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*Theory of loose parts: how not to cheat children
LA 30-34 1971, October*

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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, 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 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 York⁴, 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, i.e. 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 where 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

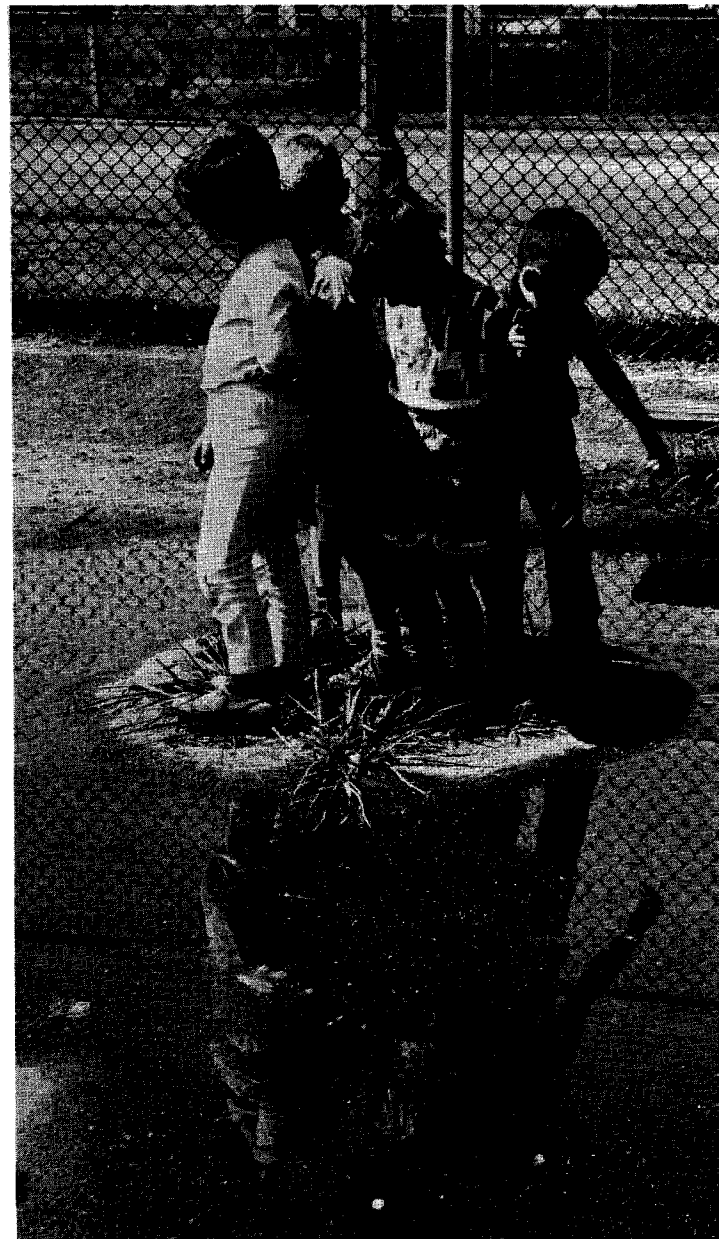


Photo from Education Development Center, Newton, Mass.

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 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 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 Minnesota⁹. 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.

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 overzealous 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."¹¹ We are beginning to realize 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 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 realize 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 program of educational, recreational and environmental improvement must be started. I would like to propose the following four-part program, 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 K-6 elementary schools, day-care, preschools and children's hospitals. These are the environments that need immediate transformation. This holds true even in innovative school districts that have extended or abolished the classroom walls. They should 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 center, or wherever the children may be.¹² Ten years of vest-pocket parks, concrete plazas and adventure 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.

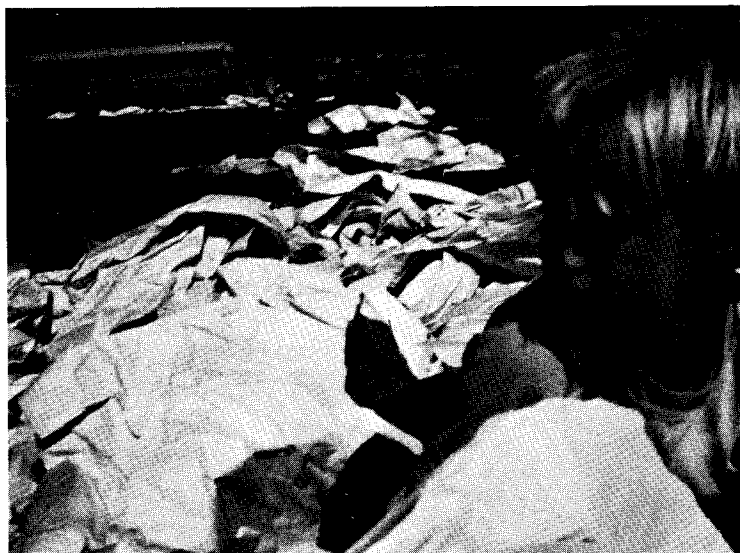
2. Let children play a part in the process

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 neighborhood 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 four-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 either/or classifications normally applied by adults to a child's environment. Education is



Above: Newsprint fun at Isla Vista Elementary School project, College of Creative Studies, University of California at Santa Barbara. Children used the enormous rolls for sliding, folding, hiding, painting, mattress-building, bouncing, etc. University faculty, students provided with the rolls mostly stood and stared at them, expecting others to be actively inventive.

Below: human interaction and involvement with water at Portland Auditorium forecourt, its refraction, beading, noise. Liquids, gases (waterfall, wind tunnel) afford classic examples of how loose parts permit experimentation, creativity.



*See "Principles of Site Development for Elementary Schools," Michael Hough and Associates, LAQ, Oct. '69.

**See "Adventure Playgrounds: Europe Leads U.S. in Reuniting its children with 'The Lost Landscape of Spontaneity,'" by Clare Cooper, LAQ, October 1970, and winner of the Bradford Williams Medal, 1971. (Ref: PEOPLE, pp. 6-7 this issue). ED.

***See also *Unobtrusive Measures: Nonreactive Research in the Social Sciences*, by Eugene J. Webb, Donald T. Campbell, Richard D. Schwartz and Lee Sechrest; Rand McNally and Co., Chicago, 1966; p. 2.

Pump room of Portland Forecourt contains dimmer controls for cascades, selector switches for water flow; number of variables or loose parts would be increased by public access. Below: waiting room, San Francisco International Airport. Or waiting anywhere, any institution—no loose parts. Time spent here is life spent sitting in fixed rows in utter boredom.

Photo by Paul Ryan



recreation, and vice versa.¹³ For professional architects and landscape architects, this means a first-hand experience and knowledge of children's behavior 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 behavioral 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 the womb onward, dealing with all aspects of their growth, education, curricula and play, and, in particular, information on *human interaction and involvement* with loose parts in the environment. The time-lapse for dissemination of research and evaluation is at present about five to 10 years and should be reduced to the near-instantaneous. The information should be available in the form of newsletters, microfilm, audio- and video-cassette, and video-cassette systems linked to CATV, 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 centers, and any other person or institution

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

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) *Interdisciplinary Research Index on Play: a Guide to the Literature*, David A. Sleet, Department of Physical Education, The University of Toledo, Ohio, May, 1971.

(2) *Bibliography of Leisure: 1965-1970*, Fred W. Martin, 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 or EDC-spinoff publications).

(4) *Environment Education—A Bibliography*, Environmental Education in Early Childhood, Simon Nicholson, 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) *Making the City Observable*, Richard Saul Wurman, Walker Art Center and MIT Press, 1971.

But the best interdisciplinary compendium so far is still the sum total of the issues, especially that of September, 1971, of

(6) *Big Rock Candy Mountain*, Portola Institute, Menlo Park, California.

A Loose Parts Bibliography

(1) *What do Playgrounds Teach?* Simon Nicholson: 'The Planning and Design of the Recreation Environment,' University Extension, University of California, Davis, 1970, pp.5-1 to 5-11

(2) *Adventure Playground—A Parable of Anarchy*, Colin Ward: 'Anarchy,' Freedom Press, England, Sept. 1961, pp. 193-201 (see entire issue on this subject)

(3) *United Kingdom—Whose Playgrounds?:* in 'Interbuild/Arena, Dec. 1967, pp. 19-19

(4) *Residents and Architects Plan Local Center in Brooklyn*, John Darnton: 'The New York Times,' Wed. Jan. 6, 1971

(5) *Community Action in a Twilight Zone*, Roger Barnard: 'R.I.B.A. Journal,' Oct. 1970, pp. 445-453

(6) *Democracy begins at Golborne*, Des Wilson: 'The Observer,' London, 11 April, 1971

(7) *Structures for Self-Instruction*, Simon Nicholson: 'Studio International Journal of Modern Art,' New York, June 1968, pp. 290-292

(8) *I Do and I Understand*, and curriculum materials, The Nuffield Foundation, John Wiley and Sons, New York, and *Introduction to the Elementary Science Study* and curriculum materials by the Education Development Center, Newton, Mass.

(9) *Environmental Studies for the Elementary School*, and curriculum materials, Grades 3-6, Environmental Science Center Distributing Co., Golden Valley, Minnesota

(10) *Environmental Education in Early Childhood*, Simon Nicholson: University of California Extension, Davis, California 95616

(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 (and all other issues), Portola Institute Inc., Menlo Park, California. For information on communications see *Radical Software*, Raindance Corporation, 24 East 22d, New York City 10010: Edition 1, pp. 11-12; Edition 2, p. 16, and Edition 3, p. 6.