While attempting to refine and redefine the composing process, rhetoric teachers have overlooked research showing how the brain's visual and verbal components interrelate. Recognition of the brain's visual potential can mean more than the use of media with the written word—it also has implications for the writing process itself. For example, outlining is a linear, left-hemispheric, and limiting activity that may not allow a student the kind of inventive richness of right hemispheric activities such as flow charts, arrows, boxes, parentheses, Venn diagrams, and story boards. Unfortunately, many students come to class visually inhibited. One step toward teaching students the value of visuals is to present them regularly with information in a two-dimensional form. Summarizing the data in a numerical table can be a useful exercise in abstracting information and can reveal one virtue of illustrations. Teachers should also take advantage of the similarities between the process of writing and the processes of drawing or painting. A full recognition of the brain's dual capacities not only could lead to an expanded view of composition as a visual and verbal skill but also could help to explain phenomena already recognized, such as invention and style, being more right hemispheric, while arrangement may draw more on the orderly, logical left hemisphere. (HOD)
Composition teachers now generally agree that writing is not simply "putting thoughts into words." In 1969, Robert Zoellner made the point in his lengthy and controversial article, "Talk-Write: A Behavioral Pedagogy."¹ In an interview six years later, James Moffet said, "Intricate things are not linear,"² succinctly explaining the impossibility of converting thoughts into writing. In 1978, Robert DeBeaugrande made a similar observation: "The transition from the topographic mental mode to the linear mode entails a substantial margin for problem."³ Mina Shaughnessy defined the problem in more practical terms: "Even where the writer is experienced, this task of controlling the direction of an essay while at the same time giving play to the ideas that are generated along the way is probably the most taxing part of writing."⁴ The need to help students find order in the brain's apparent chaos has produced a rich array of techniques for invention and arrangement. And yet, despite all of the research and theorizing, teachers of rhetoric have largely ignored an area with potentially profound implications for solving the composing problem, variously expressed by Zoellner, Moffett, DeBeaugrande, and Shaughnessy. While attempting to refine and redefine the composing process, we have overlooked the brain's visual capacities; more precisely, we have neglected recent research which shows how the brain's visual and verbal components
interrelate. With greater awareness of this research and its implications we can better equip our students for translating the brain's intricacy into the comparative simplicity of the written word.

R.W. Sperry and his associates at California Institute of Technology began reporting their brain research in the early sixties. Since then, a complex and fascinating theory about the brain's two hemispheres has emerged. The brain's left hemisphere handles verbal and mathematical tasks, those associated with logical or linear thought. In the past this side of the cerebral cortex has been referred to as "dominant," reflecting the left-sided bias in education and the practical world. Conversely, the right hemisphere seems to be the location of the mind's more visual, holistic, intuitive workings. The right hemisphere appears to work by association rather than sequential processes, although contrary to early assumptions, the right hemisphere does display some language potential. Robert Ornstein refers to right hemisphere thought as "simultaneous," in contrast to "sequential" left hemisphere thought. The brain's division of labor is sometimes called "lateralization" or, to use a phrase suggested by Robert McKim, "ambidextrous thinking." In theory, all normal individuals frequently shift back and forth between left mode and right mode thinking, although some have a greater proclivity toward one mode or the other.
Research concerning the brain's duality has not gone completely unnoticed among rhetoricians. In "Hand, Eye, and Brain: Some 'Basics' in the Writing Process," Janet Emig suggests that "there may be biological bases for composing behaviors" and points to a need for increased knowledge of brain physiology by writing teachers. Ross Winterowd explores bihemispheric theory as a way of understanding different literary styles, particularly "propositional" (left-hemispheric, abstract, tightly organized) and "appositional" (right-hemispheric, concrete, loosely organized). James Kinney argues that heuristic procedures fall into three categories (empirical, rational, and intuitive) and suggests that intuitive (right-hemispheric) and empirical methods should more often be used as well as the more common rational heuristics. Free writing and meditation are perhaps examples of the sort of intuitive heuristic Kinney has in mind.

While Emig, Winterowd, and Kinney have suggested that writing teachers look more carefully at the brain's double-faceted abilities, other writers, though not alluding to brain theory, have advocated visual techniques as preludes to writing. Three articles from College English, reprinted in Ideas for English 101, edited by Richard Ohmann and W. B. Coley, are typical of this approach to invention. In "Invention, Composition, and the Urban College," Michael Paul and Jack Kligerman recount their success with the use of several non-traditional techniques, such as meditation.
and experiential assignments.\textsuperscript{11} Harvey S. Wiener's "Media Compositions: Preludes to Writing" documents his success with having students prepare personal collages prior to writing essays. In justifying his use of visuals, Wiener writes, "To hold an inveterate suspicion toward the non-written medium as if it debases the word as the golden means of communication is a narrowness of vision that will not serve well the interests of this special generation of students."\textsuperscript{12} The third visually oriented piece in the Ohmann and Coley collection is "Using Painting, Photography, and Film to Teach Narration" by Joseph Comprone; Comprone points out that today's students are visually sophisticated and that their visual prowess can be used to improve verbal skills, particularly narration.\textsuperscript{13} In "Language, Literature, and the Release of Meaning," a more theoretical article than those just cited, Maxine Greene argues that in all writing, perception must precede conception and suggests that "... instead of viewing the range of experiences with media as a threat to the tradition of literacy, we ought to understand enough to deal with them as part of the perceptual field."\textsuperscript{14}

Such advice coming from college instructors adds to impressive evidence from elementary schools showing how a dual hemisphere approach can work with young children.\textsuperscript{15} Until recently, we have not known quite why visual and verbal skills work so well in tandem. The brain research cited above now
provides a reason why visualization can produce stronger writing: it enables writers to utilize both brain hemispheres. Of course English teachers harbor a longstanding mistrust of the audiovisuals that too often have detracted from reading and writing. The critical difference between this notorious abuse of the media and a more constructive use of it rests in the degree of student involvement. The techniques recommended by Wiener, Comprone, and others — as well as successful elementary school experiments — make students responsible for creating or manipulating visuals as an integral part of the composing process. This is quite different from having students passively watch a film that may be only tangentially related to a writing assignment. Thus, to recognize the right hemisphere's role in writing is not simply to knuckle under to the sensory overkill which surrounds us in the form of television, radio, billboards, video games, shopping malls, and traffic. Rather, it means tapping a source of power that can produce stronger and more thoughtful prose.

Recognition of the brain's visual potential can mean more than the use of media with the written word. It has implications for how we view the writing process itself. For example, we should beware of techniques, such as outlining, that force students prematurely into a left-hemispheric mode. Fortunately, outlining has fallen into disfavor as a preliminary to writing because it so often proves to be a burden rather than a help.
An outline is a linear, left-hemispheric, and thus limiting, construction. It may not allow a student the kind of inventive richness the right hemisphere is capable of. An experienced writer sees an early outline only as a tentative set of directions made to be altered, perhaps ultimately discarded. A novice is more likely to feel constrained by an initial outline.

We should familiarize students with less restrictive techniques as options to outlining. Flow charts, arrows, boxes, parentheses, Venn diagrams, and story boards are useful tools for visualizing how a composition might fit together. Peter Elbow often refers to the messiness of composition in the early going. Freewriting may fruitfully give way to freesketching for some students, and while this may become messy, sketching or diagramming may produce a richer array of ideas than an outline. Donald Murray's *A Writer Teaches Writing* shows several examples of constructively messy drafts. In preparing this article I have produced a manuscript so cluttered, so filled with arrows, boxes, and squiggles, that some pages almost appear three dimensional. If ultimately allowed to rein free, of course this chaos, this evidence of the right hemisphere's labors, would be unacceptable. The left hemisphere, the brain's more logical side, must later steady the right side's wild gyrations through some process of arrangement.

Not only should we think of visualization as an aspect of
the writing process; we should also accept the notion that even in the final product, visual and verbal can complement one another. Magazines, newspapers, textbooks, signs, and pamphlets display this duality so commonly that we take it for granted. And yet we seldom encourage students to use illustrations in their writing. Students usually find that in the English classroom visual and verbal do not mix, and this well-learned principle is not easily abandoned. On occasion I have suggested to students that their regular journal entries be supplemented with sketches. Yet I seldom see more than a small marginal doodle. For a recent essay assignment I had students write essays about aspects of our college as if they were preparing an "Underground Student Handbook". I recommended the use of illustrations and pointed out how maps, diagrams, or sketches could strengthen the written text. I emphasized that I would not pass judgement on the technical quality of the illustrations, only on the ideas behind them. Even here, I only received one illustration, a map duplicated from our library handbook. Asked why they had not used visuals, some indicated that they "were not used to that," while others pleaded a lack of drawing skill. Although living in a world suffused with visual stimulation, few students appear to see the writing classroom as a part of that world.

An experience with a student research paper showed me how useful visuals can be and reminded me that I have my own visual inhibitions. The student in question was struggling
mightily with a research paper on Depression-era photographers who worked for the federal government. A Visual Arts major, he was interested in the powerful photographs of the poor and downtrodden by Walker Evans, Ben Shahn, and Dorothea Lange. One of the student's problems was the difficulty of finding adequate information on the photographers' attitudes toward their subjects. I acknowledged his problem, and we discussed it for some time before I realized that his solution was obvious. The photographs themselves offered sufficient information. Once he realized that he would be "allowed" to duplicate some of the more striking pictures and to comment on how they reveal attitudes of the photographers, his problem was largely solved. I realized that I had been blinded by my initial inability to see the validity of these visual clues for a "scholarly" paper.

One step toward teaching students the value of visuals is to present them regularly with information in a two-dimensional form. My colleague John Monro has shown me the benefits of working with tables, charts, and graphs in writing classes. Summarizing the data in a numerical table can be a useful exercise in abstracting information and can reveal one virtue of illustrations: the possibility of packing large amounts of information into a small space. Despite their prevalence in textbooks, tables, graphs, and charts often pose problems for college freshmen. Perhaps this is because these sorts of illustrations are at once visual and verbal (or numerical),
holistic and linear, right hemispheric and left hemispheric. The dual characteristics which make them such powerful communicators may be the very qualities which make them challenging to comprehend. Thus, writing teachers need to have students practice writing about tables, charts, and graphs, finally leading them to use these powerful tools in their own work.

Besides recognizing the benefits of using visual and verbal messages in tandem, we should examine the similarities between the process of writing and the process of drawing or painting. Verbal composition is more closely related to visual (or musical) composition than to most other disciplines. Yet, the art departments seem largely to have been left out of the "writing across the curriculum" movement. We continue to assume that you neither write in art class nor draw in writing class. This prejudice persists in spite of the numerous parallels between the two disciplines. The common terminology suggests these parallels (image, sketch, composition, outline, etc.).

Robert Jay Wolff, an art educator at Brooklyn College, points out that visuals too often have been considered aids without an integrity of their own. He calls for a greater unity between modes of composing:

If the overwhelming blight of hopelessly clichéd writing at the college level cannot be overcome by the classical emphasis on syntax and sentence structure
or by reference to great works of literature, perhaps the professors of English will finally look to visual education for help in providing the remedy.18

Another strong voice from the field of art and aesthetics is that of Rudolph Arnheim. In *Visual Thinking*, he argues that visual perception and expression are cognitive acts.19 In other words, sketching or painting, like writing, can be a way of thinking.

In her book, *Drawing on the Right Side of the Brain*, Betty Edwards suggests further parallels between verbal and visual conceptualization.20 Her "how to" book, which is sure to have a lasting effect on art instruction, also has something to offer teachers of rhetoric. Edwards describes her difficulty in explaining drawing techniques to her students. Invariably, she resorted to saying, "Like this!" and demonstrating the techniques wordlessly. She recognized the inadequacy of this "Do as I do" approach but was unable to lead her students through the required process. Finally, she learned about the function of the right hemisphere in drawing and was able to develop specific techniques to coax her students out of the left hemisphere mode and into the less familiar but more artistic right hemisphere mode. She found that in order to draw well, her students had to learn to see and think in a different way. Her knowledge of the right hemisphere enabled her to explain this and to alter her teaching methods.
Edwards' experience is similar to that of writing teachers in recent years: Preoccupied for so long with the product, we were unable to explain the process, or the alternate way of seeing which would lead to the product. Now that we are more cognizant of the process we can teach more effectively. But the usefulness of Edwards' book no doubt extends beyond the cross-disciplinary parallels it suggests. In making our students aware of the visual dimension in writing, aware of the writer's need to look constantly for new ways of seeing and composing, we could profit from this book.

A full recognition of the brain's dual capacities not only could lead to an expanded view of composition as both a visual and verbal skill but also could help to explain phenomena already recognized. For example, it is possible that among the classical divisions of discourse, invention and style are more right-hemispheric, while arrangement may draw more on the orderly, logical left hemisphere. Also, recent findings about the nature of writing could be further clarified by brain research. The recursiveness that Sondra Perl and Arthur Egendorf observed in the act of writing may in fact be a frequent shifting back and forth from one hemisphere to the other. And the "reader-based prose" as defined by Linda Flower and John Hays may actually be "right hemisphere prose," while the other, more rational hemisphere may produce "writer-based prose."
While much of this is speculative, there is no doubt that acknowledging the rich implications of brain hemisphere research can broaden our view of how the composing process works. More than that, such acknowledgement can lead to greater kinship with our colleagues in biology, psychology, and the visual arts. Finally, besides helping to bridge the two (or more) cultures on our campuses, it can help to bridge the two modes of thinking within ourselves and our students.
NOTES

1College English, 30(January 1969), 267-320.
2"A Talk with James Moffett," interview by David Sohn, Media and Methods, 11(February 1965), 61.
3"Linguistic Theory and Composition," CCC, 29(May 1978), 134-140.
5See, for example, "The Great Cerebral Commissure," Scientific American, 210(January 1964), 42-52.
10"Classifying Heuristics," College Composition and Communication, 30(December 1979), 351-356.
11College English, 33(March 1972), 651-659.
12College English, 35(February 1974), 566-574.
See, for example, John L. Debes and Clarence M. Williams, "The Power of Visuals," *Instructor* 82 (December 1974).


