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Words in Their Place

Rudolf Arnheim

Although language helps thinking, it is not indispensable to thought and its structure or perceptual dimensions as a medium of thought are severely limited. What makes language valuable for thinking is our use of words to refer to other thought media, such as visual imagery. Not being restricted as language is to linearity, the visual medium offers structural equivalences to all characteristics of objects, events, relationships—in two and three dimensions. A literary image grows through accretion by amendment; a pictorial image presents itself whole, in simultaneity.

Can one think in words, as one can think in circles or rectangles or other such shapes?

The answer commonly given is almost automatically positive. In fact, language is widely assumed to be a much better vehicle of thought than other shapes or sounds. More radically, it is taken to be indispensable for thought and perhaps the only medium available. Thus Edward Sapir says in his influential book on language: "Thought may be a natural domain apart from the artificial one of speech, but speech would seem to be the only road we know of that leads to it."[1]

Nobody denies that language helps thinking. What needs to be questioned is whether it performs this service substantially by means of properties inherent in the verbal medium itself or whether it functions indirectly, namely, by pointing to the referents of words and propositions, that is, to facts given in an entirely different medium. Also, we need to know whether language is indispensable to thought.

The answer to the latter question is "no." Animals, and particularly primates, give clear proof of productive thinking. Roger Brown

has concluded that it is very clearly the character of the animal mind to abstract. Animals can respond to categories of things, and they display "an astonishing disregard of the unique object."[2] By means of their perceptual concepts, animals solve problems that look elementary if judged by human standards but have the striking characteristics of genuine productive thinking. Animals can connect items of their environment by relations that lead to the solution of a given problem; they can suitably restructure a situation facing them; they can transfer a solution to different, but structurally similar instances. And they do all this without the help of words.

However, animal thinking may be inferior to that of humans in one important respect. It may be limited to coping with directly given situations. A chimpanzee uses his powers of abstract thought ingeniously for the practical purpose of escaping from an enclosure or fashioning a tool. But there is no evidence that he can think about how one could make a short stick longer if the problem does not face him then and there. Experiments do tell that a chimpanzee's reasoning is not strictly confined to what meets his eye. He can turn around and get from his den a blanket he wants to use to retrieve an object outside his cage. But it is quite possible that he cannot detach his thinking from his immediate practical needs. In the words of Wittgenstein: "We say, the dog is afraid his master will beat him; but not: he is afraid his master will beat him tomorrow. Why not?"[3]

How man succeeded in overcoming this limitation need not concern us here. What matters is, first, that this independence of human thought is by no means necessarily a gift of language and, second, that it is not in itself an aspect of reasoning. Detached, theoretical thinking can function without words; and the ability to think about a remote question while sitting at a desk or walking through the woods concerns the organism's use of its cognitive functions, not the nature of these functions themselves. In many ways it is surely easier to think about something when one has the facts in front of one's eyes, although the stubborn presence of these facts can also hamper the freedom of thought. It is easier to play a game of chess with one's eyes on the board than to play it blind, but it is equally true that one may have to remove one's attention from a given particular event in order to find the solution of a problem. The nature of the cognitive operations that constitute thinking does not

depend on whether the target of thought is physically present or absent. The range, applications, and objectives of animal thinking may be severely restricted; but the feats that reasoning animals do perform, without the benefit of language, have the earmarks of genuine thought.

Words as Images

Language, then, is not indispensable to thought, but it helps. The question is, in what way. Since language is a set of perceptual shapes—auditory, kinesthetic, visual—we can ask to what extent it lends itself to dealing with structural properties. The answer must ignore the so-called meaning of words, that is, their referents. They belong to a different realm of perceptual experience. It must limit itself to the shapes of language.

Suppose we asked what reasoning can be done with the shapes of music. Consider the intricate pattern of pitch relations in the diatonic mode of Western music. A pentatonic scale divided into five equal intervals suggests a simpler level of thought. But even so-called primitive music is made dazzlingly complex by the interaction of structural variables. There are the many ratios of duration, the variety of rhythms, the relations between melody and harmony, the ranges and sequences of intensity, the different timbres of instruments. To handle these intricate patterns calls for thinking that taxes the brain to its limits. Musical thinking takes place entirely within the formal resources of the medium itself, although the content of musical statements is derived from, and applicable to, life experience beyond the realm of the tones.

If one examines verbal language in this same way one finds its perceptual dimensions severely limited. To be sure, there is no dearth of sounds, noises, or rhythms; in fact, there are more of them in every known language than there are in most purely musical systems. But, variety does not guarantee structure. The structural aspects of speech patterns are quite limited. Words or word sequences can vary in length and rhythm; they are all composed of a limited number of elements, and they can produce assonances and other auditory and visual resemblances. However, these perceptual dimensions of language are structurally so amorphous that nothing at all complex can be built of them. Compared with even the simplest musical tune,

the sound pattern of a poem is a largely irrational sequence of noises, sustained by some regular meter and by some phrasing of pitch and rhythm. This statement will sound offensively absurd if the reader fails to remember that I am talking here exclusively about language as perceptual shape; about what comes across from the sounds or written characters of a language to a listener who does not understand a word of it. The point is that the sounds of language achieve their subtle beauty, order, and meaning largely by reference to the intended meanings of the words.

The similarity of words based on common elements can be used for grouping. Rhyme ties similar words together; identical prefixes or suffixes create verbal categories. But the mere grouping of otherwise unrelatable sound patterns yields very little structurally. For example, the elementary grammatical difference between things and actions is not depicted by the sounds of language, although language sounds can, of course be either static or dynamic in character. One can tell nouns from verbs by their different sounds, but the distinction produces nothing but two bagfuls of sound patterns of no further common or different meaning whatsoever. Similarly, the linear sequence of words in sentences is a clear-cut structural feature, but language makes little use of it, if compared with the musical structure of a melody. In certain languages, one can distinguish nouns from verbs by their location in the sentence. But since nouns and verbs are nothing but two nondescript agglomerations of sounds, the purely sensory gain is negligible.

Given so largely amorphous a medium, it is not possible to think in words, unless one is satisfied with elementary statements such as: *a* sounds like *b*; or *a* comes always before *b*; or *a* takes longer than *b*. The human mind needs better tools than that.

It is true that a certain type of cognitive operation can be carried out within the language medium itself, but although useful it is hardly productive thinking. It is possible to learn that words which stand for certain concepts are related to each other in certain ways. One learns, for example, that ten minus seven is three. The learning can be done by routine drill, and the meaning attached to the concepts can be neglected or indeed unknown. Every time the statement "ten minus seven" is fed into the system, "three" will turn up automatically. This sort of association requires no reference to anything beyond the

verbal material. It leads to a system of storing and retrieval which makes information available. But the work can be done by machine and involves no productive thinking.

Language can supply information by what Kant calls analytical judgments.[4] In such propositions, the predicate is nothing but a known property of the subject and therefore simply explicates an aspect of the subject. The statement "All physical bodies have extension" is analytical if extension is one of the properties by which physical bodies are defined. No foray into the world of experience is needed. Such analytical judgments can be produced in a purely verbal way if the word that stands for the subject has been associated by verbal learning with words standing for predicates. Suppose somebody tells me that Mrs. X, who lives in Kansas City, is looking for a psychiatrist. I know a Dr. Y, whose name is tied in my mind to the information that he lives in Kansas City. I can therefore accommodate Mrs. X without going appreciably beyond the realm of language. But the same help could be supplied by a suitably programmed sorting machine, which would retrieve the pattern of punched holes assigned to Kansas City psychiatrists. Assume now that I were asked whether Dr. Y is the kind of person likely to establish good rapport with Mrs. X. This question will probably require what Kant calls a synthetic judgment, in which the predicate adds to the subject something not contained in its verbal definition. I must go beyond words to my experience with both persons and come forward with a relation not previously established. For this problem, more nearly one of productive thinking, words as such are of little use.

Purely verbal thinking is the prototype of thoughtless thinking, the automatic recourse to connections retrieved from storage. It is useful but sterile. What makes language so valuable for thinking, then, cannot be thinking in words. It must be the help that words lend to thinking while it operates in a more appropriate medium, such as visual imagery.

Words Point to Percepts

The visual medium is so enormously superior because it offers structural equivalents to all characteristics of objects, events, relations. The variety of available visual shapes is as great as that of possible speech sounds, but what matters is that they can be organized

according to readily definable patterns, of which the geometrical shapes are the most tangible illustration. The principal virtue of the visual medium is that of representing shapes in two-dimensional and three-dimensional space, as compared with the one-dimensional sequence of verbal language. This polydimensional space not only yields good thought models of physical objects or events, it also represents isomorphically the dimensions needed for theoretical reasoning.

The histories of languages show that words which do not seem now to refer to direct perceptual experience did so originally. Many of them are still recognizably figurative. Profundity of mind, for example, is named in English by a word that contains the Latin *fundus*, i.e., bottom. The "depth" of a well and "depth" of thought are described by the same word even today, and S. E. Asch has shown in a study on the metaphor that this sort of "naive physics" is found in the figurative speech of the most divergent languages.[5]

The universal verbal habit reflects, of course, the psychological process by which the concepts describing "nonperceptual" facts derive from perceptual ones. The notion of the depth of thought is derived from physical depth; what is more, depth is not merely a convenient metaphor to describe the mental phenomenon but the only possible way of even conceiving of that notion. Mental depth is not thinkable without an awareness of physical depth. Hence the figurative quality of all theoretical speech, of which Whorf gives telling examples:

> I "grasp" the "thread" of another's arguments, but if its "level" is "over my head" my attention may "wander" and "lose touch" with the "drift" of it, so that when he "comes" to his "point" we differ "widely," our "views" being indeed so "far apart" that the "things" he says "appear" "much" too arbitrary, or even "a lot" of nonsense![6]

Actually, Whorf is much too economical with his quotation marks, because the rest of his words, including the prepositions and conjunctions, derive their meanings from perceptual origins also. Of course, the non-visual senses contribute their share to making nonperceptual things thinkable. An argument may be sharp-edged or impenetrable; theories may harmonize or be in discord with each other; a political situation may be tense; and the stench of corruption may characterize an evil regime. Man can confidently rely on the senses to supply

him with the perceptual equivalents of all theoretical notions because these notions derive from sensory experience in the first place. To put it more sharply: human thinking cannot go beyond the patterns suppliable by the human senses.

Language, then, argues loudly in favor of the contention that thinking takes place in the realm of the senses. If so, what have words themselves to contribute? . . .

The Imagery of Logical Links

Language turns out to be a perceptual medium of sounds or signs which, by itself, can give shape to very few elements of thought. For the rest it has to refer to imagery in some other medium. Obviously, this must hold true for all the parts of verbal statements, not just for some; they all need a mental realm to exist in. What about concepts that do not refer to physically tangible things? It is easy to think of images representing "house" or "struggle" or even relations between physical objects, such as "larger than" or "included among." But what about "if, because, like, although, either-or"? These are conjunctions and prepositions mentioned by Freud for a very similar purpose. Being concerned with the so-called dream work, which has to give sensory appearance to the underlying dream thoughts, Freud raises the question of how the important logical links of reasoning can be represented in images.[7] An analogous problem, he says, exists for the visual arts. There are indeed parallels between dream images and those created in art on the one hand and the mental images serving as the vehicle of thought on the other; but by noting the resemblance one also becomes aware of the differences, and these can help to characterize thought imagery more precisely.

The principal difference is that thought imagery, in order to fulfil its function, must embody all the aspects of a piece of reasoning since this imagery is the medium in which the thought takes shape. A dream or a painting, on the other hand, is a product of thoughts, which an observer can try to extract from the image by interpretation. A dream can suggest, Freud tells us, that one fact is the cause of another by simply making the episodes follow each other in time. In doing so, however, the dream does not express the casual relation; it merely implies it, just as the English language often omits the logical links and simply suggests the relation by sequence, thus leaving the

reader with the task of supplying the connections. This is not possible in thought imagery. What is not given shape is not there and cannot be supplied from elsewhere.

If a dream depicts resemblance, identification, or comparison by fusing the images of several things into one it creates a contradiction between what is shown and what is meant and thereby poses a puzzle. In thought imagery, such a contradiction would be self-defeating. Similarly, if Raphael,[8] to use Freud's example, assembles on a mountain top or in a hall philosophers or poets who never met, he shows a geographical community and leaves it to the beholder to understand that these men belong together only in thought, not in space and time. Minotaur and centaur symbolize the meeting of beastly and human nature only for the interpreting spectator; as images they show two species of a fantastic zoology and nothing more.

Thought imagery achieves what dreams and paintings do not because it can combine different and separate levels of abstractness in one sensory situation. To repeat my example, it can leave the images of the empirical figures of Alexander and Napoleon unrelated in time and space as the historical facts demand it, and overlay this level or imagery with the more abstract one of "greater than," thereby connecting the two components of the thought without letting them blur each other.

It is not difficult to become aware of the kind of spatial action to which conjunctions and prepositions point. Since they are theoretical relations they are best represented by highly abstract, topological shapes. The barrier character of "but" is quite different from "although," which does not stop the flow of action but merely burdens it with a complication. Causal relations, as Michotte's experiments have shown,[9] are directly perceivable actions; therefore "because" introduces an effectuating agent, which pushes things along. How different is the victorious overcoming of a hurdle conjured up by "in spite of" from the oscillation of displacement in "either-or" or "instead"; and how different is the stable attachment of "with" or "of" from the belligerent "against."

Language Overrated

. . . At best, the relation of words to their meanings is precarious. Being stable and permanent signs, words suggest that their meanings

are equally permanent. This, however, is obviously not so, although Susanne K. Langer maintains that one of the salient characteristics of true language is that its elements are words with fixed meanings.[10] Actually, words have different connotations in different contexts and for different individuals or groups. As a currency of thought they are hardly more reliable than coins would be if their value changed unpredictably from hour to hour, from person to person. Philosophers and scientists constantly struggle with the verbal shells which they must use to package their thoughts for preservation and communication. Should they keep a familiar term and try to invest it with a new meaning, at the risk of seeming to use a concept they have abandoned? Should they coin a new term? All this trouble arrives because words, as mere labels, try to keep up with the live action of thought taking place in another medium. "The birth of a new concept," says Sapir, "is invariably foreshadowed by a more or less strained or extended use of old linguistic material."[11] This strain of birth exists primarily in the medium of thought itself. It comes about because the structure of the matter under scrutiny, to which the mind clings, is put under stress by the new, more appropriate structure imposing itself. The struggle against the old words is only a reflection of the true drama going on in thought. To see things in a new light is a genuine cognitive challenge; to adjust the language to the new insight is nothing more than a bothersome technicality. Eric Lenneberg has stressed this point by asserting that "words tag the processes by which the species deals cognitively with its environment."[12] Since these processes involve constant change, the referents of words cannot be said to be fixed.

The Effect of Linearity

Intellectual thinking, I said earlier, strings perceptual concepts in linear succession. Caught in a four-dimensional world of sequence and spatial simultaneity, the mind operates, on the one hand, intuitively by apprehending the products of freely interacting field forces; on the other hand, it cuts one-dimensional paths through the spatial landscape intellectually. Intellectual thinking dismantles the simultaneity of spatial structure. It also transforms all linear relations into one-directional successions—the sort of event we represent by an arrow. Equality, for example, which can be a state of symmetrical

interaction between two entities to the eye—twins sitting on a bench—is transformed by intellectual thinking into the sequential event of one thing equating itself with another. An equation is first of all a statement about a one-dimensional operation of one thing upon another; only secondary contemplation can transform it into an image of symmetrical coexistence.

Verbal language is a one-dimensional string of words because it is used by intellectual thinking to label sequences of concepts. The verbal medium as such is not necessarily linear. Artistically, several strings of words can be used at the same time, for example, in duets or quartets of opera. In fact, verbal sequences can be made entirely unlinear when a group of speakers, performing simultaneously, shout isolated words at irregular intervals. Words can also be distributed freely over a painting or a book page, as in "concrete poetry".

Language is used linearly because each word or cluster of words stands for an intellectual concept, and such concepts can be combined only in succession. Since words are not pictures but only signs, the spatial relation involved in the statement "Cherries on trees" cannot be depicted in the verbal phrase, which is a mere enumeration of three concepts: cherries, on, and trees. Similarly, language can describe action only by nonaction. Susanne K. Langer has put it well:

> The transformation which facts undergo when they are rendered as propositions is that the relations in them are turned into something like *objects*. Thus, "A killed B" tells of a *way* in which A and B were unfortunately combined; but our only means of expressing this way is to name it, and presto!—a new entity, "killing," seems to have added itself to the complex of A and B. The event which is "pictured" in the proposition undoubtedly involved a *succession* of acts by A and B, but not the succession which the proposition seems to exhibit—first A, then "killing," then B. Surely A and B were simultaneous with each other and with the killing. But words have a linear, discrete, successive order; they are strung one after another like beads on a rosary. . . .[13]

The examples show that the sequences of intellectual concepts which language presents are often statements about an intuitively perceived situation and can serve to reconstruct that situation. The phrase "Cherries on trees" was derived by the speaker or writer from the spatial image of an orchard and can be used to conjure up a similar scene in the listener or reader. "A killed B" can evoke a scene of

murderous action. In such examples, language serves as a bridge between image and image. However, the linear nature of the connecting medium is not without effect on the images it suggests. Although the image can supply the action that cannot be directly depicted by words, that evoked action tends to remain linear. For example, simultaneous interaction cannot be described in speech directly, and the effect of such interaction is difficult to convey by words. The classical discussion of this problem can be found in Lessing's *Laokoön*, a treatise on the limitations of painting and poetry.[14] Lessing argues that painting, concerned with shapes and colors in space, is equipped to deal with objects which coexist in space or whose parts do so: whereas actions, successions in time, are the proper concern of poetry. Painting can depict actions indirectly through bodies, and poetry can describe bodies indirectly through actions. If poetry—and this includes all language—undertakes instead to describe a visual situation by an enumeration of its parts, the mind is often unable to integrate these pieces in the intended image. Instead of citing Lessing's own examples, I will take one from the letters of Georg Christoph Lichtenberg, who, having gone to the theatre in London, attempted to describe to a German friend how David Garrick performed Hamlet's reaction to the appearance of his father's ghost:

> Garrick, upon these words, throws himself suddenly around and in the same moment falls two or three steps backward with collapsing knees. His hat drops to the floor; both arms, especially the left, are almost completely extended, the hand is at the level of the head, the right arm more bent than the left and the right hand lower; the fingers are spread out, and the mouth is open. Thus he stops, as though petrified, in a large but not excessive step, supported by his friends, who are better acquainted with the apparition and who fear he may fall. In his face horror is expressed in such a way that dread overcame me repeatedly even before he began to speak.[15]

This transcript by enumeration is unlikely to reconstruct in many minds the image Lichtenberg saw. Therefore writers, relying intuitively on the principle which Lessing formulated in theory, tend to describe what is by what happens. They introduce the static inventory of a scene on the wings of action. This device performs the task of describing a situation by means congenial to language. It traces linear connections across the state of affairs and presents each of

these partial relations as a one-dimensional sequence of events. More importantly, it presents these sequences in a meaningful order, starting perhaps with a particularly significant or evocative detail and making the facets of the situation follow each other as though they were the steps of an argument. The description of the scene becomes an interpretation. The writer uses the idiosyncrasies of his medium to guide the reader through a scene, just as a film can move the spectator from detail to detail and thereby reveal a situation by a controlled sequence. This technique is particularly evident and effective in the very first sentences of a piece of fiction, in which the narrator calls up the introductory scene from nothingness by a series of select strokes. The first sentences of Henry James' *The Turn of the Screw* are a masterly example. As a less familiar illustration I will insert here the beginning of Albert Camus' story, *The Adulterous Woman*.

A housefly had been circling for the last few minutes in the bus, though the windows were closed. An odd sight here, it had been silently flying back and forth on tired wings. Janine lost track of it, then saw it light on her husband's motionless hand. The weather was cold. The fly shuddered with each gust of sandy wind that scratched against the windows. In the meager light of the winter morning, with a great fracas of sheet metal and axles, the vehicle was rolling, pitching, and making hardly any progress. Janine looked at her husband. With wisps of graying hair growing low on a narrow forehead, a broad nose, a flabby mouth. Marcel looked like a pouting faun. At each hollow in the pavement she felt him jostle against her. Then his heavy torso would slump back on his widespread legs and he would become inert again and absent, with vacant stare. Nothing about him seemed active but his thick hairless hands, made even shorter by the flannel underwear extending below his cuffs and covering his wrists. His hands were holding so tight to a little canvas suitcase set between his knees that they appeared not to feel the fly's halting progress.[16]

In the empty cloud chamber of the reader's mind appears the one-dimensional track of the insect's flight, pacing the narrow dimensions of the bus and animating the static hollow space with action. The wind is introduced not as an item of the scene's inventory but by the effect it makes. Constant features of the situation, such as the cold air, enter the stage at an appropriate point of the sequence, like an actor obeying his cue. A continuous action, such as the exploits of the

fly, can be given three separate appearances, for three different purposes: the pacing of the confined space, the discovery of the contrastingly motionless hand, the demonstration of the man's insensitivity to touch. By selecting a few significant features and by describing them with a purposeful stress on some of their qualities, the writer presents the abstract, dynamic components of his plot: the frantic struggle against confining walls, an observant woman, a man moved by nothing but his sense of possession, contact without communication, chill, a clumsy locomotion without progress, burdensome weight. Here then the perceptual evocation of a stationary situation is channeled into controlled scanning. This is obtained by imposing upon the potentially two-dimensional or three-dimensional medium of visual imagery the one-dimensional medium of language. Language forces the referents of the verbal statements into a sequence by acting as a kind of template.[17]

Needless to say, such a sequence of statements can serve at the same time to build up the whole stationary situation gradually, as brush strokes build up a painting. But one needs only to compare the effect of a painting on a somewhat similar subject, perhaps Daumier's *Third Class Carriage*,[18] with the visual experience produced by Camus' narration to grasp the fundamental difference.

A pictorial image presents itself whole, in simultaneity. A successful literary image grows through what one might call accretion by amendment. Each word, each statement, is amended by the next into something closer to the intended total meaning. . . .

Since any verbal concept is committed to one of its particular aspects by the proposition, definition, or other context in which it is used, its visual nature is not different in principle from pictorial representation in drawing and painting. True, the part of the concept which the eyes can see directly is limited in verbal representation to an almost totally arbitrary sign or complex of signs whereas the visible picture contains more elements of portrayal. But there is only a difference of degree between the verbal concept *reclining nude* and a particular piece of sculpture representing that subject. Both percepts, the words and the bronze, are hung with mental associations beyond what is directly perceived. The statue, being much more specific, restricts the range of pertinent connotations more severely. It is much less adaptable.

One cannot take pictures or pieces of pictures and put them together to produce new statements as easily as one can combine words or ideographs. Pictorial montages show their seams, whereas the images produced by words fuse into unified wholes. The shapes and color patterns of visual art form the particular image that constitutes the statement. The shapes of verbal language are tooled for the mass evocation of images, whose individuality is induced indirectly by the combination of the standardized labels.

1. *Language* (New York: Harcourt Brace, 1921), p. 15.
2. *Words and Things* (New York: Free Press, 1958), p. 268.
3. *Philosophische Untersuchungen* (Frankfurt a.M.: Suhrkamp, 1967) (*Philosophical Investigations*, Oxford: Blackwell, 1953), Part I, 650.
4. Immanuel Kant, *Kritik der reinen Vernunft*, Introduction, section 4.
5. "The Metaphor: A Psychological Inquiry," in Mary Henle (ed.), *Documents of Gestalt Psychology* (Berkeley and Los Angeles: University of California Press, 1961), pp. 324–333.
6. *Language, Thought, and Reality* (Cambridge: M.I.T. Press, 1956), p. 146.
7. Sigmund Freud, *Die Traumdeutunf* (Leipzig and Vienna: Deuticke, 1922) (*The Interpretation of Dreams*, London: Allen and Unwin, 1954), Chapter 6, Section c.
8. Raphael, *The School of Athens* and *Parnassus* (1508–11) are in the Stanza della Segnatura in the Vatican.
9. A. Michotte, *La Perception de la Causalite* (Louvain: Institut Superieur de Philosophie, 1946) (*The Perception of Causality*, New York: Basic Books, 1963).
10. *Philosophy in a New Key* (Cambridge: Harvard University Press, 1960), Chapter 5.
11. *Language*, p. 17.
12. *Biological Foundations of Language* (New York: Wiley, 1967), p. 334.
13. *Philosophy in a New Key*, p. 80.
14. Gotthold Lessing, *Laokoon oder Ueber die Grenzen der Malerei und Poesie*, Lessings Werke, Volume V (Leipzig: Goschen, 1887(*Laocoon*, Boston: Little Brown, 1910), esp. section 16.
15. *Briefe aus England*, letter to Heinrich Christian Boie, dated October 1, 1775.
16. In *L'exil et le Royaume* (Paris: Gallimard, 1957) (*Exile and the Kingdom*, New York: Knopf, 1958).
17. Rudolf Arnheim, *Radio* (London: Faber and Faber, 1936), Chapter 7.
18. Honoré Daumier's painting, *Un Wagon de Troisienne Classe* (*ca.* 1861), is in the Metropolitan Museum of Art, New York.

This article has been excerpted from Dr. Rudolf Arnheim's book *Visual Thinking* (Berkeley & Los Angeles: University of California Press, 1969) and is reprinted by kind permission of the author and publisher.

Broken Scripts and the Classification of Typefaces

Gerrit Noordzij

Current systems of typeface classification are fundamentally useless as they isolate type from other renderings of handwriting. Typeface design can only be understood in its relation to handwriting. The German classification system (DIN 16 518) is analyzed, and a binary classification system is suggested—not of type only, but of writing generally. Broken type is not more German than other derivatives of the roman alphabet; its isolation has done much damage to German type design and typography.

This article has its original cause in Walter Plata, *Schätze der Typography, gebrochene Schriften* (Frankfurt on Main: Polygraph Verlag, 1968, 96 pages). Three articles by Walter Plata and the reactions of seventeen other German authors are collected in this book on broken type and its application. The contributors differ in their evaluation of broken type, but they agree in the presumption that broken type should be German heritage and that it could be regarded as opposed to roman type according to the German classification of typefaces DIN 16 518.

The book shows about twenty typefaces of the discussed class in text and display, and there are lists with many other typefaces available for hand- and machine-composition. These features alone make the book a valuable source of information on the subject of broken type.

Rather than entering the discussion, it will be my concern here to examine the said presumption, which is generally accepted—and not only in Germany as we can learn from the following quotations:

"It was the penetration of western Europe by the spirit of humanism that brought about the victory of 'roman' and 'italic' types; and it was the resistance to the spirit of humanism that made the Germans, Russians, and Turks cling to the isolationalism of Fraktur, Cyrillic,