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, behavioral psychology, and so on—can properly solve environmental problems.

How NOT to Cheat Children

The Theory of Loose Parts

By Simon Nicholson

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, and motion; chemical interactions, cooking and fire; and other people, 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.*[1]

It does not require much imagination to realize 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 centers, 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*[2] 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 playparks 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 Neighborhood 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, especially in the area of recreation, is that the really meaningful programs soon appear to leave play, parks, and recreation by the wayside and become social organizations 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 involved in the revolutionary 'Neighborhood Council' project in Golborne.[6] 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.

Behavioral Planning and Design

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

The relationship of behavioral 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 behavioral studies have only gone so far as to state very broad and general requirements (such as the statement, for example, that "children like caves")—but have not explicitly described the more subtle forms of behaviour that may occur—to use an analogy—"inside the caves." The behavioral generalizations of the 1970's 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 behavior: 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 behavioral 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 group of researchers working in curriculum innovation for elementary schools. The obvious pattern of behavior 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]

Photo from Education Development Center, Newton, Mass.

Loose parts at work—water, ripples, reflections, slush, floating and living objects. Many curriculum units are based on experiments with water; here is the quickest, cheapest way to introduce variables into an asphalt/chain-link environment.

The Impact of Curriculum Development

The principle of variables and loose parts has been acknowledged by most educators since the 1960's when *Mathematics in Primary Schools* was first published in England 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 organizations.[8]

The E.S.S., for example, has now produced 30 of the most imaginative curriculum units ever devised: their format, as is that of the Nuffield Mathematics Program, 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 programs 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 1930's. 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 rediscover? 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 and completed a system which is a perfect methodology for designers, and which pre-dated the recent application of behavioral studies to urban planning. Meanwhile, the emphasis on real-life problems, frequently outdoor and off the school premises, was the beginning of a natural trend toward 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. 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.

Several groups in the U.S. have been experimenting with this process with children, by far the most comprehensive being the Environmental Science Center in Minnesota[9]. A complete bibliography of publications and 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 programs. 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 to those exhibits involving the maximum amount of variables and human interaction). In 1970 the first comprehensive exhibition of interaction-works titled "Play Orbit" was held at the Institute of Contemporary Art in London. This has recently followed by an exhibition of

Photo above, left: pendulums and bouncers at the Valley Oak Elementary School project, University of California, Davis. Children love to oscillate vertically on bouncers and can experiment with weight, period, orbit, and many other concepts. Left: Voice tube made from PVC tube and a brass snap-strainer connects three levels of the Hide Away, Human Resources Center, Pontiac, Mich. Voice tube adds variables to any structure, allows experiments in communication, increases perception of space and volume.