9th Inaugural Lecture

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Synthesis

in design and education

THE INAUGURAL LECTURE SERIES enables newly appointed Professors of the University of Nairobi to deliver their first public lecture in Kenya. Funds for the publication of the series have been made available through the University Deans' Committee and copies of the lectures are on sale at bookstores.

Nature reveals to us in its vast complexity simple truths of order and purpose. The interdependence of all things is a revelation in itself and from all this we can learn much in the struggle to bring harmony to our lives. In attempting to evaluate this ideal Professor Wood asks us to examine with him objectives and processes in Design and Education which hopefully lead to that state of harmony which we call SYNTHESIS.

Professor Wood is a native of Belfast in Northern Ireland, although he grew up in the almost rural context of the small provincial town. As a consequence, over the years, he has developed a consciousness concerning the environmental contrasts between small knit communities and those of very large towns and cities.

From a very early age Professor Wood has felt deeply about things which have had a bearing upon his life and his work ever since. He believes in the uniqueness of man as an individual whose ability and motivation in life know no boundaries. He also believes that this potential is a powerful force in society as a whole — which must have expression, and that given adequate liberation will lead to untold harmony.

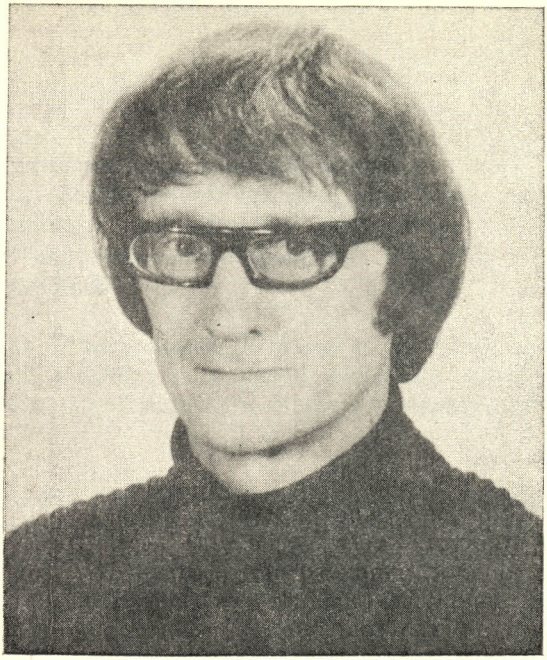
He sees the Arts, the Sciences, and other forms of life as avenues leading to such expression, and Architecture itself as the environmental crucible for such liberation.

Professor Wood's own interests and activities over the years reflect something of this philosophy. He has always had an interest in the Sciences as well as Arts and has studied both, though the former to a much lesser extent. During the early War years he studied Civil Engineering at Queens University Belfast, before entering his chosen career in Architecture. Commencing in the College of Art, Belfast, he completed his studies at the College of Art in Edinburgh, where he graduated in 1946 and received the Royal Institute of British Architects Silver Medal in 1947, the year when he took up a Post Graduate Scholarship in Planning.

Whilst a student, Professor Wood enjoyed both work and play. He boxed, ran and swum for his University and today one of his greatest forms of release is deep sea long distance swimming.

He became President of the SRC in his final year at Edinburgh and was soon to be among students once more when he took his first teaching post as lecturer at King's College, University of Durham, in 1950. The College later became known as the University of Newcastle Upon Tyne, from whose School of Architecture Professor Wood come to Nairobi, some two years ago.

During his career as a teacher Professor Wood vigorously involved himself in practice — indeed was thrust into a long period of responsibility by his own university, when he was architect to the rehabilitation of most of the main campus, including the onerous task of designing the new School of Architecture in the old quadrangle of the university. His work in practice has scaled from furniture design, buildings and redevelopment to participation in the design of one of the new towns in the North East of England.



Professor Wood's interests on the Science side are best seen in his activities as an amateur astronomer, which are linked with his fascination for man's endevours in space. A fellow member of the British Interplanetary Society since 1962 he was a Founder member of an Astronomical Society in the North East of England. He has designed several observatories including one which houses a $2\frac{1}{2}$ ton telescope. His great interest was ultimately rewarded when he became the designer of the University Geophysics Research Station — to which the Apollo Mission Moon Rocks were actually brought and tested.

Professor Wood is married, his Edinburgh born wife is a graduate in Design and his son — a musician and composer.

Two years in Kenya have helped Professor Wood to the conclusion that the climate has its extremes — but is superb for astronomy, the valleys and mountains are physically tough but rewardingly beautiful, the coral reefs are skirted by sharks but still invite total immersion, and most challenging of all — her students — the reason for coming in the first place!

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SYNTHESIS IN DESIGN AND EDUCATION

INTRODUCTION

Never before has the human being examined himself so closely — as a living phenomenon. Today, knowledge of human behaviour, and predictibility in relation to environmental change, place a more measurable responsibility upon those concerned with the physical world and man's place in it.

The revelation is one of total interdependence in all things, as now more clearly witnessed in nature. It is equally concerned with the fact that life is a continuous process and not simply a compound of parts and events.

Comparably — in the world of DESIGN, true purpose and quality are not achieved in simple additive terms, but through creative and intellectual processes, often tenuous and demanding, which hopefully bring together the elements in a designed solution, in effect — SYNTHESIS.

In recognising this a deeper study is implied of man and environment, and of response to challenge in wholly integrated terms.

This lecture attempts such a study, wherein one can examine some of the diverse areas of design — each aspiring to its own level of synthesis, whilst playing an integrated role in the total spectrum of design in society.

It should be helpful if I give an outline of the Form and Content of what is to follow. There will be four parts, the first two of which are the more extensive. They are:

PART 1. DESIGN AND CONTEXT
Nature and Man
PART 2. ARCHITECTURAL DESIGN
Design and Designing
PART 3. DESIGN AND EDUCATION
Individual development and potential
PART 4. SYNTHESIS IN OUR OWN CONTEXT
Pressures and priorities of today and tomorrow

A lecture of this kind is normally read, as it is published in full by the University.

However in this particular case the lecture will be heavily illustrated — for such a subject greatly concerns visual and other values, which will directly concern YOUR OWN perception and interpretation.

You will thus have opportunity for immediate response, and of greater importance perhaps, be enabled to retain more information of what you see and hear for your own critical evaluation later.

In delivering this lecture in relation to its being so illustrated I hope I do not stray too far from the printed word.

PART ONE

DESIGN AND CONTEXT

In nature, design and the processes of design are continually revealed to us. We never cease to wonder at the order of things and how life sustains an overall balance within the eternal laws of the Universe.

It gives us an unusual sense of awareness if we look back some 500 million years and contemplate this picture of a TRILOBITE, a hard shelled, multi egged creature which thrived in the warm primeval seas. Now extinct, it dominated life on earth for a span 75 times as long as man's whole existance. What was its purpose? A design situation certainly prevailed and there must indeed have been a balance of all the related elements for that situation to have survived for so long.

We now look at this sea bird, the Common Tern from the Farn islands. N.E. England, — a creature beautifully designed for its own purpose, a wonder of aerodynamics yet capable of plunging into rough seas to pick out its marine prey. We must surely be moved by the aesthetic qualities of its form and perhaps moreso of its movement in flight. Yet man had no hand in the creation of this articulate wonder of design.

This tree, seen against a Northern sky, provides another example of design in all its complexity yet in a state of naturally arranged balance. NOTE the form of its structure. See how it provides shade and shelter. Birds nest in its branches. It is like a kinetic sculpture offering change in response to day, night and season. We observe the dynamics of form, colour, pattern, texture, and even noise. The tree, affected by climate, itself creates a micro climate. Its growth and its decay affect the life surrounding it. Such is the extent of its purpose as prescribed by nature.

From these examples we can learn much which assists us in understanding design, the comprehensive nature of problems, and solutions to them. In an examination of nature we come to appreciate underlying purpose. The design is already there in all its wonderous complexity. For man the process is in reverse. Firstly the purpose — then the design leading to the solution.

There is one other aspect of learning from nature which I should like to comment upon — before looking at man in relation to design.

Nature's response to its own purpose is essentially an adaptive one. At any fixed time when we witness a total synthesis in natural design terms, what we see is part of an evolutionary, or perhaps devolutionary process. This in respect of man designed environment implies the need for built in adaptability to change — especially where the design situation has a predictably long life.

As we will see later, whilst synthesis in design is very much concerned with a totally integrated balance, it nevertheless demands flexibility in the design process and frequently leading to flexibility in the nature of its solution.

As a prelude to discussing man as a designer I should like you to look upon these two beautiful landscapes. One Kenyan which you may recognise, and the other Yugoslavian. I make no further comment here but will offer relevance a little later on.

These two diagrams should prove helpful.

The one on the left schematically shows the main areas of Design and associated Designers. NOTE that the artist, poet, writer and musical composer are shown as examples of designers. NOTE also that the diagram is arranged in a general order of scale as concerns the applied arts, science and technology and associated disciplines — that is, from micro to macro scale.

design	designers
MUSIC	COMPOSER ARRANGER
	POET AUTHOR JOURNALIST PLAYWRIGHT
FINE ART	PAINTER SCULPTOR
APPLIED ART/DESIGN	GRAPHIC DISPLAY TEXTILE FASHION PRODUCT STAGE INTERIOR ARCHITECT LANDSCAPE ARCHITECT ENVIRONMENTAL PHYSICIST ENGINEER. CIVIL STRUCTURAL ELECTRICAL: MECHANICAL PLANNER. URBAN REGIONAL
SCIENCE & TECHNOLOGY RELATIVE TO ALL AREAS	EXAMPLES REPRESENTATIVE AND NOT EXHAUSTIVE

The diagram on the right concerns Perception and Response. It is important to appreciate some of the concepts — for not only do they concern the designer but of equal importance they concern all who respond to design situations.

perception		response	
SENSES		FIELDS	
EYES	VISUAL	VISUAL FORM COLOUR & PATTERN	
EARS	AUDITORY	NOISE	
SKIN	TACTILE	TEXTURE	CONNECTIVE
BODY	KINESTHETIC	MOVEMENT	FIELDS OF
HAND	HAPTIC	PHYSICAL FORM	TIME & SCALE
NOSE	SMELL	ATMOSPHERIC	
MOUTH	TASTE	CHEMICAL	
		FURTHER FIELDS	
		THERMAL	
		HUMIDITY	
		ELECTRICAL	
SENSES NORMALLY INTERACTIVE		FIELDS NORMALLY INTER-RELATED	

PERCEPTIVE EXPERIENCE IS A FORM OF SYNTHESIS

Let us now fairly quickly look at the work of a range of Designers. What is each trying to do? What is his motivation or aim? What design criteria are involved and to what extent is synthesis achieved?

In music the creative and organisational capability of the composer reveals an area of design which touches virtually all our senses. His world, like that of the artist may be quite personal and we may just happen to be privileged to hear what he is himself exploring. Equally so his work may offer a profound message whether entirely personal or as created through his own response to a particular demand.

The composer, a title indicative of his role as a maker of composition, primarily seeks through his own design process an answer to a particular challenge. His work will have personally directed from and content and share with the artist, writer, and all other designers, a range of recognisable dimensions. We can think of these as major and minor structure, rhythm, pattern, tone, texture, colour, etc. The synthesis of such dimensions in a composition created by the designer often transcends the essentially predicted objectives. Such is the reward of design at this level and one's response to it.

Now I want to direct your thoughts to the visual arts beginning with the artist and the graphic designer, who share an essentially two dimensional world. Herein composition, whatever its purpose, is appreciated primarily in one plane. It concerns spatial arrangement which may derive from a highly rationalised design process, but may have a lesser or greater degree of subjective input. Design at its best essentially involves within the act of creativity — insight and imagination. The total synthesis is guided with sensitivity, through emotional and intellectual involment and often also by physical contact with the actual process. This sensorial ingredient is often referred to by the Finnish architect Alvar Aalto, who believes that it plays, or should play, a vital part in the synthesising process. Certainly it has inescapable meaning for the artist and the sculptor.

Look now at two paintings by one artist. The first is descriptive and recognisably direct in approach. It conveys a scenic message sensitively interpreted by Victor Pasmore its creator, as compared to his other work which abstractly explores form for its own sake.

Do you remember the two landscape illustrations? Your own response will have been immediate for the experience was both short term and second hand. Nevertheless you will each have your own impression of what you saw and experienced. The artist tries to convey such impressions often with a rare ability to crystallise the essential aspects of his own experience.

Paul Klee's painting is of somewhat abstracted nature, entitled "Autumn Place" — but in derivative terms offers a beautiful composi-

tion. By comparison the painting of Moholy-Nagy is totally abstract — as an exploration essentially concerned with area, line and tone.

The next two illustrations are by one artist — the subject being the same in each case. On the left we have a derivative but recognisable street scene, and alongside an impression of the emotional effect of the same street in terms of enclosure and focus.

Finally we see Kandinsky's painting which is a kaleidoscope of form, in colour and pattern, compared to the dramatically bold geometric composition of Auguste Herbin.

In graphic design, we observe very similar dimensions — precisely employed to convey specific messages. The graphic designer is above all a communicator whose success normally depends upon absolute readability in the final synthesis of his work. Three of the examples chosen are Danish, each with its own objective character. One example relates to the legendry Bauhaus wherein design in almost all forms was taught. NO school in history has contributed more to design and the concept of synthesis through the interaction of art, science, technology and craftsmanship, than the Bauhaus. The artists Klee, Moholy-Nagy and Kandinski whose work you have just seen, all taught in the Bauhaus. Graphic design has application in many fields, none the least of which is architecture, wherein the three dimensional context assumes importance in relation to angle of view, scale and movement. We shall see examples of this a little later on.

Moving away from the basically two dimensional field we now have examples of what can be termed relief work. Here, due to surface modulation readability depends upon the angle of light and perhaps also its movement. The Egyptian and Greek examples convey figurative messages, whilst the works of Victor Pasmore and Ben Nicholson are, by contrast, mathematical, geometrical and abstract.

Now we move to fully three dimensional from and the world of the sculptor. Synthesis in his terms is achieved not only through the creative processes but via physical effort as he works with his material. There are exceptions of course where the sculptor may commission his work to be constructed for him. This has a parallel with the work of the architect who very rarely participates in the construction of his own designs.

The sculptor will have a fundamental purpose or objective as a challenge in his creative work, but often he has the task, and joy, of exploring his material — through which he may feel out his solution, and if need be discover his purpose. Equally so he may premeditate the design, usually in model form, and thereafter set about the task of recreation at full scale.

Michelangelo's "David" took two and a half years to carve. His experience in emotional and physical terms can have been NO less in

scale than the impact of this masterpiece of synthesis upon the millions who have seen and experienced the finished work. Henry Moore's sculpture is different — it is dynamic in its interpretive power, matched by the drama of its form and surface treatment. He is probably the greatest living sculptor of our time. We can look briefly at other kinds of sculpture, metal shapes in true synthesis of Stephen Gilbert, and on the right the environmental scale of Tim Scott's geometrical forms.

The final examples bring us to a further dimension, for both are Kinetic sculptures — involving movement and the interplay of light. Francis Morellet and Nicholas Schoffer have both taken their work to the scale of creating live auditoria performances involving the dimensions of light and sound.

Now we take a step into the field of applied art in the form of product design. Here especially the totality of design serving specific purposes, has very close links with architecture and in a sense can be said to be an integral part of it — thus playing a role in the more comprehensive sense of synthesis in design. I have spent some time already describing the purpose and nature of design in the areas so far covered. Now I feel it would be sufficient to outline a range of criteria concerning the examples about to be seen. Much to do with purpose and method applies equally to the work of the product designer. However he usually designs for a market often implying mass production and thus his ideas and the designs undergo a severe testing at many levels. This concerns economics, production constraints, and public response as the final arbitrator.

The examples here shown include plastic cups and saucers, glazed pottery ware, cutlery designed by students of the Manchester College of Art, a door handle, textiles, fashion design, Kenyan baskets and a chair incorporating basket work. All these elements of design are essentially simple involving only one or two materials. Their forms are well conceived and developed in respect of material and finish.

The latter examples involve more sophistication, and e.g. incorporate electrical services.

I show a view of the Design Centre, London, wherein examples of good design, at a wide range of levels, are constantly on display. It is an information centre similar to that existing in many capital cities. Not only does its existance help promote interest in design but by doing so it helps bring the designer and his public closer together. In effect it plays an educative part in the broader aspects of design synthesis.

The next two sets of examples form a bridge to the second part of the lecture which concerns Architectural Design.

Furniture and fittings are normally based upon measurable criteria related to human form, movement and work. Here we see such design

criteria as determinants for the three dimensional arrangement of the Kitchen as a work place. In similar terms we see the actual fitting out of a bed-sitting room.

Architects normally design the interiors of their own building projects — for generally one conceives the interior level of design as an integral part of the whole. However, some designers prefer to work at this scale and many specialise in the interior aspect of design, just as others may devote their professional lives to the exterior. In all cases their particular disciplines become part of the total design.

The application of graphic design in architecture is illustrated by these exterior and interior examples. This Nairobi building displays its graphic messages with quite well ordered conviction in the city centre. The lettering and symbols not only relate to the individual building but make their own contribution to the overall urban synthesis at this level of design.

The interior view of West London Air Terminal offers evidence of our growing dependence upon visual communication in the overall design of our environment.

It is clear that we face an ever increasing struggle to achieve synthesis — more and more has to be fed in.

PART TWO

ARCHITECTURAL DESIGN

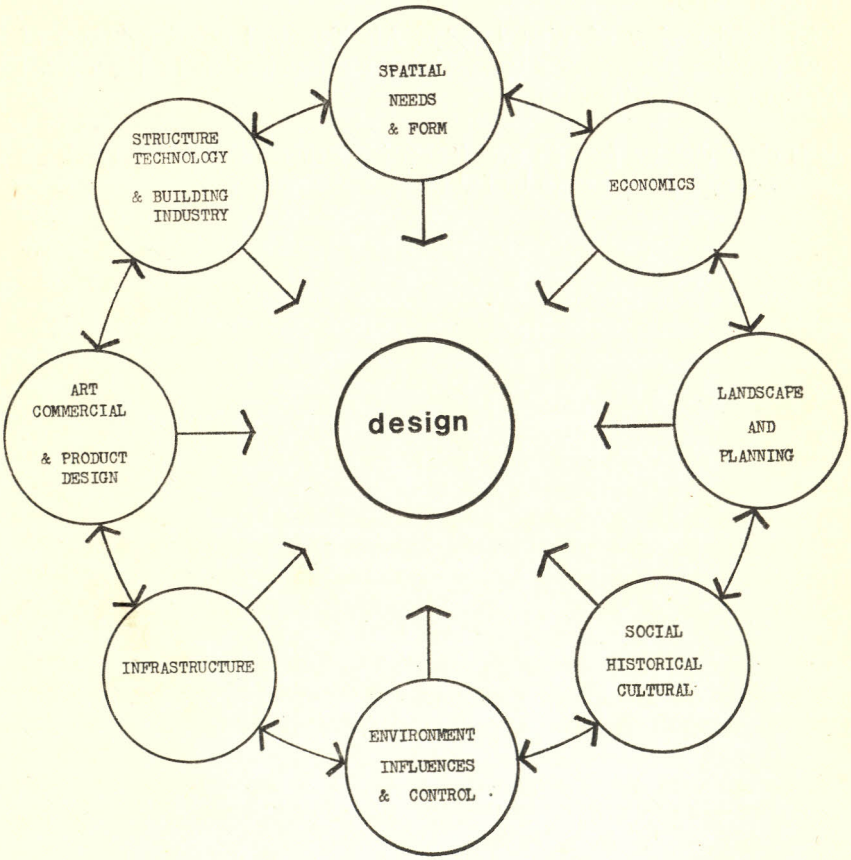
We now move up in scale to think about architecture as concerns more total environmental contexts.

The diagram shows the main factors which relate to design in architecture, and indeed on upwards to design as concerns whole towns, cities and regions.

The interactive factors on either side of the basic world of architecture — from MICRO to MACRO, are by nature diffuse.

There are no rigid boundaries.

Before looking at examples I should like to focus your thoughts, though only briefly, upon the processes of designing.



A great deal has been written and spoken about DESIGN-approach and methodology. There are some who seek ideal solutions and ideal methods of achieving them. What ARCHITECTURE is concerned about is just TOO COMPLEX for one to even contemplate such simplification. Architecture is not only about life — it IS life, and as such it is INFINITELY complex and diffuse.

I have known design tutors who seek an ideal solution from a class of students. How disastrous! If I have fifty students I would expect, and demand, fifty solutions.

It is argued by some that Architecture is a Science. The fact remains that Architecture is inseparable from Science, as it is for example from Technology. The relevance however of Science in Architecture, like so many other factors, is that it is but a tool to the whole process. All the more reason for us to realise that the demands are becoming increasingly greater in attempting to achieve SYNTHESIS. The most desirable and meaningful processes are closer to ART than anything else I can describe.

In attempting to rationalise approach and method, some designers feel that highly predictable steps should be taken in arriving at solutions. This way, it is claimed, room for error is minimised. However, if we observe carefully, we can learn from ourselves and others and compare results. One of the rewards of teaching is that we learn so much from our students. I remember one very bright young person who believed that as the rationale developed the aesthetic ordering and articulation should be gradually infused. That was HIS way of handling design and he produced some very sensitive results. Another student attempted everything by Systems, and always arrived at frighteningly complex solutions, and none of which cared very much for human response. Yet another student, who was the nearest to a total designer I have had the joy to teach, believed in what HE called the process of "FESTERING". He had an instinct for involvement in playing with the elements which would lead up to his design. He would literally TO and FRO with his emergent scheme, changing and articulating right up to the last minute. He never had preconceived ideas and even once hotly declared that to have a conception in architectural terms is sheer arrogance! His sensitivity was also backed by the ability to produce well controlled and technically excellent designs — much to the distress of some of his classmates — especially those who felt they were working within infallible systems.

In summary let me say that what is central to good design is the ever constant need to respond to the total design context and to be sensitive to human response at all levels.

Now let us return to the Screen.

Every day, week, month and year the universal pilgrimage continues to the Parthenon on the Greek Acropolis at Athens. Why? Partly because it suits the tourist promoters, but essentially because here is one example of total design, in historical terms, which embodies simplicity and quality of form and detail. Built of Pentelic marble with infinite precision and skill it is a form of synthesis which proclaims its unity for all who see and experience it. History has endowed it as one of our finest examples of the ART of ARCHITECTURE.

Its architectural values arose out of its own time and we can learn from it — just as we are today, more than ever, realising the need to search for the eesence of all that is meaningful and good in our own traditional heritage of architecture.

Briefly this can be seen by example.

At Bamburgh Castle, on the North East coast of England — A fortification built in defence against man and climate, it offers superb synthesis in form and material.

At Blanchland, an inland village — also in the North of England — the thick stone walls, stone roof tiles and small windows give unity to this place of human settlement.

Witness this also in the community layout and form of construction as revealed by these pictures of a Masai settlement and one of its houses. The lifestyle of these people in equatorial Kenya still carries on — and how much we can thus learn from such an example of synthesis in architecture.

Equally the same applies to the street houses of the Swahili coastal town of Lamu, also in this country. They express a form of solution in response to a definitive way of life.

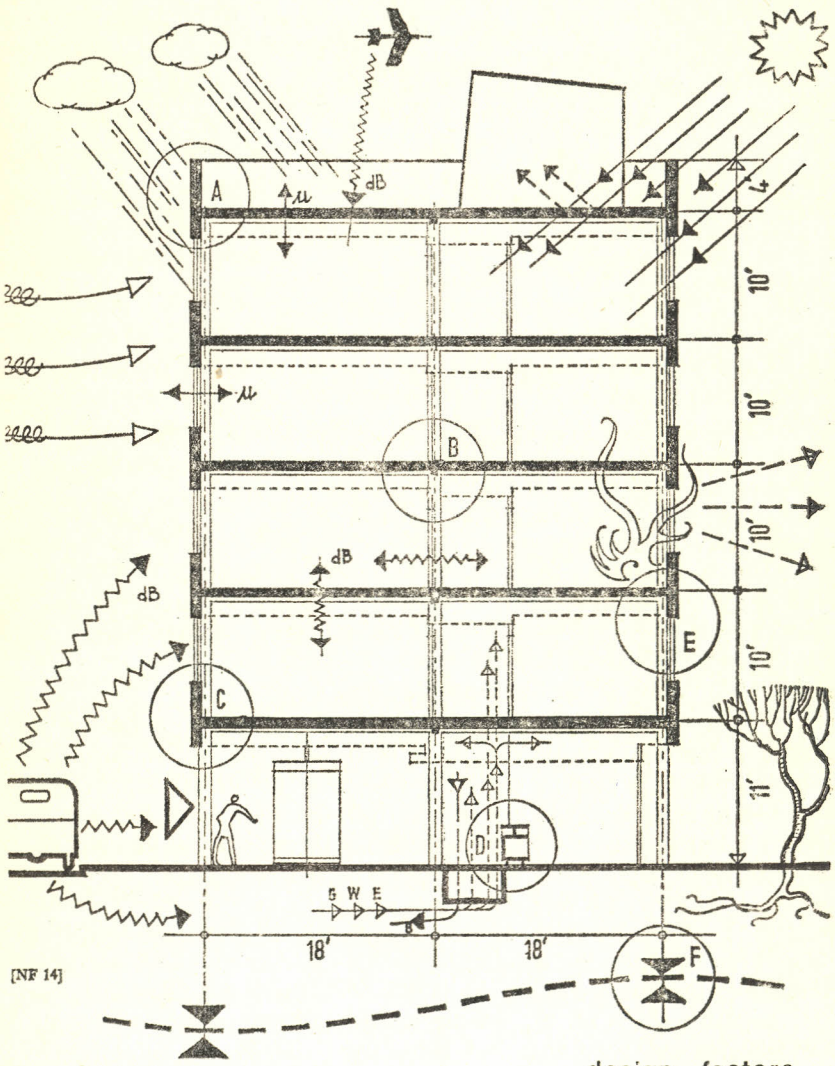
On a larger scale we see the unity which prevails in a Tunisian townscape, let alone the amazingly undisturbed unity of the city of Florence — as can be seen today.

Now we come to specific examples — wherein we can appreciate how different designers have brought together the numerous dimensions of architecture in an effort to achieve totality in design terms.

One of the great designers of our time is Sir Ove Arup, primarily a structural engineer, he has excelled in many fields of design. This footbridge in the English cathedral city of Durham is a tribute to his imagination and articulate sense of design. In contextural terms it has been most senstively handled and relates beautifully to the Student Union building which we will be looking at in a few minutes.

Arup was the consultant engineer for this concrete sports pavilion in Gala, Scotland, the architect being Peter Wormersley. NOTE the

geometrical thesis of triangular form — which through the medium of one material offers both structural and visual synthesis.



design factors

Before looking at some buildings it may prove helpful just to glance at this diagram — which shows some of the factors which need to be taken into account when designing such an enclosure as a building. The saloon car is shown as an analogy — for here we have in sophisticated micro terms, the equivalent to a building. NOTE the overall form — related to structure and aero-dynamics, and in this case achieved industrially on a production basis. The light toned roof reflects solar heat, whilst in front of the driver and his passenger the dark tone avoids reflected light and glare. The windows are designed for effective viewing and may have tinted glass to deal with further solar problems. There is provision for natural and artificial ventilation, heating, cooling and demisting. The internal fitting out is designed to human dimensions and specific needs — and so on and so forth. The totality is the car and likewise has its meaning in the more complex architectural problem of building enclosure.

This twenty-six storey office block in Dusseldorf, Germany, was photographed whilst under construction. The view is like that of a cross-section drawing and shows us a number of the integrated elements which make up the total design. Bear in mind the related number of specialists and professional and technical roles which go into the total design and building operation. For example note the super-structure and its wind bracing cross members. Note the hung envelope as a skin to the whole building — so evident in the beautiful exterior view of the finished project. The floor construction is evident as is the battery of vertical services. Finally see how the whole edifice is so beautifully landscaped, bringing a fuller sense of synthesis to the wider context. Not every building succeeds in answering every aspect of the design problem. Here we see what I know to be beautiful looking windows, but in functional terms they are a failure in this indoor sports building at Hull University — as the second picture so clearly shows.

By comparison the Veledrome pavilion in Rome, built as part of the provision for the Olympic Games in 1960, has answered its particular daylight problem and in so doing has brought an aesthetic to the building as a whole. Another maestro of structural engineering is the Italian Luigi Nervi — whose contribution to the Games in 1960 was universally acclaimed. His major Sports Palace is a beautifully unified piece of design, and was developed alongside the artificially created landscape — giving a total context of hard and soft materials, sensitively related forms, tones and colours — all out of what could be said to be nothing — stemming from a virgin site. This university Sports Pavilion in Newcastle, England was on the other hand designed to respond to an existing and very beautiful landscape. The overall form is firm enough to read in its setting whilst meeting its own functional demands. The minor forms anticipated their own reflection in the water, and the use of cedarwood provides a surface scale and material which is sympathetic to its setting — in all, an attempt to achieve synthesis.

Now let us turn to another building type and see how different architects again respond to problems in their own way.

The Student Union building, at Durham, and approached from the Cathedral side of the river via Arup's footbridge — is a very fine example of synthesis. The designers — the Architects Co-Partnership, planned a complex multi-level building on the river bank, providing sensitively inter-related internal spaces, and external forms — all unified by the use of one material — concrete. Even the glass to the windows overlooking the river terraces, is set directly into the concrete, though carefully detailed for replacement — if and when necessary.

By comparison the Students' Union building at Dipoli, in Finland, is much more vast in scale and spread out in form. The architects Pietila and Paatelainen, have married the complex sequence of plan forms to the landscape in masterly terms. The three dimensional spatial relationships internally and externally are brought into a finer sense of synthesis by the thoughtful use of materials. These include copper, wood, exposed concrete and natural stone. In choosing this particular example I am aware of the many other distinguished works by the architects of Finland, including above all Alvar Aalto — which reveal the special Finnish ability to synthesise solutions to complex architectural problems.

In this country, Kenya, we have beautiful and challenging landscapes to which some of its architects have responded with vigour, and sensitivity. As an example of imaginative synthesis, following the views of the Student Union building at Dipoli, I would like to show you two views of Voi Safari Lodge, in Tsavo East. The architects, Dalgliesh Marshall have created a particular environment in one of nature's dramatic settings with great skill. The spatial arrangement of the wings of the whole complex, and the articulation of form in cross section over the natural fall of the site is simply beautiful. Enhanced by the superb timber structures of Peter Campbell, and utilising a limited range of natural materials, including timber and stone, the whole becomes infinitely more than the sum of its parts, The art of architecture can be felt and experienced at Voi.

Finally in this part I should like to move up in scale, from the building to complexes of buildings. In fact the scheme at Dipoli is of that order.

What I wish to emphasise at this stage, though it has its meaning in respect of all building, is the relationship of the user. In the larger context this infers the Community at one level or another. Here it becomes vital, in seeking a synthesis, to share the exploration and the responsibility with the community. Often this is not done, to the dismay and sometimes the distress of those who thereafter have to live their lives in the completed scheme.

In his specially edited publication "INSCAPE", Sir Hugh Casson refers to the words of N.J. Habraken.

I happily requote.

"Why is environment so often — and so conveniently for architects and designers — considered to be the private province of the specialist? An interior (or a building in a city) that carries too heavily and forever the professional signature of its designer, and permits no contribution from its users, may be a fine monument, but it is nevertheless a tomb".

Perhaps it is sufficient to have made this point and say no more — but in Architectural Education we find the point needs not only emphasis but reality. Thus where possible community participation based projects are given to the students. As an example I show something of such a project recently explored by 4th year students in our own Department of Architecture in this University. The project was based upon community needs in the Kawangware district. A research report which followed the exercise reveals that much can be learnt by all who participate in such a venture.

Such community participation presents a part urban problem of vast complexity and proportion, when, for example, we look at the human scale of activity in the Accra city market in Ghana, West Africa. I have never before seen a market on this scale and the immediate impression was, here is synthesis in its own terms. Now as Architects and Planners what do we do with it?

Nairobi, capital of Kenya, at over 5000 feet and blessed with a superb climate, is subject to pressure and change. Such is the price of urbanism, especially in a developing country situation. Can existing qualities of architecture and open space, comprehensible scale and character, survive and for how long?

We have a special responsibility in seeking synthesis at this scale, for what we plan and create must have built in flexibility for such long term commitment.

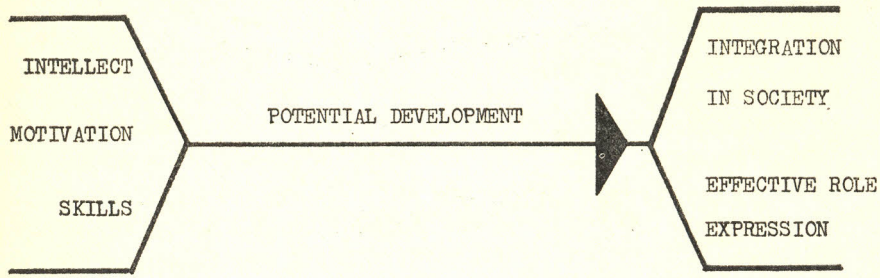
Before proceeding to the short remaining parts of the lecture, let us have sight of New York. My own response to it during a short sojourn was one of warmth, but listen to the words of the distinguished journalist and writer James Cameron.

"No avenues swerve an inch, there are virtually no squares or piazzas; the thoroughfares run to the horizon and the asphalt alleys lead always to that far-away U-shaped sky" and,

"New York is consummately artificial. It is the apotheosis of urbanity, from which Nature has been excluded as nowhere else of human habitation. Even the people, one must conclude, are man-made.

PART THREE

DESIGN AND EDUCATION



individual potential

The diagram is simplification of fact.

If, as we have seen, synthesis is desirable in any one situation it is certainly vital to society as a whole. What one seeks in this view of life is a state of affairs where the living processes can have freedom within an overall flexible framework.

It is necessary to evaluate the potential of the individual as will concern his role in the total matrix of society.

Firstly, let us look at one very important aspect which concerns the early stages of personal development and which remains important throughout the succeeding years.

The world of the designer is very much a visual one. The development of visual perception in young people and of associated skills in exploring the visual world, is an inescapable responsibility of general education. Art, in various forms could be said to be an essential part of education for all — inasmuch as everyone is concerned with design throughout his life and his response to designed situations will have more meaning if his awareness and critical faculties have been encouraged to develop.

In these two pictures we see children at play. In Ibiza the young ones have discovered an environment of their own making. In this Kenyan school provision is made for child play with built-in constructive relationships. These are the nursery steps of self-made and designed-for situations, wherein the child can begin to develop his visual awareness and perceptive skills at many levels.

Walter Gropius, on the occasion of the opening of the "50 years Bauhaus" Exhibition in London, said:

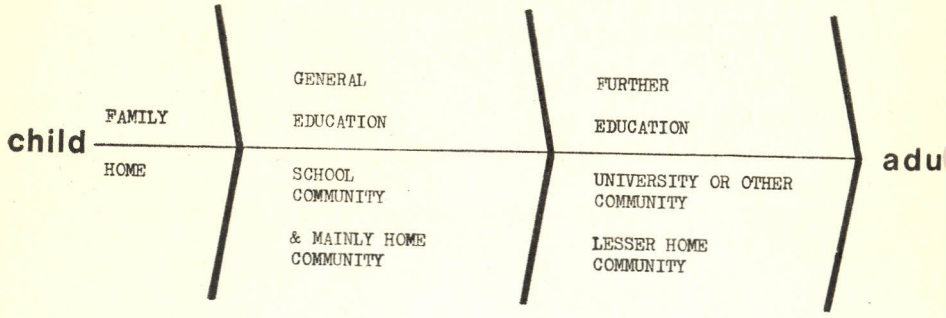
"In this country it was Herbert Read who early in his book 'Education through Art' recognised the education potentialities of the Bauhaus. He agreed with me that art is a basic requirement of life, that accordingly occupation with art in all stages of education should not be treated as a dispensable luxury or as a status symbol at the margin of teaching programmes, but that it rather should be put right into the centre of any educational blueprint from the nursery on up. Only a plan in which science and art are balanced can develop a cultural group-consciousness as preconditioning for a flowering of the arts as a powerful equal to science and the economics of affluence."

In East Africa too few schools give classes in visually based subjects, or if so the provision is very limited. Inherent abilities in perception are not given adequate opportunity for exploration and development, and associated skills in drawing, painting and modelling are not sufficiently exercised. Trained teachers are needed and hopefully more graduates of schools of Art and Design will find their way back into general education.

We have seen that Architecture has many facets and that the processes of design are concerned with a vast range of inter-active factors. In human terms the roles to be played within the whole spectrum of Design and its realisation as concerns man environment — have become increasingly diverse.

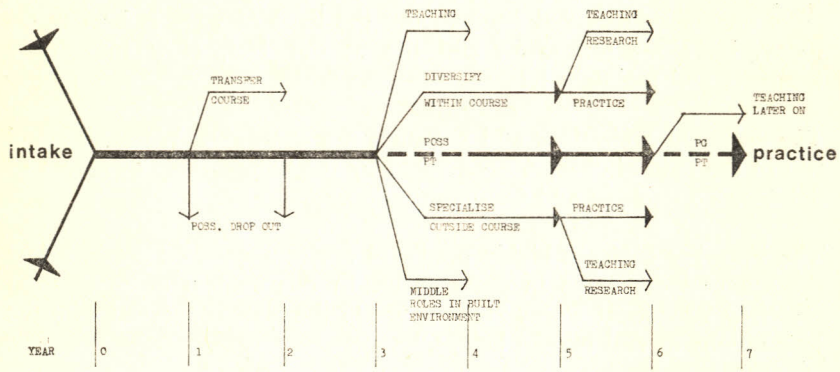
Bearing this in mind the responsibility of education becomes moreso clear, as it affects not only the development of the individual but his eventual effective role in Society.

It is evident that courses in Design, and especially so in Architecture, should be as fully integrated and flexible as possible.



overall education

The diagrams show the range of development, basic to overall education on the left, and to further education on the right.This linear diagram is spaced over a number of years as would concern all those entering courses in Architecture — or, in broader terms, courses as related to the full environment field.



further education architecture and associated fields

The critical factor to observe is that the intake, which concerns all those entering at any one time, initially follows a single line, but as the individual develops the line branches out in different directions, for different reasons, to do with eventual fulfilment and effective roles for all those who have passed through the educational sieve.

Only by the careful structuring of staged progress can the diverse development of the individual be made possible. This infers flexibility and interaction in respect of the content of courses and degrees. It is known to be a difficult, and slow task to achieve suitable structures within AND between educational institutions. Much depends upon human and material resources.

Often national economic pressures can lead to narrowing of objectives of educational horizons. The challenge is nevertheless still there, and any educational process which can maximise potential — in all senses, will surely lead to a better synthesis in life.

PART FOUR

SYNTHESIS IN OUR OWN CONTEXT

At last we have come to Part Four — to focus our thoughts and ask the question — what about priorities for today and tomorrow?

We have already looked at the Design Context of Nature and Man, at a range of examples of Architectural Design and thoughts on what we might mean by the "Design Process". We have made brief observations on the Educational context, but the issue of what is best to do today, let alone tomorrow, still lies at our feet. How to achieve synthesis and maintain it?

The universal aspirations and pressures are enormous. We can't stand still in the face of change, accelerated by the unbelievable advances of Science, Technology and Communication.

The Futurists envisage highly predicted environments, on earth, below the sea and of course in outer space. In this context of speculation Geoffrey Broadbent warns "One is not in the least concerned with the interactions of real human beings."

For example look at Archigram's "Plug in City" or its "Moving City" — a terrifying prospect?

Observe the growth potential of this polygonal concept of human habitation,—

not much different from Safdie's Habitat of EXPO. 67. though of a different geometry — but very different from the environment of this projected oil field.

As man is transported slowly in the manner he was accustomed to thousands of years ago, at the same time extra-terrestial man encircles the moon of his own planet.

What we can do is seek an economic balance between answering essential human needs and facing the challenge of the future. It is wise to sense out the climate of response to pressures and needs. NOTE the shift in concern towards conservation of resources and of our architectural and cultural heritage. The problem of human settlement, especially in the context of this shift in emphasis is very real in the Developing Country situation. I predict a synthesis in some of the goals to be reached which may indeed prove to be an object lesson for the world at large.

It is as if man, in spite of earthly conflict, seeks to share and create a balance — so that the essentials of life for survival, human dignity and expression can be part of a total harmony.

Design, and its realisation, is dependent upon the balance of educational growth if society is to aspire to its true potential — such would be the reward of SYNTHESIS IN DESIGN AND EDUCATION.

AUTHOR'S NOTE: Paragraph spacing, word emphasis and punctuation have been arranged in relation to oral prensentation which is illustrated.

REFERENCES.

Aalto, Alvar. "Alvar Aalto Synopsis"
Selection from the Writings of Alvar Aalto.
Birkhäuser Verlag Basel, 1970.

Moore, Henry. "Henry Moore", Catalogue of Exhibition at the Tate Gallery. Selections by David Sylvester. The Arts Council of Great Britain, 1968.

"50 years Bauhaus" Catalogue of Exhibition at the Royal Academy. Sponsored by Federal Republic of Germany.
Royal Academy of Arts, London, 1968.

Kawangware-Report "Education and the Community. Multi-Service Centre at Kawangware", project leader Bruce Creager.
Department of Architecture, University of Nairobi, 1975.

Cameron, James. "Does anyone love New York?"
Daily Telegraph Magazine, June 14, 1968.

Broadbent, Geoffrey. "Architecture in the Future?"
Paper, RIBA Board of Education, Cambridge Conference, 1970.

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TEXTILES-FABRICS
MASAI SETTLEMENT AND HOUSES
LAMU STREET HOUSES
STUDENT UNION, DIPOLI
VOI SAFARI LODGE
KAWANGWARE
CHILD PLAY, KENYA
PROFESSOR SAGAAF
KAJ ANDERSEN
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