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## INTRODUCTION

It has been several years since the Student Publication has presented work done in the School of Design; this issue, devoted to projects undertaken in the context of the School, attempts to sample current involvement. All of the contributors to Volume 19:1 have taught at the School; two are graduates as well. Their interests vary widely, from the conceptual study of environmental design by Vernon Shogren to an examination of perception by Russell Drake. Duncan Stuart and Fred Eichenberger explain and illustrate their process for the mass production of unique items with offset lithography, while Gene Messick's inset folder reflects his experiments with intermedia. Together, these authors represent a portion of the activity of the School of Design; we hope that this publication of their efforts will generate some interest in design-related disciplines.

*Marian Scott*

Editor

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**NOTES TOWARD A CONCEPTUAL MODEL  
OF ENVIRONMENTAL DESIGN**

**Vernon Shogren**



1 It is true, of course, that several claims have been staked in the debate: What is Environmental Design? However, there is no operational field nor funded activity which practices in the name. Rather, there are only gleams in various eyes. Environmental Design is now considered open game, to be seized and codified to suit personal whim.

2 There are *at least* three definitions of Environmental Design which are being currently advocated:

- (1) Design *in* the environment.
- (2) Design *for* the environment.
- (3) Design *of* the environment.

The critical question in any form of design is the source of parameters not of constraints. The first and third of these definitions obviously regard environmental criteria as constraints, and are consequently the same. They are also indistinguishable from traditional approaches to design. Only the second, which accepts environmental criteria as valid parameters, can be regarded as non-traditional in any sense.

3 Immediately at issue is the entire question of physical science, behavioral science, cybernetics, decision theory, information theory, and all similar formalizations of experience. Of what value are they to Environmental Design?

4 A pragmatic activity, such as design, often finds its preoccupations following about one generation behind the human pioneers. The question at issue here involves the same abandonment of transcendental norms which gave rise to the existential and phenomenological schools of thought in the twenties and thirties. The difference lies in the fact that Environmental Design voluntarily abandons such norms, due to disenchantment with the consequences of their enforcement. Consequently, it should be possible to avoid the despair—the “cosmic hypochondria,” as one

What do we mean when we use the term “Environmental Design?”

(1) Or better: Why do we use the term? Why isn’t the simple word “Design” sufficient? Or, *why* was it once sufficient, and is no longer so?

Environmental Design must mean—if it means anything at all—a renewed emphasis on Place, the locality of a locale, the specificity of a situation. It signals the collapse of formalism, of generalized rules of design behavior which are simply adapted to specific occasions. (2)

The significance of the term lies in its implicit rejection of the abstract. Gone are esoteric theories of proportion, harmony, and beauty; concepts of symmetry, balance and order; optimal conditions and standards of achievement. In short, gone are all those universals which were the mainstay of design for thousands of years, which in fact *identified* a work of design *as* a work of design. (3)

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To replace all this, we now have the situation. The situation is this one. It is not a kind or type of situation, but this one. Within it is found what is needed to know, and within it is judged what is done. All else is abstract, irrelevant, and immaterial.

The fundamental dilemma posed by the idea of Environmental Design is that of nihilism. (4) When all universal standards are considered as empty forms, when the ideas of class and classification are conceived as intellectual games, how are we to measure worth and value? If standards are determinable only within a situation, by what means are we to evaluate the standards? (5)



So long as design was conceived as the specific application of general rules, the primary task of the designer was one of identification. (6) Problems, needs, and goals fell into classes, and could be identified. Solutions also fell into classes, and could be identified. Judgements could then be made on the basis of class criteria and class relationships: *this* kind of thing was the solution to *that* kind of problem. Specifics were, like Platonic 'appearances,' to be ignored. (7)

As soon as we accept the uniqueness of a situation, all this is lost to us. We can no longer refer to this or that kind of situation, but rather to a situation of this kind. (8) The distinction is a subtle one, but extremely important. It involves the expansion of the situation into its own universe of discourse, within which standards of need, value, and purpose can be established.

The basic attitude of Environmental Design is constructive and not adaptive. It entails the rejection of what is ordinarily called knowledge. Knowledge must, in one way or another, be based on the statistical mean. By definition, it rejects the individual case, the very basis of Environmental Design. (9) So long as knowledge is conceived as information about shared properties of anonymous entities, it is of little or no value.

The kind of knowledge that is useful to Environmental Design is not that of things, but of relations of things. (10) Things are of infinite variety, but *relations* are limited and far more stable. They describe the modes of adaptation *between* things, bound by the limits of perception and communication.

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writer puts it—which characterized much existentialist thought.

This also refers back to footnote (2). For forty 5 years, we have been aware that the self-sufficiency of *any* axiomatic system is not possible, even including mathematics, the paradigm of paradigms. This makes non-sense of any talk of "designing the total environment." A thing cannot be designed if it is every-thing, simply because our concept of "thing" breaks down. In other words, a thing cannot be conceived as such, without relations to other things. This is the whole idea of Environmental Design.

One does not escape from this dilemma by calling the thing a system, or a structure. These are useful and often necessary ways of looking at a thing; to see it as a system or as a structure is to see the thing with a bias which reveals much otherwise obscured.

To conceive of the total environment as one thing raises the general question of subjectivity and objectivity, and the even more general question of consciousness. We cannot conceive of ourselves *as* selves without the "other," or objective world. Without such a world we would be—in truth—no self. That also would be the fate of a total thing, called all-environment. It would be nothing.

John Dewey: "The naming is the knowing." 6 What we ordinarily call knowing lies in finding a correspondence between a phenomenal occurrence—an occasion of experience—and a pre-existing classification. The occasion is made to correspond to a classificational type, and thereby awarded such predicates (properties) as are considered "proper-to" that type.

Plato believed that phenomenal events within 7 our world of actual experience were but degraded specimens of ideal types, "up there"—somewhere. Design—and much of what we call science, and knowledge in general—follow this dictum.



Design often proceeds on the assumption that only the "idea" is somehow pure and unsullied. The actual world forces "compromise," which is a bad thing. Progression from the idea to the actuality is a history of real or attempted degradation, with the designer as hero, struggling with the forces of evil.

Environmental Design seeks to replace this elaborate myth with one centered on existence. What may be true for another world is no longer considered good enough for this one.

- 8 This raises the question of general concepts, and opposed to them, abstract concepts. The word "abstract" has almost passed into limbo, due in part to its being used as a polemical weapon. It is often used to suggest vagueness, immateriality, the unreal, or unsettled. For example: "Design proceeds from the abstract to the concrete." This means, presumably, that the actuality of a designed thing was preceded by a vague *notion* of that thing.

The word "abstract" is opposed etymologically by the word "attract." The common stem is "tract": to take. At-tract is "to take to (oneself)," completely, as is. Abs-tract is "to take away," partially, selectively. An abstract concept is an idea not of a thing, but of some *aspect* of a thing. It is a partial product of analysis.

A general concept, on the other hand, is an idea of a thing *as* analyzed. It is not a judgment of what a thing *is*, but of the possibilities as revealed through analysis. In sum, it is a comprehensive view of internal relationships, rather than isolated bits and pieces.

- 9 The paradigm case of knowledge is that offered by physical science. It is based on "large numbers," and reduces to probability in individual cases. A designer cannot work on the dubious assurances of probability. What is really at stake is the probability of his ever being allowed to design anything again.

This inevitably brings up the old debate of 10 things-versus-relations. Which are real? as F.H. Bradley asked. So long as the question is phrased in this way, it is a chicken-and-egg controversy.

Things can be considered as entities which we create as focalized patterns of stuff. They are, in a sense, "condensed" out of a flux of events which we experience as sentient beings. After "condensation" the flux remains as ground, contributing as much to the maintenance of things as any predicated attributes of the things themselves.

For one reason or another, we seem to fluctuate between considering our world in terms of dichotomy and in terms of polarity. The dichotomy is expressed in pairs such as object-subject, extension-duration, etc. Ultimately it reduces to a grounding in space, and a grounding in time. A thing considered in spatial terms, we call an object; in temporal terms, an activity.

The polarization vista, suggested by pairs such as mind-body, can be reduced to a viewing of the spatial-temporal flux as either a system, or a structure.

Things within a system are characterized by their connections; in a structure, by their relations. Both are concerned with between-ness or interval, rather than with things as such.

Knowledge of things—which means predicate and verb associations—is for us a rarified and complex game. It has all the gratifying assurance of pinning tails on donkeys. Knowledge of the nature of intervals, of between-ness, is less common. However, our recent concern with polar thought, represented by increasing use of the ideas of system and structure, indicates that the issue is becoming important for us. At the present time, we are just in the process of determining what the terms should mean.



At issue is the question of whether we can "know" anything about what we have traditionally called the *ground* of things. Is there, for example, anything we can say about human activities previous to their inception of occurrence. Are they simply random acts of nature? Are there predictable goals which actualize humans in communal patterns, and verifiable rules which are acceptable in organizing such activities? What are the common characteristics of activities as such, by which we *recognize* them?

In Environmental Design, truth is not found by the formula of knowledge: it is not a question of verifiable predicate assertions of things. Rather, it involves matrices of possibilities, of validity of relationship within possible situations. Just as man is not and cannot be determined *as a thing*, so his inter-actions and trans-actions are not determinable as things. However, patterns of possibility can be determined, and things *hypothesized* from these patterns. A particular thing, such as one constructs in design, is then a member of a set of possibilities. It is neither right nor wrong in itself, but simply valid.

Ordinarily, design activity is focalized around a task. This task is given by class identification. It is, for example, to design a chair, a lamp, a house, a car, or whatever.

Three questions are posed by these simple statements. (11)

The questions are:

- |                        |  |
|------------------------|--|
| 1. What is it to have? | (The set of its physical properties)   |
| 2. What is it to do?   | (The set of its functional properties) |
| 3. What is it to be?   | (The nature, or thingness)             |

When we inquire into an existent thing, we do not ask what it is. (12) Rather, we ask what it has, and what it does. The question of what it is, is considered to be meta-physical—beyond physical knowing. And so it may be.

Not so, however, in human undertakings. We must know what a thing is to be, because man-made things have no only existence but purpose and meaning as well. (13) The question then becomes: What *should* it be?

This is in essence a verbal statement: A subject (3) acts (2) and has predicates (1). Ordinarily, (3) and (2) would constitute a subject-verb pair. Design assumes the verb (or function) to be transitive; i.e., wall, separates, people (or activities).

Also, there is suggested a direct, reciprocal relation between verb and predicate; one implies the other. Walls separate because they are extended; and they are extended because they separate. Extension produces separation in time; separation requires extension in space. They are simple correlates of one another.

The model is again in human terms. Agent—transfers power—to object.

12 We cannot ask about the relation or connection of a thing which was not designed by man. Or rather, we cannot be *certain* as to which of our hypotheses is correct, or whether the word "correct" even makes sense. This is simply to say that intention is not a valid predicate of a natural thing.

13 Ecologists make much of "nature's design," but indications point rather to equilibrium than to design. The concepts involved are those of conserving rather than attaining. We expect more of human acts.

14 The logical game is an illusionary refuge when based on universal predicate assumptions. To know that a house is a shelter is not very helpful so long as "shelter" is undefined. And undefined it must be, since it is a question of interpretation—in turn a product of the thing-context relationship. What is shelter in one context may be exposure in another. A designer cannot *tag* his product as being this or that; rather it must be understood as such.

15 Because living is taxing and difficult, we have adopted the doctrine of "principles," and made a virtue out of mechanized behavior. With pride we speak of "acting from principles," which means ignoring a situation by reducing it to a normative type. We substitute dogma for thought, and sanctified routine for response-ability.

How do we ask of a non-existent thing: What should it be? The traditional approach is to choose a category of being. We say: It should be like this one, or that one. Justification comes from rules of evidence, or abstract principles of behavior. The game is logical and syllogistic: All things of this kind should be such and such; this is of the kind; therefore, it should be such and such, etc. (14)

However, in Environmental Design the logic is drawn from the situation. No justification from outside has any bearing or force. Universal principles are anachronisms. (15)

To have meaning in Environmental Design, principles must be drawn from the situation, arguments from the principles and conclusions from the arguments. There can be no escape to universals. The problem is this here, this now, this one.

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When we inquire as to things within a situation, we ask three sets of questions: What questions, How questions, and Why questions. (16)

What questions:

1. What it is as a thing.
2. What it has as a thing.
3. What it does as a thing.

Thingness  
Properties  
Functions

How questions:

1. How it is what it is.
2. How it has what it has.
3. How it does what it does.

Modality  
Medium  
Method

Why questions:

1. Why it is what it is.
2. Why it has what it has.
3. Why it does what it does.

Relevance  
Place  
Use

The first question in all three sets is addressed to the existence and meaning of the thing. (17) The second is addressed to the physical properties as known in a spatial context. The third is addressed to functional properties as known in a temporal context.

The questions of primary importance to a situation are those of How and Why; those which refer to the relations a thing would have to the situation considered as a structure, and those which refer to connections a thing would have to the situation considered as system. These are questions of modality and relevance, respectively.

It has been customary to treat these questions as of minor importance. Things, we are told, are not part of situations, but belong to users. Like the What questions addressed to the things themselves, the model is one of simple ownership. (18)

See appendix: Three levels of Thought.

16

When we ask *what* a thing is, we can go on endlessly describing it in terms of properties and functions. But when we "collectivize" such description in terms of structure or system, then we explain. For example: the human body described bit by bit is a confusing and complex chaos. Described as structure, it takes on meaning, but meaning in the sense of modal possibility. It is a meaning of *signifying* both internal and external criteria, internal values and external constraints. Considered as system, another meaning is suggested; the relevance is that of *significance* of the whole as unit, its capabilities and potentialities.

17

Trigant Burrow studied the source and nature of human conflict for many years. He found it to center around concepts of ownership. Many of our value words express the importance that we give to ownership: property, proper, propriety; goods, good; rights, right; etc.

18

Our concept of things is similar to our concept of self. A thing is "that which underlies and bears (has) properties." A self is "that which underlies (subject) and bears predicates." Both are considered as owning, as being owners. Behavior (being plus having) is our dynamic mode, etc.

The user-thing pairing perpetuates this unfortunate tradition.

The question of "meaning" is a tired one by now, but it must still arise as long as human acts are construed to have purpose.



19 The phrase is after A.N. Whitehead:  
"Knowledge as such is a high abstraction."

20 We are accustomed to believe, in our pragmatic and materialistic society, that the acme of nonsense is represented by a things being "useless." Much of the current criticism of the design professions centers around the relative "usefulness" of what they are doing, as against the more "useful" goals they could be pursuing.

Environmental Design suggests that "use" can only be determined within a system. There are no extrinsic standards of a thing's being "useful." There are no universal criteria of "use," or universal values accrediting "usefulness."

21 Martin Heidegger, in his attempts to find a basis of human being has been forced to retreat to the pre-Socratic Greek thinkers. He finds there, apparently, a counter to the physical universals of modern science. The early Greek thinkers attempted to found general statements from a naive and anthropomorphic view, which Heidegger finds more validly human than the abstract universals of today.

One can trace a steady progression, in our culture, from mythological models of the universe, to physical models, to mathematical models. With the mathematical model, the general nature of things is best captured, but man has disappeared.

In human enterprises, the opposite seems to hold. Projects being with general relationships, progress through physical embodiments, and end as myths. Myths attempt to capture the *how* of occurrence and object, how they are, how they seem, the mode or manner of their being what they are. Myths are perceptual models of what is, not conceptual.

When we ask of a wall: what does it do? We answer: it separates. How does it separate? How does *this* wall separate?

However, the concept of "user" is a high abstraction, of the general order of all classificatory knowledge. (19) Use is a factor issuing from the dynamics of a situation, the temporal or activity aspect. Only because people are part of that situation and participants within it are there users.

There is no way to talk abstractly about use, users, or usefulness. Use simply involves the temporal *role* of a thing, just as place involves the spatial role. It serves to identify, but not to justify. There is no eternal value associated with a thing's being useful. (20)

Use explains functionally in terms of relevance. Method explains functionality in terms of modality; How does it do what it does? For example: If the function of a wall is to separate, *how* it separates would be its method, its manner or mode of carrying out the function. Use would explain *why* it separates, the purpose of such separation. (21)

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The most difficult question for Environmental Design concerns that of the inter-relationship of physical properties and place. Designers are accustomed to say that "Form follows Function," (22) or that all physical properties should have use correlates. That such is never the case is quite obvious, but it remains a source of embarrassment. What is to be done about properties whose functions have no use? What to do, for example, about the mass of a refrigerator, or the handle of a hammer between grip and head, etc.

The traditional approach is a typical retreat to abstraction. Rules are formulated to cover the surplus properties, and given the designation of "esthetic." (23) Intensive programs of education are instituted to convince others that the "esthetic" is good, and is to be desired above all things. In this way, solutions are by-passed for ab-solutions.

In other fields the use of the word "esthetic" is much less defensive. It is not used to designate What is done, but rather How. Mathematicians do not speak of esthetic theorems, but of esthetic proofs; writers do not speak of esthetic plots, but of esthetic writing or development of a plot, etc.

How a thing has whatever properties it has is a question of the medium in which it is carried out. How it does whatever it does is a question of the method by which functions are organized. These are the modalities of properties and functions as they are known within a situation.

A scientist would probably give a more general description in response. For example: It separates because people move, and it is a barrier. It separates because the human activity world is basically two-dimensional. This thickness of paper 40 inches in diameter is the human world. A barrier within that thickness would necessarily act to separate. *This* is how the wall separates. But function is not explained by a more general function (activity). *How*, as modality, inquires into the specific manner or way in which the function occurs, not *that* it occurs, or its cause.

A function of animals is that they move. How do they move? The index to James Gray's book, *How Animals Move*, lists the following: swimming, walking, running, jumping, creeping, flapping, flying. In the same way, one could respond to the question: how does a bridge cross a barrier? It may leap, reach, step, straddle, etc. All of these have technical correlates.

*How* a thing does what it does is one of the degrees of freedom a designer has in responding to a situation. *Why* it does what it does may be identical in any of a dozen different cases, but the issue is hardly settled at that point.

The question of form is one of the many 22  
formidable hang-ups which block communication in the design fields. Traditionally, it referred to object shape or appearance. Now, it is used in many fields as a synonym for the organization of any multiplicity, in such manner as to be comprehensible as a whole. In information theory, it is a measure of predictability of complete states from partial states, etc.

There are nine established theories of esthetics, 23  
all of which purport to tell what esthetics "is." Most attempt to prove their case on the basis of reason, explaining *why* the esthetic is, in fact, esthetic. Assuming they are all valid, which seems reasonable, how does one explain *how* the events occurred which produced what we characterize as esthetic? Certainly this latter preceded the former.



24 Traditionally, design has proceeded from an exact specification of use and medium as parameters, and place and method as constraints. As a result, functions were determined by use specification; properties by the medium.

How was the medium selected? Generally as a kind of symbolic expression of the use, as it was conceived in a generalized or universalized sense. If a thing was to be used to house governmental facilities, it should have these or those perceptual qualities; therefore, *this* medium seemed appropriate, etc.

Aside from considering the McLuhanesque conflicts of this axis, it would be interesting to consider its opposite: what if place were to determine method? What if *where* a bridge was determined *how* it crossed a barrier?

Just as functions are determined by use, so properties can be determined by place. Physical and functional are inter-dependent; both are dependent on their situation. (24)

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Traditionally, design has approached its task in the following way:

1. Needs and constraints are listed in more or less exact fashion.
2. Requirements stemming from such listings are assessed in terms of interactions.
3. An overall form conclusion is imposed on this array, giving what is called a "solution."

Recent methodologies do not vary from this pattern; they simply carry it to prodigious depths of complexity. The mystique of induction and synthesis—that things are given birth by a simple process of accretion—is still maintained.

Environmental Design suggests that this is all wrong, and always has been wrong. Things are not loose confederations of exact components. Rather it is the opposite; elements are given specificity within the exactitude of a thing. A thing is *this* one, not this kind of one. Elements, by themselves, are indeterminate future relations. They gain specification only within the concept of thingness.

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A thing is not an object, although it often has an object manifestation. Rather, it is "that which underlies." It can be conceived as both structure and system, insofar as it establishes rules of relationship and connective goals for subsumed elements (or properties).



A thing usually carries both object and activity manifestations; i.e., it has both spatial and temporal existence. It has extension and endures. Also, it is understood by us in both a conceptual (systemic) and perceptual (structural) sense. (25)

A thing, then is known to us in four ways:

1. As concept
2. As percept
3. As object
4. As activity

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The word "situation" is simply a larger thing. It is that of which the smaller thing is property and function. As property it is object-related; as function it is activity-connected.

A situation is a thing to a larger situation. Consequently, it can be conceived as standing between the larger and smaller, and serving to relate—connect them. This model carries through at all levels and scales. (26)

Environmental Design contents itself with working at one level above and one level below its point of contact. By this means, its product is integrated within the overall system. This reflects the polarity of Why and How, which in turn correlates with the conceptual and perceptual understanding. Also, this contrasts with design as such, primarily oriented toward synchronization of properties and functions. The contrast is that of the designing *of* things, and designing *for* things (situations). The verbal difference is small, but the existential difference is great indeed.

A conceptual model of a thing suggests its 25  
relevance or connection to the system of which  
it is part. In that sense, it can be defined as  
"purpose," in the sense of an intended role  
which it will play in a more general scheme.  
There is no suggestion here that such a role be  
slavishly obedient, harmonious, or such. It may  
well be stubborn, recalcitrant, or rebellious.

Likewise with a perceptual model. It denotes  
the relation or modality which a thing has (or is  
to have) within a going structure; *how* it is to  
be, in whatever pursuant role is indicated.

Conceptual and perceptual models are the two  
assertions which a designer can make relating  
physical and functional attributes. Often they  
are metaphorical in form, since they imply a  
reciprocal subject-predicate relationship.  
Example: "A wall is a separator." This could  
mean that because a thing is called a wall, then  
it separates; also, because it separates, it is  
called a wall.

See Appendix II: Conceptual and Perceptual  
Models.

This raises the question of internal-external and 26  
all the complications attached therewith. If  
internal-external is understood as a polarity,  
there is no problem. If, however, it is  
interpreted as a dichotomy—that all must be  
either inside or outside in some fixed and  
irrevocable posture—then there is a problem.

The best model is ourselves. We can conceive of  
our being in the world, in a group, etc., and an  
instant later reverse the picture. The world, the  
group, is now within us. From this ambiguity  
we construct an ego or peripheral boundary,  
the most defensive of our myths.

Things, to repeat, are modeled on ourselves.  
The resting point of thing-conception is that of  
between-ness.



## APPENDIX 1

### THOUGHT—LEVELS

The three levels of "vertical" thought are ways of asking about a thing. They ask questions of what, why, and how: What, why, and how it is what it is; and what, why and how it does what it does. These are questions regarding the physical and functional properties of the thing, and the realtions—connections they have among themselves and to the world.

### WHAT—THINKING

We address questions of *what* to the existent, here-and-now thing. We ask what it is, and what it does—in itself and without regard for past or future. The existent is taken as a simple given and examined for its understandable properties. These are abstracted and classified, and the thing is known by simple association. The thing is similar in some respects to this, and in other respects to that, etc. In this way we "sketch," or describe the thing. Listings of such abstract properties are called know-ledge, and can be considered separably from the thing. Such listings are in principle inexhaustable, but the thing remains as "that which underlies."

The word "subject" also means "that which underlies." Subjects have predicates, just as things have attributes. Truth is defined as consisting of statements of predicate-attribution which correspond to experience.

The word "what" is the Anglo-Saxon neuter form of the word "who." In this way we ask very similar questions when we ask: *Who* and *What*. The questions are those of identity.

### WHY—THINKING

Just as "what" is the neuter form, so "why" is the *interrogative* form of "who." To ask why is to search for intention, to question relevance, and inquire into meaning and purpose.

We assume that nothing understandable is arbitrary; and that a property has relevance to a thing, and the thing has relevance to the world. This relevance is not something either the thing or the world *has*, but is—in a sense—*between* them. A thing can have a function, but not a use; that is a matter of connection between thing and world.

This is especially true of man-made things. We assume such a thing was intended to be whatever it is, since to do otherwise would be absurd. We ask why it is as it is, and why does it do what it does. We cannot avoid such interpretation, since this is the manner of conceiving the world. (conceive—to take with)

### HOW—THINKING

The word "how" is also related to the word "who," and asks in what way or manner, or by what means the thing is and does. It asks about the state, condition, or meaning; not in terms of purpose, but in terms of effect. Properties are related to other properties, and things related to other things. To ask *how* they are so related is different than to ask *why*.

A thing is related to other things in a direct, perceptual way. As soon as it exists, we give it perceptual meaning—determined in large part by the relationship it bears to other existent things. We cannot isolate it from its context, and treat it as a thing apart. It becomes a part of a larger perceptual whole.

The same applies to properties of the thing. They are either successful or unsuccessful insofar as they bear a coordinated relationship corresponding to the general interpretation of the thing. They are not good or bad, right or wrong, in themselves. Such can exist only when considered in isolation and judged by abstract rules.

### Why and how; Relevance and Relation

What—thinking is oriented solely toward the thing. Why-thinking is oriented toward purpose and use, and is directed toward consideration of an intentional future. How-thinking is oriented toward mode of being within an existent fabric.

Why and How explain a thing. They do so by relating to the past and connecting to the future; i.e., the on-going and external world. Things cannot exist without such relationships, since they cannot exist in and of themselves.

When we inquire into existing things, we ask such questions as a matter of course. Attributes which a thing has are interpreted both as properties of the thing, and as relations-connections to the world. Internal and external are thereby united, and the sharp distinction between them erased.

When designing things we proceed in opposite fashion from simple investigation of the existent. We begin by establishing connective and relating patterns, which are then converted into properties. These are in turn organized as internal physical structure and functional system, coordinated with each other to produce one thing.



When we design, we design for and within a situation. Designing-for is relevantial; design-within is relational. These two determine the possibilities from which choice can be made. Such choice constitutes either a conceptual or perceptual model for which the final designed thing is a specific case.

## APPENDIX 2

### CONCEPTUAL AND PERCEPTUAL MODELS

A. We can consider the behavioral evidence of human thought to take the form of four kinds of assertion:

(1) Assertions which *communicate*; or establish or place in common with others some area of discourse (universe of discourse).

(2) Assertions which *inform* or which give form by specifications to something of which a generalized image is held.

(3) Assertions which *express* or make manifest the feelings and subjective responses of someone.

(4) Assertions which *propose* or which advance opinions, judgments, or evaluations of fact or truth or which *authenticate* such statements ("knowledge" statements).

The first three assertions are within the capability of many—if not most—animals. The fourth propositional language as such, is by unanimous agreement exclusive to humans, and is probably the best evidence of what we call conceptual thought.

B. Even though unanimous agreement exists on the point that a propositional language is unique to man, it is not at all clear as to whether such language is dependent on conceptual ability, whether conceptualizing is dependent on conceptual ability, language faculty, or whether both are evidence of some higher mental function unique to man. Since the issue is unresolved, we can only look to the behavioral evidence which exists in the form of language.

The general form of the English language is subject-predicate; something is named and then some property of function is attributed to it. Five examples:

1. The man is tall.
2. The man is a carpenter.
3. The man is black.

4. The man is virtuous.
5. The man is a thief.

Superficially, these five statements all look alike, but this is an illusion. Each can be tested in turn to discover *what we are talking about*, and each will be found different, some subtly, others dramatically.

C. (1) The man is tall.

This is (usually) a simple perceptual observation, and could without violence be recast simply as an adjective and noun: tall-man.

(2) The man is a carpenter.

Here we are attributing a function, or participation within a general activity, rather than a property of the man; i.e., something he can be said to *have*.

(3) The man is black.

At this point, interpretation is ambiguous. We could mean:

a. That blackness is a property to be attributed to the man in the same way as we would attribute tallness, left-handedness, etc.

b. Or, "The man" is a representative (symbol) of a general class.

c. Or, the statement is a metaphor, of the general form; "Abraham Lincoln is a ships-captain," (Whitman); or "Abraham Lincoln is a pine tree," (Masefield).

The first reading would, again, be perceptual in origin. We could change the form simply to "black-man." the second could also be perceptual if the criteria of classification were simply "blackness," or "black things." But, in effect, "black" is now subject, and "man" is a property attributed to it. Using the previous simplification, the form could now be recast into "man-black" in contrast, perhaps, to "woman-black," or "child-black."

If, previous to such classification, we have a firm idea of *the class itself*, by which members attributed to the class are constituted, we must call this a concept.

(4) The man is virtuous.

This statement could be taken simply as attributing a property or tendency toward acting in a certain manner; or as awarding membership to the class, "virtuous people." However, it is clear that the first would be quite meaningless without a prior *concept* of the



second. Certainly, virtue is not a perceptual observation as such, but is identifiable only by reference to standards established by a concept.

(5) The man is a thief.

Here the subject (man) is clearly converted to a predicate (or property). The man's being a thief has converted him from person to thing, and he is classified as firmly as sorting a potatoe. Perceptual recognition would again be possible when the (rather simple) criteria of class membership were made known. But such criteria depend on a whole string of prior concepts: "Thou shalt not steal;" stealing is taking another's property; property is that which a person owns; ownership is the right of possession; possession is the privilege of capture, etc.

D. Perceptual thought is that which gives us the ability (know-how—to classify. Conceptual thought constructs *the reason why* the classification takes place, or is significant. The statement, "The man is black," would be quite meaningless unless we had previously established a proposition which explained why the color of a man's skin is a significant mode of classification. The point is that a simple assertion of this kind, which sounds communicative and/or informative, is so only when the motive for making it has been established. Concepts assert the *relevance* of the observation. Without concepts, the statement would be simply relational; i.e., the man is darker than, just as we would say taller than, heavier than, etc.

E. When we ask, "What is a city?", we could respond with a purely descriptive statement as to what cities are. On the other hand, we might answer with a statement such as recently made by Christopher Alexander: "A city is a mechanism for sustaining human contact." It is important to recognize that such a statement is not a direct response to the question, but rather a response to the question, "Why is a city?" It is neither informative nor communicative but propositional, and therefore conceptual. It is one hypothesis of the meaning and significance of the classification, "city."

A perceptual hypothesis, on the other hand, would be addressed to another question: "How is a city?" What is its manner or mode of being whatever it is? Clearly, the question concerns the relational structure of elements rather than the relevance or purpose of them.

F. Although we can usually see more possibilities in *how* things are (or could be) than in *why* they are (or could be), this assumption is not justified. For every conceivable how-state there is a corresponding why-state, and vice-versa. The poverty of what-is outcomes is largely due to our lack of diligence in exploring conceptual possibilities, and in constructing perceptual models expressive of them.

This condition might be better approached in future by reversing the procedure: building perceptual possibilities, and constructing conceptual models explanatory of them. Obviously, this cannot be achieved, however, in abstraction from the existent world, for the very mechanism of perception is one based on relationship.

G. It might be asked; why, if this is so, are concepts and conceptual models necessary, or even relevant? Perhaps the best answer is the following: concepts connect events and objects into *overt patterns of meaning*, into systems of purpose ascribed to. Perception is not without meaning, but it is felt, not articulated. Concepts are necessary to give felt experience intelligibility. Whether we call them truths, myths, or fantasies, they seem necessary to tie together scattered fragments of experience into meaningful wholes.

## APPENDIX 3

### OBJECT AND ACTIVITY MODELS

In contrast to perceptual and conceptual models, which are considered as levels of "vertical" thought, object and activity models are classed as "horizontal" thought. They constitute degrees of *complexity*, whereas the vertical constitutes degrees of *difficulty*.

A *thing*, in Design (or elsewhere) is actually a thing-known. It is our mental image, idea, memory, construct, etc., the result of an intersection of ourselves and the world. Things may be scientific, cultural, social, or personal, depending on the bias and characteristics (factors) chosen to represent some external reality. Their significance consists in their use in relating ourselves and the world, both individually and collectively.

The classic definition of thing is: *A thing is that which underlies and bears properties*. The word "property" suggests "that which is proper to" (some-thing), and can be considered as either static or dynamic; i.e., physical or functional, a spatial property or a temporal property. Physical properties are attributed *to* a thing; functional properties are postulated *of* a thing. These can be considered as characterizing that which a thing *has* (attributes), and that which it *does* (functions).

Ordinary language uses this form, in the sense that predicates assign attributes to the subject, and verbs assign actions (functions).

Example: The man is tall. (attribute)  
The man runs. (function)



When we combine these, we say: The tall man runs. The form taken: Attribute—thing (subject)—function.

Both functions and attributes are additive; that is, they can be "summed" into more general collectivities, and reduced to discrete atoms, at will. A movement toward the left (above) sums up adjectival attributes to produce an *object*; a movement to the right sums up functions to produce an activity. Both can be considered as *objective* when the results can be understood in their own right; i.e. independently of the subject, or thing. The School of Design, for example, can be analyzed and understood as a set of physical attributes which comprise a generalized object; on the other hand, it can be understood as a set of functions which comprise a generalized activity. These, in turn, can be added to other objects and activities at N.C.S.U. to produce even more generalized patterns.

"Horizontal" thought is entirely classificatory and descriptive. It relies on known values and known types (archtypes), to which reference is made when making object or activity definition and decision. It is the opposite of "vertical" thought in that it assumes that the overall structure and system, of which it is a part, should be the outcome of itself and other similarly determined things. Just as it (itself) is constructed of many "atomic" judgments so the overall is constructed. The reasoning is similar to that of "states-rights," or local autonomy in government: that those most directly concerned are better able to make sound judgments as to their needs, and that the overall pattern should simply comprise a summation of those decisions. This attitude, essentially a conserving one, tends to balance excesses on the part of generalist thinkers who assume that the part exists *only* for the whole.

The weakness of "horizontal" thought and design stems from its reliance on tradition and the past, which it consciously or unconsciously accepts, and its tendency to indulge in a kind of romantic *automatism* in design procedure. Because existing things can be completely resolved into summative listings of attributes and functions, it is assumed that the opposite procedure is also possible, and valid; i.e., if we can specify each attribute and corresponding function with consideration and care, the resulting collectivity must be a sound one. But this procedure is possibly only if the outcome is *already designed*. Only to the extent that we are willing to accept existing object types and existing activity definitions is it possible to consider "horizontal" design as a satisfactory model of design procedure. Otherwise, it must be considered as "necessary but not sufficient," in the classical phrase. Unless supplemented by "vertical" thought (why and how), it becomes sterile and mechanical, substituting endless complexity for wisdom of purpose. By the same token, "vertical" thought without "horizontal" becomes empty and futile. They are interdependent.

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**RUSSELL DRAKE**, formerly a teacher of perception and communication in the School of Design, is also a graduate of the School in Product Design. An artist with interests in musical harmony and composition, Eastern art, and the enciphering systems used in allegorical literature, he presents here some of his thoughts on perception and allied problems.

# **PERCEPTION, RECALL AND COGNITIVE LEVELS**

**Russell Drake**



## PERCEPTION

Mullah Nasr Eddin was the most notorious smuggler in Central Asia. His donkey train crossed the frontiers everyday and, though he openly admitted to being a smuggler, the frontier guards found nothing in the baskets but straw. They searched his person, the donkeys' orifices, sifted the straw, soaked it in water which they evaporated looking for residues, and burnt it and condensed the smoke, but found nothing. Meanwhile the smuggler was becoming visibly more prosperous.

Finally he moved to another country to retire. One of the border guards, also retired, met him there years later.

"You can tell me now, Nasr Edin," he said. "Whatever was it that you were smuggling right under our noses all those years?"

"Donkeys," said the Mullah. (12)

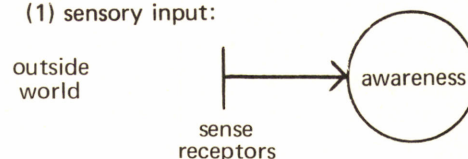
This story illustrates some essential aspects of perception.

"Perception involves an act of categorization...we stimulate an organism with some appropriate input and he responds by referring the input to some class of things or events." (2)

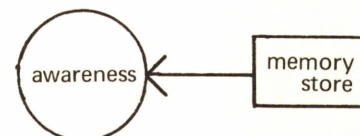
The organism (in this case: border guards) was stimulated by sensory input (donkeys, baskets, straw, etc.), and responded by referring the input to some class of things or events (places for hiding contraband).

Perception, consequently, requires information from *two* sources:

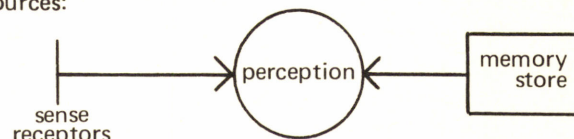
(1) sensory input:



(2) associations from past experience (stored in memory):



Perception is the *interaction* of information from these two sources:



Incoming sensory data, from present experience is recognized through connection with associations from past experience.

The problem with this interaction, personified by the border guards in the story, is that usually one's associative input interferes with one's sensory input. *Overactive associative input excludes incoming sensory data which do not correspond to the associations.* Important sensory data enters the nervous system but, like the donkeys entering the country, is simply not perceived.

The diagram of one's usual perceptual state consequently looks more like this:



This associative dominance has two major consequences.



This first is that the associative category may not fit the sensory reality. This is called non-veridical perception.

The second is that awareness of the category, even if it happens to correspond to the reality, is still overdominant and is, in effect, mistaken for the reality. Words become more important than the things referred to, and one 'lives in one's head,' disconnected from any experience other than his own associations.

In relation to the design profession, the first consequence—the mis-match of category with sensory cue, or non-veridical perception—may result in problem mis-identification. For example, an architect—like the border guards in the story—will frequently look for a solution to a problem within a certain category (architectural) when the problem itself may exist on a completely different level (e.g. social, legal, educational, etc.).

The second consequence, being unaware of the various levels of one's own experience, leaves the designer in no position to design for the experience of others. He designs environments which nominally satisfy the requirements he is capable of formulating, but which may create an abysmally unsatisfactory experience for the user. He—again like the border guards—completely misses what is essential in the problem.

In addition, the lack of contact with other levels of one's experience produces a lack of contact with the essential sources of one's creativity. This aspect will be discussed later.

The question which arises is: *Can one's perceptual state be improved? And if so, how?*

Bruner, in discussing remedies for non-veridical perception, states:

"...veridical perception...depends upon a state of perceptual readiness that matches the probability of occurrences of events in the world of the perceiver. This is true, of course, only in a statistical sense. What is most likely to occur is not what will occur, and the perceiver whose readiness is well-matched to the likelihoods of his environment may be duped... The only assurance against (this) is the maintenance of a flexibility of readiness: an ability to permit one's hypothesis about what it is that is to be perceptually encountered to be easily *informed by sensory input*." (2, my italics)

How can hypotheses be "informed by sensory input"? Unfortunately, Bruner doesn't say.

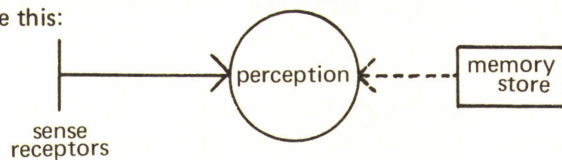
Since having infirm hypotheses to begin with seems sufficiently ludicrous to discredit as a possibility, perhaps one could increase the intensity of sensory input. This requires the creation of specific external conditions (e.g. a sensory overload environment) which may momentarily alter one's perceptual relationship to *that* environment, but which unfortunately will not permanently alter one's normal perceptual relationship to his everyday environment.

The only way this relationship can be changed effectively is *from the inside* of oneself rather than from the outside.

It involves increasing one's *awareness* of sensory input, rather than increasing the input itself.

There are existing techniques for increasing sensory awareness. They are, according to Gunther, exercises "...to quiet the overdominant verbal preoccupation of the mind...and focus consciousness on direct sensory experience..." (4)

This would amount to the subordination of categorizing, and other associative activity, to a more dominant awareness of sensory input. In the diagram it would look like this:



Some of the consequences of this shift in awareness are:

One's awareness, rather than being occupied by unnecessary associative activity, would simply have *more room* to perceive more aspects of a stimulus. In laboratory experiments subjects with a high degree of associative interference were found to perceive *fewer* aspects of a stimulus than low interference prone subjects (Klein).

In certain other experiments subjects frequently report the size or shape they *know* a stimulus object *should be* even when this is grossly contradicted by the size or shape it actually appears to be. They are reporting their associative reaction rather than the contradictory experience of present reality. Idries Shah, commenting on the donkey story, states that "... the average person thinks in patterns and cannot accommodate himself to a really different point of view ...". The shift of awareness from the dominance of past experience to that of present experience will admit a stronger impression of the uniqueness of the "here and now" and should permit more reliance on present reality even when aspects of it contradict past conditioning. In other words, one would simply be more *open*. Associative input would be reduced to its useful role of facilitating one's orientation to the "here and now" rather than substituting for it.

Before examining methods for controlling this shift in awareness it is necessary actually to experience the difference between one's awareness being occupied by associations and awareness being occupied by sensory

input. So far we have been thinking about it in the form of theory and diagrams.

It is necessary to understand the actuality of what is involved, rather than just knowing ideas about it.

The following exercise utilizes low threshold levels of sound, which cannot be heard in the presence of associative interference, as a framework for this experience.

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*Exercise: listening to ambient sounds.*

Your mind is usually filled with continuous verbal associations.

The environment is filled with low-level sounds, called ambient noise. This noise (below about 40 dbls.) is usually unnoticed because it isn't loud enough to *attract* your attention away from the associations that normally occupy your mind.

It can be heard.

To hear it, you have intentionally to shift your attention away from your associations onto the sensory reception of sound.

This is an exercise to experience the difference between:

consciousness being occupied by sensory input, and

consciousness being occupied by verbal associations (thinking, verbally recognizing, or daydreaming).

Go somewhere where it's relatively quiet.

Sit or lie down.

Get comfortable.

Close your eyes.

Be quiet. Relax.

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Listen: wind blowing, birds singing, distant voices, motors, dogs barking, flies buzzing, etc.

If you identify the sounds, try not to think about them, just listen.

Notice that when you can hear these quiet sounds clearly, the verbal associations in your mind have stopped.

In a few seconds they'll start again.

Notice that when they do, you've stopped hearing.

Listen again.

Notice that when you can hear, you've stopped thinking.

Notice that in a few seconds the associations start again. Then you've stopped hearing.

Listen again.

Etc.

Do this until you clearly *experience* the difference between hearing and thinking.

*You can't do both at once.*

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It should be clear from this exercise that the more you hear, the less you associate. The more you associate, the less you hear.

*Increasing* perception depends on *decreasing* associations. (Not irrevocably and forever, but simply for as long as you want to perceive something... probably in terms of minutes or even seconds.)

The ability to decrease associations intentionally in order to increase perception depends on the ability to control

your attention: to shift it from associations to incoming stimuli.

There are specific techniques to gain control of your attention.

Before beginning these techniques, it is necessary to know *why* you're doing them. You need to experience the difference between thinking and actually perceiving.

The purpose of the ambient sound exercise is that this difference is immediately made clear. The difference with visual stimuli may not be so clear initially. With your eyes open and light coming in, you tend not to notice that, though you seem to be looking, you're not really *seeing*.

In listening to ambient sounds, either one hears them or one doesn't. The two states of perception and non-perception have a different psychological flavor.

Perception is characterized by:

- (1) relative cessation of associations,
- (2) awareness of sensory input, and
- (3) awareness of the *effort* of controlling your attention which produces (1) and (2).

When the difference in this flavor is recognized, one can understand the need to learn how to make this effort. Perception, in the sense of increased awareness, *doesn't happen by itself*.

*By itself, one's attention follows the path of least resistance (or greatest attraction): it follows one's associations (thinking or daydreaming) until a strong enough external stimulus momentarily attracts it.*

*The recognition of this stimulus produces a new flow of associations which distracts one's attention away from the stimulus back into one's head. Perceiving stops until*

*another stimulus, or aspect of a stimulus, attracts your attention.*

It should be evident that this kind of perception, which recognizes a piece here and a part there, misses quite a bit.

How can one prevent associative distractions from interfering with perception?

One has to be able to *control* one's attention.

In order to control it, it has to be *anchored* somewhere.

Unfortunately, it won't stay anchored on the stimulus—that is, you can't simply 'concentrate' for very long on something external to yourself, because this doesn't reduce associative distractions.

The only place it can be anchored which will reduce this distraction is on the *physical sensation of your body* rather than on an external stimulus.

Paradoxically, in order to increase awareness of something external to yourself, you have to increase your awareness of yourself.

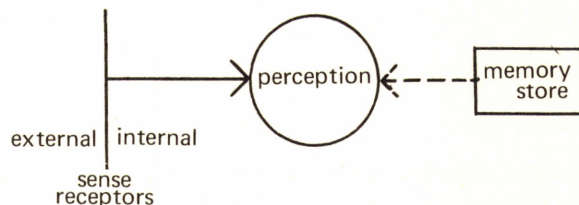
This is the function of certain relaxation techniques. They focus your attention on the physical sensation of your body. Anchoring your attention in your body shifts it away from associative activity, and the resulting physical relaxation directly reduces this activity. It diminishes its distractive power. It opens you up to the reception of sensory impressions.

Thurstone (14) in administering and cross correlating sixty different perceptual and intelligence tests included only *one*, the Two-Hand Coordination Test (13:49), which explicitly required some degree of body awareness. This test was found to be the strongest indication of an ability (called

Factor 'E' by Thurstone) which is clearly related to Bruner's "flexibility" in allowing perceptual hypotheses to be "informed by sensory input."

Witkin found that the extent to which subjects exhibited this "flexibility," which he termed "field independence," was determined by a variety of factors, one of which was "prominence of postural experience" or degree of body awareness. Of these factors, body awareness is the *only one* which is not external to the person himself and is, consequently, the only factor potentially under one's control. (15)

Since the physical sensation of one's body is itself internal sensory data, received by proprioceptors and transmitted via afferent conduction *along with* external sensory data, it would follow that an increase in the awareness of physical sensation should shift perceptual dominance toward sensory input and away from associative input.



Increased awareness of physical sensation results from certain relaxation techniques. Gunther's Sensory Awakening method, for example, begins with a basic relaxation exercise to increase body awareness (4:10). This exercise is similar to those used in Zen, Yoga, and some forms of psychotherapy, for the same purpose.

Relaxation techniques fall generally into two categories.

The first are methods usually connected with hypnosis techniques. They are based on suggestion resulting from the repetition of verbal formulas: "My arm is getting very relaxed. I'm getting very sleepy. Etc."



The problem with this approach is that thinking about relaxing is not relaxation. If I think: "My arm is getting relaxed," it may relax to some extent, but no further.

More successful methods are based on the *direct awareness of the physical sensation of muscular tension*.

Instead of thinking about your arm being relaxed, direct your attention to the actual physical sensation of it. The awareness of the sensation itself will relax it.

"Paradoxically step one in learning how to relax is to become more aware of physical tension . . . This giving up is not done by avoiding tension but by experiencing it . . ."  
(4:34)

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#### *Preliminary Exercise in Relaxation*

Try to become aware of the physical sensation of your right arm.

Don't think about your arm. Don't repeat verbal formulas. Don't try and form a mental image of it.

*Awareness of your arm happens in your arm, not in your head.*

Don't try and create sensation by tightening your muscles. Just become aware of the normal sensation that is always there.

When you become aware of this sensation, *let your arm relax*. Don't try and force it, it will relax by itself. Just try and hold your attention on the sensation.

Notice the similarity with the ambient sound exercise:

when you have a strong awareness of your arm, associations have diminished;

when they start again, you lose the awareness of your arm.

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Physical sensation is similar to ambient sounds: it is there all the time but you don't notice it because of mental pre-occupations.

Continue the effort until you clearly experience the difference between sensation and associations. When this is clear, try the following, which is a basic relaxation exercise similar to Gunther's.  
(4:10)

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#### *Basic Relaxation Exercise*

Go somewhere where you can be alone in quiet surroundings.

Sit with your back straight, but not rigid (in a straight back chair, on the floor against the wall, on the ground against a tree, etc.).

Get comfortable enough to sit for at least fifteen minutes without moving.

Close your eyes.

Begin with your face.

Concentrate your attention on the physical sensation of your forehead.

Don't try to think words. The words will come, but if you don't pay attention to them, they'll go away.

When you receive a clear impression of the sensation of your forehead, let it relax, and then move your attention down to your eyes.

Hold your attention there until you can feel them relax.

Then your lips.

Chin.

Neck.

Go back and sense your whole face for a few moments.

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Then shift your attention to your right shoulder.

Move it slowly down your right arm. (It may feel like water soaking into dry wood.)

Do each section separately: upper arm, forearm, hand, fingers.

Go back and sense the whole arm. Experience the pull of gravity on it.

Then shift your attention to your right hip.

Go slowly down the sections of your leg: thigh, knee, calf, ankle, heel, arch, toes.

Sense your whole right leg.

Then shift your attention to the toes of your left foot.

Come up your left leg the same way you went down your right.

Sense your whole left leg.

Shift your attention to the fingers of your left hand.

Come up your arm, in sections, to the shoulder.

Sense your left arm.

Then shift your attention to the base of your spine.

Then come slowly up your spine, shoulders, neck, back of your head, to your scalp.

Try and sense your whole back.

Then shift your attention to your face as a whole.

Then your whole right arm.

Right leg.

Left leg.

Left arm.

Back.

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Then try and sense your whole body at once.

You can't maintain this total sensation for long.

You have to keep your attention *moving*.

Your attention will become distracted by thoughts and fly back into your head like a window shade rolling up.

Let it come down—slowly and gently—into your body.

Circulate it again through the major parts as a whole: right arm, right leg, etc., if you need to.

Then try again to sense your whole body at once.

Become aware of your breathing without trying to manipulate it.

Maintain this awareness for awhile.

Then slowly open your eyes.

This routine is just a suggestion. You can vary the order any way you want.

Try and catch yourself at various times later in the day and contrast the sensation of your body at that time with the memory of the way it felt during the exercise.

Notice that at the moment when you caught yourself, you were not aware of your body.

Body awareness requires an intentional effort.

It doesn't happen by itself.

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## Episode from the Tale of Janshah:

... Janshah and the merchant fared forth from morning till noon when they reached a lofty mountain to whose height was no limit. The merchant dismounted from off the back of his mule and bade Janshah dismount, whereupon he dismounted. Then the merchant gave Janshah a knife and a rope and said, "I desire of thee that thou slaughter this mule." So Janshah tucked up his garments and, going up to the mule, tied the rope to her legs and threw her to the ground. Then taking the knife, he slaughtered her and skinned her and cut off her head and legs and she became a heap of flesh.

Whereupon said the merchant, "I bid thee slit open her belly and enter therein, and I will sew it up upon thee. Then remain there for a time and whatever thou seest in her belly inform me thereof." So Janshah slit the belly of the mule and entered it. The merchant sewed it up upon him, and withdrawing to a distance, hid himself in the foot of the mountain.

After a time, a huge bird swooped down on the mule and, snatching it up, flew off. It alighted on top of the mountain and would have eaten the carcass, but Janshah, perceiving the bird's intent, slit open the belly of the mule and came forth; whereupon the bird, seeing Janshah, was startled and flew off. (1)

This episode, from a Sufi tale in Arabic, was written as a multi-level communication of aspects of a certain experience.

On one level, the images are allegorical. Entering the carcass of a mule is clearly an image of body awareness: one's awareness entering within one's (otherwise) 'dead' carcass.

Fortunately, for Westerners—who are conditioned to perceive literal meanings—there is a (somewhat) less allegorical level of the story. This level is encoded by means of certain peculiarities of the Arabic language. The mechanism of the code is too complex to explain here, but is described by Shah, and is used by Western scholars to find multiple meanings in Arabic poetry. Briefly, one can, with an Arabic-English dictionary, derive the encoded meanings of the Arabic words directly in English without knowing any more Arabic than how to find the words in a dictionary.

For example, some of the words in the following phrase:

"I bid thee slit her belly and enter therein and I will sew it up . . . "

decode to these concepts (literally quoted from an Arabic-English dictionary ):

*to penetrate*  
*to be inside*  
*to appear* (....her belly)  
*to bring to light*  
*internal state of man*

*inner part*  
*hidden part* (and enter)  
*mind, heart*

*penetrating, piercing through*  
*thick, intense darkness* (and I  
will sew it up)

The concept is clearly that of penetrating into one's otherwise murky interior and bringing to light one's inner state.

Various aspects and results of body awareness are then developed through the imagery. The aspect of self

perception is explicitly emphasized:

"...and whatever thou seest in her belly  
inform me thereof."

*to see, to look in a mirror*  
*to show one self* (thou seest)

*to penetrate*  
*internal state of a man*

*to know*  
*to be fully aware of*  
(inform me)

The concept is the ancient one of "know thyself."

In addition to the aspect of self-perception resulting from  
body awareness, the function of the body as an anchor for  
one's attention is indicated by the juxtaposition (in Arabic)  
of the words "mule" and "bird."

"And after a time, descended on the mule a  
bird . . ."

*to gain mastery over*  
(the mule)

*scattered, dispursed*  
*volatile substance (i.e. attention)*  
(a bird)

Body awareness is the means for gaining mastery over one's  
scattered attention.

A variant reading of the word "mule" in the above passage  
leads into a fuller interpretation of the flight of the bird,  
carrying Janshah to the top of the mountain, as a religious  
experience. A bird, allegorically, is usually  
consciousness—or attention: a rudimentary aspect of  
consciousness—"scattered, dispersed, volatile substance")  
and being carried to the top of a mountain is an image of

consciousness expansion.

As the concept of religious experience is no longer very well  
understood in the West, the essential ingredient of contact  
with the "mountain" or one's "inborn, essential nature"  
(the "highest" part of oneself) can probably best be  
understood with whatever concepts the reader might have  
acquired from Eastern literature: such as the *Atman* or  
"overself" of Hinduism, or the concept of one's "Buddha  
nature" from Buddhism.

"And after a time, descended upon the mule a  
bird huge and snatched it up and flew. Then it  
alighted on top of the mountain . . ."

*to experience*  
*traces, impressions of*  
(after a time)

*the highest part* (descended upon)  
(one's Buddha nature)

*to rise (sun)*  
*to blaze (fire)* (the mule)  
*to dazzle*

*volatile substance* (a bird)  
(Consciousness)

*to wonder at the magnitude of* (huge)

*to ravish the mind* (and snatched  
*to be rapt in ecstasy* it up)

*volatile substance* (and flew)

*root, origin, middle of a thing*  
(Buddha nature) (then it alighted)



*the highest part*  
*(Buddha nature)*

*(on top)*

*to be clear, evident*  
*inborn, essential nature*

*(of the mountain)*

The concept of experiencing or receiving a direct impression of one's "inborn, essential nature," with the resultant effects of "wonder" and "ecstasy" is clear. Though a complete religious experience is indicated as the ultimate result of body awareness, this experience lies largely outside the sphere of Western interest. A more moderate degree of consciousness expansion—simply sensory awakening—can result.

"... then it alighted (with the carcass) on top of the mountain and intended to eat it, but felt Janshah the bird ..."

*to be clear, evident*

*(the mountain)*

*to look stealthily at*

*(and intended)*

*to be on the watch*  
*to be awake*

*(to eat it)*

*to wake, to rouse*  
*the five senses*  
*to know*  
*to perceive*

*(but felt)*

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*Exercise: connecting body awareness with looking.*

Find a quiet place outside, if possible (rather than in a familiar room).

Sit, preferably, before a vast panorama.

Look it over carefully.

Then close your eyes and do the relaxation exercise previously described (or any variation).

When you become aware of your breathing, open your eyes a crack, so that only light comes in.

This will usually shatter the awareness of your breathing.

Try to recover it.

When you do, open your eyes a little further, etc. ... until they're wide open and you can still maintain the awareness of your breathing.

Look over the panorama again.

Reinforce the awareness of your breathing as necessary.

Try to divide your attention and be aware of both seeing and breathing at the same time.

Compare what you see now with what you saw before.

It may appear as if you're seeing the scene *as if for the first time*.

Try and be aware of your feelings.

Do you feel different? Like *alive*?

Compare this experience with any previous experiences of suddenly seeing something familiar as if for the first time.

Compare this experience with the exercise of listening to ambient sounds. Can you clearly distinguish between being aware of visual input and being occupied by mental activity?

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"There is nothing, after all, in the Zen masters *kyogai* (inner state) which differentiates itself as something wondrous or extraordinary. It consists, as in all other cases, in scenting the fragrance of the laurel in bloom and in listening to a bird singing on a spring day to its heart's content. What, however, makes a difference in the case of a Zen master is that he sees the flowers as they really are and not in a *dreamy* sort of way in which the flowers are not real flowers and the rivers are not really flowing rivers."

Can you tell the difference between seeing in a "dreamy," i.e. *associative*, "sort of way," and simply seeing? Do you really *see* a tree? Or do you just *know* it's a tree?

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### *Multi-sensory Exercise*

Do the basic relaxation exercise in any environment, interior or exterior, where you can be undisturbed.

Become aware of your breathing (without trying to alter it), or hold your attention on the sensation of some part of your body. (You can't maintain a total sensation of your body for long. You can only do it with a part: breathing, your face, an arm, your feet, etc.)

While maintaining some degree of this sensation, focus on the input of different sensory channels one at a time:

- seeing
- hearing
- smelling
- tactile sensations (of your clothing from the  
inside, air movement on your skin, etc.)
- temperature

Do the exercise again using a short activity: walk a block, take a bath, get dressed, eat something, etc.

Focus, one by one, on each sense.

You have to perceive systematically, i.e. focus intentionally on one sense at a time. Otherwise, though your threshold of awareness will be lowered through maintaining some form of body sensation, your perception will be dependent on what you happen to notice. *You can't be aware of everything at once.*

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## RECALL

Zen students are with their masters at least ten years before they presume to teach others. Nan-in was visited by Tenno, who having passed his apprenticeship, had become a teacher. The day happened to be rainy, so Tenno wore wooden clogs and carried an umbrella. After greeting him Nan-in remarked: "I suppose you left your wooden clogs in the vestibule. I want to know if your umbrella is on the right or left side of the clogs."

Tenno, confused, had no instant answer. He realized that he was unable to carry his Zen every minute. He became Nan-in's pupil, and he studied six more years to accomplish his every-minute Zen. (10)

There is another aspect of perception: access to past perceptual experience, or recall.

Recall techniques fall into two categories.

The usual approach is based on verbal associations. (Cf. a very good study by Haber and Erdely: *Emergence and recovery of initially unavailable perceptual material.*) (5)

The problem with this approach is that one doesn't *directly* recall the actual experience, but recalls verbal associations connected with the experience. Actual sensory memory may or may not be connected with these associations, but the point is that it's not the *words* you are concerned with, you want to be able to *re-experience the experience*.

A more direct approach is possible.

Perceptual information, particularly visual, is stored in what is frequently called the *visual motor-system*—not in the verbal memory store. (The motor-system will be discussed in more detail in connection with cognitive processes, but for present purposes: the motor-system is more or less *recognized as being the mechanism of visualization.* (7) )

In order to gain access to sensory memory it is necessary to 'think' directly with the motor-system.

This is not as mysterious as it may sound. Try the following exercise.

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### *Exercise: perceptual recall.*

Practice this exercise at night when you get into bed. It can be used, however, any time of day.

Relax. Close your eyes, and visualize everything you did during the day, up to that time, *backwards*. That is, start from where you are—in bed for example—and visualize yourself getting into bed in reverse and going backwards to what you did just before you got into bed, what you did before that, where you were before that, where you came from in order to get there, and so on back to when you got out of bed in the morning (which you get back into in reverse).

Don't try and think, "I did this—I did that." The point of doing it backwards is to thwart verbal-logical associations of "I got up—then I brushed my teeth—then I got dressed—then I went out," etc.

Do it visually and rapidly.

If you *keep moving* and don't let yourself become side-tracked by the wealth of detail, or by verbal formulations, *you can recall your whole pathway of movement throughout the day in a few minutes.*

This is thinking with your motor-system.

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After clearly experiencing the difference between this kind of thinking and verbal thinking, the next step is to attempt to immerse yourself in the available detail.

The danger is that you'll lapse into uncontrolled associative thinking since, by stopping along the pathway, you lose the movement control that induces visualization. If you suddenly notice that you're thinking about something that happened yesterday, or ten years ago, stop and start over. If this happens too frequently to produce any results, you probably need more experience with the rapid visualization part.

Begin with some degree of physical sensation (either from the whole relaxation exercise or part of it).

Pick some point on the pathway that you want to investigate and try to recall your different sensory impressions *systematically* i.e., one mode at a time (and not just by whatever happens associatively):

What did you see? (Recall visually, not verbally.)

What sounds did you hear? (Not the names of the sounds, but the sounds.)

What did you smell?

What did you touch? (If you touched something with your hand, try and remember how the sensation felt *in your hand*, not in your head.)

Did you taste anything?

What was the temperature? (Not in degrees, how did it *feel*?)

*This pathway gives direct access to sensory non-verbal memory. You might be startled, for example, by re-experiencing a smell.*

Next, try to recall your postures and movements. Try to recall your emotional state. What thoughts were going through your head?

You can systematically cross-check the impressions received through each sensory channel with each level of internal reaction. You can connect *how* you reacted with *what* you reacted to.

What you might notice in attempting this recall is that your most vivid and complete memories were produced either by some extremely interesting and unexpected circumstances that attracted your attention, or by *your own effort to increase intentionally your perceptual awareness.*

Not surprisingly, increased perception facilitates increased recall.

And vice-versa: what you didn't notice at all, you can't remember at all.

If Tenno, in the Zen story, had simply been aware of himself as he entered the house—rather than worrying about what kind of impression he was going to make on Nan-in—he might have recalled the sensation of his umbrella in one hand or the other, or a visual impression of a wall, clogs, umbrella, etc. As it was, he walked into the house like a sleepwalker. What can you recall of sleep other than dreams?



## COGNITIVE LEVELS

Quoth Shahrazad—It hath reached me . . . that after Alaeddin had raised the slab from over the entrance to the hoard there appeared before him a Sardab, a souterrain, whereunto led a case of some twelve stairs and the Maghrabi said, "O Alaeddin, collect thy thoughts and do whatso I bid thee. . . Go down with all care into yonder vault until thou reach the bottom and there shalt thou find a space divided into four halls and in each of these thou shalt see four golden jars . . . Beware, however, lest thou take aught therefrom or touch them . . . Leave them and fare forwards until thou reach the forth hall . . . Thou wilt find therein a door . . . enter there through into a garden adorned everywhere with fruit-bearing trees. This thou must traverse by a path . . . beyond which thou wilt come upon an open saloon and therein a ladder . . . And . . . thou shalt find there a lamp hanging from its ceiling; so mount the ladder and take that lamp . . . And on return thou art allowed to pluck from the trees whatso thou pleasest, *for all is thine so long as the lamp is in thy hand . . .*" (3, my italics)

The image of descending into the subterranean chamber is essentially the same as that of Janshah entering the dead carcass: the descent of one's awareness down into one's body, rather than its usual course 'off the top of one's head.'

The lamp is obviously consciousness. It is found in the fourth room. What is in the other three rooms?

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*Exercise: perception of your internal world.*

Do the basic relaxation exercise.

Using a short activity, like eating an orange, brushing your teeth, etc., focus on what is going on *inside* of you instead of outside. Be aware *one at a time* of:

(1) *Your body itself*

What is your body actually doing? How does it feel from the *inside*? How does it move? What muscles become *tense*? How does your face feel from the inside? Etc.

Try to follow your movements with *unbroken attention*. How is your body reacting to, and manipulating, the environment? You may notice that it seems to be constantly making complicated judgments and deductions of distance and forces, that it is *thinking* all the time—not in words like your head—but in its own way. It has its own level of intelligence separate from your head. This is called your motor-system. It thinks in motor-impulses instead of words.

(2) *emotions*

You are usually only aware of the effect your emotions have on your mental associations. ("I feel angry because I'm thinking angry thoughts.") The emotions themselves, however, *originate in your body*. By becoming aware of your body, you can become aware of your emotions.

It may be difficult to connect with them at first. In fact you may not think you even have any. But if you persist, you can begin to notice them. They are a kind of energy that inhabits your body. Each emotion has a different 'flavor.' You might notice that you have several different ones at the same time.

You might notice that your emotions *have their own associations*. They make their own judgments and decisions, have their own memory, draw their own conclusions, etc. You might decide that your emotions, like your body, is a *separate level of intelligence*. It 'thinks' with feelings instead of words or motor-impulses.

(3) *thoughts*

Try to observe what thoughts pop into your head. Try to

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observe how they are connected, associatively, with the activity you're engaged in *without becoming lost in them*. That is, try to maintain some form of body awareness and, by just letting the thoughts come and go, try to discover what actually runs through your mind. You might be surprised.

You have to be careful that you don't become lost in these thoughts by losing the awareness of your body. If you do, the experience will degenerate into the usual free-association activity called 'introspection.'

*Awareness is different from introspection.* Awareness of your associations is different from being drowned in them.

Awareness is different from thinking.

(You may notice that your thoughts contain a mixture of *words and images*. Though the images occur in your head, they are generated by motor-impulses originating in the motor-system.

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One can *experience* (if he makes the effort) at least four different kinds or levels of thinking (or of reaction to the environment):

*words*—a function of the logical mind,

*feelings*—a function of the emotional system, and

*motor-impulses* and *images*—both functions of the motor-system.

Charles Rusch has derived five levels of experience from concepts of developmental psychology. Since certain of these levels appear to be functions of others—e.g. the "imaginal" level is a function of the "enactive" or motor level (Hebb is quoted below as theoretical support for this)—his conclusions closely parallel the above experiential conclusions.

The intellect, the emotional system, and the motor system, are *separate cognitive levels*.

The motor-system can perceive data separately from the logical mind, recognize it, process it at tremendous rates of speed, and store it in and retrieve it from its own memory. That is, it perceives, recognizes, thinks, and has its own memory.

It is an autonomous cognitive mechanism.

It thinks in the form of *motor-impulses* and *visual images*.

Motor-impulses are considered by psychologists to *accompany* thought, not to be a separate *form* of thought. The motor-system is still considered to be a 'dumb animal' consisting of learned, reflex, and habitual behavior. Motor thinking is not yet officially included among the "higher mental processes." This is due to the prevailing verbal-logical concept of intelligence. The fact that *one's body understands ideas* has been largely overlooked.

Einstein, however, was quoted as saying that the essential elements of his thinking were not words, but "images and musculature"—both the results of motor activity.

Motor impulses may or may not be accompanied by visual images. The motor system is essentially the *mechanism of visualization*. Its memory is the storehouse of visual experience. It does *visual thinking*.

Hebb has recognized the participation of the motor-system in visualization:

"Activation of the motor-system, overt or implicit (even possibly within the cerebrum alone, with no activity of the final common paths), contributes essentially to the development of visual integration . . ." (7:347)



Clinically, the explanation for the nearly total failure to notice the function of motor-impulses can be found in the work of Wilhelm Reich: the "armoring" produced by habitual muscular tensions prevents the perception of what is going on (or trying to go on) in one's body. (9)

Experientially, however, you can easily become aware of motor-impulses by simply relaxing and becoming aware of your body.

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*Exercise: becoming aware of motor-impulses.*

Do some form of the basic relaxation exercise.

Then *feel* how your *body thinks* these ideas:

push-pull  
back-forth  
in-out  
up-down  
etc.

Ignore the words, just let your musculature think.

When you can distinguish clearly the motor activity (the real content of the ideas) from the words (the empty shells of ideas) with these simple examples, and *are able to think the ideas without words at all*, try some more difficult ones:

energy  
mass  
the speed of light  
etc.

*Emotions* are considered by psychologists as something that influences perception and cognition. There is, however, sufficient evidence available to establish the fact that the emotions also are a separate cognitive mechanism.

Kempler and Weiner in discussing "special perceptual processes which...affect the final perception by regulating or selecting what is to be admitted to awareness," list such "constructs" as "*perceptual defense*," used for 'blocking out' dirty words, "*perception without awareness*," "*subception*," etc.

They state:

"...in all of these formulations two basic assumptions are included: (a) there are at least two relatively independent perceptual systems, a supraliminal process that operates within awareness, and a subliminal process, i.e. 'gating,' 'registration,' 'subception,' which operates outside of awareness; (b) *the latter process is more sensitive, i.e. makes discriminations the subliminal process does not make*. In each of these perceptual formulations it is assumed that the appropriate evaluative reaction to the stimulus is made within the organism while the subject cannot yet discriminate and report the stimulus. Implicitly, therefore, the meaning of the stimulus...is apprehended prior to correct recognition." (8)

That is, "prior to correct recognition" *by the logical mind*. The reported presence of measurably greater autonomic (i.e. *emotional*) activity in the subjects during the 'dirty word' experiments, for example, indicates their *emotional recognition* of the meanings of the words.

The emotional system perceived, recognized, and evaluated the words on the basis of past experience.



The emotional system, like the motor-system, separately perceives, recognizes, thinks, and has its own memory. It 'thinks' about huge quantities of data at tremendous rates of speed, and 'thinks' in the form of 'feelings.' It makes much more subtle discriminations than the logical mind. The results of its processing may become available to the logical mind in the form of *intuition*—for example, in the nearly instantaneous hierarchical evaluation of elements within a complex situation.

The *intellectual* level of thinking requires no argument to substantiate its existence. Everyone knows it is there.

The problem is, it is frequently given credit for doing something it didn't really do. Everyone probably has observed some example of a person trying to justify logically some decision he had *already made* on an emotional level.

The rationalization of motor thinking is not so often observed. The results of high speed motor processing frequently "pop into one's head." If they are even noticed, they are called "insight"—or something equally non-indicative of their origin. If they aren't noticed, they are immediately translated into words without it being observed that the words come *after the fact*—the thinking has already been done. This is inevitable since both the emotions and the motor-system think faster and are usually way ahead of the logical mind.

The virtue of the logical mind actually lies in its slowness: *because of this slowness it is more controllable.*

Control of—or at least access to—motor and emotional processes depends on the development of awareness. Awareness has to be increased and 'quickened' to be able to cope with these more rapid processes.

The human organism is connected to its environment not merely from the standpoint of sensory input, but through the cognitive reactions of these different levels of intelligence.

Rusch points out that "... we do not operate on just the intellectual level, but on all levels at all times."

In other cultures, these levels were given separate forms of education. For example, in India:

*hatha yoga* is for the education of the body,

*bakhti yoga* is for the education of the emotions,

*inana yoga* is for the education of the intellect,

*raja yoga* is for the development of consciousness.

This conception of man as a multi-leveled intelligence appears to be of considerable antiquity. The Sphinx was composed of four animals:

the body of a bull  
the legs of a lion  
the head of a man  
the wings of an eagle.

The bull is the body.

The lion is the emotions.

The man is the intellect.

The eagle is consciousness.

These four levels correspond to the four subterranean rooms in the tale of Aladdin.

Access to the first three rooms is *through the fourth*: consciousness or awareness.



## CONCLUSION

This material is the first phase of an attempt to develop a basis for the education of 'non-verbal processes': *perception, recall, body-intelligence, emotional-intelligence, etc.*

The exercises are not necessarily the form in which the material would be taught in class. They are intended to supplement the reader's understanding with the possibility of *experiencing* the ideas, as well as merely thinking about them.

This phase, though developed within the context of a design curriculum, is intentionally unconnected to design in order to maximize its potential relevance to other areas of education.

The next phase (in progress) is concerned with an indication of the relation of various non-verbal abilities to specific design activities (problem recognition, creativity, etc.) and a description of methods suitable to classroom education.

The first phase provides an indication of the general scope of directions and possibilities involved in some form of intentional and systematic education of non-verbal abilities. It is hoped that a relationship will be recognized between these possibilities and the need for the development of forms of education more relevant to human beings than the prevailing ones. This need is being expressed with increasing urgency: students are burning the schools down.

Present educational methods are limited to the development of fractional aspects of human beings.

*"... We are developing a very small part of the individual's intellectual potential, or any kind of potential for that matter. This becomes extremely evident when you get into an architectural school which does try to develop some of the less usual parts of your potential. Most of the other disciplines are still playing pretty much the same verbal and numerical games you were taught in elementary school. If you look at a typical elementary school curriculum today, despite all the new methods they have, there is still a concentration on the three Rs. Of these, reading and writing require very similar basic skills. Mathematics adds somewhat to this experience, but there are many levels of experience, and there is no good reason why our educational system can't develop a big proportion of them, if not all."*  
(11:2, my italics)

"Education is largely verbal education."  
(Aldous Huxley)

Mullah Nasr Eddin, ferrying a pedant across a rough piece of water, said something ungrammatical to him.

"Have you never studied grammar?" asked the scholar.

"No."

"Then half your life has been wasted."

A few minutes later Nasr Eddin turned to the passenger. "Have you ever learned to swim?"

"No. Why?"

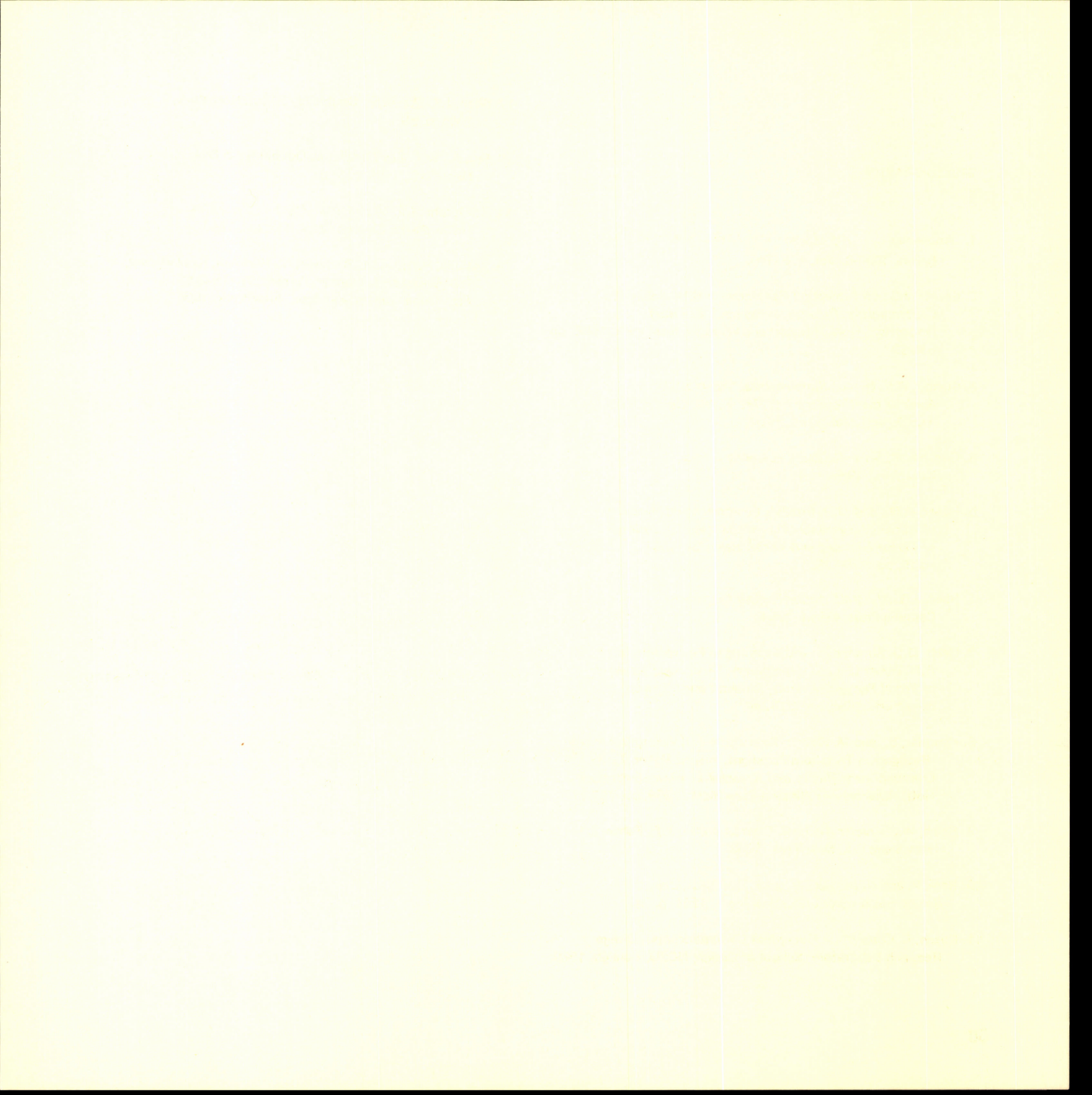
"Then *all* your life is wasted—we are sinking!"



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**FRED EICHENBERGER**, Associate Professor of Product Design in the School of Design, is an industrial designer who has developed an interest in the experimental uses of offset lithography and the graphic design of complex information. His collaboration with Duncan Stuart on earlier projects led to the present study.



# **THE MASS PRODUCTION OF UNIQUE ITEMS REVISITED**

**Duncan Stuart and Fred Eichenberger**



## FOREWARD

The following text is, with some editing, a reprint of a research report, entitled *The Mass Production of Unique Items*, that was published in a limited edition of 100 by the Design Research Laboratory of the School of Design in September, 1968. The original study produced a set of 1752 unique items by means of photographic offset-lithography. This large group of similar but not identical prints resulted from printing and overprinting 12 images and three colors within the context of certain constraints. This paper describes the system which produced that set.

The exigencies of commercial printing, plus the vast number of one-of-a-kind items that would have been required to insure uniqueness, made it impossible for us to duplicate the original study. In the simulation we designed for this publication, there are 72 different prints each of which is repeated 250 times. Each copy of the magazine contains a set of prints which illustrate the process and represent a portion of that set of 72. While the items themselves are not unique (each has 249 identical brothers somewhere in the world) the sets are. No two are identical. The production history of the set of 72 is described in an afterword to this article.

## INTRODUCTION

Many classes of design problems, perhaps most, may be characterized as having a multitude of equally plausible solutions. The notion of "best" solution either is not applicable, or so remote from realization as to be not worth the pursuit.

Techniques presently available, sophisticated as they may be, do not present the designer with a sensual realization of the domain available to his choice mechanism. Our reference here is to the various branches of mathematics which focus on the manipulation of multivariate factors. The output of such mathematics is highly abstract, bare-bones information transmitted in the main to the essentially rational segments of our consciousness.

Our hope is that the studies begun in the project will serve as an aid to presenting the designer with a more direct sensory grab on the domain of choices available to him. We further hope for the entrance of serendipity, perhaps supplying us with a tool honed for tasks as yet only dimly imagined. The results of our project suggest that this has been the case.

## OBJECTIVES

1. We wished to exploit the fullest potential of a finite set of input elements under the controlling circumstances of self and system-imposed limitations. We define fullest potential as the completely exhausted set of output elements available from the input elements combined under the imposed restrictions. Left to our traditional,



essentially handicraft production techniques, the number of images either of us could have produced would have been limited in number and, we believe, merely extensions of already formed and partially ossified sensibilities. The replacement of handicrafts with a system and the appropriate machinery allowed us to produce an unedited, non-subjectified group which contained anything we or anyone else might have accomplished by traditional means.

2. We have developed strategies by which equipment designed primarily to produce many faithful duplicates of a prototype may be employed in the production of unique items. Our employment of offset duplicating equipment stemmed from both desire and happenstance. Such equipment is readily available, not only to us, but also most probably to other designers as well. We viewed it as a particularized example of many similar mass production systems. The methods we propose would adapt themselves to a wide variety of production situations. This latter statement is prompted by having been made aware, after completion of the set, that it had been produced with ease and simplicity. This, together with the obvious visual richness of the results, convinced us that our methods have application to many areas of design activity.

3. We further wished to consider the possibility of developing out of these efforts a method or methods by which complex design problems could be encoded and produced graphically, then studied visually for significant patterns among their possible permutations and combinations. Should this end be even partially attained, we would be able to offer a useful addition to the growing family of design methodologies.

## OPERATIONS

1. INPUTS. A. Six images taken from a group of studies in mosaic transformation by Stuart. These six images were reproduced in positive and negative form yielding 12 images in all. (See Appendix 1.)

B. Three printing inks (yellow, blue, red) were chosen to yield a relatively complete spectrum through overprinting. Spectral approximation was not sought since the need to maintain true color identity against white paper would not have been possible in the case of process yellow.

2. COMBINATORIAL RULES. A. No image may appear more than once in any final print; B. No color may appear more than once in any final print; C. All combinations of 2 and 3 images and colors must be generated; D. No image may change orientation. These rules were selected, in part arbitrarily, from a larger group of possibilities. Had we chosen a different set, the character and quantity of images would have changed. For example, the introduction of asymmetric images to assume different orientations would have greatly increased the number of final images.

3. PRESSWORK. The mechanics of offset duplicator makes plate (image) change a simple operation, while ink (color) change is considerably more difficult and time consuming. For this set, we needed to change the ink only three times and the plates only 34 times in the course of producing 1752 unique images. This procedure and that of collation are detailed in Appendices 1 and 2.

4. COLLATION. The most complex and significant task in this operation is that of organizing the schedule of printing in such a way that the unique



images are efficiently produced. This task is one of, first, introducing into the duplicator appropriate-sized bundles of paper, properly oriented; second, taking the papers (or other surfaces) so printed and rearranging them in a manner appropriate to the next stage of the printing operations. This operation, which we call collation will vary with the type of printing device and the type or types of surfaces which receive the printed images. The collation scheme appropriate to this study is shown in Appendix 2.

## APPENDIX 1

The input of this study consists of 12 related visual images and three colors which are brought together under certain rules of combination. These entities achieve physical form by being printed and overprinted on a standard paper by a standard offset duplicator. The output of this study is the complete set of possible prints obtainable through the use of the input entities. The mechanism with which we are presently concerned is to structure the operations in such a manner as to demonstrably achieve the desired output in the most economical manner.

An output image is any one of the input images printed in any one of the input colors, or, any possible combination of input images printed in any possible combination of input colors. Such combinations are governed by the following constraints:

1. None of the input images may change

orientation with respect to other input images, i.e., what is designated as top for each image must remain constant throughout the operation.

2. None of the input images may appear more than once in any output image.

3. None of the input colors may appear more than once in any output image.

4. The set of output images must exhaust the possibilities defined by the restrictions. Such exhaustion must be executed with an efficient investment of effort, both from personnel and equipment.

We have made a simplifying assumption for this project that the colors employed are commutative; that is, the order in which they are used in no way significantly affects the output. The first color printed over the second color is considered to be identical in effect to that of the second color over the first, and so on. Clearly this assumption is not justified to the degree that the opacity of any color masks the appearance of a color lying beneath it. However, the colors chosen are deemed sufficiently transparent that we have felt them to be commutative enough for our purposes. A preliminary examination of the non-commutative case is contained in Appendix 3.

Let us now examine the input elements with a view to determining the nature of the expected output. We have available to us 12 images,  $I_1$  thru  $I_{12}$ , and three colors,  $C_1$ ,  $C_2$ ,  $C_3$ . We will begin with an examination of the color variance.

Let us denote the color domain available to us with the letter C. To this we will append a parenthetical



subscript (N) denoting how many at a time of these colors we are using. Thus,  $C_N$ , would denote Nth color in the domain, while  $C_{(N)}$  would denote the simultaneous employment of the colors (N) at one time. If there are two colors available, A and B, we could examine their possibilities by employing diagram 1; diagram 2 denotes the possibilities for three colors, A, B, and C.

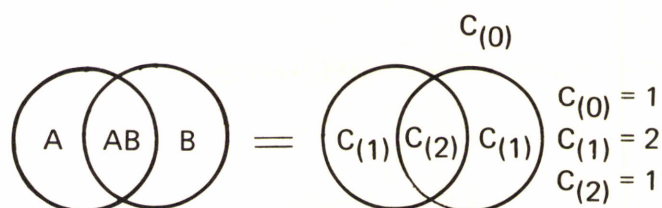


DIAGRAM 1

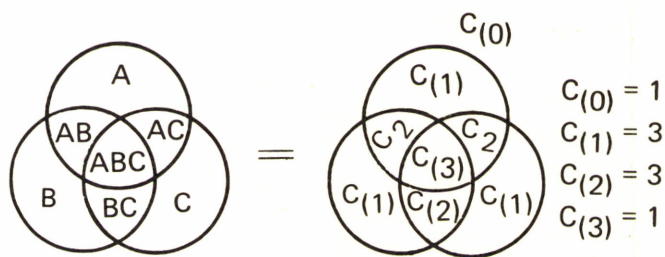


DIAGRAM 2

As we allow the number of available colors to increase, such diagrams become more difficult to draw and even more difficult to evaluate. The values for  $C_{(N)}$  may be defined much more simply by resorting to an historic figure known to us as Pascal's Triangle. The contents of a portion of this triangle are contained in the following diagram:

$\begin{array}{c} \diagdown \\ C \end{array} \begin{array}{c} \diagup \\ N \end{array}$	0	1	2	3	4	5	6	7	8	9	10	11	12
0	1												
1	1	1											
2	1	2	1										
3	1	3	3	1									
4	1	4	6	4	1								
5	1	5	10	10	5	1							
6	1	6	15	20	15	6	1						
7	1	7	21	35	35	21	7	1					
8	1	8	28	56	70	56	28	8	1				
9	1	9	36	84	126	126	84	36	9	1			
10	1	10	45	120	210	252	210	120	45	10	1		
11	1	11	55	165	330	462	462	330	165	55	11	1	
12	1	12	66	220	495	792	924	792	495	220	66	12	1

Let us now turn to the 12 images,  $I$ , which must be combined with the above defined color relationships. If we start with any one of the 12 images and superpose on it a second image, there are  $(I-1)$  or (11) choices available to us. If we in turn superpose a third image on the first two there are  $(I-2)$  choices available. Thus for our present problem, the exhausted set of output images would be

$$(C_{(1)} \times I) = 36 \text{ 1 image at a time}$$

$$(C_{(2)} \times I)(I-1) = 396 \text{ 2 images at a time}$$

$$(C_{(3)} \times I)(I-1)(I-2) = \underline{1320} \text{ 3 images at a time}$$

1752 Unique items



More generally, the total would be

$$(C_{(1)} + (C_{(2)} I)(I-1) + \dots (C_{(N)} I)(I-1)(I-2) \dots (I-N)$$

Where N= the total number of colors available, with the further restriction that  $I \geq N$ .

If we increased the number of colors until they were equal to the number of input images, the number of possible unique output images would be as shown in the following tables:

INPUT COLORS	UNIQUE OUTPUT IMAGES
1	12
2	156
3	1,752
4	18,000
5	169,000
6	1,442,172
7	11,109,336
8	82,404,032
9	436,630,860
10	2,581,284,540
11	12,549,995,964
12	53,893,291,200

Similarly, if we allow ourselves up to 12 different colors as inputs, but permit ourselves to employ them at most, say, three at a time, the total number of unique images would be as follows.

Total output images, colors taken at no more than three at a time:

INPUT COLORS	UNIQUE OUTPUT IMAGES
1	12
2	156
3	1,752
4	6,120
5	15,120
6	28,452
7	49,056
8	77,712
9	116,740
10	164,460
11	225,192
12	299,256

From the foregoing tables it may be seen that for colors less in quantity than three the number of unique output images is insufficient in number to allow an observer to get an adequate feel of the extent of the inherent possibilities. On the other hand if we go beyond three for our quantity of colors available, we are presented with what we have felt to be an excessive number of unique output elements with which to reckon. Of course, it would be possible to cut down on the number of images. We have not wanted to resort to this stratagem because the images in a sense are our primary information carrying elements, the colors serving essentially as a means of establishing a coding device allowing us to mix classes of information without undue loss of differentiation.

## APPENDIX 2

The following will serve as a history of the present project and a set of more or less explicit instructions for carrying out the printing of the 1752 unique final images obtainable from the given input images and colors. The combinatorial rules for these operations have been detailed in Appendix 1.

The images used in this study grew from investigations into the field of transformative geometry carried out over the past several years (Stuart) at North Carolina State University. The specific images were taken from a larger group prepared in the winter and spring of 1966-67. At that time it was felt that these studies would be much enhanced by some variety of color coding as a means of superposing images with reasonable maintenance of clarity. Eichenberger's previous experiments in offset lithography offered basic organizational and technical capabilities permitting the execution of this intent. Most of the work for this study was accomplished during the latter part of January and the early part of February, 1968.

The remainder of this appendix concerns itself with a set of instructions for carrying out the printing of 1752 final images obtained in this study. These instructions are adapted to the use of photo-offset duplication equipment. Had other equipment been employed, it is likely that other patterns of instructions would have been devised.

The offset duplicating press is so constituted that changing images or plates is comparatively simple while changing ink color necessitates a much more complex set of operations. Efficient use of this tool requires that operations be designed to

minimize color changes as a first order requirement and to minimize plate changes as a second order requirement.

We found that so long as color is considered to be commutative, if there are  $C$  colors to be used, one never needs to change color more than  $C$  times in the press. If there are  $P$  plates to be printed, then the minimum number of plate changes would be  $CP - (C - 1) = 34$ .

Our next question is, how many of each image appears in each of the three colors? From Appendix 1 we have seen that there are 36 possible one-at-a-time images, 1 of which is a single image in one of the three colors. There are 396 two-at-a-time images,  $2/3$  of which will contain the same color and 22 of these would contain the same plate.

There are 1320 three-at-a-time images, 110 of which would contain the same plate. Therefore, the number of copies of a single image and a single color would be  $1 + 22 + 110 = 133$ .

To describe more clearly the ordering of colors and plates through our press, the following instructions have been devised:



Given:

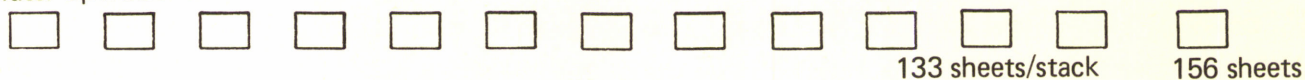
Colors—A, B, C

Plates—1, 2, 3 . . . . 12

Paper—1752 sheets

1. Fasten Plate 1 in press and charge with Color A.

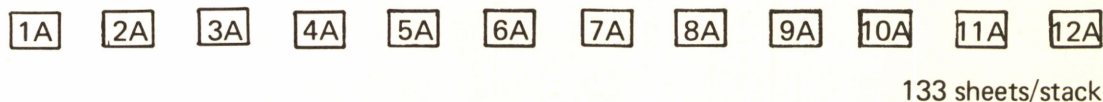
2. Divide the stack of 1752 sheets of paper into 13 smaller stacks. Twelve of these stacks will contain 133 sheets each. The thirteenth stack contains the remainder of 156 sheets. These will be introduced in later operations.



3. Print Stack(s) 1 with Plate(s) 1 and Color A

2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12

Leave Plate 12 on press and clean out Color A. We now have the following stacks:



4. Take one printed sheet from each of these 12 stacks and place in finished copy storage. Finished storage will now contain 12 sheets of finished material.

5. The placing of one printed sheet from each stack produced by Step 4 into finished storage leaves 132 sheets remainder in each stack. These stacks must now be divided into 144 stacks of 11 sheets each as shown in the next diagram.

1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	1
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	2
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	3
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	4
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	5
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	6
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	7
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	8
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	9
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	10
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	11
1A	2A	3A	4A	5A	6A	7A	8A	9A	10A	11A	12A	12

11 sheets/stack

stack numbers  
for step 7



6. Remove the printed stacks 1A 2A 3A....12A which are outlined heavily in diagram of Step 5 and substitute in each place a stack of 12 fresh sheets from the remainder of 156 sheets from Step 2. The remainder stack will now contain 12 sheets of unprinted paper. The sheets removed in this step will be set aside to be used when Color C is introduced into the process.

7. We must now form 12 new stacks for the next stage in the printing process. Referring again to the diagram for Step 5, we now form the 12 new stacks by picking up the top horizontal row and labeling it Stack 1. The second horizontal row is treated similarly and labeled Stack 2. The remaining 10 horizontal rows are picked up sequentially and are similarly labeled.

8. Plate 12 is still on the press which we now charge with Color B.

9. Print Stack(s)	12 with Plate(s)	12 and Color B
	11	11
	10	10
	9	9
	8	8
	7	7
	6	6
	5	5
	4	4
	3	3
	2	2
	1	1

Leave Plate 1 on press and clean out Color B.

10. We must rearrange our various sheets of printed and unprinted paper to, first, remove material to be placed in finished storage, and second, to form our final 12 stacks of material to be printed with Color C. Let us take the stacks which have resulted from Step 9 and arrange them as follows:

C12	C11	C10	C9	C8	C7	C6	C5	C4	C3	C2	C1	
1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	1A	R1
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	2A	R2
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
3A	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A	3A	R3
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	R4
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
5A	5A	5A	5A	5A	5A	5A	5A	5A	5A	5A	5A	R5
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	6A	R6
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	7A	R7
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	8A	R8
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	9A	R9
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	10A	R10
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
11A	11A	11A	11A	11A	11A	11A	11A	11A	11A	11A	11A	R11
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	
12A	12A	12A	12A	12A	12A	12A	12A	12A	12A	12A	12A	R12
12B	11B	10B	9B	8B	7B	6B	5B	4B	3B	2B	1B	



The 12 heavily outlined stacks in this array each contain 12 sheets. The remaining 132 stacks contain 11 sheets each. Remove one sheet from each of these 144 stacks and place them in finished material storage which will now contain 156 pieces of material.

11. Take the remainder stack of 12 imprinted sheets and printed sheets we set aside in Step 6. Make an array of these as follows:



11 sheets/stack

12 sheets

We will now form 12 substacks which will be added to the stacks to be formed from the array made in Step 10. To form these substacks we perform the following operation: Substack 1 is formed by taking one unprinted sheet and one from every other stack except Stack 1A. Substack 2 is formed by taking one unprinted sheet and one sheet from every other stack except Stack 2A. This process is continued until the twelfth substack, which is formed by taking the last unprinted sheet and one sheet from every stack except 12A. These are set aside and labeled as indicated. Each of these substacks will contain 12 sheets.

12. To form the final 12 stacks we now refer to the diagram in Step 10. Final Stack 1 is formed by taking 1 sheet from each of the stacks in this diagram except from those stacks in Row 1 (R1) or Column 1 (C1). To this stack is added Substack 1 from Step 11. Final Stack 2 is formed by taking one sheet from each stack except those in Row 2 (R2) on Column 2 (C2). To this is added Substack 2 from Step 11. The remaining 10 stacks are formed in similar fashion.

13. Plate 1 is in the press and is now charged with Color C.

#### 14. Print Stack(s) 1 with Plate(s) 1 and Color C

2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12

All of this material may now be placed in finished storage which should at this point contain 1752 pieces of finished material, and the set of possible images is exhausted.

### APPENDIX 3

In Appendix 2 we show the structural patterns involved in carrying out the matrix of possibilities under the assumption that the colors could be considered commutative. The color sample tests, however, show that such commutative properties are not, in fact, precisely obtainable within the limitations of the chosen medium.

In this Appendix we examine the patterns involved in carrying out a matrix of possibilities in which the color is held to be non-commutative. This is a much more complex operation and we have, for this reason, greatly reduced the number of input variables.

#### Given:

Colors—A, B, C  
Plates—1, 2, 3, 4  
Paper—228 sheets

That there are 228 possibilities in this matrix may be seen from the following arguments.

The commutative case would have the following possibilities (See Appendix 1):

Single color possibilities $C_{(1)}^N$	=12
Double color possibilities $C_{(2)}^N (N-1)$	=36
Triple color possibilities $C_{(3)}^N (N-1)(N-2)$	<u>=24</u>
	72

The possibilities increase in the non-commutative case by a factor of  $r!$ , where  $r$  is the number of colors being used in a particular image group, i.e.,

$r=1.....r! [C_{(1)}^N]$	=12
$r=2.....r! [C_{(2)}^N (N-1)]$	=72
$r=3.....r! [C_{(3)}^N (N-1)(N-2)]$	<u>=144</u>
	228

The above tells us how many final elements there will be in the set, but it tells us little about how we should schedule our operations to produce them.

We had planned to include the printing schedule by which the set of 228 unique, non-commutative items could be produced but we ran afoul of our budget and space allotments. Suffice it to say, it would be a vastly more complex operation (Example: the complete run would require 34 ink changes.) than that which produced the commutative set.



Even in the face of such complexities, the authors believe that such non-commutative operations are much more likely to produce elements nearer to those choice mechanisms which we view as being of human origin. The cybernetically aided designer might well consider such a course of action in future times. His position would be that of initiator of basic programs and adjudicator of appropriate output patterns, the grinding operations being carried on largely by mechanical devices such as those we have employed.

#### AFTERWORD BY FRED EICHENBERGER

When Marian Scott, the editor of this issue of the Student Publication, approached me about a year ago with the notion of redoing the unique items experiment, my enthusiasm was something less than overwhelming. In the first place, I do not enjoy replotting old ground, and in the second, the thought of processing 14,400 different things (the number it would take to insure true uniqueness for this edition of 1,200 copies) temporarily scrambled whatever was left of my mind.

However, the possibility of achieving a wider circulation was sufficiently intriguing that, despite my misgivings, I consented to proceed, and now that it is complete, I'm glad I did. The differences between this and the original effort made it essentially a new thing with its own special problems to solve.

The work was done commercially—rather effortlessly, I might add, except for one press breakdown—proving to my satisfaction that, should anyone be interested, this process has applications in the real world. Rather than attempting uniqueness in the prints (there are 72 different prints, each in an edition of 250) we have accomplished that in the collation of the sets of 12. No two sets are identical, although the variance between many is no more than one print.

The real excitement in this project lies at the head of the press. You may have a fair idea how the final combinations are going to look, but you're not really sure. Out they come—1, 2, or 250 at a time depending upon how many of each you're printing—some exciting, some disappointing, but all different. And when it's all over you know, as surely as you've known anything, that, if you've played the game according to the rules, you've gotten all there is and there isn't anymore. In a world of uncertainties, this at least is a small comfort.

#### OPERATIONS

INPUT IMAGES. We used four images based upon a deliberately banal, simplistic geometry in order to minimize ambiguity. Each image was assigned a number, 1 through 4. It is possible, with some small effort, to "read" each of the images in any of the combinations.



INPUT COLORS. Yellow, blue, and red, in that printing order, were chosen to insure maximum spectral diversity. (Had I to do it again, I would have chosen a stronger yellow to yield better oranges.)

COMBINATORIAL RULES. 1. No input image may appear more than once in any output print. 2. No color may be used more than once in any output print. 3. There may be no changes in orientation to any of the input images; what is top must so remain. 4. The set of output prints must exhaust the possibilities as defined herein. The set includes 12 one-image-at-a-time prints, 36 two-images-at-a-time prints, and 24 three-images-at-a-time prints.

PRESSWORK. There were three ink changes. The printing order, in terms of colors and plates, was yellow 1, 2, 3, 4; blue 4, 3, 2, 1; red 1, 2, 3, 4. The numerical key in the lower left corner of each print gives its lineage. For example, a blue 1, a yellow 3, and a red 4 indicate that plate 3 was first printed in yellow. From there it went to the blue 1 and the red 4 printings to achieve its final form.

COLLATION. Chart A illustrates a portion of the printing and collating schedule. Two typical cases are shown, the complete yellow run, and a complete run for one of the four images printed in blue. The column headed "Image Y(ellow), B(lue), R(ed)," indicates what color is to be laid down on which image during the particular operation. The image number which is receiving the color is boxed. "Total quantity" refers to the number of sheets printed while "Goes to and amount" refers to the number of sheets reserved for future operations. The underlined number-letter combinations in the latter column refer to the image and color to be added.

FINAL COLLATION. Chart B illustrates the procedure by which the final sets of 12 that accompany each magazine were achieved. (It shows only 32 items and seven sorts because, like Chart A, it would have consumed an inordinate amount of space had it been reproduced in its entirety.)

The 72 stacks of 250 prints each were arranged in such a manner as to insure an even distribution of the one-image-at-a-time prints and the two and three-image-at-a-time prints throughout the set. Each stack was then assigned a number from one to 72. The first sort was one through 12, two through 13, and so forth until 61 through 72 was reached. The second sort was one through 11, skip 12, pick up 13, and so forth until 60 through 72, skip 71, pick up 72 was reached. The third sort repeats the second but in reverse order. The final collation required 23 sorts and produced 1271 unique sets.

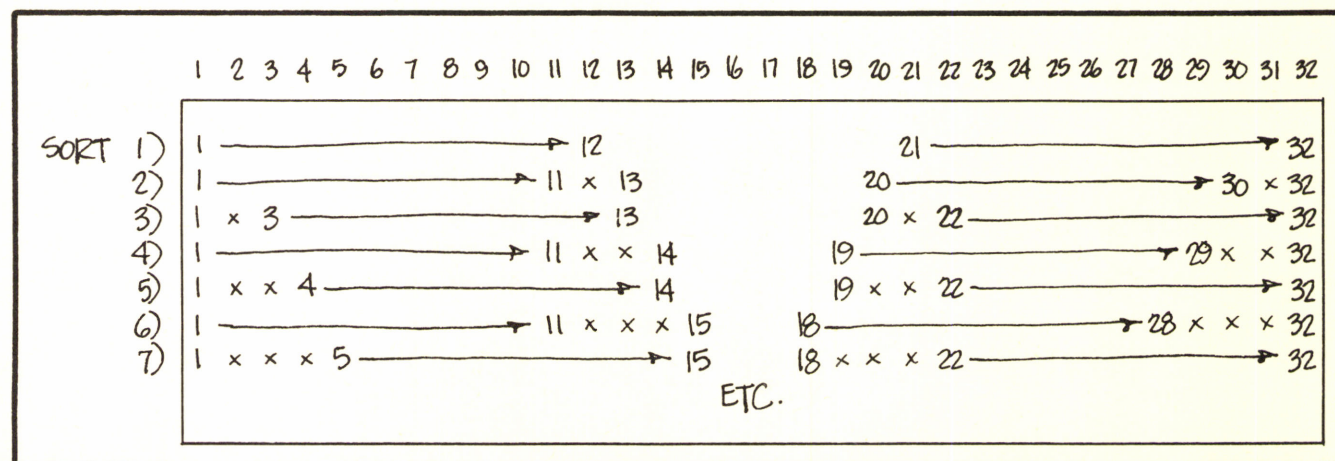


IMAGE Y B R	TOTAL QUANTITY	GOES TO & AMOUNT
1	3250	F.S. (250) • 1Y 4B (750) • 1Y 3B (750) • 1Y 2B (750) • • 1Y 2R (250) • 1Y 3R (250) • 1Y 4R (250) •
2	3250	F.S. (250) • 2Y 4B (750) • 2Y 3B (750) • 2Y 1B (750) • • 2Y 1R (250) • 2Y 3R (250) • 2Y 4R (250) •
3	3250	F.S. (250) • 3Y 4B (750) • 3Y 2B (750) • 3Y 1B (750) • • 3Y 1R (250) • 3Y 2R (250) • 3Y 4R (250) •
4	3250	F.S. (250) • 4Y 3B (750) • 4Y 2B (750) • 4Y 1B (750) • • 4Y 1R (250) • 4Y 2R (250) • 4Y 3R (250) •
Y B R		
4	1000	F.S. (250) • 4B 1R (250) • 4B 2R (250) • 4B 3R (250) •
1 4	750	F.S. (250) • 1Y 4B 2R (250) • 1Y 4B 3R (250) •
2 4	750	F.S. (250) • 2Y 4B 1R (250) • 2Y 4B 3R (250) •
3 4	750	F.S. (250) • 3Y 4B 1R (250) • 3Y 4B 2R (250) •

CHART A ↑

F.S. = FINISHED STORAGE

CHART B ↓



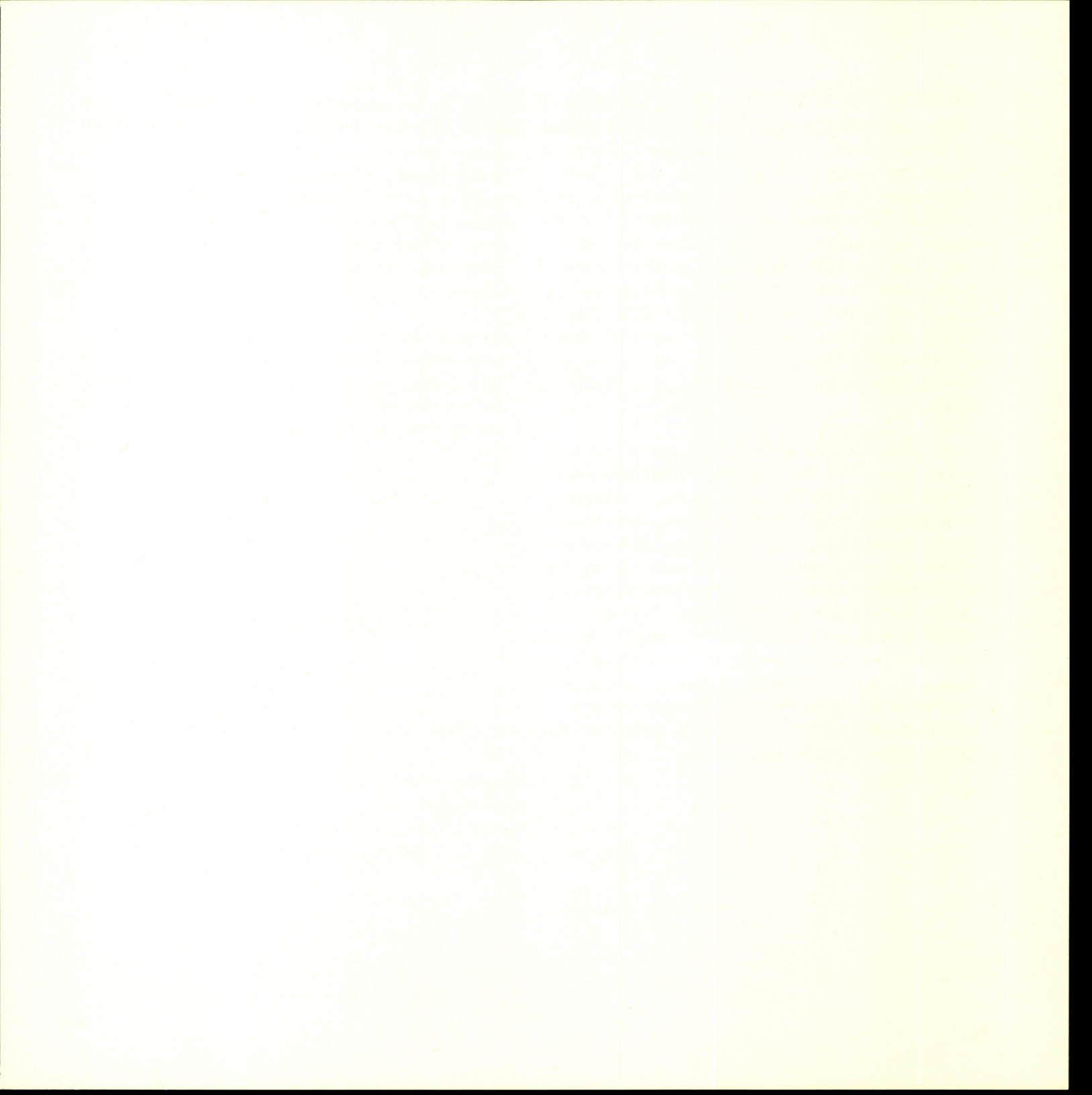
PRINTING HISTORY. The printing was done at Daniel Industries, Raleigh, North Carolina, on an A.B. Dick Model 360 offset duplicator. The press operators were Harry Daniel and Tommy Brincefield. Collation between press runs was done by Fred Eichenberger and Marian Scott. The inks used were a matched yellow, process blue and fire red, all by Van Son. The paper is an 80 lb. Simpson Lee Coronado cover and was in part donated by the Henly Paper Company of High Point, North Carolina. The original art was by Fred Eichenberger. Final collation of the unique sets was supervised by Fred Eichenberger and Marian Scott.

Each press run processed 13,000 sheets and took about four hours. In all, some 18,000 sheets were processed. The images were deliberately misregistered so as to make recognition somewhat easier. In addition, there was some accidental and inevitable misregistry which shows up in the non-alignment of the numbers. For that, and for the offsetting and the occasional "hickies" that show up, our apologies. We asked a small press and its operators to behave in a manner clearly at variance with standard operating procedures around a job print shop. That we were able to maintain the quality we did is a tribute to the pressmen and to their 360.

Note: We are preparing an exhibition of the entire set of 72 prints plus some explanatory text. It will occupy some 36 square feet of wall space and will be sufficiently flexible to allow for a variety of hangings. The exhibition will be ready for distribution in the Fall of 1970. At this time, we have no idea what the cost will be, certainly no more than is necessary to cover shipping plus insurance.

If you are interested, please contact Fred Eichenberger, School of Design, North Carolina State University, Raleigh, North Carolina, 27607, and we will inform you as soon as it is complete and we have a schedule firmed up.





**GENE MESSICK**, a former instructor of product design and a graduate of the School of Design, was the founder and director of the experimental intermedia program at Thompson Theatre, NCSU. A graphic designer and versatile technician, he has written, designed, and packaged his contribution to this issue, to be found as an inset in the back of the volume.



**INTERMEDIA AS ART AS INTERMEDIA AS ART AS ETC.**

**Gene Messick**

The Student Publication of the School of Design, begun in 1950, is maintained as an independent student project. It is nonetheless dependent upon the talents and energies of many persons, students and non-students alike, for its continuation. Volume 19:1 owes a debt of gratitude to:

- \* **Dean Henry Kamphoefner**, for continued interest and special encouragement in the face of obstacles;
- \* **Barbara Brown, Anne Craddock, Brook Gardiner, Betty Hill, Winifred Hodge, Pat McLean, and Rita Westhoff**, secretaries of the School of Design, for patient assistance with countless matters;
- \* **Ron Cauble, Bill Crook, Mike Doty, and Jerry Galliher**, for technical assistance and design contributions to Publication activities;
- \* **Professor Vernon Shogren**, for providing guidance and a sympathetic ear throughout the trials of producing this issue;
- \* **Professor Fred Eichenberger**, for graphic counsel and untold hours of assistance with production;
- \* **Harry Daniel** of Daniel Industries, for willingly and expertly mass producing the Unique Items;
- \* **A. B. Henley, Jr.** of Henley Paper Company, High Point, N. C., and **Peter J. Ringgold** of Simpson Lee Paper Company, Vicksburg, Michigan, for generously donating a considerable portion of the stock on which the Unique Items were printed;
- \* **Richard Curtis**, for expeditiously typing the final copy;
- \* the many students of the School of Design, for lending a hand to haul paper, hang exhibits, print posters, collate plates, and otherwise assist the Publication staff when needed most.

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\*E. Burton Elliott, Chairman of the Art Auction; Dean Henry Kamphoefner and Professors Fred Eichenberger and Vincent Foote, auctioneers for that event.

Staff for this volume of the **Student Publication of the School of Design** were:

**David Alpaugh** and **Marian Scott**, Co-editors

**Douglas Bennett**, Business Manager

**Gary Partin, Steve Barnhill, Curtis Fentress, and Tony Ward**,  
Circulation

**Vernon Shogren**, Faculty Advisor

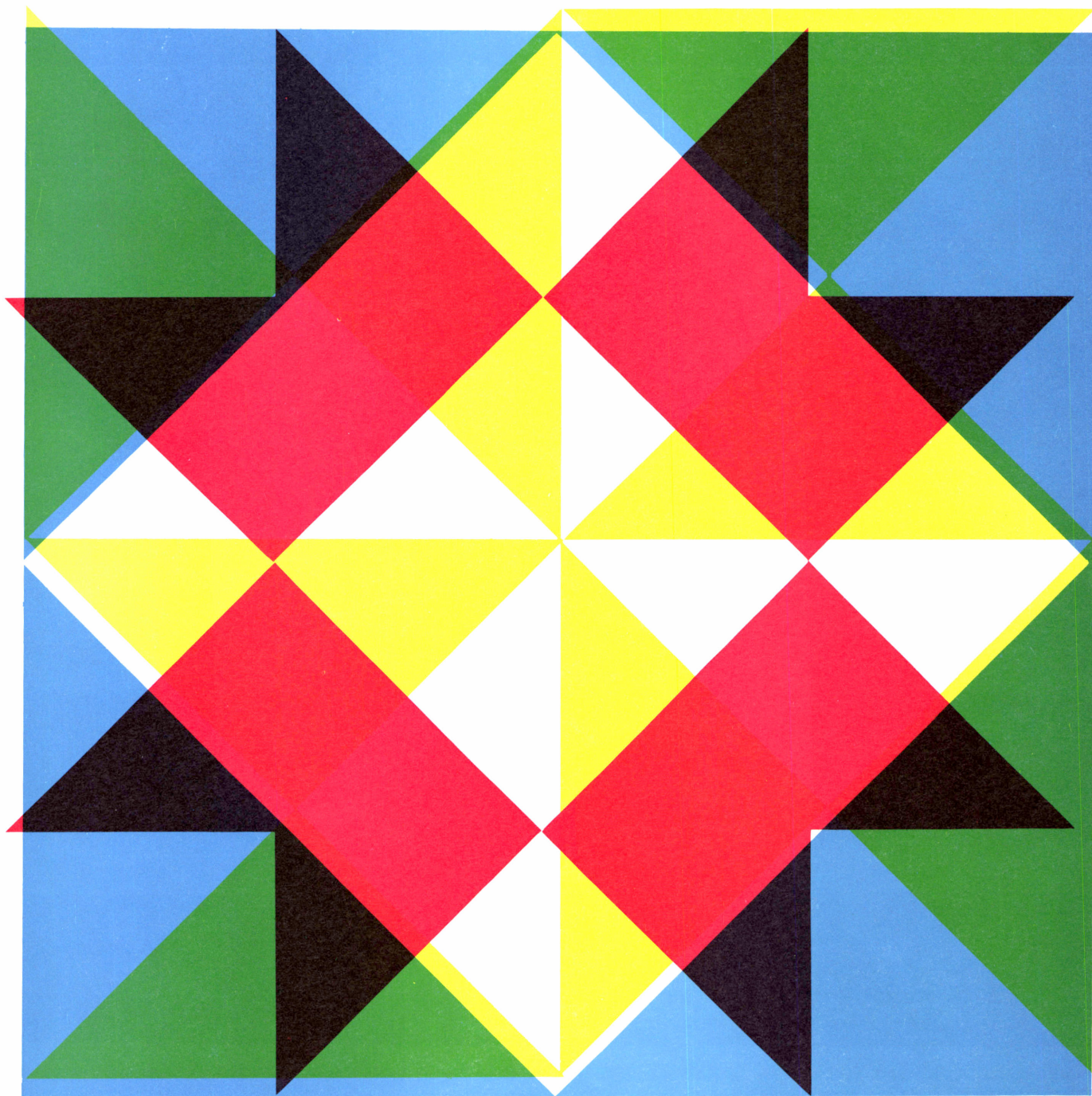
Editor in charge of this issue - **Marian Scott**

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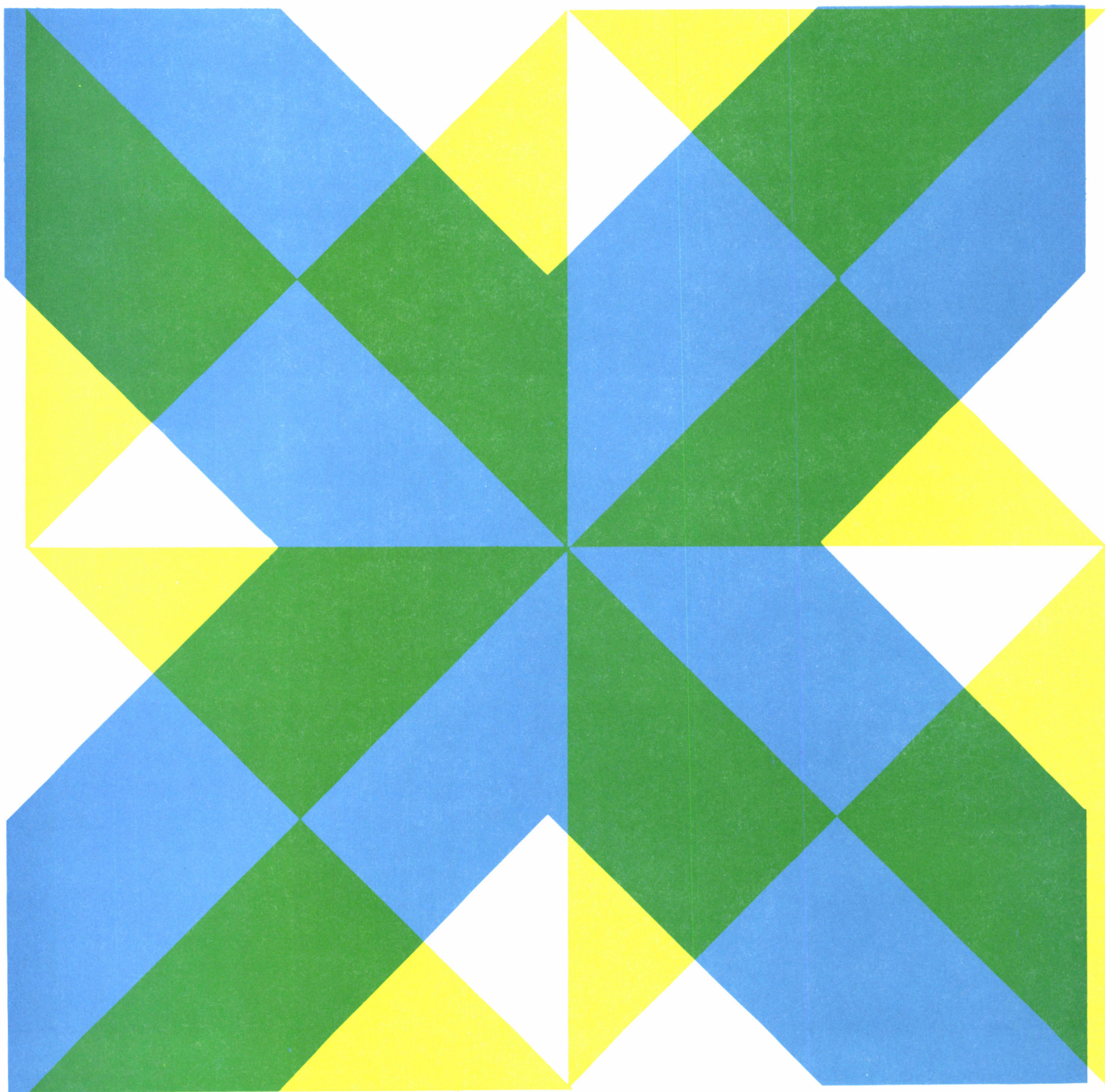
Final copy was set in Univers type on an IBM MT/SC composing system. Design and paste-up were done by the editor. The text was printed and bound by the North Carolina State University Print Shop; the folio plates were printed by Daniel Industries, Raleigh, North Carolina.





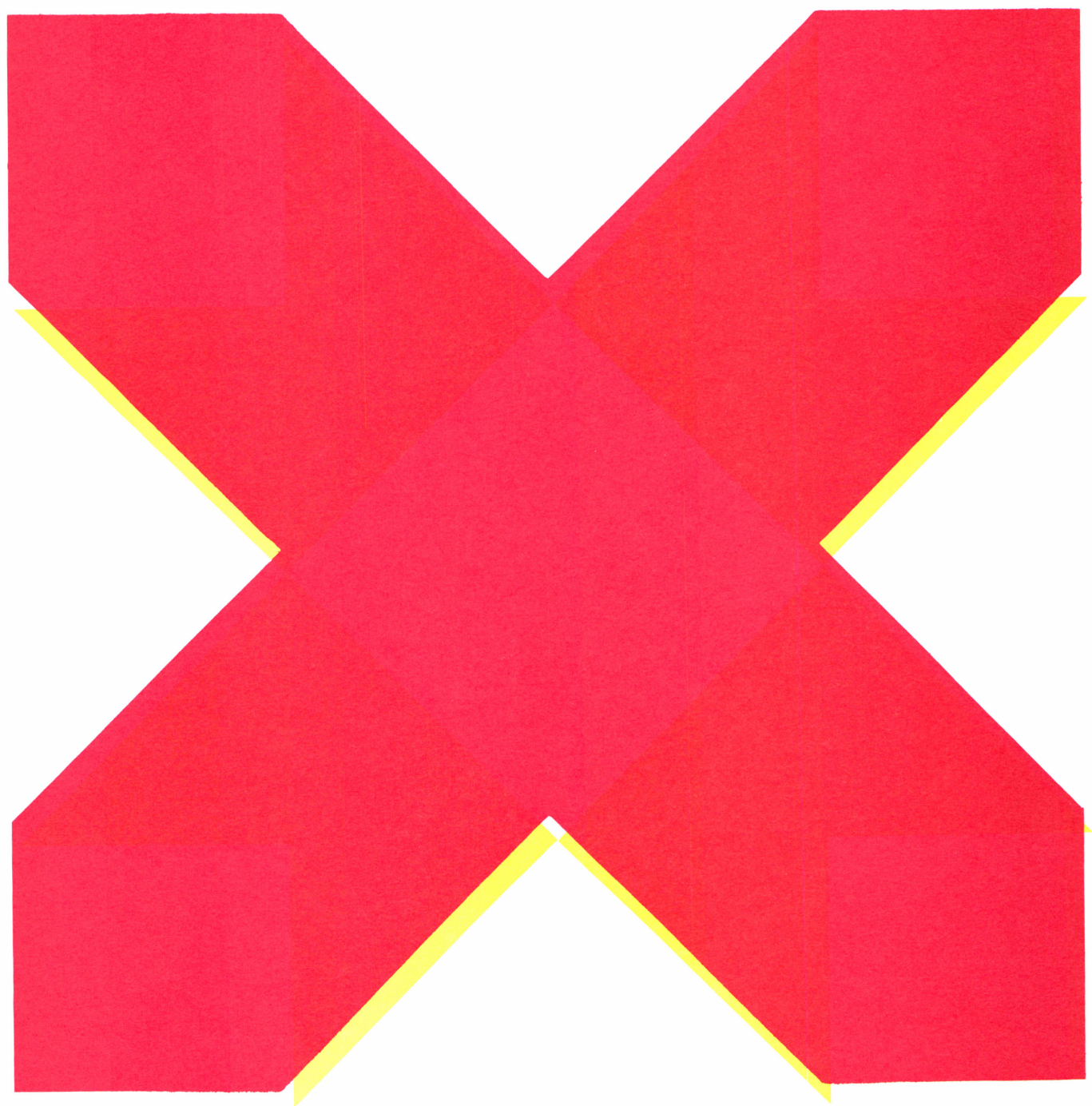










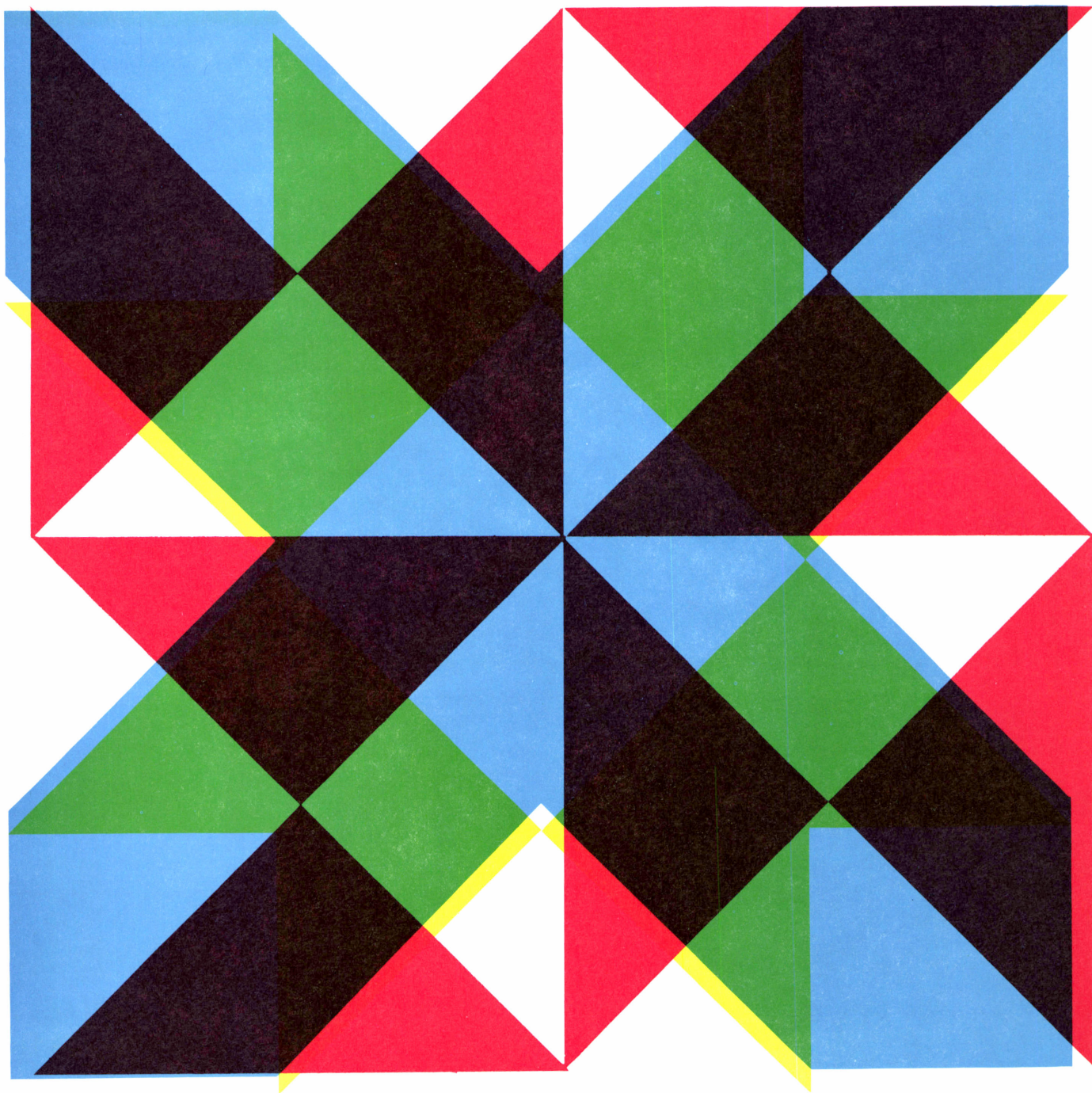


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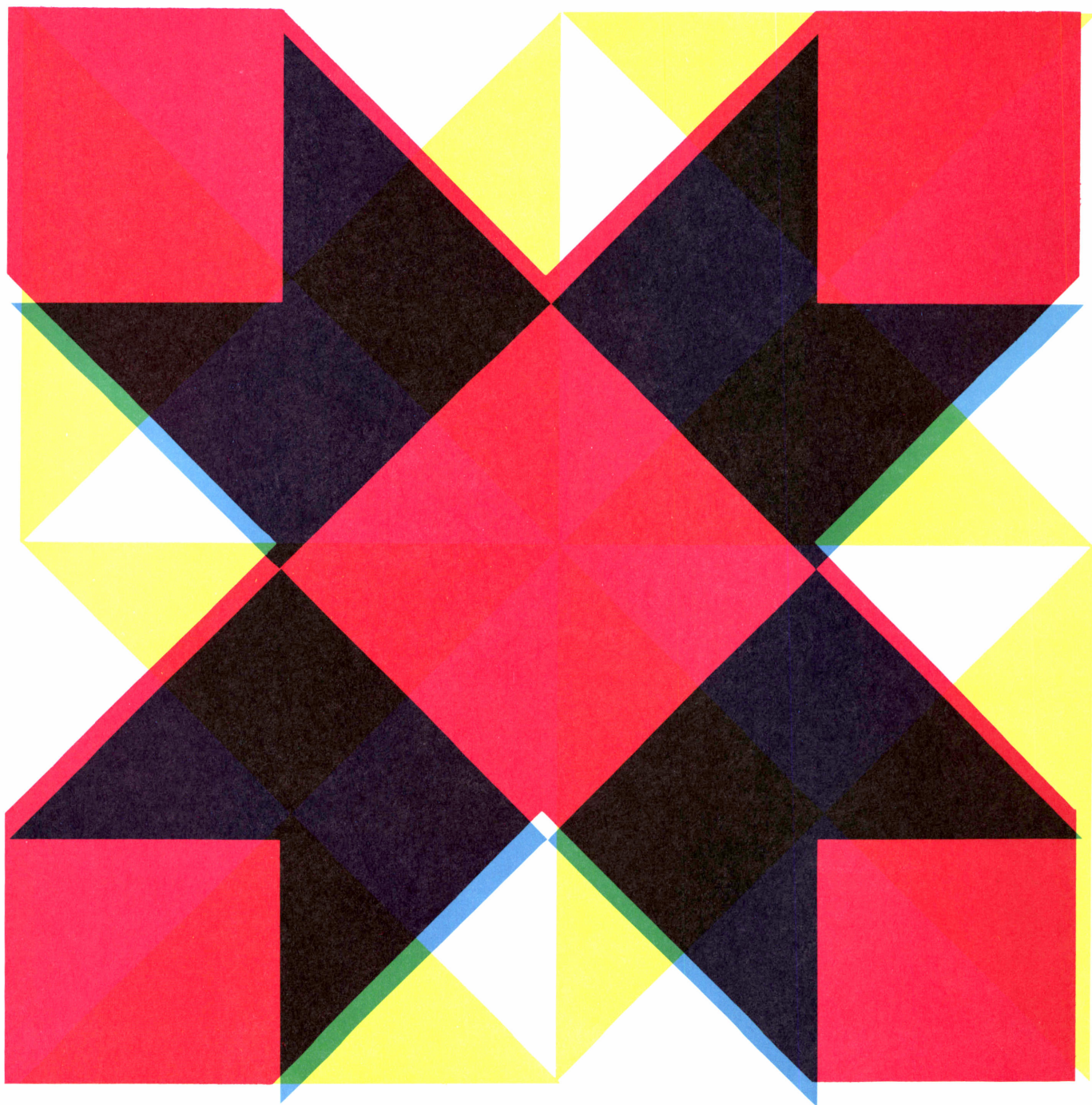
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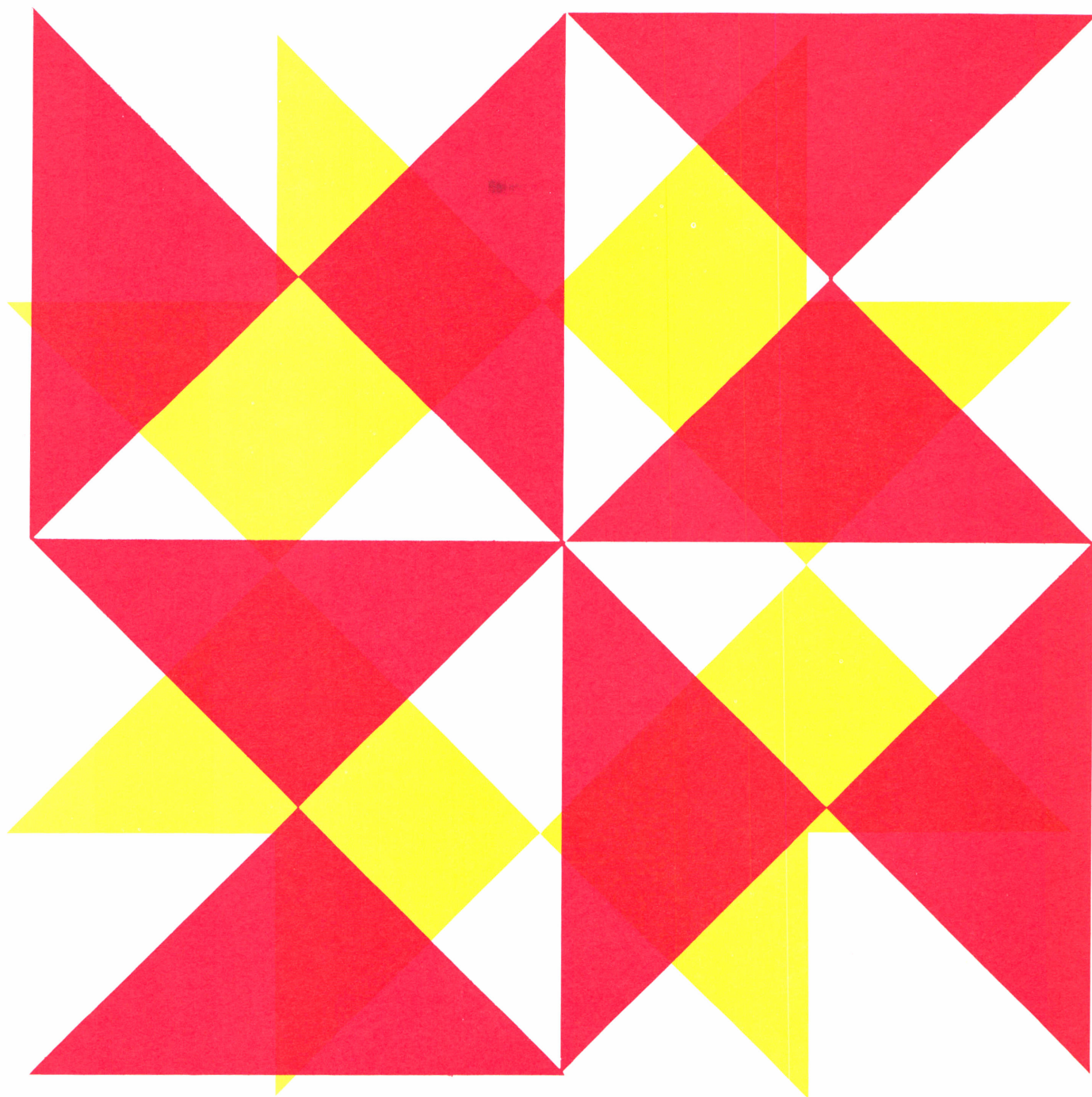






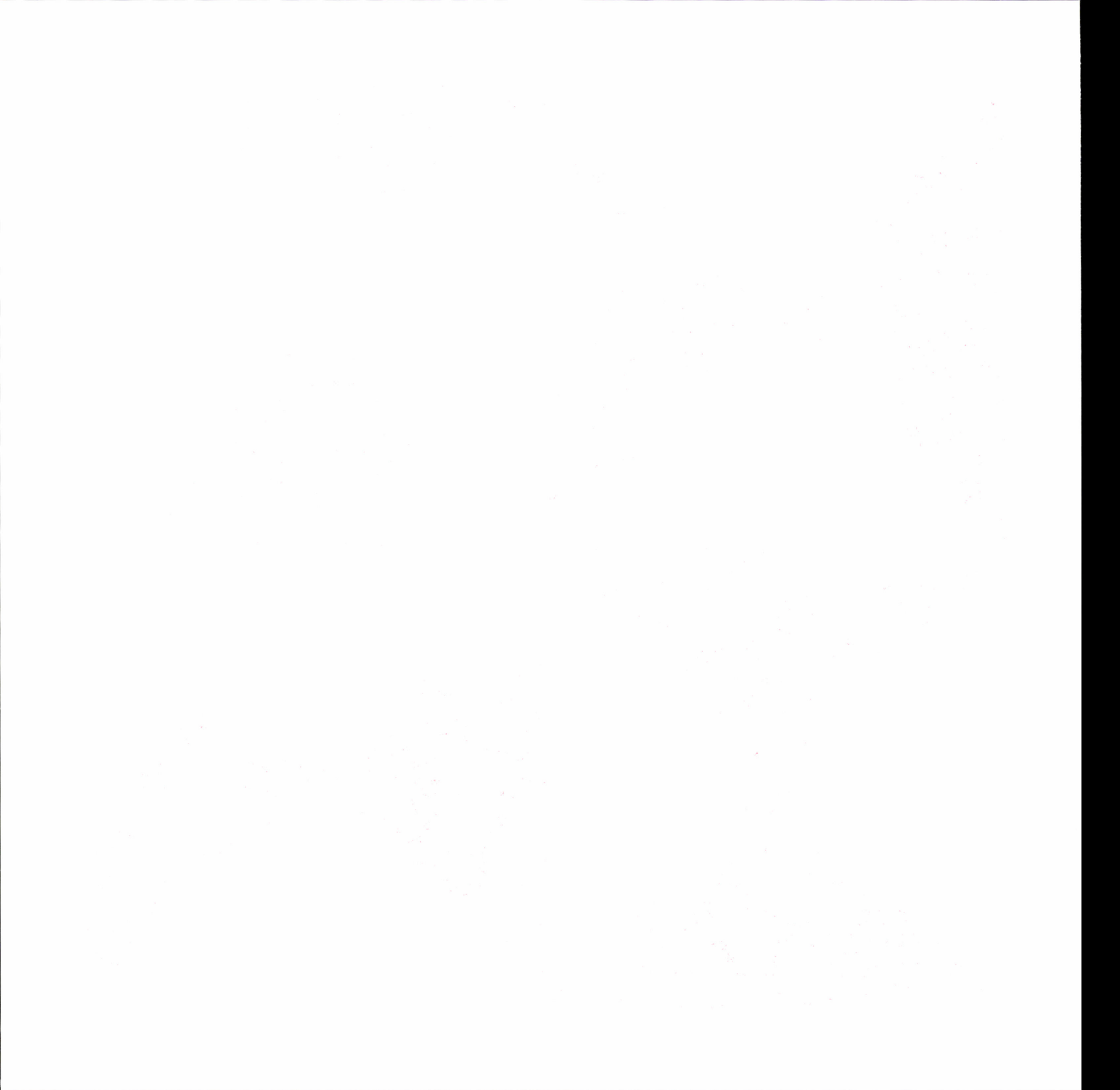




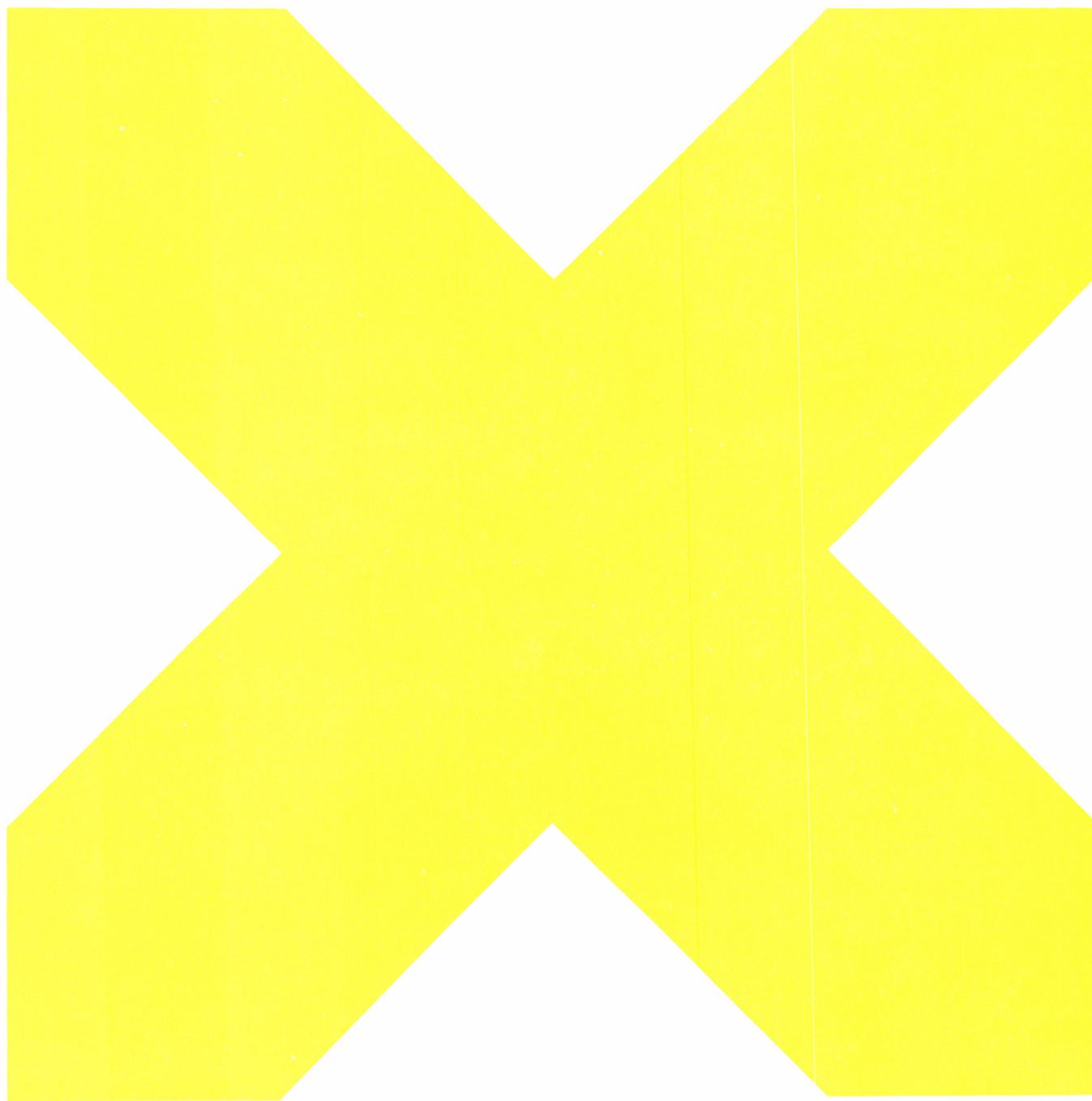


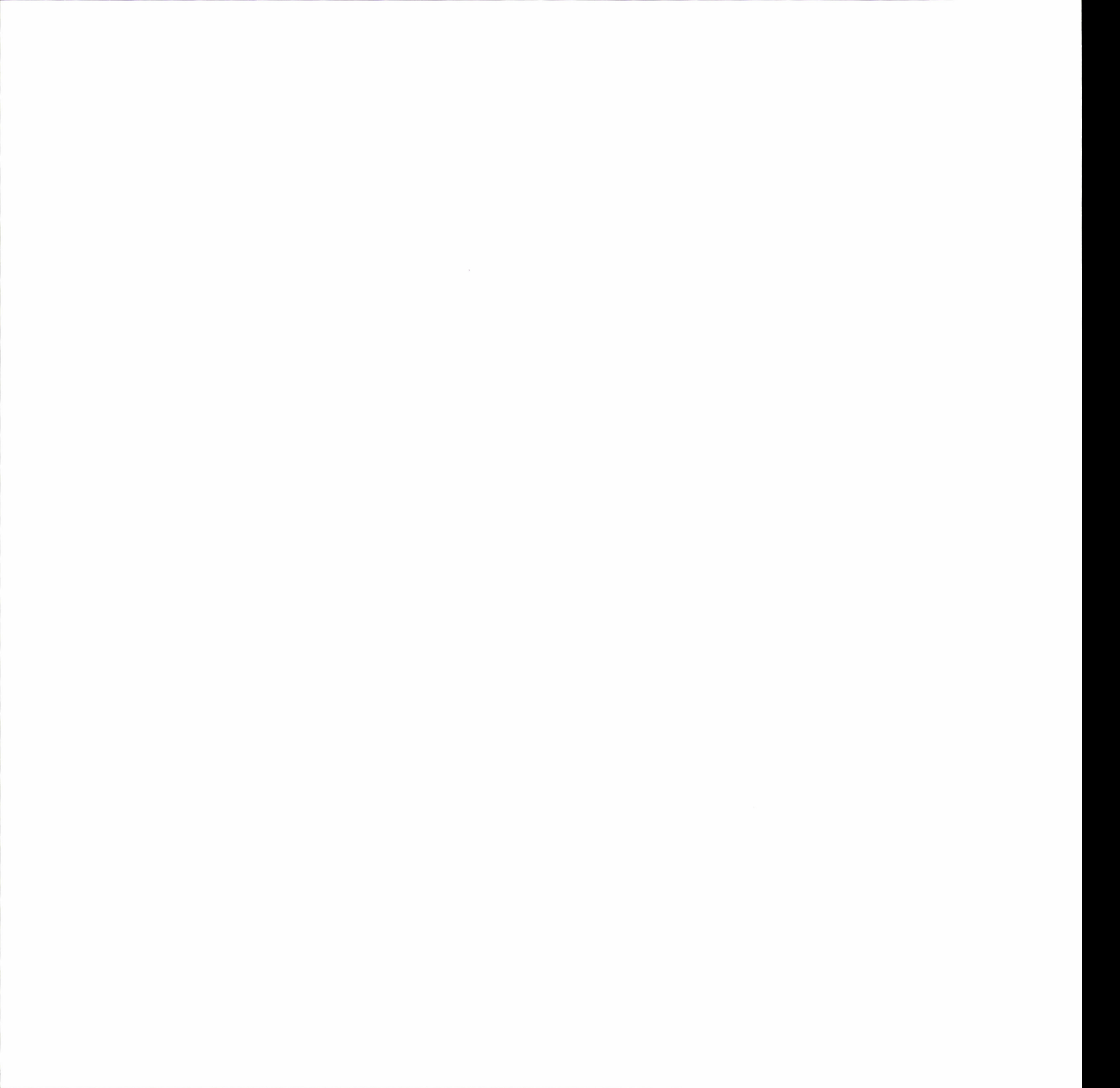
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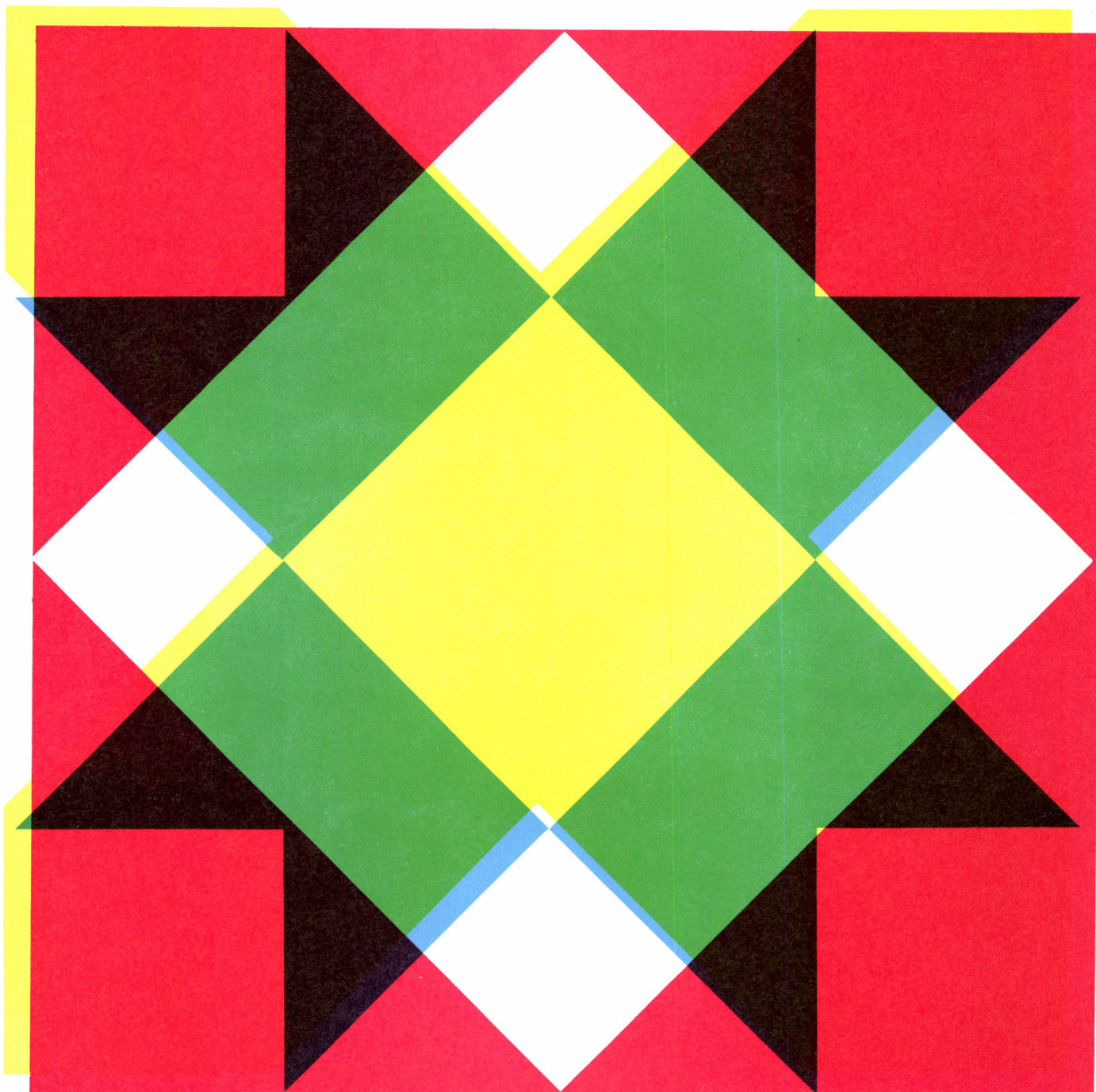








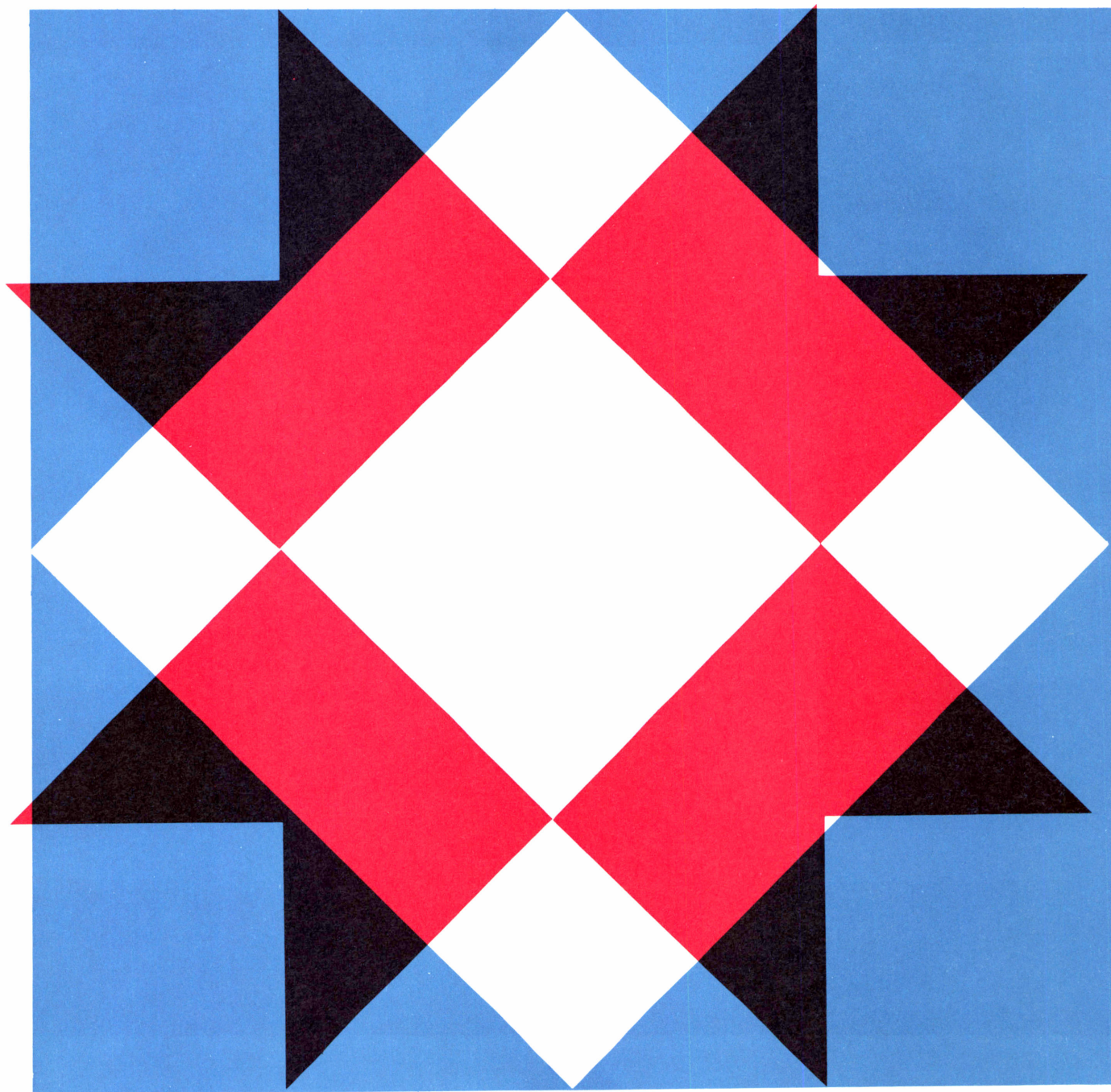




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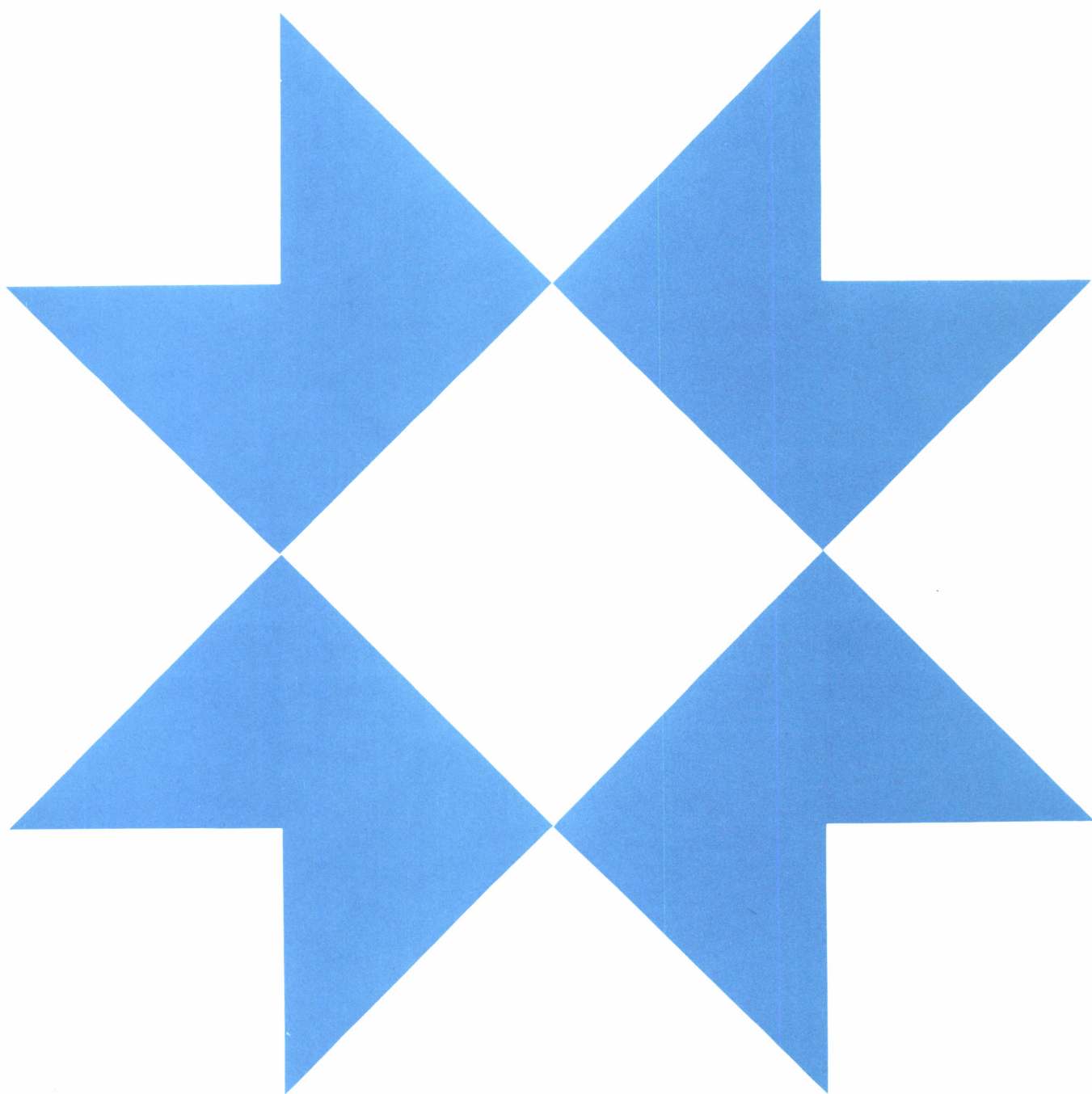






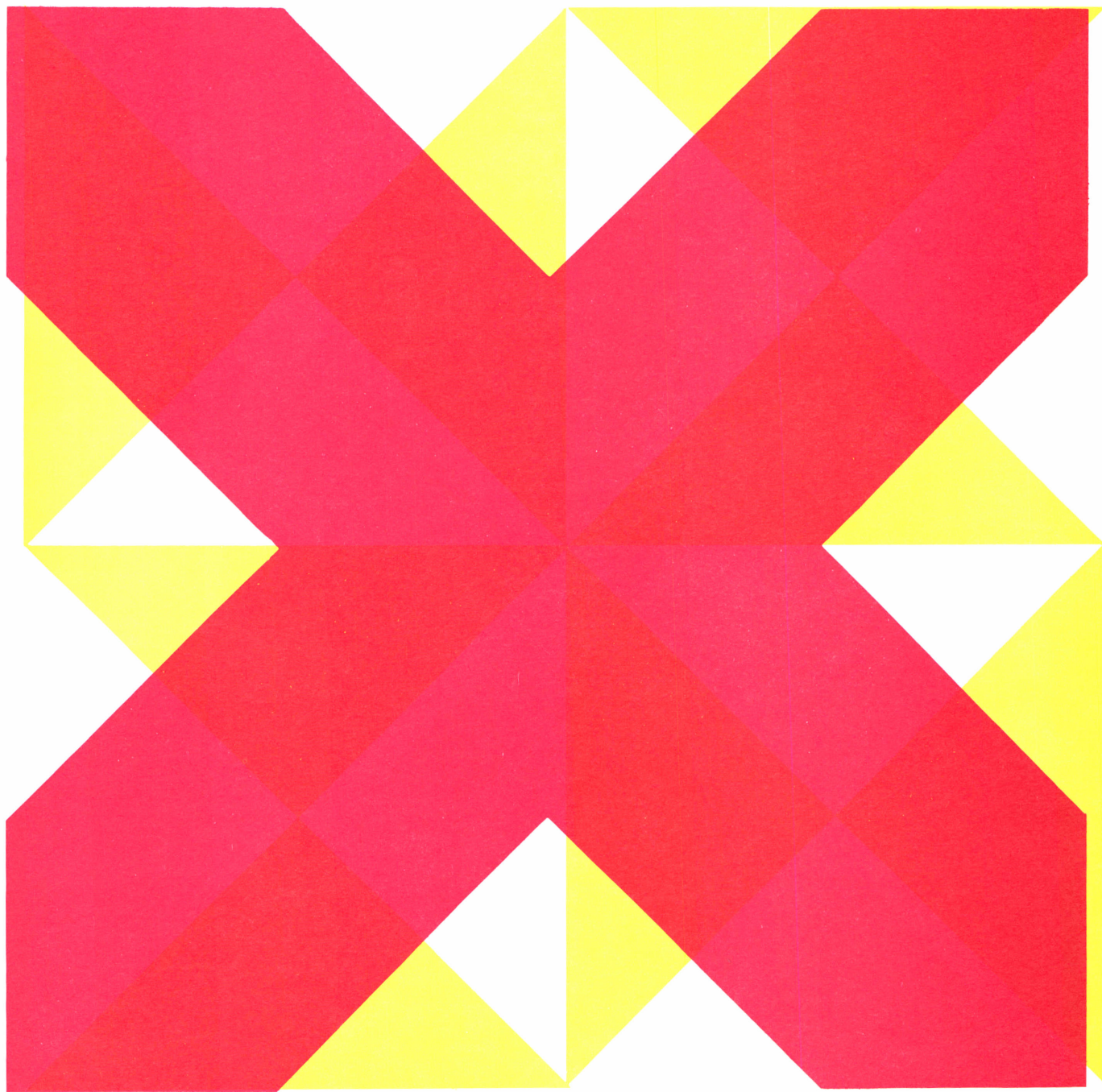






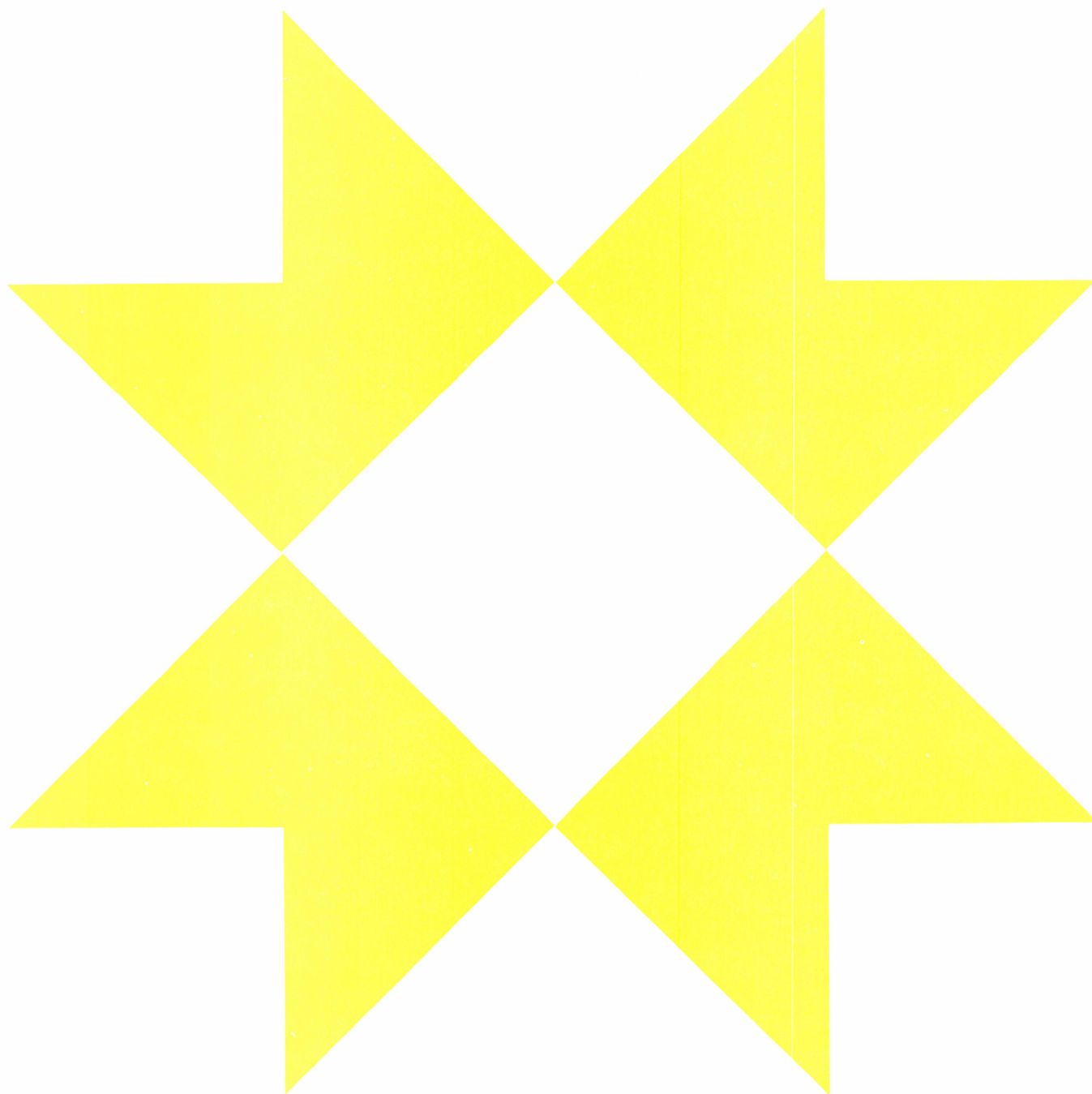


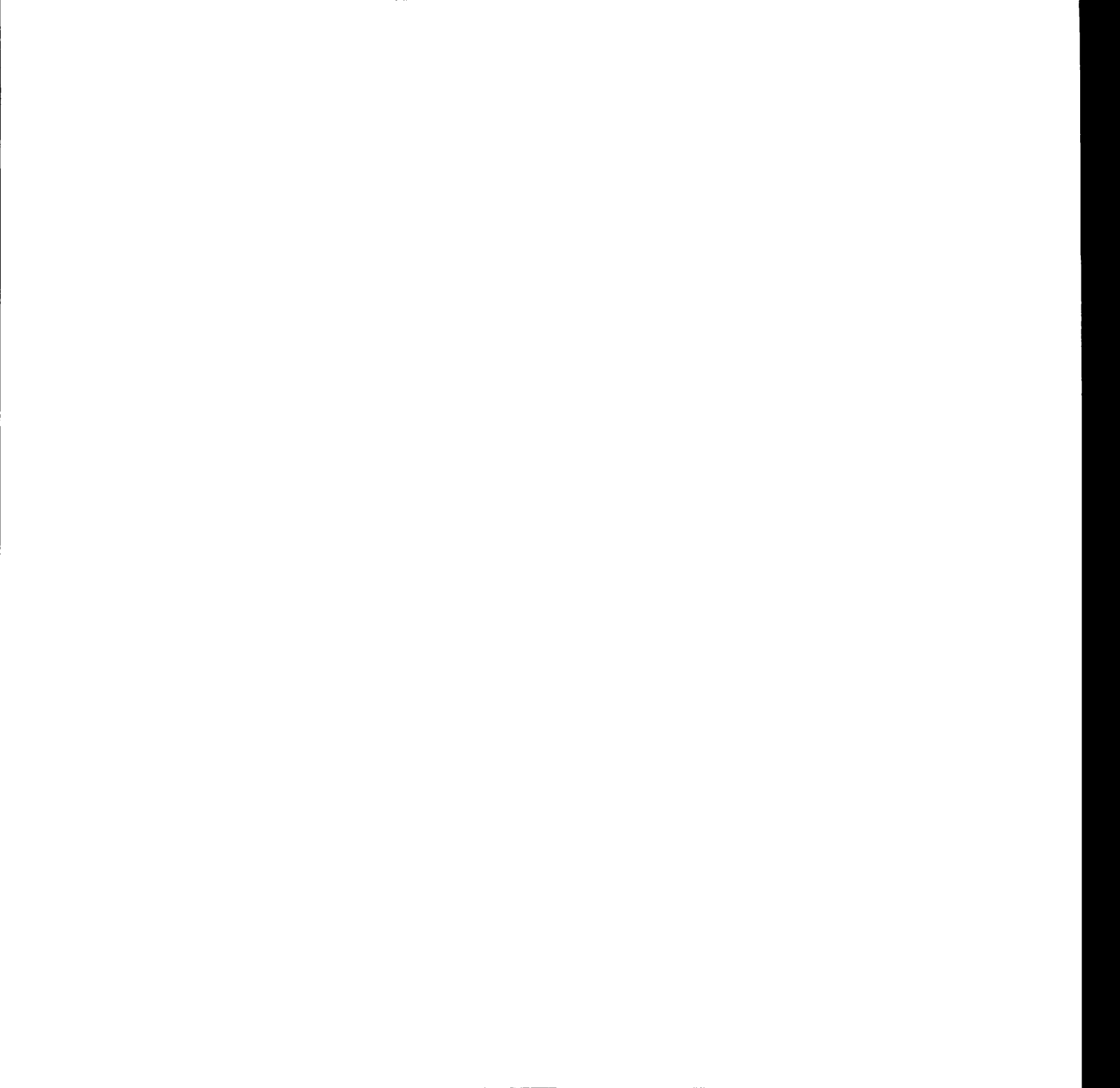












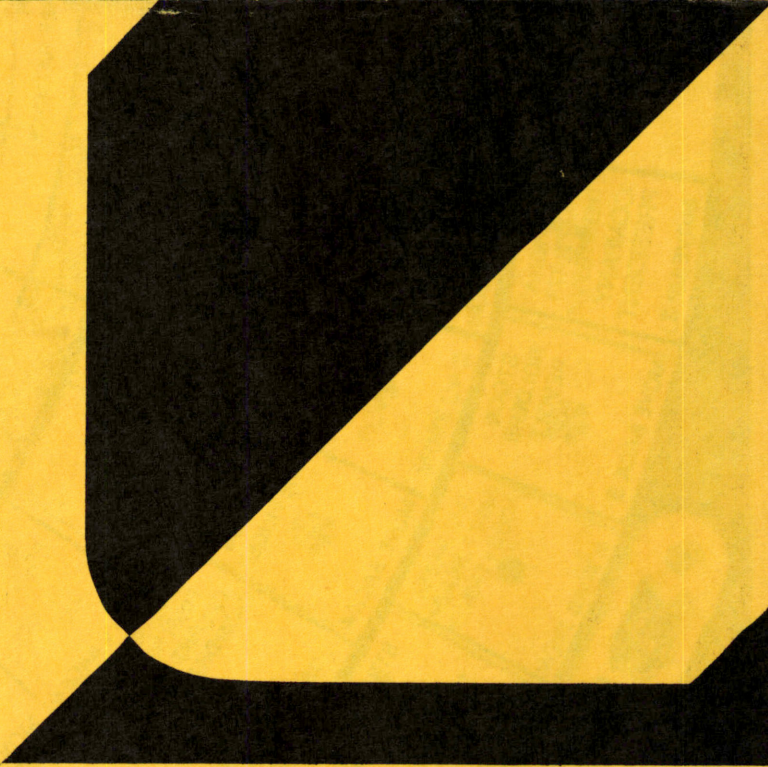


common: they each exist as a rather indiscriminate potpourri of real- and abstract-time art forms.

Up until recently in the performing arts, contribution by the visual artist was relegated to window-dressing the live (or real-time) performance with sets, costumes, props, and lighting. But in the new media, the visually controlled impact of the media is considered as important a part of the total experience as the live performer's contribution. In a motion picture, for example, the real-time scenes are filmed, then shaped into a complete filmic statement by editors and directors working in abstract-time reality: after a live performer contributes his skill, the visual impact of a scene is determined by sensitive cutting, scene transitions, use of sound, etc.

The new media require the flexibility of working indiscriminately in both abstract- and real-time concepts, yet conventional education in the arts has so far failed to recognize the consequences of the differences, much less to prepare students to meet the challenges they will encounter.

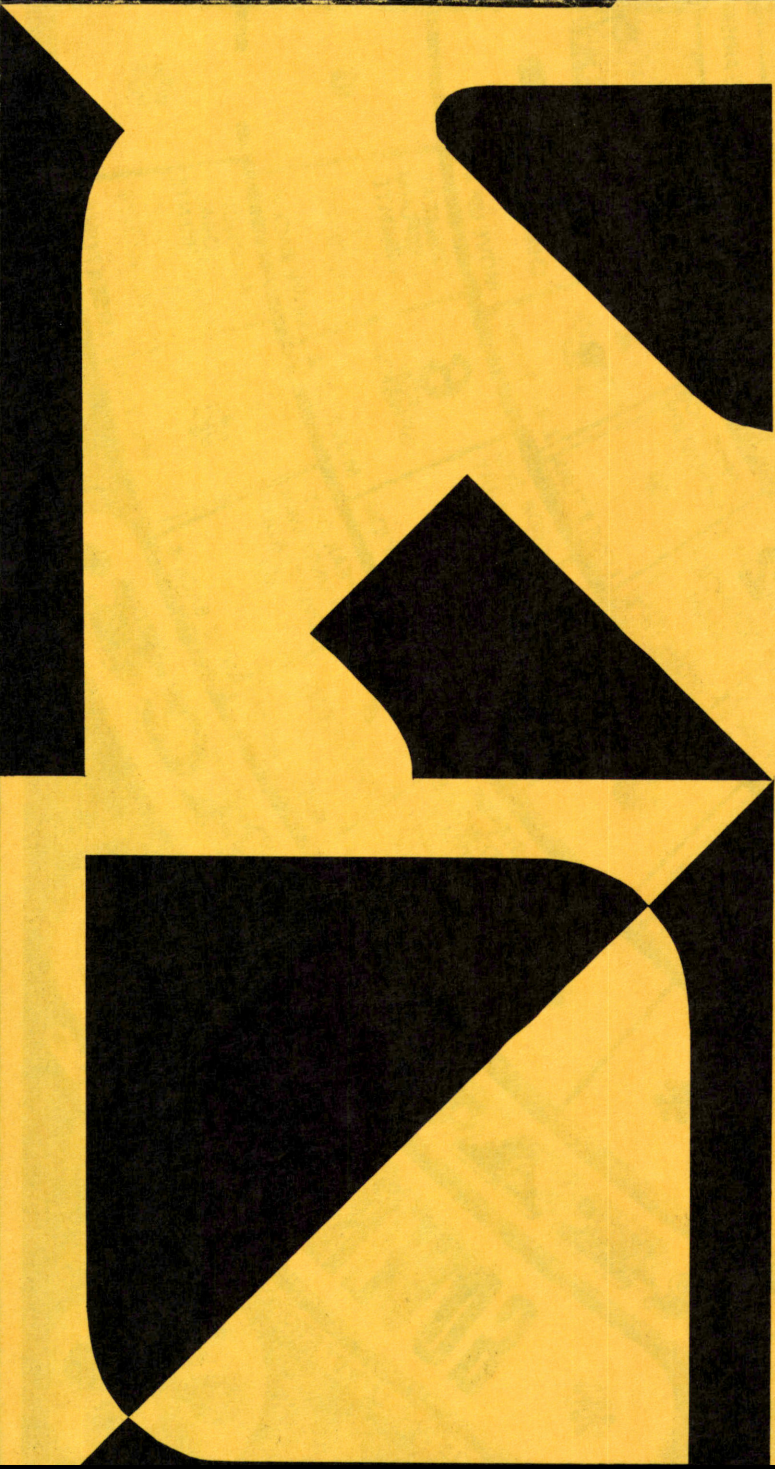
Perhaps this is not so difficult to understand: the boundaries between the arts have served the useful purpose of allowing sophisticated development of each individual art form, which could not have otherwise happened. But somewhere along the way, the boundaries became the definition, not the protective limits.



Up popped the perceptive mind of Marshal McLuhan, who looked around himself and commented, "The medium is the message (or massage, or Mass-Age)," and for the first time in the history of Western Art, the boundaries so carefully built over the centuries began to crumble. But McLuhan, with his fingers ever on the pulse of the Now Generation, was merely reiterating verbally the same statements which are everywhere being made in other media on the avant-garde wavefronts of most of the major art forms today.

The arts have always provided a sensitizing medium for society—a means through the





example of a painting, poem, or symphony for a man to examine the less superficial relationship between himself, his fellow man, and his environment. The arts were a "civilizing" influence—they conveyed, from generation to generation (especially in the times of pre-literate society) the sense-quality possible in a life style.

The Madison Avenue Ad-Empire—the 20th Century Reubens factory—is more forceful and profound as a sensitizing medium than any of the great masters ever hoped to be. Modern advertising, which embodies at the same time both the most gross distortion and the highest ideals of our culture, could never have been considered ART during the first half of the century. But then the POP-Artist (or the POP-PARTist, or the POP-APARTist), standing in the cultural mainstream, sensed the thrust of creative activity and cried, "Eureka! I have found it: what we are is what we are (not what we eat)!"

As a form of expression, Art and social conscience are merging—not in the obstruse punning of POP, or the clinical sensuousness of OP—but in a new free flowing commentary of sensation: a *segue* of sound and visual sensitivity of unbelievable magnitude and power. Those who look to the past forms for definition of the future will not only be unable to describe the future, but will also be unable to understand it.

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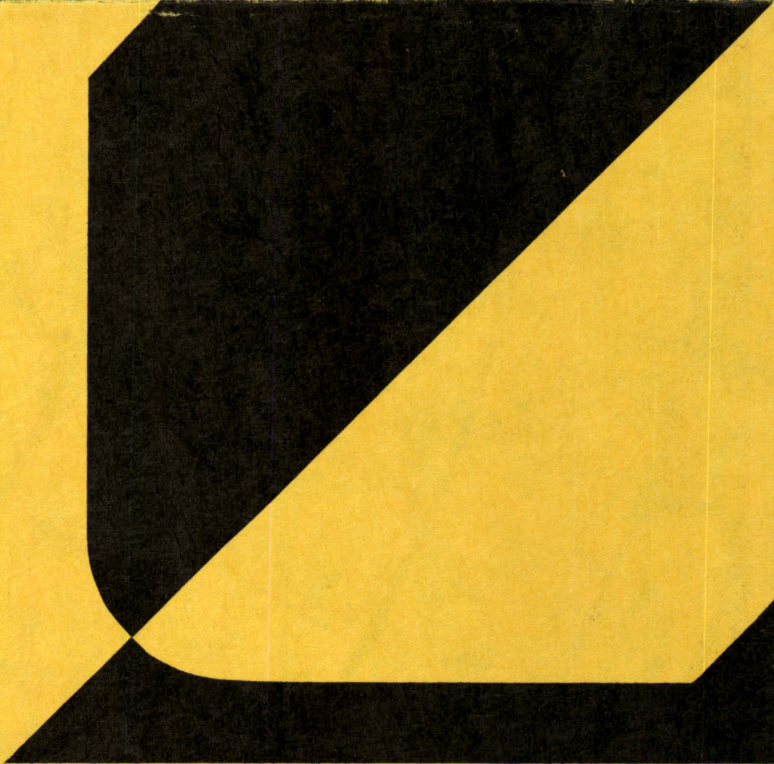


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BUREAUCRACY

INDUSTRY

1

2

12

11

10

UNIVERSITY EXPRESSWAY

GRADUATION  
PASSPORT

GIMMIE-A-DEC

3

PLANT  
MANAGER

MOVE UP 1

LABOR  
STRIKE

LOSE 1 TURN

EXPIRE

FUNERAL  
PAYMENT  
DUE

MOVE BACK 3

4  
JUNIOR  
EXECUTIVE

MOVE UP 1

STOCK  
MARKET  
COLLAPSES

MOVE BACK 5

FINGERS  
CAUGHT IN  
FILE DRAWER

LOSE 1 TURN

2  
FOREMAN

MOVE UP 1

FINGERS  
CAUGHT IN  
CASH DRAWER

LOSE 1 TURN

7  
CHAIRMAN  
BOARD OF  
DIRECTORS

MOVE UP 2

STROKE

LOSE 2 TURNS

GIVE BOSS  
THE FINGER

MOVE BACK 4

1  
JOURNEY-  
MAN

MOVE UP 1

5  
VICE  
PRESIDENT

MOVE UP 1

6

STOCK  
HOLDERS  
REVOLT

MOVE BACK 3

COMPANY  
PRESIDENT

MOVE UP 2

BUREAUCRACY

INDUSTRY

"FOLD, BEND, OR SPINDLE A BUREAUCRAT TODAY!"







**GOVERNMENT**

1 2 11 10 12

UNIVERSITY EXPRESSWAY

GRADUATION PASSPORT

3 MAYOR  
MOVE UP 1

4 STATE LEGISLATOR  
MOVE UP 1

MONUMENT PAYMENT DUE  
MOVE BACK 4

5 6 7 8

2 COUNCIL-MAN  
MOVE UP 1

5 GOVERNOR  
MOVE UP 1

CAUGHT ACCEPTING BRIBE  
MOVE BACK 4

CORONARY IMPEACHMENT THREATENED  
MOVE BACK 2

LOSE 2 TURNS

1 PRECINCT CHAIRMAN  
MOVE UP 1

6 SENATOR  
MOVE UP 2

7 PRESIDENT  
MOVE UP 2

LOSE 1 TURN

LOSE 1 TURN

LOSE 1 TURN

LOSE SEAT TO REFORM CANDIDATE  
MOVE BACK 4

AUDIT OF PERSONAL INVESTMENTS  
LOSE 1 TURN

SPEAK OUT AGAINST WAR POVERTY & DDT  
MOVE BACK 4

SIT FOR WHITE HOUSE PORTRAIT  
LOSE 1 TURN

TAXPAYERS REVOLT  
LOSE 1 TURN

DISPOSITION LANDSLIDE  
LOSE 1 TURN

GIMMIE A-DEG

FREE-RATRACE

EXPLORE

EXPLORE

EXPLORE

EXPLORE


**BUREAUCRACY**

**GOVERNMENT**

"HE WHO SITS BY A BUREAUCRAT SITS BY HIMSELF!"





An abstract graphic design on the left side of the page. It features large, bold, black geometric shapes against a yellow background. The shapes include a large 'L' shape on the left, a large 'P' shape in the center, and a large 'R' shape on the right. The shapes are interconnected, creating a complex, high-contrast composition.

example of a painting, poem, or symphony for a man to examine the less superficial relationship between himself, his fellow man, and his environment. The arts were a "civilizing" influence—they conveyed, from generation to generation (especially in the times of pre-literate society) the sense-quality possible in a life style.

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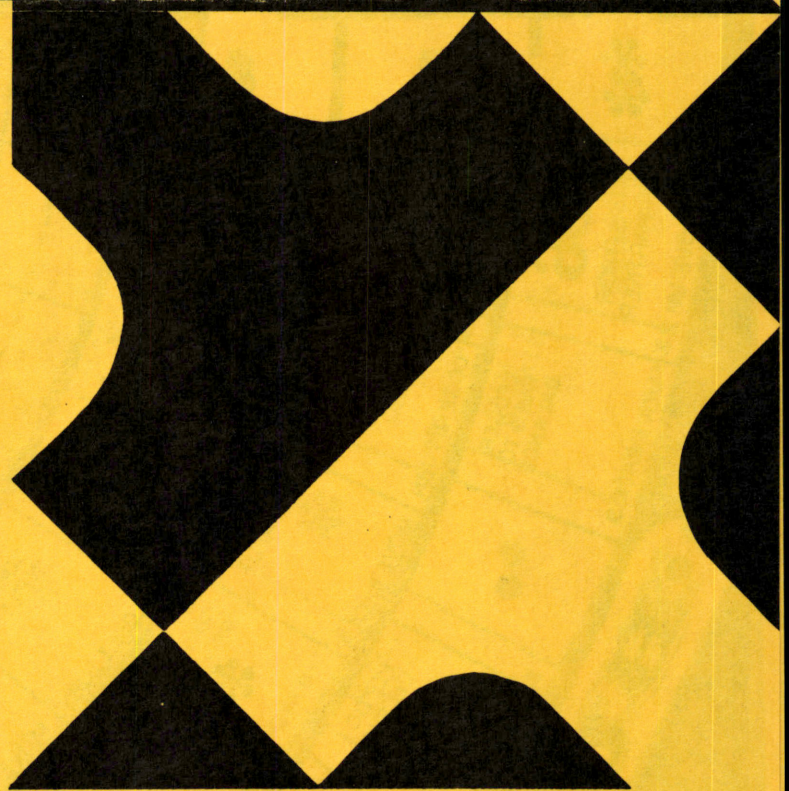
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## **Intermedia as Art as Inter- media as Art as Inter- media as Art as Interetc.**


"The Arts" is a contemporary catch phrase for the fragmentation of creative energy into convenient, definable, teachable units which can be given formal boundaries, distinguishable one from another. Dancers dance in musicals; musicians play for plays; painters hang in theatre lobbies. Each separate art form serves as embellishment for another, but seldom are two or more art forms blended together to effectively produce an extension of their creative impact. Even opera, which claims to be the oldest and most "multi-media-ed" combination of the performing arts, barely progresses beyond tacit supporting roles for the non-singing art forms.

At the heart of this disservice of one media to another, lie the problems created by conventional boundaries. And if various performing art forms seem estranged one from another, this alienation is mild compared to the chasms separating the performing arts and the visual arts. The visual artist, perhaps, has fewer restrictions imposed between media forms: he is able, although not without some difficulty, to transpose himself from two-dimensional to spatial relationships, from hand-craft media to photo-technical media.



The visual artist is trained as an introspective creature who states his perception of the world through a chosen media in detached, retrackable, abstract time. As the antithesis, the performing artist is a trained extrovert who must ply his trade in a real-time world. While the sculptor may reshape his ideas over a period of months, the musician has but the one present instant across the span of a performance to reach a given audience. These time-order distinctions have a compelling, profound effect on individual development which is seldom recognized or emphasized in foundation courses of art education.



An abstract graphic design on the left side of the page, featuring large, bold, black and yellow geometric shapes. The shapes are composed of various polygons and curves, creating a dynamic and modern visual effect. The black shapes are set against a yellow background, and the overall composition is balanced and visually striking.

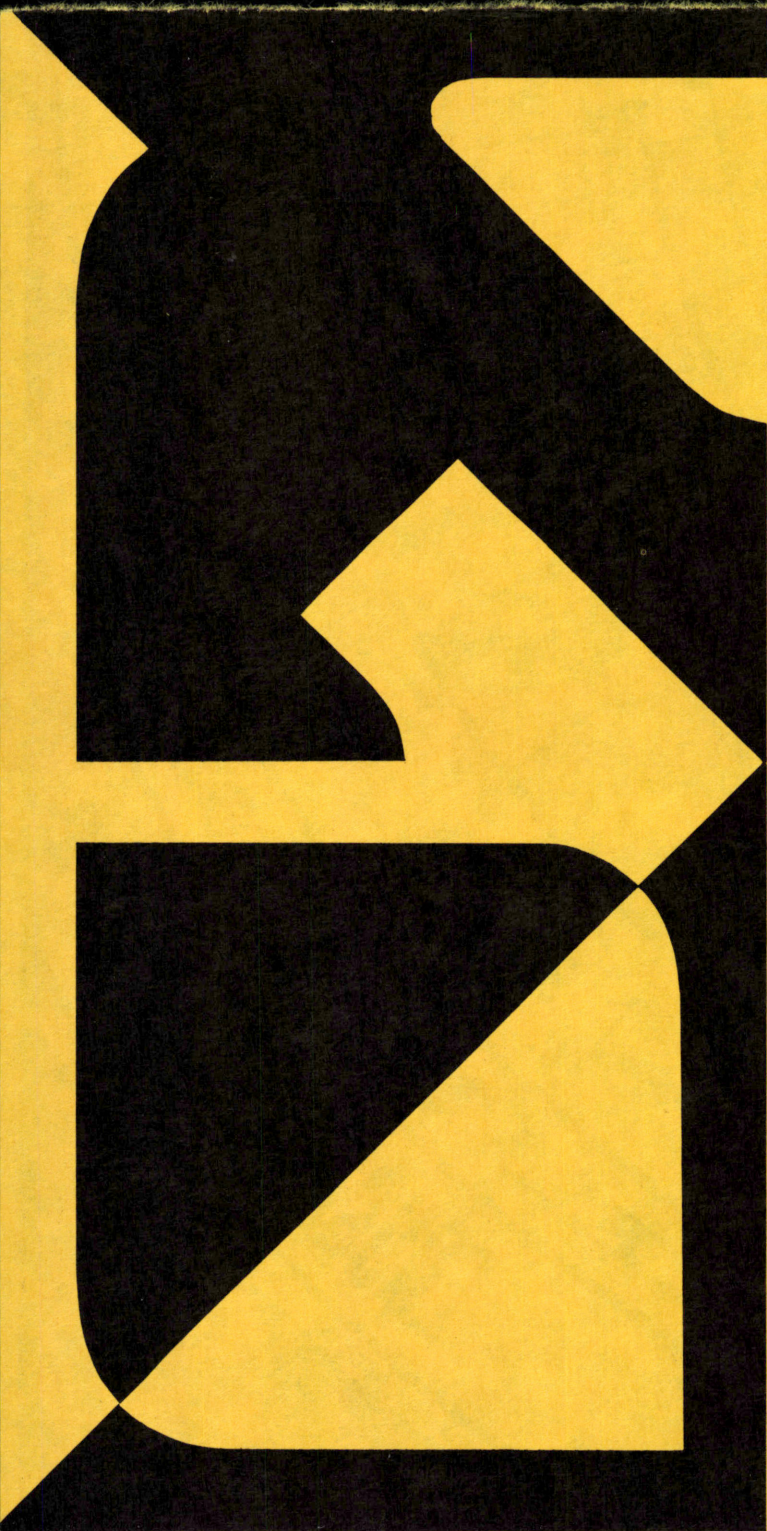
In the performing arts, the director is often ill-prepared to extract the best of each diverse set of artisans he is faced with. This may not be through fault of his own, since the cultural background he arose from displayed models of strict separation, and the educational system he faced further emphasized fragmentation.

It is at this particular 20th century juncture in the maturing of Man-as-Artist that the various performing arts and the visual arts have the possibility, indeed the challenge, of merging with themselves and with each other.

By its most over-simplistic non-definition, Intermedia can be described as the merging of various art forms into a new multi-sensory environment of experiences: an intricate blend of the live performer with the new electric technologies. Intermedia allows for the involvement of any media, any art form; it is defined not by what it excludes, but by the latitude of what it will allow. It holds that the arts must be a product of their times, must carry the imprint of its own era.

In today's world of the new techno-electronic media, photography and cinematography are barely recognized as mature art forms, live television and video-tape are being rushed through adolescence, and the confusion surrounding multi-media and Intermedia is due largely to their fledgling state. All of these new media, however, do have one element in



An abstract graphic design on the left side of the page. It features a large, solid black shape that resembles a stylized letter 'E' or a series of connected curves. This black shape is set against a bright yellow background. The black shape has several sharp, angular cutouts and extensions, creating a complex, geometric pattern. The overall effect is high-contrast and modern.

In the performing arts, the director is often ill-prepared to extract the best of each diverse set of artisans he is faced with. This may not be through fault of his own, since the cultural background he arose from displayed models of strict separation, and the educational system he faced further emphasized fragmentation.

It is at this particular 20th century juncture in the maturing of Man-as-Artist that the various performing arts and the visual arts have the possibility, indeed the challenge, of merging with themselves and with each other.

By its most over-simplistic non-definition, Intermedia can be described as the merging of various art forms into a new multi-sensory environment of experiences: an intricate blend of the live performer with the new electric technologies. Intermedia allows for the involvement of any media, any art form; it is defined not by what it excludes, but by the latitude of what it will allow. It holds that the arts must be a product of their times, must carry the imprint of its own era.

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# EDUCATION

UNIVERSITY EXPRESSWAY

GRADUATION PASSPORT

GIMMIE A-DE

FREE-RATRACE

1

2

4

7

5

6

8

11

10

12

2

PROFESSOR

MOVE UP 1

WORKING ON PH.D.

PROMOTION BY-PASS

LOSE 1 TURN

MOVE BACK 3

3

HEAD OF DEPARTMENT

MOVE UP 1

TOMBSTONE PAYMENT DUE

MOVE BACK 2

ATTEND HOMECOMING GAME

LOSE 1 TURN

4

DEAN OF SCHOOL

MOVE UP 1

FLUNKED FACULTY EVALUATION

MOVE BACK 5

1

INSTRUCTOR

MOVE UP 1

EXCESSIVE IVORY-TOWERISM

MOVE BACK 5

7

CHAIRMAN BOARD OF TRUSTEES

MOVE UP 2

MASSIVE APOPLEXY

LOSE 2 TURNS

5

CHANCE-CELLOR

MOVE UP 2

FACULTY REVOLTS

6

UNIVERSITY PRESIDENT

MOVE UP 2

\*

# BUREAUCRACY

"BUREAUCRACY IS A SIGN OF MENTAL RETARDATION."





BUREAUCRACY

BUSINESS

UNIVERSITY EXPRESSWAY

GRADUATION PASSPORT

GIMMIE-A-DEC

EXPIRE

GREEN RATRACE

BUREAUCRACY

BUSINESS

"NEVER DO NOW WHAT CAN BE PUT OFF TIL LATER."

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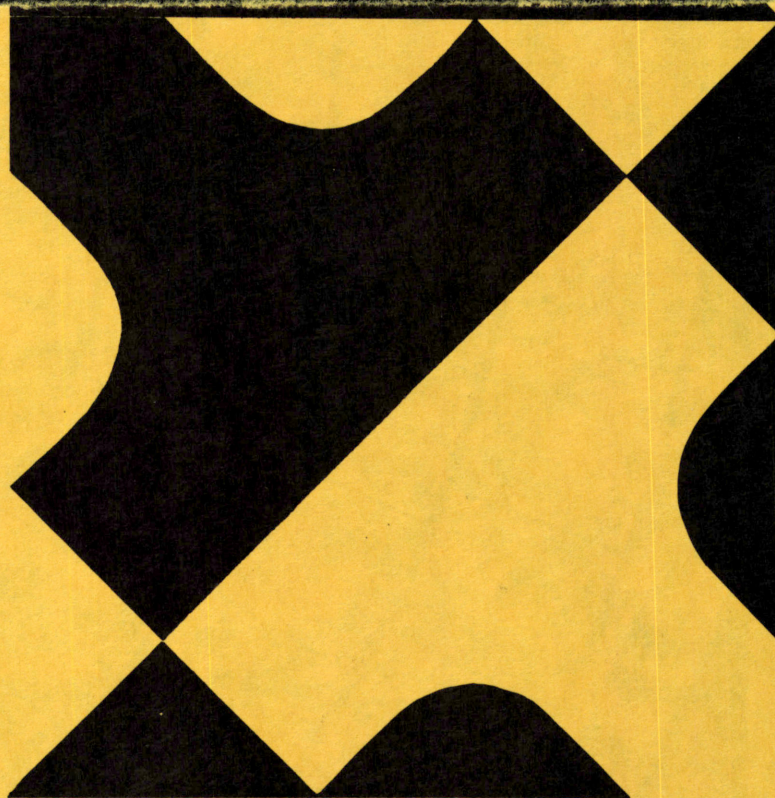
3



## **Intermedia as Art as Intermedia as Art as Intermedia as Art as Interetc.**

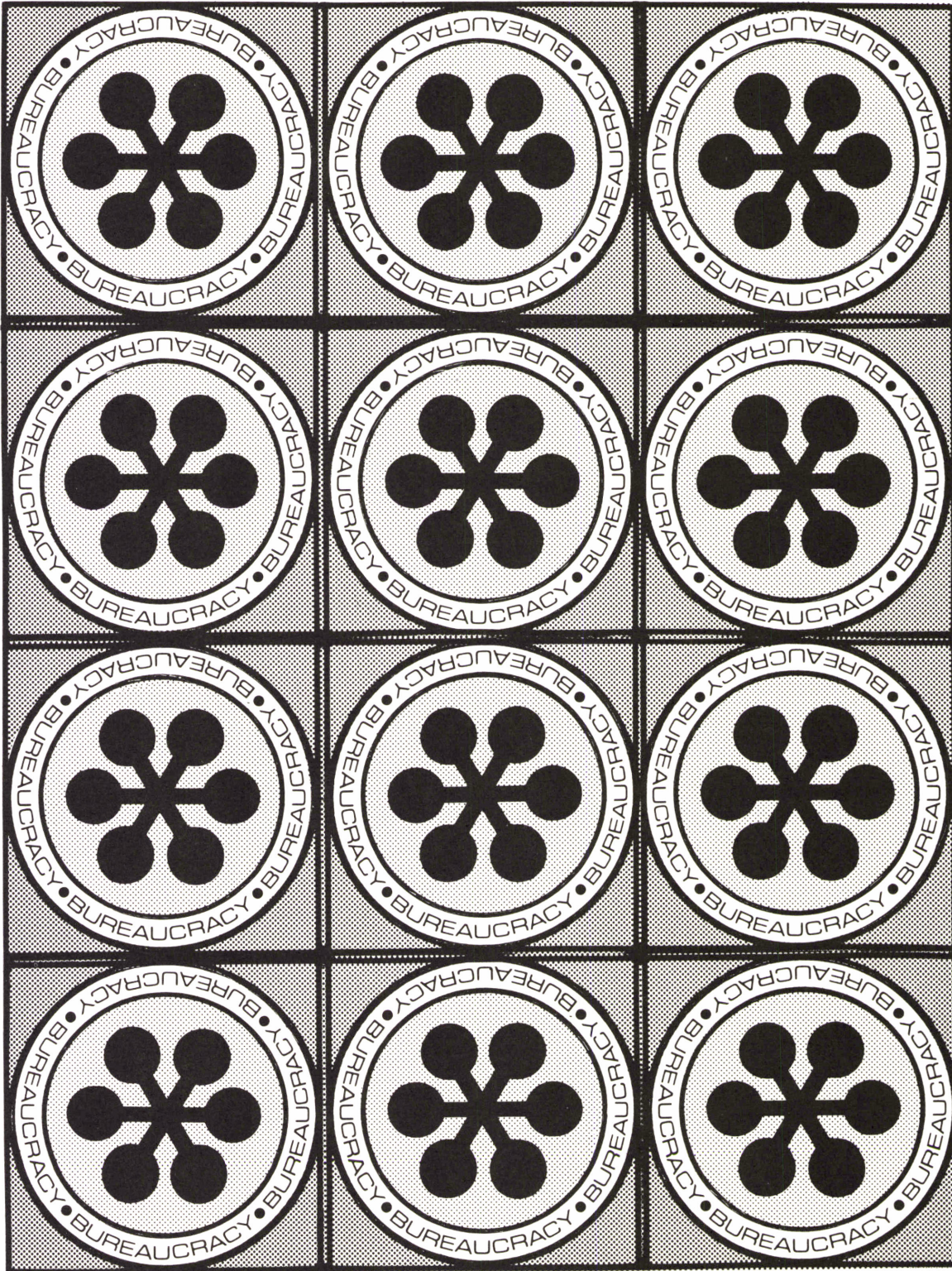
"The Arts" is a contemporary catch phrase for the fragmentation of creative energy into convenient, definable, teachable units which can be given formal boundaries, distinguishable one from another. Dancers dance in musicals; musicians play for plays; painters hang in theatre lobbies. Each separate art form serves as embellishment for another, but seldom are two or more art forms blended together to effectively produce an extension of their creative impact. Even opera, which claims to be the oldest and most "multi-media-ed" combination of the performing arts, barely progresses beyond tacit supporting roles for the non-singing art forms.

At the heart of this disservice of one media to another, lie the problems created by conventional boundaries. And if various performing art forms seem estranged one from another, this alienation is mild compared to the chasms separating the performing arts and the visual arts. The visual artist, perhaps, has fewer restrictions imposed between media forms: he is able, although not without some difficulty, to transpose himself from two-dimensional to spatial relationships, from hand-craft media to photo-technical media.



The visual artist is trained as an introspective creature who states his perception of the world through a chosen media in detached, retrackable, abstract time. As the antithesis, the performing artist is a trained extrovert who must ply his trade in a real-time world. While the sculptor may reshape his ideas over a period of months, the musician has but the one present instant across the span of a performance to reach a given audience. These time-order distinctions have a compelling, profound effect on individual development which is seldom recognized or emphasized in foundation courses of art education.







## I'M FOR INTEGRATION

BUT...

... your daughter married a Negro. While no one holds this against you, nonetheless, you are delayed one turn.

If you are in the lower echelon, move to middle office position.

# SHAKE-UP SHAKE-UP

If you are in the upper echelon, move to lowest office position.



You are suffering from Occupational Schizophrenia. Take your next two turns in the opposite direction.

# DOUBLE DAH-BULL

Move twice on your next throw.

## Exposé!

Your suburban key club is discovered. For your next turn, throw to see what you might have had, but do not move.

# BOGUS CARD

(You've been gyped!)

You tried to buck the system and

# FAILED!

Kick the buck-it habit by moving back 1 office position.

# UNCOMPENSATED OVERTIME TIME

Spend one turn buried in paperwork.

# GO/NO GO SIDESTEP

You are moved immediately to an office at the same level in the hierarchy to your right.

# UNDER DOG ★ BUCK-UP ★

Move players above you to the next level below you in either adjacent hierarchy.

# PULL

You must pull everyone behind you in your hierarchy to the first ● behind you. Return card if unused.

This card will allow you to push anyone ahead of you in the same hierarchy up to 3 blocks forward to your best advantage.

# PUSH



# INTERMEDIA EXTENSIONS

by GENE MESSICK

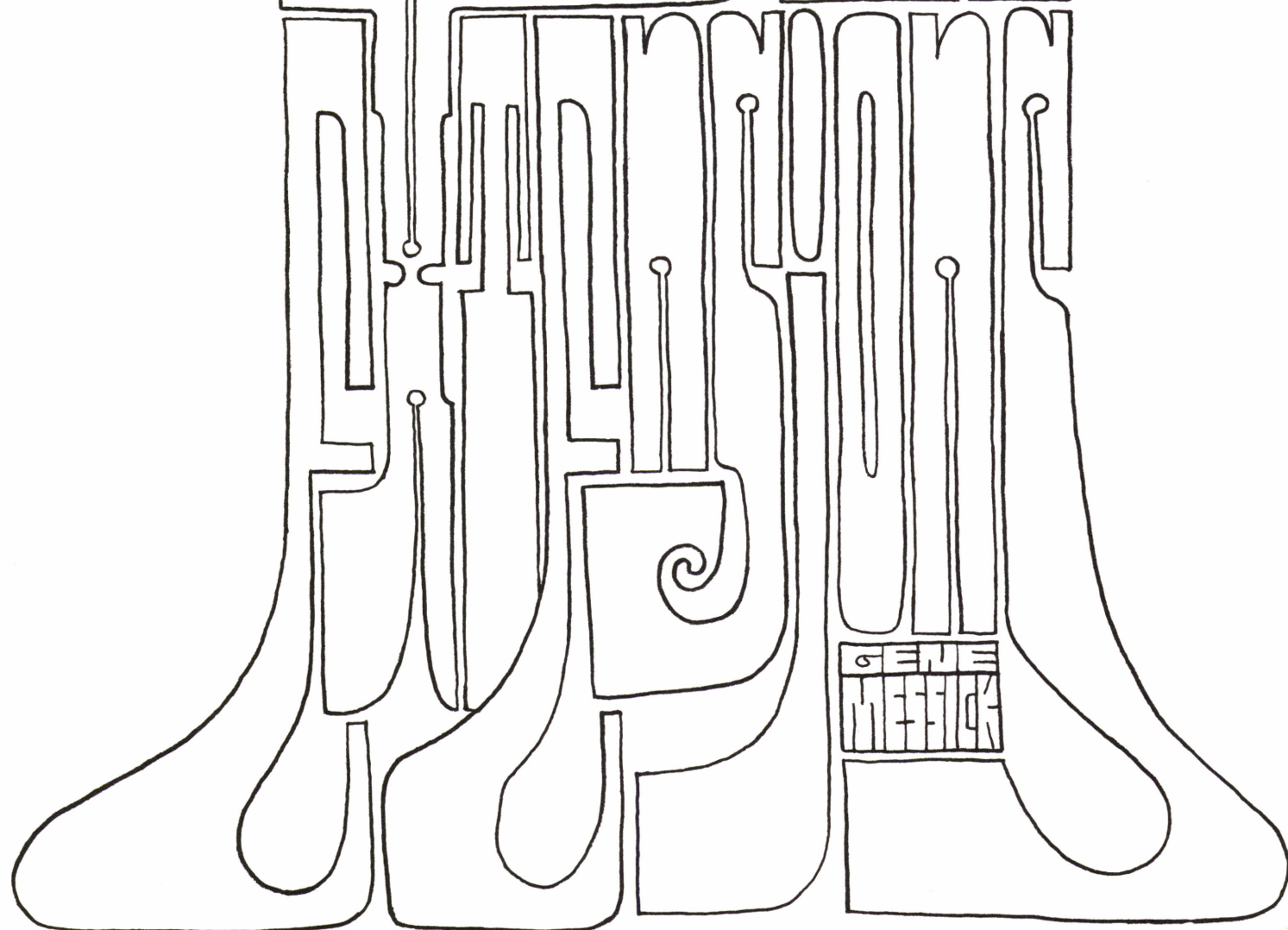
BEING ANY COMBINATION OF THE SEVERAL FOLLOWING:

- 5 Compound modular extensions of over-simplified ideas:  
Studies in multiple relationships through the print media.
- 4 The DISPOSABLE/EXPOSABLE:  
A new concept for old trash.
- 3 The Game of BUREAUCRACY.
- 2 Requiem to a Dream: M. M. C. W. @ N. C. S. U. ca. '68 & ff.  
A short history of Intermedia abbreviated.
- 1 Intermedia as Art as Intermedia as Art as Interetc.
- 0 None of the Above

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INTERIA



GENE  
WEEK



To increase communications, multiply interoffice memos by 4 and spend one turn filing second copies.



You have lost the key to the executive washroom. Stand cross-legged for one turn.

You are the 5th man in a 4-seat car. You may ride the bumper for 3 blocks forward, or take another throw.



The accounting department shredded your pay-check by mistake. Hold one turn to piece it back together.



Deficiency discovered in your educational background. Take remedial courses and return to the Graduation block of your choice.

## Switcheroo!

This card will allow you to switch markers with any player ahead of you, providing both are in the same hierarchy.

## LEFT-HANDED

This card will allow you to pass one tough break card to the player on your left.

## BUCK-PASS

## SHRUNK BY THE SHRINK

Staff psychiatrist finds you overwrought and unstable. Move back 2 office positions or Graduation, whichever is closer.

TOSS



SLOW DOWN

Throw again and move in the opposite direction.

## TEETER-TOTTER SYNDROME

Take two throws:

1st throw: move back

2nd throw: move up

Accept benefits and/or penalties of both blocks landed on.



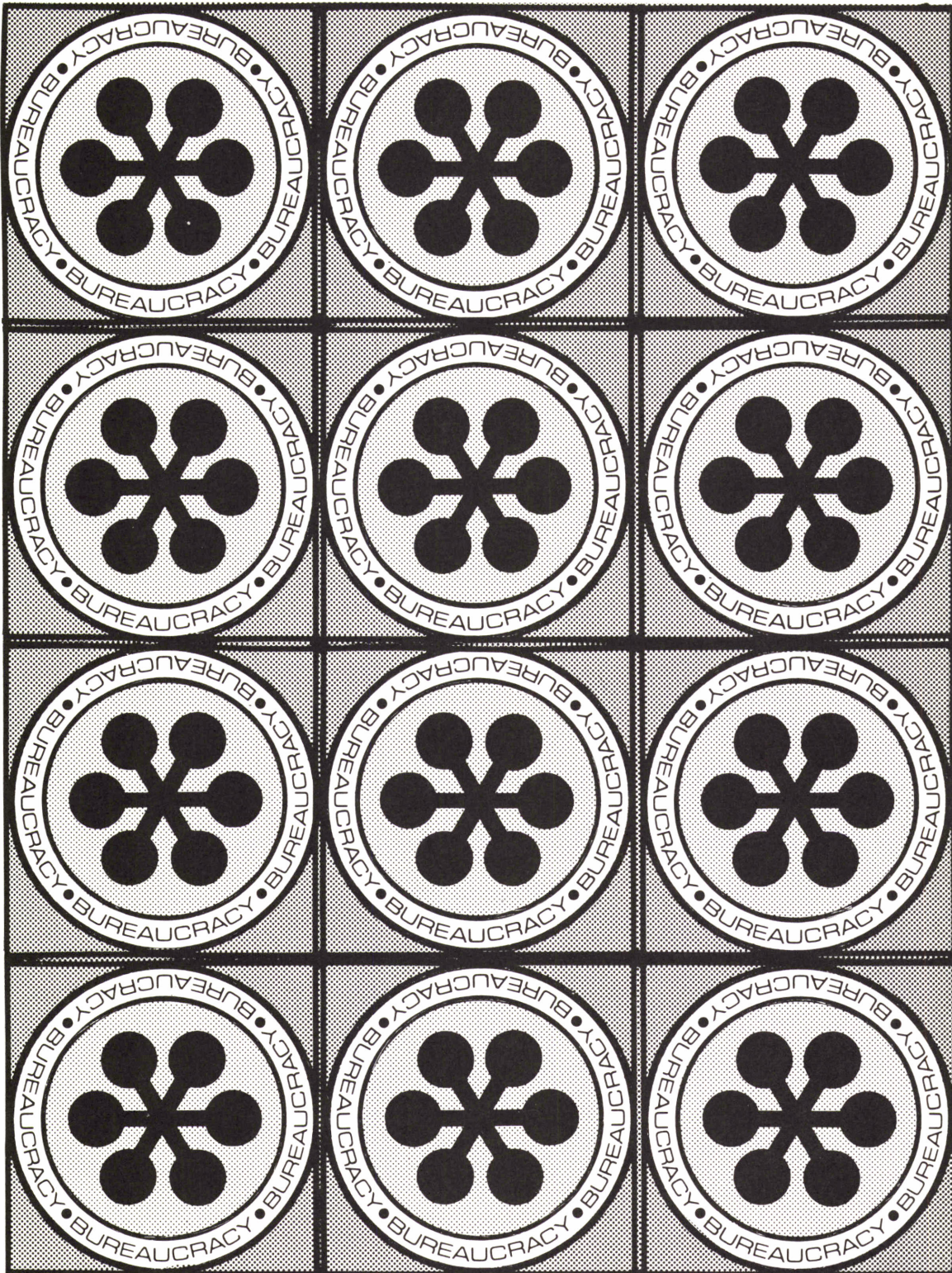
Credit card: save to cancel one tough break.

## BUNK UNAMERICARD



Credit card: save to cancel one tough break.



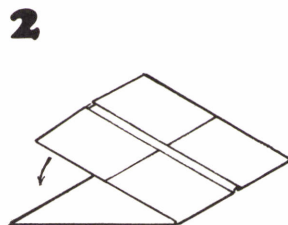
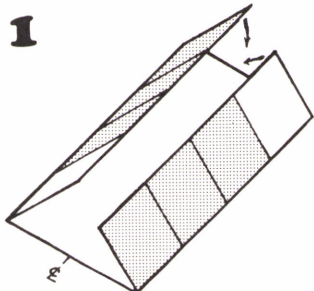




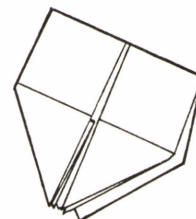
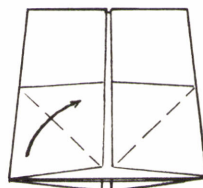
# The DISPOSABLE/EXPOSABLE

In the interest of momentarily diverting the endless flow of paper from the printing press into the trash heap of our environmental circular file, the yellow and orange sections of this publication have

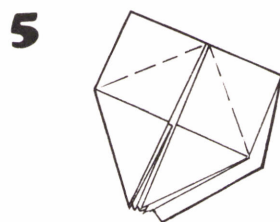
been designed to self-destruct—constructively—by additionally providing a brief period of dexterity therapy. Instructions are offered only as an aid to the origamistically uninitiated.



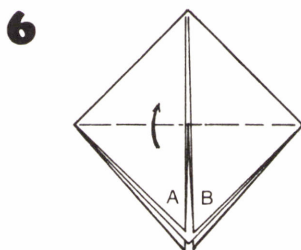
Crease lower triangles 45 degrees to center seam: 2 in front, 2 in back, then . . .



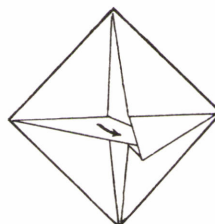
. . . reverse fold all 4 corners by pushing each triangle internally along the crease lines of step 3.



Repeat operations 3 & 4 on the two upper corners.



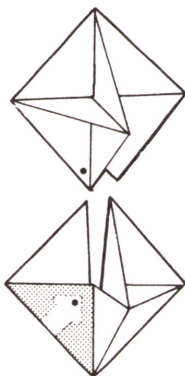
Crease triangular flaps A & B upward on front; repeat on back.



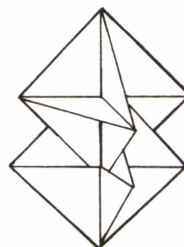
Tuck triangle A completely inside triangle B on front; repeat on backside.

**8**

Set this half (top) aside; repeat steps 1-7 for the second sheet to form the bottom half.

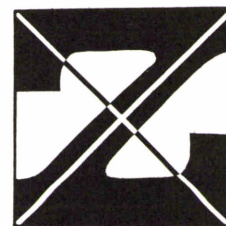


Orient the two halves as shown; plug together. The two halves self-lock by slipping the two upper joints into the two lower pockets, and vice-versa. (This may be facilitated if the pockets are first opened out, then reclosed when together.)



**10**

View your coordinated space description from each of the six external vertices.



TO CREASE: To form the line along which a fold will later be made.

TO FOLD: To deform by a permanent change in position.



## **The game of BUREAUCRACY**

BUREAUCRACY is based on the operationisms of four commonly identified, but seldom understood HIERARCHIES (represented by the 4 quadrants), which are, for the purpose of the game, patterned after the following:

**BUSINESS:** the partnership/proprietary company or office which produces little but mountains of paperwork in the name of "services."

**INDUSTRY:** a mega-structured corporation which promotes Massive Consumption to carry off the endless stream of junk it produces.

**GOVERNMENT:** based on the standard Democratic Plutocracy, and the Republic for which it stands, as idealized in the common variety high school civics textbook.

**EDUCATION:** the American Universal Oligarchy which controls (and corrupts) higher education in this country.

### HOW TO PLAY BUREAUCRACY

Begin by each player placing a marker in the inner circle of one of the four hierarchies. Each player in turn throws a die (one of a pair of dice) to determine moves along the winding and perilous path toward Ultimate Expiration. (To expire is one plateau higher than to retire.) More than four people can play at a time, since no hierarchy is considered exclusive property of any one player.

### THE INNER MINI-GAME

The Object is to land on a Graduation Passport block so that the player can next move out into the "real world" of establishment bureaucracy. The University Expressway blocks, if landed upon, may be used to shortcut the normal path.

If you overshoot the Graduation Passport block on your first try, you must continue running around in the "Gimmie-a-Degree-Ratrace" until you land on a Passport block (which could be for the rest of the game). Upon landing on a Passport block, the player begins to move toward the nearest exit, and into a bureaucracy, which need not be the one he began in.

### THE OUTER MAXI-GAME

There are seven levels (or job positions) in each hierarchy, and the final plateau, Expiration. Landing in a new job advances a player forward; dot ● blocks are neutral; other blocks are self-explanatory.

Asterisk (\*) blocks require drawing a Bureau card from the central deck. All cards drawn are kept face-up in front of each player until used or expired, then returned to the bottom of the deck for possible replay.

At each change of direction in the path, the player has the opportunity to change hierarchies if he chooses, often to his advantage to avoid penalties. There are advantages and disadvantages to being in the same hierarchy as another player, depending on how the cards fall.

To expire, players must go out on a die throw equal to the number of blocks needed, with no remainder.



## REQUIEM TO A DREAM

### MMCW@NCSUca'68 & ff\*

A short history of INTERMEDIA abbreviated

#### WORKSHOP GOALS AS PROPOSED

The workshop will concentrate on advanced experimental investigations into the communications process, dealing with the interactions of multi-media communications forms presented in a programmed and controlled environment. The program of study concerns 2-, 3-, and 4-dimensional modes of communication, with emphasis on fourth dimensional relationships: time sequential patterns for presenting information, event placement in time as a time-control concept, contrapuntal interaction between media forms, space-form modulation as related to time order of events. (i.e., event: time: object: space: figure: ground)

With the cooperation of Ira Allen, the Director of Thompson Theatre, the workshop was begun with 16 volunteer students as a non-credit summer experience. Beginning from scratch, gradually production equipment and supplies were gathered on loan from various University and private sources.

Through group discussion and study, the objectives were set to prepare individual and sub-group projects evolving from the particular interest areas of the students in the workshop. A

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\* MULTIMEDIA COMMUNICATIONS WORKSHOP at N.C. STATE UNIVERSITY, Summer 1968 & following.



preliminary display of experiments and discoveries was presented after the first month to members of the Design faculty and students.

From evaluation discussion, the group decided to present a public performance of some type in August, extending along the individual and sub-group work plan. The presentation was to be non-linear in content, coordinated only by the nature of the individual segments and such transition bridges between segments as necessary for emotional or sensory continuity.

The title, *The Orange Driver, or How to Get Out of Greensboro in a Polkadot Truck* generated from the experiences of the group on several



terms of skill development, in-depth understanding, inter-personal work relationships, and generation of new ideas, both individually and through group effort.

Instead of the one weekend of public performances originally scheduled, the workshop production ran 36 performances over a three-month period. The extension of the project became the foundation for a new Intermedia program at Thompson Theatre, which continued until November, 1969.

In the year and a half that the program existed, \*more performances of more productions were given than ever before in the history of the Theatre;

\*more students, faculty, and townspeople attended than ever before;

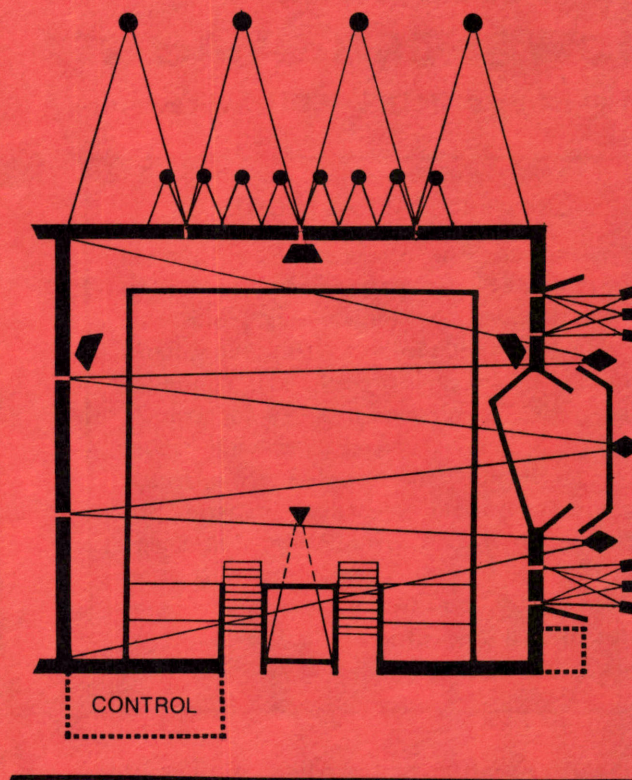
\*for the first time, a large number of students were actively involved in the writing, acting, directing, and technical design and control of professional-level quality productions;

\*box office income doubled over any previous year;

\*more publicity of higher quality, and more public recognition was secured over a wider area than ever before; and

\*numerous former students and staff members who participated in the program have gone on to apply and extend their initial studies of Intermedia across the country.

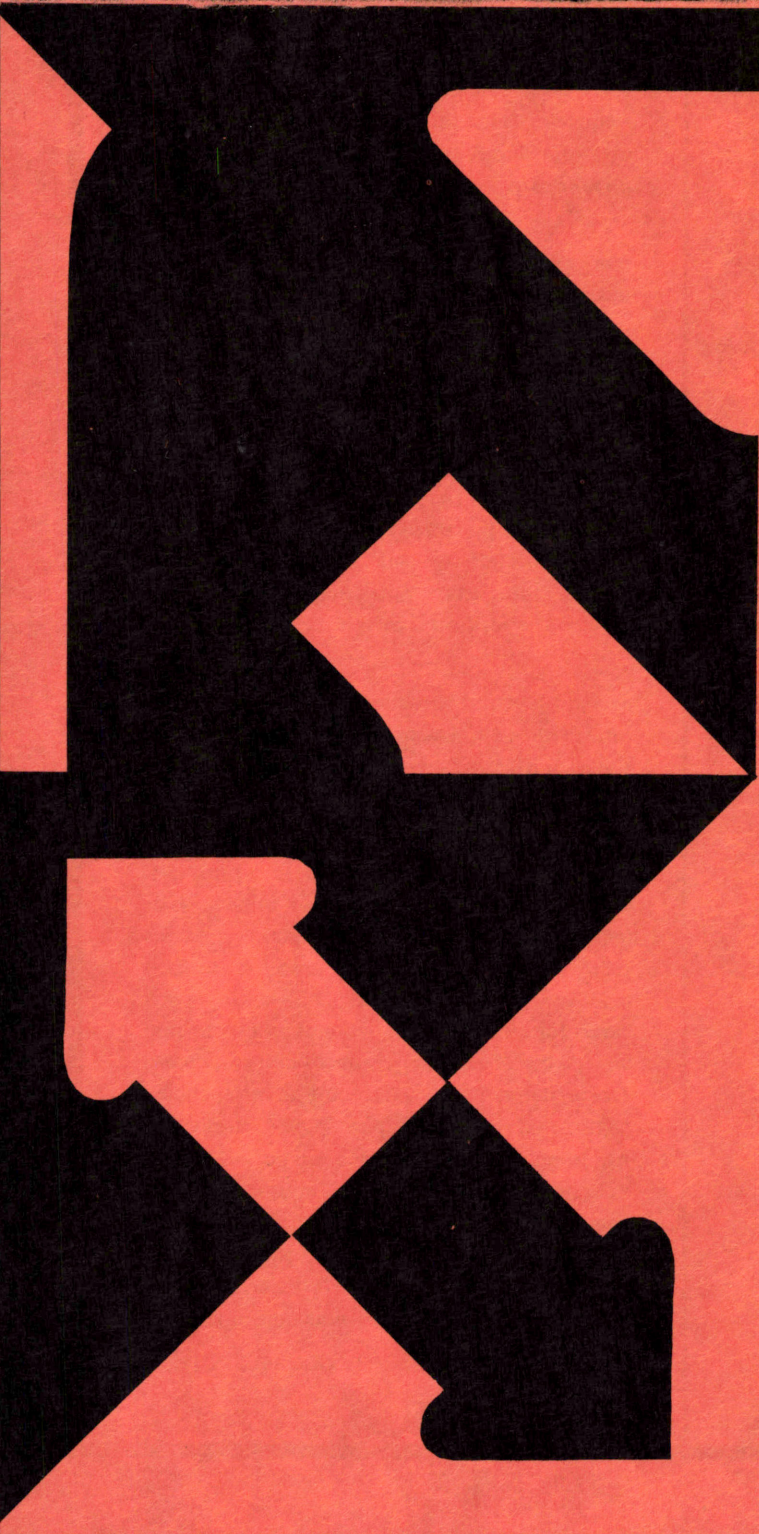
## The Orange Driver



## EPILOGUE

Shortly after the MAN AND THE ARTS production, the University administration cancelled the Intermedia program. Never in its short history did the University give the program any official recognition, nor provide the program with any incentive to grow. Its phenomenal success, which will long benefit those who participated, is due entirely to the relentless efforts of many students who gave selflessly of their time and talents to build a dream.





retreat-field trips. Live performance was added to the recorded and filmed media segments in the form of a short play, several portions written and directed by the students, and through several segments for dancers.

The physical form of the Theatre space was determined as production ideas began to solidify. It became essentially a "cube" of space with the audience on a raised central platform. The space was regarded as a sensory environment, with activity planned to occur on all four sides. Emphasis was on exploring the multiplicity of possible presentational variations: the front wall was a 48' long rear-projection screen containing a matrix of 12 slide projectors; on one side was a 48' cloth cyclorama covered by three 16mm motion projectors; another side contained two back-lit "shadow boxes" for dancers and an acting stage 12' off the floor. The rear wall contained two tunnel entrances, a large hanging glass sculpture, and a large "infinite image" mirror box viewed at the entryway of the tunnels.

The various portions of the facility were used singly or in combination, depending on the nature of the material presented. The space became a tool which could be programmed simply as from a single projector, or to the maximum of 18 projectors and encircling sound system to provide a totally surrounding environment.

CONTINUED INSIDE THIS SECTION



AUG-OCT 68 THE ORANGE DRIVER

NOV 68 Governor's Report on  
Higher Education, a three-screen  
presentation in Memorial Auditorium.

DEC-JAN 69 OHM IS WHERE THE  
ART IS: Intermedia interpretation of  
Jonesco's THE LESSON and a modern dance,  
audience participation adaptation of  
Thorber's THE LAST FLOWER.

MAR-APR 69 CLICKSTOP: Another  
participation workshop for students in  
Design and English courses; original and  
adapted material.

APR-MAY 69 CONFLICT & HOPE: An  
original non-denominational Intermedia  
religious celebration prepared in cooperation  
with the campus Chaplains.

May 69 COMMUNICATION IN THE  
FAMILY, a half-hour ASPECT television  
program, telecast by WUNC-TV. (Kinoscope  
copy on file at NSCU Visual Aids  
Department.)

SEPT 69 DUNN STREET MIND  
SHAFT: Another cube-type  
environment, concentrating  
more on original social commentary.

OCT 69 MAN AND THE ARTS:  
Displayed in an 80-foot Geodesic  
Dome at the N.C. State Fair, and funded  
by a \$5400 grant from the N.C. Arts  
Council, it was shown 170 times  
to over 25,000 viewers.

## CONTINUED FROM REVERSE SIDE

The entire non-stop performance, lasting about  
an hour-and-a-half, required split-second  
coordination from all the students, many of  
whom were sequentially on stage, then  
backstage fulfilling technical control functions.  
All of the on-off and change functions of the  
projectors, sound, and lighting were handled  
manually, with stop-watch coordination. Every  
event, including every slide change, had to be  
precise and intentional, with no room for error:  
there were no random sections in the  
performance as in the case with most pure "light  
shows." All control functions, although manual,  
were handled remotely through miles of cables  
laid from central control panels to the various  
pieces of equipment.

The coordination functions were designed  
according to need, and certain standard methods  
were developed. Slide screen blackouts were  
accomplished by programming cardboard blanks  
into the trays.

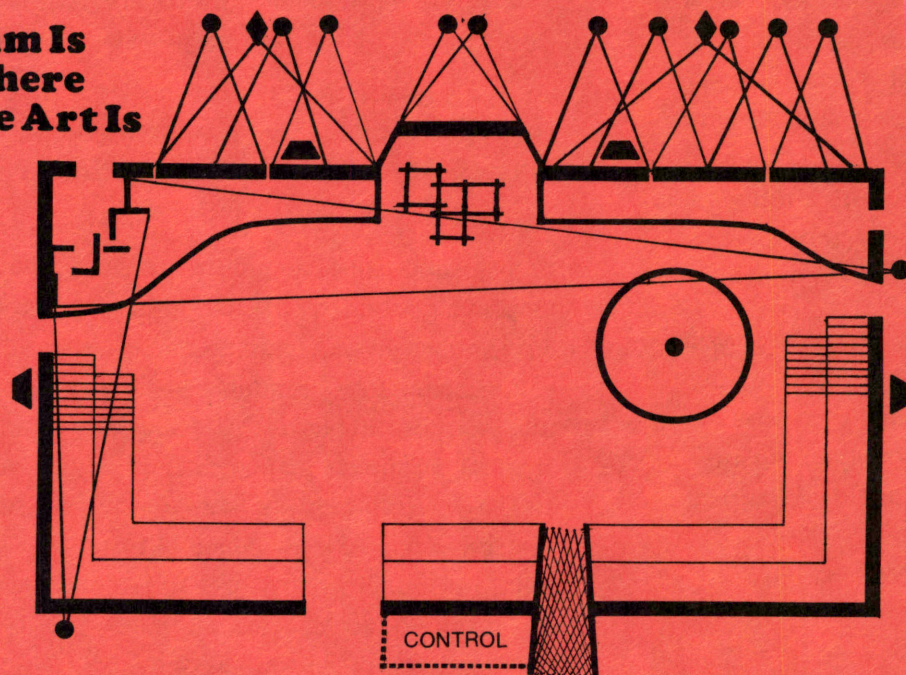
When motion film was to go off (or to come on  
and off intermittently, as from several  
projectors), opaque leader was spliced into the  
film. Thus filmed images could appear and  
disappear rapidly without stopping the  
projectors.

Cueing systems were devised as the individual  
students gravitated toward the technical control  
functions of their choice. Precision skills  
developed to an unpredicted sophistication, and  
cross-fertilization was abundant, as specialists in  
sound tried their hand at visual work and  
vice-versa.

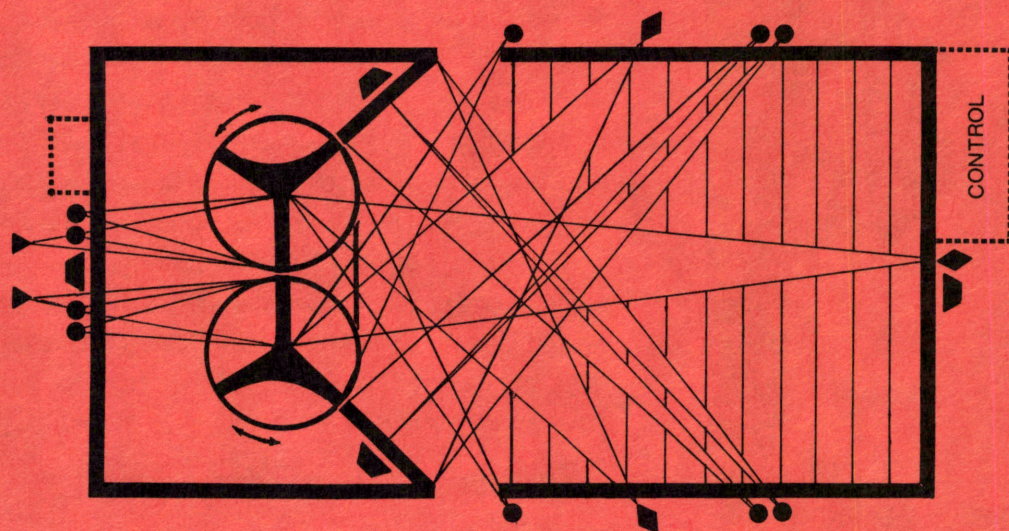
The workshop members discovered  
experientially the necessity of group effort to  
bring the reality of performance to their  
individual ideas. The learning value was  
unprecedented, compared with normal  
classroom or laboratory experience, especially in



## Ohm Is Where the Art Is



## Clickstop



## PARTICIPANTS IN THE INTERMEDIA EXPERIMENT

IRA ALLEN  
 DAVE ALPAUGH  
 JUDY ANDREWS  
 STEVE BARNHILL  
 BILL BAYLEY  
 DAVE BATT  
 CELESTE BENNET  
 GIDGET BEST  
 MAREK BIRELINE  
 CHARLIE BROWN  
 DAVE CAMERON  
 NANCY COE  
 STAN COE  
 WALLACE COLVARD  
 WILLIAM CROOK  
 CARL DANESE  
 CAROL DETRICK  
 MARILYNN DIXON  
 JOSEPH EDWARD  
 DIANE ELLEN  
 BURT ELLIOT  
 CAROL ERSKINE  
 DON EVANS  
 STEVE EVANS  
 MAGGIE FARNUM  
 LINDA FEDERICI  
 CARL GOTTSCHALK  
 VAD GIANNINI  
 FRANK GREATHOUSE  
 CYNTHIA HARDIN  
 ROBERT HARDIN  
 BRENDA HARTILL  
 MARY LUCY HUDGINS  
 BOB IRHMAN  
 ART INGRAM  
 DAVID JAMES  
 JERRY KEITH  
 ROY KING



CONTINUED FROM PREVIOUS SECTION

The merger will not be a socialization of Art, but the maturing of a society to reduce 19th century pigeon-holed goals to their proper adolescently deserved perspective. When this day emerges, Sunday painting will be clearly labeled recreation, and the term "artistic" may be forever laid to rest as a social anachronism of a bygone era. In its stead is a turned-on involvement, anchored to a reverent understanding of one's inner-self and one's outward feeling, and projected in compelling creative self-assertion.

As with many other realizations in a maturing society, Creative Behavior (in the limited vocabulary of past centuries known only as ART) is understood not to be bounded by specific media, but rather is a function of what is done within the media. If applying paint to a canvas is acceptable as Art, why is not manipulating photochemical reactions to light on paper or film? If arranging sounds and silences from a symphony of mechanical instruments is acceptable, why cannot the sounds from hundreds of electronic vibrators and oscillators be amplified and controlled to create music?

If mimicking dance movements formally set in the undated past, why not re-interpreting the nature of movement and motion itself? The fact is, as we are hesitatingly now able to admit, that the cultural value of an art form is

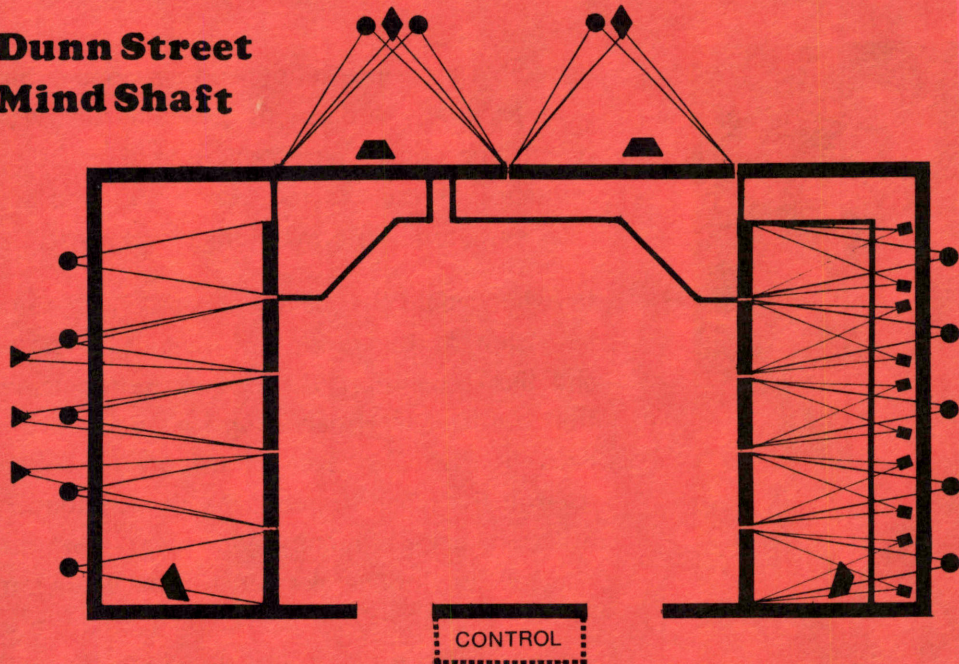
not in the media chosen, but in what is stated with the media. Extending McLuhan, our media concept of media has controlled the content of the message—the long-term social and cultural consequences of our past art forms.

A medium supplanted will find a new role, but not without infecting its supplanter. With the invention of the still camera, painting was released from one of its roles as recorder, but photographers composed pictures like painters. The motion picture film released plays from their need to be narrative, but films for a long time looked like re-staged plays. Only after

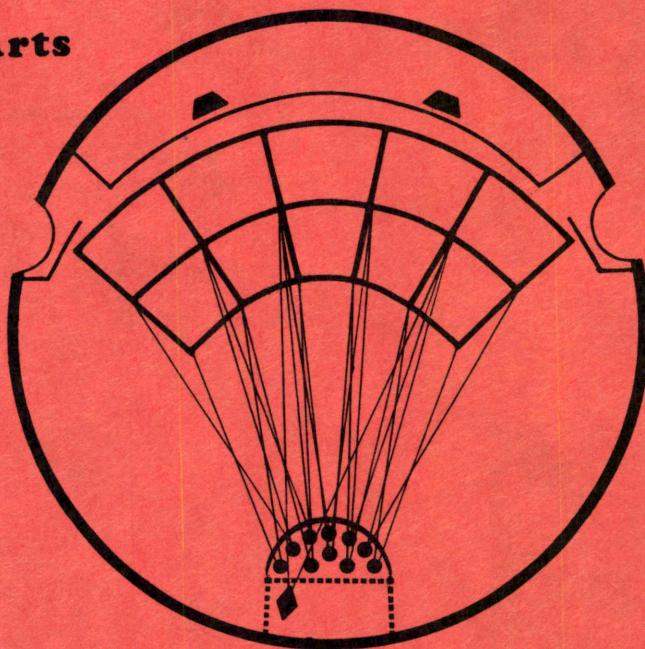




## Dunn Street Mind Shaft



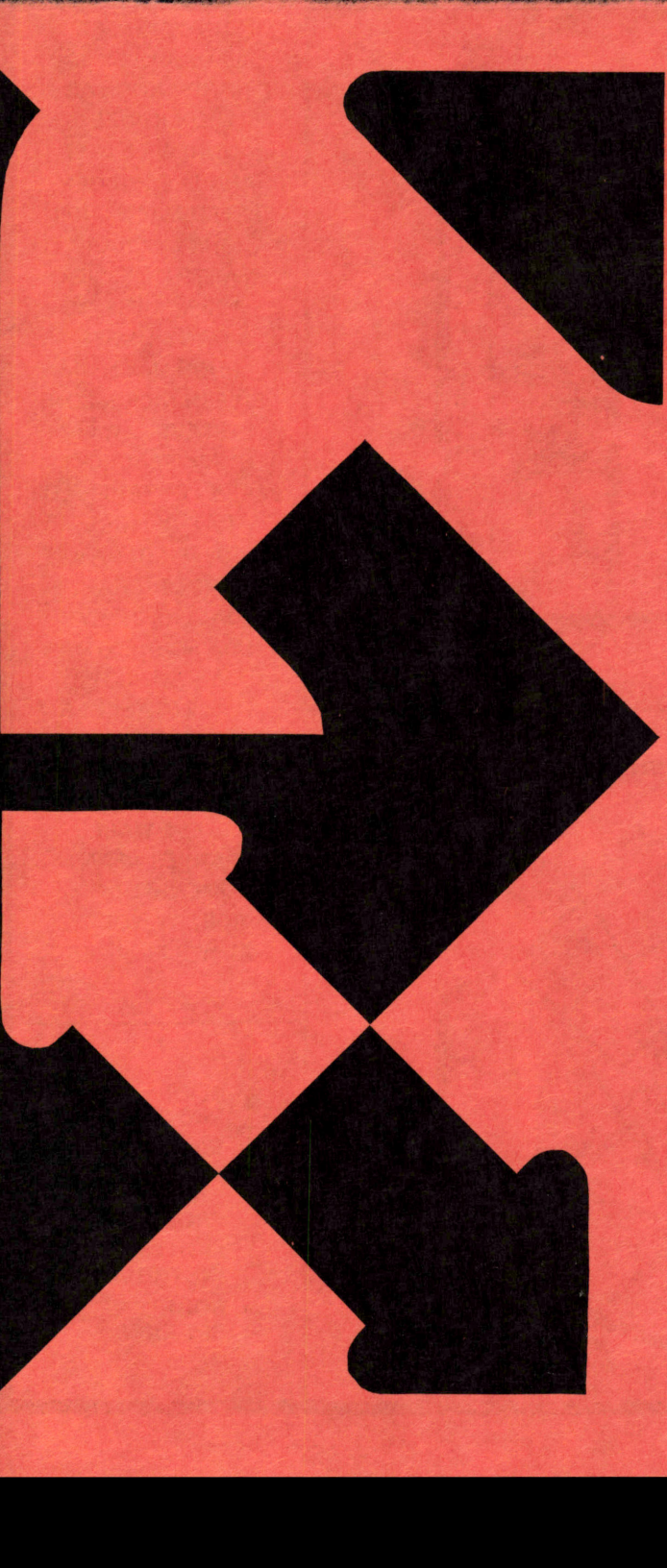
## Man and the Arts



GINNY KINSER  
LAURA KLEKAS  
NANCY KOOMAN  
DON KUNZE  
ANDREW LEAGER  
ANN LEE FURGEY  
PETER MACMANUS  
JOHN MCCRARY  
MARTHA MESSICK  
ROBBY MESSICK  
JOAN MUNGER  
HUGH NAYLOR  
EILEEN NICKELSON  
STEVE PARK  
BUCK PEACOCK  
MARY PORTERFIELD  
CATHY PRICE  
JOSEPH REGAN  
BARRET RICHARDS  
DALLAS RILEY  
LINDA SCHWERTMAN  
MARIAN SCOTT  
KLAUS STAERKER  
ROSEMARY STAMMETT  
CATHY STERLING  
MEL TOMLINSON  
STEVE WALL  
CHARLES WEANT  
JIM WHITING  
ROBERT WOLFE  
AL WOLFHEIMER

- SLIDE PROJECTOR
- ◆ 16mm MOTION PROJECTOR
- ▶ S-8mm MOTION PROJECTOR
- LIGHTING INSTRUMENT
- ▮ SOUND SPEAKER



The left side of the page features a large, abstract graphic design. It consists of several large, black, geometric shapes that overlap and interlock, creating a complex, layered effect. The shapes include triangles, quadrilaterals, and irregular polygons. The background is a solid, vibrant red. The overall composition is bold and modern, with a strong sense of geometric form and color contrast.

incredible experimentation, and developing their own peculiarly indigenous paraphernalia, were practitioners of the new forms able to escape the influence of their foster parents and find new roles as mature art forms of their own merit.

In what could be called a positive, natural extension of the decline of media boundaries, and the recognition of time-order concepts, we find the new Intermedia form emerging with a mild flourish. But even as Intermedia defines itself in the fallen stones of the classic boundary walls, it gains strength and value from the released flow of energies between the various art forms. In the end, not only will each form be stronger for the new found freedom, but with careful weaning, a new art form will have also joined their ranks.

Without disrespect for its heritage, Intermedia has no tradition to uphold or past to remain loyal to: it was born facing the future. In the best sense of the concept, Intermedia is a hybrid of technology and traditional art forms which pushes toward a new sensory awakening for Man through his Arts.