

trans formation :

arts
communication
environment

a world review

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1950

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volume
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**trans
formation:**

affirms that art, science, technology are interacting components of the total human enterprise . . .

but today they are too often treated as if they were cultural isolates and mutually antagonistic.

lack of time, misinformation, specialized terminology make it hard to keep pace with advances in all fields. it is difficult enough to keep pace with a single one.

will cut across the arts and sciences by treating them as a continuum.

will provide authentic glimpses into the emerging forms of the 'now'.

will present unifying views. specialization is a condition for progress but we are opposed to mutual ignorance, prejudice, cultural civil war.

will emphasize the dynamic process view as against static absolutes . . . open as against closed systems . . . culture under transformation.

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Billy Graham and Kid Gavilan, Madison Square Garden. Wide World



measure of man

Everyone will recognize the photographic parable on the general state of man. We might admit that a certain capacity and training for violence has seemed necessary to men from time to time, for purposes of survival. But today it is a dreary fact that the precivilized, animalistic 'dog eat dog' approaches to conflict have been augmented by 'dogma eat dogma': political and cultural cannibalism still permeates the realms of our most venerated institutions, dominates the methods and motives of men and governments.

Yet a time must come when even the threat of violence must go. Albert Einstein's message: 'a new type of thinking is essential if mankind is to survive and move to higher levels' affirms that supra-individual, supra-national world integrity is not merely desirable and necessary for survival today, but is possible

as a normal goal of civilized men. To control mutually the resources of the universe, to harmonize the social world so as to develop human potentialities everywhere—this measure of man is not fated to remain forever 'dreams' and 'utopias' of 'saints' and 'visionaries'.

The measure of man—what distinguishes man as man—emerges in his ability to *communicate, co-operate, construct*. No panaceas are possible. Yet fear, despair and withdrawal are likewise ineffective. Everyone everywhere participates within the life-process. Everyone has a viewpoint, whether aware of it or not. The individual acts—or fails to act—from the viewpoint that makes him partner to his pattern of culture, its crimes as well as its contributions. All are creators and consumers of culture; all manipulate its symbols and are manipulated by them.

Thus everyone needs to understand clearly how he relates himself to his total environment. The emergence of this understanding occurs directly through the thought-and-action of the arts and sciences. Seen as a whole they promise a new synthesis of knowledge, free from dogma and absolute.

We possess today the most constructive and clear understanding of ourselves and our universe that man has ever held. We are in a position to overcome cultural isolationism which would pit peoples and specialties against one another. The 'new type of thinking' sees the efforts of all men—layman, artist, scientist, technologist—as contributing to the total human venture. In this light, one begins to perceive one's own function and contribution in the whole co-operative enterprise.

h. h., m. j.

s. i. hayakawa

S. I. Hayakawa, a leading semanticist, is best known for his *Language in Action* and as editor of *ETC.: A Review of General Semantics*. In his memorable introduction to Gyorgy Kepes' *Language of Vision*, Dr. Hayakawa says "Whatever may be the language one happens to inherit, it is at once a tool and a trap . . ." Here he touches upon the various ways we structure our linguistic and visual abstractions.

modern art and 20th century man

In an essay entitled "Science and Linguistics," the late Benjamin Lee Whorf, an authority on the Mayan and Aztec civilizations and on American Indian languages, said a number of things about language which I believe will prove to be helpful to us in understanding some of the features of modern art. Before going into these remarks on language, however, let me explain that I am taking a somewhat circuitous path to a discussion of modern art on the assumption that there are a number of people—perhaps a minority, but perhaps not—who are still a little uneasy about artistic modernism: people who, while willing to be sympathetic, are still of an uneasy conviction that all the strange things that we have had to accept for the past three or four decades as art are a passing fad, from which we shall all eventually recover. Part of my purpose here will be to show why these feelings of bafflement are to be expected as a result of the kind of revolution that has gone on in art in the twentieth century. The other part of my purpose is to show how the twentieth century revolution in the visual arts is part of a larger revolution which has affected the thinking habits of twentieth century men in innumerable activities other than art.

Let us get back to Benjamin Lee Whorf. Most people assume that language is the "expression of thought." Such a statement contains the unspoken implication that we first have a "thought," and then "express" it by "putting it into words." Whorf, along with such scholars as Sapir and Bloomfield, established the fact that thought and language are *not* such

independent processes as traditional accounts imply. Indeed, these modern students of language reversed, for all practical purposes, the traditional notion that a thought comes first, to be followed later by a linguistic formulation of the thought. As Whorf put it,

"We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds—and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way—an agreement that holds throughout our speech community and is codified in the patterns of language. The agreement is, of course, an implicit and unstated one, *but its terms are absolutely obligatory*; we cannot talk at all except by subscribing to the organization and classification of data which the agreement decrees.¹"

Or, if I may state it more briefly if a little less exactly, what Whorf means is that the kind of language we speak largely determines the kind of thoughts we have; we cannot speak without imposing upon the

flux of experience an assumed structure implied by the formal or grammatical structure of the language we happen to speak.

Let me illustrate with one of Whorf's own examples. He contrasts the English language and that of the Shawnee Indians in their ways of isolating or abstracting different data from experience to describe a given situation. The English sentence, "I clean the gun with a ramrod" has, in addition to the words "I" and "gun," three items isolated from experience: "clean," "with," and "ramrod." In describing this situation in Shawnee, expressions for "I" and "gun" are present, but the rest of the statement is made by three isolates or abstractions not present in the English language, namely, "dry space," "interior of hole," and "motion of instrument," so that presumably the Shawnee sentence would become, if it had to be given anything like a literal translation, "I / dry space / interior of hole / motion of instrument / the gun."

Perhaps a couple of further examples will make clearer this principle of the structures created by language. In English, in order to make a sentence at all we have to use at least one each of two classes of words, namely, nouns and verbs—one to denote the actor and the other the action, as in "The boy runs," "The frog jumps." The limitation of this structure is revealed most clearly in those cases where the actor and action are inseparable, as in such sentences as "It rains," "It snows," where a purely syntactical actor, "it," is supplied for the purpose of meeting the struc-

¹ "Science and Linguistics," by Benjamin Lee Whorf, in the Appendix to *Language in Action*, by S. I. Hayakawa (New York: Harcourt, Brace, 1941).

tural requirements of an English sentence. As Whorf further says in the same essay:

"In the Hopi language, lightning, wave, flame, meteor, puff of smoke, pulsation, are verbs—events of necessarily brief duration cannot be anything but verbs. Cloud and storm are at about the lower limit of duration for nouns. Hopi, you see, actually has a classification of events (or linguistic isolates) by duration type, something strange to our modes of thought. On the other hand, in Nootka, a language of Vancouver Island, all words seem to us to be verbs . . . we have, as it were, a monistic view of nature that gives us only one class of words for all kinds of events. "A house occurs" or "it houses" is the way of saying "house," exactly like "a flame occurs" or "it burns." These terms seem to us like verbs because they are inflected for durational and temporal nuances, so that the suffixes of the word for house event make it mean long-lasting house, temporary house, future house, house that used to be, what started out to be a house, and so on."

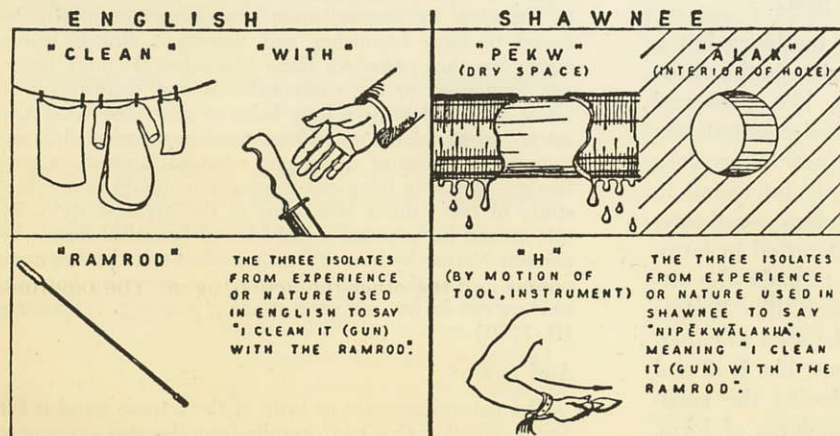
WHAT IS IMPORTANT about facts such as these? From the point of view of anyone interested in the operation of the human mind, the important fact is that any statement or observation of reality is an

abstraction—an abstraction dictated by the conventions of one's culture. Where the English-speaking person abstracts from the nameless, subverbal situation the idea of "cleaning with a ramrod," the speaker of Shawnee abstracts the "drying action with a moving instrument on the interior of a hole." The speaker of Shawnee, no less than the speaker of English, feels that his way of describing the situation is the simplest, most obvious, and most natural way of saying it. Until they get together to make systematic comparisons of the kinds of abstractions they make, it will occur to neither speaker that there can be any other way of describing the objective situation than that to which each is accustomed. I have dwelt on this example at some length in order to make clear a fundamental general point, namely, that all languages impose a conventional and more or less arbitrary structure upon the events described. That structure, as Whorf has said, is not given by nature; it does not "stare us in the face" although we may imagine that it does; it is created by the structure of the language we happen to speak.

With this background let us approach the problem of modern art. Just as most people in most cultures tend to regard their words as direct representations of fact, so have we all tended to believe that the tradi-

tional and familiar art styles of the West are direct representations (or imitations) of reality. Both in language and in art we have remained largely unconscious of the fact that what we represent through our verbal or visual symbols is not reality itself, but *our abstractions from reality*. But human beings in different cultures and in different epochs abstract and structuralize their experiences in widely different ways—and each way of abstracting makes sense to those who are accustomed to abstracting in that way, while it may make little or no sense to those with other ways of abstracting.

ANY PERIOD OF rapid growth and change, such as the world has been experiencing since the Industrial Revolution, obviously necessitates changes in the ways of abstracting. As A. N. Whitehead has said, *A civilization which cannot burst through its current abstractions is doomed to sterility after a very limited period of progress*. A basic general way in which the art revolution of the twentieth century (which had, of course, already begun in the nineteenth century) can be described is to say that artists, sensing perhaps more clearly than any others save scientists the bankruptcy of the traditional abstractions with which we had been trained to visualize the world and think about it, started systematically and even explosively to look for alternative ways of abstracting. This I believe to be the fundamental meaning of the modern movement in art: pointillism, futurism, cubism, surrealism, dadaism, expressionism, fauvism, the interest in Japanese prints, in Chinese calligraphy, in Italian primitives, in Oceanic, African, and American Indian art. And it appears to me more than coincidental that those modern artists who were philosophically, epistemologically, and semantically most aware of what they were doing (for example, some of the theorists of the Bauhaus tradition) have consistently used such terms as "visual syntax," "grammar of form," and "language of vision," in describing what they were up to. Modern artists have been, both consciously and unconsciously, seeking ways of abstracting different from those traditional in Western culture since the Renaissance. They have been doing so largely because they are convinced that traditional



Languages dissect nature differently. The different isolates of meaning (thoughts) used by English and Shawnee in reporting the same experience, that of cleaning a gun by running the ramrod through it. The pronouns "I" and "it" are not shown by symbols, as they have the same meaning in each case. In Shawnee "ni:" equals "I"; "a" equals "it".

(Benjamin Lee Whorf, *Science and Linguistics*)

Courtesy Technology Review, April 1940, Massachusetts Institute of Technology

ways of seeing are not adequate to express the visual experience of twentieth century man and are searching for better ways of symbolizing our new kind of visual experience. They have also been doing so simply to explore the many and varied ways in which we can abstract and organize our abstractions, often, I suspect, in the way that mathematicians invent new mathematical systems, not for any immediate practical use, but for the purpose of exploring possibilities.



Hopi Gourd Mask, Arizona
Museum of the American Indian, Heye Foundation, N. Y.

(I am not saying that modern art, or any part of it, is “mathematical”—whatever that may mean. I am saying that some modern artists, especially the abstract, and some modern mathematicians, are engaged in analogous pursuits in that they both appear interested in creating and exploring the possibilities of novel symbol-systems. The symbol-systems of mathematics and of art are entirely different from each

other; hence I do not know what people mean when they say of some abstract artists that their work is “mathematical.” Mathematics hasn’t a thing to do with the paintings of, for example, Mondrian.)

Modern artists have also—and in this the analogy to linguistic analysis becomes most clear—dissected the materials of their language for us. By this I mean that when we look at a traditional painting, we are made to think as little as possible of the canvas, the brush strokes, the paint, and the wood; we are made to think about the object painted—the woman, the tree, the mountain, or whatever. Modern artists, on the contrary, have encouraged us to examine the materials out of which their languages are put together, as if they were saying to us, “Look, this is paint; this is wood; this is a piece of rope; this is corrugated paper—and this is what can be said with these materials!”

Breaking down the materials of their art languages, exploring the possibilities of the picture surface, trying out new kinds of perspective or avoiding it altogether, attempting to convey the new spatial experiences of the twentieth century, scientifically analyzing the psychological facts about the minute tensions produced in the eye by the experiences of color and color combination, the modern artist has been and still is engaged in the process of evolving the new visual languages more adequate to the feel of twentieth century experience than the art languages of the immediate European and American past.

Hence, “modern art” is not one tendency but a collection of many—some, like Mondrian, in the direction of the purely abstract; some, like Klee and Chagall in the direction of the fanciful manipulation of known symbols which are given new dimensions of meaning; some, like Leger, deeply interested in the impact of the machine on modern sensibility; some, like Duchamp and Calder, interested in introducing the time dimension into art to make the art-object an experience of motion; some, like Braque in his collages, insisting that paper be seen as paper, canvas as canvas, paint as paint; some, like Dali and other surrealists, interested in producing the maximum optical illusions of depth, roundness of form,

moisture, and texture. In spite of these wide divergencies of style and aim, however, we lump these many tendencies together to call them all “modern,” and it is worth noting that most people interested in what is called “modern” are interested simultaneously in contradictory and divergent manifestations of artistic modernity.

This fact, too, seems to me to call for explanation. Traditional Western philosophies have almost always believed, after one fashion or another, in Truth with a capital T. It has long been felt, for example, that it is the function of the artist to grasp the “essence” of things and to reveal the “Truth” and “universal order” underlying the accidents of appearance. Perhaps such neo-classicists as Alexander Pope expressed as clearly as anybody this belief in a discoverable “universal order”:

All Nature is but art, unknown to thee;
All chance, direction, which thou canst not see;
All discord, harmony not understood;
All partial evil, universal good.

The artist’s intuition is supposed, under this theory, to rise above particularities and to arrive at “essences,” whereby “Truth” and “Beauty” and “Order” stand revealed. To quote still another neo-classicist, Sir Joshua Reynolds:

... The whole beauty and grandeur of the Art [of painting] consists, in my opinion, in being able to get above all singular forms, local customs, particularities, and details of every kind. All the objects which are exhibited to our view by Nature, upon close examination will be found to have blemishes and defects... But it is not every eye that perceives these blemishes. It must be an eye long used to the contemplation and comparison of forms; and which, by a long habit of observing what any set of objects of the same kind have in common, has acquired the power of discerning what each wants in particular. This long laborious comparison should be the first study of the Painter who aims at the greatest style. By this means, he acquires a just idea of beautiful forms; he corrects Nature by herself, her imperfect state by her more perfect... *As the idea of beauty is of necessity but one, so there can be but one great mode of painting.* (Discourse III, 1770)

And again:

The natural appetite or taste of the human mind is for Truth; whether that truth results from the real agreement

or equality of original ideas among themselves; from the agreement of the representation of any object with the thing represented; or from correspondence of the several parts of any arrangement with each other. It is the very same taste that relishes a demonstration in geometry, that is pleased with the resemblance of a picture to an original, and touched with the harmony of music. *All these have unalterable and fixed foundations in nature.* (Discourse VII, 1776)

"All these have unalterable and fixed foundations in nature!" There is then but one Beauty for all time and one Truth. The "universal order" has been there since the Creation, and it is there whether the artist discovers it or not.

Such a theory of Truth, Beauty, and Order is, of course, radically at variance with both current artistic theory and current philosophy of science. There is, according to the modern scientific view, no more order to be found in the universe than we put there by ordering our observations and abstractions and generalizations into systems. For example, Newtonian physics is the ordering of an enormous number of observations about the universe, arranged into a coherent system. When that system was found to be deficient in certain fundamental respects, a still more general system, the physics of Einstein, was evolved, which made possible the inclusion of those observations which could not be fitted into the Newtonian system. Similarly, data that cannot be ordered in terms of algebra may be ordered in terms of the differential calculus. Data that cannot be ordered in a two-valued logic are given an order by a probability logic.

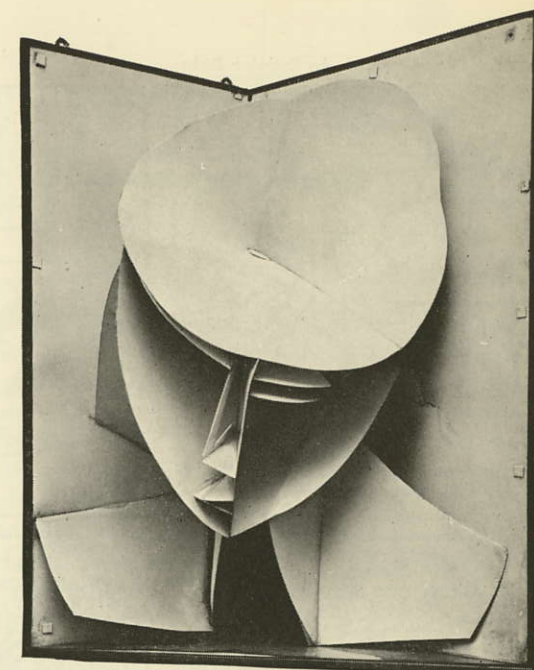
In philosophy of science, we are rapidly discovering in innumerable ways that the "order of the universe" is not something given us from outside, but something created by ourselves, by means of the ordering and arranging of our symbolic constructs at all levels of abstraction into more or less coherent systems.

In other words there is no one Truth with "unalterable and fixed foundations in nature," nor is there only one Beauty, dictating "but one great mode of painting." Every way of abstracting produces its own kind of truth, which, in the hands of one who

orders his abstractions well, results in its own kind of beauty. And the order based on Miro's way of abstracting is different from that based on Mondrian's way. Each has its validity, and each has its limitations. And it is characteristic of the modern frame of mind and the modern sensibility that all of us who delight in modern art find pleasure and excitement and order in radically different styles at once. It seems to me, therefore, that although a great deal of our pleasure in modern art lies in our admiration of individual ways of abstracting and ordering abstractions shown by the various artists, still another element in our pleasure is the knowledge we derive that all these ways of abstracting have their legitimacy. We are no longer bound by the cultural provincialism that enabled people in the past to select one favored style, Greco-Roman or Sung Dynasty Chinese, or any other, and say "This *alone* is art!" Modern art, with its own experiments as well as with its explorations of exotic arts, have widely enriched for all of us the meaning of art; and the trained modern sensibility, largely because of its education in the formal aspects of visual and plastic experience given by modern artists, is able to understand in their own terms multitudes of artistic idioms, such as the African and Oceanic and American Indian, which were incomprehensible to our immediate critical predecessors.

Modern artists are then contributing profoundly to the break-up of cultural provincialism—and in this fact lies, I believe, its deepest relatedness to other forms of modern awareness. The cultural anthropologist and the sociologist, studying different and exotic cultures, try to understand each culture in its own terms. The effect of this attempt, as we all know, is the gradual diminution of that provincialism that stands as a wall between one class and another, between one people and another.

In times past, it used to be possible for us in Western culture to say of the Zuni Indian, the Dobuan, the Arapesh, the Chinese, or the Russians, "They do as they do, they think as they think, because they don't know any better." The rise of cultural anthropology is a response to our perception of the fact that

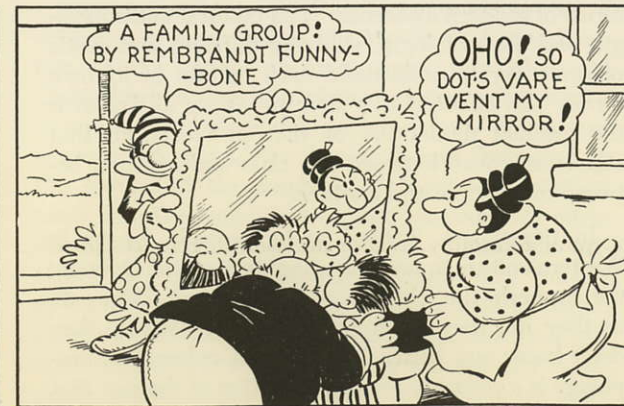
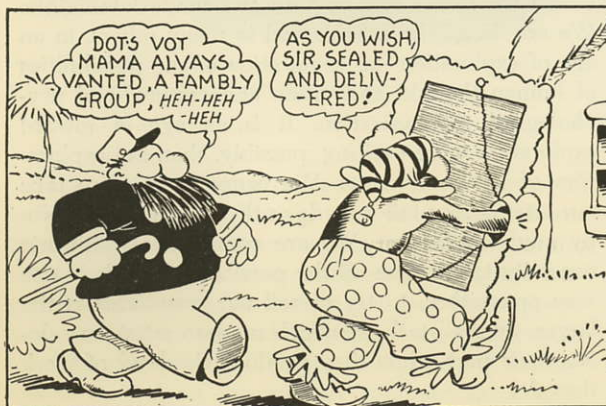
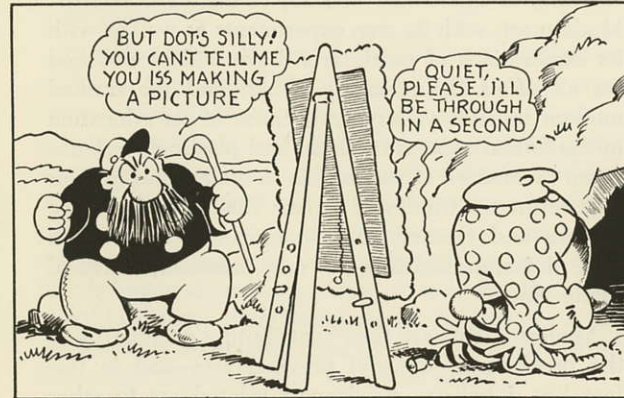
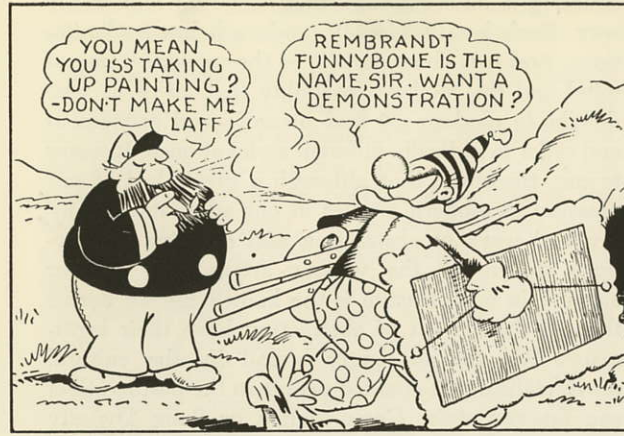
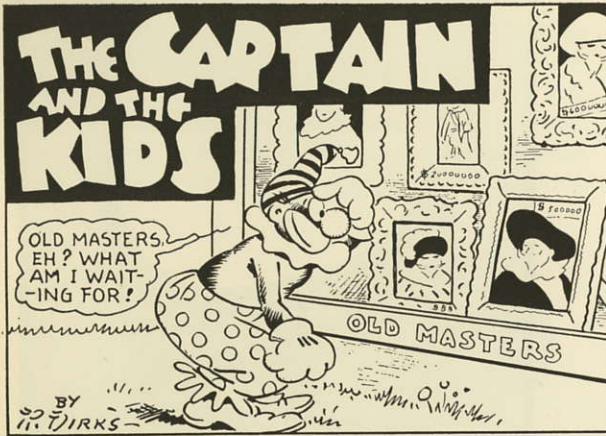


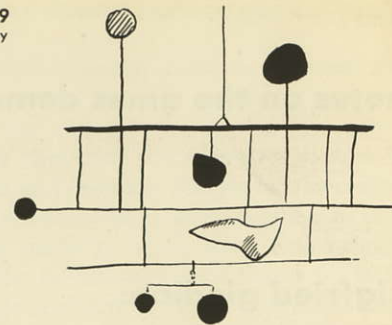
Naum Gabo, *Head of a Woman*, 1917
Construction in celluloid and metal
Collection Museum of Modern Art

such provincialism of attitude is inadequate for the purposes of social thinking in the modern world. In comparative linguistics, in semantics, in many of the new psychologies, and in the philosophy of science, we see also the attack upon cultural rigidity, and the attempt to understand the variety of ways in which the world can be seen and made intelligible. We are, in all these fields and in many others, in an age of exploration—an exploration of the possibilities of human thought and vision and cultural and psychological reorganization. It is an age of inward exploration more exciting, possibly, than the exploration of new continents. We cannot any more take our integrations tailor-made as they are handed down by any one culture. We are compelled by historic necessity to examine all the possibilities—and, in one way or another, to try to roll our own. This is the larger, over-all task, in which modern artists are doing their part when they produce the kind of work they do.

The Captain and the Kids, by Rudolph Dirks

Courtesy United Feature Syndicate, November 29, 1949





oscar wilde

art and nature*

VIVIAN. . . . Life imitates Art far more than Art imitates Life, and I feel sure that if you think seriously about it you will find that it is true. Life holds the mirror up to Art, and either reproduces some strange type imagined by painter or sculptor, or realises in fact what has been dreamed in fiction. Scientifically speaking, the basis of life—the energy of life, as Aristotle would call it—is simply the desire for expression, and Art is always presenting various forms through which this expression can be attained. Life seizes on them and uses them, even if they be to her own hurt. Young men have committed suicide because Rolla did so, have died by their own hand because by his own hand Werther died. Think of what we owe to the imitation of Christ, of what we owe to the imitation of Caesar.

CYRIL. The theory is certainly a very curious one, but to make it complete you must show that Nature, no less than Life, is an imitation of Art. Are you prepared to prove that?

VIVIAN. My dear fellow, I am prepared to prove anything.

CYRIL. Nature follows the landscape painter, then, and takes her effects from him?

VIVIAN. Certainly. Where, if not from the Impressionists, do we get those wonderful brown fogs that come creeping down our streets, blurring the gas-lamps and changing the houses into monstrous shadows? To whom, if not to them and their master, do we owe the lovely silver mists that brood over our river, and turn to faint forms of fading grace curved bridge and swaying barge? The extraordinary

change that has taken place in the climate of London during the last ten years is entirely due to a particular school of Art. You smile. Consider the matter from a scientific or a metaphysical point of view, and you will find that I am right. For what is Nature? Nature is no great mother who has borne us. She is our creation. It is in our brain that she quickens to life. Things are because we see them, and what we see, and how we see it, depends on the Arts that have influenced us. To look at a thing is very different from seeing a thing. One does not see anything until one sees its beauty. Then, and then only, does it come into existence. At present, people see fogs, not because there are fogs, but because poets and painters have taught them the mysterious loveliness of such effects. There may have been fogs for centuries in London. I dare say there were. But no one saw them, and so we do not know anything about them. They did not exist till Art had invented them. Now, it must be admitted, fogs are carried to excess. They have become the mere mannerism of a clique, and the exaggerated realism of their method gives dull people bronchitis. Where the cultured catch an effect, the uncultured catch cold. And so, let us be humane, and invite Art to turn her wonderful eyes elsewhere. She has done so already, indeed. That white quivering sunlight that one sees now in France, with its strange blotches of mauve, and its restless violet shadows, is her latest fancy, and, on the whole, Nature reproduces it quite admirably. Where she used to give us Corots and Daubignys, she gives us now exquisite Monets and entrancing Pissarros. Indeed there are moments, rare, it is true, but still to be observed from time to time, when Nature becomes absolutely modern. Of course she is not always to be relied upon. The fact is that

she is in this unfortunate position. Art creates an incomparable and unique effect, and, having done so, passes on to other things. Nature, upon the other hand, forgetting that imitation can be made the sincerest form of insult, keeps on repeating this effect until we all become absolutely wearied of it. Nobody of any real culture, for instance, ever talks nowadays about the beauty of a sunset. Sunsets are quite old-fashioned. They belong to the time when Turner was the last note in art. To admire them is a distinct sign of provincialism of temperament. Upon the other hand they go on. Yesterday evening Mrs. Arundel insisted on my going to the window, and looking at the glorious sky, as she called it. Of course I had to look at it. She is one of those absurdly pretty Philistines to whom one can deny nothing. And what was it? It was simply a very second-rate Turner, a Turner of a bad period, with all the painter's worst faults exaggerated and over-emphasized. Of course, I am quite ready to admit that Life very often commits the same error. She produces her false Renés and her sham Vautrins, just as Nature gives us, on one day a doubtful Cuypp, and on another a more than questionable Rousseau. Still, Nature irritates one more when she does things of that kind. It seems so stupid, so obvious, so unnecessary. A false Vautrin might be delightful. A doubtful Cuypp is unbearable. However, I don't want to be too hard on Nature. I wish the Channel, especially at Hastings, did not look quite so often like a Henry Moore, grey pearl with yellow lights, but then, when Art is more varied, Nature will, no doubt, be more varied also. That she imitates Art, I don't think even her worst enemy would deny now. It is the one thing that keeps her in touch with civilised man. . . .

*From "The Decay of Lying," *Intentions*, 1st ed. 1891.

notes on the ames demonstrations

art and perception

sigfried giedion:

Whoever attended the Princeton Bicentennial symposium on *Man and his Physical Environment* in 1947—later edited and published by Thomas E. Creighton under the title *Building for Modern Man—A Symposium* (Princeton University Press, 1949)—must have been struck by the adroit demonstrations set up by Adelbert Ames, Jr. and his co-workers of the Hanover Institute.

What struck us was that they showed by means of purely visual experiments that our perception does not always portray the reality, but that the “senses” are influenced by our “mental habits.” That a chair can exist in reality as a chair, but also that a chair can be assembled by our manner of seeing: out of discontinuous sticks scattered in space and out of a parallelogram painted on a black background. For the eye and the mind too the real chair and the chair dissected into particles, when seen from a specific angle, look alike, are the same object. The sticks fly together so that the eye can no longer distinguish what is the real chair and what is the particle chair.

Here the psychologists proved to us what the modern artists had to say against “*trompe l’oeil*”¹ since the first decade of the twentieth century. The “chair” seen from the side, with its parts dissected and hovering in space, looks like the painting of a Russian Constructivist of 1914 with its lines of force. It is like a symbol of the invisible forces which run through its body. Like “*objets placés à la loi du hasard*”² (Hans Arp), they are objects without “meaning” if considered from a routine viewpoint.

¹ Literally “deceive the eye”—a highly illusionistic representation.—(Ed.)

² “objects placed according to the laws of chance”—(Ed.)

More intensively than any other period, the nineteenth century demanded of its artistic representatives that they serve as a “*trompe l’oeil*.” Yet ages ago, the analytical mind saw the elements of nature as decomposable into parts and particles. What the “eye perceives” can be a chair, but it may also turn out that this chair is nothing but a few sticks hovering in mid-air. The modern artist has forever overthrown the belief that what the eye sees is reality. He carried to its consequences what Mr. Ames showed us with his particle chair. But he has transplanted it into another sphere, the emotional. The psychic “eye” has the privilege of not being forced to follow routine patterns as is our body eye, but is free in the immeasurable world of new emotions and to invent signs and symbols for them.

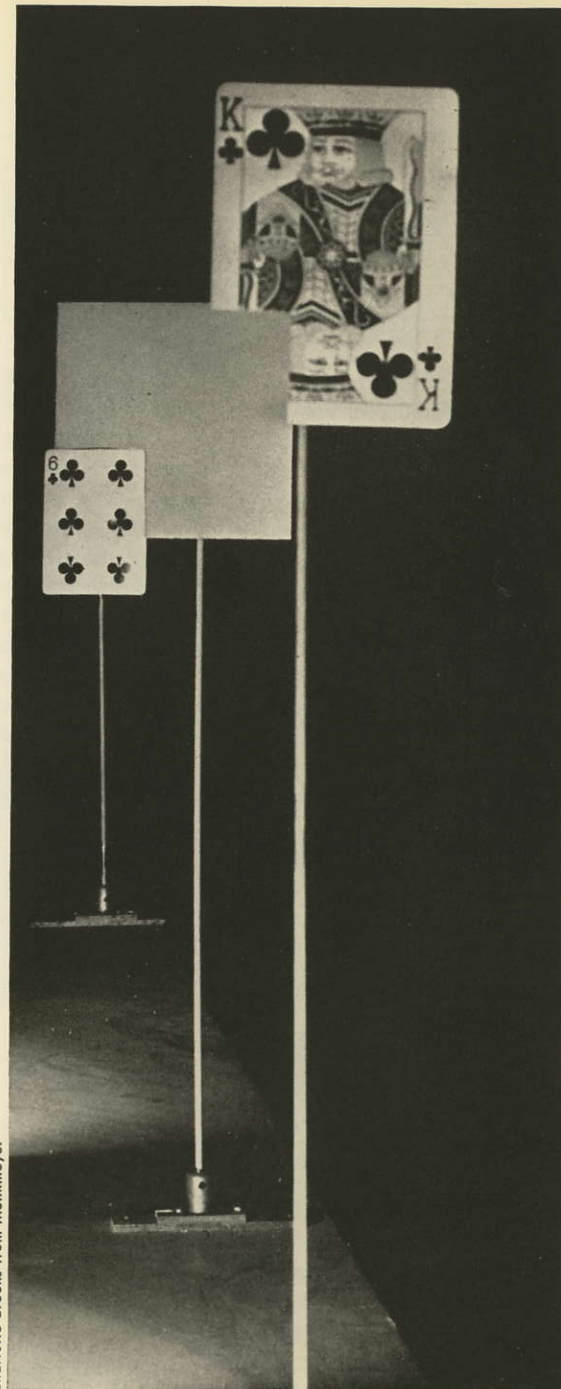
alfred h. barr, jr.:

From a report to a committee of the Museum of Modern Art on the laboratory demonstrations of the Hanover Institute Division of the Institute for Associated Research (formerly known as the Dartmouth Eye Institute).

At the invitation of Professor Artemas Packard of Dartmouth, I drove down from Greensboro to the Hanover Institute to try to get some idea of what it was about.

Professor Adelbert Ames, Jr., the head of the Institute, gave me a two days’ intensive optical and psychological steeple-chase through the Institute’s demonstrations. This is an extraordinary experience, exhausting and disquieting in several ways because so many of one’s ideas about vision and the nature of sensation in general are undermined or destroyed.

As Professor Ames says, you really cannot get a satisfactory impression of the demonstrations without actually seeing them work. Fortunately Earl Kelley,



Charlotte Brooks from Monkmeier

Professor of Secondary Education at Wayne University of Detroit, spent a long period at the Institute and, in the course of a report on its relation to education, he gave a very succinct and clear account of several of the demonstrations and their significance. This is given in Chapter Three of his *Education for What Is Real*¹. This should be read by anyone trying to learn about the demonstrations secondhand.

Broad Implications

These optical investigations have very wide implications in mathematics, psychology, philosophy, sociology and education. Psychologically and metaphysically the findings of the Institute support the conclusion that:

“. . . we go through life receiving stimulus patterns and rightly or wrongly calling them objects and placing them in relation to ourselves. The name and position we give to the object do not lie in the objects themselves, but in what we ascribe to them out of our past experience. No two people can do the same ascribing, because no two people can bring the same experiential background to the task. So what we call reality lies in each unique background, and not in the objects which send the light rays. The only reality we can experience is what we make of the objects around us, and is always unique for each of us.” (E. C. Kelley: *Education for What Is Real*, p. 29)

Professor Ames believes that these findings lead to two basic concepts which may help in the understanding of human affairs:

1. The processes that underlie our perception of our immediate external world and those that underlie our perception of social relationships are fundamentally the same. (Back of this statement, as I understand it, is the conclusion that the external world is far less an objectivity than it seems, far less alike to each individual than is commonly or even scientifically supposed and that this holds true for social relationships too.)

2. The insights gained by the study of vision offer indispensable leads for the better understanding and handling of social relationships.

¹New York: Harper and Bros., 1947.

General Implications for Art

Although Professor Ames was himself a painter in his youth, apparently the Institute has so far concerned itself very little with art except for certain devices intended to increase the sense of depth in painting. Yet it seems probable that, to paraphrase the second concept above, the insights gained by the study of vision offer leads for the better understanding and handling of *artistic* relationships.

During my visit at the Institute, Professor Ames wrote down some subtle and original observations on composition which throw light on what he himself thinks the Institute's demonstrations might offer to those concerned with art. Here they are:

A BASIC ASPECT OF “COMPOSITION”

“Composition” in externality can be thought of as the coincidental happening of events in space or time or both that increases the prognostic reliability—surety—(for purposeful, valueful action), and at the same time the value attributes of the sensations that are related to the physiological stimuli given rise to by the externality.

“Composition” in artifacts (architecture, sculpture, pictorial art, writing) can be thought of as the putting together of abstractions in space or time or both that increases the prognostic reliability—sense of surety—and the value attributes of the sensations that are related to the physiological stimuli given rise to by the artifacts.

The aesthetic message in a work of art is related to the interplay of value attributes such as sense of surety and sense of lack of surety (“frustration”) experienced by the observer.

In order for an artist to produce such an interplay he must know the relative prognostic probability of all the “indications” (clues) related to the characteristics of his stimulus patterns. These are his technical tools.”

For example, one demonstration (described in Kelley's *Education for What Is Real*, pp. 31 ff.)

shows vividly the relationship between apparent size and distance, another between apparent size and brightness. Another and most fascinating demonstration proves how important are subjective factors in our sense of size and distance. Simply by association a white rectangle which we know to be the size of a playing card is made to seem most convincingly *nearer* and *smaller* by the suggestion that it is a calling card; or *bigger* and *farther* by the suggestion that it is a billboard.

Such demonstrations might, I think, be of use to painters, sculptors, architects, landscape and theater and industrial designers.

I agree, too, with Professor Packard that the demonstrations might help shake people's conventional ideas about vision and reality—thereby making them more openminded about the convention-breaking modern arts.

Analogies Between the Demonstrations and Modern Painting

There are also specific analogies between some of these demonstrations and the esthetics of modern painting.

For example, in the third part of the first demonstration (described by Kelley, page 26 and figure B, right) what you see through the peephole appears to be a cube but when you look behind the screen what you see are twelve strings stretched in an apparently haphazard way upon wires. The relation between the cube and this cluster of strings is parallel to the relation between the object in nature and the object in a Picasso of 1912.

The effect of light on apparent distance so precisely demonstrated at the Hanover Institute is also used with remarkable effect by Matta in his big composition in our collection.

The Hanover Institute approaches surrealism in its general tendency to discredit conventional common-sense reality by disquieting or astonishing visions—hallucinations which take place in a kind of Rube Goldberg dungeon with the help of darkness, Alice in Wonderland spectacles, false perspectives, trompe l'oeil, secret levers, masks, remote control balloon inflations and violent conflicts between the senses.

Collection Museum of Modern Art



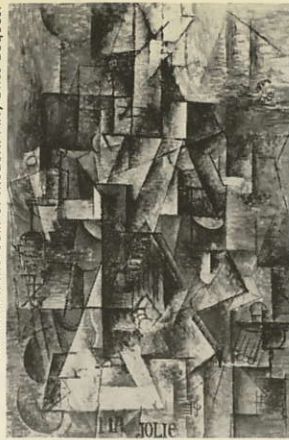
Matta *Le Vertige l'Eros*, 1944

Janis Gallery



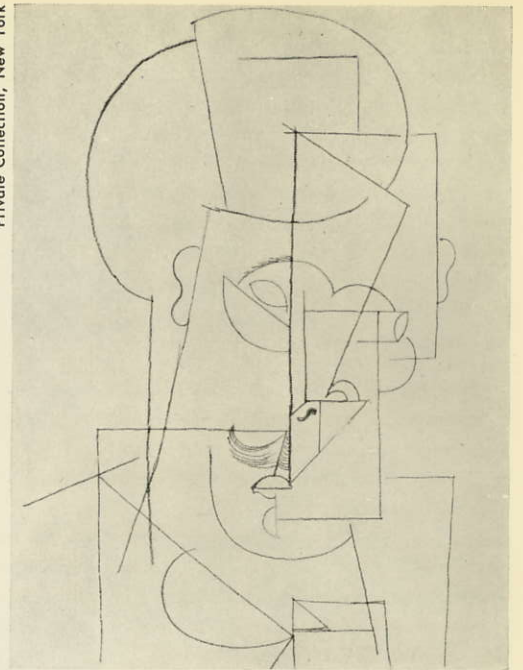
Arp *Forms Lending Themselves to Interpretation*, 1949

Collection Museum of Modern Art, Bliss Bequest

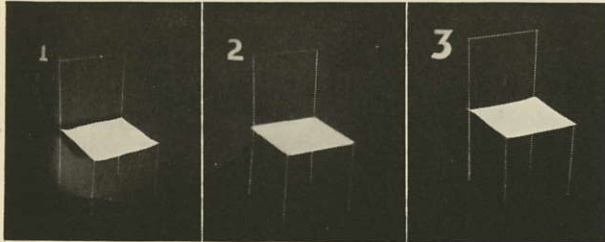


Picasso *Ma Jolie*, 1911-12

Private Collection, New York



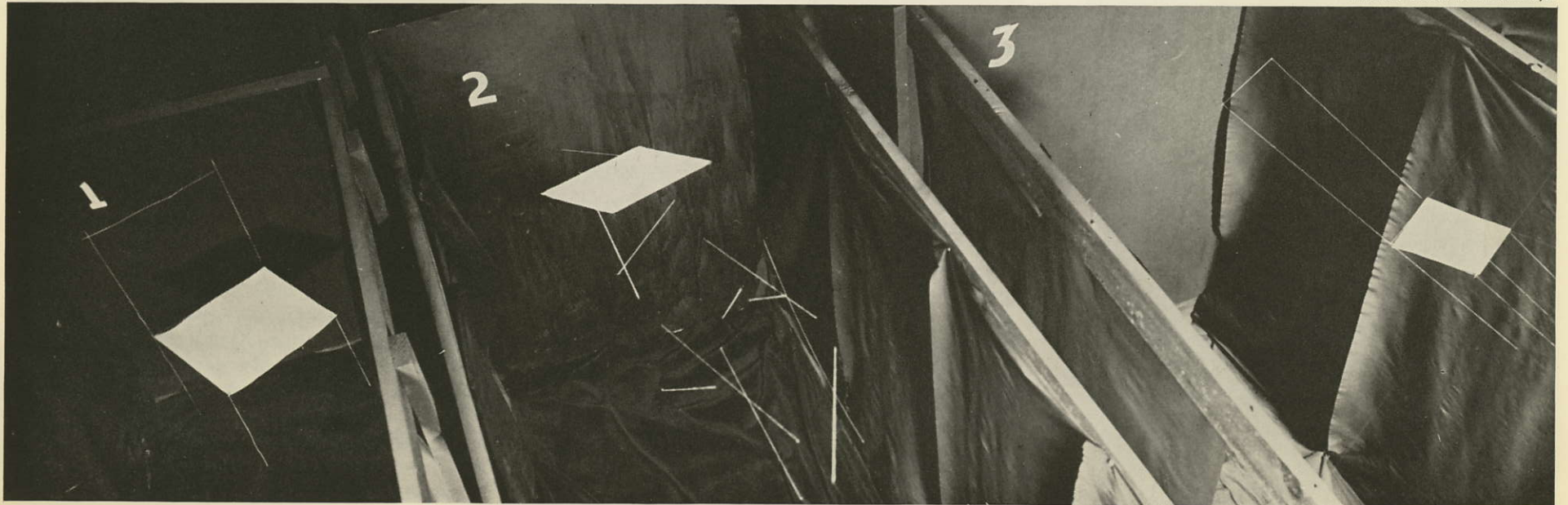
Picasso *Portrait Head*, 1912



CHAIR DEMONSTRATION
Hanover Institute Division, Institute for Associated Research.

- ◀ The three units as seen through peepholes in screen.
- ▼ The three corresponding units as seen from above.

Charlotte Brooks from Monkmeier



adelbert ames, jr.

sensations, their nature and origin

I. HISTORICAL BACKGROUND

The research activities of the Hanover Institute Division began in 1919 and have dealt increasingly with the relation of vision to human behavior.

Chronologically, the major contributions of the Institute have had to do (a) with a more precise understanding of the characteristics of the images that form on the retina; (b) with binocular vision and the functioning of the eyes; (c) with binocular space perception, which led to the discovery of *aniseikonia*, a visual defect in which the images of the two eyes, as recorded by the brain, are of unequal size.

Much of this research has been published in 110 papers in various medical and scientific journals.

Throughout this evolutionary development (financed largely through grants from The Rockefeller Foundation) steady advance has been made in the understanding of the relation between visual sensations and human behavior.

A complete understanding of these findings can be given only by lengthy exposition and the personal experiencing of numerous phenomena through laboratory demonstrations. Both an exposition and the development of demonstrations are in process. In the meantime, a brief summary of the significance of the findings concerning sensation is presented.

II. FINDINGS

An important aspect of the Institute's work has dealt with vision in all its relations to human functioning. These investigations have been supplemented by empirical demonstrations which substantiate the central findings that have emerged. Some of the more important of these findings are as follows:

A.

The Nature of Sensation

Although the human organism in its behavior acts as a result of stimuli, *these stimuli have in themselves no meaning*. The significances that are related to them in consciousness—and are experienced by the organism as sensations—are *derived entirely from the organism's prior experience, personal and inherited*.

Comment: This point of view is contrary to the prevailing lay and scientific belief that what is in consciousness has its origin either in whole or in part in the immediate externality or in the stimulus pattern.

It is apparent that there is no "meaning", for instance, in the undifferentiated light rays themselves which impinge on the cornea. Nor is there any "meaning" in the light rays as differentiated by the lens systems of our eyes that impinge on the receptors in our retinas; or in the electrical-chemical disturbances that take place between the retina receptors and the visual center of the brain. "Meaning" is significance which has been disclosed through prior purposeful action. The significance is related to stimulus patterns existing at the time of the original experience and is reactivated when the organism is later subjected to similar stimulus patterns.

The function of sensations is not to disclose the innate character of a thing as such or its spatial position as such. It is to establish between the evolving organism and the ever-changing environment a relationship on the basis of which the organism may

effectively carry out its purpose. This means that sensations are prognostic directives for purposeful action.

Comment: A thing as such (and its position in space) has no "meaning" except as it is related to the organism in its "now." It must be so related before the organism can sense its significances and act in regard to them.

B.

The Role of Purpose

The function of sensations is to disclose alternate possible courses of action. It is the *purpose* of the organism in the "now" that determines which course will be followed.

Comment: Our field of visual sensations discloses multiple possibilities for action, but only certain of these possibilities will further the organism's purpose. Therefore, it is in accordance with purpose, conscious or unconscious, that the choice is made. Within the chosen course, sensations are again important in determining the effectiveness of the action. For example, if the visual sensation is "illusory" then the action, while guided by sensation, will be ineffective in carrying out the purpose.

C.

The Relation of Abstractions to Reality

Abstractions, whether they are words or complex physical laws, are symbolic references. They refer to significances of reality that are relatively fixed and repeatable.

Abstractions are all characterized by the fact that of necessity they exclude the "point of view" of the organism. By "point of view" is meant his present relationship to other functional activities and his present position in his biological continuum. The organism's purpose is served by abstractions but cannot be deduced from them.

Comment: Because abstractions do not include the "point of view" or purpose of the organism, they in themselves are not identical with reality. Abstractions are indispensably useful

in dealing with limited aspects of a situation (measuring a table to determine whether it can be carried through a door) but they can never disclose why a person would want to carry the table through the door. When the situation is one involving relationships and functional activities beyond those that can be abstracted—a normal condition in actual behavior—it is our sensations and not our abstracted knowledge that determine the nature of our actions. (Hitting a golf ball or driving an automobile cannot be successfully carried out on the basis of reasoning alone.)

D.

Sensation and Surety

A sensation is not a basic unit of animal behavior (any more than a molecule is a basic unit of matter.) The sensation is an integration of numerous significances related to specific characteristics of the impinging stimulus pattern.

These various significances (which in vision may be thought of for convenience as "indications" of what things are and where they are) may or may not be in agreement with what constitutes the organism's reality. The degree of conflict among the indications is responsible for the sense of relative surety or unsurety which characterizes the organism's behavior.

Comment: From this it seems to follow that surety and unsurety can be brought within the field of precise scientific study and this knowledge made use of in education and training.

E.

Sensation and Purpose

Purpose underlies the constituent parts of sensation much as energy is now known to underlie the constituent parts of the atom. Empirical evidence shows that a sensation is an experienced value resulting from purposeful action. The significance of the value therefore seems to involve purpose.

Comment: This makes it understandable why abstracted knowledge as such does not affect sensations. If it is purpose and not abstracted knowledge that underlies sensations, it is only

through change in purpose that sensations and the behavior of the organism can be affected.

III. SIGNIFICANCE OF THE FINDINGS

The investigations of the Institute have been in the field of visual sensation and perception. The implications of these findings, however, lead to two basic concepts which open a new avenue for the understanding of human affairs.

1) The processes that underlie our perception of our immediate external world and those that underlie our perception of social relationships are fundamentally the same.

2) The insights gained in the study of visual sensation can serve as indispensable leads to better understanding and more effective handling of the complexities of social relationships.

Comment: In every department of human relationships we are confronted with pressing problems which must be solved: prejudice, personal and group readjustment in a rapidly changing world, an alarming increase in the incidence of mental and nervous disorders, etc., etc. The solution of all these problems hinges on the scientific understanding of the factors involved.

For instance, in education and training in the school and the home, we need to know how best to bring out the full potentiality of the individual child and how to develop in him surety in sensing the actual significance of the realities with which he is dealing.

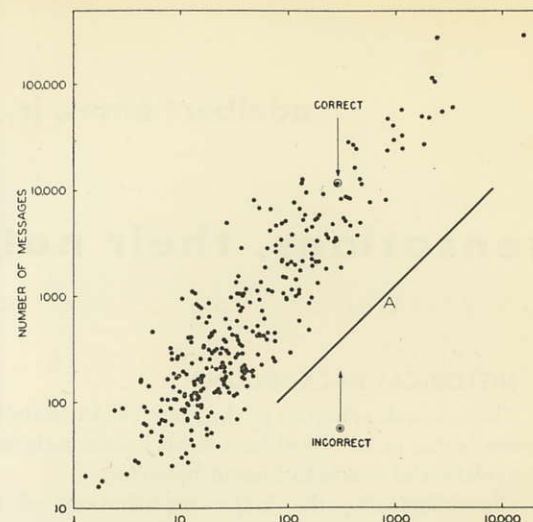
To assure the survival and growth of democracy, we need to know

1) How to train citizens (a) to recognize their purposes as individuals, (b) to rely on them, (c) to make them known and carry them out.

2) How to train citizens to raise their purposes to higher standards; and

3) How to train leaders who will not impose their purposes on the people but who will see that the purposes of the majority are carried out.

October 1945



Systematic Empiric Social Science: Predictability

Dear Prof. Zipf:

In reading with much interest "Human Behavior and the Principle of Least Effort", I noted that you direct attention to the fact that the Chicago-Grand Rapids toll message data are not in harmony with the general pattern established by the corresponding data for other pairs of cities.

This caused you to raise the question, "Does this sole point represent a freakish case or a typist's slip that has been detected statistically?" . . .

I was sufficiently curious to check the original data furnished to you some years ago and find that the number of toll messages between Chicago and Grand Rapids was indeed in error; it should have been 10,958, instead of 56 as reported to you. The corrected data will, of course, place the point in question in its proper relationship to the remaining dots . . .

Otto C. Richter, Chief Statistician
American Telephone & Telegraph Co.

transformation: systematic empiric social science and the principle of least effort

1. *The Stage of the Barbarians and Holymen.* (*Journalistic Account*).

Rarely if ever is a person a barbarian in his own eyes. A person is a barbarian only in the eyes of some exclusive group that views him as such. By and large those who live outside the boundaries of a group have tended historically to be viewed as barbarians by members of that group.

The boundaries in question need not be territorial, for they may be boundaries of privilege, of occupation, of religion, caste, or of some other field of common sentiments. The distinguishing feature of the boundaries is not so much the barbarian's difficulty of transgressing them, as his feeling of restricted freedom of action, once he has done so.

The feeling of restricted freedom may spring from the barbarian's unfamiliarity with the customary paths and landmarks within the boundaries, when these are geographical; or from his unfamiliarity with the conventional acts and responses of the exclusive group, when the boundaries demark privilege or a community of sentiments. In either case the barbarian is like a stranger who is obliged to compete in an unfamiliar foreign market in an unfamiliar foreign tongue, and who may lose his property—or even his life—before he can learn the tongue and practices of the natives with whom he deals.

Yet the term, *barbarian*, is not merely a neutral label that designates the outsider. It also has an evaluative social connotation — actually a double-edged

connotation—that betokens both the contemptible inferiority of the barbarian and the enviable self-superiority of the members of the select group.

This feeling of self-superiority may well spring originally from the select group's superior familiarity with the actual structural elements that are fundamental and necessary to the intellectual and social functioning of the select group itself. And since the select group cannot easily conceive of anyone's functioning "properly" according to ways that are different from its own, the group concludes that all persons who think and act differently also think and act "improperly"—or at least may be suspected of underlying "improper" thoughts and acts.

IN THIS FASHION the select group may come to view its own ways as an absolute norm, or measuring rod, for judging the conduct of others. The amount that any person's conduct deviates from this norm represents the degree of his barbarity.

To the select group, its own "proper" way of behaving represents presumably its own most efficient rules of living in its own situations as viewed by itself. It represents the group's code of rules in terms of its own conventional symbols with their conventionally correlated responses. It represents the group's cultural vocabulary by means of which communication between its members is effected.

This communication is not just verbal in which words are interchanged. It is also behavioristic in the widest sense, in which a person's conscious or un-

conscious commission or omission of any act in a given situation may signal an intent upon his part, as interpreted by some other member of the select group who observes him.

And so it happens that when a member of the select group observes the barbarian's conduct, the select member automatically imputes to the barbarian the intentions, status, and background which the barbarian's conduct means in terms of the cultural vocabulary of the select group, even though the barbarian is completely ignorant of the cultural vocabulary in question.

The select group's code of rules of conduct includes also the group's rules of "morality" and "etiquette," a breach in which classifies any person, including the barbarian, as "immoral" and a "social boulder." This association of etiquette with morality is not gratuitous, since a breach in etiquette (e.g. picking one's nose) may betray the barbarian quite as much as an immoral act.

And once classified as a barbarian because of an observed ignorance of, or contempt for, the rules of etiquette, the barbarian may easily be suspected of an ignorance of, or contempt for, the rules of morality. Observed overt breaches, though slight, lead to the suspicion of unseen covert breaches of great enormity. Since manners and morals go hand in hand, that person is prudent who not only prays to God, but does so loudly in public places, and in an otherwise culturally thoroughly appropriate manner, lest he be confused with the sinner huddled in the corner.



CUTTING A NEW BRITAIN "RUG"

NEW BRITAIN — FELLOW YANKS AND NATIVES BOTH GET A GREAT BIG KICK OUT OF A POPULAR NATIVE (U.S.) DANCE. AFTER MARINES WITNESSED A TALSEA NATIVE SING-SING AND TRIBAL DANCES, THEY JUST COULDN'T RESIST GIVING OUT WITH SOME JITTERBUGGING.

(Press Agency Caption, 7/13/44—Marine Corps Photo From Acme)

THIS ASSOCIATION OF morality with God is not gratuitous either, since virtually every select group, being unaware of the source of its moral code, accepts it on an authoritarian basis. And since God is by definition the final authority *non plus ultra*, no one short of God is used to sponsor the select group's morality.

Because of this supposed divine sponsorship, the select group's code of morality and manners becomes something that is "absolutely right." Hence whenever a barbarian's conduct is judged by the select group's code, the judgment refers ultimately back to God who is the final authority for the "absolutely right" moral code that serves as a judicial standard.

Of course divine wisdom, if it is to become available to mortal man, must somehow be tapped by mortal man. Regardless of whether the wisdom is in a book that the select group possesses, or in a stone, or a sulphur spring, or in a configuration of clouds, a hierarchy of men whom we shall call *holymen* must be at hand to do the divine deciphering. Obviously these holymen must be suitably distinguishable from the rest, say, by peacock feathers or by caps and gowns, so that when they open their mouths the rest of the group will know that the outpouring is Divine Wisdom tapped at the source.

Naturally when any select group is so favored as to have a monopoly on Divine Wisdom through its holymen, the group also has inescapable responsibilities. In short, "moral right" carries with it a commensurate "moral responsibility." For that reason the select group has not only the "moral right," for example, to take or keep by force what is "justly" its own, after appropriately consulting the holymen in peacock feathers or cap and gown. The select group also has the "moral responsibility" so to do, as the holymen will convincingly argue, as they add impressive reasons marshaled from history, sociology, poetry, economics, and political science — thereby showing the reasonableness of the Divine Purpose.

For that reason, the poor barbarian is never secure in his real and personal property which at any moment the moralists may feel morally obliged to assume as a "burden" for the sake of "progress." And there is nothing the barbarian can do to insure himself against

suddenly becoming a victim of the "absolutely right morality." As long as the barbarian is not on the "right" side as judged by the "right" book of etiquette and the "right" holymen, he is forever suspected of covert complicity with the forces of evil, regardless of what he does or does not do.

IF THERE WERE only one select group on the planet at any time, the barbarian's plight would not be so bad, since he would need only to master the "proper" book of etiquette and the "absolutely right" morality in order to become one of the select. But unfortunately there are so many different select groups, each with its own "absolutely right" morality, its own "proper" etiquette, and its own set of sooth-saying holymen, that the barbarian finds himself in a perfect welter of contradictory and competitive "absolutely right" moralities, etiquettes and groups of pontifical holymen, each one claiming God as uniquely its own.

Since anyone who is outside the boundaries of any one of these select groups is a barbarian to the group, everyone is a barbarian in the eyes of some group or other, even though his status may be that of a holymen in his own group. And so it may happen that a locally highly respected, thoroughly moral, exquisitely mannered person—perhaps even the local top holymen in peacock feathers or a silken cap and gown—may suddenly find himself treated as a barbarian by an outside select group, as he is carted off to a concentration camp, hanged as a war criminal, burned as a heretic, or seared by an atom bomb, at the behest of a competitive set of holymen in peacock feathers, or caps and gowns, whose morality is "absolutely right" and replete with "moral obligation."

Out of the great welter of competitive "absolutely right moralities" with attendant "moral obligations," which one is "really" the right one?

Should the barbarian ask this question of a group of holymen, and, if so, of which one? Or should he argue with himself that the most powerful group is "morally the most absolutely most right"? In that case, might makes right.

BUT ALAS AMERICA has avowedly gone through another world war in order to prove by superior might

that might does not make right. For, World War II was a war of competitive "moralities," "ideologies," "justices" that referred ultimately to a future well-being of mankind as variously blue-printed by the holymen of the opposing camps.

The man who was conscripted on whichever side to risk his life in mortal combat was told what to believe by careful indoctrination to the effect: "our side is right," "we have moral obligation," "our enemies are the forces of evil," and for good measure as a closing word: "kill or be killed!"

World War II may inadvertently have helped mankind more than the competitive holymen had envisaged, much less intended. For the war brought to an end the caste of holymen—a caste which, though it publicly praises the martyrs, is nevertheless apostolically descended from those who shed the martyrs' blood. Thanks to the catastrophic consequences of World War II in which the "forces of evil" surrendered unconditionally to the "forces of righteousness"—the holymen have been reduced to self-important men in peacock feathers—or elderly intellectuals with marked paranoid tendencies who in their caps and gowns like to play God.

With the effective passing of the breed of self-righteous holymen who have possessed the "Book," the "Word," the "absolutely right morality," the "proper way of life," and who have heretofore defined the "right" and the "evil," the "proper" and the "barbaric," has also passed—the barbarian.

2. The Stage of Transition

The history of the undermining of the dominance of the holymen is an exciting chapter in the advance of human knowledge. Indeed it may be viewed as the history of the growth of science itself which seems to have been fought at every turn by the holymen who, nevertheless, have not hesitated to appropriate for themselves the fruits of scientific inquiry whenever the said fruits served their holy purposes in the discharge of their moral obligations. Thus if we tremble today at the thought of our annihilation by the atom bomb which the scientists have invented, let us not reproach the scientists for their ingenuity, since what

we really fear is the use of this bomb by the "wrong" set of holymen in following the examples set by our own.

Science's battle with the holymen has been centuries long. It began with a primary interest in physical phenomena that in due course extended to the biological, from which the holymen were driven. Now that scientific inquiry is invading the psychological and social field which is the holymen's last stand, the battle is intense.

Unfortunately in the present battle in the psychosocial field, many physical and biological scientists must also be viewed as holymen who are particularly dangerous because of a confusion in the popular mind which may at times be present also in the scientist's mind. For it does not follow that the same scientific validity that attaches to the scientist's carefully reasoned empirically supported statements will also attach to his *ad hoc* personal opinions in political, economic, and moral matters. The fact that people may fondly believe otherwise seems to have made the physical scientist a favorite front for group-movements that have not always been based upon careful observation and reasoning. As a result the status of physical science may have suffered unjustly. Thus for example, the physicist and chemist are obviously necessary for the invention and construction of the atom bomb, and the greatest of praise belongs to them for the brilliance of their achievement. Yet the decision as to the advisability of dropping an atom bomb upon a particular human population is not a problem in physics or chemistry.

This does not mean that the physical scientist does not have the right to express his political, economic, or social opinions, and to join with, or lead, group-movements, as well as the responsibility to suffer the consequences for the same (since no political immunity attaches to the cap and gown). This does not mean that many a physical scientist has not far sounder judgment of human affairs than many a professional sociologist, political scientist, economist, or "humanist."

IT MEANS THAT the actual scientists in the psychosocial field who are dispelling superstition from this

field are those who view human behavior as a natural phenomenon and who study it as such with the objective methods of empiric science. This view is frankly distasteful to many since it admits of no "unnatural act." Thus, instead of publicly shouting their moral indignation when they learn that one group of persons has made lampshades from the skin of the backs of another group, the natural scientists view this as a natural phenomenon which emerges quite automatically from the conditions, into the nature of which they seek to inquire objectively. For only by understanding the conditions that govern events, may we hope to control events.

To repeat, this coldly dispassionate view will outrage the moralists including those physical scientists who have merely inherited the physical and intellectual apparatus and the questions of their calling without any of the venturesomeness of those who won them. Yet may the outraged holymen of all sorts be careful in their moral indignation! It is doubtful that humanity has suffered any hell that has not been blessed by some morally righteous group of holymen in peacock feathers or caps and gowns somewhere.

PERHAPS THE FIRST major advance of science in the psycho-social field was made by the field studies of the cultural anthropologists who years ago began studying objectively the moralities, etiquettes, religious beliefs, and the actual holymen of the various barbarians outside the boundaries. These anthropologists (e.g. Malinowski, Boas, Sapir), whether motivated by the curiosity of small boys at the zoo, or by the loftier motives of pure science, may be said to have discovered the human being in the barbarian and under the peacock feathers of his holymen. And they also discovered how politically powerful and economically remunerative a good set of peacock feathers could be.

In some of this research there may well have been political motivation. For it must have been obvious to all that a cheap way to rule the barbarians was to gain and keep the favor of their holymen whom they revered and feared.

Yet even though the barbaric holymen could be

bought in the usual human fashion by gift-giving and mock deference, they clearly were not all to be bought by the same kind of gifts and mock deference. Only those things will be effective which *in the eyes of the holymen* appear as suitable gifts and deference. In short, in order to work with the holymen, it does not suffice to observe him and his culture objectively. It is also necessary to try to understand what the cultural elements mean to the members of the culture, and how the world seems through the eyes of the beholder.

THENCE CAME TWO concepts of tremendous importance to present-day scientific social thinking. First, *every culture at a given moment is relative to its cultural group at that moment*. Second, *a person behaves in reference to the world as he sees it from the accumulated data of his experience* (his *phenomenal world*, to borrow a term from Gestalt psychology).

These two concepts, or inductions, merit stressing. We shall shortly come upon them again.

And yet the brilliant field studies of cultural anthropologists in "outlandish" cultures should not obscure the brilliant field studies of persons like Lloyd Warner who studied the culture of the small New England town of Newburyport, Massachusetts; or of the studies by F. J. Roethlisberger and W. J. Dickson of the employees of the single large Hawthorne plant of the Western Electric Company, which led to inductions that seem to include the above.

IN ADDITION TO the foregoing studies were those of the Berlin school of Gestalt psychologists under Max Wertheimer, Wolfgang Köhler, Kurt Lewin, and later J. F. Brown. Köhler returning after World War I from his studies of chimpanzees in Africa reported, for example, that unless the monkey "saw" the stick at hand as an effective tool for knocking down the otherwise unattainable bananas, he did not use it as such (even though Dr. Köhler who arranged the experimental set-up saw the stick as an effective solution of the monkey's problem). Yet once the monkey "saw" the tool as a solution to his problem, he thenceforth used it as such in similar problems. Here again was a case of a "phenomenal world"—this time of a monkey. Observations of this general kind, in addi-

tion to other experimental findings, led to the elaboration of what is known as Gestalt psychology ("phenomenology," "topological psychology").

Another approach was that of Sigmund Freud and his school, who in studying mental and emotional illnesses, arrived *on the basis of objective case material* at the hypothetical construct of a conflict between the desires of the individual's own self-concept ("ego" plus "id") and the demands of his culture as represented in the person's phenomenal world by his "superego." The relationship between the Freudian hypotheses and those of the Gestalt psychologists and cultural anthropologists is, I think, patent.

And yet there was also a fourth approach: that of the semanticists. Without minimizing the importance of the contributions of the members of the Vienna school, and of Ogden and Richards of England, and of the still earlier fundamental pioneering semantic studies of Percy Bridgman, it seems that the great intellectual interest in, and appreciation of the scope of, the field of semantics came with the publication of Alfred Korzybski's monumental *Science and Sanity*. Here, insofar as I know, was presented explicitly for the first time the analogy of the topological relationship between a "map" and its "territory" on the one hand and a person's "phenomenal world" and the origin of his sensations on the other.

If we merely point out two common elements in the above four different approaches to a study of the psycho-social field, that does not imply that there are not other common elements, and that a careful synthesis of the content of these fields is not urgently needed.

3. The Quantitative Stage

While the foregoing studies were contributing to the transformation from holymen-superstition to empiric science in the psycho-social field, there were also quantitative studies of great importance. Some of these quantitative studies were carried on by the above mentioned schools (e.g. those by the Gestalt psychologists and by Roethlisberger and Dickson). Others antedated them, and many of them were independent of one another.

OF GREAT IMPORTANCE have been the official censuses of populations and of other demographic phenomena. Of great importance also have been the extensive studies of vital statistics that led to the various actuarial tables that are essential to insurance which in turn is essential for our present-day life.

Then there was the important observation by Vilfredo Pareto that the monetary incomes of individuals were distributed according to a rectilinear doubly logarithmic equation. This important discovery has been bitterly berated and challenged by social reformers and social planners who apparently have been irked by the thought that their reforms and plans might conceivably be subject to the operation of natural laws governing human social behavior.

There was the little known observation of Felix Auerbach in 1913 that the frequency-distribution of cities when ranked in the order of decreasing population-size was in some cases doubly logarithmically rectilinear. There was the observation of E. U. Condon in 1928 (corollary to the earlier observation by J. B. Estoup) that the rank-frequency distribution of words in the stream of speech was similarly rectilinear. There was the observation by W. J. Reilly in 1929 (related to the earlier ones by E. G. Ravenstein and A. M. Wellington) to the effect of a two dimensional gravitational attraction between competitive retail-centers.

There is the important work on population-potentials, on population-densities, and on the "gravitational attraction" of cities for persons by J. Q. Stewart whose studies are characterized by extensive observations and precise measurement.

In short, the stage of quantification and of quantitative correlation has been reached.

Is the time ripe for the next stage: that of systematic empiric social science?

4. The Stage of Systematic Empiric Social Science

The time is always ripe for any stage of scientific inquiry, as well as for any scientific question. The problem is whether the investigator is ripe to handle

the stage, or to ask and answer the question. Nothing ventured, nothing gained.

Recently the present writer ventured to announce the unifying principle of least effort, to the effect that a person will tend to behave individually and collectively in such a manner as to minimize the probable average rate of his work-expenditure overtime as estimated by himself. The principle was tested on a diversity of empiric data. If this particular theory is inadequate for a systematization of social science—and historically all theories become obsolete—the stage is still set for a systematization in which a serviceable unifying principle is to be disclosed.

Indeed it may be that some of the approaches we have previously mentioned are virtually at a departmentalized dead-end—except for further elaborational studies—until a unifying principle has been found that breaks down the traditional academic barriers of departments, of divisions, and even of faculties that have to date effectively impeded a study of the *totality* of human behavior.

WE HAVE HEARD much about a person's "phenomenal world" that includes his own "self-concept." The work of Adelbert Ames at the Hanover Institute has shown objectively the distortions of a person's judgment of physical relations because of the pre-conceptions of his "phenomenal world."

Has not the time come when we might measure the structuring and the underlying dynamical principles of an individual's "phenomenal world"? This could conceivably be done by studying not merely the effect of a person's "phenomenal world" upon his behavior in his physical environment, but also its effect upon his behavior in his cultural environment.

I for one have argued that just such a study of a "phenomenal world" is possible in the cultural field, and that a person's usage of words, for example, may shed light upon the dynamics of his "phenomenal world"—indeed, of any person's "phenomenal world." Or, to shift the terminology, it might shed light on a person's "map" of a "territory," or on "maps" of "territories."

Thus for example we have observed again and again in the most diverse cultures among a great variety of different persons that the frequency-distribution of words in a sizable sample of a person's stream of speech is such that the product of a word's frequency of usage when multiplied by the rank-order of the word is a constant. This is today known as the harmonic law.

Words are classes! Words have meanings! Words occur in statements! Words are symbols! Language is a part of culture! CLASSES, MEANINGS, STATEMENTS, SYMBOLS, LANGUAGE, CULTURE! These terms are the stock in trade of semanticists, psychologists, cultural anthropologists, personnel administrators with their "non-directive interviewing," etc., etc.

What has the observable fact of the harmonic law to do with the hypotheses of "maps," "phenomenal worlds," "self-concepts," "super-egos" and the like?

Or, more felicitously stated, how are these sundry hypotheses to be squared away with observable fact?

The harmonic law is only one observation. There are many others, each one of which is telling us something about the dynamics of mind.

AS SOON AS an investigator sees "in his own phenomenal world" or on his own "map" that these empiric regularities have value for him for both the testing of hypotheses, and for refining upon them and extending their scope, then that investigator would seem to have passed into the stage of systematic empiric social science.

The above stages are not mutually exclusive in time. The holymen will be with us for years yet, while the field-work and the quantitative measurements and correlations continue. Even the most advanced stages of systematic empiric social science will still need to be supported by continual field work and case studies, precise measurement and correlation.

The point remains, however, that the stage of systematic empiric social science represents today one of our most urgent tasks, and, once attained, will provide a most valuable intellectual tool for further inductive-deductive studies.

r. buckminster fuller

Buckminster Fuller is best known as designer of the dymaxion house, dymaxion automobile, geodesic house; as geographer and geometer, etc. An integral view of the total process of man-world-universe is fundamental to his concept of the Comprehensive Designer as "an emerging synthesis of artist, inventor, mechanic, objective economist and evolutionary strategist".

comprehensive designing*

The Comprehensive Designer emerges as the answer to the following problem (the greatest problem ever addressed by mankind): The Human Family now numbering 2¼ billion is increasing at an annual rate of 1% and trends toward 3 billion by the end of the second half of this century. Of this number 65% (at present approximately 1½ billion people) are chronically undernourished¹, and one third of them (at present ¾ of a billion people) are doomed to early demise due to conditions which could be altered or eliminated within the present scope of technology,—specifically, that area of technology comprising the full ramifications of the building arts, which now contains the negatives or blanks which match the lethal factors. Relative to this premise, Nehru speaking recently in Chicago, U. S. A. said "it is folly to attribute the disquietude of the orient to ideological pressures". Nehru went on to point out that the de-energized and doomed are prey to any political shift of the wind that might promise arrest of their fate.

At present all the world's industrial, or surfaced, processed and reprocessed functional tonnage (the *Industrial Logistics*) is preoccupied in the service of one quarter of the world's population though 100% are directly or indirectly involved in its procurement processing and transportation.

Historically, the trend of those to be served by in-

*A talk given before the Faculty Club of the Massachusetts Institute of Technology, January 19, 1950.

¹ *American Forestry Monthly*, November 1949.

dustrialization is 0%→100%. The problem then is not one of countering the trend but of accelerating it exquisitely.

All the politician can do regarding the problem is to take a fraction of that inadequate ratio of supply from one group and apply it to another without changing the over-all ratio. The politician can of course recognize and accept the trend rather than oppose it, but this does not accelerate it, that is, in adequate degree to arrive at a solution in our day and generation,—and more importantly before deadline of the doomed.

All that money can do is shower paper bills of digits on the conflagration. Relative denominations neither decrease or increase the velocity of combustion.

How, and by whom if at all, may the problem be solved? Scientists are often charged with the task, but scientists as a class (irrespective of their proclivities as individuals) do not function in the *comprehensive* capacity, they function as *specialists* in taking the universe apart to isolate and inventory its simplest behavior relationships. Engineers function as *invoked specialists* in *reproducing* satisfactory interactions of factors ascertained as 'satisfactory' by *past* experience and a wealth of behavior measurement. Both engineers and politicians would lose their credit by society if they incorporated the unprecedented in wholesale manner.

We hear and read frequently in scientific and philosophic journals of the desirability for ways in which problems of universe may once more be approached by comprehensive and scientific principles.

A New Social Initiative

There emerges the need for a new social initiative which is not another function or specialization but is an integral of the sum of the product of all specializations, i.e., the Comprehensive Designer.

The Comprehensive Designer is preoccupied with anticipation of all men's needs by translation of the ever-latest inventory of their potentials. Thus he may quickly effect the upping of the performance-per-pound of the world's industrial logistics in four-fold magnitude through institution of comprehensive redesign incorporating all of the present scientific potentials that would otherwise be tapped only for purposes of warfaring, defensively or offensively.

In view of our myriad of performance-per-pound-advances of multifold degree (in contrast to percentage degrees) typified by pounds of rubber tire upped in performance from 1,000 miles to 30,000 miles expectancy without poundage increase (yet with complete chemical, though invisible, transformation) or of communication advance from one message to 250 concurrent messages per unit of cross-section of copper wire (and both of these multifold advances have been accomplished within a quarter of a century),

it is seen as a meager technical problem to consider advancing the over-all efficiency of worldwide industrial and service logistics fourfold (to serve 100% of the population).

SOME MAY TEND to underestimate the comprehensive nature of the problem, saying the people are thus starving and we have the land capacity to raise the food. This conception voiced by the theoretical specialist or casual observer is without benefit of logistic experience. It is not just a matter of raising food but getting food to people, anywhere from zero to 25,000 miles distant. And then it is not just a matter of getting food to people zero to 25,000 miles away—it is a matter of getting it there at certain velocities; and it is not just a matter of getting it there at certain velocities, but it is a matter of getting it there on schedules in certain *conditions*, conditions of nourishing content, palatability and vital preservation. And even then it is not a matter of success concerning all the preceding conditions, for the dumping of a year's food supply in front of a helpless family huddled on the street-curb is but an unthinkable tragedy. The maggots appear in hours. And once again the continuing energy controls providing progressive freezes, heatings, etc. cannot be effected by refrigerators and stoves dumped in the street along with a year's tonnage of food. Obviously a world continuity of scientific-industrial controls resultant upon comprehensive and technical redesign is spelled-out as the irreducible minimum of solution.

For those who think that this minimum can be obtained through legislative enactment by the politician or by the establishment of new dollar credits and who are forgetful that the total world tonnage is already preoccupied with service of only 25% of the world-people, it is to be noted that the economic-statistical approach is at present being voiced by the press in conjunction with the historically unprecedented water-shortages of the great U. S. metropoli, New York and Los Angeles.

These are not problems unique to those cities, but symptomatic of the trend of the great industrial interactions. The economic-statistical solution voiced by the politicians and the news proposes further en-

croachments into the watershed origins through the rerouting of waters otherwise destined to lesser centers.

Ergo: typical question asked by the Comprehensive Designer is: what do people want the water for? They are using 100 gallons per day per capita, consuming only one gallon for their vital processes while employing 99 gallons to dunk themselves and gadgets and to act as a liquid conveyor system of specks of dirt to the sea. We note that scientists do not need water to dunk their instruments in, nor industrialists to dunk their machinery in. Are there not superior ways to effect many of the end purposes involving no water at all, and where water is found to be essential, can it not be separated out after its combining functions and systematically recirculated as chemically pure, sterilized, 'sweet' and clear, and with low energy expense or even an improved energy balance-sheet as a result of comprehensive redesign?

THE SPECIALIST IN comprehensive design is an emerging synthesis of artist, inventor, mechanic, objective economist and evolutionary strategist. He bears the same relationship to society in the new *interactive continuities* of worldwide industrialization that the architect bore to the respective *remote independencies* of feudal society.

The architect of 400 years ago was the comprehensive harvester of the potentials of the realm. The last 400 years have witnessed the gradual fadeout of feudalism and gradual looming of what will eventually be full world-industrialization,—when all people will produce for all people in an infinity of interacting specialized continuities. The more people served by industrialization, the more efficient it becomes.

Positive Constituents of Industry

In contrast to the many negative factors inherent in feudalism, such as debt, fear, ignorance and an infinite variety of breakdowns and failures inevitable to dependence on the vagaries of nature, industrialization trends to "accentuate the positive and eliminate the negative" first by measuring nature and converting the principles discovered in the measurements to

mastery and anticipation of the vagaries. Day and night, winter and summer, fair weather or bad, time and distance are mastered. *Productive continuities* may be maintained and forwardly scheduled. There are three fundamental constituents of industry; all are positive.

The first consists of the aspect of energy as *mass*, inventoried as the 92 primary chemical elements which constitute earth and its enclosing film of ever-alternating liquid-gaseous sequence.

The second fundamental component of industry consists of energy but in a second and two-fold aspect, i.e.: (a) energy as *radiation* and (b) energy as *gravitation*, of both of which we are in constant receipt from the infinite cosmic fund. Third and most important component of the industrial equation is the intellect-factor which secretes a continually amplifying advantage in experience-won knowledge.

Complex-component number one cannot wear out. The original chaotic disposition of its 92 chemical elements is gradually being converted by the industrial principle to orderly separation and systematic distribution over the face of earth in structural or mechanical arrangements of active or potential leverage-augmentation. Component number two, cosmic energy, cannot be exhausted.

Constituent number three not only improves with use but is interactively self-augmenting.

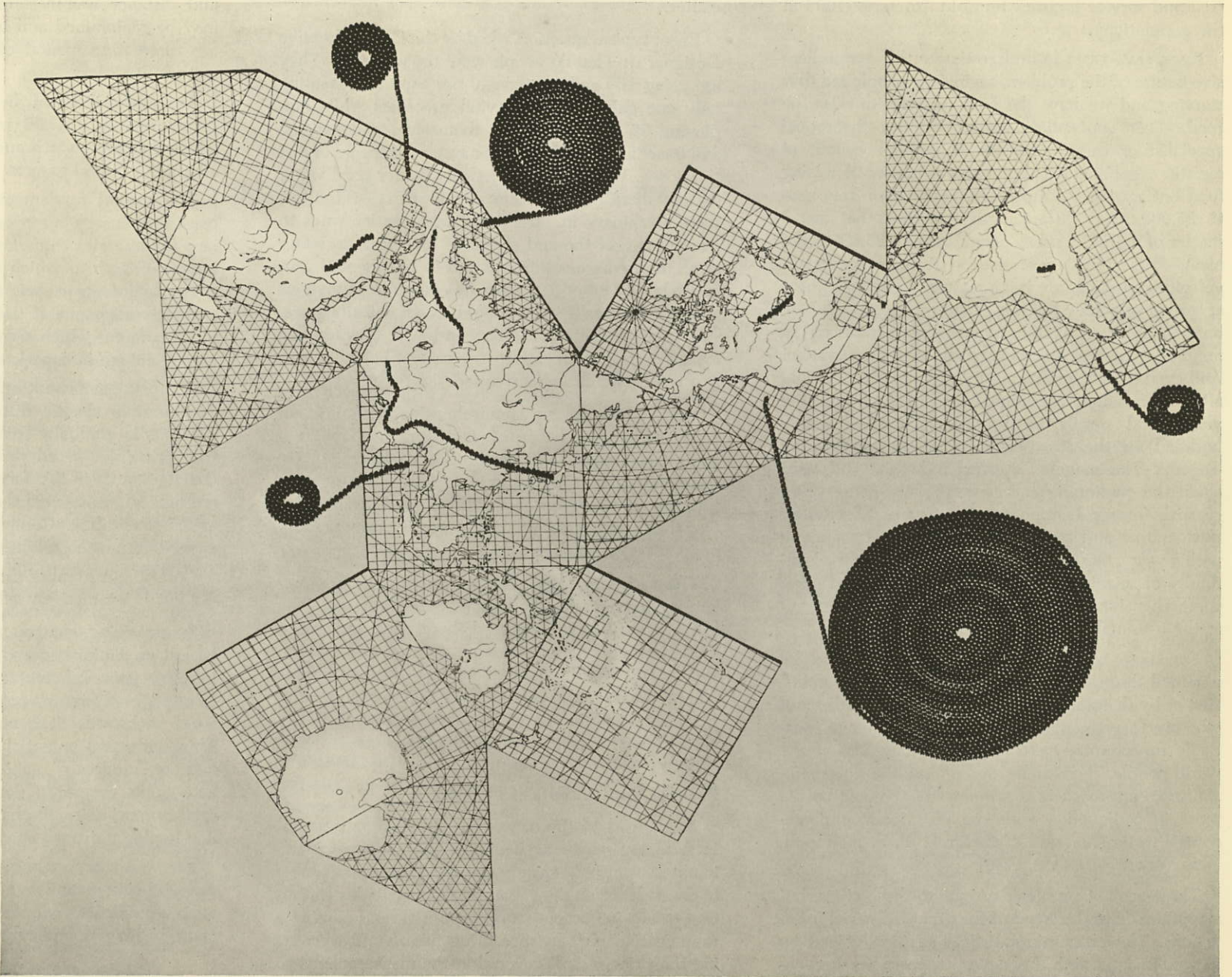
Summarizing, components No. 1 and No. 2 cannot be lost or diminished and No. 3 increases; net result *inherent gain*. Inherent gain is realized in physical advantage of *forward* potential (it cannot be articulated backwards; it is mathematically irreversible). Thus, industrial potential is schematically directional and not "randomly" omni-directional. Thus, the "life" activity as especially demonstrated by man represents an anti-entropic phase of the transformations of non-losable universal energy.

THE ALL-POSITIVE PRINCIPLE of industry paradoxically is being assimilated by man only through emergent expedients,—adopted—only in emergency because of his preponderent fixation in the direction of

(cont. on page 22, col. 2)

world energy map on dymaxion projection (patented)

r. buckminster fuller



Copyright 1950 by R. BUCKMINSTER FULLER. Photo Aaron Siskind

NAME OF MAP PIECE	POPULATION		% OF WORLD POPULATION		ENERGY SLAVES POPULATION		% OF WORLD'S ENERGY SLAVES		% OF WORLD'S ENERGY SLAVES In Terms of Human Equivalents As Shown on Map)		SLAVES PER HUMANS PER AREA In Round Numbers	
	1940	1950	1940	1950	1940	1950	1940	1950	1940	1950	1940	1950
	ASIA	1,062,500,000	1,125,000,000	50	50	2,211,000,000	2,565,000,000	6	3	102	114	2
EUROPE	531,250,000	540,000,000	25	24	8,475,500,000	14,535,000,000	23	17	391	646	16	27
AFRICA AND MEDIT. WORLD	255,000,000	270,000,000	12	12	2,579,500,000	3,420,000,000	7	4	119	152	10	13
NORTH AMERICA	148,750,000	180,000,000	7	8	22,110,000,000	62,415,000,000	60	73	1020	2774	148	347
SOUTH AMERICA	85,000,000	90,000,000	4	4	1,474,000,000	2,565,000,000	4	3	68	114	17	28
CENTRAL AMERICA	21,250,000	22,500,000	1	1	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -
ALL OTHERS	21,250,000	22,500,000	1	1	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -	- 0 -
	2,125,000,000	2,250,000,000	100%	100%	36,850,000,000	85,500,000,000	100%	100%	1700%	3800%		

The map on the opposite page is a *dymaxion* projection. First published in *Life*, March 1943, the *dymaxion* projection is the first and only projection to receive a U.S.A. patent. Through its use, one may survey the whole surface of the earth with no visible distortion. This is to say that if direct comparison is made of the shapes and proportional size of the land and water masses with their counterparts on the surface of a world-globe, no physical difference will be detected. There is deformation but it is only mathematically detectable. Because the *dymaxion* map's longitude and latitude grid is developed after its great circle grid projection, the poles need not be given symmetrical position on the projected map. As the great circle grid may be freely oriented upon the sphere before projection, it is possible to arrange that the sinuses (openings in the stretched-out earth "skin") all occur in the *one* or *continuous ocean*. This makes possible the particular arrangement of linked-together continental masses, without breaks in their contours, completely surrounded by the "ocean".

Because one can see all the world at once (impossible with a globe), without visible distortion of its parts, any superimposed visual representations of statistical data are free of the false impressions usually obtained by looking at non-distorted proportional forms against a distorted background.

The special statistical data superimposed on the map is furnished by the metallic beads which appear in two categories of arrangement.

The first consists of relatively short strands of beads superimposed upon those triangles and squares containing the respective portions of the world's population. The

other main category is comprised of plaited coils of metallic beads placed outside the surfaces of the map with their uncoiled ends leading to the appropriate area of the map to which they refer.

The first category of short strands contains 100 beads altogether. Each bead represents 22,500,000 humans or 1% of the world's population taken at 2,250,000,000 for 1950.

As it will be seen, the particular *square* of the map logically referred to as "Asia" contains 50 beads because 50% of the world's population live in the area represented. The 1,125,000,000 humans of "Asia" do not live precisely along the line where the beads lie. The curved line of beads only roughly approximates their line of position.

On the triangle which contains most of Europe and may therefore be called "Europe", there are 24 beads because 24% of the human population live in that area. It will be noted that a portion of land which we are used to thinking of as "Europe" is contained in the particular square which might be quickly identified as "Africa" because it contains approximately all of Africa but also happens to contain the "Mediterranean world", that is Italy, Greece, Southern France and Spain, Asia Minor and Arabia: to wit, all of the countries south of the large earth fault which we approximately associate with the line of Pyrenees-Alps and Caucasus mountains. This is quite a natural separation as this "Mediterranean world" is historically a world apart from the triangle which constitutes the later development known as "Europe." The square containing Africa and the "Mediterranean world" has 12 beads superimposed as it contains 12% of the world's population.

In like manner, the square comprising "North America" shows 8 beads superimposed, and the square identified by "South America" has 4 beads. The triangle identifiable as "Central America" has 1 bead.

So far we have accounted for 99 beads. One bead is missing because all the peoples in all the other 6 triangles and 2 squares together constitute less than 1% of the population.

We are customarily impressed with the large aggregate of world's population represented by "Europe" and "Asia", for these two pieces alone contain 74% of the world's population. The diminutive number of 8 on the "North American" continent and the additional 5 of the other Americas (totaling 13) approximately balances "Africa's" 12% on the other wing of the map.

Category two of the superimposed data, the plaited coils whose ends lead to the respective areas whose data they modify, completely alters the significance of the information gleaned from category one. There are 3800 metallic beads in the 5 plaited coils. This is because these beads represent what might most appropriately be called the "energy slaves" serving man, — and outnumber 38 times the man population which they serve.

An "energy slave" is determined as follows:

In addition to the energy spent from his metabolic income in "working" his own body, one man in one 8 hour day can do approximately 150,000 foot pounds of work. A foot pound of work equals the amount of energy required to lift one pound one foot vertically. This additional work might be called his "net advantage" in dealing

with environment. The "net advantage" potentially to be gained by each human each year, working 8 hours each of 250 days per year, is 37½ million foot pounds.

Stated with a probable error of less than 10%, the world consumption of energy from mineral fuels (coal, oil, gas) and water power for the present year (1950) will be 80¼ quintillion foot pounds (80,156,250,000,000,000,000 foot pounds). Assuming man's efficiency in converting his gross energy consumption into work to average an over-all 4%, he will net therefrom 3¼ quintillion (3,206,205,000,000,000,000) foot pounds.

Dividing this figure by 37½ million foot pounds (each man's net annual energy advantage), we receive the figure 85½ billion man year equivalents of work being done for him. The 85½ billion man equivalents we will call 85½ billion "energy slaves".

85½ billion energy slaves
2¼ billion world population

—=38 energy slaves per capita

However, these energy slaves were not divided up equally in their service to each man on the face of earth as the above tables will show. Marked contrasts are to be seen in the table, — e.g. each of the 180 million "North American" inhabitants is served by 348 energy slaves (1400 per family) while each of the inhabitants of "Asia" is now limited to the services of 2 energy slaves.

To further appreciate the significance of this table, it must be noted that "energy slaves", though doing only the foot pound equivalent of humans, are enormously more effective because they can work under conditions intolerable to man, e.g. 5000° fahrenheit, no sleep, ten thousandths of an inch tolerance, can see at one million magnifications of man's vision, 400,000 pounds per square inch sinuosity, 186,000 miles per second alacrity, etc.

What is the world energy picture? North America, though running out of its petroleum resources, has domestic mineral fuel resources for 1000 years at present rate of consumption. Despite this energy wealth, it will trend after a few decades toward less energy consumption while upping standard of living through increased technical efficiency of energy use, with net energy for exporting, a condition already obtaining in many of its above-and-below-grade mineral resources and industrial products and services.

World petroleum resources will gain but will be augmented by other mineral fuel resources to approximate the same per capita wealth for rest of world as is now known to exist in North American continent.

World per capita consumption will trend to equivalence of North America by end of century with world equivalence in standard of living. World population trends to 3 billion by end of century, and even if trending to 4 billion by end of 21st century, world wide man may continue to up his standard of living indefinitely (without recourse to atomic power—his capital account)—through 16% success in converting sun energy receipts by metabolic processes throughout the arable, temperate and tropic areas.

(cont. from page 19)

tradition. Backing up into his future, man romantically appraises the emergent dorsal sensations in the negatively parroted terms of his ancestors' misadventures.

Essence of the principle of industry is the principle of *synergy* (Miriam Webster: "Cooperative action of discrete agencies such that the total effect is greater than the sum of two or more effects taken independently"). The principle is manifested both in the inorganic and organic. The alloying of chrome and nickel and steel provides greater tensile strength than that possessed by any of its constituents or by the constituents in proportional addition. Three or more persons by specialized team work can do work far in excess of the work of three independently operating men. Surprisingly, and most contradictory to the concept of feudal ignorance, the industrial chain's strength is not predicated on its weakest link. So strong is the principle that it grows despite a myriad of superficially failing links! In fact there are no continuous "links" in industry or elsewhere in universe because the atomic components are,—interiorly, spatially discontinuous.

The strength of "industry" as with the strength of the "alloy" occurs through the cocentric enmeshment of the respective atoms. It is as if two non-identical constellations of approximately the same number of stars each were inserted into the same space making approximately twice as many stars, but none touching due to the difference in patterns. The distances between stars would be approximately halved. It is the same with alloyed atoms whose combined energetic cohesion increases as the second power of the relative linear proximities of the component parts. Though the parts do not "touch," their mass cohesive dynamic attraction follows the gravitational law of proportionment to second power of the distance apart of centers. Therefore, alloying strength is not additive arithmetically but is advantaged by gravity which as Newton discovered is inversely proportional to the "square" of the distance apart.

MAN HAS NOW completed the plumbing and has installed all the valves to turn on infinite cosmic wealth. Looking to the past he wails, "How can I

afford to turn on the valve? If I turn it on, somebody's going to have to pay for it!" He forgets that the bill has been prepaid by all men through all time, especially by their faithfully productive investments of initiative. The plumbing could not have been realized except through *absolute prepayment* of intellectually organized physical work, invested in the inherent potentials of nature.

Epochal Transformations

Not only is man continually doing more with less,—which is a principle of trend which we will call "ephemeralization,"—a corollary of the principle of "synergy,"—but he is also demonstrating certain other visible trends of an epochal nature. Not only does he continually increase literacy but he continually affords more years of more advanced study to more people. As man becomes master of the machine—and machines are introduced to carry on every kind of physical work with increased precision, effectiveness and velocity,—his skilled crafts, formerly intermittently patronized, graduate from labor status to continuity of employment as research and development technicians. As man is progressively disemployed as a quantity production muscle-and-reflex machine, he becomes progressively reemployed in the rapidly increasing army of research and development,—or of production-inaugurating engineering—or of educational and recreational extension, as plowed-back increment of industrialization.

Product and service production of any one item of industry trends to manipulation by one man for the many through push-button and dial systems. While man trends to increasing *specialized function* in anticipatory and positive occupations of production, he also trends to *comprehensive function* as consumer. Because the principle of industry improves as the number of people it serves is increased, it also improves in terms of the increase of the number of functions of the individual to which it is applied and it also improves in terms of its accelerated use.

THROUGHOUT THE WHOLE history of industrialization to date man has taken with alacrity to the pre-occupation of the specialist on the production side of

the ledger, but the amplifications of the functions of the individual as comprehensive consumer have been wretched and jerked and suffered into tentative and awkward adoption in the mumbo-jumbo and failure-complex of obsolete feudal economics. Up to yesterday man was unaware of his legacy of infinite cosmic wealth. Somewhere along the line society was convinced that wealth was emanating from especially ordained mortals to whom it should be returned periodically for mystical amplification. Also with feudal fixation man has looked to the leaders of the commercial or political states for their socio-economic readjustments,—to the increasingly frequent “emergencies.”

Throughout these centuries of predominant ignorance and vanity the inherently comprehensive-thinking artist has been so competent as to realize that his comprehensive thoughts would only alienate him from the economic patronage of those who successfully exploited each backing up into the future. The exploiters, successively successful, have ever attempted and in vain to anchor or freeze the dynamic expansion at the particular phase of wealth generation which they had come to monopolize.

The fool-hardy inventors and the forthright prospectors in humble tappings of greater potentials have been accounted the notable failures. Every industrial success of man has been built on a foundation of vindictive denouncement of the founders.

Thus the comprehending artist has learned to sublimate his comprehensive proclivities and his heretic forward-looking,—toward engagement of the obvious ripening potentials on behalf of the commonwealth. The most successful among the artists are those who have effected their comprehensive ends by indirection and progressive disassociations. So skillful have the artists of the last centuries been that even their aspiring apprentices have been constrained to celebrate only the non-utilitarian aspects of the obvious vehicles adroitly employed by the effective artists to convey their not so obvious but all important burden.

THUS THE LEGEND and tradition of a “pure” art or a “pure” science as accredited preoccupation have

grown to “generally accepted” proportion. The seemingly irrelevant doings of the pure scientist of recent decades exploded in the face of the tradition of pure mathematical abstraction at Alamagordo. No one could have been more surprised than the rank and file of professional “pure” scientists. The results were implicit in the undertakings of artist-scientists whose names are in the dim forefront or are anonymous in the limbo of real beginnings. How great and exultant their secret conceptioning must have been!

The Time Has Come

Now the time has arrived for the artist to come out from behind his protective coloring of adopted abstractions and indirections. World society, frustrated in its reliance upon the leaders of might, is ready to be about-faced to step wide-eyed into the obvious advantages of its trending. Ergo—the emergence of comprehensive training for specialists in the husbandry of specialists and the harvesting of the infinite commonwealth.

Will the comprehensive designer, forthrightly emergent, be as forthrightly accepted by the authorities of industrialization and state? If they are accepted, what are the first-things-first to which they must attend?

The answer to the first question is YES. They will be accepted by the industrial authority because the latter has recently shifted from major preoccupation with exploiting original resource to preoccupation with keeping the “wheels” which they manage turning,—now that the original inventory of “wheels,” i.e. tools in general has been realized from out original resource. Though original resource-exploiters still have great power, that power will diminish² as the mines now existing above grade, in highly concentrated “use” forms (yet in rapidly obsolescing original design), become the preponderant source of the annual need. Severe acceleration in the trend to *increase of performance per pound of invested material* now characterizes all world-industry. With no important increase in the rate of annual receipt from original mines, the full array of mechanics and structure

² See *New York Times*, June 17, 1949, page 2.

requisite to amplifying the industrial complex, from its present service to approximately one-fourth the world's population to serve all the world's population, may be accomplished by the scrap “mined” from the progressively obsolescing structures and mechanics. World-industrial management will be progressively dependent upon the comprehensive designer to accelerate the turning of his wheels by *design acceleration*. Each time the wheels go round the infinite energy wealth of cosmos is impounded within the ever greater receptive capacities of the 92 element inventory of earth and those who manage the wheels can make original entry on their books of the new and expanding wealth increments even as the farmer gains cosmic energy wealth in his seasoned cycles.

Answer to whether the designer will be accredited by political leadership has been made. Political leadership in both world camps has announced to the world of potential consumers their respective intents to “up” the standard of living of all world peoples by “converting the high technical potential to account through design.”

Only the designer can accomplish this objective. Legislative mandate and dollar diplomacy cannot buy the realization.

As first of the first things, the designer must provide new and advanced standards of living for all peoples of the world. He must progressively house and rehouse two billion and one-quarter people in establishments of advanced physical control. The mechanically serviced sheltering must be a continuity of roofs, stationary and mobile, sufficient to allow for man's increasing convergent-divergent interactions of transiency or residence, of work, play or development, interconnecting every central of the world and penetrating to autonomous dwelling facility of most advanced standard even in the remotest of geography. The logistics of this greatest phase of industrialization must impound cosmic-energy wealth, within the inventory of 92 chemical elements, to magnitudes, not only undreamed of, but far more importantly, adequate to the advancing needs of all men. Implicit is man's emancipation from indebtedness to else but intellect.

allen walker read

Allen Walker Read's study of the word "semantics" is the most up-to-date and extensive survey of this growing field's origins. It will be concluded in the second issue of *trans/formation*. Prof. Read teaches at Columbia University, giving courses in "Current English Usage", "The English Language in America," etc. He is Managing Editor of the magazine *American Speech* (Columbia University Press), President of the American Dialect Society, member of the Executive Committee of the Linguistic Society of America, and President of the New York Society for General Semantics.

the background of the word 'semantics'

People who believe that every word ought to have a single and definite meaning are unhappy in the presence of the word **semantics**. It has been ping-ponged about in some curious ways. At first blush its pattern of usage seems confusing, but a consideration of the historical background reveals a reasonable development. The present essay, using a rather narrowly lexicological approach, deals with the early appearances of the word, its use in the field of language study, and a comparison with other words of related meaning; and a later essay will take up the many facets of its remarkable vogue in recent years.

First Appearance of 'Semantick' in English

The adjective *semantick* made its appearance in English in the seventeenth century. As far as is now known, the example is unique. John Spencer, a fellow of Cambridge University, in 1663 published *A Discourse concerning Prodigies*, and re-wrote it completely for a second edition in 1665. In this second edition appeared the following passage:

Moreover, Philosophy will very probably direct us to the true Original of Divination by *Prodigies*, and the other *Species* thereof, *Chiromancy*, *Capnomancy*, *Oneiromancy*, *Haruspicina*, *Augury*, in use among the Ancient Heathens: which was (if I mistake not) a Philosophick Divination (much studied of old) stretcht by Ignorance and Superstition beyond the limits of sobriety: for all these curious arts, however they are froth at the top, contain under them the good liquor of a useful Philosophy. [These are elaborated in about four pages, and he concludes the section:]

'Twere easie to shew how much this *Semantick Philosophy*, in all the parts of it, was studied by the more ancient Philosophers, being so much recommended to them by the subtilty, pleasure and singular usefulness thereof to the ends of common life, but this would prove an impertinence in this place.¹

It is clear from this passage that the phrase 'Semantick Philosophy' refers to the study of the various types of divination, or in a more up-to-date terminology, to prediction of the future on the basis of signs.

This passage was collected in the broad sweep of the *Oxford English Dictionary*, but the definition there given illustrates, alas, one of the pitfalls of lexicography. The contributor who sent in the quotation evidently copied out, in addition to the sentence containing the word *semantick*, merely the sentence that immediately preceded it. This was as follows:

Thus *Castor* and *Pollux* (those twin-lights, so called, seen somtimes about ships in the silences of the night) were anciently received as the indications of a quiet passage; because any disposition in the air to motion would soon have divorced those gentle fires.

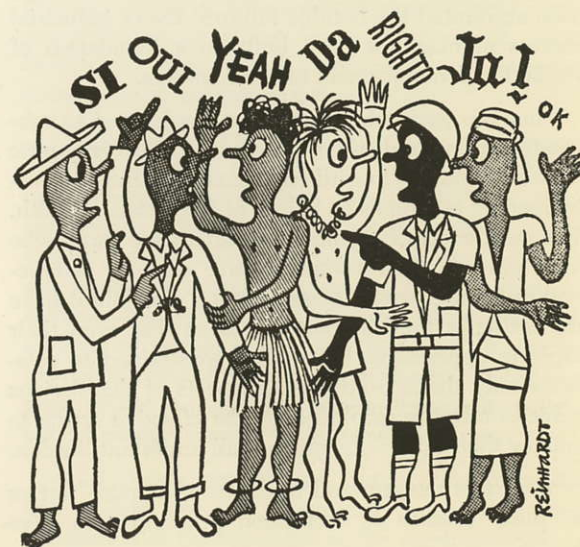
Thus the editor, Henry Bradley, in December, 1911, did not have the full context, but guessed at the meaning from this one sentence. His definition therefore was, 'Relating to signs of the weather.' This is clearly an error, for the expression 'this *Semantick Philosophy*,

¹ *A Discourse concerning Prodigies: wherein the Vanity of Presages is Reprehended, and their True and Proper Ends Asserted and Vindicated* (2nd ed.; London, 1665), pp. 296-300.

in all the parts of it,' refers to the whole passage dealing with predictions and not to the detail that happened to be taken up in the sentence immediately preceding it. The definition to cover Spencer's usage should therefore be widened.

As no other seventeenth century example has turned up, we may assume that Spencer borrowed the word from classical sources. The Greek adjective *σημαντικός*, 'significant,' was frequently used, as by

From *The Races of Mankind* by Benedict and Wel fish
Courtesy Public Affairs Committee, Pamphlet No. 85



Aristotle,² derived from the verb σημαίνω, which has a wide range of meanings: 'show by a sign,' 'declare' (of the Delphic oracle), 'appear,' 'be manifest' (in later prose), 'signify,' 'indicate,' 'interpret,' 'explain,' 'mean' (of words and sentences), etc. The adjective *semanticus* was known in Latin (borrowed from the Greek, of course), having been used at least once, by Martial.³

Coinage of 'Semantique' in French

The active usage of *semantics* did not begin until late in the nineteenth century, and was the coinage, in a French form, of the noted linguist Michel Bréal. In an article in 1883 in the annual of a society for Greek studies, he launched the word in the following passage:

The study into which we invite the reader to follow us is so new that it has not yet received a name. In fact, it is on the body and form of words that most linguists have exercised their talents: the laws that control the alteration of senses, the choice of new expressions, and the birth and death of locutions have been left in a shadow or only indicated in passing. Since this field of study—just as much as phonetics and morphology—deserves to have its own name, we will call it semantics [*la sémantique*] (from the verb σημαίνω), that is to say, the science of significations.⁴

Two years later, in 1885, another French linguist, Arsène Darmesteter, adopted Bréal's term in a study of word history. He wrote: 'We have recognized the methods of the changes of sense. What are the causes? Here we touch upon problems of the greatest obscurity and difficulty in semantics.' And as a footnote: 'This word, taken from the Greek, designates the science of the change of signification in words.'⁵ In 1887 Bréal wrote a long and searching review of

² In *De Interpretatione*, 16-a-19, etc. Cf. Liddell & Scott, *Greek-English Lexicon*, ed. Jones (Oxford, 1925 ff.), pp. 1592-3.

³ *Harper's Latin Dictionary* (New York, 1879), p. 1663.

⁴ 'Les lois intellectuelles du langage: fragment de sémantique,' in *Annuaire de l'association pour l'encouragement des études grecques en France*, XVII (1883), 132-42, especially p. 133.

⁵ *La vie des mots: étudiée dans leurs significations* (5th ed.; Paris, 1895), p. 88.

Darmesteter's book,⁶ and he regarded that review, as he declared ten years later, as 'the first idea of our own semantics.'⁷

Borrowing into English

Bréal continued to publicize his outlook in a number of short articles, and the word *semantic* or *semantics* might have appeared in English any time after 1883. For instance, a noted American author, Lafcadio Hearn, was in 1884 writing essays for a New Orleans newspaper, and he chose a paper of Bréal's as the subject of one of them, but he did not make use of the word *semantics*.⁸

The word *semantics* made its first appearance in English in 1886, when an unidentified translator turned Darmesteter's study into English. He made mention of 'the most difficult questions connected with *semantics*,' and added the footnote: 'This word is derived from the Gr. σημαίνω, to denote; and signifies the science of change of meaning.'⁹

Thereafter it was open to speakers of English to use the word again, and in 1894 an American scholar picked it up. Charles R. Lanman, professor of Sanskrit at Harvard University, on December 27, 1894, read a paper before the American Philological Association entitled 'Reflected Meanings; a Point in Semantics,' in which he declared: 'The doctrine of the principles that underlie the processes of the development of the meanings of words may be called semantics or semasiology.'¹⁰ In the next year Maurice Bloomfield of Johns Hopkins University even used

⁶ 'L'histoire des mots,' in *Revue des deux mondes*, LXXXII (1887), 187-212.

⁷ *Essai de sémantique* (Paris, 1897), p. 305, footnote. Extracts of the review are reproduced, pp. 305-39.

⁸ 'The Mental Dictionary,' in the *New Orleans Times-Democrat*, November 16, 1884, reprinted in *Occidental Gleanings*, ed. Albert Mordell (New York, 1925), II, 11-14. It was inspired by Bréal's paper, 'How Words Are Classified in the Mind.'

⁹ Arsène Darmesteter, *The Life of Words as the Symbols of Ideas* (London, 1886), p. 83.

¹⁰ *Transactions of the American Philological Association*, XXVI (1895), Appendix, p. xi.

semantically: 'Every word, in so far as it is semantically expressive, may establish, by hap-hazard favoritism, a union between its meaning and any of its sounds.'¹¹

Our word received a great push when Bréal's full book, toward which his articles had been looking, appeared in 1897.¹² Though it was regarded as a landmark in language study, some English reviewers hesitated to transform the term *la sémantique* into English dress. The reviewer in the *Athenæum* in 1899 wrote: 'The semasiologist, or student of "la sémantique," has to trace the vicissitudes which the history of forms, words, and phrases presents with respect to signification, many of which admit of classification.' And he concluded by making reference to 'the infinite variety of topics furnished by "la sémantique".'¹³ The noted littérateur Charles Whibley was less cautious, for in his review in 1899 he declared: 'Thus it is the purpose of Semantics, the new method of investigation devised by M. Michel Bréal, to turn the study of language into a wiser channel.'¹⁴

When Bréal's book appeared in English in 1900,¹⁵ the translator, Mrs. Henry Cust, used the form *semantics* without apology. She thanked Mr. Charles Whibley 'for his constant advice and assistance,' and she was thus no doubt following his naturalization of the word.¹⁶ Thereafter the *Athenæum* did not hesitate to print the word, permitting in 1901: 'As applied to language, psychology is not easily distinguishable from semantics or semasiology.'¹⁷ Even a severe stylist

¹¹ 'On Assimilation and Adaptation in Congeneric Classes of Words,' in the *American Journal of Philology*, XVI (1895), 409.

¹² *Essai de sémantique (Science des significations)* (Paris, 1897), 349 pp.

¹³ *Athenæum*, CXIV (August 5, 1899), 185/3 and 186/2.

¹⁴ 'Language and Style,' in the *Fortnightly Review*, LXXI (January, 1899), 101.

¹⁵ *Semantics: Studies in the Science of Meaning* (London, 1900), lxvi, 341 pp.

¹⁶ *Op. cit.*, 'Translator's Note,' p. v.

¹⁷ *Loc. cit.*, July 13, 1901, p. 51/1, in a review of Wundt's *Völkerpsychologie*.

like Professor Paul Shorey, the Chicago Platonist, admitted the word: '. . . these and similar propositions were not first enunciated or illustrated by the science of Semantics.'¹⁸

Establishment in Linguistics

Thus launched, the word *semantics* made its way gradually among linguists, until it was the generally accepted term, preferred over *semasiology*. In 1902 America's leading linguist, Benjamin Ide Wheeler, constructed a definition as follows: 'Semantics . . . The doctrine of historical word-meanings; the systematic discussion of the history and development of changes in the meanings of words.'¹⁹ Its acceptance in a general survey of 'philology' in a lecture in 1908 by A. V. Williams Jackson, Professor of Indo-Iranian Languages at Columbia University, is attested by his statement: 'The study of the meanings of words in different languages (a branch of paramount importance in lexicography) has led to another specialized phase of philological research known as semasiology, or semantics, in which the name of the French scholar Bréal stands in the foreground.'²⁰

But even in 1912, when Professor Ernest Weekley wrote an essay entitled 'Semantics', he regarded it as a pioneer effort: it is, he said, 'so far as I know, the first attempt at a simple treatment of a science which is now admitted to an equality with phonetics, and which to most people is much more interesting.'²¹ The essay itself began: 'The convenient name semantics has been applied of late to the science of meanings, as distinguished from phonetics, the science of sound.'²² It consisted of etymological tidbits, such as: 'Cubit is Latin for *elbow* . . .'; 'A *furlong* is a *furrow-long*'; 'The *steward*, or *sty-ward*, looked after his master's pig'; 'Farce, from French, means stuffing';

and so on. The narrowness of this conception is striking. Shallow antiquarianism of this sort easily finds a public, and for many folk this has become the prime signification of *semantics*.

In 1920 an anthropologist, Bronislaw Malinowski, took up the word in a widened sense that tended to rehabilitate it. In his study of languages of Melanesia he came upon difficult theoretical problems. After mentioning the works of Wundt, Paul, Oertel, etc., he went on:

All these works, however, are résumés of the present state of linguistics, and they reflect the insufficient attention hitherto given to Semantics. And it is only from the development of Semantics, as will be shown later on, that the ethnographer can look for real help. [Footnote:] Bréal's work *Semantics*, English translation, London, 1900, though interesting and stimulating, in my judgment does not face the real problems of the subject.²³

He was acutely aware of 'the need for a sound guiding theory.' As he said: 'Such a theory—specially adapted for the ethnographer's need—can only be achieved by a frontal attack on Semantics, that is by a thorough study of the relation between linguistic Form and Meaning.' He concluded, 'Finally we must remember that . . . sound semantic definitions valid for a wide range of linguistic types are needed before any grammatical analysis of native languages is possible.'²⁴ He returned to the problem in 1923 in his important essay, 'The Problem of Meaning in Primitive Languages,' and made free use of *semantic* and *semantics*, in passages like the following: 'Finally, I myself, at grips with the problem of primitive languages from Papuo-Melanesia, had been driven into the field of general Semantics.' Or, 'The misuse of words, based always on a false analysis of their Semantic function, leads to all the ontological morass in philosophy.' Or, 'we shall be able to give an outline of a Semantic theory, useful in the work on Primitive

Linguistics, and throwing some light on human language in general.'²⁵

C. K. Ogden and I. A. Richards, in their influential work of 1923, *The Meaning of Meaning*, did not make use of the word *semantics*; it appears there only once, in a paraphrase of a comment by Professor J. P. Postgate.²⁶ Their favorite term was 'science of symbolism.' Their followers, however, have adopted the word, for in 1941 Hugh Walpole published a tortured chapter entitled, 'What Is Semantics?'²⁷

Another linguist to wrestle with the term was Alan H. Gardiner, and he wrote in 1932, concerning the 'student of linguistic theory': 'His interest is, in fact, what has been variously called semasiology, significs, or semantics.' To this he added the footnote, 'Among English writers, the term "semantics" seems to have carried the day.'²⁸ Leonard Bloomfield described the usage that has prevailed among American linguists; he wrote: 'When the phonology of a language has been established, there remains the task of telling what meanings are attached to the several phonetic forms. This phase of the description is *semantics*. It is ordinarily divided into two parts, *grammar* and *lexicon*.'²⁹ Thus *semantics*, in a restricted sense, gained a well established place in the usage of linguistic scientists. *

A research project begun at Teacher's College, Columbia University, in 1934, used not only *semantic* but the derivatives *semanticist* and *to semanticize*. Under the direction of Professors E. L. Thorndike and Irving Lorge, a count was made, to determine the relative frequency of the meanings to be found in about five million running words. As Dr. Lorge stated, 'Since a count of meaning frequency was the primary purpose of the research, it was called the

¹⁸ 'The Science of meaning,' in the *Dial*, XXX (May 1, 1901), 300.

¹⁹ In James Mark Baldwin's *Dictionary of Philosophy and Psychology* (New York, 1902, in ed. 1928), II, 513.

²⁰ *Philology* (New York, 1908), p. 23.

²¹ *The Romance of Words* (London, 1912, in reprint of 1927), p. vi.

²² *Op. cit.*, pp. 86-104.

²³ 'Classificatory Particles in the Language of Kiriwina, in the *Bulletin of the School of Oriental Studies, London Institution*, I, part iv (1920), 35.

²⁴ *Ibid.*, pp. 36 and 62. In a later popular work, *Argonauts of the Western Pacific* (New York, 1922), he used the word *linguistic* where *semantic* might have been expected.

²⁵ Printed in C. K. Ogden and I. A. Richards, *The Meaning of Meaning* (2nd ed.; London, 1927), pp. 296-336. Quotations, pp. 298, 308, 309-10.

²⁶ *Op. cit.*, 1st ed., p. 3.

²⁷ Hugh R. Walpole, *Semantics: the Nature of Words and their Meanings* (New York, 1941), pp. 20-37.

²⁸ *The Theory of Speech and Language* (Oxford, 1932), p. 85.

²⁹ *Language* (New York, 1933), p. 138.

"semantic count" from the word *semantic* meaning "related to signification or meaning".³⁰ The workers who carried out the analysis of meaning were called *semanticists*, and the work they did *semanticizing*.³¹

Rivals of 'Semantics'

The word *semantics* should not be considered in isolation, for it has made an adjustment in relation to a set of other words. Some of these are limited to the strictly linguistic sense, and others look forward to the generalized scope of Alfred Korzybski's terms. His *time-binding*, *humanology*, and *general semantics* will be dealt with in a later essay. The principal rivals to the word *semantics* now follow.

I. *Semasiology* (1829-). The word *semasiology* can be traced back to a coinage of a professor of Latin at the University of Halle, Christian Karl Reisig, who died in 1829. In his study of Latin linguistics, published posthumously, in 1839, he called his first part 'Etymologie,' and for his second part he wanted a title of parallel form from the Greek. He called it, therefore, 'Semasiologie oder Bedeutungslehre.'³² He was thereby able to use a handy adjective, *semasiologisch*. The terms caught on among German scholars and became their regular usage. The English form, *semasiology*, is first recorded from 1877.³³ So many American scholars took postgraduate study in Germany in the nineteenth century that the term became common in America; and probably for the restricted sense of 'dictionary-meaning' it has until recently outweighed *semantics* in frequency. In 1945 H. L.

³⁰ Irving Lorge, 'The English Semantic Count,' in *Teachers College Record*, XXXIX (October, 1937), 66.

³¹ *Ibid.*, p. 72, footnote. For example, p. 67, footnote: 'It was decided to *semanticize* all words regardless of their frequencies in other counts'; and p. 77: 'Expert semanticists independently assigned meanings to the chosen word in each sentence.'

³² *Professor K. Reisig's Vorlesungen über lateinische Sprachwissenschaft*, ed. F. Hasse (Leipzig, 1839) pp. 286-307.

³³ In the *Oxford English Dictionary*: R. Martineau's translation of Ignaz Goldziher's *Mythology of the Hebrews* (1877), p. 43, 'Some phenomena in the semasiology of Arabic words.'

Mencken could declare: 'Semantics is a new name for semasiology, the study of the meaning of words.'³⁴ Usage provides no clear-cut distinction between *semantics* and *semasiology*.

II. *Rhematic* (1830). On September 23, 1830, in conversation, Samuel Taylor Coleridge tossed off a suggestion for a science of sentences, under the name of 'rhematic.' He said: 'The object of rhetoric is persuasion,—of logic, conviction,—of grammar, significance. A fourth term is wanting, the rhematic, or logic of sentences.'³⁵ It was a flash from his fecund mind, and nothing further came of it.

III. *Sematology* (1831-). An English grammarian, Benjamin H. Smart, in 1831 launched an anonymous work entitled *Outline of Sematology*. Following Locke's divisions of knowledge, he suggested that, parallel to the terms *physiology* and *practicology*, all instruction for the use of τὰ σηματα, or the signs of our knowledge, might be called *Sematology*.³⁶ He made further use of this terminology in later books,³⁷ and the word was taken up by some other English scholars, notably Archibald H. Sayce and James A. H. Murray. In fact, it is Murray's regular word in his introduction to the *Oxford English Dictionary* (1884).³⁸ However, both *semasiology* and *semantics* have driven it out of use, and so far as I am aware it has been little used in the present century.

IV. *Glossology* (1871-). The word *glossology* has been used in various general senses in English since 1716, but it was taken up in a technical sense in the latter part of the nineteenth century. The word formed part of the terminology of the famous historian George Grote (1794-1871). At his death he left an extensive manuscript in the field of the 'science of

³⁴ *The American Language: Supplement I* (New York, 1945), p. 102, footnote 1.

³⁵ *Table-talk and Omniana*, ed. T. Ashe (London, 1909), p. 110.

³⁶ *Op. cit.*, p. 1.

³⁷ *Sequel to Sematology* (London, 1837) and *A Way out of Metaphysics* (London, 1839); all three reprinted as a single volume, *Beginnings of a New School of Metaphysics* (London, 1839), 518 pp.

³⁸ As in the re-issue (Oxford, 1933), I, xxxi.

meaning,' entitled 'On Glossology,' and it was printed in succeeding years.³⁹ His fundamental distinction was between a *phone* (a word as sounded) and a *noem* (a word as thought); and on this basis he went on to such terms as *dianoematism*, *perinoematism*, *sematism*, *noematosematism*, *phonogrammatism*, etc. But the system was still-born, and a later critic rightly called the nomenclature 'too cumbersome and repellent to be generally adopted.'⁴⁰

V. *Comparative ideology* (1886). The word *ideology* has come now to refer to the philosophical pattern of one's outlook, but at a meeting of the Philological Society in London on June 4, 1886, it was set forth as a linguistic term. A French professor, Terrien de Lacouperie, speaking in English, declared that 'valuable evidence for detecting foreign influence in the structure and evaluation of languages could be derived from comparative ideology, a branch of the science of language that hitherto has been much neglected.'⁴¹ He announced that he had prepared lists of 'ideological indices' for over two hundred languages.

VI. *Sensifics* (1896). Problems of signifying engaged the attention of the Hon. Lady (Victoria) Welby, and in an important article in 1896 she called her system 'sensifics.'⁴² She said of Jespersen that he 'seems to forget that in order to have a really higher grade of significance, we must train a new generation in "sensifics." Indeed we even require to evolve skilled "sensificians" able to disengage the most subtle overtones of sense from the complex note of expression.'

VII. *Significs* (1896-). Lady Welby in her later writings turned to the word *significs* rather than *sensifics* and continued to publicize it with urgency and cogency.⁴³ In 1911 she stated that she regarded

³⁹ *Journal of Philology*, IV (1872), 55-66, 157-81, and V (1874), 153-82.

⁴⁰ J. P. Postage, in the *Fortnightly Review*, LXVIII (1897), 427.

⁴¹ *Proceedings of the Philological Society*, 1886, p. xliii.

⁴² 'Sense, Meaning and Interpretation,' in *Mind*, new ser., V (Jan., 1896), 24-37, and (April, 1896), 186-202. In this early article, she gave priority to *sensifics*, using it exclusively in her summary, p. 202.

⁴³ *Loc. cit.*, p. 193.

her signification as including semantics: 'Semantics may thus, for present purposes, be described as the application of Signification within strictly philological limits.'⁴⁴ Signification was specially important, she felt, in child training: 'The most urgent reference and the most promising field for Signification lie in the direction of education. The normal child, with his inborn exploring, signifying and comparing tendencies is so far the natural Significian.'⁴⁵ The movement she started took root specially in the Netherlands and is chiefly associated with the mathematicians L. E. J. Brouwer and G. Mannoury; the Fourth International Signification Conference was held from August 26 to September 3, 1948.

VIII. *Rhematology* (1896—). Professor J. P. Postgate, upon taking his chair of comparative philology in University College, University of London, gave an inaugural address on 'The Science of Meaning' on October 6, 1896. His very subject, he said, was 'at present without a special designation and must be indicated by a periphrasis.'⁴⁶ To fill the gap, he proposed a set of terms:

New titles are then required, and I propose to take them from the Greek, that storehouse of scientific terms, and to call the expression of a single idea or notion a *rheme*, from ῥῆμα, 'a thing said,' and to distinguish the expressions of qualifications and connections of such *rhemes* by calling them *epirrhemes*, though, as a general term, *rheme* may serve for both. If these terms be approved of, I should propose to call our science *Rhematology*, or the study of *rhemes*. Thus, in 'hands off the table,' we may say that there are four *rhemes* (more strictly three *rhemes* and an *epirrheme*), *hands*, *the-table*, *off*, expressing the notion of removal and the tone of the voice which conveys the speaker's will.

⁴⁴ Especially in her books *What Is Meaning? Studies in the Development of Significance* (London, 1903) and *Signification and Language* (London, 1911).

⁴⁵ Art. 'Signification,' *Encyclopædia Britannica* (11th ed.; 1911), XXV, 79/1. And further, XXV, 79/2: 'The first duty of the Significian is, therefore, to deprecate the demand for mere linguistic reform, which is indispensable on its own proper ground, but cannot be considered as the satisfaction of a radical need such as that now suggested.'

⁴⁶ *Fortnightly Review*, LXVIII (Sept., 1897), 427-28.

⁴⁷ In his 'Preface' to the English translation of Bréal's *Semantics* (London, 1900), p. lvii.

Again in 1900 he proposed the name *rhematology*, saying: 'I should limit the word to the special study of separate *rhemes*, preferring *Semantics* as the general name of our science.'⁴⁷ Postgate's word was well received by a writer in the *Athenaeum*,⁴⁸ and an American word collector thought that it would rival *semantics*: 'The terms proposed by these two scholars have about equal chances of a long and useful career.'⁴⁹ But *rhematology* is now forgotten.

IX. *Semiotic* (ca.1897—). The word *semiotic* has loomed into great importance among philosophers in recent years, but it has a shorter history in its general circulation than is commonly realized, except in medical contexts relating to the diagnosis of the symptoms of disease. A dim forerunner is found in John Locke. He wrote the first draft of his famous *Essay*, in 1671, without touching upon this subject.⁵⁰ But in the revised and expanded version, published in 1690, in the final chapter, he dealt with the divisions of sciences: first was Φυσική, or natural philosophy, second was Ηθική, or ethics, and, then, 'Thirdly, the third branch may be called Σημειωτική, or the doctrine of signs; the most usual whereof being words, it is aptly enough termed Λογική, logic: the mind makes use for the understanding of things, or conveying its knowledge to others.'⁵¹ It will be noted that the word we are studying appears only in its Greek form, and from the lexicographical point of view is not part of the English vocabulary. It is significant that the editors of the *Oxford English Dictionary*, although they combed Locke carefully, did not use this passage. Only from the point of view of the so-called 'historian of ideas' is the passage relevant.

But no doubt it was the hint from Locke that brought the term *semiotic* into the system of Charles S. Peirce. In an unidentified fragment, around 1897,

⁴⁸ *Loc. cit.*, February 16, 1901, p. 203/2.

⁴⁹ Leon Mead, *Word-Coinage* (New York, 1902), p. vi.

⁵⁰ *An Essay concerning the Understanding, Knowledge, Opinion, and Assent*, ed. Benjamin Rand (Cambridge, Mass., 1931).

⁵¹ *An Essay concerning Human Understanding*, ed. A. C. Fraser (Oxford, 1894), II, 461.

Peirce stated: 'Logic, in its general sense, is, as I believe I have shown, only another name for *semiotic* (σημειωτική), the quasi-necessary, or formal, doctrine of signs.'⁵² It will be noted that this was not printed until 1932, so that it could not influence the usage of others until that date. It appeared just in time, in fact, to affect the terminology of Professor Charles Morris. Peirce did use the term in his correspondence with Lady Welby, telling her, ca. 1908, that her signification 'would appear from its name to be that part of Semeiotic which inquires into the relation of Signs to the Interpretants.'⁵³ But so far as I can find *sem(e)iotic* was never printed during Peirce's lifetime.

The Polish mathematician Léon Chwistek used *Semantik* when writing in German, but on writing in English in 1924 he chose *semeiotics*, declaring: 'As the Pure Theory of Types does not assume any existence-axiom and does not lead to Richard's paradox, it is a natural base for rational Semeiotics, a science whose importance can scarcely be denied.'⁵⁴

X. *Semiology* (ca.1913). The French linguist Ferdinand de Saussure, when he died in 1913, left a manuscript that upon its later publication influenced linguistic thinking deeply. He wished to emphasize the importance of an analytical study of the function of words in everyday social life. This he called *sémiologie*, launching it in the following passage:

We may conceive of a science which studies the life of signs in the midst of social life; it would form a part of social psychology, and consequently of general psychology; we will call it semiology [*sémiologie*] (from the Greek *sēmeion*, 'sign'). It would teach us what the signs consist of and what laws govern them. As this science does not yet exist, one cannot say what it will be like; but it has a right to exist, and its place is determined in advance. Linguistics is only part of this general science; the laws which semiology will discover will be applicable

⁵² *Collected Papers of Charles Sanders Peirce* (Cambridge, Mass., 1932), II, 134 (§227).

⁵³ Quoted from the MS by Ogden and Richards in *The Meaning of Meaning* (2nd ed.; London, 1927), pp. 281-82.

⁵⁴ 'The Theory of Constructive Types (Principles of Logic and Mathematics,' Part II, in *Annales de la société Polonaise de mathématique*, III (1924), 92-141; quotation, p. 92.

to linguistics, and the latter science will find itself attached to a domain well defined within the wholeness of human life.⁵⁵

This word has in English, as with *semiotic*, been chiefly medical; but usage relating to linguistics can be found. Thus the recently appointed professor of general linguistics at the University of Amsterdam stated in 1947: "The latest attempt to design a semiology is that of Charles Morris: "Signs, Language and Behavior," 1946."⁵⁶

XI. *Orthology* (1928-). In arranging for new worlds to conquer after the publication of *The Meaning of Meaning*, C. K. Ogden set forth the subject of 'orthology,' which he described as 'the science of correct symbolism based upon an elaborate analysis of the technique of communication.' As he wrote further, 'America is on the verge of reconstructing her legal edifice—with a sub-structure of encrusted Word-magic, and the remedy is Forensic Orthology alone.'⁵⁷ But Ogden's efforts were soon monopolized by the shepherding of 'Basic English' into the world scene, and the term *orthology* now exists only as a vestigial remain in the name 'Orthological Institute.'

XII. *Science of idiom* (1944). An American scholar, Murat H. Roberts, has explored the possibilities of a 'science of idiom,' using *idiom* to mean 'the atmosphere of thought which pervades the signification of all its words and governs the architecture of all its sentences.'⁵⁸ As he explained: 'Idiom, the combinatorial government of language, deserves to become, and at some future day may well become, the object of a special science. This proposed science would be more comprehensive than literary history or literary stylistics. It would treat not merely of linguistic forms and literary traditions, but also of the realia behind language and literature, and would in-

⁵⁵ *Cours de linguistique générale* (Lausanne, 1916), p. 34.

⁵⁶ Anton Reichling, 'What is General Linguistics?' in *Lingua*, I (1947), 14, footnote 21.

⁵⁷ 'Forensic Orthology,' in *Psyche*, VIII, No. 32 (April, 1928), 5 and 10.

⁵⁸ 'The Science of Idiom: a Method of Inquiry into the Cognitive Design of Language,' in *PMLA*, LIX (March, 1944), 291-306; quotation, p. 291.

volve the use of data drawn from the sciences of history, geography, anthropology, and art.⁵⁹

XIII. *Dramatism* (1945-). Kenneth Burke in 1945 presented an analysis of human action under the name *dramatism*.⁶⁰ It involves an extended figure of speech drawn from the theatre, using five terms as the 'generating principle' of the investigation—*act*, *scene*, *agent*, *agency*, and *purpose*. He attempted to find a perspective that 'treats language and thought primarily as modes of action.'⁶¹

XIV. *Semologics* (1949). Harold D. Lasswell in 1949 felt the need for a term 'which deals with the use and impact of what is communicated.'⁶² His own suggestion was *semologics*, which he believed would fit well into the general science of communication.

XV. *Evaluatics* (1949-). J. Russell Bruff, a student of Korzybski's 'general semantics,' was disappointed to find that the word *semantics* tended to confuse and unnecessarily limit his interests. He felt that the 'process of evaluation' should occupy the key position and he fashioned a new term on that basis, writing: 'Therefore, from the word *evaluate* I have coined the word *evaluatics* for my use, and now whenever I encounter the expression "general semantics," I translate it, for my own use, into *evaluatics* or *symbol-evaluatics*. Where "semantic" occurs as an adjective, I substitute the term "evaluatic".'⁶³

XVI. *Metalinguistics* (1949). The coinage of *metalinguistics* by George L. Trager, of the Foreign Service Institute, U. S. Department of State, has grown out of an old dispute among linguistic scientists concerning the scope of their science. In 1942 he and a collaborator drastically dismissed matters of meaning as really outside the field of linguistics. They wrote:

⁵⁹ *Loc. cit.*, p. 304.

⁶⁰ *A Grammar of Motives* (New York, 1945), xxiii, 530 pp.

⁶¹ *Ibid.*, p. xxii.

⁶² Harold D. Lasswell *et al.*, *Language of Politics* (New York, 1949), p. 9, footnote.

⁶³ *Etc.: a Review of General Semantics*, VI (Spring, 1949), 207-08. The suggestion was seconded by an Australian, Ben Ehrlich, *ibid.*, VII (Winter, 1950), 153-54.

'In practice, we are content with approximate definitions, arrived at by contrasting a few typical situations in which the word occurs with a few similar situations from which it is absent. Even this kind of definition, however, lies outside the scope of linguistic method, which is concerned solely with the linguistic symbols themselves.'⁶⁴ This emphasis pointed up sharply the fact that formal signals provide the basis for getting at meaning, but it left them with a thin and juiceless subject matter, very nearly out of contact with human life. Therefore, in 1949, Trager made a re-survey of his field, dividing it into 'prelinguistics,' 'microlinguistics,' and 'metalinguistics.'⁶⁵ It is in the last of these that direct analysis of meaning re-enters. He points out that a culture consists of a number of systematic arrangements of relational items (language, religion, law, technology, etc.), and the correlation, point by point and pattern by pattern, between language and the other systems in the culture 'will contain all the "meanings" of the linguistic forms, and will constitute the metalinguistics of that 'culture.' As he concludes:

Metalinguistics is then a greatly expandable field of science which can come to serve as the means whereby linguistics, and language, can become the tool for the scientific description (= measurement) of all phenomena in the universe. Its data will serve to connect the physical and biological sciences on the one side with linguistics, and the latter with the other social sciences (and humanities) on the other side.⁶⁶

We are now ready to consider the fortunes of the word *semantics* in the later phases of its usage—by logical positivists, by Alfred Korzybski and his followers, and by popular writers in newspapers and magazines. A descriptive account of the pattern of usage⁶⁷ may help us to clarify our formulations.

⁶⁴ Bernard Bloch and George L. Trager, *Outline of Linguistic Analysis* (Baltimore, 1942), p. 6.

⁶⁵ George L. Trager, *The Field of Linguistics*, 'Studies in Linguistics: Occasional Papers,' I (Norman, Oklahoma, 1949), 8 pp.

⁶⁶ *Ibid.*, p. 8.

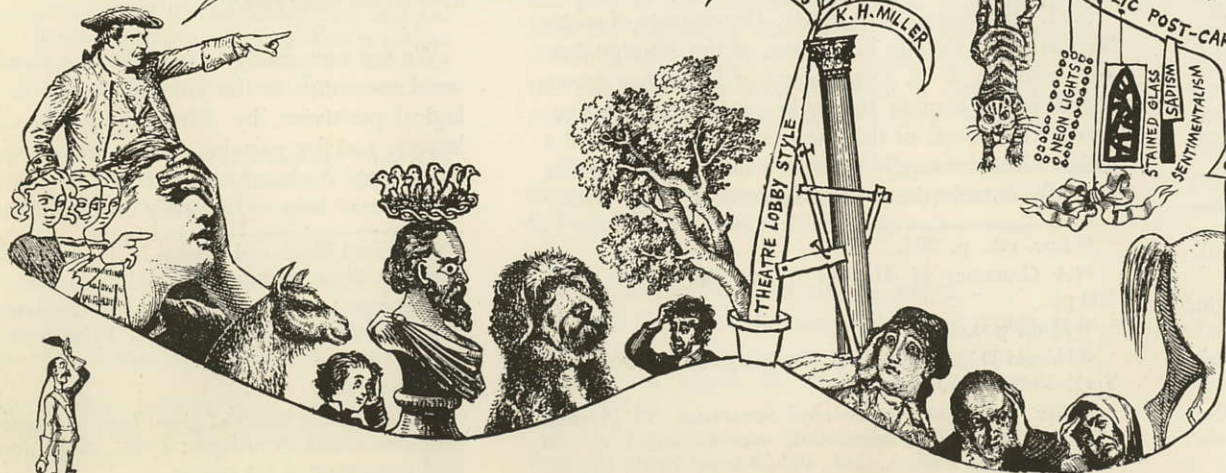
⁶⁷ Some of the material given here has appeared in the magazine *Word*, IV (August, 1948), 78-97, and is used by kind permission of the editors.

The Art Digest Vol. 24, No. 7 January, 1950 Abstraction Crowned at Whitney Annual

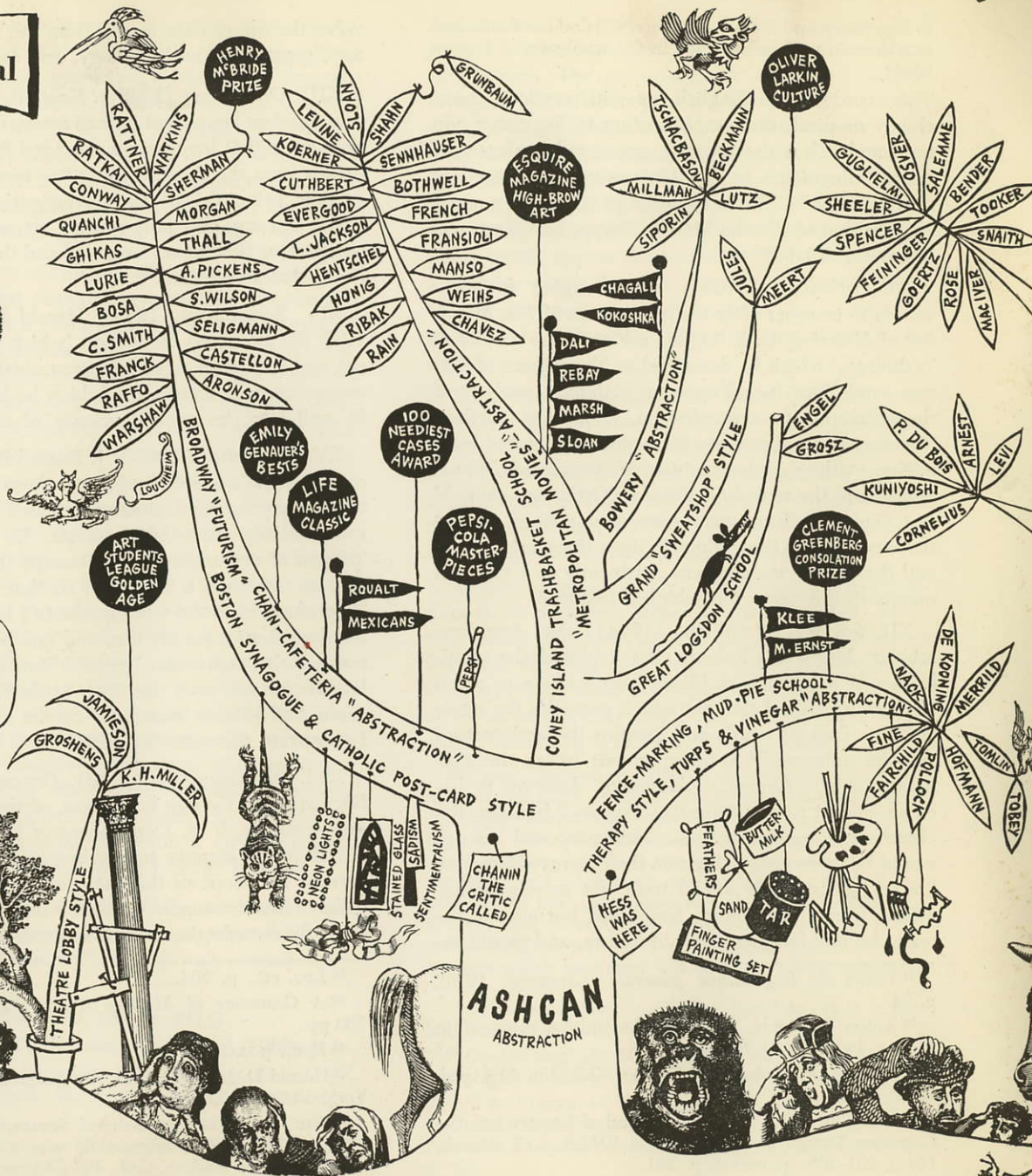
THE WHITNEY'S CURRENT exhibition, "Contemporary American Painting" raises a question: what does the phrase "American painting" connote? From Colonial days until the early years of this century, out the country cannot be denied. The 161 pictures are by artists from 19 states. More than half of the painters sought a studio. horrify the conservatives, and probably give much pause for thought to the most enlightened liberals. Abstraction is king here—but not only the abstraction of the cubists and their followers.

MUSEUM LANDSCAPE

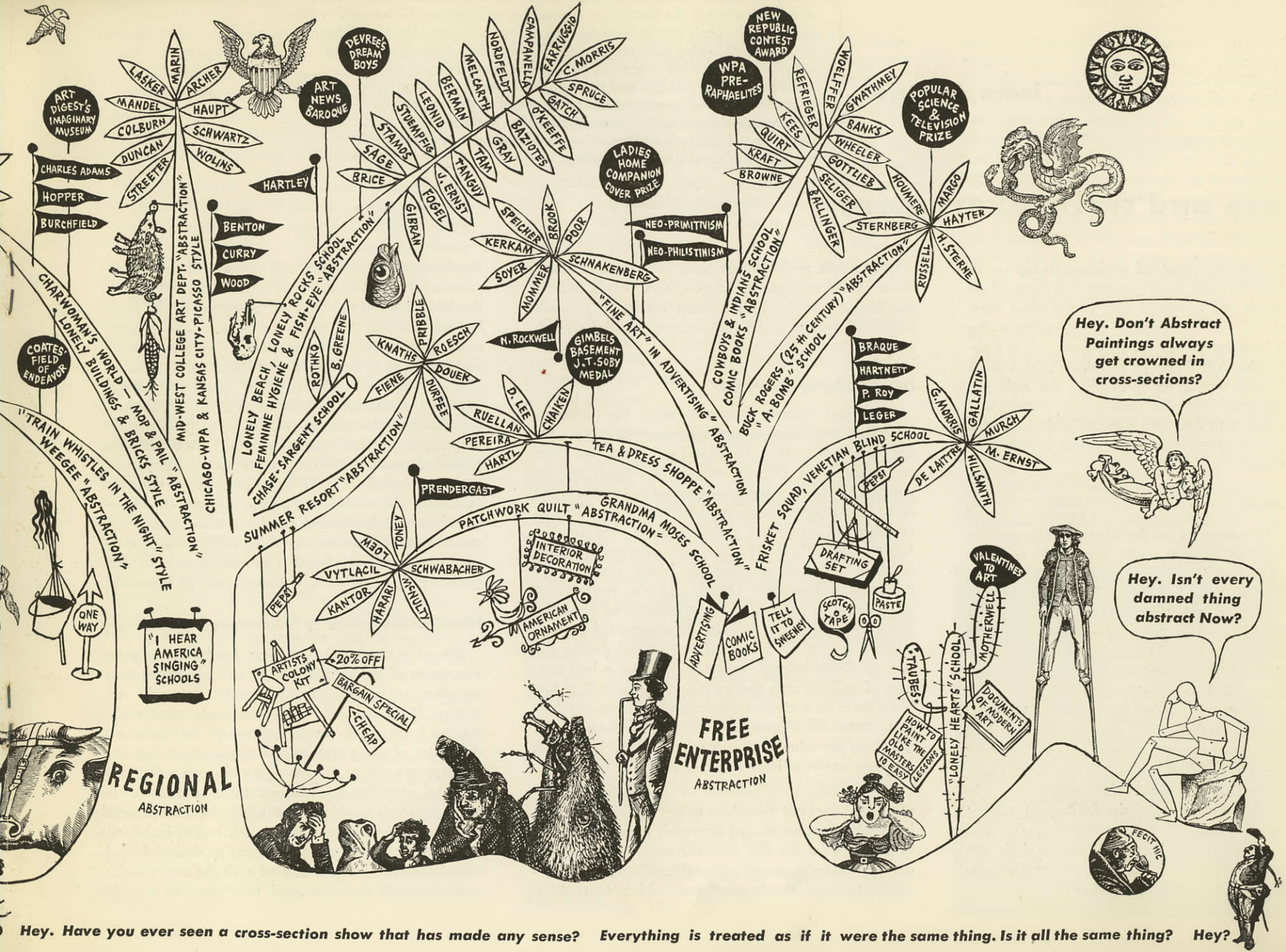
Hey! Isn't that the same, old, sad, dirty America of the "ashcan" twenties? Isn't that the same, clean, empty, wide-open America of the "regionalist" thirties? Isn't that the same, lonely, opportunist, primitive America of the "pepsi-cola" forties?



by Ad Reinhardt (with additional constructive criticism by Alfred Russell)



Leaves are exhibitors, branches are schools, balloons are sponsors, flags are influences.



Hey. Have you ever seen a cross-section show that has made any sense? Everything is treated as if it were the same thing. Is it all the same thing? Hey?

laura thompson

Laura Thompson is an anthropologist with field experience in the Pacific and with the Indians of the Southwest. Among her writings are *Guam and Its People*, considered a basic source book on Guam; *Fijian Frontier*; *The Hopi Way*; and her forthcoming *Culture in Crisis* (Harper & Bros.). She is concerned with the development of basic social science, the relating of cultural anthropology, psychiatry and ecology, and their application to the problems of organizing local governments in a peaceful world community. "Cooperative social action research holds the hope of giving man, the potential artist-philosopher, a key tool by which he may exercise a measure of control over his destiny."

science and self-government

One of the pressing practical problems in the world today is how to build local government, focused on regional needs and resources and, at the same time, dovetailed to the developing world community. Though it may appear simple on paper, this is actually one of the most complex problems which challenges the free world, for it involves not only the people concerned but also their administrators and scientists, and it throws into unmistakable relief the whole question of the relation between science and human values.

The Question

It is in the nature of his function that the government administrator must make immediate and far-reaching decisions in terms of policy and program; that is, decisions involving values. His practical problems are vital, often critical, with human lives and community welfare hanging in the balance; indeed, often with a whole web-of-life and its basic resources at stake, including men, animals and plants in complex linkage with the earth. The question is: can the scientist help the administrator to solve his *total* problem of long-range policy and program, including his value problem, by means of the methods of science? Or is the policy problem at bottom a subjective one irrevocably outside the limits of the scientific problem? Need the application of the findings of science to government administration mean merely the kind of social engineering whereby scientific skills are used to manipulate people and things toward extraneous goals superimposed from without?

This whole problem has been brought into sharp focus by the struggle of the people of Guam, American Samoa and the Pacific Trust Territory to obtain improved welfare and self-government under civilian auspices.

Opportunity in the Pacific

A United States' possession since the Spanish-American war (except for Japanese occupation during World War II), the island of Guam has been under the Navy Department for fifty years and its people have been without citizenship or a constitution or any civil rights guaranteed by statute law. Due to pressure of organized public opinion led by the Institute of Ethnic Affairs in Washington, this anomalous situation is currently being changed by Presidential Executive Order, and the government of Guam is in process of being transferred from the Navy Department to Interior. It is expected that an organic act for the island will be passed during the present Congressional session. Thus after a half century of military rule the people of Guam will at last have their own civilian government, beginning July first. American Samoa and the United States Trust Territory are scheduled for similar transfer to civilian auspices one year later (July 1, 1951).

The transfer from military to civilian jurisdiction, of course, does not guarantee to the Islanders genuine local self-government and improved welfare. It merely provides for the first time the *opportunity* for the development of a people's government keyed unequivocally to local needs, resources and potentialities.

But how this opportunity will be met—what will happen under civilian rule—is of significance not only to the Islanders but to everyone interested in the problem of building genuinely democratic local government, focused on the development of regional needs and resources in the larger world community context. These overseas American trust and dependency islands are situated far out toward the Philippines, the East Indies and Asia, where island problems are duplicated on large scales (see map). Actually their statistical smallness in size (988 square miles) and total population (99,000) is no measure of their importance. They furnish a unique opportunity for research and achievement in the science and art of community administration, which might influence the world and help to develop or reinforce local self-government in dubious, decisive areas of humanity.

Island Communities as Laboratories of Discovery

Since the time of Darwin there has been a growing awareness of the significance of isolated island communities as natural laboratories for scientific discovery. We now know that from such communities we can learn much not only about the evolution and dynamics of plant and animal aggregations but also about man's role in the life-web and earth-web. Then too, the extensiveness, wholeness and subtlety of the administrator's problems are highlighted in isolated island communities such as those of the Pacific Islands where ecological arrangements are so delicately balanced that the introduction of a single new species, as for example the giant snail, may upset an arrange-

ment with far-reaching effects on the welfare of the whole community. Or the use of a new tool, such as the deep clearing plough, may critically accelerate soil erosion and quickly limit the usefulness of much of the relatively meager supply of garden land. Or the introduction of new ideas may upset traditional patterns necessary to survival in the island setting.

The researches of Alice Joseph and Veronica Murray¹, psychiatrists who studied Saipanese personality under the auspices of the Institute of Ethnic Affairs, throw light on this point. For they reveal the cumulative penalties in terms of human suffering, suppression of creative energies, frustration, and neurosis, which the people of Saipan are paying for government interference with their traditional community values and established patterns of culture. Such interference has been the rule on Saipan through four centuries of foreign domination—under Spain, Germany, Japan and, since World War II, under United States' trusteeship. Its negative effects have been enhanced by the shock of the recent American bombardment, invasion and military occupation. But they have also been accentuated, the findings show, by attempts on the part of the American Naval government, following general directives from Headquarters, to impose certain political forms and responsibilities quite foreign to local tradition, such as municipal elections and the levying and collection of local taxes, on a people unprepared to handle them. The Saipan personality findings indicate that we cannot rely entirely on rigid political and economic formulas and on traditional devices such as, for example, majority rule, in our attempts to improve the welfare and develop democratic life ways in our island possessions and trust territory. Any sudden change of status accentuates the anxiety of a people already tense and strained. The more the position which the individual is led or forced into is beyond his experience and capacity, the greater is the strain. "In the case of the Saipanese," the psychiatrists suggest, "there is need for wise and patient guidance. Consistent values must be pre-

¹ "Chamorros and Carolinians of Saipan", Pacific Science Board, National Research Council, Harvard University Press (forthcoming).

sented and consistent administrative practices maintained, explicitly directed toward *developing the natives' own values and capacities for self-direction.*"

The Saipan research, by defining urgent human needs on Saipan, moves the community welfare problem faced by government administrators out of the realm of conjecture or trial and error and into that of scientifically-based action and therapy, and it provides a scientifically acceptable method whereby progress toward improved group welfare may be measured at the psychological level. Thus it helps to refine our thinking about the administrator's trusteeship mandate to improve native welfare and develop self-government, and it reveals one of his major problems to be in social therapy. It clarifies his role and provides precise data enabling him to formulate adequate and realistic long-range policy and program in terms of the human needs and aptitudes of the given community.

What Do We Mean by "Development"?

The larger significance of research such as the Saipan project is clarified if we study documents regarding United Nations' Trusteeship agreements or current "Point Four" legislation providing for the development of underdeveloped peoples. These documents express a striking international consensus of avowed purpose regarding peoples in trusteeship, dependency and minority status, consistent with the present world-wide movement toward increased human dignity which is most conspicuously embodied perhaps in the United Nations' bill of human rights. The term "development" occurs repeatedly in these documents, but what do we mean by "development"?

A deep, factual study of the colonial record in Southeast Asia and Africa by J. S. Furnivall² arrives at a relevant generalization. Economic development in the colonial and dependency areas, Furnivall finds, has not necessarily brought a corresponding development of welfare; on the contrary, the relation between "development" and "welfare" has tended to be in-

² *Colonial Policy and Practice: A Comparative Study of Burma and Netherlands India*, Cambridge University Press, Cambridge, 1948.

verse, antithetical. Emphatically, Furnivall's facts suggest that the explanation of this profoundly troubling outcome—namely, that development and welfare have tended to be antithetical in the underdeveloped areas—does not lie only in runaway increases of population. They suggest that the explanation should be sought rather in the area of social organization and social energy, in the area of culture and personality, and in the area of the man-nature relationship. It lies apparently in social disorganization which includes, in the one direction, personality disorganization and, in the other direction, disorganization of the ecological complex, disruption of the relationship between man and nature.

The Value Problem

The Institute of Ethnic Affairs has identified and described this condition of man-nature disorganization as it exists not only in the Pacific islands but also in India, in South Africa and tropical Africa, in the Philippines, Puerto Rico, the American Indian country and the Near East.³ These researches, growing

³ See the *Newsletters of the Institute of Ethnic Affairs*, especially "Truman's Point Four: 'Democratic Fair Dealing' for the World's Underdeveloped Areas," vol. 4, no. 1,

Pacific Trust Territory
Courtesy of E. H. Bryan, Jr.



out of the needs of administrators and designed to illuminate local government problems by means of the methods and findings of science, have yielded a rich harvest in both factual data and theoretical approach. Not only have they given us a new understanding of how total communities function in space and time, including how human societies build their cultures as part of a whole ecological arrangement. But from the study of total communities have emerged intrinsic values in the life-web process itself—biological, cultural and psychological values which apparently underlie the health and welfare, indeed the physical and psychical patterns, of the given community viewed as a whole.

Such life-web values do not necessarily emerge from scientific investigations of the orthodox type—investigations dealing with a fragment of a total web such as the social structure of its human component, or the ecology of its plant component, or the geology of its land base. Such inherent values apparently emerge only when the web as a whole is considered in its major dimensions and in the local setting. Thus the findings suggest that the value problem does not become fully a part of the scientific problem unless and until the investigator overcomes not merely his egocentric and ethnocentric biases, but also and particularly his *hcmocentric* bias.

Man, it appears, is intrinsically and irrevocably a part of nature, and every human society is part of a specific local organic arrangement which contains not only human beings but also animals, plants, soils and waters. Apparently social scientists of the past and

1949, pp. 1-3; John Collier, "Indonesia: Facts for Understanding," vol. 2, no. 8, 1947, pp. 3-6; "Union of South Africa: How the White Man Can Hang Himself" and "Africa: False Dawn or New Day?" vol. 3, no. 7, 1948, pp. 1-5; "India in Transition," vol. 3, no. 8, 1948, pp. 1-4; Bruno Lasker, "Indochina on the Way to Freedom," vol. 2, no. 10, 1947, pp. 1-5; Felix S. Cohen, "The Myth of Puerto Rican Overpopulation," vol. 2, no. 8, 1947, pp. 1-3; Clarence Senior, "Puerto Rico is Overpopulated," vol. 3, no. 2, 1948, pp. 1-3; Doloris Coulter, "The Cuzco Conference on Indian Life," vol. 4, no. 4, 1949, pp. 1-4; also John Collier, *The Indians of the Americas*, New York, 1947 and *America's Colonial Policy*, Fabian Society, London, 1947.

present have been caught in a blind alley of traditional fundamentalism which, regardless of the evidence of science, would still put man and his values in some special category, apart from the rest of nature and particularly apart from other animals and plants. The dilemma of the applied scientist regarding science and values cannot be resolved, it seems, until the scientist abandons this outmoded dichotomy and includes the value problem in the total life-web problem of which it is a part. As soon as this is done it becomes apparent that the problem of human cultural values is part of a more inclusive ecological-cultural problem.

Nature and Culture

Specifically, recent researches in isolated island communities and elsewhere indicate that although certain of the activities of the human population may be harmful to the whole organic arrangement in environmental context, many isolated human groups have tended in the long run to organize and integrate their habits of feeling, thought and behavior systematically with the world of nature in such a way as to play a basically positive role in the multi-dimensional process of attaining and maintaining a balanced, healthy adjustment of the whole community.⁴ These researches suggest the tentative hypothesis that in isolated island communities human culture processes and values tend through millennia and in isolation to complement and reinforce intrinsic ecological processes and values.

Once formulated, this generalization appears to be obvious. How, otherwise, could human groups have survived, for example, in isolated, sea-bound communities? Patently, it was to their advantage to discover and reinforce the rules of life laid down by nature. Indeed, their very existence depended on it—if they destroyed their resources beyond a certain point, if they overran their base in relation to their

⁴ For example, see the writer's "The Relations of Men, Animals, and Plants in an Island Community (Fiji)," *American Anthropologist*, vol. 51, no. 2, 1949, pp. 253-67; and "The Basic Conservation Problem," *Scientific Monthly*, vol. 68, no. 2, 1949, pp. 129-32.

technological development, the welfare of the group would suffer. The group might perish utterly. It becomes apparent that success in human culture-building, measured in terms of the survival of the cultural group generation after generation on its resources base, is dependent on its seeking out and reinforcing, to a certain extent at least, nature's inherent value system by means of cultural processes.

Once we grasp this generalization it appears to be demonstrated on all sides—in isolated desert cultures like that of the Hopi Indians,⁵ for instance, who have survived for millennia as arroyo flood farmers in an arid highland where, were there but one inch less average annual rainfall, farming by indigenous methods would probably be impossible. It is no accident that the Hopis became good applied naturalists. Their survival depended on it.

Building on this hypothesis, it follows that solution of the government administrator's total problem, referred to above, by means of the methods of science not only would engender discovery of intrinsic values in a particular life-web process itself but also would necessitate the identification of man-made purposes, including government administrative long-range policies, with those inherent values.

New Perspectives in Administration

Thus, as I have noted elsewhere,⁶ "The eco-cultural structure of a community provides the persistent core of basic relationships between man and nature, and between man and man, whereon may be developed a truly functional and economical local administration, oriented toward the welfare of the whole community. Understanding of the subtle and delicately balanced web of relationships between and within the organic species of the community, including man, focuses administrative problems in a new perspective. It reveals how the resources-development and conservation problem is directly related to that of population regulation and control; how the problem of natural resources conservation is directly related to that of

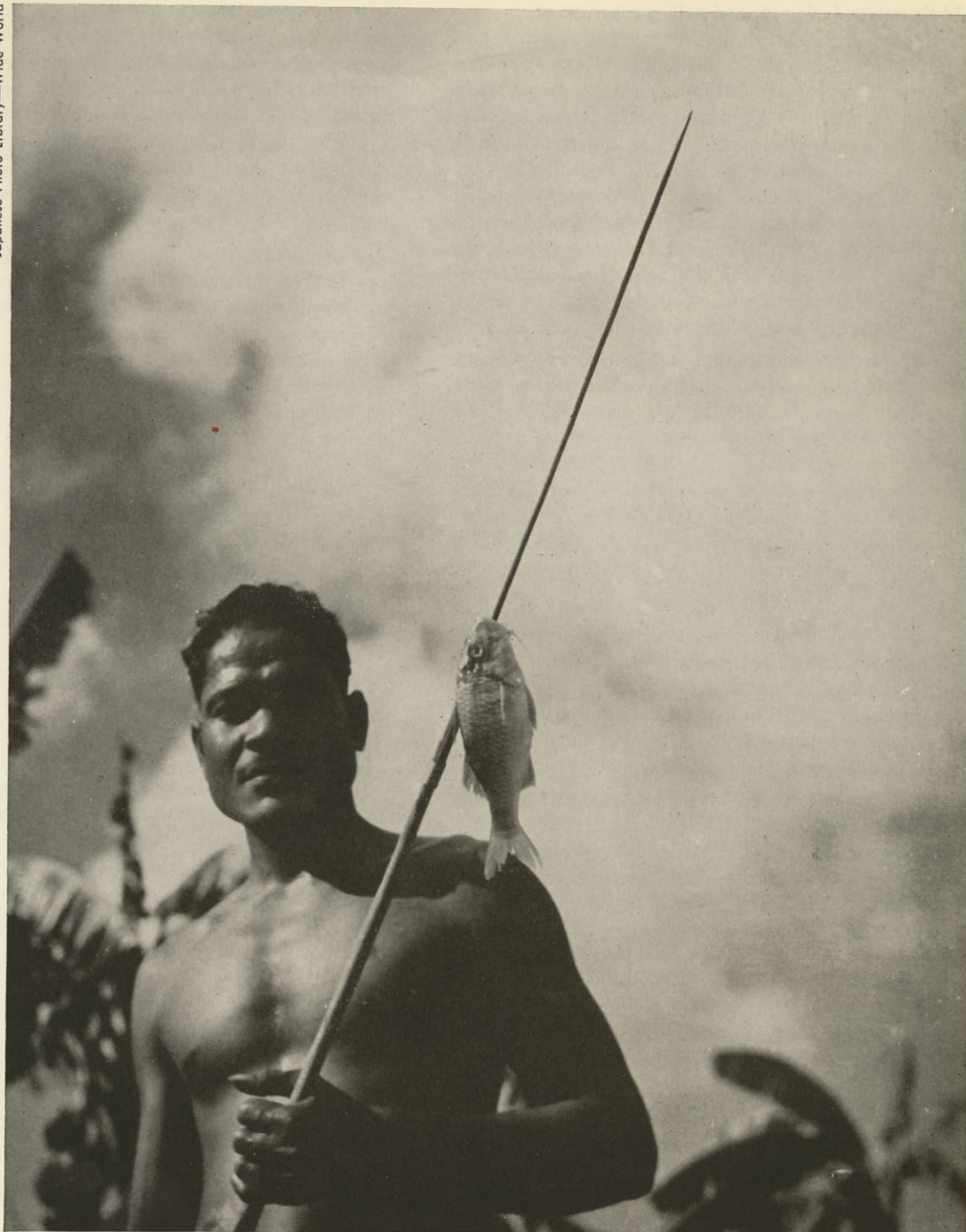
⁵ For details see the writer's *Culture in Crisis*, Harper and Bros., New York (fall 1950).

human resources conservation and health; how administrative efforts often tend to cancel one another because of the segmented approach to these problems which is customary in government. For example, while promoting public health and infant-maternal welfare, we frequently also promote over-population and over-use of resources, etc. Indeed, recent research points up the disastrous effects on community welfare as a whole, of harmful interference with its eco-cultural structure on the part of administrators or outsiders, regardless of motives.”

In sum, these researches shift the emphasis regarding human welfare from standards of living and physical health as measured by various indices developed mainly by economists and social workers, to optimum norms of whole organic life-webs, of group personality balance, of community bio-psychological health, of resources conservation and preservation (both human and natural resources) in the setting of the total environment—social, cultural, ecological and historic. The welfare question posed is not simply that usually stressed: namely, how can the group's standard of living and health be raised? The question is rather, how can the health, resources, and group welfare of the *whole community* be nurtured and conserved within the limitations and pressures of its total setting? The scientific problem becomes that of defining the physical, biological and cultural resources and needs of the groups-in-environment under investigation, and of the individuals within them viewed as dynamic personalities-in-cultural-context, and of suggesting how the effectiveness of government may be increased, through long-range policy and action research, in helping to conserve those resources, meet those needs, and nurture those personalities.

According to the community-centered action research approach herein described, the applied scientist's role is not primarily one of adjuster, mediator, or “trouble shooter,” but rather it is essentially one of diagnostician and integrative leader in cooperation with the administrators and the residents of the community under consideration. Such an approach log-

⁶ “A Model Trusteeship for Micronesia,” *Newsletter of the Institute of Ethnic Affairs*, vol. 3, no. 7, pp. 6-7.



Micronesian
Spear
Fisherman

ically implies that the total ecological arrangements of local communities, with special emphasis on their human components including the local culture pattern and group personality needs and trends, shall set the administrative problem; it logically implies that the local residents shall be drawn into the administrative enterprise through skillful leadership to the extent that they shall be encouraged to solve their own problems, with the help of administrative personnel and scientist technicians, primarily by means of the structures and values of their own cultures.

Such an approach implies that community government shall be a local career service, designed to *serve* the local residents, and that its personnel shall be carefully selected and professionally trained according to the specific ecological arrangements and the bio-social personality needs and trends of the local area wherein they are to serve. It implies, furthermore, that the administrative organization shall be so structured and decentralized that creative community administration is made possible, encouraged and rewarded.

Charter for Self-Government

These findings and generalizations, therefore, may furnish us with a basic charter for the organization and scientific implementation of self-government in local communities, dependent areas and trust territories—a charter which highlights unequivocally the fundamental structural differences between the basically dominating, authoritarian values and principles which necessarily underlie any type of government directly under military or other totalitarian auspices and the flexible, integrative values and principles whereon may be built, by means of multi-discipline action research, new creative types of local and regional government arrangements in accordance with the emergent concept of trusteeship. They suggest that the core of the self-government building task which Americans now face in the Pacific is clarification of this basic charter in terms of the many ecologically and culturally diverse island communities, and its flexible, pluralistic implementation by means of the methods of action research. During the past few years a great deal of basic fact-finding has been

done in the Islands.⁷ There remains a major work of analyzing the relevant known facts integratively in the extensive, multi-lateral frame described above, of filling in the gaps in our knowledge, and of implementing the findings through multiple-discipline action research in the direction of improved community welfare and local self-government.

Fortunately, there is a growing appreciation of the practical importance of this multiple-science approach especially among conservationists, ecologists, applied anthropologists and administrators. As a result, this type of research is already being encouraged on a large scale and under international auspices. Witness, for example, the first resolution of the UNESCO Conference on the Protection of Nature in August 1949, which calls for the investigation of representative ecological areas as total dynamic situations, "including all possible facts such as soil, water, food, climate, plants, animals and the people concerned, with special emphasis on their interrelationships. This multi-discipline and inter-discipline approach is to include the methods of the physical and biological sciences together with those of human ecology, medicine, sociology, anthropology, economics and psychology."

The Outlook

Returning now to our original question: can the scientist help the government administrator to solve his total problem of long-range policy and program by means of the methods of science?

The answer which has emerged from recent researches is "Yes," the scientist can help the administrator with his total problem *if he can devise a conceptual framework and methodology which will include all the relevant relationships of the total*

reality with which the administrator deals. He must be able to translate the administrator's practical problem into a scientific problem without leaving out any relevant part of the whole "field" for which the administrator is responsible. This means that the scientist's frame of reference must be as broad and multilateral as that in which the administrator operates. It must be broad enough, for example, to include the human group with its changing culture and its personality needs and trends, viewed in historical and geographic perspective, and in the contemporary world setting. And it must include the animals and plants of the community—indeed, the whole life-web—in total environmental context. This means that the scientist's approach must be integral and multi-faceted, involving not one but several disciplines; that he must be able to handle many relevant factors of a complex whole in interrelationship, giving due weight to each in relation to the whole and due weight to the whole itself. He must be able to work with and through the group itself in a common action research endeavor. And he must operate in a long-range, ample perspective of time and space.

The cumulative findings to date suggest, furthermore, that while the ecological community in environmental context should set the frame of reference of scientists and administrators whose aim is to improve community welfare, *the bio-social personality needs and trends of the human group in total environmental setting and under changing pressures from without and within should be a primary focus of attention.*

This is a large order—involving a certain cross-discipline competence and virtually a new, multi-dimensional type of mental approach. But it is important to emphasize that we have reached a stage in the history of science when some scientists working in teams can fulfill these difficult requirements. We may expect more and more scientists to learn to fulfill them as a result of the rapid development of the biological and social sciences and their application to practical problems which we are now witnessing. Thus the necessary groundwork in theory and method has been laid, and we may look forward to rapid advances along these lines in the near future.

⁷ For example, 1) a survey of existing literature on the area published in four handbooks issued by the Office of the Chief of Naval Operations during the recent war; 2) a series of unpublished studies by a group of scientists, mainly anthropologists, sent to the islands by the United States Commercial Company in 1946; 3) and a body of scientific materials collected by some 40 anthropologists participating in the Coordinated Investigation of Micronesian Anthropology beginning in 1947.

gilbert k. krulee

With a background in chemical engineering, Gilbert K. Krulee has studied in the Industrial Relations Section at Massachusetts Institute of Technology and has worked with the Research Center for Group Dynamics. He is interested in the problems of organizations—industrial, social agency or educational—and is now associated with the Department of Economics and Social Science at M.I.T.

group dynamics and action-research

*"The Research Center for Group Dynamics has grown out of two needs or necessities, a scientific and a practical one. . . . Modern society demands a deeper understanding and a more efficient and less prejudicial handling of group problems. I am persuaded that this need is particularly acute and particularly essential in a democracy."*¹—Kurt Lewin, 1945

Problems of Practitioners

In one sense, *action-research* implies the notion of attempting to study and to reach some partial understandings of group phenomena as a result of collaboration between "scientists" and "practitioners" who are concerned with current community activities. I hesitate to use the terms "scientist" and "practitioner" since I think they represent a false and frequently dangerous dichotomy. Unfortunately, these terms are in common usage and communication is difficult without them. Certainly, the frequency and insistence with which individuals having so-called "practical" backgrounds present questions concerning the behavior of groups to social scientists has increased markedly in the past five years. Let me describe some of the requests for assistance by means of which the term group dynamics begins to be defined.

¹Kurt Lewin, on the then newly formed "Research Center for Group Dynamics at Massachusetts Institute of Technology." *Sociometry*, Vol. VIII, No. 2, May 1945, p. 126. The Research Center has since migrated to the University of Michigan.

THE DIRECTOR OF a council of social agencies is concerned over the lack of effective collaboration between the different member agencies. She can present considerable evidence to illustrate two types of inefficiencies:

1) The agencies do not plan together as a group so as to meet the needs of the community. There are too many agencies in one section of the town, not enough in another. There are so many agencies offering programs in adult education and to teen-age groups that the agencies compete with each other and actually remain overstaffed in terms of the services performed. Yet, although the few agencies which operate nursery schools or child-guidance clinics are overwhelmed with requests for help, other agencies are not interested in developing such programs and resist allotment of financial aid to these services.

2) There exists considerable friction between agencies. Some refuse to accept referrals from another agency or to share pertinent information. There is considerable ill-feeling between the personnel of competing agencies and for them it is a popular pastime to discuss the stupidity, criminal negligence, etc. of other agencies. In order to be able to help certain individuals, cooperation between more than one agency would often be helpful, i.e., cooperation between a nursery school and a child-guidance clinic, but this is usually impossible.

This director feels that it is important to improve these relationships and that a social scientist should be able to understand why these inefficiencies arise and how they could be alleviated. Furthermore, she is well aware that change would be difficult. In a community with similar problems, a study was made and recommendations for action submitted by a prom-

inent educator. Although she felt that the report was excellent, she is puzzled by the fact that considerable hostility between the agencies was developed as a result of this report and that it seems unlikely that any worthwhile changes will result.

THE INDUSTRIAL RELATIONS DIRECTOR of a manufacturing concern of moderate size wishes to install an "incentive" system. He states that labor costs are high in this firm and that their competitive position is being undermined. The workers as represented by their local union have absolutely refused to consider such a change. He realizes that incentive systems have a reputation of having been seriously misused by companies in the past, but can not understand why it is now so difficult to convince the union of his and the company's honesty and good faith. He is even more disturbed by the fact that what were meant by him as insignificant remarks have frequently been interpreted as evidence of his unreasonableness and general lack of good faith. His actions are thus misinterpreted (according to his judgment) and invariably in such a fashion as to impute to him more or less "evil" and "undemocratic" motivations. As a preliminary step, he wants outside experts to conduct an unbiased survey of "morale" and to prepare recommendations as to what actions the company should take to improve morale and the relationship between the company and the union.

AN OFFICIAL OF a labor union has been involved in political activity in particular congressional dis-

tricts. He feels very strongly that it is very much to the advantage of union members to be aware of political activities in general and of the way in which certain of "labor's gains" are nullified by the actions of congressmen. Yet, in certain districts he makes the judgment that there is remarkable apathy even to issues which are important to the future of labor unions, and that union members in their voting behavior often reward their enemies and execute their friends. He is concerned with actions leading to greater "rank and file" participation in union and political activities and with actions designed to "educate" these people to see such problems more clearly.

For a final example, I will describe a pertinent interest of the director of a community *adult education association*. This organization has set up courses in "leadership training." Actually, there are many community "leaders" who have responsibility for the functioning of some sort of a discussion group: on personnel problems with a group of foremen; teachers involved with student seminars; educational seminars at churches, social agencies, etc. In one way or another, these people describe themselves as "discussion-leaders" and verbalize the problems they face as follows: "How can I handle a person who talks too much or is overly aggressive?" "Why don't some people participate at all in a group?" "What functions should a leader perform so that the discussion group

experience will be as valuable as possible for the group members?"

These group leaders in general feel the need for help in improving the functioning and productivity of the groups they represent, in understanding the functions of leadership in a group, in understanding why it is difficult for a group to make decisions and even more difficult to carry them out, and in understanding why many group members are much more likely to express their opinions, ideas, and feelings about the group in the coatroom or over a cup of coffee to a few friends than to the group as a whole.

The problem of the director of the adult education association is to find psychologically sound ways of helping these people by providing a training course through which the skills of these leaders could be improved.

THESE DIFFERENT PROBLEM SITUATIONS have certain common threads running through them.

One thread involves the conditions under which *the behavior of an individual in his relationships to others* can be changed. This is sometimes described as a problem of "training": foreman-training, leadership-training, training for social workers, etc.

Yet in a broader sense, in every situation described, change in the direction desired by that individual who has formulated the problem would involve

changes in the behavior of many of the members in the relevant groups: if a group of people changes its ways of operating, the behaviors of the members must also change. If this is to be accomplished, there must take place some analogy to a training process by which the groups and their members become familiar with different ways of working together and the members become familiar with the new roles they must perform.

Furthermore, in each situation there is an organization of people—not in the sense of a formally constituted organization, but in the sense of a *group of people whose actions are interdependent and who are potentially in communication with one another*. Each of these organizations can be described as having a *hypothetical goal*: the industrial organization that of productive efficiency, the community agencies that of serving the community, etc. Yet in each case, the difficulty could be restated as a situation in which the functioning of the organization is inefficient in terms of this hypothetical goal or in which the organizational goal is at least partially in conflict with the goals of particular subparts. This formulation of the problems can perhaps be seen most clearly in the situation involving several competing community services each of which will undoubtedly claim that it wants to serve the community as well as it can. Yet the relationships of the leader of a men's club at the local church to the members of the group may well be described in similar terms.

Implications for Social Science

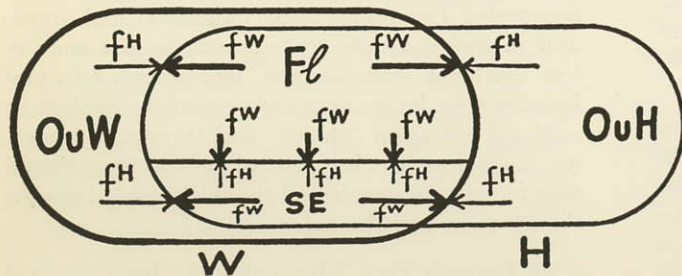
So far, I have attempted two things:

1) To describe some problems of group behavior as seen by the "practical" people who are directly involved in them.

2) To reformulate these problems in terms of the functioning of an organization of interdependent members relative to an over-all goal and in terms of change in the functioning of this organization.

Now I should like to indicate why these problems are of interest to those involved in theorizing about

A GROUP SITUATION, MARRIAGE:



Conflict as to the Extent of Common Life.

In the situation represented here, the husband wishes to decrease, the wife to increase, the extent of family life; in regard to sex life, the opposite is true.

W, wife's activities
H, husband's activities
Fl, common family life

OuW, activities of wife outside common life
OuH, activities of husband outside common life
SE, sex life

Fw, force corresponding to wife's wishes
Fh, force corresponding to husband's wishes

groups. And I will show some consequences of this reformulation of the original questions. Asking questions in different ways is sometimes no more than a harmless exercise in logic. But reformulation may permit an unanswerable question to be answered or may provide us with answers of broader generality than before.

In the literature of economics, psychology, sociology, history, and cultural anthropology, there are many remarks that represent a theory about some aspect of social and organizational change, from theories of international trade, of the development of modern "nationalism" to an analysis of the impact of "western civilization" on some "primitive" culture. Most theories are explanations of what has happened, and either have never been tested by an attempt to predict some observable event or what is perhaps more confusing are stated in such a form that there does not appear to be any conceivable event, the occurrence of which could disprove the particular theory.

IN RECENT YEARS theorists have attempted to apply their theories of change to the understanding of "practical" problems not unlike the ones we have described. This is of considerable importance for the development of group dynamics.

Significantly, such men have been obliged to do more than explain some event after it happened, more than give advice to society by means of articles and speeches: they have become involved with people who were attempting to bring about change with theories that for the most part were clearly ineffective.

When a group of people doesn't want to change in some direction that an outsider feels is "desirable" it is easy to condemn them: "People are stupid, irrational, and lazy." Similarly, exasperation and bewilderment can be found in the following comments: "Working with groups is very inefficient"; "I can't understand why people refuse to be helped. If they had any sense at all, they would . . ." It would be an easy escape solution to conclude from such experiences that the problem of organizational change is an insoluble one.

Nevertheless, some more optimistic explanations have also begun to emerge.

1) To the individual or group, particular ways of organizing their behavior are perceived by *them* as the best possible ways of operating. Thus, the outsider interested in change may have been deluded into expecting change when none occurs for several reasons: the group may not perceive a better possible way, the group may be motivated by concerns and motivations other than those considered by the change-agent, or the group may perceive change as dangerous. Groups are not necessarily illogical; if one accepts the underlying assumptions of some union groups that "management has something up its sleeve," then change is undesirable.

Thus, change hinges in part on whether or not these underlying assumptions can be modified. Frequently, a person attempting to introduce change presents his rationale in terms of what he thinks ought to be the relevant considerations. Unfortunately, the perceptions of the people concerned may involve quite different considerations.

2) *The assumptions people make* about the motivations of others or about the advisability of change *are not readily verifiable or refutable* by any straightforward presentations of behavioral evidence.

This is a commonplace and yet by no means trivial observation that will be familiar to anyone who has had experience in the field of psychotherapy. If I am jealous of my wife, there is little use in some friend presenting evidence to prove that I am wrong. I can always come up with some explanation, although it may seem strained, to prove that I am right after all. Similarly, ineffectiveness in the operation of a group is furthered by the presence of analogous mechanisms which make it difficult to change underlying assumptions about the dangerous intentions of others in the group.

3) Related to the above and perhaps more optimistic is the growing feeling that *imposed change* is extremely difficult (at least without quite unexpected and deleterious side-effects) but that *collaborative change* is much more possible.

In short, people seem to be able to accept different ways of operating if they have worked them out themselves in collaboration with some outsider in such a fashion that they have made the decisions themselves. An "expert" who presents a ready-made solution to a group for them to accept or reject is often expecting them to decide, not on whether or not they understand the meaning of the decision, but on the basis of his reputation as an authority: this all too frequently describes the relationship of a social scientist to a social organization.

4) The social scientist is also struck by the fact that *the effectiveness of a group which has taken the initiative for introducing change into itself is remarkable.*

Recently in a nearby area which is supposedly in the lower-income class, a committee of citizens decided to build a community center and playground because it was needed: at the same time other community centers were complaining about the lack of interest and financial support they receive from the areas in which they are located. Yet in this case, the response was and still is phenomenal. The center was built, money was raised easily, and what is more, people of all age levels make active use of the center. Examples from other fields, such as in the history of the labor movement, could easily be found which illustrate this same paradox. Evidently, there are tremendous untapped resources in a group which emerge only under rather unusual conditions.

A social scientist has difficulty in helping groups because *undistorted communication of his knowledge* is invariably difficult. Perhaps if one knew more about the conditions under which groups are able to initiate change by themselves in their operations, he would find that in the process of self-initiated change groups can on their own initiative find ways of collaborating with social scientists and thereby make undistorted communication possible.

5) At present it is popular to talk about the need for *integration of the social sciences*. It might be wiser to talk about the problems of *integrating the efforts of social scientists*.

Although for any given social problem one can usually find concepts from each social science which

are pertinent to the problem, the different concepts can only rarely be integrated into a broader and more powerful *explanation or theory*. Similarly, representatives of different fields can easily discuss the same empirical facts in such a fashion that they neither understand each other nor do they communicate anything but confusion to their audience. However, understanding change in the functioning of certain types of organizations is impossible without taking into account economic, technological, psychological, and cultural factors.

For example, experiences of social scientists with the problem of "industrial morale and productivity" is beginning to necessitate an understanding of the reactions of men *in a particular industrial setting*. The circumstance that some work has been and can easily be standardized and routinized as in mass production industries, while other work such as skilled machine operations, radio and automobile repair work can not be so organized, is psychologically important. The seasonal character of some industries as opposed to steady year-round operations in others is also significant. Personnel practices appropriate for this country are unworkable in different cultural contexts. The fact that different social sciences are of necessity becoming involved in the solution of such group problems is gradually leading towards increased cooperation and increased communication between these fields.

Action-Research

Why is "action-research" in the title? From the point of view of the "scientific necessity" that Lewin mentioned, the development of science should involve three interdependent activities:

- 1) *The development of theories of the functioning of organizations*—theories which will not only further the understanding of social change, but will be useful in bringing about such change as will lead to more effective functioning of the organization.
- 2) *The testing of these theories in part by means of experimentation* on relatively "controlled" and relatively "artificial" situations.
- 3) *The testing of these theories in part by means of collaboration* of social scientists and social prac-

tioners. Simplification of problems so that laboratory experimentation is possible all too often leads to distortion of empirically stated problems and to the development of theories that are either unworkable or that contain nothing that is relevant to problems of introducing change into the functioning of an organization. Theories should not only enable the scientist to explain phenomena but should also provide a framework for guiding the actions of practitioners.

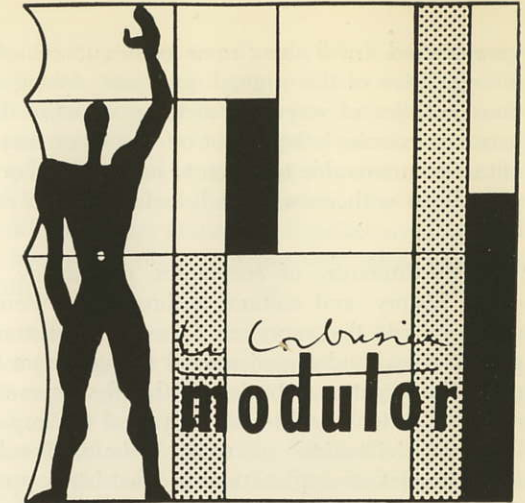
An integration of these three activities is what I have meant as action-research.

I once asked a friend of mine if most people meant by "group dynamics" just the work of the Research Center for Group Dynamics. He replied, "Yes." This puzzled me, for actually there are many other social scientists with whose work I am familiar who are interested in similar problems. These people are influenced by, and in turn influence the Research Center personnel.

It seems to me to be relatively unimportant what label is attached to the work of a particular social scientist. What may be important are the characteristics of his work: *the kind of problems* in which he is interested and the way in which he attempts to reach understandings of these problems. I have attempted to describe and "define" group dynamics by describing certain related problems of group functioning and of organizational change as well as by describing the notion of "action-research."

For many social scientists, action-research is important because certain group problems can't be studied in other than natural settings. For Lewin, this was not the only reason: he felt that the solution of these problems was necessary if democratic societies were to survive, and he was continually involved in activities designed to meet this need. Actually, being a social scientist can often be a means of escaping from any great social responsibility under the rationalization of "scientific objectivity." For those of us who reject such a personal goal, group dynamics offers an opportunity to be involved in constructive social action and at the same time be involved in experimental group situations oriented towards social reality and towards democratic ethics.

Courtesy S. Papadaki



The human figure provides the two main values of the Modulor series: height of a standing man; and height of a standing man with upraised arm.

From my forty years of building experience, I humbly offer to the "People of the World" two little tools which should help to pacify and universalize, to remove some annoying and dangerous obstacles, and to make smooth the road. I have always thought in terms of "Nature and Cosmos," and have left politics to the politicians. In my laboratory (studio) I have watched the transformation from indeterminacy to order.

The two devices are the MODULOR and the CIAM GRID.

The CIAM GRID was devised on instructions from the 6th CIAM Congress held at Bridgewater, England in 1947. It was the work of ASCORAL. ASCORAL is the Assemblée de Constructeurs pour la Re-

tools of universality

le corbusier

novation Architecturale (Architects for the Renewal of Architecture). This Assembly is the foremost of the groups representing the world-wide CIAM in France. The CIAM, or International Congresses for Modern Architecture, was founded in 1928, uniting the avant-garde architects of some twenty countries on four continents. In twenty years they laid the groundwork of modern urbanism. The principles of CIAM are set forth in the "Athens Charter," which has been published in a small book with preface by Jean Giraudoux (1943).¹ The Athens Charter was printed in a magnificent and compellingly illustrated volume, *Can Our Cities Service?*² which José Luis Sert edited in New York also during the war.

Last summer the CIAM held their 7th Congress. Chapters from all over the world and guests displayed a rich gamut of urbanistic themes—ranging from the household to the multiple dwelling, to the neighborhood unit, to the city (new city, reconstructed city, or transformed city), to the Three Establishments of Man (agricultural production community; linear industrial town; the radial concentric city of economic and cultural exchange)³, to the nationwide plan, and finally to the Continental plan, which offers a map conceived by men who wish to make possible the enjoyment of living-and-working in an environment that should satisfy universal norms.

The thought of implementing so thorough and comprehensive a program may seem sheer fantasy. To make it practical, two ASCORAL panels devised a Grid. I quote from their recent book:⁴

¹ La Charte d'Athènes, (Paris 1943).

² Harvard University Press, (Cambridge 1942).

³ Editor's note: See Les Trois Etablissements Humains, in collaboration with the group ASCORAL, Ed. Denoel (Paris 1943).

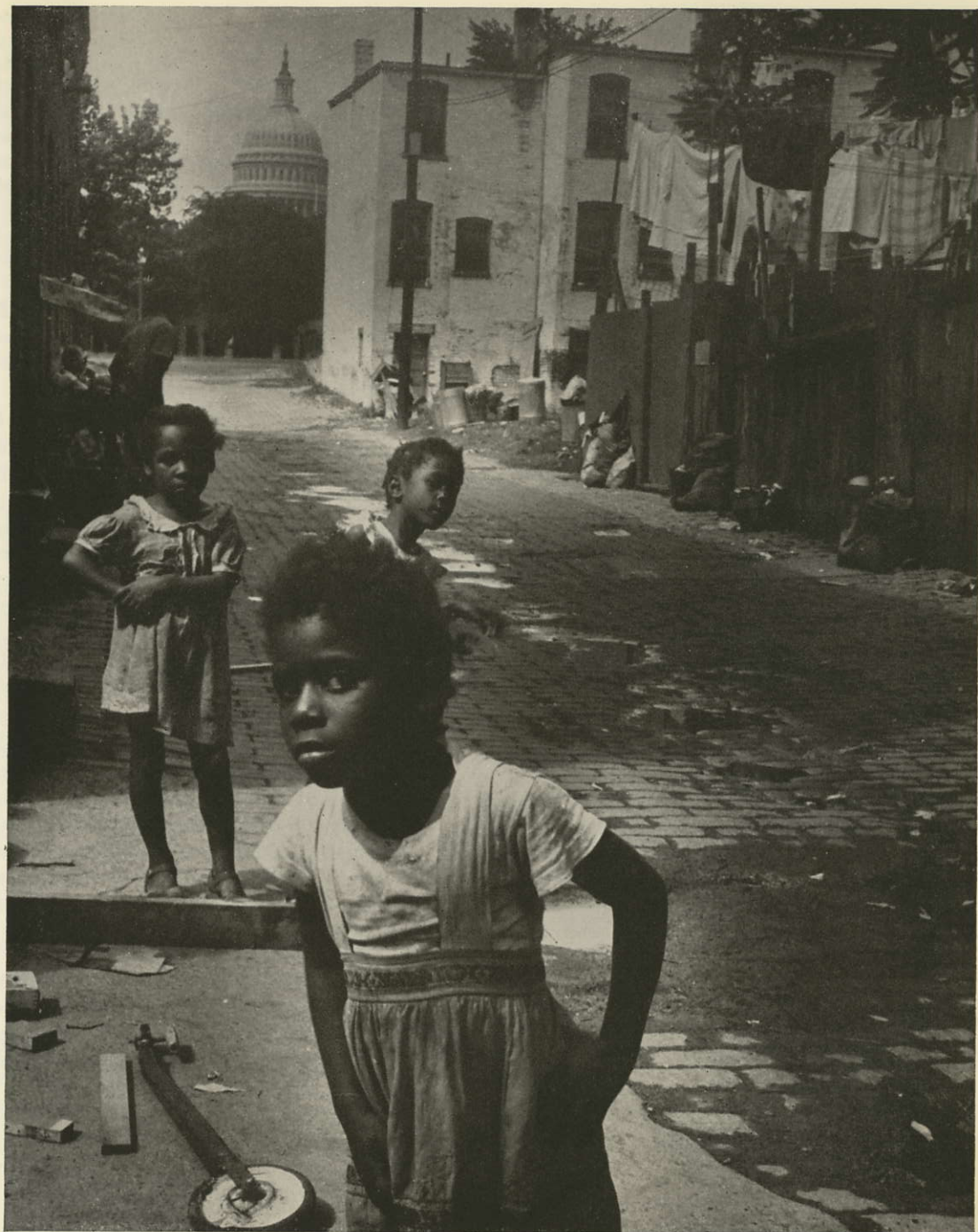
⁴ "Grille-CIAM d'Urbanisme" Publication ASCORAL aux Editions de L'Architecture d'Aujourd'hui, 5 rue Bartholdi, Boulogne, Seine.

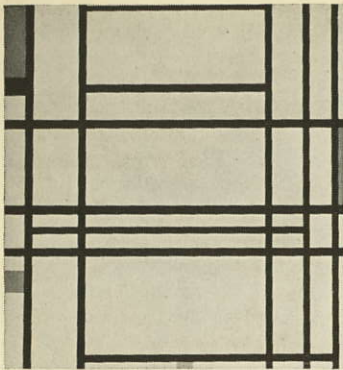
The Athens
Charter
in
practice
—CIAM Grid

classe classification	TITRE 1 : LE THEME. HEADING 1 : THE THEME.		LES 4 FONCTIONS THE 4 FUNCTIONS				
	1 living	2 working	3 care of body and spirit	4 circulation	d misc.		
10	LE MILIEU (données naturelles, données géographiques et démographiques). ENVIRONMENT (natural conditions, geographic and demographic data).	geograph. physique physical geography geograph. humaine human geography geogr. historique historic geography					
11	OCCUPATION DU TERRITOIRE, Zonage et tracés à 2 dimensions. OCCUPATION OF THE LAND, Zoning and two dimensional plans.	rural rural industriel industrial échanges, pensée et administration trading, education administration					
12	VOLUME BÂTI ET UTILISATION DES ESPACES AMBIANTS, urbanisme à 3 dimensions. VOLUME CONSTRUCTED AND USE OF AMBIANT SPACES planning in three dimensions.	villes urban campagnes rural					
13	EQUIPEMENT. EQUIPMENT	du territoire of the territory du volume bâti of the volume constructed					
14	ETHIQUE ET ESTHETIQUE, avec étude éventuelle des rapports de l'ancien et du moderne. ETHIC AND AESTHETIC with the contingent study of the relationship between ancient and modern.						
15	INCIDENCES ECONOMIQUES ET SOCIALES. ECONOMIC AND SOCIAL INFLUENCES.						
16	LEGISLATION. LEGISLATION.						
17	FINANCEMENT. FINANCE.						
18	ETAPES DE REALISATION. STAGES OF REALISATION.						
19	DIVERS. MISCELLANEOUS.						
classe classification	TITRE 2 : REACTIONS AUX THEMES. HEADING 2 : REACTION TO THE THEME.		LES 4 FONCTIONS THE 4 FUNCTIONS				
	1 living	2 working	3 care of body and spirit	4 circulation	d misc.		
20	REACTIONS D'ORDRE RATIONNEL. RATIONAL REACTION.	usagers the client opinion general public autorité the authority					
21	REACTIONS D'ORDRE AFFECTIF. REACTION OF SENTIMENT.	usagers the client opinion general public autorité the authority					

washington, d.c.

marion palfi





Composition, 1938-42

piet mondrian

home—street—city

The Work of Piet Mondrian (1872-1944) has become a center of discussion and controversy in the extremes of modern art. His essays *Plastic Art and Pure Plastic Art* (Wittenborn, Schultz, Inc. 1945) revealed the broad philosophical basis of his work. *Home—Street—City*, written in 1926, shows how Mondrian's art transcends a narrow conception of painting as a decorative adjunct, and reflects his broad concern with the total environment of man.

Today, just as in the past, the Home is Man's true "refuge." But there never was, and there still is no equivalence between the Home and the Street, and therefore neither harmony nor unity in the City. This is due partly to climate and partly to lack of equivalence between individuals. Inequality among men created the natural tendency to avoid one another; but the cause of all disharmony is in the individual himself. So long as in the mass he remains as he is today, he will be unable to create a harmonious material environment.

In early times communal life was facilitated by greater equality among the masses. The people were clearly separate from the intellectually more advanced kings, priests, etc., and they used the Home only as a refuge from bad weather. They preferred to live outdoors. This changed with the course of civilization. Then came the natural and logical instinct to feel oneself an individual. Consequently collective life ceased to be possible. People became more and more concerned with the Home, and the outdoors became merely a place for transit (the Street) or for breathing some fresh air (the Park). All this was in keeping with mankind's progress and the evolution of the individual, so that he developed by concentrating upon himself without being hindered or disturbed by others. Today, heirs of this thinking, we are individualists even though we are seeking and developing a universal outlook.

We must therefore detach ourselves from the majority of people. And here I would like to add a

personal note. I have always fought the individualist in man and have tried to show the value of seeing in a universal way; but this does not mean I believe in full collectivism for the present. That is the dream of the future. Already in our own day there are groups who could live communally if they were not scattered through the world. But we cannot expect this of the great masses. Today everything is created in and by the individual, and for myself I applaud Marinetti when he said: "Long live inequality! Let us increase inequalities among men! Everywhere let us unleash and arouse the individual's originality. Let all things be differentiated, transvalued, disproportioned."

As man becomes more mature, he becomes more of a creator himself, opposing physical and natural matter and those who are still under its domination. Man will choose or create his own material environment. He will not regret the absence of natural aspect, that aspect of nature which most people still regret even as they are unwillingly forced to abandon it. The truly evolved human will no longer try to beautify, healthen or shelter the City's streets and parks by means of trees and flowers. *He will build healthy and beautiful cities by opposing buildings and empty spaces in an equilibrated way.* Then the outdoors will satisfy him as much as the interior.

Unfortunately, today it is very difficult to create, and we are forced to live amid *the plastic expression of the past*. Individuals and groups who have detached themselves from the grip of the past suffer from its *depressing expression*. They have found a

new world as yet unrealized. Yet while they suffer they are bringing about the realization of their ideas, and for them each creation (so far as the backward majority allows) is their brilliant proof. This majority loves to live in the Past. Since they possess the Power, and since building materials are long-lasting and costly, it follows that today a general and speedy renewal of environment is almost impossible. But thanks to the power and vigor of new individual creations, and also to the new and imperious demands of Life, the old way of building will die its own death.

Neo-plasticism, therefore, views the Home not as a place of separation, isolation or refuge, but as *part of the whole, as a structural element of the City*. And this is the present great difficulty: the City as yet unchangeable in contrast to the Home which is being renewed. We must have the strength and courage *to dare face a period of disharmony*. Fearing disharmony we fail to advance today, and still worse we adapt to the past. *We must not adapt, we must create.*

We must think of the Home in a very different way than in the past. So long as man is ruled by his fleeting individuality and does not cultivate his true self which is universal, he will neither seek nor find anything but his own person. The Home thus becomes the place where this fleeting individuality is fostered, and the Home's plastic expression reflects this petty concern. *The outward manifestation of this concentration upon the self has so far been fatal for our whole epoch.* If our material environment is to be pure in its beauty and therefore healthy and practical,

it can no longer be the reflection of the egotistic sentiments of our petty personality. In fact it need no longer be lyrical in expression, but purely plastic.

Leaving aside purely philosophical trends, and to speak only of the movements based on plastic expression, Futurism has been one of the most effective in reducing the naturalistic lyricism of the past. (*Les Mots en Liberté* by F. T. Marinetti.) The Cubist, Purist and especially the Constructivist movements have also shown the notion of *universalized self*. But it was Neo-plasticism that *replaced lyricism with the purely plastic*. Through the intensified but variable rhythm of relationships of an almost mathematically pure plastic means, this art can come close to the super-human, and certainly the universal. That is possible, even today, because art precedes life. Neo-plastic art loses something of the super-human as it becomes realized in life in the form of material environment, yet retains it enough for the individual no longer to feel his petty personality but feel uplifted through beauty toward universal life.

Many people today are afraid of the idea of "beauty." Is it not because the Past completely separated beauty from life by establishing a conventional aesthetic? An aesthetic which negated the pure beauty of construction so that it seemed right to build in disregard of the organism and utility of the thing constructed. But by following naturalistic organization one soon goes astray, and as a result equilibrated relationships are totally lacking. Today's architecture clearly proves this. *We therefore need a new aesthetic based on the pure relationships of pure lines and colors, for only pure relationships of pure constructive elements can result in pure beauty.* Not only is pure beauty necessary for us today but it is the only means manifesting purely the universal force which is in all things. It is identical with what the Past revealed under the name of Divinity and is indispensable if we poor humans are to live and find Equilibrium, for things in their natural state are against us and the most external conditions of matter fight us.

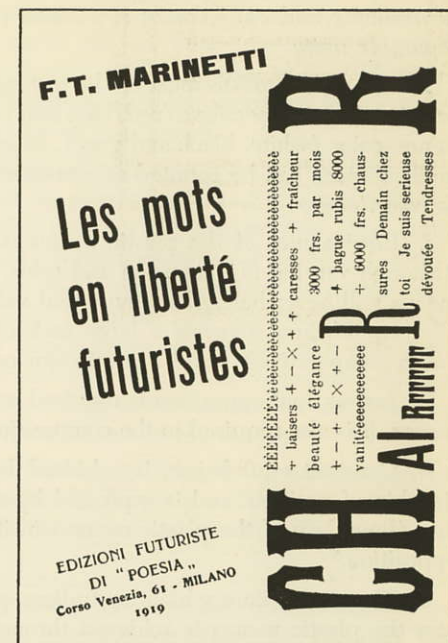
A new aesthetic has sprung from Neo-plastic painting. In the design of a few interiors, and in a few

buildings whose construction is free of Tradition, we can discern the new spirit and detect the newly created laws. These laws revolutionize the old notions of architecture which have become purified and simplified by new materials and by the daring efforts of a few architects.

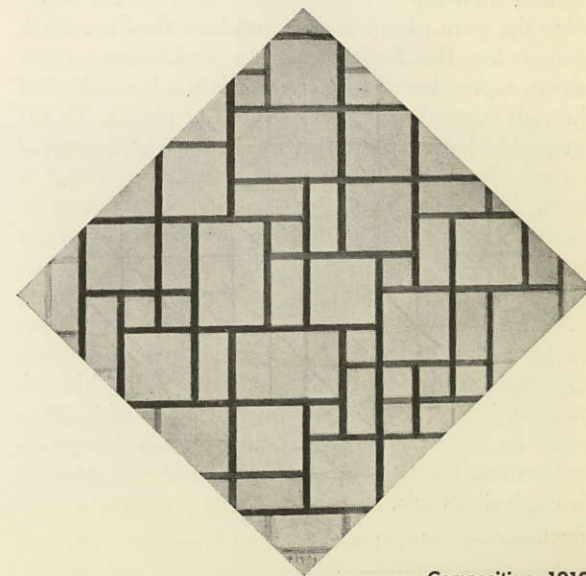
Whereas, especially in the metropolis, the aspect of the Street has been transformed by the myriad artificial advertising lights, by colored billboards, by well-composed window displays, by utilitarian buildings, the Home on the other hand requires a special and conscious effort. To defeat the still so powerful influence of the past, *we must concentrate first and foremost on the plastic expression of the Home*, on the dwelling and its rooms; and we must leave the technical problems of construction to the engineers.

At present, I see no chance of achieving perfect plastic expression by simply following the structure of what we build and studying its utility alone. For that, our intuition, still weighted with the past, seems insufficiently developed. If it is difficult enough for us to express these equilibrated oppositions in simple buildings, we are even more at a loss with the more complex structures. For instance, utility often requires repetition in the manner of nature (as in a group of low cost dwellings), and here the architect must have some notion of plastic expression and know how to balance what the utilitarian need seems to require. For it is always possible to find structural solutions which satisfy both the utilitarian goal and the aesthetic aspect.

The pure and logical plastic conception is always in accord with practical demands, for both are simply a matter of equilibrium. Our time (the Future!) demands pure equilibrium, and to it there is only one road. There are endless ways to express beauty, but pure beauty, the expression of pure equilibrium, can be manifested only *through pure plastic means*. That is one of the most important laws of Neo-plasticism for the construction of Home, Street and City. But pure means alone do not suffice to produce Neo-plasticist expression. *They must be composed in such a way that they lose their individuality and through*



Cover of Futurist Manifesto 1919



Composition, 1919
Kröller-Müller Collection

neutralizing and annihilating opposition form an inseparable unity.

1. The plastic means must be the rectangular plane or prism in primary colors (red, blue and yellow) and in non-color (white, black and gray). In architecture, unfilled space can be counted as non-color, materials as color.

2. Equivalence of the plastic means is necessary. Although varying in dimension and color, the plastic means will nevertheless have an equal value. Generally, equilibrium suggests a large area of non-color and a comparatively small area of color or materials.

3. Just as dual opposition is required in the plastic means, it is also required in the composition.

4. Constant equilibrium is achieved by the relationship of position, and is expressed by the straight line (boundary of the plastic means) in its principal opposition.¹

5. The equilibrium which neutralizes and annihilates the plastic means is achieved through the relationships of proportion in which they are placed and which create vital rhythm.

Here then are five Neo-plastic laws which determine the pure plastic means and how they are used. Concerning the fourth law: In architecture *exact plastic expression of cosmic equilibrium* is manifested through vertical or horizontal lines or planes. This is precisely what distinguishes architecture from original nature where these planes and lines are confused in form. Neo-plastic painting succeeded in similarly establishing cosmic equilibrium *by abstracting from natural appearance* — not by imitating architecture. This explains the perfect unity of Neo-plastic painting with the new architecture, and also its constant equilibrium. Thus it contrasts with earlier painting which almost never used the vertical or horizontal. Although past art favored the curve, the large lines of its compositions were diagonal; and nearly all earlier architecture expresses the vertical and horizontal position through diagonals.

Therefore it is astonishing that Neo-plasticism was

¹ Rectangular opposition—Editor

recently accused of being classical and of trying to follow natural appearance (even though abstractly). *Neo-plasticism is classical only insofar as it is the true and pure manifestation of cosmic equilibrium from which we cannot separate ourselves as long as we are "men."* At first sight some points seem to support the accusation. Therefore an explanation is necessary, especially as the use of the oblique in architectural chromoplastic is liable to destroy the Neo-plastic unity of architecture and painting.²

Starting from a misunderstanding of the vertical-horizontal position it has been said that "the new painting must stand in opposition to the new architecture"! Is that really logical? If the new painting were opposed to the new architecture, of what would the renewal of architecture consist? Must not architecture be renewed in accordance with renewed painting? And does this not demand unity of the arts?

We note that in Neo-plastic art not the vertical or horizontal position but the perpendicular position is essential—and is therefore the relationship to be obtained. It is the relationship which expresses Immutability in contrast to mutable nature. Very fine things, even Neo-plastic works, can therefore be created by turning this relationship to the oblique. But despite relativism, man's eye is not free from his body. Only the mind can know anything of the fourth dimension and detach itself from our poor physical body!³ As men, we must deal with *man's equilibrium*; if we upset it we create nothing! Plastic expression is determined by our physical and spiritual equilibrium. One cannot deny the naturalistic and capricious character of the oblique. Moreover its disequilibrated expression cannot be annulled by an opposing line. Although in this way one can also produce an expression of stability, the plastic expression of the oblique remains an expression of external movement, therefore of natural appearance. And this is where the

² Mondrian and Van Doesburg differed on this issue, Van Doesburg having formulated his theory "Elementarism" which was based on the assumption that the oblique gives the most dynamic form.—Editor

³ Mondrian is comparing basic spatial intuitions to the abstract concepts of modern physics.—Editor

superficial attempt to find a new plastic expression leads: without wanting to we return to nature.

On the contrary, the vertical and horizontal in the rectangular relationship produce a plastic expression of inner strength and repose. When united in the "appearance" of a cross, these lines express a form—though abstractly; but in Neo-plastic composition they are really opposed, thus annihilating all form. In this composition they express the movement of life, matured by a deeper rhythm arising from relationships of dimension. And since opposition to nature can stem only from these relationships, it is in them and them alone that we must seek the culminating point of Neo-plasticism.

General observation: Denaturalization being one of the essential points in human progress, it is therefore of primary importance in Neo-plastic art. Neo-plastic painting has shown its power by demonstrating plastically the need for denaturalization. It denaturalized the structural elements as well as their composition. For this reason it is *true abstract painting*. To denaturalize is to abstract. By abstracting one achieves pure abstract expression. To denaturalize is to deepen. Denaturalization takes place consciously or unconsciously. The progress of fashion is proof of the latter, for are not our clothes becoming purer in form and are even used in opposition to natural forms? And does not the very use of cosmetics show a distaste for the appearance of natural skin?

In architecture, matter can be denaturalized in various ways, and here technology has not said its last word. *Roughness, rustic appearance* (typical of materials in their natural state) *must be removed*. Therefore:

1. Surfaces will be smooth and brilliant, which is also accompanied by a decrease in weight. This is one of the many cases where Neo-plastic art agrees with hygiene which demands smooth easily cleaned surfaces.

2. The natural color of materials must also disappear so far as possible under a layer of pure color or of non-color (black, white or gray).

3. Not only will materials be denaturalized in their use as plastic means (constructive elements), but so will architectural composition. Neutralizing and annihilating opposition will destroy natural structure.

Application of these laws will destroy the tragic expression of Home, Street and City. Physical and moral happiness—prerequisite for health—will be furthered by equilibrated oppositions, relationships of proportion (dimension), and colors sustained by relationships of position. The creation of a sort of Eden is not impossible if there is but a will. To be sure this cannot be done in a day, but by giving all our effort, we can not only achieve it in time but can start to enjoy its benefits even tomorrow. The abstract spirit cannot be annihilated by the past which we still see everywhere; conscious of its strength, it admits only the expression of the future. Assembling all its expressions now scattered in space, it constructs (abstractly) this earthly paradise, and in these creations it is realized, and transforms without destroying.

The application of Neo-plastic laws is the road of progress in architecture. This is confirmed by Reality

itself as it emerges and develops through the force of necessity—new requirements of life, new materials, etc. In fact, what is today most advanced in technique and construction is precisely what comes closest to Neo-plasticism. Neo-plasticism blossoms more readily in the Metro than in Notre-Dame, prefers the Eiffel Tower to Mont Blanc.

In this article I have discussed certain ideas and their embodiment in basic laws. I have said little about the details of execution because I know that external life is forever changing—air transport, for instance, may require a very different type of architectural construction. But the plastic laws which we have set forth will in no way be affected; on the contrary, the most modern and progressive building increasingly confirms them.

The demands of the new life will modify all details of execution; but these are insignificant before the *new conception*, which is paramount.

So I conclude: the Home can no longer be sealed, closed, separate. Nor can the Street. While fulfilling

different functions, Home and Street must form a unity. To achieve this we must cease regarding the Home as a box or a void. The idea of the “Home”—Home, Sweet Home—must be destroyed at the same time as the idea of the “Street”.

Home and Street must be viewed as the City, as a *unity formed by planes composed in a neutralizing opposition that destroys all exclusiveness*. The same principle must govern the interior of the Home, which can no longer be a conglomeration of rooms—four walls with holes for doors and windows—but a *construction of innumerable planes in color and non-color unified with the furniture and household objects, which will be nothing in themselves but will function as constructive elements of the whole*.

And man? Nothing in himself, he will be part of the whole, and losing his petty and pathetic individual pride, he will be happy in the Eden he will have created!

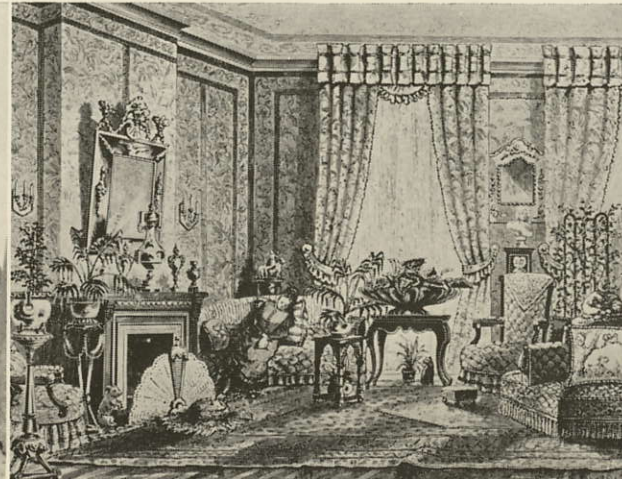
Translated by Harry Holtzman and Martin James.

This essay first appeared in *Vouloir* no. 25, 1927 (in French), and *i 10* vol. 1 no. 1, 1927 (in Dutch).

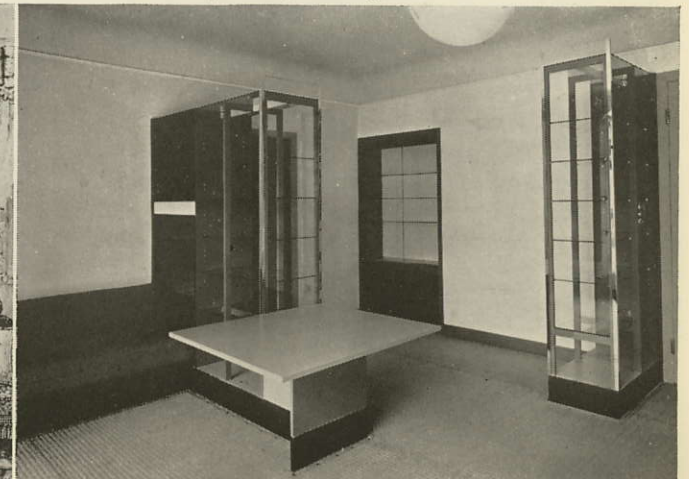
Cameroon Village
Courtesy French Embassy Information



Late 19th Century Interior
New York Public Library



Marcel Breuer. *Thost apartment*, Hamburg, 1926



nicolas calas

Nicolas Calas, a leading spokesman for the Surrealist movement, has written *Foyers d'incendie*, a book of Surrealist essays (Paris 1938) and *Confound the Wise* (Arrow Editions, New York 1942), and has worked on the studies of national culture patterns headed by the late Ruth Benedict. His book on the fifteenth century painter, Hieronymus Bosch's *Garden of Delights* is to be published by Harper & Bros., Fall 1950. The following is the first part of an essay called "Surrealist Intentions, Existentialist Fears."

surrealist intentions

Freud, says Dali, once told him that when he looked at an ordinary picture he wanted to discover its unconscious meaning but, when confronted with a surrealist one, he reversed the process and asked himself what was its conscious meaning. Had this remark been made to a true surrealist, I would have expected the latter to query in his turn: "Is it not surrealism's great merit to have made the spectator pay **more** attention to the conscious meaning of pictures?"

A shift of emphasis, from the unconscious to the conscious is unavoidable every time we pass from the field of research to that of communication. Psychoanalysis, like all sciences which deal with diachronic data, looks for what is hidden back of the present. The writing of a poem and the painting of a picture fall into the category of means of communication by which a certain type of relationship is established between the communicator and others.

Confessions

I would call *expository* the communicated information dealing with data that is not unknown to the public, and *revelatory* that dealing with facts mostly or totally unknown. If the revelation refers to events concerning the affective life of the communicator himself, it is a *confession*.

There are four types of confession: the *judicial*, the *religious*, the *literary* and the *psychoanalytic*. Certain modern forms of writing, such as the stream of consciousness used by Dostoevski and Joyce, and which

the surrealists call automatic writing, resemble the psychoanalytic confession. But does this comparison imply that the surrealist confession has ceased to be a literary one? Before answering one should explore the difference between psychoanalytic and religious confession. Comparison with judicial confession, however, would only be confusing as the purpose of the latter is to seal the fate of the guilty instead of raising his hopes which is the objective of both psychoanalysis and religious confession.

As has been excellently said by Victor White,¹ confession refers to sin, that is to say to "the evil men do" — "*malum culpae*," while the psychoanalytic confession refers to "the evil men suffer" — "*malum poenae*." A psychoanalyst could brush aside this distinction on the ground that the evil men do is, in the last analysis, caused by an evil they have previously suffered (which is but a way of posing once more the vexing problem of free will only to dismiss it in the name of psychological naturalism). If correct it would follow that the artist should be evaluated according to what his unconscious urges lead him to write rather than in accordance with what he says.

A major part of the writing done by the surrealists in the Twenties was produced on the basis of an absolute faith in psychological determinism. The purpose of automatic writing was to enable the artist to feed his work with the stream of unconscious associations. However significant this phase of development

¹ Victor White: "The Analyst and the Confessor," in *The Commonweal*, July 23, 1948.

may have been for the self-education of the surrealist writers and painters, its contribution to art and literature remained secondary and no surrealist can honestly claim that his major works were ever done purely automatically. Nevertheless these unsuccessful experiments are worth considering. Had it been found that the inner core or essence of art could be reduced to automatic associations, the artist would have been turned into a seismograph of his soul which is tantamount to the denial of talent and art, or the assertion that *all free flow of unconscious thought is art*.

SURREALISM WHICH STARTED its career as a successor of Dada did actually advocate the abolition of art. If the purpose of writing or painting is reduced to the outpouring of the unconscious on paper or canvas, the objective of art would be to transform reality into the bed of dreams.

It is one thing, however, to say that by means of a conscious description of an experience such as a dream we shall *introduce* the contents of an unconscious activity into the realm of reality; and another to *substitute unconscious methods of expression* for the reality by which we communicate the unconscious contents. The former is done by an ordinary description of dreams, the latter is what automatic writing *claims* to do when, instead of pouring unconscious content into a mould of reality, it replaces this mould with an unrecognizable form.

The mould of reality into which the unreal must be set is language; the unrecognizable form is made of the meaningless sentences that have poured from the soul under the dictation of the unconscious.

Surrealism

If the artist's purpose is the negation of reality he could approach this goal better by substituting drugs to writing or painting, thereby plunging himself more fully into phantasy, or by becoming an anarchist and devoting himself to the destruction of an abhorred reality: society. But surrealism has always claimed that it wished to reform society—which presupposes a recognition of its value. Members of the human society understand each other by the use of symbols. To abolish society would mean to abolish language which is the mould which contains the symbols. Language being the basic means of interpersonal communication, all interpersonal methods of communication such as painting and poetry must be adapted to a linguistic structure; they are founded on the *linguistic level of Reality*.

AS I SEE IT, surrealism does not purpose to abolish the linguistic reality of poets (any more than it aims at abolishing society), but to reform it by introducing into its reality symbols obtained from dreams.

Surrealism can only reform reality by preventing the stream of unconscious associations, which it has allowed to pour out freely, from flooding the reality of language. The surrealist must know when he should close the dam that keeps the unconscious under his control. Using his judgment he must decide when to stop speaking automatically. There is in the creative process a point which even the surrealist cannot bypass and at which he arrives when he chooses to close the gates. Only he can decide at what moment this should be done. Upon his choice will depend what proportion of unknown or unconscious symbols will be mixed with the known linguistic symbols.

Being responsible for his choice, the surrealist is responsible for what he communicates, as the function of language is to establish communication.² Even psychoanalysis, the latest invented method of confession, is based upon freedom of choice and construed on the premise of the analysand's free will. If the analysand does not choose to communicate the analyst

² See the writer's "Iconolatry and Iconoclasm," in *College Art Journal*, N. Y., Winter, 1949-50.

remains powerless. Like the confessor the utmost he can do is to help the sufferer help himself, which implies that confession takes place this side of freedom.

THE WESTERN EMPHASIS on free will is reflected in justice: the courts tend to be more lenient to that offender who confesses his guilt. To plead guilty shows a will to reform. In *Crime and Punishment* Dostoevski has forcefully illustrated this point and described how, through his will to improve, a man can become strong enough to persevere along the path of reform even after he has been condemned.

Although religious and psychoanalytic confessions may often go deeper than literary confessions they are less perfect: just as the teacher of a language helps us to communicate our feelings by indicating the 'proper' meaning and usage of words, so the psychoanalyst 'teaches' the patient the true meaning of symbols that he pours out in a stream of unconscious associations; so the confessor 'teaches' the penitent the meaning, or implications, of his sins. The purpose of these 'lessons' is to help the individual to communicate with his neighbors—through psychoanalysis; or with God—through confession.

The difference between the confessor and the analyst is analogous to that between the teacher imparting a foreign language to an adult and a teacher who instructs children how to talk. The priest teaches a 'foreign language,' the language of prayer, for confessions must be finally addressed to a 'foreign' person: God. The psychoanalyst treats us as children who do not know the meaning of their emotions; like children we can only understand them ourselves by learning what meaning others attribute to them. This implies the knowledge of language and calls for an adaptation to language, as it is only through it that we can communicate with others in terms they can understand.

The Message

Unlike the patient or the penitent, the mature artist, whether surrealist or not, is not hampered by 'communication difficulties' and is able to communicate

LETTER FROM SIGMUND FREUD to André Breton

Dear Sir:

Forgive my lateness in answering your letter transmitted through my daughter; this was due to illness as you can well believe of a person my age.

I regret that I cannot contribute to your collection of dreams. I must admit that I have nothing new to say about the dream. The superficial aspect of dreams, what I call the manifest dream, holds no interest for me. I have been concerned with the "latent content" which can be derived from the manifest dream by psychoanalytical interpretation. A collection of dreams without associations and knowledge of the context in which it was dreamed does not tell me anything, and it is hard for me to imagine what it can mean to anyone else.

Naturally, manifest dreams reflect the whole gamut of our thinking activity, for according to Aristotle's still valid view, dreams are the continuation of thought into sleep, modified, however, by the peculiar nature of this state. S. Freud

PROF. DR. FREUD
 Hochgeachteter Herr André Breton
 Vergessen Sie dass ich Ihr Freund
 lieber zu meine Tochter geschicktes
 aber, für mich bestimmtes Schreiben
 mich so grosser Verehrung beehrt
 worte. Sie werden es bei meinem
 Alter nicht ungläubig finden.
 Aber ein Trafferin dich behuld
 deren Frau
 Ich bedauere lebhaft dass es mir
 nicht möglich ist Ihren Wunsch
 nicht zu erfüllen
 nach Traumsammlung zu erfüllen
 Ihrer Liebe muss ich bekennen dass
 für's Erste meines mehr über den
 Traum zu sagen habe. Zudem aber
 kenne ich die für Parisis zu haben
 dass der Wortlaut der Traume, das
 was ich kein Interesse für mich
 kenne, Ich habe mich damit beschäftigt
 hat latenten Trauminhalt zu finden
 den man durch analytische Deutung
 aus dem manifesten Traum zu
 wissen kann. Eine Sammlung
 von Traumen ohne zugehörige Asso-
 ziationen hat keinen Wert für den
 Stände, unter denen ertraumt
 wurde. Ich habe nichts, und ich
 kann mir kaum vorstellen
 was sie anderen sagen könnte
 Es ist begreiflich dass die manifesten
 Traume die Möglichkeit des Traums
 nicht enthalten. Ich möchte Ihnen
 diese nach der Möglichkeit nicht an-
 der, doch ich die Fortsetzung einreden
 dass ich in den Schlaf, und
 Druck hat nur kurzzeitig durch
 Ich habe nur kurzzeitig durch
 die psychologische Methode
 dieses Verfahrenes nicht
 Ich bin Ihr Freund

Courtesy André Breton—Cahiers G. L. M., Paris

with his public directly without the assistance of a teacher. The readers are not expected to tell the writer what is the meaning of the symbols he uses; on the contrary it is the reader who expects the communicated message to have meaning and to contain a 'truth'.

This message, as is the case in art, can refer to an emotion but the emotion cannot be *part* of the message which, delivered linguistically, consists merely of signs. Some signs have a symbolic meaning and can be associated by the reader with his own emotions through which he can identify himself with the communicator's emotions, but the message or content of the work he sees or reads remain symbolic. *The reader who cannot comprehend certain symbols has the right to assume that he can learn their meaning just as he learns the meanings of signs used in another language or the signs of the language of music or mathematics. But the signs and the symbols must refer to a given code.*

If the communicator himself cannot refer them to any known language, it is as if he had not used language at all and had therefore never formulated his ideas or feelings; it is as if he had not spoken—the implication being that he should have either kept silent or have learnt to speak before writing or painting. To use words without knowing their symbolic meaning (which is the automatic writing process) is analogous to using unfamiliar foreign words and constitutes a *misuse* rather than a use of language. One cannot therefore speak of communication when confronted with a work that does not have conscious meaning.

What Freud actually meant (assuming Dali reported his statement correctly) is that he was not interested in the "artistic" and communicative value of a work but only in its psychological value, until he was confronted with a surrealist picture; whereupon he became interested in what the communicator had to say—an indirect way of declaring that surrealist painters have something to say.

The Mask

If he is to find an audience the surrealist, like all artists, must follow certain laws *that in the last analy-*

sis are linguistic. Communications hold our interest either for *what* is said or for *how* it is said, either for the *value* of the information contained or for the *attractiveness* of the presentation. The latter is the artistic component of the communication. If the public feels that the information contained in the communication is not new and has been *better* presented in an earlier version they will have no reason to pay any attention to the later work.

VIEWED FROM THE ANGLE of what is said, the communication is either an exposition of carefully made *observations* or a revelation obtained through *insight*. The less a communication appears to be an exposition the stronger will be the demand to have it presented in an attractive way: communication through insight is of the order of *showing the hidden*. The false artist is one who exhibits his showmanship (mannerisms) and attempts to compensate the lack of insight by adding superfluous decorations. Actually, however, instead of showing what is hidden, the artist—all artists—replaces the hidden with a substitute which he embellishes to make it more attractive so that the spectator, charmed, should come to expect that what is hidden will actually be shown. What we are actually shown, however, is a mask.

Art Is Enigmatic

Art is a form of communication that insinuates. We *expect* the artist to have more to say than what he communicated and to *suspect* that what he said was a subterfuge for hiding something. Hence the interest in the artist's intentions that lead him to produce or not a work, and the deep feeling of frustration one feels when an artist dies young or substitutes his eloquent enigmas with the eloquent silence of a Rimbaud.³ To understand the *significance* of a work of art means to be more interested in the artist's intentions than in his communication.

It follows that it is not sufficient to say that the work of art must have linguistic meaning as it is a medium by means of which a relation, through per-

ceptual contact, is established between the observer and a hiding place. The 'place' from which the work of art emerges is situated within the communication and referred to as mind, psyche, or heart. Through artistic communication one can establish a *deeper* rapport with the artist than one can by a *closer* contact, as for instance through conversation.

The Gift

The work of art is primarily a communication but it is also more: we expect the artist to say *better* what others may have already said. This *improvement* is obtained by *doing* something to the medium (language). The transformation of the 'raw material' into a work of art, the 'gift' to present 'beautifully' what others have said 'crudely,' to be 'poetic' where others are prosaic, constitutes the artist's *gift* to the community.

THE MAKING OF a work of art requires *labor*, that is expense of energy, and involves fatigue of mind and body—one must take *pains* if something is to be done well.

Rationalization of pain has played a most important role in the elaboration of the cultural values of the Western world. An aura of glory surrounds that pain which has been wilfully accepted in a spirit of *sacrifice*. In sacrifice there is an element of *satisfaction* that is of "the willing acceptance and performance of some task imposed as compensation and as a token of good faith and willingness to accept the penal consequence of sin" (V. White). When reinterpreted in aesthetic terms satisfaction is the willing acceptance of artistic tasks as a compensation for deep-felt anxiety and the willingness to communicate one's suffering to one's fellow men. The artist is willing to take pains, and the community recognizes his sacrifice, his labor, his suffering, by *accepting* his work as a token of good faith, that is as a *gift*. One could add parenthetically that the popular belief that artists are not avaricious and spend money freely corresponds to the need to place the artist in the position of a donor.

THE DONOR GIVES in order to enter into the good graces of the beneficiary, the way the penitent gives to receive forgiveness from his God, or the way the lover

³ At the age of eighteen Rimbaud abruptly stopped writing poetry and virtually disappeared from France. Little is known about his later life. (Ed.)

gives to acquire favors from the beloved. But the artist is a particular kind of donor, for what he gives is a work that is not simply a token of good faith for it contains a message. The message, as it were, confirms the gift by convincing us that the donor is sincere, for what he says is true, in the sense that the message has been delivered in good faith. In the last analysis the message, like the gift, must be appreciated in relation to the artist's good intentions.

The profoundest works of art are those related to the most hidden intentions. The deeper the artist plunges into himself through introspection, the further he moves away from the assurance of facts, the nearer he will approach the ambiguity of dreams. To convictions obtained through inquiries concerning the facts of reality he will oppose the doubts of his own emotions. In place of self-assurance and certitude he will offer doubt and anxiety. It is anxiety that he will *express*. But the *subject* of confession can only be sin or guilt (unless we consider it a sin to be anxious, for then it is the sin of anxiety that we confess) which is tantamount to saying that the artist does not actually confess. What he does do is to give form to anxiety by substituting to it an enigma.

The artist does not want to expose his sins or perversions but to convey his anxiety. To make his anxiety understood he will describe conditions that will evoke in our minds feelings similar to his own. This is why often a metaphorical expression of anxiety achieved through the description of fictitious circumstances creates better conditions for communication of anxiety than does an accurate report of the actual conditions under which it had been experienced. The greatest confessions of anxiety are the false or fictitious confessions such as those Dostoievski made in *The Possessed*, *Crime and Punishment* and *The Brothers Karamazov*. What we want is the enigma, not the truth; the beautiful confession, not the true confession. To the extent that Augustine and Rousseau falsified their confessions they are sincere.

The church, aware that confession requires *satisfaction* at the accomplishment of some task, insists that it should be followed by contrition, that is to say "the turning of the will from sin to God" (V.

White). If we substitute anxiety to sin then we can see how satisfaction can be obtained by contrition or *insight* into suffering, and satisfaction by the accomplishment of the artistic task and the making of the enigma.

The "turning of the will" of the artist through contrition involves a turning away from the specific circumstances that caused pain and the concentration of his will upon the task of communication. The ambiguity between personal suffering and impersonal circumstances can only help to heighten that enigmatic quality which makes us ask that art be 'truer to life than life itself'.

If the artist did not work in good faith and in a spirit of contrition, if his basic motivation was not to give but to *receive*, if money or fame were his real motivations, then his work is no more a gift and therefore is not a work of art. One of the basic functions of the critic consists in finding out whether a work is



MARCEL DUCHAMP From a film by Maya Deren, 1943



Jan Vermeer
THE ARTIST IN HIS STUDIO
(detail)
Vienna Collections: Metropolitan
Museum, N. Y., Feb.—May, 1950



Jacques Villon
PORTRAIT OF BAUDELAIRE
(etching)
Collection Museum of Modern Art

genuine and has been made in good faith for otherwise the community has been cheated.

The Dandy

When in our examination of the work of art our interest is directed toward the donor's intentions rather than toward the communicator's message, the only information we can expect to obtain is related to what the artist *failed to do*. What he has *done* we will find in his biography, what he *says* by studying his work. Intentions will reveal his most secret desires and help us understand which ones were never realized either in deeds or in words.

THE THEORY OF intentions is a theory of the failure to act out (to do or communicate). Surrealism, by using symbols borrowed from the vocabulary of dreams has indicated that the surrealist messages are concerned with the failure to *do*.

This explains why the models of the surrealists are neither heroes nor villains, who are judged by their deeds, but beings whom we judge by their dreams, as Breton's *Nadja*, Nerval's *Aurelia*, Kafka's

"K," Charlie Chaplin's impersonations. In surrealist art, the artist *viewed as dreamer*, becomes the subject of art.

The need for a shift of emphasis from the objective world of reality to the subjective world of the self in art was keenly felt, although ambiguously expressed already, by Oscar Wilde when he said that he put his talent in his art and his genius in his life. The artist who concentrates all his energy on his art no longer understands life and has turned himself into a workman, thereby putting the emphasis on *making* rather than on *giving*, on the pain of necessity rather than on the pain of contrition, on the pleasure of reward rather than the pleasure of satisfaction.

If the artist is to express his inner self with all its anxieties, what he does must be related to love and pleasure rather than to work and duty. Hence the pain that the artist goes through and expresses in his work of art is the pain of contrition, while the pleasure is derived from the feeling of relief that it is not a product of work and that he was free to *play* with his work as a child can play with its toys. In all great works of art there is a combination of joy and grief stemming from the joy of not having to work and the pain of being anxious.

If one does not put one's genius in one's art then one risks to put one's talent at the service of necessity. Unless of course one has no genius, and puts one's talent in one's life. Just as the artist imitates anxiety through enigmas so he imitates work in his 'play.' He plays the role of a worker which would suggest that he is an actor, although he is not an actor because acting is not his work. He does not play the role of an actor the way the actor plays the role of a hero, but like the actor he enjoys showing himself different from what he is. It is as if he wore an actor's mask to play himself.

THE ARTIST IS different from both the hero and the worker in that he has no profession and belongs to the type described so well by Baudelaire: the dandy. *The artist is a dandy; the artist is a donor.* The dandy is person who *owns* nothing, neither power nor money, and *owes* nothing, neither gratitude nor service; the gifts therefore that he gives have no value—a meaning which is implied in the idea that art is useless.

The Player

The feeling that art is useless heightens the artist's Hamletian anxiety which can be overcome only by greater devotion to play. The surrealist interest in playing games helps to remind the artist of the danger of exchanging the independence of the player for the servitude of the worker. A work of art can lose its freshness if it bears the traces of too much work. A work of art fades when the public dissects it with the labor of scholarship; when viewing work as priceless one is led to believe that it involves more work than money could buy. The role of the artist qua dandy is to play with masterpieces and add mustaches to the *gioconda*.⁴

To play means to have faith in chance; nothing could be more artistic than to allow chance (instead of work) to complete one's work as Marcel Duchamp did when he permitted the accident that shattered his glass painting.

The artist should achieve that state of grace in which one overcomes the vain satisfaction of solving purely aesthetic problems. This the mystics do when they renounce art and pursue through prayer a soliloquy with God. The *exercise of the attention* achieved through pursuit of God being the positive element of prayer, it follows that for the artist the exercise of the attention will be followed in the field of games. For the true artist, like Marcel Duchamp, a soliloquy is established over a chess-board rather than in front of an icon—an attitude that can only lead one to become aware of one's own limitations in time, for like toys we are destined to total destruction.

This does not imply that because the artist uses pawns he must allow himself to be used as a pawn by those who, intent on drawing attention to their work, focus their gaze at a given moment of their career upon someone who, like Picasso, happens to be the object of general attention.

The supreme message of art as conveyed by those who have put their genius in their life is to help us realize that failure, failure to solve the enigma of life is more important than to find successful solutions.

⁴ Marcel Duchamp drew mustaches on a reproduction of the *Mona Lisa*, which he exhibited. (Ed.)

Dr. Kracauer, author of the psychological history of German film, *From Caligari to Hitler*, is writing a book on film esthetics for Oxford University Press.

siegfried kracauer

pictorial deluge

Ours is an age of pictorialization. Wherever we go or stay, pictures surround and besiege us. They stare at us from the pages of our tabloids and popular weeklies, pass across the screen in a nonstop procession, and, with television seeking new outlets, increasingly invade the last refuges of introspection, the bars. There is no baseball game which cannot vicariously be attended by anybody everywhere; nor is there a remote work of art that would evade mass reproduction. Thus a situation arises in which we are literally flooded with sights and spectacles—a vehement and interminable pictorial deluge.

In his recent book, *From Cave Painting to Comic Strip*¹, the well-known English writer Lancelot Hogben makes us acutely aware of the uniqueness of this situation. What most people take for granted at present is in effect the last stage of an evolution which can be traced back to the dawn of human culture. Man as a picture-making animal, Hogben asserts, is man in quest of communication. And he bears out his thesis by emphasizing the enormous role which pictures played in the slow growth of areas of mutual understanding. His book follows closely the developments which led from prehistoric cave paintings to primitive seals and calendars, and from the creation of alphabets and numerals to the invention of the printing press and photography, these two basic tools of an era of mass communication. It is a story of tragic setbacks, uneventful intervals, and gigantic conquests rendered possible by the contributions of peoples long since forgotten or sunk into apathy. All this is not told in chronicle fashion, but with a view to relating each successive step to the material needs and conditions of the moment. In

¹Chanticleer Press, New York, \$5.00.

such a history of techniques the materialistic approach proves rewarding indeed. And since the author of *Mathematics for the Million* knows how to popularize intricate thought patterns, the whole is a true source of enlightenment, made even more fascinating by a wealth of beautiful illustrations.

Hogben is not just a historian but a fighter as well; and as his book draws to a close, his combative spirit visibly wins out. A fervent champion of federal world government, he urges us to use the mass media of communication in its interest. His main concern is the pictorial medium. He suggests that we should develop a sort of international pictorial language—fixed symbols which because of their universal appeal might help disseminate knowledge among the peoples of the earth and remove the barriers that separate experts and specialists from other mortals. Unless we succeed in establishing such a pictorial esperanto, he gloomily contends, western civilization will fall back into barbarism and perish, as is amply evidenced by the fate of whole peoples which failed to put their means of communication to good use.

AT THIS POINT American mass culture comes into focus. Hogben indicts it for wasting invaluable energies on sheer entertainment. "If it is a platitude that America has given the world an object lesson in the popularity of the pictorial medium, it is also a truism to say that America has not as yet contributed to our common civilization any outstanding vindication of its potential value" (P. 231). His attacks against the American output in general culminate in a criticism of our comic strips which will ingratiate itself with any American educator. In fact, there are ever more voices in our country which condemn this unquestioned delight of millions of children and adults as an excrescence on the body of our civilization. And Hogben's idea of capitalizing on the entertainment value of comic strips for educational purposes is just now materializing in a New York University course.²

Hogben could have gone much farther in his criticism. Contrary to what he and others want us

to believe, comic strips are at best, or at worst, a minor evil easily recognizable as such. The real danger lies in the uninhibited use made of pictures for their own sake. Pictorialization has become a wanton habit with us, and this in itself constitutes a threat. For that habit results in the exhibition of a mass of pictures which seem to be shown for no other reason than to fill space. Many of them are not even particularly entertaining; and all of them make the impression of being inserted with little regard for their possible meanings. Essentially stopgaps, they either remain unnoticed like passers-by in the crowd or provoke highly confused reactions.

IF LOOKED AT intently any picture will yield valuable information. But it is as if our picture makers did not wish us to look behind the scenes; as if they did everything in their power to sustain the confusion which their abundant offerings are likely to create. As a matter of fact, pictorial material is more often than not presented in a manner which effectively forestalls our attempts to grasp its significance. Take the captions in our magazines: their obtrusiveness is such as to divert our attention from the very illustrations they predigest for us. It sometimes happens that a caption attributes, say, an endearing smile to a person whose features bespeak entirely different intentions; but we usually ignore discrepancies of this kind because of the hypnotic power of the editorial suggestions. Even more striking is the negligence with which most American movies—not they alone, of course—pass over the messages their visuals might convey. Our newsreels, documentaries and feature films are overcrowded with verbal statements, thus putting the unfortunate spectator in a dilemma. If he wants to watch the pictures, subtle wisecracks and poetic love declarations are lost on him; and if he wants to follow the dialogue he inevitably misses the fine points of purely visual communications. Since verbal meanings are less evasive than pictorial ones, audiences naturally prefer the latter, relatively effortless alternative.

In sum, we are submerged by pictures and at the same time prevented from really perceiving them. Pictures, as they are presented today, are like a veil

between us and the visible world. Instead of tempting us to inquire into their contents, they dull the edges of our intellect and stifle our imagination. The habit of being exposed to them blinds us to the phenomena they render. Paradoxically enough, the more reproductions we see, the less are we able or willing to practice the art of seeing, with all that it implies in spontaneous responses. We are lulled into passivity; our perceptive faculties threaten to decline. The incessant flow of visual material from the assembly belt has the soporific effect of a drug, adding to the drowsiness which our kind of mass culture tends to spread.

Hogben is all against this squandering of pictures. Yet the solution he offers is naive, to say the least. He seems to believe that a common effort in the interest of world-wide visual education will not only promote international understanding, but largely reduce the present waste and thus benefit the pictorial medium itself. This is improbable for the simple reason that pictures serve many other vital purposes than those envisaged by Hogben. They are not merely a means of communication in his sense; and even as such they may be applied in ways he never mentions. Why, then, should we assume that their increasing utilization as elements of a pictorial esperanto will suffice to channel their overpowering flow? Whatever such an esperanto may mean to us, it cannot possibly be expected to become the organizing principle of pictorialization. But Hogben is so completely possessed by his pet idea that he overestimates its wholesome influence on picture making in general as well as its educational value. His is a single-mindedness of purpose which prompts him to deprecate all seemingly useless differentiations. Significantly, he holds that we dissipate our strength by learning foreign languages and irrational spelling. He is a plain rationalist. And his dream of a uniform world culture omits the best that culture has to offer: depth.

There are problems which we should not immediately try to solve. All that counts is to pose them. Perhaps the pictorial deluge from which we suffer belongs among these problems. And perhaps its general recognition as a problem already marks the first move toward its solution.

²See "Course in Comics Seeks Social Good," *New York Times*, November 16, 1949.

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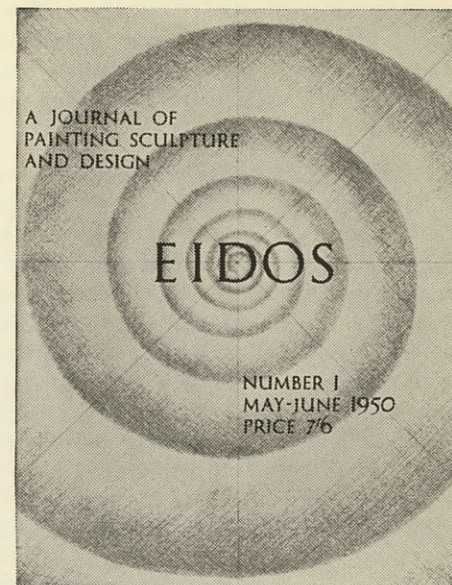
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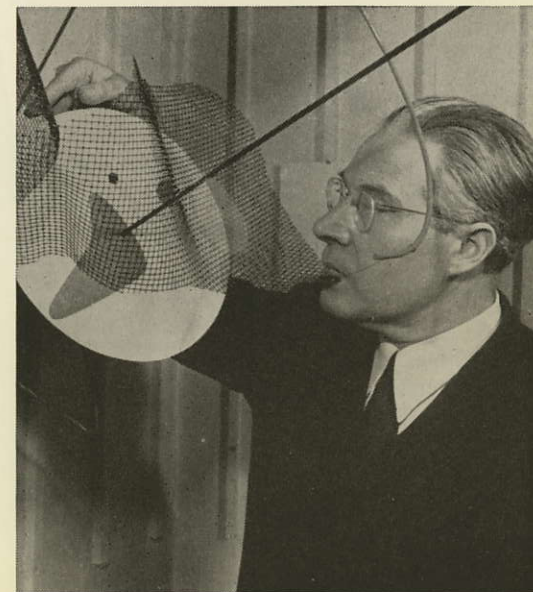
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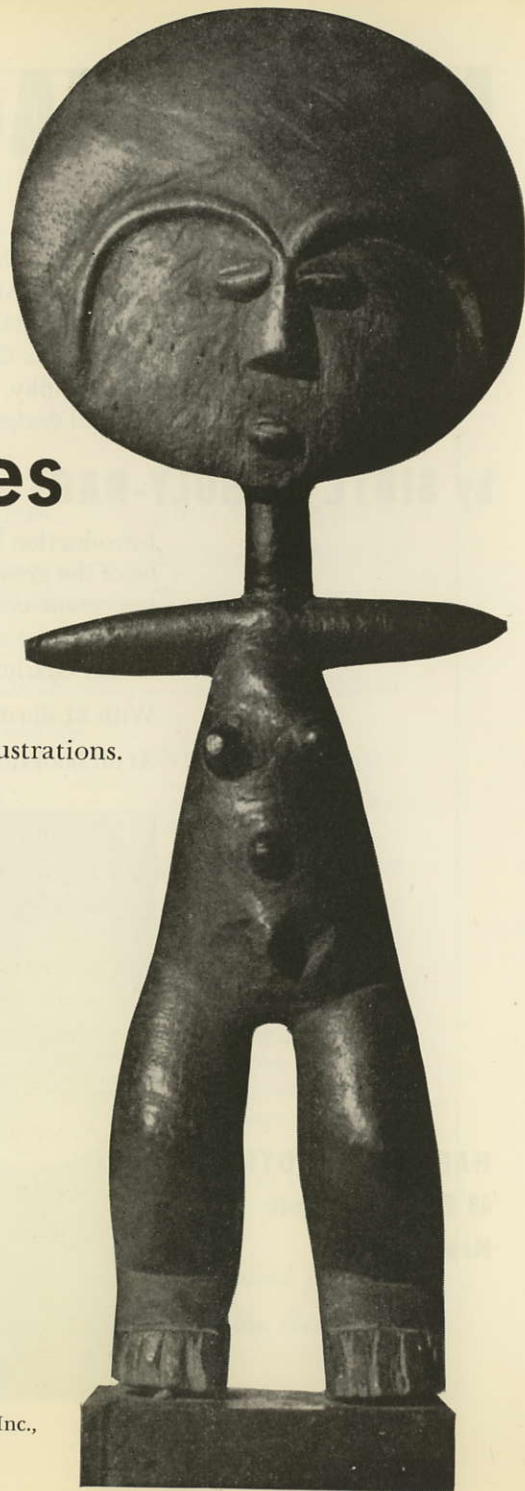
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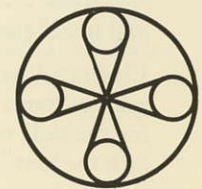


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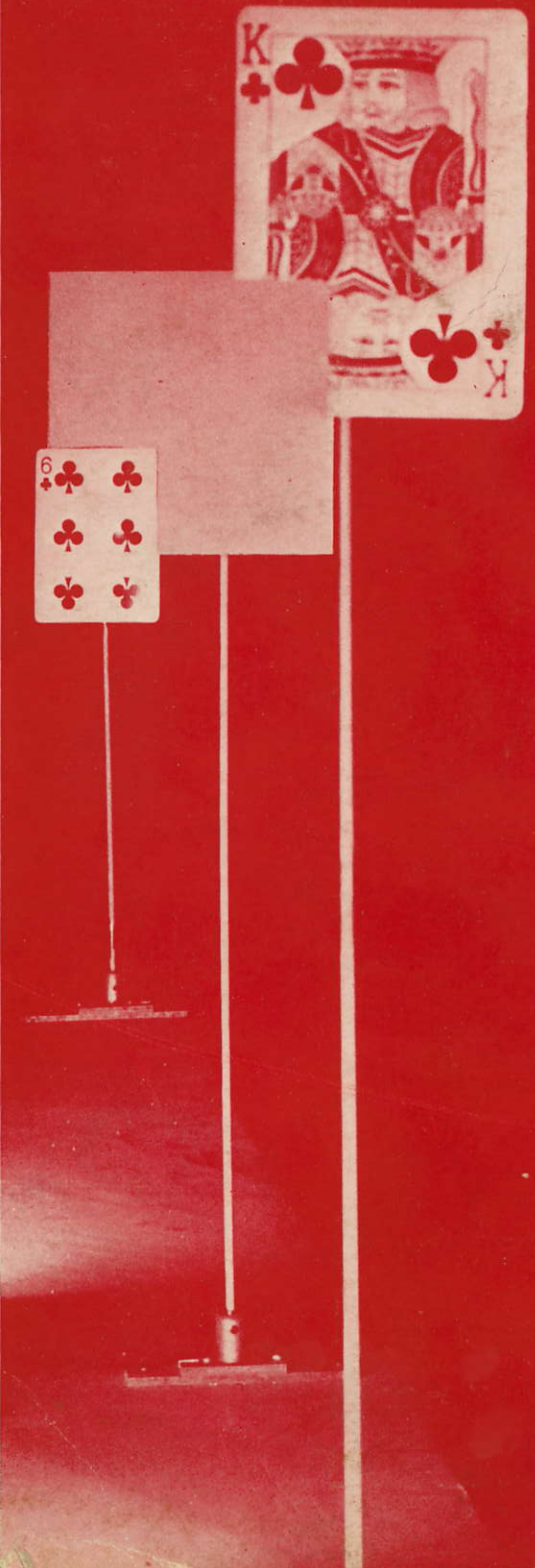
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