

The Theory of Loose Parts

An important principle for design methodology.

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Creativity is for the gifted few: the rest of us are compelled to live in environments constructed by the gifted few, listen to the gifted few's music, use gifted few's inventions and art, and read the poems, fantasies and plays by the gifted few.

This is what our education and culture conditions us to believe, and this is a culturally induced and perpetuated lie.

Building upon this lie, the dominant cultural elite tell us that the planning, design and building of *any part* of the environment is so difficult and so special that only the gifted few — those with degrees and certificates in planning, engineering, architecture, art, education, behavioural psychology, and so on — can properly solve environmental problems.

The result is that the vast majority of people are not allowed (and worse — feel that they are incompetent) to experiment with the components of building and construction, whether in environmental studies, the abstract arts, literature or science: the creativity — the playing around with the components and variables of the world in order to make experiments and discover new things and form new concepts — has been explicitly stated as the domain of the creative few, and the rest of the community has been deprived of a crucial part of their lives and life-style. This is particularly true of young children who find the world incredibly restricted — a world where they cannot play with building and making things, or play with fluids, water, fire or living objects, and all the things that satisfy one's curiosity and give us the pleasure that results from discovery and invention: experiments with alternatives, such as People's Park, Berkeley, have been crushed or quashed by public authorities.

The simple facts are these:

1. There is no evidence, except in special cases of mental disability, that some young babies are born creative and inventive, and others not.
2. There is evidence that all children love to interact with variables, such as materials and shapes; smells and other physical phenomena, such as electricity, magnetism and gravity; media such as gases and fluids; sounds, music, motion; chemical interactions, cooking and fire; and other humans, and animals, plants, words, concepts and ideas. With all these things all children love to play, experiment discover and invent and have fun.

All these things have one thing in common, which is variables or 'loose parts'. The theory of loose parts says, quite simply, the following:

'In any environment, both the degree of inventiveness and creativity, and the possibility of discovery, are directly proportional to the number and kind of variables in it.'

It does not require much imagination to realise that most environments that do not work (i.e. do not work in terms of human interaction and involvement in the sense described) such as schools, playgrounds, hospitals, day-care centres, international airports, art galleries and museums, do not do so because they do not meet the 'loose parts' requirement; instead, they are clean, static and impossible to play around with. What has happened is that adults – in the form of professional artists, architects, landscape architects and planners – have had all the fun playing with their own materials, concepts and planning-alternatives, and then builders have had all the fun building the environments out of real materials; and thus has all the fun and creativity been stolen: children and adults and the community have been grossly cheated and the educational-cultural system makes sure that they hold the belief that this is 'right'. How many schools have there been with a chain-link and black-top playground where there has been a spontaneous revolution by students to dig it up and produce a human environment instead of a prison?

If we look for a moment at this theory of loose parts, we find that some interesting work supports it and in particular that there has been a considerable amount of outstanding recent research by people not in the traditional fields of art, architecture and planning. Much of this research fits into the following five categories:

Design by Community Interaction and Involvement

Ten years ago, a special issue of the magazine *Anarchy* was published in which nearly all the fundamental educational, recreational and community advantages of adventure-playground environments were described, including the relationship between experiment and play, community involvement, the catalytic value of play-leaders, the relationship between accidents and the environment, and indeed the whole concept of a 'free society in miniature'. Later, in 1967, the facts on adventure playgrounds and play-parks were taken and discussed in the context of the architecture and planning professions in an article in *Interbuild/Arena* (3) Although the implications of the concepts and facts outlined in these researches are only now being widely disseminated, the process of community involvement has evolved very fast in both Europe and the United States. Outstanding among these have been some of the educational facilities 'charettes' such as those in East New York,(4) and the Shelter Neighbourhood Action Project (SNAP) in Granby, Liverpool, recently described in an unusual article in the *RIBA JOURNAL* (5)

The interesting aspect of the evolution of community involvement – in the area of recreation in particular – is that the really meaningful programmes soon appear to leave play, parks, and recreation by the wayside and become social organisations for community action in *all* aspects of the environment. Pat Smythe, for example, a pioneer in this field, worked for nine years on adventure playgrounds and then became fully



Example of an exhibition with few loose parts. Visitors could only interact in a minimal way, (even visually) and most people passed right through the gallery to high-interaction exhibits beyond. Even the attendant's job does not involve interaction with his environment, except in emergency.

involved in the revolutionary Neighbourhood Council project in Golborne. In terms of loose parts we can discern a natural evolution from creative play and participation with wood, hammers, ropes, nails and fire, to creative play and participation with the total process of design and planning of regions in cities.

Behavioural Planning and Design

Parallel with the development of community involvement there has been a growth in behavioural planning, i.e.: the study of human requirements and needs as the basis for the design of the man-made parts of the environment. A recent example outlining this approach to design is Constance Perin's in her book *Man in Mind*. Another example where the use of behavioural data is being used as a design determinant is the 'pattern-language' at present being developed at the Centre for Environmental Structure, Berkeley.

The relationship of behavioural planning to the theory of loose parts is a direct one since the theory itself derives from it: however, one of the problems of loose parts is that the range of possible human interaction is an exceptionally wide one and many behavioural studies have only gone so far as to state very broad and general requirements (such as the statement, for example, that 'children like caves') and have not explicitly described the more subtle forms of behaviour that may occur – to use an analogy – 'inside the caves'. The behavioural generalisations of the 1970s often resemble the generalities or 'laws' of the pioneers of social anthropology and merely state what we already know to be true.

The process of community involvement is actually inseparable from the study of human interaction and behaviour: for example, to carry the previous analogy further, the study of children and cave-type environments only becomes meaningful when we consider children not only being in a *given* cave but also when children have the opportunity to play with space-forming materials in order that they may invent, construct, evaluate and modify *their own* caves. When this happens we have a perfect example of variables and loose parts in action and – more important – we find that a behavioural methodology of design, related to this example, has existed for some years: the methodology – involving what is called the 'discovery method', has been developed by a unique group of researchers working in curriculum innovation for elementary schools. The obvious pattern of behaviour that can be identified here is a self-instructional pattern – namely – that children learn most readily and easily in a laboratory-type environment where they can experiment, enjoy and find out things for themselves. (7)

The Impact of Curriculum Development

The principle of variables and loose parts has been acknowledged by most educators since the 1960s: when *Mathematics in Primary Schools* was first published in 1966 by H.M.S.O., to quote the Advisory Centre for Education, 'It was a bombshell'. The discovery method that it described has since then been wonderfully exemplified by the Nuffield Foundation, the Elementary Science Study, and several other organisations. (8)

The E.S.S., for example, has now produced thirty of the most imaginative curriculum units ever devised: their format (as is that of the Nuffield Mathematics Programme) is almost totally interdisciplinary, and concerns visual art and music, as much as mathematics and the natural sciences. But this is not all, for another characteristic of these programmes is that they break down the distinction between indoors and outdoors, a feature that had hitherto been experimented with mostly in the progressive schools of the 1930s.

By allowing learning to take place outdoors, and fun and games to occur indoors, the distinction between education and recreation began to disappear.

The introduction of the discovery method has been accompanied by intense research into the documentation of human interaction and involvement; what did children do with the loose parts? What did they discover or re-discover; What concepts were involved? Did they carry their ideas back into the community and their family? Out of all possible materials that could be provided, which ones were the most fun to play with and the most capable of stimulating the cognitive, social and physical learning processes?

It was educational evaluation that provided the missing element in the design process and completed a system which is a perfect methodology for designers, and which pre-dated the recent application of behavioural studies to urban planning – while the emphasis on real-life problems, frequently outdoor and off the school premises, was the beginning of a natural trend towards de-schooling and environmental education.

Environmental Education

It is hard to talk about environmental education without mentioning that the whole educational system, from pre-school through university, is on the verge of changing: for who needs these institutions in their present form? The prototype for education systems of the future are almost certainly those facilities that take children and adults out into the community and, conversely, allow all members of the community access to the facility.

There are several groups in the U.S. which have been experimenting with this process with children – by far the most comprehensive being the Environmental Science Centre in Minnesota (9): a detailed bibliography of publications and environmental curriculum materials has recently been compiled for a new course at the University of California, Davis (10)

Environmental education, (as opposed to conservation education, or the understanding of preservation of the non-man-made environment) means the *total study of the ecosystem*, i.e.: man, his institutions, and his structural, chemical, etc., additions, included. The subject of human ecology, our values and concepts, the environmental alternatives and choices open to us – in the fullest sense – has recently become a dominant factor in some education programmes. To express this in the simplest possible terms, there is a growing awareness that the most interesting and vital loose parts are those that we have around us every day in the wilderness, the countryside, the city and the ghetto.

Art and Science Exploratoria

Finally there are groups of people experimenting with the theory of loose parts in art galleries and the science museums. (A simple example leading to this interest was the discovery that the most worn tiles on the floor of museums were usually adjacent those exhibits involving the maximum amount of variables and human interaction). In 1970 the first comprehensive exhibition of interaction-works entitled 'Play Orbit' was held at the Institute of Contemporary Art in London. This was recently followed by an exhibition of work (parts) by Robert Morris at the Tate Gallery: to quote a critic's review of the exhibition, "the public got into the party spirit – a somewhat over-zealous participation. They were jumping and screaming, swinging the weights around wildly – the middle aged in particular. The children were the most sensible of all the visitors" (!) We are beginning to realise that there are more ways to interact with art than to be solely contemplative (i.e.: there exists the possibility of more loose parts and 'variables' than via visual perception alone) and that although it is fine to allow scientists and artists to invent things, how about allowing everybody else to be creative and inventive also?

The Immediate Future

The whole idea of loose parts raises some fundamental questions about the way we design things: if you are an inventor or designer yourself, what parts or proportion of an environment – or components for an environment – can you legitimately invent yourself, and how much, for example, can children or adults in the community invent and build? How are variables and loose parts introduced into the world of newly born children, and what function do the variables have on cognition and perception? If contemplation is merely one of the many possible forms of human interaction, what exactly are the other ways we can interact with our environment? Is society content to let only very few of its members realise their creative potential? It is the purpose of this article to propose that it is not, and that if we know that creativity is not just a characteristic of the gifted few, a crash programme of educational, recreational and environmental improvement must be started. I would like to propose the following four-part programme using the loose parts principle, whereby this could be achieved:

1. Give top priority to where the children are

All children – and particularly many of the most needy such as those living in an urban ghetto or who are disadvantaged – spend a lot of the most important time of their lives in elementary schools, day-care, preschools and children's hospitals: these are the environments that need immediate transformation. (11, 12) This holds true even in innovative school districts that have extended or abolished the classroom walls – simply give top priority to the environment of the new 'classroom' or 'playground', whether it be a mobile unit, exploratory museum, ecological reserve or study centre, or wherever the children may be. Ten years of vest-pocket parks, concrete plazas and adventure



Institute for Contemporary Arts, London – an example of a high-interaction environment, with many loose parts: the Magic Blower is an abstract cylindrical sculpture, in which travels a column of moving air. The viewer may set it at any angle and can operate a solid-state power control attached to the on-off switch: most important, the participant invents all of the materials and shapes that can be used with the column. At full speed many shapes may spin and bounce above the end of the perspex cylinder. How much of a sculpture does the artist invent, and how much does the public invent? Joey Schlenhoff, a young boy who came to Play Orbit, went back home and invented his own. Could the paintings in Fig. 1 generate the same degree of interest?

playgrounds have failed to do this: we *must* solve this problem. Even if a local community is sold on the idea of a pocket-park or adventure-playground it is still better to use the asphalt area of an elementary school for it, for this is where the children are.

2. Let children play a part in the process

Children greatly enjoy playing a part in the design process: this includes the study of the nature of the problem; thinking about their requirements and needs; considering planning alternatives; measuring, drawing, model-making and mathematics; construction and building; experiment, evaluation, modification and destruction. The process of community involvement, once started, never stops: the environment and its parts is always changing and there is no telling what it will look like. Contrary to traditional parks and adventure playgrounds, the appearance of which is a foregone conclusion, the possible kinds of environment determined by the discovery method and principle of loose parts is limitless. The children in the neighbourhood will automatically involve all their brothers, sisters and families: this is design through community involvement, but in the total community the children are the most important. It is not enough to talk about a design methodology – the methodology must be converted into three-dimensional action, or it is worthless.

3. Use an interdisciplinary approach

In early childhood there is no important difference between play and work, art and science, recreation and education – the classifications normally applied by adults to a child's environment: education *is* recreation, and vice versa (13). For professional architects and landscape architects, this means a first-hand experience and knowledge of children's behaviour and an understanding of their physical and social needs and cognitive learning processes. The revolution in curriculum innovation, mentioned briefly above, was undertaken by researchers acquainted with real human needs, not by researchers employing behavioural consultants on the side: such an interdisciplinary approach is a prerequisite to the solution of the problem.

4. Establish a clearing-house for information

We desperately need an international clearing-house for information on children's environments, from maternity onwards, dealing with all aspects of their growth, education, curricula and play, and – in particular – information on *human interactions and involvement* with loose parts in the environment. The time-lapse for dissemination of research and evaluation is at present about 5-10 years and should be reduced to the near-instantaneous. The information should be available in the form of newsletter, demand-printing, micro-film, audio- and video-cassette, and video-cassette systems linked to CATV and satellite, and communicated to school districts all over the country, from which it could be distributed, either free or by subscription, to members of the community, elementary schools, day-care centres, and any other person or institution

needing it (14). Much of this evaluation, filming and videotaping can be experimented with, recorded, photographed and played back by the children themselves.

Where does all this lead us to

There are a lot of suggestions and recommendations in this article. Maybe more than can be acted upon at any one time. But we need to act on all of them if we are to build a society in which individuals and communities have greater control over the loose parts with which their environment may be constructed — loose parts that are at present controlled and fixed by an inflexible education system and cultural elite. The problem is a critical one when we consider young children. Most of the existing design methodologies do not take into account the theory of loose parts and thereby fail. The 4-part programme could act at least as a start toward solving the problem of cultural availability of bits and pieces of the environment — in both the software and hardware sense — and the extent to which a new generation will be able to invent new systems with the parts.

A LOOSE PART BIBLIOGRAPHY

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- (2) Colin Ward: 'Adventure Playground — A Parable of Anarchy', *Anarchy*, Freedom Press, England, Sept. 1961 pp.193-201. (entire issue on this subject)
- (3) 'United Kingdom — Whose Playgrounds?': in *Interbuilt/Arena*, Dec. 1967, pp12-19
- (4) John Darnton: 'Residents and Architects Plan Local Center in Brooklyn', *The New York Times*, Wed. Jan. 6 1971
- (5) Roger Barnard: 'Community Action in Twilight Zone', *R.I.B.A. Journal*, Oct. 1970 pp.445-453.
- (6) Des Wilson: 'Democracy begins at Golborne', *The Observer*, London, 11th April, 1971
- (7) Simon Nicholson: 'Structures for Self-Instruction', *Studio International Journal of Modern Art*, New York, June 1968, pp.290-292.
- (8) The Nuffield Foundation: *I Do and I Understand*, and curriculum materials, John Wiley and Sons, New York, and Education Development Centre: *Introduction to the Elementary Science Study* and curriculum materials, Newton, Mass.
- (9) *Environmental Studies for the Elementary School*, and curriculum materials, Grades 3-6 Environmental Science Center Distributing Co., Golden Valley, Minnesota.
- (10) Simon Nicholson: *Environmental Education Early Childhood*, University of California, Davis, California.
- (11) *The School Playground as an Outdoor Learning Environment — a Community Project to Extend the Elementary School Curriculum to the Outdoor Playground*. Office of Project Planning and Development, Berkeley Unified School District, Berkeley, California, 6/23/70.

- (12) The first example of the low-cost conversion of an existing K-6 elementary school in N. California took place at Valley Oak School in 1970: see *Domain for Creative Play at Valley Oak Playground*, 'The Davis Enterprise', Davis, California, July 17, 1970.
- (13) *Everett Interim Preliminary Report, Education/Recreation, General Analysis and Recommendations* (Appendix 2), Lawrence Halprin and Associates: City of Everett, Washington.
- (14) The quickest way to get some preliminary information is at present *Big Rock Candy Mountain: Resources for our Education*, Winter 1970, Portola Institute Inc., Menlo Park, California. For information on communications see *Radical Software*, Raindance Corporation, New York: Edition 1, pp.11-12; Edition 2, p16, and Edition 3, p6, Edition 4, Education Alternative Programming, pp.14-16, and Michael Shamberg, *Guerrilla Television*, Holt Rinehart and Winston, 1971

CLEARING HOUSE FOR INFORMATION

Apart from ERIC (Education Resources Information Center) which is academically oriented, there have been few attempts to create a nation-wide system of environment-information, especially in the area of early childhood, elementary and secondary education. Most of the work at assembling data has been restricted to compiling book titles – a method which has proven practically useless. Most people do not have the time to check off bibliographies. Some examples are as follows:

1. David A. Sleet, *Interdisciplinary Research Index on Play: a Guide to the Literature*, Department of Physical Education, The University of Toledo, Ohio, May 1971.
2. Fred. W. Martin, *Bibliography of Leisure: 1965-1970*, Program in Leisure Education, Recreation and Related Community Service, Teachers College, Columbia University, January 1971.
3. *A Bibliography of Open Education*, Education Development Center and the 'Advisory for Open Education', 55 Chapel Street, Newton, Mass., 1971. (primarily a list of EDC and EDC spin-off publications).
4. Simon Nicholson, *Environment Education – A Bibliography*, Environmental Education in Early Childhood, UNEX, University of California, Davis, California, 1971.

In addition to such lists, there are also some imaginative writings that may have more meaning for the average citizen and community, for they are not merely literary. Such an example is:

5. *The Last Whole Earth Catalog: Access to Tools*, Portola Institute, 1971, distributed by Random House.
But the best interdisciplinary compendium so far, is the sum total of the issues, especially that of September 1971 of:
6. *Big Rock Candy Mountain*, Portola Institute, Menlo Park, California.

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