapling gun built this tower to a height of 65 feet working under the direction of Professor James W. Fitzgibbon.

Often during combat operations, antennas must be transported over difficult terrain, erected at considerable expense, and then owing to the extreme mobility of modern warfare, abandoned or destroyed. As another example both military and civilian personnel are often lost beyond communications range of rescue operations with no means of extending the range of their radio equipment. Briefly these were some of the considerations with which this project was undertaken. The problem was to develop an expandable antenna which could be fabricated out of standard available materials, light in weight and cheap enough to be expendable without appreciable financial loss. Moreover the structure had to be so designed that a 100 foot tower when packaged would be light enough and compact enough for one man to carry around under one arm. Parts for the tower prior to assembly occupied about three cubic feet when packaged.

Working from the ground up 3 rolls of tape (.010″ x 2″ venetian blind slat material) were stapled together to form a tower of triangular cross section. Cords were fed from 3 prefabricated spindle stands stationed at three points equidistant from each other to the tower where they were attached to the main stays on the shaft every 15 feet as the structure rose from the ground. These main stays as well as the intermediate



EDWIN EGAN



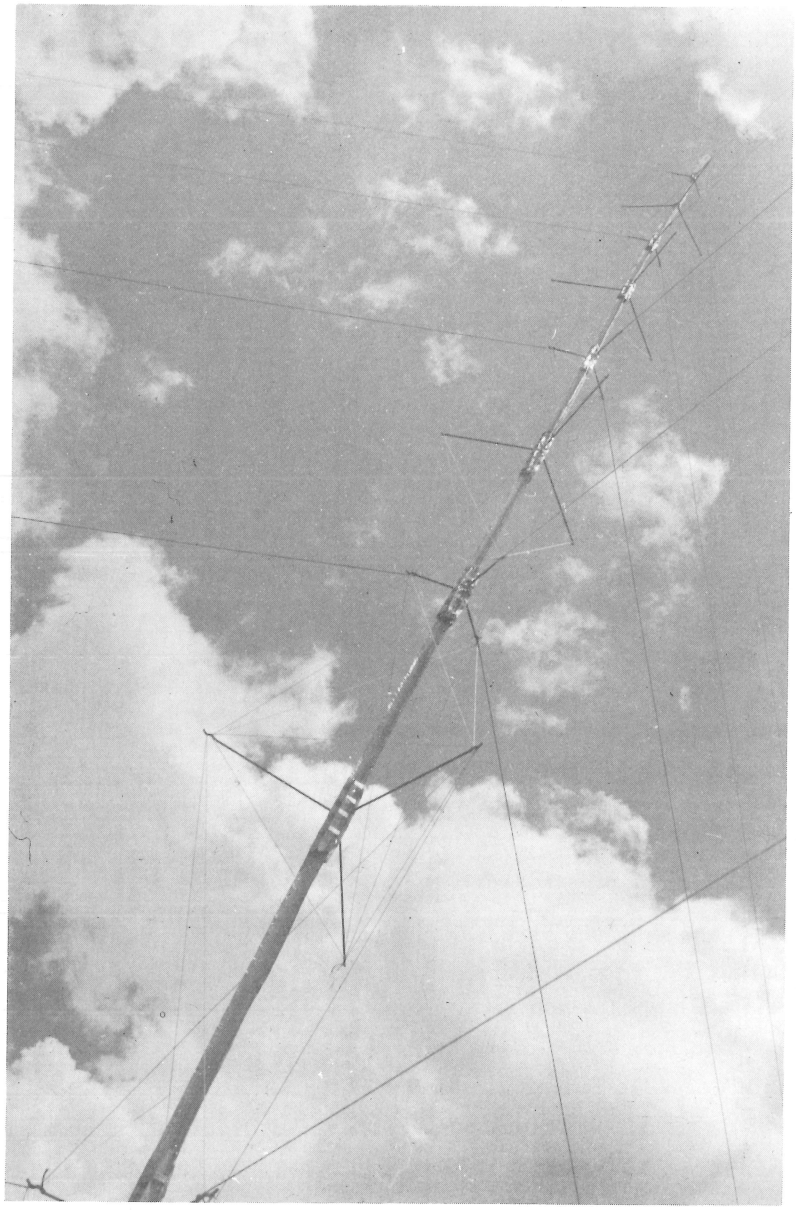
RALPH MILLS

outriggers, also placed 15 feet apart, were made of ⅛" diameter steel wire.

The outriggers and main stays were trussed together as the tower went up thus providing necessary lateral bracing to reduce the column action. The wire outriggers and main stays were inserted in the hollow core of the shaft and allowed to protrude at 7½ foot intervals along the stapled edges of the shaft. The spindle stands played out the guy cords as the column rose. Two men were required to staple the edges of the shaft and to insert and truss the stays. A third moved about viewing the progress of the tower and making any adjustments needed in the guy cords to prevent sway or bending in the shaft.

The second tower, an improvement on the first, reached a height of 65 feet when material shortages halted the work. It remained standing for three to four days and was then abandoned. In general it lived up to expectations. It is light in weight weighing less than 7 oz. per foot complete. It is easily fabricated because it uses materials already being mass produced by industry. It is compact and easily packaged occupying less than 3 cubic feet. It is cheap costing approximately 23¢ per linear foot complete. Work on a third design refined from the experience of the first two is now in progress, and a new tower is planned for the near future.

FROSTY COILE ED EGAN
JEFF BROOKS JOHN KINA
4th year students



RALPH MILLS

The Architect and Agriculture

When we enquire whether we may expand the function of the architect beyond his popularly recognized tasks, we are immediately confronted with the fact that his tasks have been essentially urban and suburban. Less than one per cent of America's farm building has been designed by architects. Despite the dramatic bulking of city to the human eye, the American farm building constituted, until very recently, by far the largest portion of America's building. It is unfair to the contemporary student of architecture to conclude that he is inherently excluded from structures simply because architects of recent generations have been held to function only in superficial, ornate and luxurious ways. There is an increasing acceleration of architectural penetration into the remote places. Smart glass box dwellings appear with increasing frequency in unexpectedly remote places.

This appearance is essentially an expansion of urban and suburbanism and its luxurious standards to serve urbanites in their retirement, vacationing or their secondary vocational indulgence (rich business gentlemen farmers). Present generation farmers' children return from college importing to the farm their own modern design adaptations for the new house not far from the old folks' farm house. This too is borrowed urbanism. The fact remains that except in less than one per cent of cases, farmers do not call on architects to help them plan their primary structural facilities. The farmer has been aided by the professional designers—but this professional was the engineer. The engineer was not usually employed directly by the farmer. He was employed by industry or county, state or federal government. The engineers worked not in the terms of any

one individual and the latter's idiosyncracies, ignorance and emotional deficiency patterns, as the architect has been forced to do as a consequence of direct personal patronage of his profession. The engineer designed apparatus in the terms of scientifically acquired (instrument measured) data, governing the special complex of events. characterizing the seasonal, geographical, biological, etc., differences in agricultural functions. Engineers thus came to gestate an unprecedented regenerative evolution of farm tools. Performance per man hour, continually amplified in all measurable directions of involved quantities and qualities. The conversion of natural energy income and inventory into man-preferred metabolic patterns has always constituted No. 1 function in the spontaneous priority schedule of the farmer. He didn't say it that way. He didn't have much use for words. His work tended to keep him remote from his fellow men and suspicious of unfamiliar vocabularies. Despite the engineering augmentation of his abilities—the farmer did not soon prosper. He led the chain reaction bankruptcy of 1928, when, overloaded with mortgaged capital investment in the new machinery, too large a proportion of the swelling metabolic increment of the new machinery was syphoning off through interest rates and service charges to pay for an expanding urban banking facility. Too little was known by the debt servicing farmer of the 20's regarding the complementary augmentations that could be had by large scale design mutations,—such as irrigation, flood control, water shed pooling, top soil immobilization by shelter belt growths, etc.—which valved patterns of dynamic nature to serve him with an increasingly favorable environment for his metabolic harvesting and which, unattended, had continually frustrated him in progressive waves of "hard luck" events as his new machinery involved him in ever larger patterns, the ramifications of which he was utterly ignorant. Engineers on government, state and county payrolls, whose functions related inherently to the larger patterns of resource conservation, came to his aid as the fundamental energy harvesting function essential to man's survival was reestablished.

Characteristic of the recovered agricultural equilibrium pattern throughout the late 1930s, '40s, was the picture of the farmscape nuclear grouping of structures and apparatus. Prominent in the nuclear grouping were the tools of planting, cultivating, harvesting, and distribution convoy. Large and sound barns, silos, corncribs, galvanized or aluminum grain bins, poked up above the skyline of the orchards and shade trees. The nuclear group of buildings were randomly interspersed with large insective shaped portable machines —too large to be afforded expensively housed space, accorded only the metabolic increments. Oldest and least impressive unit of the farm nucleus was and is the dwelling, so obsolete in standards as to be clearly datable as earlier than the vintage of the machinery, harvest, husbandry buildings—almost always, even now, the privy or privies 25 yards from the back door. Clearly written is the fact that the original dwelling was the bridgehead shield that made possible the presence of the farmer at the heart of the required remoteness of the acreage essential to the increment involvement minima of the increasing dependance upon the in-

dustrialization gamut of function augmenting facilities. This acreage minima has continually advanced in the last 20 years so that, though millions more acres have been put under farming through the U.S.A., there are a million less farms now operating. This means that the same kind of merging that took place in the industrial city's corporate structures throughout the '20s and '30s was coming to characterize the economic pattern of the basic energy income harvesting of the farm. This is to say that industrialization itself which is the principle of synergy (behavior of the whole unpredicted by the behavior of any of the parts) is spreading throughout the land requiring a science strategied team work operation in shunting the energy income into a world wide distributive pattern.

With this evolution, certain changes are discernable as we enter the first years of the second half of the twentieth century. Most physically notable is the disappearance from the apple orchard and farm yard of the recumbent insective machinery that could only be used by any one farmer for small percentages of the days of the year and whose unprotected recumbent days involved accelerating deterioration by the chemical processes of unanticipated inexorable energy events of nature. As one now speeds over the farm linking super highways of the west, at average traffic cruising velocity of one mile per minute, the student of evolving pattern will note that most of that formerly recumbent machinery may now be rediscovered, as yet recumbent, but dozing between high frequency employment, on the platforms of trucks comprising army-like caravans manned by new generation enterprisers. The new dynamic pattern is one in which large mergers of farm areas are scientifically pattern rotated and conserved and are mechanized only by the tools which have sufficient employment to warrant their inhibition into the farm nucleus. The dynamically evoluting geographical pattern is constant, relative to which the accelerated mobilization of the large seasonally employed tools is variably applied. The machinery can follow the discernable geographical motion of the thermal latitudes and is temporarily augmented in its functioning by migrant harvest workers. The migrant workers will be inevitably displaced by mechanical harvesting into the metabolic stabilization channels of deep freezing, etc. as the new mobile machinery enterprise begins to demonstrate what the minimum frequency of use levels are which characterize break-even point between energy increment loss and gain. As these new control magnitudes of the dynamic processes become discernable, science and technology will become accredited, which will close the gap between the mechanical interludes, ever less effectively serviced by manual operation.

It is interesting to note that, though the philosophy of economics and government which control the lands of North America and Russia are avowedly, on both sides, in diametric opposition, the evolutionary pattern of man's fundamental dealing with nature has been unwittingly congruent in both lands. Entirely remote reporting intelligence services give unwittingly identical disclosures of the evolution, in both lands, of the merging of farm groups into new and larger scientifically managed patterns—whose high point, seasonal

functions are serviced by entirely separate personnel, moving in two differentiated groups of a) machining caravans, b) gangs of fortuitous manual task servers. This whole served by a vast high speed communication network of highwayed, bywayed, piped, wired and wireless broadcast and beamed acceleratingly energized and valved communication.

It is semantically notable that the large part played in all this energy shunting and valving evolution, by engineering, in contradistinction to the secondary superficial luxury role played by architecture, is evidenced by the fact that function "engineer" as subjective identity has an objective verb form "engineering" which may modify any special category of differentiated man tasks, whereas the subjective identity architect has only a noun form in its objective identity "architecture."

Whereas we can speak of agricultural engineering and thus conjure up a myriad of potential investigations and teleologic investigations, when we say agricultural architecture we conjure up only a review of the conscious or unconscious superficial aspects of what **has been** rather than what **may be.** We recoil spontaneously, and charge it to aesthetics, against such word invention as "architecturizing" which inherently connotes superficial tampering. Identity of the **scope** of the function of "architect" had, during the last half millenium, shrunk, not because of inherent limits of the function itself, but because in a large historical wave pattern it had come to be identified with the more visible aspects and results and celebrations of man's first meager victories informed shunting of inexorably dynamic energy universe into man valuable patterns of magnitudes and frequencies modularly synchronous with evolutingly favorable periodicities and magnitudes modularly characterizing and expandingly integrated and identifiable patterns of responsibly initiated man regenerative function in universe.

The two word description of the function architect-comprehensive designing—which clearly identifies his function as broad energy and knowledge resource integrator in contradistinction to the differentiatingly effective specialized functions most dramatically emphasized in contemporary historical reporting and analysis was therefore fortuitously promoted for the purpose of regaining awareness of the inherently broad function of "architect."

Comprehensive designing applied to the farm pattern takes cognizance of discernable potentials now emergent as the kaleidescopic seasonal geographic and energy patterns of yesterday are shaken away and displaced by new magnitudes, new periodicities and new associations. The modulation of the economic scheduling of increment wage distribution is evidenced in industrial trends which anticipate total life pattern involvements of the individual both as producer and consumer wherein daily and weekly and employment and employer worker involvement trends to larger inherent associative considerations involving annual and lifetime emphasis. Seemingly unreasonable hourly rates of specialists as craftsmen, tend to level off at higher

overall standards as the crafts are inhibited within the dynamic network of industrialization. Here the differentiable tasks multiply in astronomical number as they are taken over by mechanical functioning as the task-disassociated individual emerges as a whole man again,—as a comprehensive operator of an increasingly wide variety of more controlable tasks inhibited into the mechanical complex.

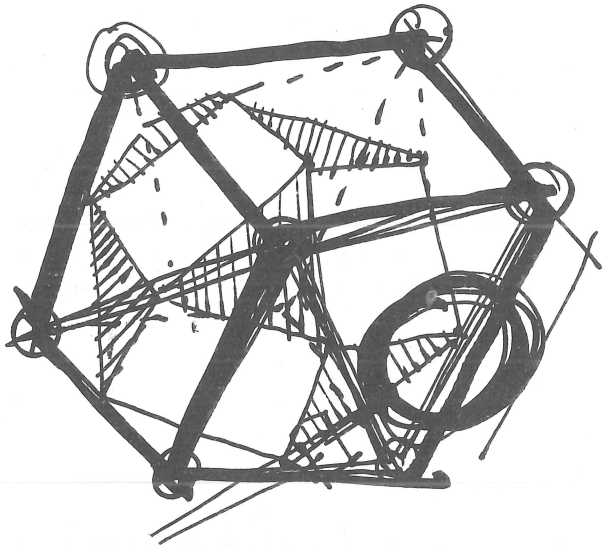
Comprehensive designing discerns, for instance, that field rotation of farm land in poly-annual rather than annual cycles can be effected by geometrical controls. In the habitual preindustrial farm pattern, the brown and green chequerboard of quadrangular fallow and cultivated fields, it seemed expedient to employ every inch of the active field. To comprehensive designing it has been discernable for the last quarter century that it would be far more effective to triangulate all arable land, by installing, at laterally equidistant points at the vertexes of such a triangular grid, a pattern of adapter bases to receive vertical mechanical assemblies in the form of masts and booms. These being mechanically rotated, the circular tangential pattern would be terraced, relative to respective bases by the boom action. The land would be tilled, cultivated and harvested by the progressive mechanical functions of the booms while the mast structures would support appropriate energetic environment control means such as silos, reflectors, water channelings, atmospheric condensers, etc. The triangular base patterns would employ annually alternate vertexes, leaving fallow or in rotational cover alternate intercircle spaces and thus provide greatly accented and augmented efficiency and conservation.

A host of potentials of comprehensive designing thus applied to industrializing agriculture, bring into prominence the expanding potentials of the renascent function architect discover that the delimiting is brought about by discard of the primary assumption of broad man patronage of a scientifically competent anticipation of the family of factors systematically characterizing general and subpattern evolution and design integration.

The co-existence at Raleigh of North Carolina State College's Department of Agricultural Engineering and Department of Architecture constitutes a stimulating challenge to the initiative of the architect.
The project which I will conduct from January 19 to February 14 at the North Carolina State College, Department of Architecture, will encourage a wide inventorying of discernable potentials, processing a selected number into industrial prototyping and industrial logistics synchronization with equal emphasis on the individual and synergetic functioning of the group.

Natural collaboration with the Agricultural and Engineering departments prior, during and after the project, will take advantage of the experience gained by collaboration with the Textile School and other departments in the development of the Cotton Mill Study and will be a fundamental policy of the 1953 project.

R. B. FULLER, Visiting seminar director



The "Bubble House" and other summer projects **Fred M. Taylor**

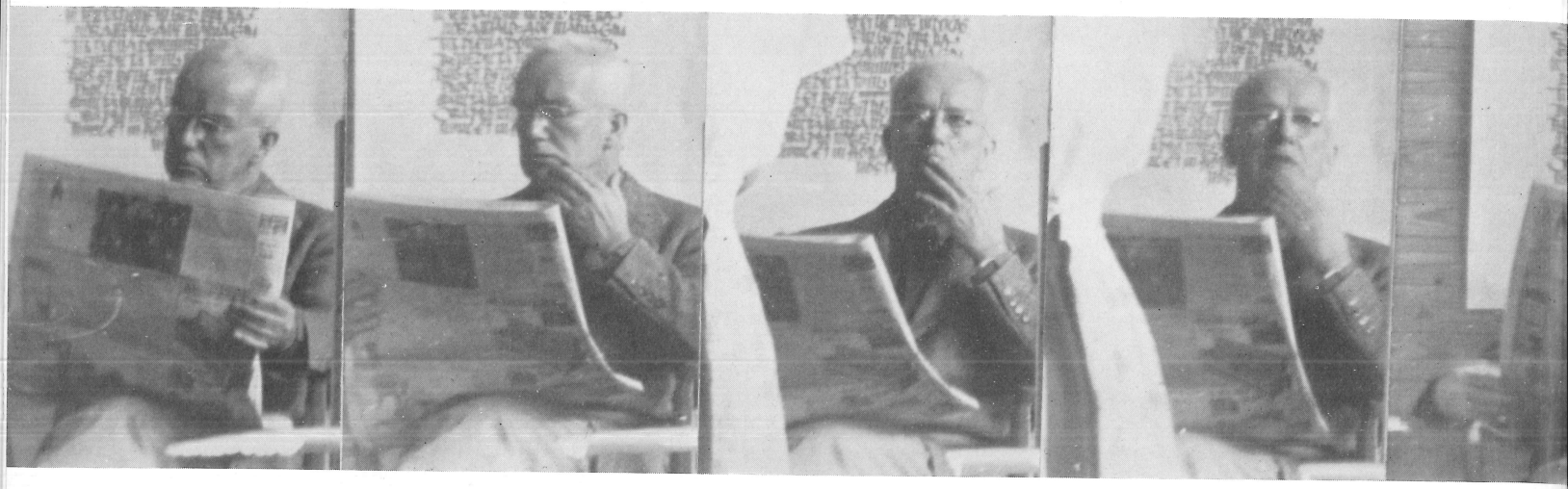
Bucky asked four of us to spend the summer with him in New York with a model of a prototype shelter to be the main objective. This project, proposed to raise funds for the erection of the real thing in the Modern Museum garden, was to be done in collaboration with George Nelson. On July 8 during the summer's heat wave we percolated into the metropolis of anonymity, and soon in the seclusion of Mr. Nelson's office we listened to the history of operation: bubble house. This was the beginning of a summer session which was to blossom into everything from a pogo stick to a ninety foot skylight.

Getting down to work about nine-thirty each morning we spent half the day working with George Nelson and his office staff on various projects for various clients. At two o'clock Bucky would come bustling in ready for another day's thought waves. After supper and a nostalgic look through the theater section of the New York Times, we generally continued the afternoon's activities until Bucky returned with fresh ideas connected with the project or with a discourse on the significance of the evolution of the comprehensive designer. George, though he never admitted it, must have known that these night sessions seldom broke up before two, three, or four o'clock in the morning.

George Nelson and Associates are located off Fifth Avenue behind the Gorham Hotel on Fifty-fifth. On the sixth floor is a receptionist and general office, a room in which clients are entertained, and the drafting room. In here a girl is composing copy for a publication, a designer is making little bitsy furniture models; others are also designing.

The room we had was on the floor below and just across the hall are two more designers, designing axe heads and beer signs. Our work with this staff was centered around cocooned table lamps, demountable storage shelves, and an adjustable pole known as the "pogo stick." During the summer the latter developed into an assemblage of telescoping poles, on which adjustable brackets slide and at whose ends two rubber suction cups are attached. This contraption does just about everything there is to do.

We spent our afternoons building a great big sphere of corrugated pasteboard, "to give us the feel of the project;" it was so large it nearly disrupted the high school in the building across the court. Bucky said, "It's wonderful, just marvelous, it really is!", while Nelson kept wondering what this had to do with the "bubble house."



Then it happened. A series of interruptions developed from which we never recovered. First, Garry Moore wanted Mr. Fuller to appear as a guest on his TV show a few days previous to an exhibit in which a geodesic shelter was to compete with Keisler's egg. The result was a hasty model constructed mostly of transparent materials which helped the Museum goers to see the inner works of the living unit, but which only sufficed to give TV viewers the impression of Niagara Falls in a rain storm.

After the show we took the model up on the roof in order to photograph it in natural sunlight. Several roofs down the street, however, someone else was capitalizing on the sunlight. While all this was in progress Bucky was waiting at home for us, ready to take off on a week end trip we had all planned. He said nothing of our being late until the developed film arrived. Inspecting the results, he suddenly came upon the nude lost among the skylights and flues, commenting: "Hmmmm—fine local color."

One day Bucky came puffing in explaining how he had met and chatted with some of his friends walking alternately in opposite directions along Fifth Avenue. Because of this, he was late but still had time to tell us that the transparent model was appearing on another TV show in twelve minutes. There was nothing to do but to find a set.

After chasing through a couple of radio-TV shops without finding a screen hooked up, we dashed over to the Columbia Broadcasting Building to discover there was not a single set on the premises from which we could see the show. When we finally found one in the Liberty Music Shop, Bucky was so pleased he nearly bought it.

The final interruption and the ultimate achivement of our summer work was a dome for a Michigan project. For presentation we made a model as well as drawings. Bucky was to catch a train to Detroit, and we worked until fifteen minutes to train time; it was then he got excited, so we grabbed everything and started toward the elevator door with the model packed in a three foot box. Bucky, still frantically grabbing last minute odds and ends, was oblivious to this last seemingly insurmountable problem. I turned and looked at Bucky; his face fell; the sparkle left his eyes: "We're trapped in the building!" We were tired and because of this it took us two or three agonizing minutes to realize that by turning the box on its side we could get it through the elevator door. The cab raced across town to Grand Central Station. New York stood still and watched progress charge across the concourse: Bucky with bags, one of us following by instinct with the boxed model, the other trailing with an eight foot section of the isotropic vector matrix

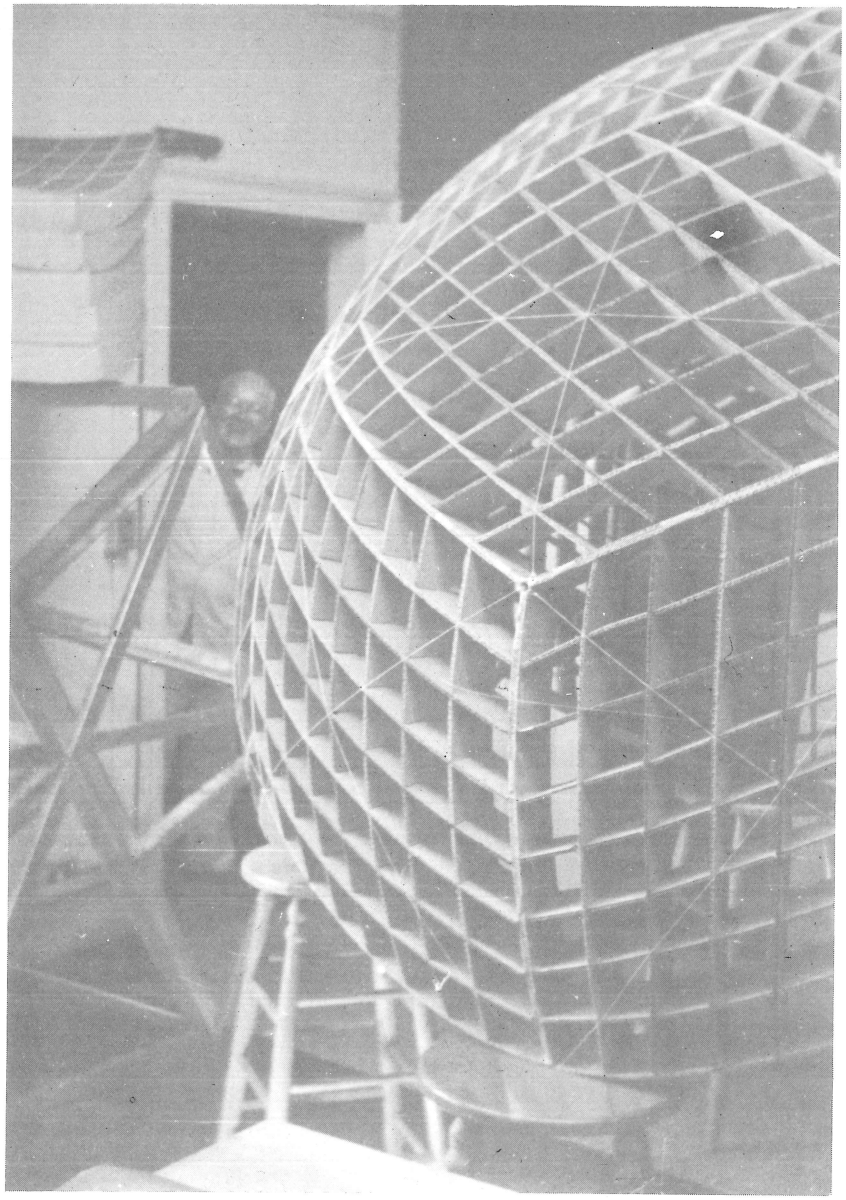
floor knocked down. All this we squeezed onto the train down the aisle only to discover none of it would fit through the door to his compartment. Nevertheless, he was off.

One weekend we took a trip upstate to attend the Fourth Annual Woodstock Art Conference to which Bucky had been invited to speak. Instead he conducted an exercise in thought projection. Afterwards excited people were seen everywhere with their hands on top of their heads, talking about the man who wanted to be a cow. You see he had spent some time tracing his sensorial development which he began with the story of how he was asked as a little boy what he wanted to be when he grew up. "There was a conventional set of answers little boys were supposed to give, but I said, 'I want to be a cow!' " He had looked through his ABC book, and a cow for C looked like a good thing to be. "But after exposing my senses to several cow barns, I decided it might not be so pleasant after all." At one of the final parties Bucky was made a member of the "Farouks" to the tune of a drum, a bagpipe, and a clown. Called upon for an acceptance speech, he did one of his own mathematicly calculated ("Yes, Yes, No") dance steps with someone's pregnant wife.

By this time we had only two weeks to go, and the working drawings for the Michigan dome had to be revised and completed. Every few days Bucky would fly out to try to straighten things out with the building commissioner. When the code seemed to stand in the way of the unclassified polyester fiberglass as a roof material, Bucky simply explained, "Oh, this isn't a roof, this is a skylight, all ninety feet of it!" It was approved without further argument. One morning we stopped work about three o'clock and started home. We stopped at the Post Office, however, for Bucky to mail some of the plans of the geodesic structure with all of its "nifty" details. Waiting outside for what seemed like hours, we finally concluded that some postal clerk must have asked him what was in the package.

We left New York on September 13, like awakening from a dream without having quite reached the conclusion, but confident that we were well on the way of becoming "Junior Comprehensive Designers."

FRED TAYLOR
5th year student



T. C. HOWARD

Philosophy and Politics

Bertrand Russell

THE British are distinguished among the nations of modern Europe, on the one hand by the excellence of their philosophers, and on the other hand by their contempt for philosophy. In both respects they show their wisdom. But contempt for philosophy, if developed to the point at which it becomes systematic, is itself a philosophy; it is the philosophy which, in America, is called "instrumentalism." I shall suggest that philosophy, if it is bad philosophy, may be dangerous, and therefore deserves that degree of negative respect which we accord to lightning and tigers. What positive respect may be due to "good" philosophy I will leave for the moment an open question.

The connection of philosophy with politics, which is the subject of my lecture, has been less evident in Britain than in Continental countries. Empiricism, broadly speaking, is connected with liberalism, but Hume was a Tory; what philosophers call "idealism" has, in general, a similar connection with conservatism, but T. H. Green was a Liberal. On the Continent distinctions have been more clear cut, and there has been a greater readiness to accept or reject a block of doctrines as a whole, without critical scrutiny of each separate part.

In most civilized countries at most times, philosophy has been a matter in which the authorities had an official opinion, and except where liberal democracy prevails this is still the case. The Catholic Church is connected to the philosophy of Aquinas, the Soviet government to that of Marx. The Nazis upheld German idealism, though the degree of allegiance to be given to Kant, Fichte, or Hegel respectively was not clearly laid down. Catholics, Communists, and Nazis all consider that their views on practical politics are bound up with their views on theoretical philosophy. Democratic liberalism, in its early successes, was connected with the empirical philosophy developed by Locke. I want to consider this relation of philosophies to political systems as it has in fact existed, and to inquire how far it is a valid logical relation, and how far, even if not logical, it has a kind of psychological inevitability. In so far as either kind of relation exists, a man's philosophy has practical importance, and a prevalent philosophy may have an intimate connection with the happiness or misery of large sections of mankind.

The word "philosophy" is one of which the meaning is by no means fixed. Like the word "religion," it has one sense when used to describe certain features of historical cultures, and another when used to denote a study or an attitude of mind which is considered desirable in the present day. Philosophy, as pursued in the universities of the Western democratic world, is, at least in intention, part of the pursuit of knowledge, aiming at the same kind of detachment as is sought in science, and not required by the authorities to arrive at conclusions convenient to the government. Many teachers of philosophy would repudiate not only the intention to influence their pupils' politics but also the view that philosophy should inculcate virtue. This, they would say, has as little to do with the philosopher as with the physicist or the chemist. Knowledge, they would say, should be the sole purpose of university teaching; virtue should be left to parents, schoolmasters, and churches.

But this view of philosophy, with which I have much sympathy, is very modern, and even in the modern world exceptional. There is a quite different view, which has prevailed since antiquity, and to which philosophy has owed its social and political importance.

Philosophy, in this historically usual sense, has resulted from the attempt to produce a synthesis of science and religion, or, perhaps more exactly, to combine a doctrine as to the nature of the universe and man's place in it with a practical ethic inculcating what was considered the best way of life. Philosophy was distinguished from religion by the fact that, nominally at least, it did not appeal to authority or tradition; it was distinguished from science by the fact that an essential part of its purpose was to tell men how to live. Its cosmological and ethical theories were closely interconnected: sometimes ethical motives influenced

the philosopher's views as to the nature of the universe, sometimes his views as to the universe led him to ethical conclusions. And with most philosophers ethical opinions involved political consequences: some valued democracy, others oligarchy; some praised liberty, others discipline. Almost all types of philosophy were invented by the Greeks, and the controversies of our own day were already vigorous among the pre-Socratics.

The fundamental problem of ethics and politics is that of finding some way of reconciling the needs of social life with the urgency of individual desires. This has been achieved, in so far as it has been achieved, by means of various devices. Where a government exists, the criminal law can be used to prevent anti-social action on the part of those who do not belong to the government, and law can be reinforced by religion wherever religion teaches that disobedience is impiety. Where there is a priesthood sufficiently influential to enforce its moral code on lay rulers, even the rulers become to some extent subject to law; of this there are abundant instances in the Old Testament and in medieval history. Kings who genuinely believe in the Divine government of the world, and in a system of rewards and punishments in the next life, feel themselves not omnipotent, and not able to sin with impunity. This feeling is expressed by the King in *Hamlet,* when he contrasts the inflexibility of Divine justice with the subservience of earthly judges to the royal power.

Philosophers, when they have tackled the problem of preserving social coherence, have sought solutions less obviously dependent upon dogma than those offered by official religions. Most philosophy has been a reaction against skepticism; it has arisen in ages when authority no longer sufficed to produce the socially necessary minimum of belief, so that nominally rational arguments had to be invented to secure the same results. This motive has led to a deep insincerity infecting most philosophy, both ancient and modern. There has been a fear, often unconscious, that clear thinking would lead to anarchy, and this fear has led philosophers to hide in mists of fallacy and obscurity.

There have, of course, been exceptions; the most notable are Protagoras in antiquity, and Hume in modern times. Both, as a result of skepticism, were politically conservative. Protagoras did not know whether the gods exist, but he held that in any case they ought to be worshiped. Philosophy, according to him, had nothing edifying to teach, and for the survival of morals we must rely upon the thoughtlessness of the majority and their willingness to believe what they had been taught. Nothing, therefore, must be done to weaken the popular force of tradition.

The same sort of thing, up to a point, may be said about Hume. After setting forth his skeptical conclusions, which, he admits, are not such as men can live by, he passes on to a piece of practical advice which, if followed, would prevent anybody from reading him. "Carelessness and inattention," he says, "alone can afford us any remedy. For this reason I rely entirely upon them." He does not, in this connection, set forth his reasons for being a Tory, but it is obvious that "carelessness and inattention," while they may lead to acquiescence in the *status quo,* cannot, unaided, lead a man to advocate this or that scheme of reform.

Hobbes, though less skeptical than Hume, was equally persuaded that government is not of divine origin, and was equally led, by the road of disbelief, to advocacy of extreme conservatism.

Protagoras was "answered" by Plato, and Hume by Kant and Hegel. In each case the philosophical world heaved a sigh of relief, and refrained from examining too nicely the intellectual validity of the "answer," which in each case had political as well as theoretical consequences—though in the case of the "answer" to Hume it was not the Liberal Kant but the reactionary Hegel who developed the *political* consequences.

But thorough-going skeptics, such as Protagoras and Hume, have never been influential, and have served chiefly as bug-bears to be used by reactionaries in frightening people into irrational dogmatism. The really powerful adversaries against whom Plato and Hegel had to contend were not skeptics, but empiricists, Demo-

critus in the one case and Locke in the other. In each case empiricism was associated with democracy and with a more or less utilitarian ethic. In each case the new philosophy succeeded in presenting itself as nobler and more profound than the philosophy of pedestrian common sense which it superseded. In each case, in the name of all that was most sublime, the new philosophy made itself the champion of injustice, cruelty, and opposition to progress. In the case of Hegel this has come to be more or less recognized; in the case of Plato it is still something of a paradox, though it has been brilliantly advocated in a recent book by Dr. K. R. Popper.[1]

Plato, according to Diogenes Laertius, expressed the view that all the books of Democritus ought to be burned. His wish was so far fulfilled that none of the writings of Democritus survive. Plato, in his Dialogues, never mentioned him; Aristotle gave some account of his doctrines; Epicurus vulgarized him; and finally Lucretius put the doctrines of Epicurus into verse. Lucretius just survived, by a happy accident. To reconstruct Democritus from the controversy of Aristotle and the poetry of Lucretius is not easy; it is almost as if we had to reconstruct Plato from Locke's refutation of innate ideas and Vaughan's "I saw eternity the other night." Nevertheless enough can be done to explain and condemn Plato's hatred.

Democritus is chiefly famous as (along with Leucippus) the founder of atomism, which he advocated in spite of the objections of metaphysicians—objections which were repeated by their successors down to and including Descartes and Leibniz. His atomism, however, was only part of his general philosophy. He was a materialist, a determinist, a free thinker, a utilitarian who disliked all strong passions, a believer in evolution, both astronomical and biological.

Like the men of similar opinions in the eighteenth century, Democritus was an ardent democrat. "Poverty in a democracy," he says, "is as much to be preferred to what is called prosperity under despots as freedom is to slavery." He was a contemporary of Socrates and Protagoras, and a fellow-townsman of the latter; he flourished during the early years of the Peloponnesian war, but may have died before it ended. That war concentrated the struggle that was taking place throughout the Hellenic world between democracy and oligarchy. Sparta stood for oligarchy; so did Plato's family and friends, who were thus led to become Quislings. Their treachery is held to have contributed to the defeat of Athens. After that defeat, Plato set to work to sing the praises of the victors by construcing a Utopia of which the main features were suggested by the constitution of Sparta. Such, however, was his artistic skill that Liberals never noticed his reactionary tendencies until his disciples Lenin and Hitler had supplied them with a practical exegesis[1]

That Plato's Republic should have been admired, on its political side, by decent people is perhaps the most astonishing example of literary snobbery in all history. Let us consider a few points in this totalitarian tract. The main purpose of education, to which everything else is subordinated, is to produce courage in battle. To this end, there is to be a rigid censorship of the stories told by mothers and nurses to young children; there is to be no reading of Homer, because that degraded versifier makes heroes lament and gods laugh; the drama is to be forbidden, because it contains villians and women; music is to be only of certain kinds, which, in modern terms, would be "Rule Britannia" and "The British Grenadiers." The government is to be in the hands of a small oligarchy, who are to practice trickery and lying—trickery in manipulating the drawing of lots for eugenic purposes, and elaborate lying to persuade the population that there are biological differences between the upper and lower classes. Finally, there is to be a large-scale infanticide when children are born otherwise than as a result of governmental swindling in the drawing of lots.

Whether people are happy in this community does not matter, we are told, for excellence resides in the

[1]*The Open Society and its Enemies.* The same thesis is maintained in my *History of Western Philosophy.*

[1]In 1920 I compared the Soviet State to Plato's Republic, to the equal indignation of Communists and Platonists.

whole, not in the parts. Plato's city is a copy of the eternal city laid up in heaven; perhaps in heaven we shall enjoy the kind of existence it offers us, but if we do not enjoy it here on earth, so much the worse for us.

This system derives its persuasive force from the marriage of aristocratic prejudice and "divine philosophy"; without the latter, its repulsiveness would be obvious. The fine talk about the good and the unchanging makes it possible to lull the reader into acquiescence in the doctrine that the wise should rule, and that their purpose should be to preserve the *status quo,* as the ideal state in heaven does. To every man of strong political convictions—and the Greeks had amazingly vehement political passions—it is obvious that "the good" are those of his own party, and that, if they could establish the constitution they desire, no further change would be necessary. So Plato thought, but by concealing his thought in a metaphysical mist he gave it an impersonal and disinterested appearance which deceived the world for ages.

The ideal of static perfection, which Plato derived from Parmenides and embodied in his theory of ideas, is one which is now generally recognized as inapplicable to human affairs. Man is a restless animal, not content, like the boa constrictor, to have a good meal once a month and sleep the rest of the time. Man needs, for his happiness, not only the enjoyment of this or that, but hope and enterprise and change. As Hobbes says, "Felicity consisteth in prospering, not in having prospered." Among modern philosophers, the ideal of unending and unchanging bliss has been replaced by that of evolution, in which there is supposed to be an orderly progress toward a goal which is never quite attained or at any rate has not been attained at the time of writing. This change of outlook is part of the substitution of dynamics for statics which began with Galileo, and which has increasingly affected all modern thinking, whether scientific or political.

Change is one thing, progress is another. "Change" is scientific, "progress" is ethical; change is indubitable, whereas progress is a matter of controversy. Let us first consider change, as it appears in science.

Until the time of Galileo, astronomers, following Aristotle, believed that everything in the heavens, from the moon upwards, is unchanging and incorruptible. Since Laplace, no reputable astronomer has held this view. Nebulae stars, and planets, we now believe, have all developed gradually. Some stars, for instance, the companion of Sirius, are "dead"; they have at some time undergone a catalysm which has enormously diminished the amount of light and heat radiating from them. Our own planet, in which philosophers are apt to take a parochial and excessive interest, was once too hot to support life, and will in time be too cold. After ages during which the earth produced harmless trilobites and butterflies, evolution progressed to the point at which it generated Neros, Genghis Khans, and Hitlers. This, however, is a passing nightmare; in time the earth will become again incapable of supporting life, and peace will return.

But this purposeless see-saw, which is all that science has to offer, has not satisfied the philosophers. They have professed to discover a formula of progress, showing that the world was becoming gradually more and more to their liking. The recipe for a philosophy of this type is simple. The philosopher first decides which are the features of the existing world that give him pleasure, and which are the features that give him pain. He then, by a careful selection among facts, persuades himself that the universe is subject to a general law leading to an increase of what he finds pleasant and a decrease of what he finds unpleasant. Next, having formulated his law of progress, he turns on the public and says: "It is fated that the world must develop as I say; therefore those who wish to be on the winning side, and do not care to wage a fruitless war against the inevitable, will join my party." Those who oppose him are condemned as unphilosophic, unscientific, and out of date, while those who agree with him feel assured of victory, since the universe is on their side. At the same time the winning side, for reasons which remain somewhat obscure, is represented as the side of virtue.

The man who first fully developed this point of view was Hegel. Hegel's philosophy is so odd that one would not have expected him to be able to get sane men to accept it, but he did. He set it out with so much

obscurity that people thought it must be profound. It can quite easily be expounded lucidly in words of one syllable, but then its absurdity becomes obvious. What follows is not a caricature, though of course Hegelians will maintain that it is.

Hegel's philosophy, in outline, is as follows. Real reality is timeless, as in Parmenides and Plato, but there is also an apparent reality, consisting of the every-day world in space and time. The character of real reality can be determined by logic alone, since there is only one sort of possible reality that is not self-contradictory. This is called the "Absolute Idea." Of this he gives the following definition: *"The Absolute Idea.* The idea, as unity of the subjective and objective Idea, is the notion of the Idea—a notion whose objective is the Idea as such, and for which the objective is Idea—an Object which embraces all characteristics in its unity." I hate to spoil the luminous clarity of this sentence by any commentary, but in fact the same thing would be expressed by saying "The Absolute Idea is pure thought thinking about pure thought." Hegel has already proved to his satisfaction that all Reality is thought, from which is follows that thought cannot think about anything but thought, since there is nothing else to think about. Some people might find this a little dull; they might say: "I like thinking about Cape Horn and the South Pole and Mount Everest and the great nebula in Andromeda; I enjoy contemplating the ages when the earth was cooling while the sea boiled and volcanoes rose and fell between night and morning. I find your precept, that I should fill my mind with the lucubrations of word-spinning professors, intolerably stuffy, and really, if that is your 'happy ending,' I don't think it was worth while to wade through all the verbiage that led up to it." And with these words they would say goodbye to philosophy and live happy ever after.

But if we agreed with these people we should be doing Hegel an injustice, which God forbid. For Hegel would point out that, while the Absolute, like Aristotle's God, never thinks about anything but itself, because it knows that all else is illusion, yet we, who are forced to live in the world of phenomena, as slaves of the temporal process, seeing only the parts, and only dimly apprehending the whole in moments of mystic insight, we, illusory products of illusion, are compelled to think as though Cape Horn were self-subsistent and not merely an idea in the Divine Mind. When we think about Cape Horn, what happens in Reality is that the Absolute is aware of a Cape-Horny thought. It really does have such a thought, or rather such an aspect of the one thought that it timelessly thinks and is, and this is the only reality that belongs to Cape Horn. But since we cannot reach such heights, we are doing our best in thinking of it in the ordinary geographical way.

But what, someone may say, has all this to do with politics? At first sight, perhaps, not very much. To Hegel, however, the connection is obvious. It follows from his metaphysic that true liberty consists in obedience to an arbitrary authority, that free speech is an evil, that absolute monarchy is good, that the Prussian State was the best existing at the time when he wrote, that war is good, and that an international organization for the peaceful settlement of disputes would be a misfortune.

It is just possible that some among my readers may not see at once how these consequences follow, so I hope I may be pardoned for saying a few words about the intermediate steps.

Although time is unreal, the series of appearances which constitutes history has a curious relation to Realty. Hegel discovered the nature of Reality by a purely logical process called the "dialectic," which consists of discovering contradictions in abstract ideas and correcting them by making them less abstract. Each of these abstract ideas is conceived as a stage in the development of "The Idea," the last stage being the "Absolute Idea."

Oddly enough, for some reason which Hegel never divulged, the temporal process of history repeats the logical development of the dialectic. It might be thought, since the metaphysic professes to apply to all Reality, that the temporal process which parallels it would be cosmic, but not a bit of it: it is purely terrestrial, con-

fined to recorded history, and (incredible as this may seem) to the history that Hegel happened to know. Different nations, at different times, have embodied the stages of the Idea that the dialectic had reached at those times. Of China, Hegel knew only that it *was,* therefore China illustrated the category of mere Being. Of India he knew only that Buddhists believed in Nirvana, therefore India illustrated the category of nothing. The Greeks and Romans got rather further along the list of categories, but all the late stages have been left to the Germans, who, since the time of the fall of Rome, have been the sole standard-bearers of the Idea, and had already in 1830 very nearly realized the Absolute Idea.

To anyone who still cherishes the hope that man is a more or less rational animal, the success of this farrago of nonsense must be astonishing. In his own day, his system was accepted by almost all academically educated young Germans, which is perhaps explicable by the fact that it flattered German self-esteem. What is more surprising is its success outside Germany. When I was young, most teachers of philosophy in British and American universities were Hegelians, so that, until I read Hegel, I supposed there must be some truth in his system; I was cured, however, by discovering that everything he said on the philosophy of mathematics was plain nonsense.

Most curious of all was his effect on Marx, who took over some of his most fanciful tenets, more particularly the belief that history develops according to a logical plan, and is concerned, like the purely abstract dialectic, to find ways of avoiding self-contradiction. Over a large part of the earth's surface you will be liquidated if you question this dogma, and eminent Western men of science, who sympathize politically with Russia, show their sympathy by using the word "contradiction" in ways that no self-respecting logician can approve.

In tracing a connection between the politics and the metaphysics of a man like Hegel, we must content ourselves with certain very general features of his practical program. That Hegel glorified Prussia was something of an accident; in his earlier years he ardently admired Napoleon, and only became a German patriot when he became an employee of the Prussian State. Even in the latest form of his Philosophy of History, he still mentions Alexander, Caesar, and Napoleon as men great enough to have a right to consider themselves exempt from the obligations of the moral law. What his philosophy constrained him to admire was not Germany as against France, but order, system, regulation, and intensity of governmental control. His deification of the state would have been just as shocking if the state concerned had been Napoleon's despotism. In his own opinion, he knew what the world needed, though most men did not; a strong government might compel men to act for the best, which democracy could never do. Heraclitus, to whom Hegel was deeply indebted, says: "Every beast is driven to the pasture with blows." Let us, in any case, make sure of the blows; whether they lead to a pasture is a matter of minor importance—except, of course, to the "beasts."

It is obvious that an autocratic system, such as that advocated by Hegel or by Marx's present-day disciples, is only theoretically justifiable on a basis of unquestioned dogma. If you know for certain what is the purpose of the universe in relation to human life, what is going to happen, and what is good for people even if they do not think so; if you can say, as Hegel does, that his theory of history is "a result which happens to be known to *me,* because I have traversed the entire field"—then you will feel that no degree of coercion is too great, provided it leads to the goal.

The only philosophy that affords a theoretical justification of democracy, and that accords with democracy in its temper of mind, is empiricism. Locke, who may be regarded, so far as the modern world is concerned, as the founder of empiricism, makes it clear how closely this is connected with his views on liberty and toleration, and with his opposition to absolute monarchy. He is never tired of emphasizing the uncertainty of most of our knowledge, not with a skeptical intention such as Hume's, but with the intention of making

men aware that they *may* be mistaken, and that they should take account of this possibility in all their dealings with men of opinions different from their own. He had seen the evils wrought, both by the "enthusiasm" of the sectaries, and by the dogma of the divine right of kings; to both he opposed a piecemeal and patchwork political doctrine, to be tested at each point by its success in practice.

What may be called, in a broad sense, the Liberal theory of politics is a recurrent product of commerce. The first known example of it was in the Ionian cities of Asia Minor. which lived by trading with Egypt and Lydia. When Athens, in the time of Pericles, became commercial, the Athenians became Liberal. After a long eclipse, Liberal ideas revived in the Lombard cities of the middle ages, and prevailed in Italy until they were extinguished by the Spaniards in the sixteenth century. But the Spaniards failed to reconquer Holland or to subdue England, and it was these countries that were the champions of Liberalism and the leaders in commerce in the seventeenth century. In our day the leadership has passed to the United States.

The reasons for the connection of commerce with Liberalism are obvious. Trade brings men into contact with tribal customs different from their own, and in so doing destroys the dogmatism of the untraveled. The relation of buyer and seller is one of negotiation between two parties who are both free; it is most profitable when the buyer or seller is able to understand the point of view of the other party. There is, of course, imperialistic commerce, where men are forced to buy at the point of the sword; but this is not the kind that generates Liberal philosophies, which have flourished best in trading cities that have wealth without much military strength. In the present day, the nearest analogue to the commercial cities of antiquity and the middle ages is to be found in small countries such as Switzerland, Holland, and Scandinavia.

The Liberal creed, in practice, is one of live-and-let-live, of toleration and freedom so far as public order permits, of moderation and absence of fanaticism in political programs. Even democracy, when it becomes fanatical, as it did among Rousseau's disciples in the French Revolution, ceases to be Liberal; indeed, a fanatical belief in democracy makes democratic institutions impossible, as appeared in England under Cromwell and in France under Robespierre. The genuine Liberal does not say "this is true," he says, "I am inclined to think that under present circumstances this opinion is probably the best." And it is only in this limited and undogmatic sense that he will advocate democracy.

What has theoretical philosophy to say that is relevant to the validity or otherwise of the Liberal outlook?

The essence of the Liberal outlook lies not in *what* opinions are held, but in *how* they are held: instead of being held dogmatically, they are held tentatively, and with a consciousness that new evidence may at any moment lead to their abandonment. This is the way in which opinions are held in science, as opposed to the way in which they are held in theology. The decisions of the Council of Nicaea are still authoritative, but in science fourth-century opinions no longer carry any weight. In the U.S.S.R. the dicta of Marx on dialectical materialism are so unquestioned that they help to determine the views of geneticists on how to obtain the best breed of wheat,[1] though elsewhere it is thought that experiment is the right way to study such problems. Science is empirical, tentative, and undogmatic; all immutable dogma is unscientific. The scientific outlook, accordingly, is the intellectual counterpart of what is, in the practical sphere, the outlook of Liberalism.

Locke, who first developed in detail the empiricist theory of knowledge, preached also religious toleration, representative institutions, and the limitation of governmental power by the system of checks and balances. Few of his doctrines were new, but he developed them in a weighty manner at just the moment when the English government was prepared to accept them. Like the other men of 1688, he was only reluctantly a rebel, and he disliked anarchy as much as he disliked despotism. Both in intellectual and in practical matters he stood for order without authority; this might be taken as the motto both of science and of Liberalism. It de-

[1]See *The New Genetics in the Soviet Union*, by Hudson and Richens. School of Agriculture, Cambridge, 1946.

pends, clearly, upon consent or assent. In the intellectual world it involves standards of evidence which, after adequate discussion, will lead to a measure of agreement among experts. In the practical world it involves submission to the majority after all parties have had an opportunity to state their case.

In both respects his moment was a fortunate one. The great controversy between the Ptolemaic and Copernican systems had been decided, and scientific questions could no longer be settled by an appeal to Aristotle. Newton's triumphs seemed to justify boundless scientific optimism.

In the practical world, a century and a half of wars of religion had produced hardly any change in the balance of power as between Protestants and Catholics. Enlightened men had begun to view theological controversies as an absurdity, caricatured in Swift's war between the Big-endians and the Little-endians. The extreme Protestant sects, by relying upon the inner light, had made what professed to be Revelation into an anarchic force. Delightful enterprises, scientific and commercial, invited energetic men to turn aside from barren disputation. Fortunately they accepted the invitation, and two centuries of unexampled progress resulted.

We are now again in an epoch of wars of religion, but a religion is now called an "ideology." At the moment, the Liberal philosophy is felt by many to be too tame and middle-aged: the idealistic young look for something with more bite in it, something which has a definite answer to all their questions, which calls for missionary activity and gives hope of a millennium brought about by conquest. In short, we have been plunging into a renewed age of faith. Unfortunately the atomic bomb is a swifter exterminator than the stake, and cannot safely be allowed so long a run. We must hope that a more rational outlook can be made to prevail, for only through a revival of Liberal tentativeness and tolerance can our world survive.

The empiricist's theory of knowledge—to which, with some reservations, I adhere—is halfway between dogma and skepticism. Almost all knowledge, it holds, is in some degree doubtful, though the doubts, if any, is negligible as regards pure mathematics and facts of present sense-perception. The doubtfulness of what passes for knowledge is a matter of degree; having recently read a book on the Anglo-Saxon invasion of Britain, I am now convinced of the existence of Hengist, but very doubtful about Horsa. Einstein's general theory of relativity is probably broadly speaking true, but when it comes to calculating the circumference of the universe we may be pardoned for expecting later investigations to give a somewhat different result. The modern theory of the atom has pragmatic truth, since it enables us to construct atomic bombs: its consequences are what instrumentalists facetiously call "satisfactory." But it is not improbable that some quite different theory may in time be found to give a better explanation of the observed facts. Scientific theories are accepted as useful hypotheses to suggest further research, and as having some element of truth in virtue of which they are able to colligate existing observations; but no sensible person regards them as immutably perfect.

In the sphere of practical politics, this intellectual attitude has important consequences. In the first place, it is not worth while to inflict a comparatively certain present evil for the sake of a comparatively doubtful future good. If the theology of former times was entirely correct, it was worth while burning a number of people at the stake in order that the survivors might go to heaven, but if it was doubtful whether heretics would go to hell, the argument for persecution was not valid. If it is certain that Marx's eschatology is true, and that as soon as private capitalism has been abolished we shall all be happy ever after, then it is right to pursue this end by means of dictatorships, concentration camps, and world wars; but if the end is doubtful or the means not sure to achieve it, present misery becomes an irresistible argument against such drastic methods. If it were certain that without Jews the world would be a paradise, there could be no valid objection to Auschwitz; but if it is much more probable that the world resulting from such methods would be a hell, we can allow free play to our natural humanitarian revulsion against cruelty.

Since, broadly speaking, the distant consequences of actions are more uncertain than the immediate consequences, it is seldom justifiable to embark on any policy on the ground that, though harmful in the present, it will be beneficial in the long run. This principle, like all others held by empiricists, must not be held absolutely; there are cases where the future consequences of one policy are fairly certain and very unpleasant, while the present consequences of the other, though not agreeable, are easily endurable. This applies, for instance, to saving food for the winter, investing capital in machinery, and so on. But even in such cases uncertainty should not be lost sight of. During a boom there is much investment that turns out to have been unprofitable, and modern economists recognize that the habit of investing rather than consuming may easily be carried too far.

It is commonly urged that, in a war between Liberals and fanatics, the fanatics are sure to win, owing to their more unshakable belief in the righteousness of their cause. This belief dies hard, although all history, including that of the last few years, is against it. Fanatics have failed, over and over again, because they have attempted the impossible, or because, even when what they aimed at was possible, they were too unscientific to adopt the right means; they have failed also because they aroused the hostility of those whom they wished to coerce. In every important war since 1700 the more democratic side has been victorious. This is partly because democracy and empiricism (which are intimately interconnected) do not demand a distortion of facts in the interest of theory. Russia and Canada, which have somewhat similar climatic conditions, are both interested in obtaining better breeds of wheat; in Canada this aim is pursued experimentally, in Russia by interpreting the Marxist Scriptures.

Systems of dogma without empirical foundation, such as those of scholastic theology, Marxism, and fascism, have the advantage of producing a great degree of social coherence among their disciples. But they have the disadvantage of involving persecution of valuable sections of the population. Spain was ruined by the expulsion of the Jews and Moors; France suffered by the emigration of Huguenots after the Revocation of the Edict of Nantes; Germany would porbably have been first in the field with the atomic bomb but for Hitler's hatred of Jews. And, to repeat, dogmatic systems have the two further disadvantages of involving false beliefs on practically important matters of fact, and of rousing violent hostility in those who do not share the fanaticism in question. For these various reasons, it is not to be expected that, in the long run, nations addicted to a dogmatic philosophy will have the advantage over those of a more empirical temper. Nor is it true that dogma is necessary for social coherence when social coherence is called for; no naton could have shown more of it than the British showed in 1940.

Epiricism, finally, is to be commended not only on the ground of its greater truth, but also on ethical grounds. Dogma demands authority, rather than intelligent thought, as the source of opinion; it requires persecution of heretics and hostility to unbelievers; it asks of its disciples that they should inhibit natural kindliness in favor of systematic hatred. Since argument is not recognized as a means of arriving at truth, adherents of rival dogmas have no method except war by means of which to reach a decision. And war, in our scientific age, means sooner or later, universal death.

I conclude that, in our day as in the time of Locke, empiricist Liberalism (which is not incompatible with *democratic* socialism) is the only philosophy that can be adopted by a man who, on the one hand, demands some scientific evidence for his beliefs, and, on the other hand, desires human happiness more than the prevalence of this or that party or creed. Our confused and difficult world needs various things if it is to escape disaster, and among these one of the most necessary is that, in the nations which still uphold Liberal beliefs, these beliefs should be whole-hearted and profound, not apologetic towards dogmatisms of the right and of the left, but deeply persuaded of the value of liberty, scientific freedom, and mutual forbearance. For without these beliefs life on our politically divided but technically unified planet will hardly continue to be possible.

Patron Subscribers

Architectural Forum	New York, N. Y.
Leslie N. Boney	Wilmington, N. C.
Manuel Bromberg	Raleigh, N. C.
William A. Coleman	Kinston, N. C.
John James Croft, Jr.	Asheboro, N. C.
Edward Dahl	Flint, Michigan
William Henley Deitrick	Raleigh, N. C.
Lawrence Enerson	Lincoln, Neb.
James W. Fitzgibbon	Raleigh, N. C.
Goldstein, Parham and Labouisse	New Orleans, La.
Roy Gussow	Raleigh, N. C.
Holbrook Company	Norfolk, Va.
House and Home	New York, N. Y.
Mrs. Alvin Pike Howard	New Orleans, La.
Isaac Delgado Museum of Art	New Orleans, La.
L. L. Ivey	Raleigh, N. C.
John Summerfield Jenkins	Norfolk, Va.
Dean Henry L. Kamphoefner	Raleigh, N. C.
John Leon	Detroit, Michigan
Edward Loewenstein	Greensboro, N. C.
Anthony Lord	Asheville, N. C.
H. W. Moser, Sr.	Raleigh, N. C.
Mrs. Stanislawa Nowicki	Philadelphia, Pa.
A. G. Odell, Jr.	Charlotte, N. C.
Louis A. Oliver and Herbert L. Smith III	Norfolk, Va.
Mr. and Mrs. Sherman Pardue	New Orleans, La.
J. N. Pease and Company	Charlotte, N. C.
Mr. and Mrs. O. L. C. Radford	New York, N. Y.
John J. Rowland	Kinston, N. C.
Gerald Schiff	New York, N. Y.
F. Vernon H. Smith, Sr.	Charlotte, N. C.
Edwin G. Thurlow	Raleigh, N. C.
Voorhees and Everhart	High Point, N. C.
Ralph Walker	New York, N. Y.
Edward W. Waugh	Raleigh, N. C.
F. Carter Williams	Raleigh, N. C.
Williams, Coile and Blanchard	Newport News, Va.

The Staff: **Paul Braswell**
Ligon Flynn
Edwin Egan
Frosty Coile
Vincent DeGutis
F. Vernon H. Smith, Jr.
Thomas C. Howard
Truman L. Newberry
Thomas Condit
John Morris

Circulation Manager: **Harry Moser**

Technical Coordinator: **Conrad Taylor**

Faculty Advisor: **Duncan Stuart—Associate Professor of Design**

Associate Editor: **William Hall**

Visitors to the School of Design for the Fall and Winter term will be:

Robert Royston (September 25 - October 15) landscape architect (Eckbo, Royston, and Williams) conducting a 3 week site planning problem with the fourth year class. One public lecture.

Howard Dearstyne (January 12-14) architect working on restorations (Colonial Williamsburg Inc.) Three afternoon seminars. Public lecture January 12.

R. Buckminster Fuller (January 15 - February 15) conducting a one month problem with selected students. Seminars and one Public lecture.

Editor: **Sherman Pardue, Jr.**

Business Manager: **Fred M. Taylor**

Editorial and Business Offices: **box 5273, Raleigh, North Carolina**

THE GRAPHIC PRESS, INC., RALEIGH, NORTH CAROLINA