Time for a revolution in art and design education

Bruce Archer

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Foreword

The two pieces reproduced here were originally the material for the second and the fourth in a set of ten seminars given by Professor Bruce Archer at the Royal College of Art during the academic year 1976-7, under the title *A Philosophy for Design*.

In this series he presented compendiously the outcome of his many years spent in studying design, design methodology and what he usefully calls 'the material culture'. Perhaps for the first time — at all events with such clarity — this aggregation of human activities was laid out, looked at, classified, given conceptual coherence, and finally put forward as a new and major field for education and research.

Of the total structure of *A Philosophy for Design* the ensuing two papers form a conveniently detachable segment, and Professor Archer did in fact deliver them as such at a seminar specially organised by the Department of General Studies in July 1976. From the point of view of art and design education they embody the most urgent content of the series, their two leading themes being:

(i) That there exists an under-recognised but definable third area of human knowing, additonal to numeracy and literacy, which we might colloquially call 'wroughting and wrighting'.

(ii) That this third area should be given proper esteem and proper resource provision in our general system of secondary education; and also that it should be the subject of systematic study at higher-educational level.

Professor Archer's own Department of Design Research has already done much pioneer work on the higher-educational wing of this dual campaign; and has significantly advanced the general-educational side by carrying through, in response to grass-roots initiatives on the part of the teachers concerned, the research programme called Design in General Education.

This began as a two-year research project commissioned in 1973 by the Secretary of State for Education; and consisted of a diagnostic look at what is happening in our secondary schools in the way of design and craft and allied making activities, and how these relate to other aspects of the curriculum; together with recommendations for their future. The Department of Design Research has continued this contribution, in association with the Department of General Studies, by sponsoring thesis studies in the area on the part of in-service members of the design teaching profession, (normally lecturers in Colleges of Education as being the persons best placed to give wide dissemination to new ideas).

The Design in General Education programme is undoubtedly the Royal College's most substantial contribution so far to educational theory, and as such will be the subject of a separate paper in the present series. What we have in the text below is the philosophical understructure for it, as well as for many of the variegated and strenuous activities of Professor Archer and his departmental fellow-workers.

Editor

The world of education is full of anomalies. No definition or categorisation or form of organisation devised for one purpose seems to remain valid when applied to another purpose. Few educational definitions are watertight even when examined in their own terms. Take that extraordinarily durable expression, 'The Three R's', for example. It is very widely held that when all the layers of refinement and complexity are stripped away, the heart of education is the transmission of the essential skills of reading, writing and 'rithmetic. This expression is internally inconsistent, to begin with. Reading and writing are the passive and active sides respectively, of the language skill, whilst 'rithmetic is the subject matter of that other skill which, at the lower end of the school, we tend to call 'number'. So the expression 'The Three R's' only refers to two ideas: language and number. The first idea, language, is referred to twice and the second idea, number, is referred to once. Moreover, the world 'arithmetic' is mispronounced as well as mis-spelled, giving the impression that the speaker takes the view that the ability and the necessity to do sums is somehow culturally inferior. If challenged, most who use the expression would deny they intended any such bias, but aphorisms often betray a cultural set. Explicit or implied denigration of Science and numeracy in favour of the Humanities and literacy was certainly widespread in English education up to and beyond the period of the second world war, and was the subject of C P Snow's famous campaign against the separation of 'the two cultures' in 1959. The two cultures may be less isolated from one another these days, and may speak less slightingly of one another, but the idea that education is divided into two parts, Science and the Humanities, prevails. There are many people, however, who have always felt that this division leaves out too much. Art and craft, dance and drama, music, physical education and sport are all valid school activities but belong to neither camp. There is a substantial body of opinion, not only amongst teachers but also amongst groups outside that profession, which holds that modern society is faced with problems such as the material culture problem, the ecological problem, the environmental problem, the quality-of-urban life problem and so on, all of which demand of the population of an affluent industrial democracy competence in something else besides literacy and numeracy. Let us call this competence 'a level of awareness of the issues in the material culture', for the time being. Under present circumstances, it is rather rare for a child who is academically bright to take art or craft or home economics or any of the other so-called 'practical' subjects having a bearing on the material culture to a high level in the fourth, fifth or sixth forms. Universities and professional bodies do not usually accept advanced level qualifications in these subjects as admission qualifications for their courses, even where the course, such as architecture, engineering or even, in some cases, art and design, is itself concerned with the material culture. It is really rather an alarming thought that most of those who make the most far-reaching decisions on matters affecting the material culture, such as business men, senior civil servants, local government officers, members of councils and public committees, not to mention members of

parliament, had an education in which contact with the most relevant disciplines ceased at the age of thirteen.

A third area in education

The idea that there is a third area in education concerned with the making and doing aspects of human activity, is not new, of course. It has a distinguished tradition going back through William Morris all the way to Plato. When Saint Thomas Aquinas defined the objects of education in the thirteenth century he adopted the four Cardinal Virtues of Plato (Prudence, Justice, Fortitude and Temperance) and added the three Christian Virtues (Faith, Hope and Charity). These have a quaint ring in modern English, but Plato's virtues, rendered into Latin by Saint Thomas Aquinas were taken to mean something quite specific and rather different from their modern English interpretations. To Saint Thomas Aquinas PRUDENTIA meant 'being realistic, knowing what is practicable'. JUSTITIA meant 'being ethical, knowing what is good'. FORTITUDO meant 'being thorough, knowing what is comprehensive'. TEMPERENTIA meant 'being economic, knowing when to leave well enough alone'. It is no coincidence that in our own day Dr E F Schumacher, in the epilogue to his book *Small is Beautiful* quotes the four cardinal virtues of Plato as the basis for the socially and culturally responsible use of technology in the modern world. Certainly the craft guilds, who bore a major responsibility for the general education of the populace following the Renaissance, took the view that a virtuous education meant learning to know what is practicable, what is good, what is comprehensive and what is enough, in a very broad sense. It is a curious twist in fortunes that when the craft guilds lost their general educational role somewhere between the fourteenth and eighteenth centuries, it was the rather narrow, specialist, bookish universities, academies and schools which had been set up to train priests to read and translate the scriptures which became the guardians of what we now call general education. No wonder our education system came to be dominated by the Humanities. When Sir William Curtis MP, coined the phrase 'The Three R's' in or about 1807, he placed an emphasis on literacy which reflected the virtual monopoly which the church then had in the running of schools. I had an old great-aunt who protested fiercely whenever the phrase 'The Three R's' was mentioned. She swore that Sir William had got it all wrong. The Three R's were:

1 Reading and writing
2 Reckoning and figuring
3 Wroughting and wrighting

By wroughting she meant knowing how things are brought about, which we might now call technology. By wrighting she meant knowing how to do it, which we would now call craftsmanship. From reading and writing comes the idea of literacy, by which we generally mean more than just the ability to read and write. Being literate means having the ability to understand, appreciate and value those ideas which are expressed through the medium of words. From reckoning and figuring comes the idea of numeracy. Being

numerate means being able to understand, appreciate and value those ideas that are expressed in the language of mathematics. It was from literacy that the rich fabric of the Humanities was woven. It was from numeracy that the immense structure of Science was built. But what of wroughting and wrighting? It is significant that modern English has no word, equivalent to literacy and numeracy, meaning the ability to understand, appreciate and value those ideas which are expressed through the medium of making and doing . We have no word, equivalent to Science and the Humanities, meaning the collected experience of the material culture. Yet the output of the practical arts fills our museums and galleries, equips our homes, constructs our cities, constitutes our habitat. Anthropology and archaeology, in seeking to know and understand other cultures, set at least as much store by the art, buildings and artefacts of those cultures as they do by their literature and science. On the face of it, if the expression of ideas through the medium of doing and making represents a distinctive facet of a culture, then the transmission of the collected experience of the doing and making facet should represent a distinctive area in education.

The vacant plot

If there *is* a third area in education, what distinguishes it from Science and the Humanities? What do Science and the Humanities leave out? It now seems generally agreed amongst philosophers of science, that the distinctive feature of science is not the subject matter to which the scientist turns his attention, but the kind of intellectual procedure that he brings to bear upon it. Science is concerned with the attainment of understanding based upon observation, measurement, the formulation of theory and the testing of theory by further observation or experiment. A scientist may study any phenomenon he chooses, but the kind of understanding he may achieve will be limited by the observations he can make, the measures he can apply, the theory available to him and the testability of his findings. Some sorts of phenomena may therefore be inappropriate for scientific study, for the time being or for ever. Some sorts of knowledge will be inaccessible to science, for the time being or for ever. Moreover, the scientist is concerned with theory, that is, with generalisable knowledge. He is not necessarily competent or interested in the practical application of that knowledge, where social, economic, aesthetic and other considerations for which he does not possess any theory may need to be taken into account. He would regard most of the making and doing activities of the material culture outside his scope, although he would be prepared to bring a scientific philosophy to bear upon the study of the making and doing activities of other people. Amongst scholars in the Humanities there seems to be less agreement about the nature of their discipline, apart from unanimity in the view that it is quite distinct from Science. There is a fair consensus that the humanities are especially concerned with human values and the expression of the spirit of man. This justifies scholars in the humanities in studying the history and philosophy of science, but not in contributing to its content. There also seems to be a measure of agreement, by no means universal, that the humanities exclude the making and doing aspects of the fine, performing and useful arts, although their historical, critical and philosophical aspects would still be fair game for the humanities scholar. It is interesting to note that writers on the science side frequently mention technology and the useful arts as being excluded from their purview, presumably because they are only just outside the boundary. Writers on the humanities side frequently mention the fine and performing arts as being excluded, presumably because they, too, are only just outside. A third area in education could therefore legitimately claim
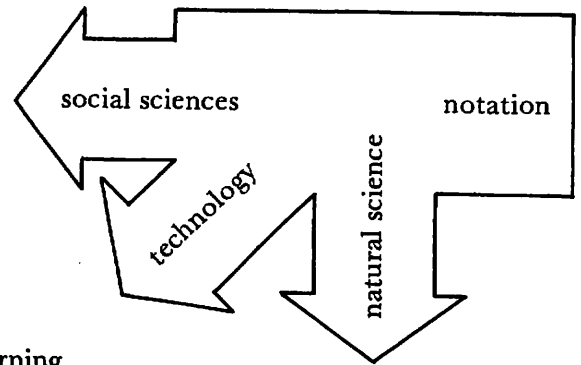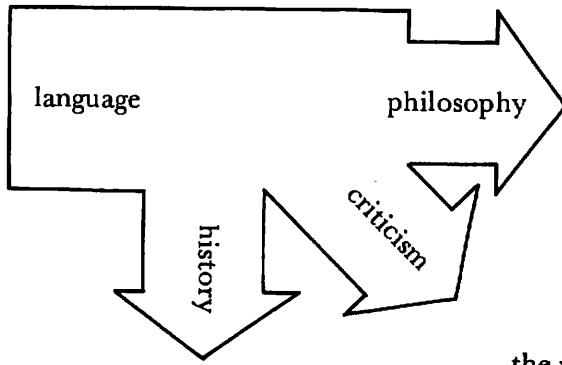
technology and the fine, performing and useful arts, although not their scientific knowledge base (if any) or their history, philosophy and criticism (if any), without treading on anyone else's grass.

The naming of the parts

Clearly, the ground thus left vacant by the specific claims of Science and the Humanities extends beyond the bounds of 'the material culture' with whose pressing problems we began. The performing arts are a case in point. There are other areas, such as physical education, which have not been mentioned at all. It would be tempting to claim for the third area in education everything that the other two have left out. However, we should stick to our last, if I may take my metaphor from the doing and making area, and clarify the question of education in the issues of the material culture. Any subject which relates with man's material culture must necessarily be *anthropocentric*. A discipline which claims, as some kinds of science do, to deal with matters that would remain in true whether man existed or not, would be ruled out from our third area. Material culture comprises the ideas which govern the nature of every sort of artefact produced, used and valued by man. Those ideas which take the form of scientific knowledge would belong to Science. The historical, philosophical and critical ideas would belong to the Humanities. What is left is the artifacts themselves and the experience, sensibility and skill that goes into their production and use. If the human values, hopes and fears on which the expression of the spirit of man are based are shared with the Humanities, the striving towards them, and the inventiveness that goes into the production and use of artefacts, is a necessary characteristic of our third area. Any discipline falling into this area must therefore be *aspirational* in character, and, to take them clearly out of both the Science and the Humanities fields, it must be *operational*, that is to say, concerned with doing or making. Under these tests, how do the subjects ordinarily left out by the traditional Science/Humanities division fare? The fine arts, which in schools can be executed in a variety of materials such as ceramics and textiles as well as through the media of painting and sculpture, clearly fall into the third area. In the useful arts, woodwork and metalwork would usually qualify. Technical studies are sometimes conducted in such a way that they are not actually concerned with doing and making, and may or may not rank as Science, instead. Similarly environmental studies might or might not fall into the third area, according to their manner of treatment. Home economics presents a problem. Taken as a whole, home economics is clearly anthropocentric, aspirational and operational, and therefore falls centrally into the third area. In practice, however, home economics may be taught in schools through the medium of individual subjects ranging from needlecraft taken as fine art through home-making taken as useful arts to nutrition taken as science. So home economics, too, may fall into Science, the Humanities or the third area, according to the manner of treatment adopted. Outside the bounds of the material culture altogether are the other subjects explicitly left out by the first and second areas. Amongst the performing arts, music might qualify as anthropocentric, aspirational and operational. So might drama and perhaps dance. So might gymnastics, the way it is pursued these days, but probably not the other areas of physical education. But this is going too fast. Any number of objections can be raised and counter-arguments offered in respect of many, but perhaps not all, the subjects I have mentioned as belonging or possibly belonging to an alleged third area in education. The point I wanted to make is simply this. The justification for the nomination of a third area in education lies not in the existence of subjects which
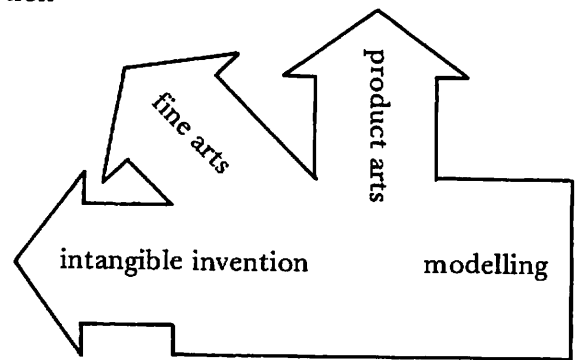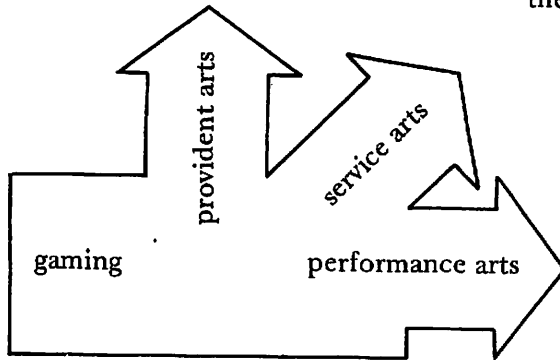
language   philosophy   social sciences   notation

history   criticism   technology   natural science

the world of learning

the world of action

provident arts   service arts   fine arts   product arts

gaming   performance arts   intangible invention   modelling

AFFAIRS   (operational arts)   (creative arts)   DESIGN

Figure 1

do not fit readily into the definitions of Science and the Humanities, but by the existence of an approach to knowledge, and of a manner of knowing, which is distinct from those of Science and the Humanities. Where Science is the collected body of theoretical knowledge based upon observation, measurement, hypothesis and test, and the Humanities is the collected body of interpretative knowledge based upon contemplation, criticism, evaluation and discourse, the third area is the collected body of practical knowledge based upon sensibility, invention, validation and implementation.

The naming of the whole

This leaves us with the problem of finding the correct title for the third area. The term 'the Arts' would be ideal, if the expression had not been appropriated by, and used more or less as a synonym for, the Humanities. Plato would not have objected to 'Aesthetics', but that has taken on a special and distracting meaning in modern English. 'Technics' has been used, and is in the dictionary, but has not proved very popular in educational or common use. A term which has gained a good deal of currency, especially in secondary schools in England and Wales, is 'Design', spelt with a big D and used in a sense which goes far beyond the day-to-day meaning which architects, engineers and other professional designers would assign to it. Thus Design, in its most general educational sense, where it is equated with Science and the Humanities, is defined as the area of human experience, skill and understanding that reflects man's concern with the appreciation and adaption of his surroundings in the light of his material and spiritual needs. In particular, though not exclusively, it relates with configuration, composition, meaning, value and purpose in man-made phenomena. We can then go on to adopt, as an equivalent to literacy and numeracy, the term 'design

awareness', which thus means 'the ability to understand and handle those ideas which are expressed through the medium of doing and making'. The question of the language in which such ideas may be expressed is an interesting one. The essential language of Science is notation, especially mathematical notation. The essential language of the Humanities is natural language, especially written language. The essential language of Design is modelling. A model is a representation of something. An artist's painting is a representation of an idea he is trying to explore. A gesture in mime is a representation of some idea. Everyone engaged in the handling of ideas in the fine arts, performing arts, useful arts or technology employs models or representations to capture, analyse, explore and transmit those ideas. Just as the vocabulary and syntax of natural language or of scientific notation can be conveyed through spoken sounds, words on paper, semaphore signals, Morse code or electronic digits, to suit convenience, so the vocabulary and syntax of the modelling of ideas in the Design area can be conveyed through a variety of media such as drawings, diagrams, physical representations, gestures, algorithms — not to mention natural language and scientific notation. With all these definitions in mind, it is now possible to show the relationships between the three areas of human knowledge according to the diagram in Figure 1.

The repository of knowledge in Science is not only the literature of science but also the analytical skills and the intellectual integrity of which the scientist is the guardian. The repository of knowledge in the Humanities is not simply the literature of the humanities but also the discursive skills and the spiritual values of which the scholar is the guardian. In Design, the repository of knowledge is not only the material culture and the contents of the museums but also the executive skills of the doer and maker.

For all sorts of reasons, although the collected body of
artefacts in the material culture has been valued by
scientists and scholars, if only as subjects for their own kind
of *post hoc* scholarship, the collected body of executive
skill in the Design area has not. Both of C P Snow's two
cultures have been condescending towards the executive
aspects of Design. Hence, perhaps, British society's failure
to give adequate social, political and intellectual support to
its own manufacturing industries, but that is another
question. Lack of scholarly regard for practical skills and
the subjects associated with them is unquestionably
widespread in British education. One of the consequences
of lack of scholarly regard is a lack of scholarly effort.
Astonishingly little work has been done to achieve
understanding of design phenomena, design sensibility, the
act of invention, the theory of modelling, the nature of
judgement or the character of skill. Even the most centrally
relevant professions, such as architecture and engineering,
have done almost nothing to develop an understanding of
their own skills, judgement and inventive activity. They
have relied on Science for their facts, upon the Humanities
for their history and philosophy, and on progressively less
rigorous and less lengthy apprenticeships for their skills.
Innumerable reports have been published by distinguished
committees concerned with architectural education, art and
design education, and engineering education at tertiary
level. Many of these have offered well-meaning, but often
pedagogically naive, advice to the secondary level of
education with a view to improving the quality of entrants
into the professional schools. The tertiary level itself,
however, has never sustained scholarly work on its central
pre-occupation, the design activity, in the way that
scientists or historians or poets have sustained scholarly
work on their central pre-occupations at tertiary level. The
teacher of design-related subjects in secondary schools has
never been able to use the ideas, the techniques and the
publications of his colleagues at undergraduate,
postgraduate and professional levels, simply because a
recognised body of ideas, techniques and publications has
not existed. With little in the way of curricula, knowledge,
or teaching materials to work on, it is small wonder that the
vicious circle of ill-supported secondary school teaching,
barely relevant school examinations, few passes in the
examinations demanded as university admission
qualifications, low-grade work at undergraduate level, little
scholarly work at postgraduate level, little handed on in the
way of curricula, knowledge or teaching material to
secondary level, is repeated.

The knowledge base

It is sobering for those of us who are actually engaged in
postgraduate research and teaching in the Design area to
record that the most strenuous attempts to break that
vicious circle have been made not by ourselves but by
secondary school teachers of design-related subjects. The
movement which led to the introduction of the term Design
to describe this area of education and which caused the
Minister of Education and Science to commission the
enquiry conducted in DDR under the title *Design in General
Education*[1] was a grass-roots movement. It was started by

[1] See Foreword

teachers of art, craft and technical studies, and to a lesser
extent by teachers of home economics and others, all of
whom were gravely concerned about the relevance of
education to the major problems facing mankind today —
that is, to the quality of life, the urban environment, the
use of physical resources, and so on. It is even more
sobering for some of us who teach or practise mainstream
design activities to record that it was not until these same
secondary school teachers, and the educational
philosophers who work with them, asked fundamental
educational questions, that we looked seriously at the
knowledge base for our own activities. The most
fundamental question in any discipline is the question of
epistemology. How do we know what we know? What
makes us believe what we believe? What sorts of test of
validity can be applied to the ideas that we handle? The
field of Science has very clear answers to such questions,
and we can borrow them for those aspects of Design which
are susceptible to scientific examination. We have argued in
this series of seminars, however, that there are certain
aspects of Design which are explicitly inaccessible to
scientific enquiry. The field of the Humanities also has its
own answers to the questions in epistemology, but here,
too, we must recognise that these answers may not be
appropriate to circumstances expressly excluded from the
Humanities field. I know of no substantial body of
knowledge concerning the nature and validity of the ways
of knowing and believing in the field of Design.

The most fundamental data in any discipline are the
data arising from its history, using the word in its strict
sense, meaning a systematic account of observed
phenomena. Design history would be a systematic account
of what is generally the case, as well as of what was the case
at various periods in time, in relation to design phenomena.
It would include architectural history, art history, the
history of ideas, the history of technology and the natural
history of design phenomena. It would include the history
of knowing how, as well as of knowing what. Where is the
systematic account of design phenomena, to be compared
with natural history and social history and the history of
scientific enquiry?

The most fundamental intellectual tools in any
discipline are an agreed terminology, an agreed method of
classifying the phenomena handled, and, most valuable of
all, an agreed method for comparing, ordering or measuring.
In other words, a discipline needs a language, a taxonomy
and a metrology. Leaving aside the technological questions
and literal questions capable of being handled within
Science and within the Humanities, where are the tools of
language, taxonomy and metrology capable of handling the
central issues of Design excluded by the special conditions
of those other fields? In language, we have an answer.
Design has a highly developed language in its range of
means of graphic expression, from representational
drawing, through orthographic projection to graphs and
diagrams. We shall discuss, at a later meeting, the structure
of this language, which I have already called 'modelling'.
The taxonomy of Design, on the other hand, is a
hotch-potch of classifications drawn from many other
disciplines or sub-disciplines, and having no underlying
structure at all. The metrology of Design is almost totally
deficient in the techniques of comparing and ordering
important, non-quantifiable qualities like usefulness,
convenience, ethics and style, despite the existence of
well-developed theories in basic logic. Taking as our model
the academic organisation of other disciplines, where the
scholarly support has been more fully provided, we can
suggest the following framework for a knowledge base in
design:

0   design technology:
     the study of the phenomena to be taken into account
     within a given area of design application;

1   design praxiology:
    the study of the design techniques, skills and
    judgement applied in a given area;

2   design language:
    the study of the vocabulary, syntax and media for
    recording devising, assessing and expressing design ideas
    in a given area;

3   design taxonomy:
    the study of the classification of design phenomena;

4   design metrology:
    the study of the measurement of design phenomena,
    with special emphasis on the means for ordering or
    comparing non-quantifiable phenomena;

5   design axiology:
    The study of goodness or value in design phenomena,
    with special regard to the relations between technical,
    economic, moral and aesthetic values;

6   design philosophy:
    the study of the language of discourse on moral
    principles in design;

7   design epistemology:
    the study of the nature and validity of ways of
    knowing, believing and feeling in design;

8   design history:
    the study of what is the case, and how things came to
    be the way they are, in the design area;

9   design pedagogy:
    the study of the principles and practice of education in
    the design area.

It is the aggregated body of knowledge under all these
sub-headings, constituting the scholarly support, which the
practice of design and the teaching of Design at all levels of
education lacks. It is the task of the sub-discipline, design
research, to assemble this body of knowledge.

Tasks for research

Of the sub-headings listed, design praxiology and design
language probably need to be studied within the field of
design practice itself. It seems unlikely that any
sub-disciplines of Science or the Humanities would make
much contribution to them, and the sub-discipline of design
research would thus need to be closely based on practical
activity. Design technology already exists, having been
lifted largely from Science. Workers in the design research
field would need to lean heavily on scholars in the
Humanities for help in design philosophy, epistemology and
history. Science undoubtedly holds the keys to design
taxonomy, metrology and axiology but a great deal needs
to be done to adapt existing theory in these areas to design
needs. Design pedagogy may also need development beyond
existing theory. Design research methods themselves will
also require original development, since Design contains
subjects for enquiry and kinds of knowing which do not
lend themselves to conventional scientific or speculative
enquiry.

Time for a revolution

It is not the purpose of this particular paper to explain how
and why the institutions of higher education in the Design
field came to invest so little in scholarly effort. The
enquiries conducted by the various design professions at
irregular intervals into the state of their respective
conditions, performances and educational systems bear
witness to the facts. It is not the purpose of this paper to
explain how and why this particular College came to be the
way it is. But we must face the accusation that we are
elitist, vocational and aloof. Elitist, because we enrol our
students primarily on the basis of selecting for existing
talent, and because we do little more than give the selected
few an opportunity to widen the gap between their own
performances and those of others who were not so lucky.
Vocational because we enrol people who are already
committed to become practitioners in a narrow field, and
do little more than give them guided experience in a
narrower one. Aloof, because we neither set syllabuses and
examinations for our feeder institutions nor recognise those
which do exist; we neither produce educational material
nor employ it. All this might be excusable if everything
were going right for the material culture; if the design
professions were so highly regarded that no-one challenged
their propositions; if our graduates were able to run rings
round the technologists, the business men and manipulators
of red tape they have to work with. But these conditions
manifestly do not prevail. If there is indeed a structural
defect in our society and in our education system which
under-represents the doers and makers, in favour of the
writers and reckoners, then we have condoned and
preserved that defect by our elitism, vocationalism and
aloofness. The advocates of alternative technology,
alternative art, alternative society and alternative education,
including the body of teachers in secondary education to
whom I have already referred, are in their various ways
struggling to repair that defect. With our help or without it,
a body of people are bringing about a revolution in
attitudes to art, craft, design and technology which I, for
one, am persuaded is necessary and long overdue. I, for one,
believe that this College was founded to be a force for
precisely this sort of change. I, for one, believe that we have
failed to live up to it. It is time the College, and its opposite
numbers in other parts of the general field of Design, ceased
to be elitist, and enrolled on the basis of educational intent
as well as on executive talent. It is time we ceased to be so
overwhelmingly vocational, and engaged in scholarship,
criticism and education as well as in professional training. It
is time we ceased to be aloof, and recognised that we are in
the education business as well as in the art and design
business. The invention of the Department of Design
Research, and the introduction of courses in design
research, is intended to be a contribution to progress in that
direction.