to be regarded properly as the titles given at any moment by a particular group to the arguments that it finds most convincing, the assumptions that it questions least, and the paradigms that it follows in defining what counts as knowledge. Consequently, logic is indistinguishable from argument and knowledge is inseparable from rhetoric: As in the subversion Plato feared, knowledge is not conveyed but *produced* by rhetoric. Furthermore, knowledge must be inseparable from the group or community, its material circumstances, its historical conditions, its forms of discourse, and its agenda of self-preservation, replication, and extension.

But what of the evils of rhetoric? Must we now accept that the beliefs of racists, warmongers, and unjust societies are true and unassailable, as good as the truths offered by anyone else? Isn't this substituting persuasion for truth? Perelman and Olbrechts-Tyteca (1958/1969) offer an answer to these questions in the conclusion of *The New Rhetoric*, their massive study of argumentation. Many arguments, they point out, rest on the claim that they are self-evidently true or that they are consonant with the natural order or that they transcend history and culture. This claim is both false and dangerous. There is no knowledge that could possibly be "identical in all normally constituted minds, independently of social and historical circumstances" (Perelman & Olbrechts-Tyteca, 1958/1969, p. 510). Therefore, claims of self-evident or transcendent truth serve to obscure the fact that all such "truths" are in fact convictions based on arguments and thereby "withdraw them beyond the realm of discussion and argumentation" (p. 510). Thus, ironically, Plato's philosophy of ideal truth helps to maintain the dangerous belief that some ideas may be absolutely true and others false. Perelman and Olbrechts-Tyteca (1958/1969) reject all claims to absolute truth in favor of argumentation: "It is because of the possibility of argumentation which provides reasons, but not compelling reasons, that it is possible to escape the dilemma: adherence to an objectively and universally valid truth, or recourse to suggestion and violence to secure acceptance for our opinions and decisions" (p. 514). The truth is not found but made; it is never unassailable; its genesis is to be investigated in the arguments that have established it, in the purposes it serves, in the power it confers. This, I believe, is the strongest and most valuable form that the social view of communication can take. The rhetorical view of knowledge that underlies the social perspective in communication is, finally, a critique of the ways that knowledge is created and the purposes for which it is used.

INTERPRETATION

3

Ideology and the Map: Toward a Postmodern Visual Design Practice

BEN F. BARTON
MARTHALEE S. BARTON

Introduction

In their multidisciplinary review of trends in visual representation, Barton and Barton (1989) document a shift in the literature from a positivistic view of visuals as autonomous structures to a view of visuals as embodiments of cultural and disciplinary conventions. Attacks on positivism in the literature on visual representation are, in fact, now endoxal. It is clearly time for the theoretical science of the visual signifier to move on. But move on to what? Information designer Sless (1986) offers an attractive suggestion: He issues a call to go beyond the study of visuals as embodiments of cultural conventions to the study of the ideologies that,

AUTHORS' NOTE: The authors gratefully acknowledge their debt to Brenda Sims, who suggested numerous improvements incorporated in the final draft of this chapter.

in turn, inevitably underlie those conventions. This chapter attempts to answer that call. It elects, moreover, to look at ideology in a *critical* sense, adopting the rationale of social theorist Giddens (1987):

> We can only develop a viable notion of ideology if we either treat the notion as a "neutral" concept; or alternatively if we link it specifically with exploitative domination. The first tactic seems to me essentially uninteresting, because then "ideology" is no different from general descriptive terms such as "idea-system" or "symbolic system." I therefore prefer to adopt the second sense. According to such a standpoint, modes of signification are ideological when they are pressed in the service of sectional interests via the use of power. (p. 270)

Thus a critical study of the ideology of visuals focuses on the ways in which visual signification serves to sustain relations of domination. Moreover, as Giddens notes, ideology performs such service with a Janus face —it privileges or legitimates certain meaning systems but at the same time dissimulates the fact of such privileging. This double nature of ideology provides the impetus for many of those interested in cultural criticism. For Marxist critic S. Hall (1982), for example, the ideological model of power entails

> a way of representing the order of things which endow[s] its limiting perspectives with that natural or divine inevitability which makes them appear universal, natural and coterminous with "reality" itself. This movement—towards the winning of a universal validity and legitimacy for accounts of the world which are partial and particular, and towards the grounding of these particular constructions in the taken-for-grantedness of "the real"—is indeed the characteristic and defining mechanism of "the ideological." (p. 65)

The Map as Quintessentially Ideological

The double nature of ideology in the advertising image has been widely recognized, but the very recognition of its dissimulative nature is its own undoing. For to do its work, ideology depends on its dissimulative nature not being recognized. In this sense, advertising is *not* ideological, for the interpretive tradition is not on its side in its claims of innocence (W. Mitchell, 1987, p. 4). What form *is* quintessentially

ideological in this sense? What form, in other words, is traditionally viewed as realistically presenting a "neutral" view of reality, as innocent of a productive, meaning-creative practice? Huck Finn makes a persuasive case for the *map:*

> "If we was going so fast we ought to be past Illinois, oughtn't we?"
> "Certainly."
> "Well, we ain't."
> "What's the reason we ain't?"
> "I know by the color. We're right over Illinois yet. And you can see for yourself that Indiana ain't in sight."
> "I wonder what's the matter with you, Huck. You know by the *color*?"
> "Yes, of course I do."
> "What's the color got to do with it?"
> "It's got everything to do with it. Illinois is green, Indiana is pink. You show me any pink down here, if you can. No, sir; it's green."
> "Indiana *pink*? Why, what a lie!"
> "It ain't no lie; I've seen it on the map, and it's pink." (Twain, 1924, p. 23)

Huck clearly reads the map as a factual rather than a semiological system: that Indiana is pink "ain't no lie." For Huck, the color of the state as represented in the map and the color of the state itself must coincide, for the signifier and the signified have a *natural* rather than a *conventional* relationship.

In Borgès's (1972) justly celebrated parable of mapping practice in a mythical empire, *scale* rather than *color* discrepancy between signifier (a map of the empire) and signified (the empire itself) is perceived intolerantly by the College of Cartographers:

> In that Empire, the craft of Cartography attained such Perfection that the Map of a Single province covered the space of an entire City, and the Map of the Empire itself an entire Province. In the course of Time, these Extensive maps were found somehow wanting, and so the College of Cartographers evolved a Map of the Empire that was of the same Scale as the Empire and that coincided with it point for point. (p. 141)

The Imperial Cartographers clearly share Huck's innocent notion of the map as a factual rather than a semiological system. But the map, as Borgès's continuation of the parable dramatizes, is not coterminous with the reality, and attempts to make or conceive it so are doomed to failure. Unfortunately for the professional cartographers, it remained for succeeding, lay generations to "deconstruct" the innocence of such maps—and on other than a conceptual level at that:

> Less attentive to the Study of Cartography, succeeding Generations came to judge a map of such Magnitude cumbersome, and, not without Irreverence, they abandoned it to the Rigors of sun and Rain. In the western Deserts, tattered Fragments of the Map are still to be found, Sheltering an occasional Beast or beggar; in the whole Nation, no other relic is left of the Discipline of Geography. (Borgès, 1972, p. 141)

In short, "the map is *not* the territory" (Hayakawa, 1941, p. 31); yet because it is perceived as such so readily, it is for Borgès the paradigm of the sign. And although we don't believe that Indiana is pink, and would expect cartographic representations of the empire to be radically scaled, our everyday discourse nevertheless reflects our acceptance of Twain's and Borgès's fictional recognitions of the map as the paradigm of the sign. Semiotician Marin (1980) frames the point like this: "The map . . . is exemplarily the sign and the idea one has of it: thus one says spontaneously and unhesitatingly . . . of a map of Italy 'That's Italy' " (p. 47; authors' translation). Or, one might add, of a map of Indiana "That's Indiana" and of a map of the empire "That's the empire." Most signs are treated less paradigmatically: Thus we spontaneously say "That's a diagram of the circuit" and not "That's the circuit."

Still, to establish the map as a quintessentially ideological genre does not necessarily validate its centrality in an article written by and targeted to information designers. That is, our institutional and intellectual affiliations are not with departments of geography, and we probably do not feel threatened by the fact that the failure of Borgès's College of Cartographers to deconstruct the map led to the demise of their discipline. We may, then, find warrant in the perceived general importance of the map to contemporary information designers, however unconcerned they may be with ideological issues. Bertin (1983), for example, focuses on the map in his seminal work *Semiology of Graphics*. Note also Tufte's (1990) privileging of the map as an exemplary genre for those interested in the visual display of information: "Standards of excellence for information design are set by *high quality maps*" (p. 35). And elsewhere: "The most extensive data maps, such as the cancer atlas and the count of the galaxies, place millions of bits of information on a single

page before our eyes. No other method for the display of statistical information is so powerful" (Tufte, 1983, p. 26).

Let us turn to an analysis of the relation between ideology and power in mapping practices—specifically to an analysis of a discursive mode that, in Barthes's (1970) term, *naturalizes* and universalizes a set of practices so that the phenomenon represented appears to be described rather than constructed (p. 129). We first denaturalize the natural by foregrounding the occulted or naturalized ideological component of map discourse; in other words, we access the *doxa*, which theorist Bourdieu (1977) refers to as "the universe of the undiscussed" (p. 168). We then propose a new visual design practice exploiting avant-garde representational devices for denaturalizing the represented phenomenon, e.g., the collage with its emphasis on the heterogeneity and discontinuity of representational format. Although we take the map as paradigmatic, our discussion of a postmodern visual design practice systematically includes noncartographic examples to suggest more fully the relevance of our analysis to other visual genres. Ultimately, the map in particular and, by implication, visual representations in general are seen as complicit with social-control mechanisms inextricably linked to power and authority.

Denaturalization of the Natural

How do we, as critics, denaturalize the natural? The notion of *hegemony*, derived from the Italian Marxist Gramsci (1971), suggests a promising methodology. According to Marxist literary critic Williams (1973), hegemony—a process by which certain definitions of reality attain dominance in a society, rather than a conspiracy on the part of the ruling group and a passive compliance by the dominated ones—operates in a dual mode: Thus in the hegemonic process "certain meanings and practices are chosen for emphasis, certain other meanings and practices are neglected and excluded, . . . reinterpreted, diluted, or put into forms which support or at least do not contradict other elements within the effective dominant culture" (p. 9). Hence we look first at what is emphasized and then at what is excluded or repressed, at what we will term the *rules of inclusion* and then at the *rules of exclusion* underlying the dual mode in which ideology operates.

Rules of Inclusion

Rules of inclusion determine whether something is mapped, what aspects of a thing are mapped, and what representational strategies and devices are used to map those aspects. These rules amount to either explicit or implicit, overt or covert, claims to power. An explicit or overt link between power and ideology in mapping can be seen in the indispensability of maps for the conduct of war. According to Emmerson (1984): "Making war meant making maps. The National Geographic Society made them in unprecedented numbers, nearly twenty million in 1941-1942" (p. 7). We are not surprised, therefore, to learn from the president of the American Cartographic Society that the circulation of maps of the Middle East increased ten-fold in the United States after the wholesale movement of American troops into the region (National Broadcasting Company, 1990). The Americans were not alone in map-making endeavors: Shortly after the Iraqis invaded Kuwait in 1990, their Ministry of Information reportedly published a flurry of Middle East maps (Colvin, 1990, p. 32).

Such overt linkages of maps to power require little denaturalization and, therefore, are of only passing concern in this chapter. Of more interest here is the fact that the Iraqi maps feature Kuwait as the 19th province of Iraq, as it was before the British split it off after World War I (Colvin, 1990, p. 32). For the implicit agenda, the "real uses of most maps," as Wood and Fels (1986) point out, are "to possess and to claim, to legitimate and to name" (p. 72) or, as in the case of the Iraqi maps, to repossess and to reclaim. Giddens (1979) would agree: For him, the legitimation of dominant interests is one of the primary modes in which ideology operates and, therefore, one of the chief concerns of the student of ideology (p. 188). The conclusion of Helgerson's (1986) study of the mapping practices of English Renaissance cartographers reflects this perspective: "The choice they made, the choice of what to study and describe, was, however little sense they may have had of its broader implications, a choice of one system of authority, one source of legitimacy, over another" (p. 58). Such choices, moreover, are not confined to inclusions that legitimate or empower the dominant interests: they may also entail inclusions that *disempower* "the Other." In her study of 17th-century Dutch mapping practice, Alpers (1983) notes the claim by Dutch cartographers Braun and Hogenberg that human "figures were included in their city views to prevent the Turks—whose

religion forbade them to use an image with human figures—from using them for their own military ends" (p. 133).

Rules of inclusion determine, moreover, not only what phenomena are mapped but also which aspects of the included phenomena are represented. Barthes (1970) notes, for example, that the *Hachette World Guide,* dubbed the "*Guide bleu*" by the French, "hardly knows the existence of scenery except under the guise of the picturesque, . . . found any time the ground is uneven" (p. 74). In Barthes's deconstruction, this inclusionary rule is interpreted as the "bourgeois promoting of the mountains," as a manifestation of the desire to legitimate "Helvetico-Protestant morality"—a morality linked to difficulty and solitude (p. 74). Consider, too, the issue of inclusionary rules informing the city feature map. The map must isolate key iconic features to symbolize the city, but which ones? A cursory survey of such maps reveals a focus on icons representing cultural, recreational, civic, and commercial sites. For graphic designer Trieb (1980), the rules of inclusion are clear: The feature map focuses only on what is "positive and desirable"; it manifests an "optimist world view" in its attempt to create "a 'booster' image so positive and intriguing that it will draw visitors" (p. 19). One strongly suspects that the bourgeois morality legitimated by the feature map is not the Helvetico-Protestantism legitimated by the *Guide bleu—la difficulté vaincue en solitude*—but rather the more self-indulgent morality of capitalist consumerism. Note, however, that the fundamental ideological mechanism—the legitimation of hegemonic interests—remains the same, although the particular Marxist mediating code linking the formal elements of a map and its "social ground" may differ (Jameson's term, 1981, p. 39).

Rules of inclusion also determine the strategies and formal devices used to symbolize the aspects of phenomena chosen for representation. Of particular interest here are the representational strategies used to legitimate dominant interests. The primary legitimating strategy is based on the hierarchization of space, for space is not perceived isotropically, i.e., as everywhere having equal value (Arnheim, 1974, p. 30). Because space is perceived anisotropically, the placement of visual elements becomes a way of imparting privilege. Positioning to privilege may be effected in various ways. Privileging through *centering* has not escaped notice in the cartographic literature. Thus Mercator's 15th-century mapping system, still a standard, placed the designer's homeland, Germany, at the center of the map—a Eurocentric strategy quickly adopted across the Continent. Harley's (1988a) generalization of this phenomenon is worth citing in full:

> A universal feature of early world maps, for example, is the way they have been persistently centred on the "navel of the world," as this has been perceived by different societies. This "omphalos syndrome" [Edgerton, 1987, p. 26], where a people believe themselves to be divinely appointed to the centre of the universe, can be traced in maps widely separated in time and space, such as those from Mesopotamia with Babylon at its centre, maps of the Chinese universe centred on China, Greek maps centred on Delphi, Islamic maps centred on Mecca, and those Christian world maps in which Jerusalem is placed as the "true" centre of the world. (p. 290)

Privileging can also be effected through placement on *top*, as seen in the hierarchical representation of organizational structure in charts, whereby administratively higher echelons of personnel are located above the rest. According to Mumby (1988), "the concept of hierarchy has been reified to the point where the structuring of organizations is perceived as 'naturally' occurring from the top down" (p. 88). In fact, given the degree of naturalization of this particular mode of positional enhancement, our readers may be surprised to learn that Australian children often place their continent in the top half of their world maps, i.e., the maps are upside-down for residents of the Northern Hemisphere (Simon, 1987, p. 15).

Finally, privileging is also effected in a series through *ordering*, where the first, and to a lesser extent the last, elements gain distinction. Wood (1987) writes, for example, of the effect of map ordering in *Goode's World Atlas* when nation-states are given "the ontogenetically privileged position of coming first—out in front of a long sequence of maps of the physical environment" (p. 31). Wood obligingly appraises the consequences of this privileging in terms of *naturalization:* "It [privileged positioning] imposes the impression that these nation-states have the same developmental status as landforms and climate, as though the nation-states were just as natural and hence *not* implicatable in any different way from the rains and the winds in the fate of man. It naturalizes the state" (p. 31).

Representational hierarchies, however, need not originate in spatial anisotropy; they may also be traced to other bases of visual saliency—a saliency associated with the legitimation of hegemonic interests. Marin (1988) speaks eloquently to this point in his analysis of a 17th-century map of Paris developed by the king's engineer, Jacques Gamboust:

> The knowledge and science of representation, to demonstrate the truth that its subject declares plainly, flow nonetheless in a social and political hierarchy. The proofs of its "theoretical" truth had to be given, they are the recognizable signs; but the economy of these signs in their disposition on the cartographic plane no longer obeys the rules of the order of geometry and reason but, rather, the norms and values of the order of social and religious tradition. Only the churches and important mansions benefit from natural signs and from the visible rapport they maintain with what they represent. Townhouses and private homes, precisely because they are private and not public, will have the right only to the general and common representation of an arbitrary and institutional sign, the poorest, the most elementary (but maybe, by virtue of this, principal) of geometric elements: the point identically reproduced in bulk. (p. 173)

Here, the saliency observed derives from the fact that bigger things (two-dimensional signs) are more impressive than smaller things (point signs), iconic structures more impressive than noniconic ones, different symbols more impressive than repeated identical ones (Gombrich, 1979, pp. 151-156).

Marin's (1988) analysis suggests, moreover, a second source of rules of inclusion, a source based not, as just discussed, on the norms and values of "the order of social and religious tradition," but rather on those of what he terms "the order of geometry and reason" (p. 173). For rules of inclusion based on the objective order of science may also be viewed as serving sectional—in this case, disciplinary—interests. Wood and Fels (1986) denaturalize the inclusion of conventional scientific visual forms and devices on the map: "It's not just pragmatism or objectivity that dresses the topographic map with reliability diagrams and magnetic error diagrams and multiple referencing grids, or the thematic map with the trappings of F-scaled symbols and psychometrically divided greys. It's the urge to claim the map as a scientific instrument and accrue to it all the mute credibility and faith that this demands" (p. 99). Furthermore, let us focus on just one representational device mentioned by Wood and Fels, namely, the grid. In doing so, we turn our attention, in terms of Gestalt psychology, from the *figure*, already revealed as complicitous, to the *ground*, which may initially seem especially innocent. In fact, to the extent that the background of the map seems particularly innocent, it is an even worthier candidate for denaturalization—and, ultimately, for viewing as complicit with mechanisms linked to power and authority. In the case of the map, the culprits are the rules governing the transformation of a three-dimensional object

Figure 3.1. Sketch Illustrating the Distortions of the Mercator Map
SOURCE: Kaiser (1987, p. 13).

(e.g., the world) into a two-dimensional representation (e.g., a map of the world). The primary transformational device is the projection scheme chosen—a formal device that inevitably introduces distortion and, as Harley (1988a) notes, "can magnify the political import of an image even when no conscious distortion is intended" (pp. 289-290). Reconsider, in this context, the case of the Mercator world map. The Eurocentric Mercator map manifests clear distortions: For example, Russia, with 22 million km^2 of area, looks twice the size of Africa, with 30 million km^2 (Figure 3.1). For Peters (1983), the most vocal critic of the Mercator map, such distortions serve the sectional interests of the white colonialist powers (p. 63).

In any event, whatever projection scheme is chosen for a mapping, the transformation is embodied in the cartographic space as a *grid,* e.g., as lines of equal latitude and longitude, and this too is complicit with mechanisms linked to power and authority. The overlay of this representational device on the mapping surface has been associated by researchers with diverse ideological notions. Edgerton (1987) observes, for example, that by the time of the Renaissance the Ptolemaic cartographic grid had become a talismanic symbol of Christian authority "expressing nothing less than the will of the Almighty to bring all human beings to the worship of Christ under European cultural domination" (p. 12). Similarly, Konvitz (1990) notes the significance of the regularization imposed by the grid in 18th-century French maps:

> Just as national geodetic surveys bearing a minimum of local references lent themselves to an interpretation of space as a fluid medium for the diffusion of power, urban maps which described a street network at the expense of property lines and the architectonic volume of buildings lent themselves to an interpretation of space which emphasized movement and the economic potential of development and growth. (p. 11).

Rules of Exclusion and Repression

Clearly, our discussion of rules of inclusion serving to legitimate dominant interests demands one of rules of exclusion and repression, for "ideology not only expresses but also represses" (J. Thompson, 1984, p. 85). An inclusionary rule such as "centering of the dominant interest," for example, entails the marginalization of nondominant interests. For some social critics, the study of exclusions rather than inclusions is, in fact, paramount. As Belsey (1980) notes:

> Ideology obscures the real conditions of existence by presenting partial truths. It is a set of omissions, gaps rather than lies, smoothing over contradictions, appearing to provide answers to questions which in reality it evades, and masquerading as coherence in the interests of the social relations generated by and necessary to the reproduction of the existing mode of production. (pp. 57-58)

We turn our focus to that which is excluded, that which is repressed. Once again, we begin with explicit rules of exclusion in mapping practices, because "the map that is not made . . . warrants as much attention as the map that is made" (Monmonier, 1982, p. 99). Indeed, if the very decision to map is fraught with ideological implications, as we have already noted, the same can also be said of the decision *not* to map. In Wood and Fels's (1986) formulation, if "to map a state is to assert its territorial expression, to leave it off [is] to deny its existence" (p. 64). While unmade maps have understandably received scant attention in the cartographic literature, restrictions on the publication and dissemination of maps have been widely recognized. Harley (1988b) discusses numerous cases: In Renaissance Portugal, for example, pilots faced the death penalty for giving or selling charts to foreigners (p. 61). Harley (1988a) also provides provocative examples of exclusionary practices at the level of cartographic aspects, including the omission of the locations of nuclear waste dumps from official topographical maps of the United States Geological Survey (p. 289; Monmonier, 1991, pp. 118-122).

Synchronic Perspective

As with the explicit inclusionary rules, explicit exclusionary rules require little denaturalization and, similarly, receive only passing attention here. We turn, then, to implicit exclusionary rules. Prime targets for exclusion are members of the nonhegemonic groups, what is commonly referred to in the critical literature as the Other. In organizational terms, this practice is exemplified in the exclusion of the lower echelons of personnel from organization charts; in class terms, it is exemplified in the exclusion of the lower class from maps. In the latter instance, as Harley (1988b) observes in an analysis of 16th- and 17th-century mapping practices,

> social taxonomy seems to have underlain the silence in European cartography about the majority social class. For map makers, their patrons, and their readers, the underclass did not exist and had no geography, still less was it composed of individuals. . . . The peasantry, the landless labourers, or the urban poor had no place in the social hierarchy and, equally, as a cartographically disenfranchised group, they had no right to representation on the map. (p. 68)

Others consider the exclusion of what may be termed *the otherness of the Other*. Trieb (1990), for example, writes of the exclusion of the *living conditions* of the Other: "Feature maps . . . do not show us what is undesirable. We never see slums, buildings in poor condition, suggestions of danger. The feature map is an optimistic world view, an image which focuses on only the positive aspects of urban, and in some instances, rural life" (p. 19). And Marin (1984), of the exclusion of the *production practices* of the Other: "All the productive and transforming activities have been concealed. The city [17th-century Paris] is not to be read as a workplace. It is, rather, the place of virtue and glory, commerce and exchange" (p. 214).

Moreover, strategies of containment may involve not only exclusions but also repressions (Jameson, 1981, p. 213), and frequently what are repressed are individual differences. Differences can be repressed, for

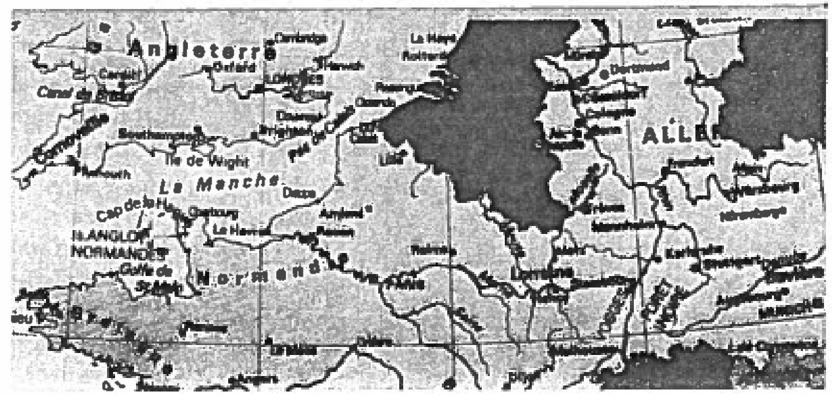

Figure 3.2. French Map of the Channel Region That Employs Exonyms

instance, through the strategy of *typing*. Thus in the *Guide bleu*, "men exist only as 'types' "—a strategy Barthes (1970) decries as a "disease of thinking in essences, which is at the bottom of every bourgeois mythology of man (which is why we come across it so often)" (p. 75). One is reminded, in this connection, of the observation by Marxist critic Williams (1960) that "there are in fact no masses; there are only ways of seeing people as masses" (p. 300).[1]

Differences can also be repressed by naming practices, for naming—the use of a proper name in particular—is "the ultimate signifier of difference, of uniqueness" (Williamson, 1978, p. 51). Earlier, we viewed the labeling of Kuwait as the 19th province of Iraq as an inclusionary act in the service of legitimation of the dominant interest; here we view it obversely as an act of repression of the otherness of the Other, for to label Kuwait as Iraqi Province 19 is to place it in a homogeneous series of Iraqi territories, thereby denying its national autonomy. Consider, too, mapping practices associated with the use of exonyms, that is, "the rendition of geographic names in a language not having official stature in the region in question and which differs from the local rendition" (Ormeling, 1980, p. 332; authors' translation). Thus, for example, international maps designed in the past by French cartographers often designated Germany with the French word *Allemagne* rather than the German *Deutchland* (Figure 3.2). The supplantation of indigenous forms with foreign versions amounts to a repression, by linguistic appropriation, of the otherness of the Other. Recognizing this, the United Nations is committed to suppressing the practice of exonyms on international maps (Ormeling, 1980, p. 333).

Repression of the otherness of the Other also occurs when that Other is situated in a space ethnocentrically conceived to have homogeneous qualities. Consider that one of the first initiatives of the French Revolution "was to devise a rational system of administration through a highly rational and egalitarian division of the French national space into 'departments' " (Harvey, 1989, p. 255; Figure 3.3). Above all, this reform sought in administrative boundaries "the best model to abolish privilege and eliminate precedent" and thereby to achieve "what had eluded an absolute monarchy: the uniform application of law and administration throughout the nation" (Konvitz, 1990, p. 5). However, such changes are never arbitrary, natural, or innocent; rather, they imply a new structure of power (Raffestin, 1980, p. 153).

Diachronic Perspective

Strategies of repression operate, moreover, on more than the synchronic level considered so far. They can also operate on the diachronic level because, although the map as a concrete graphic text is an act of enunciation with ideological dimensions, such an act takes place in a social context and the map is thus also both an act of production and an act of reception. The map, in other words, may be considered as *process* rather than *product*, and strategies of repression take the form of the repression of process in map discourse.

Repression of the Act of Production. Consider first the map as act of production: In this case, strategies of repression can take the form of repression "in some stricter Hegelian sense of the persistence of the older repressed content beneath the later formalized surface" (Jameson, 1981, pp. 213-214). De Certeau (1984) analyzes the progressive repression of the act of production in the map:

> In the course of the period marked by the birth of modern scientific discourse (i.e., from the fifteenth to the seventeenth century) the map has slowly disengaged itself from the itineraries that were the condition of its possibilities. The first medieval maps included only the rectilinear marking out of itineraries (performative indications chiefly concerning pilgrimages), along with the stops one was to make (cities which one was to pass through, spend the night in, pray at, etc.) and distances calculated in hours or in days,

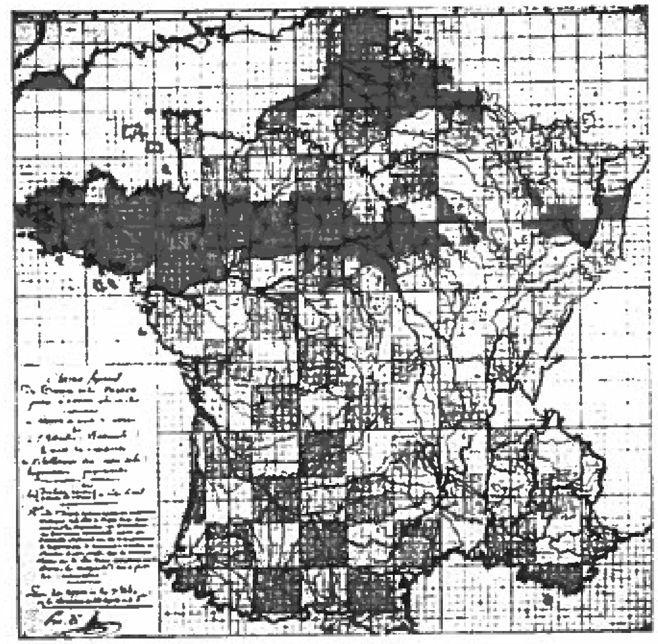

Figure 3.3. Map Used by the National Assembly in Planning the Administration of the First French Republic
SOURCE: Archives Nationales de France, Paris.

> that is, in terms of the time it would take to cover them on foot. Each of these maps was a memorandum prescribing actions. . . . Between the fifteenth and the seventeenth centuries, the map became more autonomous. . . . it colonizes space; it eliminates little by little the pictural figurations of the practices that produce it. (pp. 120-121)

Production practices are now inscribed only in highly sedimented, or vestigial, form.[2] De Certeau speaks of the presence of *narrative* figurations (ships, animals, human figures) that function to indicate the operations underlying the making of the given map. Thus, for example, "the sailing ship painted on the sea indicates the maritime expedition that made it possible to represent the coastlines" (de Certeau, 1984, p. 222). And while de Certeau would prefer a fuller representation of production practices on the map, he clearly appreciates the retention of vestigial forms. However, the presence of even these vestiges of the production act has engendered criticism from other quarters. Information designer Tufte (1990), for example, who shows little appreciation for the ideological dimension of visual discourse, seemingly would remove all such traces of production practices:

> Symbols of Scheiner's patron and religious order decorate those areas without spots in a hundred such diagrams, a reminder of Jonathan Swift's indictment of 17th-century cartographers who substituted embellishment for data:
>
> *With savage pictures fill their gaps,*
> *And o'er unhabitable downs,*
> *Place elephants for want of towns*
>
> These symbols, similar to a modern trademark or logotype, may have served as a seal of validation for the readers of 1630. Today they appear somewhat strident, contradicting nature's rich pattern. (p. 21)

Not surprisingly, the trend toward suppression of the act of production is paralleled in a repression of the *agent* of production. Jacobi and Schiele (1989) note the suppression of the scientist in scientific journals:

> Scientists are never portrayed in primary scientific journals, and it is out of the question to publish photographic portraits. The reason for this is easy to understand: science is enunciated without reference to the enunciator. The author disappears behind an object that seems to speak for itself, or write itself out independently. (p. 750)

The enunciator is equally suppressed in the map. No longer, for example, do we encounter the patron portrait which figured so prominently in the cartographic cartouche of yore. Rarely do we even encounter on the map the name of the designer, much less its prominent placement in the manner of the Minard maps.

Repression of the Act of Reception. Turning from the map as act of production to the map as act of reception, we encounter equally repressive strategies at work. If earlier we viewed the map as the totalization of past itineraries, here we view it as the totalization of all potential itineraries or narrative journeys; the critical question becomes: How is the viewer inscribed in such discourse? or, in Althusserian terms, How

is the concrete individual interpellated as subject? In answer, we consider the influential design of the critically acclaimed London Underground Diagram (LUD). There, as in routing diagrams generally, the viewer is interpellated not as a concrete individual with a specific potential itinerary in mind, but rather as a contemplative observer—the master of abstract possibilities—and while she might appear to be empowered through ascription of an Olympian perspective, such empowerment is illusory: As a specific user with concrete travel needs, she is relatively unempowered.

What goals are served by the ascription of such an Olympian perspective? To answer this question, we must consider the representational strategies of the LUD in more detail. These strategies are particularly clear when viewed from a historical perspective. The LUD has as a forebear the underground (subway) map in use in 1924, which faithfully presented geographic relations among the many stations (Figure 3.4). In consequence, the individual lines appear to meander and the portion of the diagram devoted to central London is seriously congested. This map is, moreover, in the nature of a palimpsest in that the origins of the underground as a multiplicity of independent, uncoordinated enterprises and facilities are readily detected. In contrast, a recent LUD, based on a design by engineering draftsman Beck, is ostensibly a highly schematized representation of the system that sacrifices geographic accuracy in the interests of both readability and consonance with experience (Figure 3.5).

Thus the LUD distorts not only by representing the individual lines with graphical elements oriented either vertically, horizontally, or diagonally but also by comparatively outsizing the central region, with the overall impression of a rather homogeneous structure when judged from apparent separations between stations. Katz (1988) rationalizes this homogenization on the basis that "experientially, the distance between stops is the same: the rapid transit experience is measured in stops not time or distance. . . . The scale adjustment, or shift, in the [LUD] is 10 times—an inch in the country equals ten times the distance in the city" (p. 2). Moreover, in another homogenization, the use of standard symbols to represent stations masks the considerable physical differences among them.

Many critics have lauded the resulting clarity and intelligibility of the LUD (Arnheim, 1974, p. 159; Garland, 1969, p. 79; Katz, 1988, p. 2; Walker, 1979, p. 2). But the clarity is deceptive; it is attained, as we have shown, at the cost of considerable distortion. More important here,

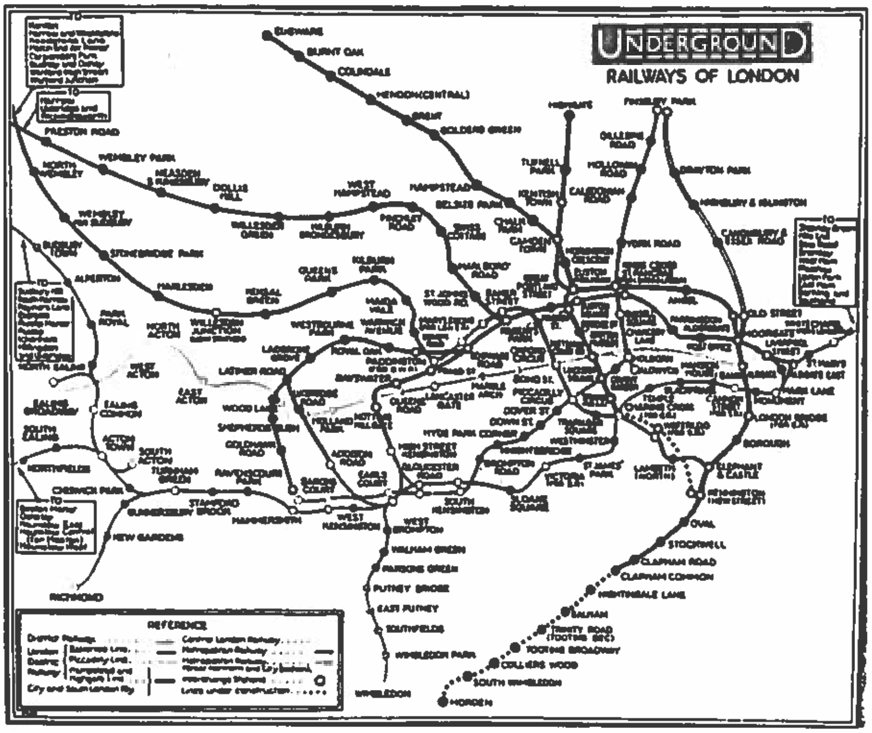

Figure 3.4. London Underground Map of 1924 Showing Stations in Geographically Correct Relations
SOURCE: London Transport.

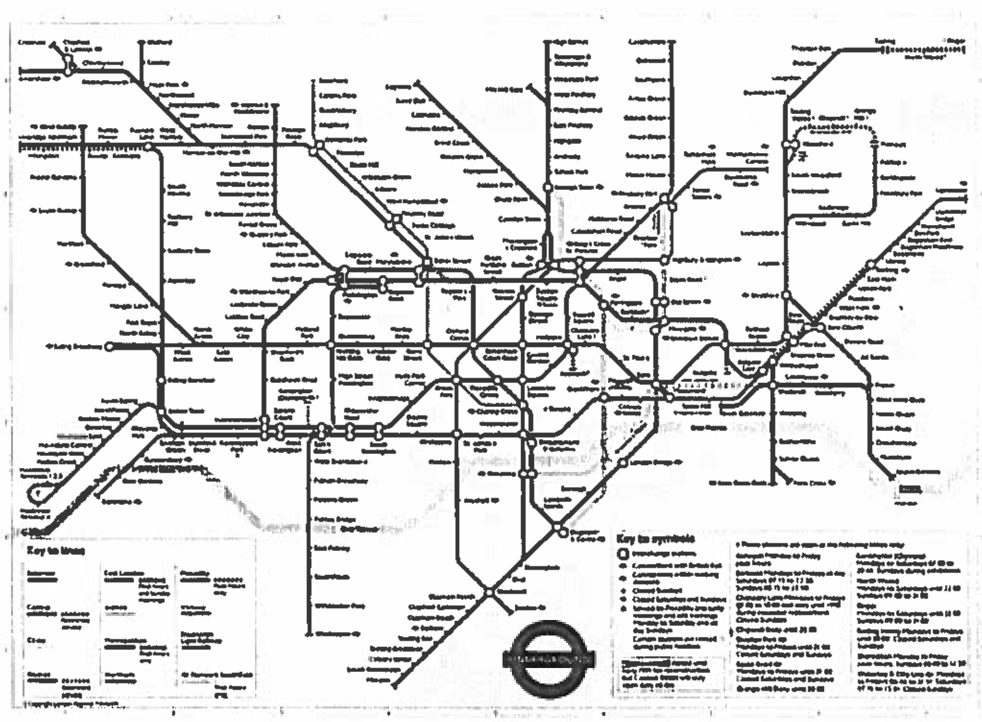

Figure 3.5. Recent London Underground Diagram
SOURCE: London Transport.

however, it is attained at the cost of considerable dissimulation. Dissimulation of what? And dissimulation to what end? In effect, Trieb (1980) answers the first question: "Due to the powerful effect of the underground map, many visitors sense the structure of urban London as the structure of the underground. . . . The diagrammatic structure of the underground map is clear, articulate, and legible—all the things that London as a city is not" (p. 15). For an answer to the second question—dissimulation to what end?—we recall Barthes's (1970) association of visual discourse with the mythological discourses of the bourgeois class, especially those seen to foster nationalism and the fetishization of commodities (p. 127). Certainly Trieb's comment would sustain a reinterpretation in terms of nationalism, i.e., the disparity between the clarity of the London of the LUD and the messiness of the actual city can be interpreted as a dissimulative attempt to engender chauvinism in the viewer. For an association of the LUD with the "fetishization of commodities," we turn to Forty's insightful account relating the act of LUD reception to capitalist consumerism: For Forty (1986), the purposive distortions of the LUD "induced people to undertake journeys they might otherwise have hesitated to make. . . . It is impossible to say to what extent London Transport's design policies excited people's appetite for travel, but there seems every reason to believe that by making travel seem easy, effortless and enjoyable, they contributed to the very substantial leisure traffic" (pp. 237-238). In short, claims Forty, the viewer of the LUD is confronted with an "object of desire," not an "object of use." And that viewer, we might add, is correspondingly interpellated as consumer rather than as user.

Denaturalizing Mapping Practices

Certainly the deconstructive cast of this chapter so far has served to reveal the complicity of map discourse with ideology, but simply to reveal the radical entanglement of ideology and maps may not be enough. Recall Peters's (1983) deconstruction of the Mercator map as an expression of the superiority of Caucasians, an interpretation shared generally by the cartographic establishment (p. 63). Unfortunately, as cartographer Robinson (1985) observes, the Mercator map is "still regularly displayed. Millions see it daily, since it forms the backdrop for the ABC and NBC evening television news programs, as well as others, and it is

embarrassing to see it used similarly in the briefing rooms of both the Department of State and the Pentagon, which appear frequently on TV news presentations" (p. 109). Clearly, denaturalization of the Mercator map by the cartographic professionals has not sufficed. Rhetorical theorist Bizzell (1990) points out the limits of a purely deconstructive mode of analysis:

> In their deconstructive mode, the anti-foundationalist critics do point out the effect of historical circumstances on notions of the true and good which their opponents claim are outside time. In other words, the critics show that these notions consist in ideologies. But once the ideological interest has been pointed out, the anti-foundationalists throw up their hands. And because they have no positive program, the anti-foundationalist critics may end up tacitly supporting the political and cultural status quo. (p. 667)

We are thus prompted to go beyond establishing the ideological interest underlying mapping practice to projecting a positive program for new map design methodologies. What would such a program entail? Barthes's (1985) indictment of naturalized sign systems provides a hint: "There is an evil, a social and ideological disorder, ingrained in sign systems which do not frankly proclaim themselves as sign systems" (p. 66). One solution, then, is to design maps that *do* frankly proclaim themselves as sign systems. What would be the *desiderata* in such maps? What, in other words, are some of the denaturalizing mapping techniques that might imbue a new design practice?

To some extent, the call is for a broader palette of mapped texts. In this spirit, Harley (1989) calls for a "new cartography" that would replace "the arid academic cartography"—a new cartography characterized by "a greater pluralism of cartographic expression" to "serve the breadth of social and historical problems that now engage our attention" (p. 88). But more is not necessarily different. Consider, for example, the proffered alternatives to the Mercator world map. Peters (1983) offers an alternative map based on an equal-area projection scheme, a map that, in his words, "is an expression of the basic equality of all peoples in this post-colonial era" (p. 145), a map that he also unfortunately claims "is entirely free of any ideology" (p. 148). The United Nations has, in fact, adopted Peters's *Third World Map* for many purposes. However, according to Robinson (1985), the Peters map eliminates one set of biases only to introduce others. Robinson's alternative, a compromise between geographic fidelity and aesthetics, has in its turn been the target of similar charges. And so it goes.

In short, what is really needed is a new politics of design, one authorizing heterodoxy—a politics where difference is not excluded or repressed, as before, but valorized. This ideal of encompassing contestatory as well as hegemonic discourses has been variously expressed in the literature of postmodernist theory. Barthes (1986) calls for the inclusion of "acratic" discourse (discourse outside power, which repudiates the doxa) as well as "encratic" discourse (discourse within power, which conforms to the doxa) (p. 120); Bourdieu (1977), for the construction of "extraordinary discourse" or counter discourses (p. 170); Venturi (1966), for the privileging of "elements which are hybrid rather than 'pure,' " "both-and" over "either-or", for "messy vitality over obvious unity" (p. 22); Foucault (1969/1972), for a view of discourse as a "space of multiple dissensions," a space characterized by provisionality and heterogeneity rather than totalization and homogeneity (p. 155). Harvey (1989) sees such concern for *alterity*, or otherness, as the "most liberative and therefore the most appealing aspect of postmodern thought" (p. 47).

Such inclusion of the Other will necessitate, in turn, a new vision of the map. After all, when Huck Finn's notion of the map as reality, or even that of the map as mirror, proved a disabling perspective, we were led in our deconstuction of the map to adopt the more enabling metaphor of map as text, more specifically, as "textually homogeneous site of ideological inscription." Now, concerned with the proposal of denaturalizing practices, we suggest two new metaphors: For addressing the suppression of the spatial or synchronic perspective, we propose the metaphor of the *map as collage;* for addressing the suppression of the temporal or diachronic perspective, we propose the metaphor of the *map as palimpsest.*

Synchronic Perspective: The Map as Collage

The denaturalizing power of the collage—an assemblage of diverse elements drawn from preexisting texts and integrated into a new creation manifesting ruptures of various sorts (Group *Mu*, 1978, pp. 13-14) —has not escaped notice in the theoretical and practical postmodernist discourses (Derrida, 1979; Hassan, 1987, p. 445; Kuspit, 1989, p. 46; Ulmer, 1983, p. 88). In an analysis of postmodern photography, Hutcheon (1989) describes the collage effect induced by the invasion of words

into the semantic space traditionally dedicated to the pictorial and the consequent denaturalization:

> Postmodern photo-graphy [*sic*] works to "de-doxify" by making both the visual and the verbal into overt sites of signifying activity and communication. It also contests the glossing over of the contradictions that make representations (linguistic or pictorial) serve ideology by seeming harmonious, ordered, universal. Its paradoxes of complicity and critique, of use and abuse of both verbal and visual conventions, point to contradiction and, thereby, to the possible workings of ideology. (pp. 138-139)

Unlike the photograph, visual genres such as the graph and the map are to some extent already collages, of course, because they are traditionally composed of both alphanumeric and figural signs, but we are advocating an even stronger melange of sign systems. A strong commitment to the collage technique is, incidentally, not without historical precedence in cartography; it was favored by Minard, a 19th-century French engineer and graphics innovator, whose demographic maps often bore tables, references, notes, and text (Figure 3.6). An admirer of Minard's work, Tufte has exploited the collage technique to great effect in the design of his landmark work on information display (Barton & Barton, 1990). A theoretical commitment to the collage effect on various levels is also evident in his book: On the level of the individual graphic, he encourages us to "write little messages on the plotting field to explain the data, to label outliers and interesting data points, to write equations and sometimes tables on the graphic itself, and to integrate the caption and legend into the design" (Tufte, 1983, p. 180). On the level of the page, Tufte (1983) advocates a breakdown of the semantic spaces dedicated to text or graphic: "Tables and graphics should be run into the text whenever possible, avoiding the clumsy and diverting segregation of 'See Fig. 2,' (figures all too often located on the back of the adjacent page)" (p. 181).

Nor is the collage effect confined to unexpected juxtapositions of linguistic and pictorial systems; juxtapositions may also occur *within* either the linguistic or pictorial systems. Russian formalist Uspensky (1973) points out the defamiliarization effect induced by the juxtaposition of different linguistic systems within a given textual space (pp. 20-32), e.g., by the insertion of French in (the Russian) *War and Peace*, whereby language loses its ostensible transparency as a universal signifying system and is thereby seen as a culturally relative phenomenon. The United Nations' policy of suppressing exonyms in favor of indigenous place

Figure 3.6. World Map by Charles Minard, Illustrating a Collage Effect
SOURCE: Collection de Documentation et de Communication, L'École Nationale des Ponts et Chaussées, Paris.

names on world maps and the attendant juxtaposition of differing points of view—the hegemonic and the contestatory—is clearly relevant here.[3] As an example of the juxtaposition of pictorial systems, we cite Bryson's (1983) illustration of the way "paintings can violate the existing doxa by representing within the same frame discursive practices thought to be disparate" (p. 42; Shapiro, 1988, p. 150). Within the mapping tradition, one finds relevant examples in the indigenous scenes inserted long ago in cartographic space. Moreover, our taxonomy of collage strategies is far from complete, for it is not our intent here to present a comprehensive taxonomy, much less an analysis, of the myriad ways in which heterogeneity of representational orders can create a collage effect. Lynch and Woolgar (1988) suggest the scope of such an endeavor by mentioning the heterogeneities resulting from the juxtaposition of various representational devices, theoretical principles, or representational functions, e.g., resemblance, symbolic reference, similitude, abstraction, exemplification, or expression (p. 100).

Diachronic Perspective:
The Map as Palimpsest

Reculons pour mieux sauter. Thus far in our discussion of denaturalization techniques for the map, we have advocated a paradigmatic shift to a heterogeneity of representational order induced by the juxtaposition of various representational systems—a juxtaposition metaphorically captured by the expression *map as collage.* Indeed, construing the map as collage proved a useful heuristic for discovering a radical design practice that would juxtapose communication elements laterally in seemingly anarchistic fields and thereby accord representational status to hitherto excluded or repressed interests. Because it is a synchronic, or spatial, notion, however, the collage is ultimately limited, for, as we noted earlier, strategies of repression also operate in diachronic, or temporal, perspectives where corresponding counterstrategies of denaturalization are equally needed. In his discussion of the representation of place on maps, de Certeau (1984) recognizes the limited heuristic value of the collage metaphor: "The place, on its surface, seems to be a collage. In reality, in its depth it is ubiquitous. A piling up of heterogeneous places. Each one . . . refers to a different mode of territorial unity, of socioeconomic distribution, of political conflicts and of identifying symbolism" (p. 201). "The kind of difference that defines every place is not on the order of a juxtaposition but rather takes the form of imbricated strata" (p. 200). In short, de Certeau concludes, "the place is a palimpsest" (p. 202). The map as palimpsest metaphor enables us to address the kinds of repression that occur in a diachronic perspective, i.e., the repression of the acts of production and reception of the mapped text considered vertically rather than laterally, considered as process rather than as product, as speech act rather than as structure.

Denaturalizing the Act of Production

How does one denaturalize the act of production? For Harkin (1989), it means making "one's discursive strands visible, like the plumbing and ductwork of a postmodern building" (p. 56). In less figural terms, it means resisting strategies designed to reify one's text by allowing a franker representation of the layers in which the text is historically and inevitably imbricated. In the field of document design, denaturalizing the act of production means challenging many tenets of current publication policy. It may mean, for example, resisting the increasingly popular policy of suppressing the set-off, extended quotation, which visually acknowledges the alterity of the Other, in favor of the seamless web of text produced by the paraphrase, which more fully but less overtly appropriates the Other. It may also mean resisting the equally popular publication policy of suppressing the footnotes and marginalia that contextualize one's work and that visually establish the ongoing relation of one's thought with past thought. Tufte's practice of placing references and notes alongside the relevant text material is laudable in this respect and, given its ease of implementation in this era of desktop publishing, is certainly available to all. Harley's (1989) praise of the *Historical Atlas of Canada* serves as a testimonial to the value of the palimpsest technique in mapping practice:

> Part of the success of the acclaimed *Historical Atlas of Canada* [R. C. Harris, 1987] is that the Editors have broken the link with the narrow dogma of academic cartography. Bar graphs, flow lines and proportional circles survive but they are enriched by architectural and archeological drawings, by original maps and town views of the past, and by landscapes with people and artefacts. We begin to know what it might have felt like to have lived in old Canada. A narrative unfolds expanding rather than denying the rhetorical power of the map. Even the most austere maps can become a *pictura loquens* as other images help to trigger their meaning. (p. 88)

Denaturalizing the act of production also means not closing off the movement of contradictions by representing meaning as fixed and stable. The design tradition, of course, has been to *stabilize* meanings, but the designers of visuals can just as easily choose to *destabilize* meanings. In the field of medical illustration, cardiologist Wahr (1987) advocates the inclusion in journal articles of the *multiple* radiographic views taken during a cardiac catheterization procedure to assess coronary artery disease, not just the *one* best supporting a given research thesis. For a cartographic example, we return to the issue of representing Kuwait. According to Gilbert Grosvenor, president of the National Geographic Society, if the status of Kuwait remains in question when the first update to the sixth *Atlas of the World* is printed, the regional map will include a statement of who occupies the territory and the United Nations' position in the situation (cited in Christian, 1990). For Wood (1986), destabilizing meaning may entail more than the addition of an explanatory note to a map: Rejecting the conventional distinction between reference and narrative atlases, he praises the latter for the fact that in "committing themselves explicitly and narratively to a point of view, [they] become thereby full (not empty); and, in admitting what they were about, become, *through this gesture*, truthful in a way 'reference atlases'—hiding their messages behind the false front of 'objectivity'—never have" (p. 38). Wood presumably would favor the incorporation in reference atlases of the running text characteristic of narrative atlases, thereby denaturalizing the ostensible objectivity of the former's point of view.

Denaturalizing the Act of Reception

How, in turn, does one denaturalize the act of reception—the other occluded layer of the map considered as process? How, in other words, does one denaturalize the traditional view of visuals as objective artifacts that speak for themselves? Clearly, one can begin by more frankly acknowledging that looking is an interpretive act. Once again, Minard's maps offer an exemplary strategy: They bear notes telling the viewer how to interpret the map. Recall, also, Tufte's (1983) similar advice to "write little messages on the plotting field to explain the data" in quantitative graphs (p. 180). More generally, denaturalizing the act of reception means producing positions that enable subjects to occupy realistic rather than imaginary relations within the social totality. Earlier in our discussion of the LUD, we noted a relative disempowerment of the wer as a specific user with concrete travel needs—a disempower-nt masked by the illusory power accrued through ascription of an ympian perspective inscribed in the map. The viewer's relative dis-powerment becomes immediately obvious when one considers an ernative, more enabling representation—the lighted board map in eral Parisian Metro stations whereby the viewer can override the alizing effect of the map by registering her destination and receiving individualized, highlighted itinerary.[4] "You are here" indications on ps provide a second, admittedly less powerful, example.

Denaturalizing the act of reception also means adopting the perspec-e of the traditionally disempowered. Earlier we noted the exclusion lower echelons of personnel from organization charts; here we ad-cate not simply their inclusion but, rather, the adoption of their point view. Technical-communication educators Mathes and Stevenson 976) propose, for example, replacing the conventional organization art with an "egocentric organization chart" (Figure 3.7) as a way of hancing the position of, or empowering, the writer: "The egocentric art categorizes people in terms of their proximity to the report writer her than in terms of their hierarchical relationship to the report writer. aders are not identified as organizationally superior, inferior, or ual to the writer, but rather as near or distant from the writer" (p. 15). porting on the field of cartographic education, Minerbrook (1991) tes that the Texas Education Agency has recently required a compar-n of different map projections in new textbooks for secondary schools 60). Moreover, the Peters projection, favoring the Third World point view, is now routinely included in the map presentations of Paramus, w Jersey, schools.

Conclusion

Our proposal of a more inclusionary visual design practice may con-e up visions of an ocular cacophony of juxtaposed and superimposed ments, devices, and practices. Clearly, the governing aesthetic of the ual as collage-palimpsest is not the modernist "less is more" but her the postmodernist "less is a bore"—an aesthetic that privileges mplexity over simplicity and eclecticism over homogeneity, an aes-tic that tends toward the fragmentary and the local, an aesthetic that nounces the driving ambition toward Unity with a capital "U" and

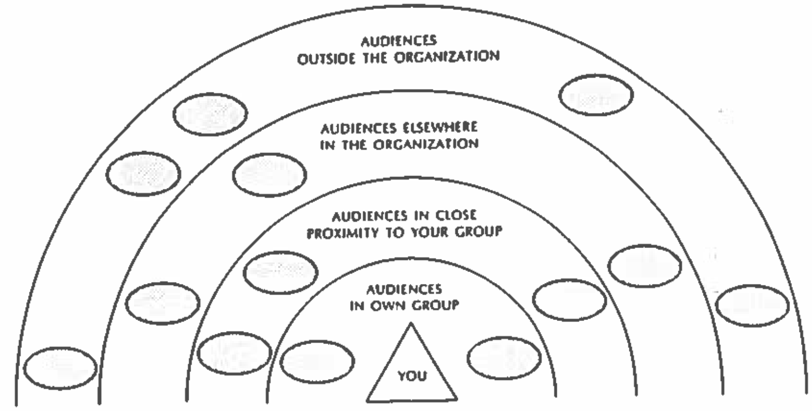

Figure 3.7. Egocentric Organization Chart
SOURCE: Reprinted with the permission of Macmillan Publishing Company from *Designing Technical Reports* by J. C. Mathes and Dwight W. Stevenson. Copyright © 1976 by Macmillan Publishing Company.

"disperses itself among discreet claims and observations" (Bryson, 1989, p. 705). Unity may still be achieved, but it will be a hard-won unity—a unity eschewing the reassuring grand synthesis in favor of the uneasy collocation of competing and rival claims, the difficult unity of inclusion rather than the easy unity of exclusion—perhaps, in fact, the only meaningful unity for our time (Barton & Barton, 1987).

Notes

1. On the other hand, this is not to say that the alternative is to view people as obviously unique, autonomous, and totally self-determining individuals, for that would be to succumb to what Althusser (1971) has termed "the elementary ideological effect" (p. 161). Rather, in Althusser's famous phrase, "ideology interpellates concrete individuals as subjects" (p. 160).

2. Similarly, Bazerman (1988) notes a trend toward increased sedimentation of experimental physics procedures in journal articles. In a study of visuals in articles published early and late in the career of *Physics Review*, he notes the progressive exclusion of visuals more closely reflective of laboratory practice. His documentation of the decreasing use of "detailed apparatus drawings and extensive tables of raw experimental data" in favor of "extensive equations and schematized graphs" clearly reveals a trend toward suppression of the production act in scientific visuals (p. 172).

3. Note that the suppression of exonyms is neither new nor necessarily easy. According to Ormeling (1980), "As early as the end of the nineteenth century, cartographers working on an international series of world maps . . . decided to adopt exclusively the naming system peculiar to each country. But there is a world of difference between good intentions and execution. Whether one likes it or not, each national cultural politic commits itself, in the name of the mother country, to preserving its own exonyms rather than sacrificing them to facilitate communication" (p. 333; authors' translation).

4. M. Burke and McLaren (1981) report the recent introduction of electronic displays by the London Transport at certain mainline rail stations. The displays "present a menu of approximately three hundred routes which may be taken from that point. The dialogue with the system is in three languages simultaneously (English, French, and German). The selected route is presented in isolation from the total network; points where the passenger is obliged to change train are stated clearly" (p. 109). Moreover, as M. Burke and McLaren note, "theoretically the system could be extended by being distributed to domestic television sets by means of a viewdata or teletext system" (p. 109).

INTERPRETATION

4

Formalism, Social Construction, and the Problem of Interpretive Authority

THOMAS KENT

Following the lead of philosophers and historians like Nietzsche, Dewey, Heidegger, Wittgenstein, and especially Kuhn, professional writing teachers and writing theorists tend generally to accept nowadays the claim that knowledge is socially determined. Instead of talking exclusively about knowledge in terms of cognitive processes like brain function (Walker, 1990), logic (Young, Becker, & Pike, 1970), recall (H. Clark & Haviland, 1977), or thinking procedures (Flower & Hayes, 1981), writing teachers more and more frequently talk about knowledge in cultural and historical terms and fall in line with rhetoricians like Bruffee who claim that knowledge derives from the socially constructed—and, therefore, historically determined—discourse communities in which we live. Because we no longer believe that knowledge is something that exists only in our heads, we are led also to say that the production of discourse, especially in settings outside the academy, comes into being through social interaction, because discourse can be recognized as discourse only after it becomes part and parcel of the normative conventions that form the social communities in which we all must live and work.