EDUCATION IN PROGRESS:
Design Department, Southern Illinois University

by John McHale
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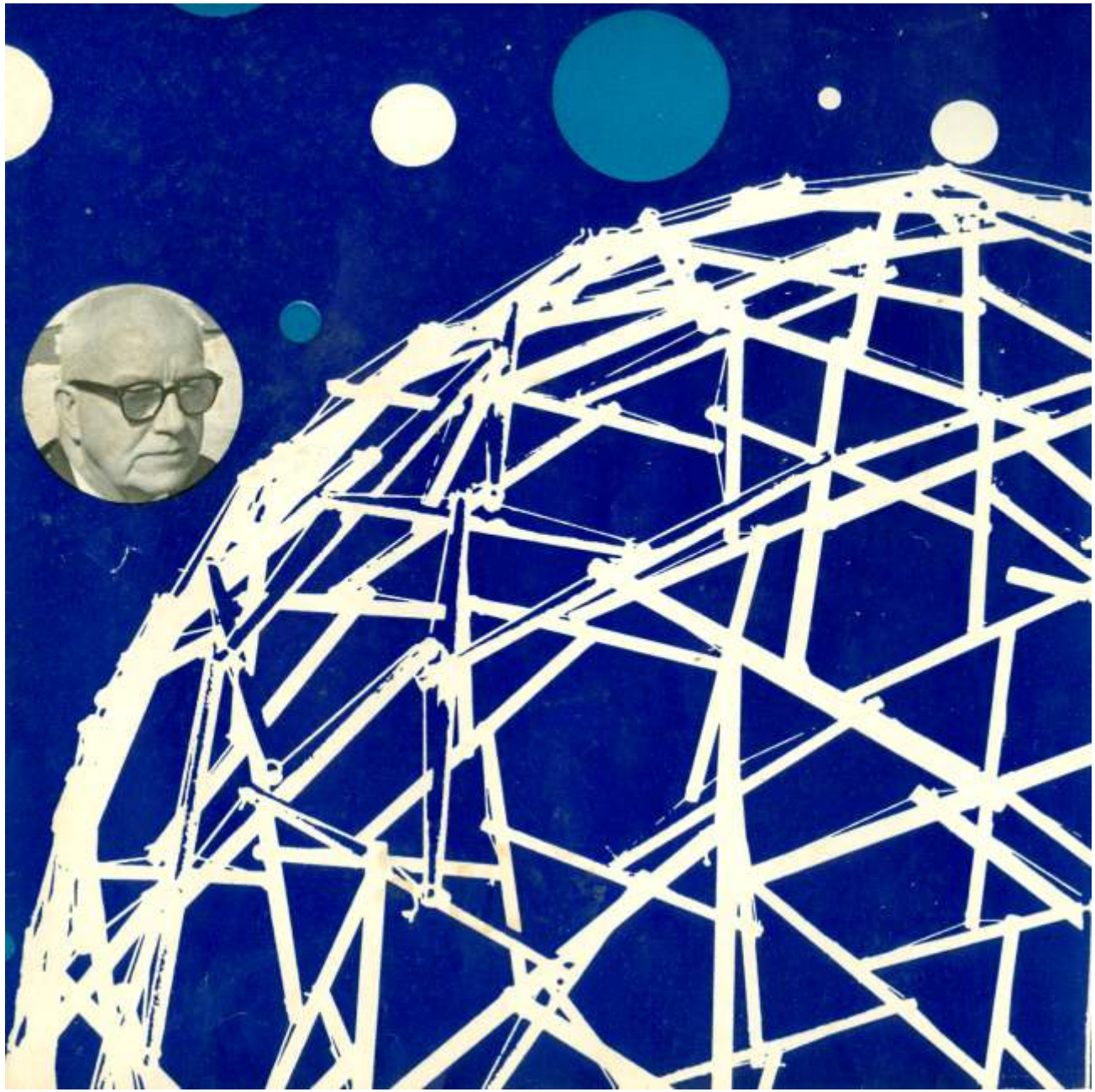

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A general view of the department with two workshop domes in the foreground

It has long been agreed that changes in man's environ relations effected by advanced technology require new orientations of his educational processes. But, in architectural and design education, where such re-orientation has been attempted, it has been limited to marginal revisions of existing curricula, to inclusion of this or that fashionable field study-to further differentiating out of 'subjects' covered. This has been done, largely, without any sense of overall integrative purpose. Yet changes effected by the industrial process have operated, in an overall manner, towards presenting a 'one world' situation socially and economically, thereby underlining the necessity of relating to this process in similar comprehensive fashion. We need now to reframe our goals, no longer in terms of specifically local needs, but more clearly to fit our developed capacities to fulfil man's requirements on a global scale.

This essay outlines the formulation of such a direction at the Department of Design of Southern Illinois University in the United States.
Whatever the eventual demerits, failures or successes of the endeavour, the positive declaration of intent, quoted below, is timely, and merits considerable attention.

In attempting to communicate the true nature of the Department of Design's educational approach we have found it helpful to begin by stating what the Department is not. The Department of Design is not an industrial design school and it is not a commercial art school; it is not an engineering or architectural school; it is not a trade school and it is not an industrial arts school. It is not a professional school, in the sense that it does not attempt to prepare its graduate specifically for clearly-defined positions in industry or in advertising, graphics, and other allied fields of communications.

Department of Design students are involved with all of these areas of man's activity and many others. Their programme integrates an awareness in depth of industrial design, the visual communications processes, engineering, architecture, and more. Their programme goes beyond these, searching broadly into the liberal arts and sciences, exploiting to each individual's capacity the available intellectual resources of the University of which the Department is a part. This would be a beginning of a definition of the Department of Design.

Some brief historical note may be relevant. In September 1955 Burnett Shryock, Dean of the School of Fine Arts, invited Harold Cohen to head a Design department within his

school. Cohen was then in charge of Product Design at the Institute of Design, Chicago. As one of the last generation of students there to have come under the personal influence of L. Moholy Nagy, he brought to his new task a strong sense of the overall involvement of design education with man's basic needs. This, tempered with considerable experience of design and manufacture in the field, had already established his present comprehensive direction.

The department began with 8 students and one room. By the summer of 1956 there were 15 students, the course had been set, and, though the programme remained basically similar to that of the Institute of Design, the underlying premise was more extensively framed and its character had begun to evolve. It is significant that the first visiting lecturer, invited to conduct an eight week seminar in this year, was Buckminster Fuller. Though this choice underlines the policy and aims of the school, subsequent invited lecturers-Leo Lionni, Will Burtin, Felix Candela, Charles Eames, etc.-reflect the broad nature of its approach. By 1958, there were 50-75 students, and today around 100. As the number of students has grown, the department has evolved physically through a collection of varied workspaces. For only a brief period, in 1958, has it been housed collectively under one roof.

This flexibility and physical relocation at intervals has contributed in a subtle way to the school's growth. Though the direction and goal have remained constant, the internal organization of its curriculum, its relation of teaching to research and its role within the university, has been, and is, constantly evolving. Equally harassing, at times, to students and staff alike, this has kept alive a sense of urgency and immediacy. The lack of emphasis on physical plant, on 'school building', has encouraged awareness of the importance of the activity and process itself-as extending beyond the given local context.

Housed now in a collection of post-war temporary buildings, with four geodesic domes as workshop areas, one still has the feeling that the whole school could be dismantled in a few hours, flown anywhere in the world, and be operative as an educational and research tool immediately. This communicated atmosphere stresses its approach to design education. The emergent designer is seen, not simply as manipulator of tools, materials and end-products of the present industrial process, but as an individual capable of purposive action in any given location and situation.

Following Moholy Nagy's dictum that 'Man not the product is the aim', there is no separation of the direction of design from that of general education. In terms of stated curriculum, the student takes a programme of lecture and laboratory/workshop sessions which range through the basic visual, materials and techniques courses to development, in various areas, of full scale prototyping work for

mass production. Though orthodox in layout, in practice the approach, and projects undertaken, are keyed to the overall character of the school's direction. They are paralleled with required courses in economics, geography, history and sociology, the biological sciences, psychology and/or anthropology and philosophy.

On paper, this looks like the usual well-intentioned, 'broadly liberal', scheme-likely to produce an equally well intentioned, but 'half-baked', jack of all trades. This danger is avoided by a rigorous methodology which emphasizes the common principles operative through the different disciplines, by the overlapping of 'areas', and by reiteration of the 'whole situation' in depth, in which the student is involved. He is encouraged, even forced, to regard the whole university, and surrounding community, as his work area.

Some typical assignments may illustrate how this cross-disciplinary approach is achieved, but it should be pointed out that these occur, not as isolated projects, but as part of comprehensive design studies. Equal space might be given to specific work in graphics, typography, to the workshop programme, and the projects in cinematography and recorded sound.

In early environment control studies, the student was given a basic survival problem which is a unique variant of the traditional 'beach hut' theme. Working to a very limited budget, he was required to design a 'survival kit' for a set number of days in open country-then dumped on a nearby peninsula for the given period to check how well he had planned! Results of initial tests like these are correlated, linked to data from relevant fields and projected into different climatic conditions in further studies. The local terrain is exploited like this in various ways. Another early exercise was given, in which a primitive culture was outlined, in a defined local area, as at a particular level of development based on agriculture, etc. The assignment design a religion to fit the given conditions. This used the student's course work in other departments, and required an analysis of the defined area's various natural cycles, and, the eventual production of suitable images, rituals and symbols to go with the outline of the religion. An associated problem was the design of a carrier for primitive food gathering, to transport a given weight of beans a considerable distance over difficult country. Again, like the survival problem, this was literally 'field tested'.

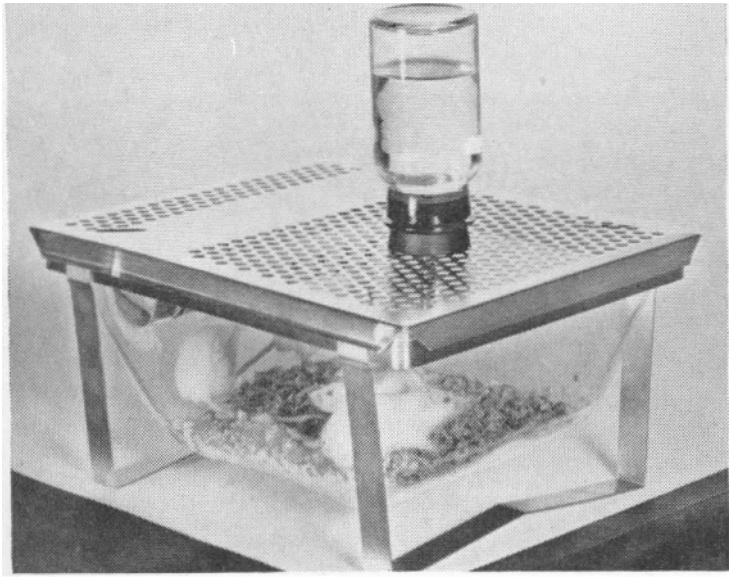
The simple 'learn by doing' flavour conveyed by these examples does not really obtain in context. At this level it expresses the rigour of later pragmatic assessment, and emphasis on forward planning, in evaluating the student's work. Attention is also switched deliberately in scale and area. A project in the history and design of clothing may be followed by an investigation of rural and urban sewage disposal systems.

In a recent senior class project, groups were directed to prepare a report on a local

township, which had been scheduled as a depressed area owing to relocation of industry and other factors. This entailed an historical review and socio-economic analysis of the township, field work on site interviewing local authorities, manufacturers and inhabitants. The final report required detailed 'design' recommendations on redeveloping the area, restoration of the community, etc. Such studies, and the subsequent reports made, whilst of immediate practical value to the student, are not allowed to lie fallow, but are further developed by the research side of the school where appropriate.

An interesting example of this was the 'disposable mouse house' programme, which demonstrates the relation of class work to research, and of both to the rest of the university and the outside world.

With the expansion of scientific research the laboratory housing of experimental animals is a major problem. Existing methods have developed haphazardly on the whole. Feeding, cleaning, security against cross-infection, sterilization of cages, etc., takes an undue amount from research budgets in material outlay and manpower. No comprehensive attempt seems to have been made to arrive at a scientific and economic solution in terms of available technical resource.



An S.I.U. disposable laboratory cage, final production model

In the S.I.U. study mice were the selected test animals, as constituting 75 per cent. of the laboratory animal population. Initially this 'mouse environment control' was undertaken as a student project, then carried forward by a collaborative team of the Design and Microbiology departments. After the basic requirements had been set, various units in different materials were experimented with. The optimum solution seemed to lie with a lightweight, but escape proof, cage embodying an automatic feeding device, and preferably disposable by incineration. 'Escape proofing' was a difficulty-mice were able to gnaw through most disposable materials with ease. The countering design strategy to this took the ingenious form of establishing standard data for 'gnaw angle' by X-raying and measuring mice jaws, and adjusting the curvature of the plastic cage form to circumvent this capacity. The first experimental prototypes of this study were exhibited to the May 1959 Annual Meeting of the Society of American Bacteriologists. Response was enthusiastic, and, after a year's crash programme, the final version of the cage was in full production and distribution commercially by the end of 1960.

Such aspects of the work of Design Research and Development-the Graduate Research branch of the Design Department-are described later. The aim of this section is self described as ' .•• to reorient the use of our industrial wealth for the purpose of solving or directing towards solution those parts of the world's problems that can be aided by Man's

physical reorganization of his mineral wealth through the use of his industrial know how'.

Research in many directions is carried out by faculty members, and graduate assistants, also engaged in the teaching programme. Buckminster Fuller was appointed Research Professor in 1959, in the area of 'Generalized Design Science Exploration'. Individual work is correlated by the research section which also functions as an information processing and access centre. One aspect of its central activity is in charting environmental trends, surveying areas of human need, and establishing priorites for research direction. An obvious emphasis is placed on food production and shelter-particularly for emergency conditions and under-developed areas. One approach to this is from the angle of the maximum distribution and present availability of industrial plant easily converted to solving such problems as are presented. Paper processing checks out with most potential, and research is directed towards using its capacities in various ways, e.g. paper-board housing, the conversion of pulping and milling plant to producing animal feed, and other agricultural uses.

As was implied in the given statement many obvious world problems require the redirected employment of available industrial potential for their solution. Therefore a central activity of the research section, under its director, is a continuing and meticulous analysis of trends in world industrial resources-this keeps in review where and how such resources are being employed, and where, by discoveries of new materials and processes their performance and capacity are being augmented. Adequate shelter and food production being seen as prior world needs, particular attention is paid to developments in these areas.

This survey activity relates broadly to the 'International Design Studies' as displayed in the organizational diagram. This study was initially concerned with collecting information on the needs of 'new' nations faced with problems of education, housing and feeding. It has now been extended to a three-phase project involving: (1) international student exchange; (2) coordinate aid, through major industrial concerns, in setting up new industries; (3) the establishment of centres of design education and research in these countries.

The first phase of the operation is now under way. A study has been completed for the second, in investigating Nigeria as location for a pilot wood pulp and paper plant-as co-operative investment with a local papermaking corporation with whose assistance the study was made. The design centre phase is partially contingent on student exchange, but such centres are envisaged as beginning with a team of present design graduates who would initiate similar experimental centres to the present one at S.I.U. These when fully operative would be 'run by their own developed design staff.

The ultimate goal of the international studies in this latter phase is seen as the

Dome of wood strut and canvas membrane construction, put up in 1957 by the design students

establishment of a number of such centres throughout the world, working in co-ordinate fashion to develop the industrial, economic and cultural potential of their countries.

More specific and local researches are also undertaken: a student research project into the needs of a local depressed area township-'to find means, through design, of restoring the community's economy and self-dignity'. From this pilot study a socio-economic survey of the area of Southern Illinois has been outlined for 'research and development'.

Not all 'problems' however admit of, or require, in their initial statement that an immediate material solution can be reached, and manufactured—as in the case of the 'animal house' above. In some the 'design function' may well be, simply to act as a catalyst towards solution, by drawing attention to a requirement, and bringing together the requisite agencies necessary for its comprehensive assessment. This was the case in the research into the evaluation and design of equipment for crippled children-conducted in co-operation with the Easter Seal Foundation. In earlier studies it had been tackled directly by students, who to gain full understanding of design requirements had simulated the various disabilities, e.g. taped back fingers during eating, etc. The later more overall ‘solution’ was found to lie in the calling together of all various agencies, concerned with such equipment, in a national conference. In effect, the reason for certain inadequacies in some of the equipment was due, not so much to individual design variation, but to lack of co-ordinate directive in conception of function. No real 'equipment evaluation criteria' had been comprehensively agreed upon between the various physicians, therapists, educators related to its use.

Research into the potential of paper processing is another example of the way in which the 'whole confrontation of situations is stressed, and relations not apparent before are thus discovered. In this case, food production in under developed areas was under review-in particular seed planting and control of growth in various special soil conditions, of erosion, etc. Papermaking as one of the most widely available processes was indicated here as possible industrial advantage. Initial examination showed how this

capacity could be used to produce 'packaged' seed in strips, with contained plant nutrients, etc., for early protected growth. Further studies have widened this to include the 'pulp and mill' complex as a whole in producing cattle feeds, and so increase protein yields required in such above areas.

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The organizational diagram shows how these various activities are related together. It was explained, in dealing with the school as a whole, the way in which research activity relates to general teaching. Faculty members have between 16-20 class hours of teaching per week, their individual research time, in addition, is allocated by them personally. Teams are variously composed of teachers, graduate assistants and senior class students.

Research may be initiated through class projects as explained above. Students are specifically instructed through such projects, and others, in techniques of 'problem' statement, and in the methodical procedures of information access and analysis in various ways. One example of such directed method is the allocation of 'Search, Document and Report' assignments. These are given 'at random', as weekend problems, in addition to ordinary work to encourage the flexible and rapid use of libraries, other university departments and information sources. Two students will be given the same assignment, independently, as a checking device. Typical S.D.R. assignments would be, for example:

1. What is the chemistry of one gallon of sea water taken at random off the New England
   coast, say Cape Cod, in the month of July
2. Describe a tornado, power, general behaviour, location and area patterns and other general information.
3. Describe the operational procedure and all general information on the Carbondale gas or water or sewage disposal system.

4. What corporation made the highest ratio of profit to dollar investment in 1959? Lowest? Highest and lowest through 1955 to 1958? Describe products and activities of each corporation.

The contractions used in the organizational diagram panel referring to 'individual faculty research' refer to different area, e.g. DAH-Disposable Animal Housing; AHD-Adaptable Housing Development, etc. GDSE stands for 'Generalized Design Science Exploration' which is how Buckminster Fuller's activity, as Research Professor, is described. It is interesting to note, that apart from the workshop domes themselves, there is much less superficial evidence of his presence here-in the way of geometrical models, geodesics, etc.-than is to be found in the usual design school. The influence is more apparent in the kind of thinking that is done, and even here, there is no uncritical acceptance of his ideas-rather they more often receive the kind of severe analysis that he, himself, is wont to apply to others. Though there is an obvious parity of purpose which accounts for his being there, direction of the school itself rests firmly with the chairman, Harold Cohen, and Fuller regards himself as 'on the team'.

There are two projects, however, in which he is particularly involved. The first, called 'The Brain' is described as a 'synergetic' resultant of Fuller's approach to integrated world communications as demonstrated by his Geoscope, *Francis Thompson's film on Atomic Energy, the present growth of mechanical information access and retrieval systems and the Design Department's own actual procedures. Briefly, like Fuller's Geoscope, this is envisaged as a giant information centre-housed this time inside a dome, not a sphere.

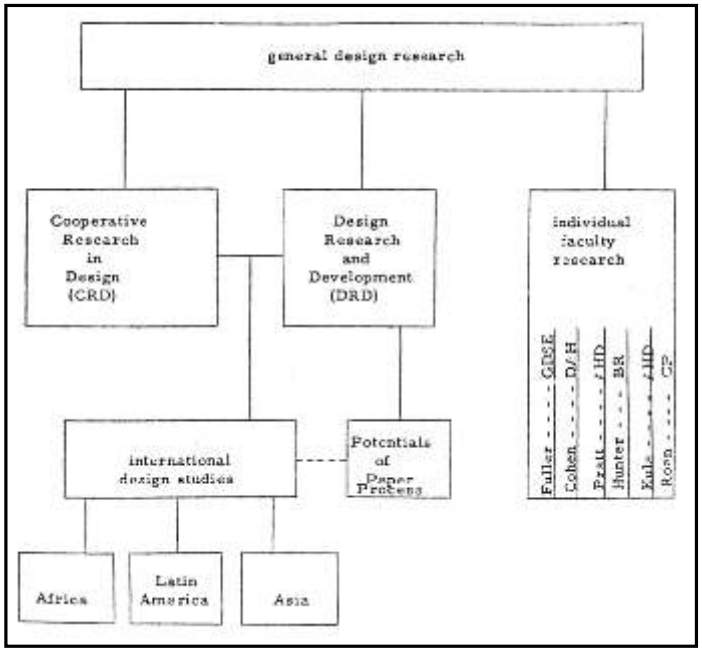
With the accelerated gain of 'information' in so many fields, the present growth of mechanical access and retrieval systems gets progressively more cumbersome. As Professor Bernal has said, 'Before too much effort is put into devising super-electronic machines for selecting scientific information, more thought should be given to making use of the best kind of device that we know, the human brain itself, which has had considerable evolutionary development for this purpose.'

The Carbondale 'Brain' operates on this latter assumption. As the functional parts of the human brain are multiple, this 'Brain' also would be multiple. Its centre would be a system of direct oral communication with every man information centre and 'expert assembly' in the world-with variable speed recording/replay for information relay and compression. Thus its major aspect is the use of human intellectual power at its highest level. Information transfer units would be equipped with complete aural and visual apparatus, with multi-screen projection, so that very complex information could be reviewed rapidly, and if necessary with degrees of simultaneity so that information could be multiply reinforced. For example, 'a body of opinion' on a

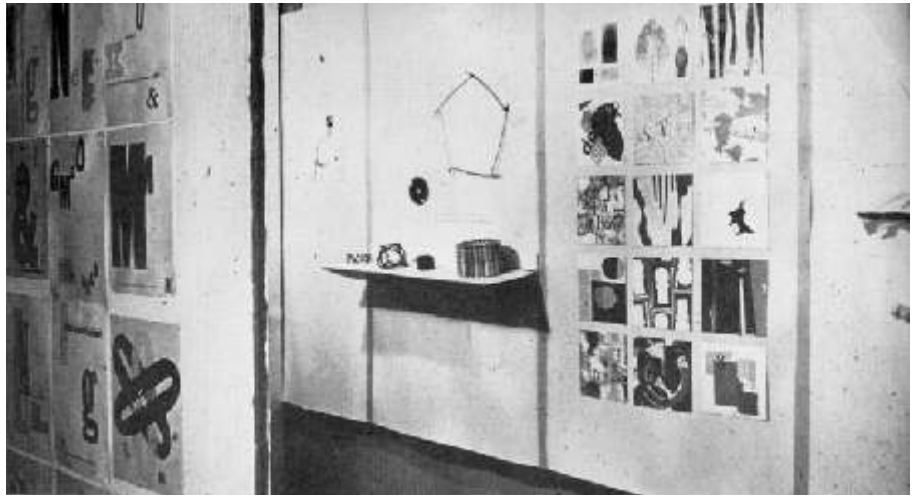
matter of medical urgency could be assembled in a short time and 'received' with all appropriate graphs, X-rays, etc. One could draw on a "World research team' and view findings directly, both micro- and macroscopically.

This 'Brain' project is seen as being a part function of the total research centre, and its use is also recognized as an educational machine for group reception of complex material in ways not at present possible.

The most recent project is in a similar area, and is described as, 'the comprehensive documentation of the significant individuals of our time'. Most men who make significant contributions to our cultural inventory leave behind them only fragmentary records of their thoughts-in books, on music paper, as artworks, more recently on record or tape, and occasionally now in short films. This project is designed to fully and authoritatively record, for future generations of students, the work and thoughts of such men, as expressed by themselves in their appropriate settings. The first 'subject' for the pilot study is Buckminster Fuller, and the preliminary stages of filming and recording one of his complete seminars has already been concluded. This will now be expanded to provide the visuals of references made to different phenomena, to include animation sequences of models, diagrams, etc. This film is being made by Francis Thompson in co-operation with the University Film Production Unit.



Within the space available, it has seemed appropriate in describing the researches of this school to select out, and place emphasis on, particular activities. They have been chosen as best communicating the atmosphere of ideas, and as giving some sense of the direction which is being taken in this most interesting experiment in education. Many aspects of its work have not been touched upon here, but it is hoped that as this school evolves, a future more complete and more balanced report may be forthcoming.



An exhibition of students' work in 1957. The photographs show examples of the foundation courses in basic design. This was the young department's first public showing