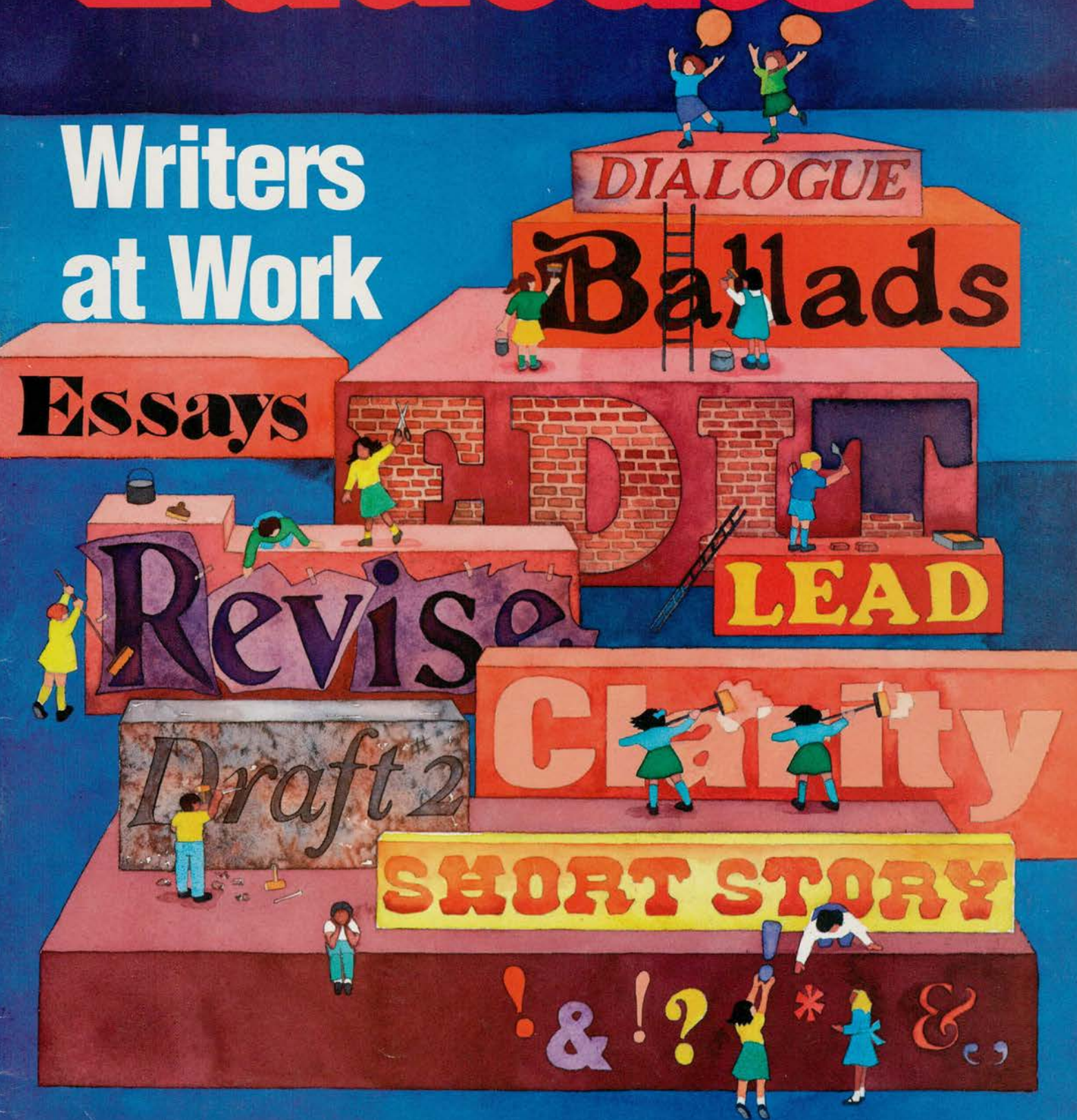


AMERICAN

AMERICAN FEDERATION OF TEACHERS
SPRING 1989

Educator

Writers at Work



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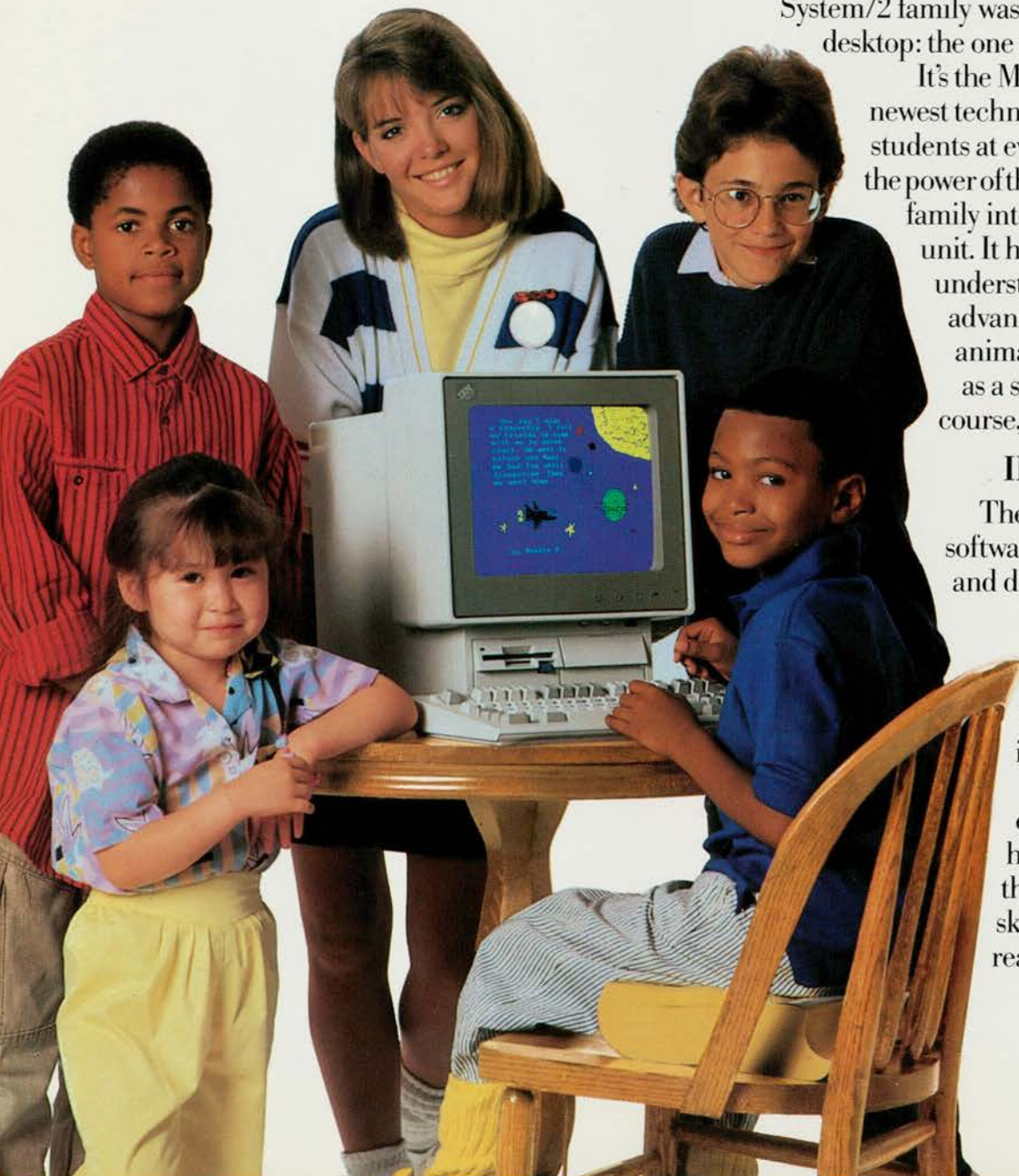
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Or write to us at Dept. 25, 101 Paragon Drive, Montvale, NJ 07645,  for more information.



Typing for Beginners



Biology Series



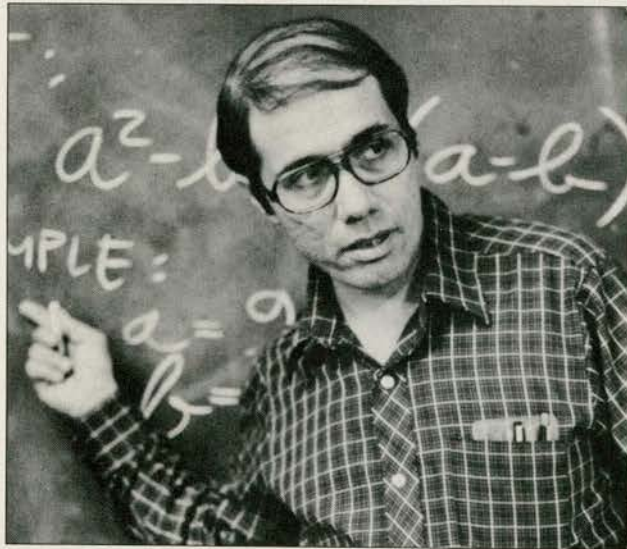
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The IBM network helps students get right to work on the right subjects, and advance at their own pace.

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Edward James Olmos portraying Jaime Escalante in "Stand and Deliver."

Since 1983, the ARCO Foundation has been supporting a summer math program for high school students at East L.A. college. The teacher, Jaime Escalante took a group of students from the barrios of East L.A., and taught them the most demanding of all math sciences. Calculus.

His methods were so unconventional, the results so incredible, that Jaime's story was made into the movie "Stand and Deliver."

ARCO is proud to be a continuing part of Jaime Escalante's vision, giving students a better chance in life.

Stand and Deliver

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AN AMERICAN PLAYHOUSE THEATRICAL Film by RAMÓN MENÉNDEZ / MUSICA & OLMOS Production
"STAND AND DELIVER" EDWARD JAMES OLMOS · LOU DIAMOND PHILLIPS · ROSANA DE SOTO
ANDY GARCIA Music by CRAIG SAFAN Executive Producer LINDSAY LAW
Written by RAMÓN MENÉNDEZ & TOM MUSCA Produced by TOM MUSCA Directed by RAMÓN MENÉNDEZ

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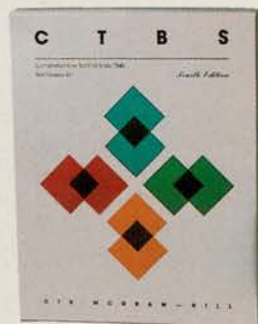
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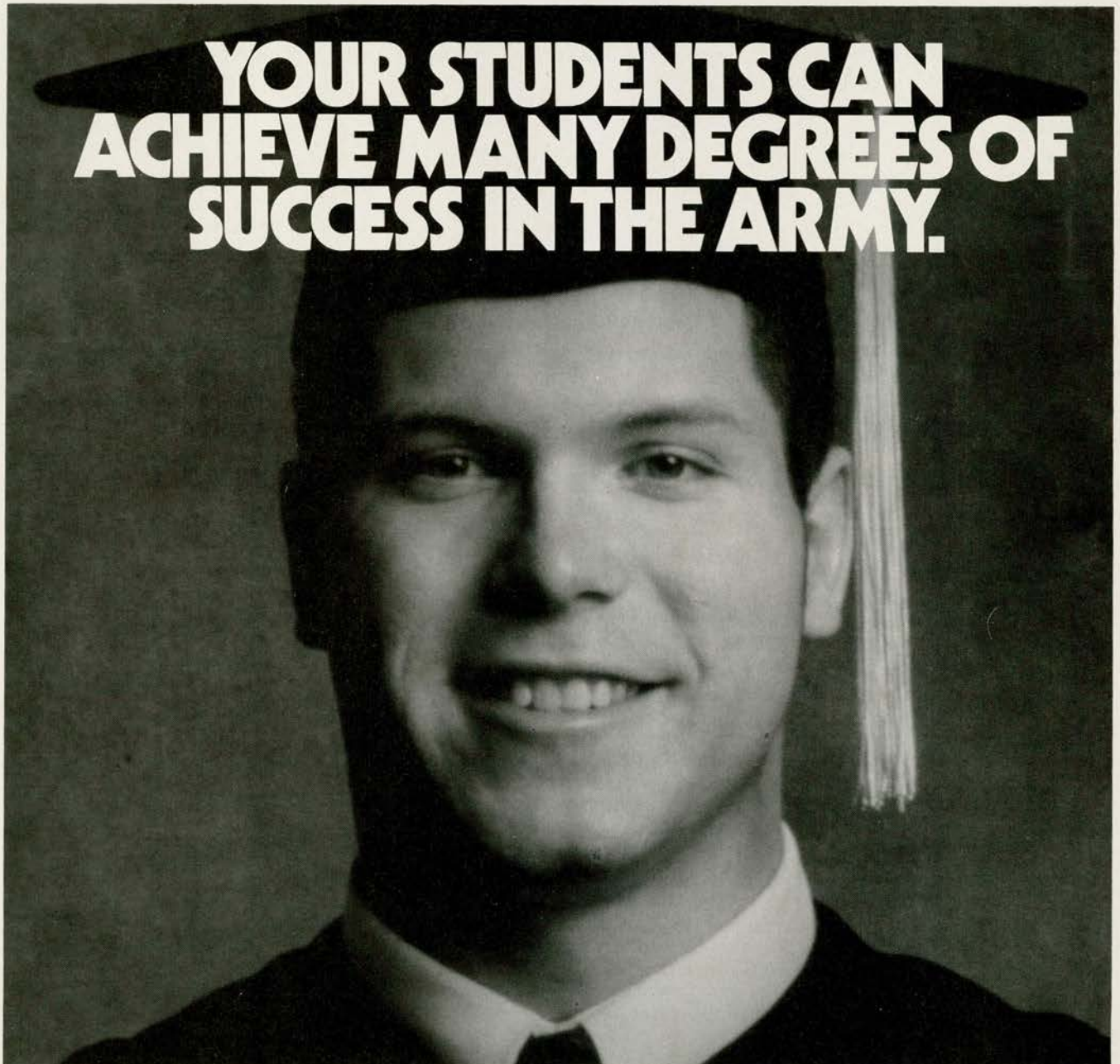
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Additionally, the Montgomery GI Bill Plus the Army College Fund can offer as much as \$25,200 toward continuing education, for qualified soldiers.

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SUCCESS IN THE ARMY.**



**The Professional Journal
of the American
Federation of Teachers
Volume 13, No. 1,
Spring 1989**

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Subscriptions: AFT members receive *American Educator* as part of their AFT membership services. Nonmembers may subscribe for \$8 per year.

Signed articles and advertisements do not necessarily represent the viewpoints or policies of the American Federation of Teachers, AFL-CIO.

American Educator cannot assume responsibility for unsolicited manuscripts.

American Educator is published quarterly by the American Federation of Teachers, AFL-CIO, 555 New Jersey Ave., NW, Washington, DC 20001. Telephone: 202-879-4420.

General advertising office
555 New Jersey Ave., NW
Washington, DC 20001
Telephone: 202-879-4420

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Dayton, OH 45439
513-294-5785

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American Educator is produced with the assistance of members of Local 2, Office and Professional Employees International Union, AFL-CIO, and members of AFT Staff Union. Composition and printing are done in 100 percent union shops.

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AMERICAN **Educator**

NOTEBOOK 8

WRITING WORKSHOP 14

By Nancie Atwell

A teacher gives a frank and searching account of how she transformed her classroom from a place where she delivered English lessons and gave writing assignments to less-than-enthusiastic recipients into a place where students are busily engaged in the hard work of becoming writers.

MINORITIES IN MATHEMATICS: A FOCUS ON EXCELLENCE, NOT REMEDIATION 22

By Allyn Jackson

Why were bright, highly motivated black college students failing or dropping out of calculus in disproportionate numbers? A determined mathematician finds some answers and establishes a program that gets dramatic results.

SMALLER IS BETTER: HOW THE HOUSE PLAN CAN MAKE LARGE HIGH SCHOOLS LESS ANONYMOUS 28

By Diana Oxley

The evidence is now compelling: Huge secondary schools—with their bureaucracy and anonymity—are a great impediment to good education. By subdividing these schools into more intimate "houses," we can provide students with many of the benefits of smaller schools.

EDUCATING THE TWO SIDES OF THE BRAIN 32

By Sally P. Springer

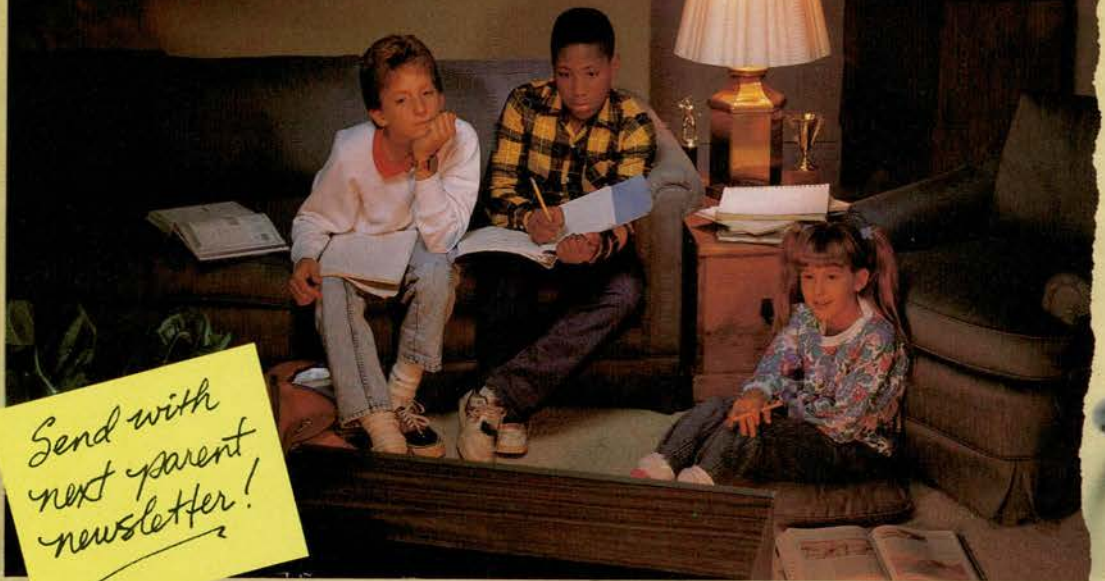
Has knowledge about the brain advanced to the point where we can meaningfully talk about how to educate one side of it to enhance specific abilities? No, says the author, that evidence does not as yet exist.

RECRUITING THE NEXT GENERATION OF TEACHERS: CONVERSATIONS WITH HIGH SCHOOL SOPHOMORES 38

By Barnett Berry, Christine McCormick and Tom Buxton

Efforts to stem the teacher shortage with superficial PR or fancy incentive packages forget one thing: Students see the teaching profession up close; and, according to these in-depth interviews, they don't like what they see—the lack of autonomy, the low pay, the frustrating working conditions, and the limited opportunity for advancement.

With Public TV your students keep learning.



Send with next parent newsletter!

Send the next page home today to show them how.

Now it's easy to keep your students learning—even after the school day ends. Just make copies of the next page, which lists a selection of upcoming Public TV programs, and send it home to your kids' parents.

Why? Because educational programs on Public TV bring your influence home. They show your students—and their parents—that learning doesn't have to stop when the bell rings.

The programs on the next page show how Public TV can reinforce and enhance the lessons you teach in the classroom—from social studies to science, from math to language arts, from the fascinating diversity of different cultures to the basic skills of problem-solving. When your students watch Public TV at home, they build on the work they do in school. And they enjoy it!

Send the next page home today—and mark any programs of special interest. You'll teach your students the most important lesson of all: that learning doesn't end with the school day.



CORPORATION FOR PUBLIC BROADCASTING

From March through May, help your children learn with these Public TV programs.

Dear Parents:

We *all* know how much our children love television! That's why this spring, I recommend programs on Public TV like the ones listed here. They're examples of programs that are worth watching because they help children keep learning after the school day ends.

If you can watch *with* your child, that's even better. Your interest will make a big difference in how much your child learns. And who knows, you may learn something new, too!

Please keep this page where you can refer to it often—and be on the lookout for these programs. The schedules can change, so check the local TV listings to find out exactly when they're on.

And thanks for helping us teach "our" children!

Upcoming Specials

- **Stand and Deliver (mid-late March)** is the feature film that chronicles the triumphs of Los Angeles math teacher Jaime Escalante. Escalante's mostly disadvantaged students from the Los Angeles barrio scored so well on national calculus tests they were suspected of cheating—although in fact their successes were a tribute to their teacher's tireless efforts. Starring Edward James Olmos (*Miami Vice*) and Lou Diamond Phillips (*La Bamba*).
- **National Geographic Specials (mid-March and mid-April)**. In March, "Those Wonderful Dogs" looks at the history of dogs—from hunting to herding to helping the handicapped. In April, "Serengeti Diary" reveals the glorious natural wonders of Tanzania's Serengeti National Park. (CC)
- **Infinite Voyage (late March)** explores the richness of life on earth and its multifaceted interactions in "The Web of Life." The special presents new interpretations of evolution, including the prospects for the continued evolution of mankind. (CC)
- **Timeline**, an innovative series of special programs, uses the format of a television newscast to bring world history to life with "live" reports, interviews and even commercials for products of the era! "The Black Death, 1400" (mid-April) examines the terrible period of Plague that turned the medieval world upside down, setting the stage for the Renaissance.

Old Favorites

- **Long Ago & Far Away (weekly)**, hosted by James Earl Jones, presents superior adaptations of classic stories. Highlights include "The Wind in the Willows" (mid-March), the Academy Award-winning film "The Man who Planted Trees" (mid-April) and the beloved "Frog and Toad" (early May). (CC)
- **Reading Rainbow (weekdays beginning in late March)** returns for its seventh season of reading adventures designed to motivate young readers. Each program brings a featured children's book to life—and then host Levar Burton guides his viewers on a real world "field trip" based on the book. (CC)
- **3-2-1 Contact (weekdays)** shows older elementary children that science is a part of everyday life, as four youthful hosts explore a single theme in each week's programs. Upcoming themes include "Eating" and "Light" in March, "Architecture" in April and "Mammals" and "Antarctica" in May. (CC)

I also want to recommend a program for *you*. **Learning in America**, a special documentary series that will begin in **late March or early April**. In five one-hour programs, host Roger Mudd considers issues such as the disparities in educational standards between rich and poor districts, and whether American students are learning subjects necessary for survival in the 21st century.



CORPORATION FOR PUBLIC BROADCASTING

NOTEBOOK

NEWSLETTERS GALORE . . .

The right newsletter can be the most efficient and—when the editor has wit and style—interesting way to get quick, concise information on either a rather narrow slice of a subject or on the constant output of a broad field.

For Peace Educators: For social studies teachers required, or inclined, to weave a peace or nuclear studies strand into their teachings, we recommend *American Purpose*, published by the James Madison Foundation. We regard it as the single best place to go for a thoughtful critique of the intellectual currents at work in peace studies, the peace movement, and, by extension, in peace education. Briskly written reports and commentaries have discussed the indivisible connection between peace and human rights and the degree to which the connection is honored in various peace efforts. Other topics include the role in peacemaking of international law, arms control, the religious community, and the peace movements in Western and Eastern Europe. An interesting source of information, it provides a provocative and needed counterpoint to the romanticism underlying much of the new peace education material.

For Science Teachers: We recommend *Bookwatch Reviews*, published by the National Center for Science Education, Inc. It calls its reviews “candid appraisals,” and they are. Reviewers have detailed how textbooks (which they name) provide misleading explanations of taxonomic classification, thus assuring that students of evolution will be totally baffled; noted the failure of most texts to teach anything at all about probability, greatly diminishing the chance that students will understand genetics; and exposed numerous errors (including a suggestion that unicorns once roamed the planet), shallow analyses, and confusing analogies.

Each issue contains three reviews each of two textbooks used in middle and high school life science, earth science and biol-



ILLUSTRATED BY SUSAN DAVIS

ogy courses. For each text, two reviewers are professional scientists in the field addressed by the book and one is a professional educator with scientific expertise.

For all Educators: Lastly, we remind you of the special subscription rate to the *Harvard Education Letter* available to AFT members: \$12 for a year's subscription (six issues per year)—43 percent off the regular price. Each eight-page issue offers crisp reports, concise summaries, and insightful reviews of the more interesting developments in the education field.

To subscribe to *American Purpose* write to: Subscriptions, Heldref Publications, 4000 Albemarle St. NW, Washington, DC 20016. Ask for the special AFT members rate of \$15 a year (a 25 percent discount) and enclose your payment. To subscribe to *Bookwatch Reviews*, (\$15 for nine issues) write *Bookwatch Reviews*, P.O. Box 9477, Berkeley, California 94709. For the HEL, send \$12 to the Harvard Education Letter, 79 Garden St., Cambridge, MA 02138.

. . . AND A TEACHER'S JOURNAL

Another type of publication has also made its debut. This one is not only *for* teachers, it is *by* teachers. *The Teacher's Journal* aims to offer a classroom perspective on “a broad range of teaching issues, from the most philosophical to the most practical.” The premier issue fulfills its promise, demonstrating—as one of the contributors, Joseph McDonald, puts it—that “there are some things which teachers know, by virtue of their daily work, that others who care about schools typically do not know.” For more information, write: *The Teacher's Journal*, Education Department, Box 1938, Brown University, Providence, Rhode Island 02192.

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A LITTLE BIT OF GLASNOST FOR HUNGARY'S PROFESSIONAL WORKERS

When the Communist Party consolidated its control over Hungary in 1948, it transformed existing trade unions into party-controlled puppet organizations. The role of the new organizations was to serve, in Lenin's words, as a "transmission belt" through which the teachings and policies of the party would be conveyed to the workers. No grievances, no strikes, no collective bargaining, and, definitely, no competing workers' organizations were permitted.

But things are changing. According to an AFL-CIO report written by unionists who visited Hungary in December (including AFT international affairs director David Dorn), thirty thousand Hungarian workers (a 2,000 percent increase over last year!) are now in independent trade unions. Up to three hundred thousand workers have left the official unions in which membership was everywhere required until recently. Since last May, five new independent trade unions—representing scientific workers, teachers, special education teachers, filmmakers, and health care workers—have formed. In December, four of the unions established a loose coordinating federation, the Democratic League of Independent Trade Unions. Also in December, the new teachers union led one thousand teachers in a march on Parliament to demand a 50 percent increase in the government's education budget and to denounce the official government unions—the first such protest march by workers since 1956.

Pal Forgacs, a member of the scientific workers union (the TDDSZ), in an interview published in the *Hungarian Observer*, attributes the sudden upsurge in organizational activity to three circumstances: the political, economic, and social crisis facing the country; the changes taking place in the Soviet Union that have inspired people in Hungary "to take an interest in self-management"; and the coming of age of various "autonomous social groups" that have been active underground, publishing materials on democracy, for the past ten or fifteen years.

Interestingly, it is professional workers, including teachers, who are at the forefront of the new workers' movement, and largely professional issues driving them. For example, behind much of the teachers' activism is the starved education budget; Hungary devotes the lowest portion of its national budget to education of all the East-bloc countries.

The union of scientific workers, which represents college professors and administrators, members of cultural institutions and public collections, and scholars in the social, natural and technical sciences, decries that science has become "an instrument of power politics." To combat the manipulation of science, says the union's founding documents, the union aims toward "achieving independence of scientific life from power" and "establish[ing] the institutional frameworks for making the findings of scholarship public property."

The new organizations are also aggressively pursuing higher pay and job security, high priorities in a country where professional and white-collar salaries have traditionally trailed blue-collar salaries. The scientific union asks that "intellectual work be paid what it is actually worth; that intellectual work attain the rank it merits in a modern civilized society." The union also hopes to address the "practice whereby people are not only stripped of their jobs for their political views but are also impeded in practicing work appropriate to their qualifications. TDDSZ will use every means at its disposal to protect those discriminated against for their political views."

The new Hungarian labor federation has requested and received fraternal support from the AFL-CIO, which it regards as a strong ally. The Hungarian government, which so far has allowed the unions to exist, is now debating whether and how independent organizations should be regulated. Provided there is no crackdown, expect much activity on Hungary's labor front.



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Summer 1989 Schedule

ARIZONA, Phoenix
Grand Canyon College
June 19-23
\$295

ARIZONA, Tucson
Grand Canyon College
July 17-21
\$295
(held at Canyon del Oro H.S.)

CALIFORNIA, Fresno
Fresno Pacific College
August 7-11
\$295

CONNECTICUT, Bridgeport
Sacred Heart University
August 14-18
\$395

FLORIDA, Orlando
Barry University
June 19-23
\$295
(held at West Orange H.S.)

GEORGIA, Atlanta
Brenau College
July 31-August 2 & August 7-9
\$295 (held at Riverdale Jr. H.S.)
*5 qt. credits; 6 days

ILLINOIS, Chicago
Elmhurst College
July 17-21
\$325

INDIANA, Fort Wayne
Univ. of Indianapolis
August 7-11
\$295
(held at New Haven H.S.)

INDIANA, Indianapolis
Univ. of Indianapolis
June 19-23 \$295

IOWA, Cedar Rapids
Drake University
August 7-11
\$325 (held at Marion H.S.)

IOWA, Council Bluffs
Drake University
July 10-14
\$325 (held at Kirm Jr. H.S.)

IOWA, Bettendorf
Drake University
July 31-August 4
\$325
(held at Bettendorf Mid. Sch.)

IOWA, Des Moines
Drake University
July 24-28
\$325

IOWA, Sioux City
Drake University
July 17-21 \$325
(held at Sioux City Com. Sch.)

MARYLAND, Baltimore
Western Maryland Coll.
June 26-30
\$350
(held at Pikesville Mid. Sch.)

MICHIGAN, Detroit (East Side)
Marygrove College
June 26-30
\$315
(held at Macomb Comm. Coll.)

MICHIGAN, Detroit (West Side)
Marygrove College
August 7-11
\$315
(held at Mercy Center, Farmington Hills)

MICHIGAN, Grand Rapids
Marygrove College
July 10-14
\$315 (site to be determined)

MICHIGAN, Kalamazoo
Marygrove College
August 14-18
\$315 (held at Kalamazoo P.S.)

MICHIGAN, Lansing
Marygrove College
July 31-8/4
\$315
(held at Waverly Mid. Sch.)

MICHIGAN, Midland
Marygrove College
July 17-21
\$315
(held at Delta Comm. Coll.)

MINNESOTA, St. Paul
College of St. Thomas
July 31-August 4
\$295
*graduate continuing education credit

MISSOURI, St. Louis
Maryville College
June 26-30
\$325

MISSOURI, Kansas City
Maryville College
July 10-14
\$325
(held at Blue Springs Sr. H.S.)

NEW JERSEY, Lodi
St. Peter's College
July 17-21*
\$350
(held at Felician College)
*coursework extends to 7/28

NEW JERSEY, Camden County
St. Peter's College
June 26-30*
\$350
(held at Voorhees Mid. Sch.)
*coursework extends to 7/7

NEW JERSEY, Middlesex Cty.
St. Peter's College
July 10-14*
\$350
(held at Old Bridge Mid. Sch.)
*coursework extends to 7/21

NEW YORK, Albany
Long Island University
August 7-11
\$375 (held at Colonie H.S.)

NEW YORK, Long Island
Long Island University
July 24-28
\$375
(Suffolk Cty. -site to be determined)

NORTH CAROLINA, Charlotte
Queens College
July 31-August 4
\$295

OHIO, Canton
Ashland College
July 24-28
\$350
(held at Drage Center, Massillon)

OHIO, Cleveland (West)
Baldwin-Wallace College
June 12-17
\$350
*5 qt. credits; 6 days

OHIO, Cleveland (East)
Baldwin-Wallace College
August 7-12
\$350 (held at Euclid Central Middle School)
*5 qt. credits; 6 days

OHIO, Columbus
Ashland College
July 10-14 \$350
(held at Westerville No. H.S.)

OHIO, Dayton
University of Dayton
August 7-11
\$350

OREGON, Portland
Portland State Univ.
June 26-30
\$295
(held at Park Rose S.D. #3)
*quarter credits

PENNSYLVANIA, Philadelphia
St. Joseph's University
July 10-14
\$350

PENNSYLVANIA, Pittsburgh
Carlow College
July 31-August 4
\$350
(held at Moon Jr. H.S., Coraopolis)

TENNESSEE, Nashville
Trevecca Nazarene Coll.
June 12-16*
\$295
*coursework extends to 6/27

TEXAS, Dallas
Texas Wesleyan College
June 12-16
\$295
(held at Richardson ISD-Birkner H.S.)

TEXAS, Fort Worth
Texas Wesleyan College
July 31-August 4
\$295

TEXAS, Harlingen
Texas Wesleyan College
June 26-30
\$295
(held at Harlingen H.S.-Alamo Campus)

TEXAS, Houston
University of St. Thomas
July 24-28
\$295

TEXAS, Midland/Odessa
Texas Wesleyan College
August 7-11
\$295
(held at Ector Cty. ISD-Permain H.S.)

TEXAS, San Antonio
Texas Wesleyan College
June 12-16
\$295 (held at North East ISD)

UTAH, Salt Lake City
University of Utah
July 10-15
\$295
*5 qt. credits; 6 days

WISCONSIN, Milwaukee
Cardinal Stritch College
August 7-11
\$325
(held at Brown Deer Mid. Sch.)

WISCONSIN, Madison
Cardinal Stritch College
July 17-21
\$325
(held at Sun Prairie H.S.)

WISCONSIN, Wausau
Cardinal Stritch College
June 26-30
\$325
(held at D C Everest H.S.)
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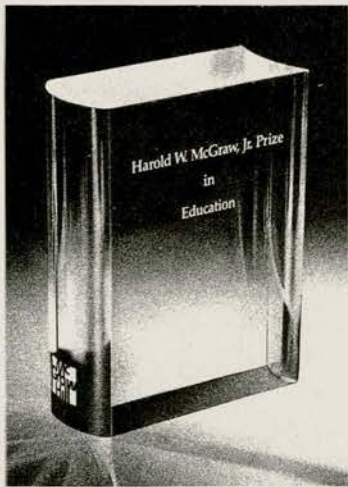
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Helen B. Crouch



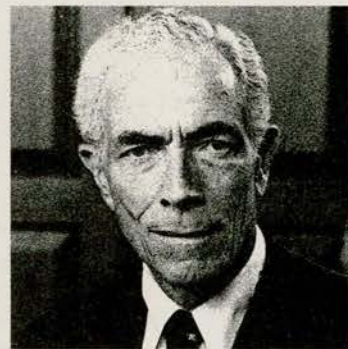
The awareness that millions of adult Americans are functionally illiterate has been late in coming to the public consciousness.

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WRITING WORKSHOP

*A teacher describes how she learned to teach
so that her students could learn to write.*

BY NANCIE ATWELL

In 1986, the National Assessment of Educational Progress reported that only 12 percent of eighth graders and 19.4 percent of eleventh graders could write a convincing letter to a prospective summer employer, only 18 percent of both eighth and eleventh graders could do an "adequate" job of imaginative writing that did not rely upon a given story framework, and, in general, American students could not "express themselves well enough to ensure that their writing will accomplish the intended purpose."

In contrast to these dismal findings, the story that follows—and it does read like the best of stories—describes a group of normal, average eighth graders in rural Boothbay Harbor, Maine, who are undoubtedly like their cohorts around the country except in one extraordinary respect: Every day these eighth graders write. They write, and revise, and confer, and revise, and edit, and write some more. They write in every possible genre. They sometimes publish their writing. Like all serious writers, they continually struggle to clarify what it is they want to say, to recognize false starts and unfocused topics, to conquer the difficulties of dialogue. In the context of their work, they even come to care about commas. Unlike the passive, reluctant, disengaged adolescents that John Goodlad found all too often in his massive, observation-based study of secondary classrooms across the country, these youngsters provide a compelling, real-life portrait of the concept of student-as-worker that is talked about so frequently these days.

*Behind them and beside them is their remarkable teacher, Nancie Atwell, whose book, *In the Middle* (from which this article is adapted), tells how she transformed her classroom into a writing workshop. In her frank and searching account of how she and her colleagues came to make such dramatic changes in their approach to teaching, Atwell shines a clear light on the ingredients that made the process possible: They were given time, authority, access to professional resources, and encouragement to question the traditional ways of doing things. They were constrained only by their own professional integrity, which gradu-*

ally forced them to admit that their traditional methods were not working and which energized their commitment to find ones that would.

In the Middle was recently awarded the Modern Language Association's Mina P. Shaughnessy Prize, the first time this award has been given to a classroom teacher. We are very pleased to present the following excerpts from this book, with apologies that we are able to give only a flavor of its richness.

—Editor

I CONFESS. I started out as a creationist. The first days of every school year I created; for the next thirty-six weeks I maintained my creation. My curriculum. From behind my big desk I set it in motion, managed, and maintained it all year long. I wanted to be a great teacher—systematic, purposeful, in control. I wanted great results from my great practices. And I wanted to convince other teachers that this creation was superior stuff. So I studied my curriculum, conducting research designed to show its wonders. I didn't learn in my classroom. I tended and taught my creation.

I had a writing assignment for each week of the school year, my own composition treasure trove—from drama to narrative to idea writing, with extensive pre- and post-writing activities. Students role played, then wrote monologues. Or they talked in small groups, then wrote dialogues. Or they read selections from an anthology, then wrote fictional narratives. Then I wrote all over their drafts and they "revised." On Friday I collected all the compositions. On Saturday I avoided the room where they lay awaiting me. On Sunday I wrote all over

*Nancie Atwell taught junior high English for twelve years, most of them in Boothbay Harbor, Maine. She currently directs a literacy project for the Bread Loaf School of English of Middlebury College, Vermont, and is the editor of two books forthcoming from Heinemann Educational Books, Inc.: *Workshop and Coming To Know*. This article is adapted, with permission of the publisher, from *In the Middle* (Boynton/Cook, a division of Heinemann, 1987).*

"Make eye contact with the writer," advises Atwell. "Because the student and the student's reaction are the focus of the conference, don't look at or read the paper or allow the writer to give it to you."



Atwell keeps her conferences short and sees as many writers as possible each day. "You're not asking to hear every word students write," she says. "Ask them to read or talk to you about the lead or conclusion, a part that's working well, or a part where they need help."



PHOTOGRAPHS BY ROBERT MITCHELL

them, recorrected too many of the same mistakes, then started pumping myself up for Monday morning's pre-writing activity. Whatever that activity, the resulting compositions always broke neatly into three divisions. There were six "gifted" writers who made my task their own and did something wonderful with it, fifteen kids who did the assignment more or less adequately, and six whose papers I chalked up to poor effort or low ability.

This writing program fit my assumptions about junior high students and writing instruction. I assigned topics because I believed that most of my kids were so intimidated by expressing themselves on paper they wouldn't write without a prompt and also because I believed that my structures and strictures were necessary for kids to write well. When it came right down to it, though, I assigned topics because I believed that my ideas were more credible and important than any my kids might possibly entertain. And from my perspective—that big desk at the front of the classroom—it looked as if real writing were going on out there. It took a long time for me to admit to myself that it wasn't.

These days, I learn in my classroom. What happens there has changed; it continually changes. I've become an evolutionist, and the curriculum unfolds now as my kids and I learn together. My aims stay constant—I want us to go deep inside language, using it to know and shape and play with our worlds—but my practices evolve as eighth graders and I go deeper. This going deeper is research, and these days my research shows me the wonders of my kids, not my methods. But it has also brought me full circle. What I learn with these students, collaborating with them as a writer and reader who wonders about writing and reading, makes me a better teacher—not great maybe, but at least grounded in the logic of learning, and growing.

I didn't intuit or luck into this place, and I didn't arrive overnight. I paved the way through writing and reading about writing, through uncovering and questioning my assumptions, through observing kids and trying to make sense of my observations, through dumb mistakes, uncertain experiments, and, underneath it all, the desire to do my best by my kids. I learn in my classroom these days because I moved, because the classroom became a reading and writing workshop, a new territory my students and I could inhabit together.

I'm beginning with the story of how this workshop came to be because its genesis sets the stage for all that follows. All the particular methods of the writing and reading workshop grow from my particular experience; I'm hoping other teachers, in sharing my experience, will grow right along with me. Above all, I'm hoping the story of my evolution points to one crucial and heartening message: If I've ended up here, anyone can.

I

LEARNING TO TEACH

After several years of guarding my cherished creation, I no longer could ignore the fact that all my helpful structures were not working. I had too many images in

my head—images I tried hard to forget but couldn't—of eighth graders who every day sat in front of my big desk struggling with the assignments I had given them but who were not becoming writers. How could I help them? I did not know. Indeed, I knew very little about them as writers beyond the degree to which they carried out my Monday morning assignments.

What I did know was this: Kids can't be the only learners in a classroom. I also had to learn. Common sense, good intentions, wide reading, and the world's best writing program aren't enough.

How could I learn about writing? How could I learn to look, and how could I make sense of what I saw? How could I learn anything at all in Boothbay Harbor, Maine?

ON THE VERGE OF LEARNING: BREAD LOAF

The next summer I left Maine for seven weeks to try to begin to learn. The Bread Loaf School of English Program in Writing, at Middlebury College in Vermont, was in its second year. Paul Cubeta, Bread Loaf's director, had secured full tuition grants for English teachers from rural schools, and I qualified.

I chose Bread Loaf because I thought its catalogue promised resources Boothbay Harbor couldn't offer, but when I got there, Dixie Goswami, my teacher, persisted in inviting me to become *my own resource*, to learn about writing firsthand by becoming a writer and researcher. All that summer I wrote, looked at how I wrote, and thought about what my discoveries meant for my kids as writers. It was a summer of contradictions.

I saw that the choices I made as a writer—deciding how, when, what, and for whom I'd write—weren't options available to the writers in my classroom. But I also saw an unbridgeable gap between my students and me. As an adult writer, I knew my intentions and ways to act on them. As an English teacher, I knew only the safety of my assumptions about students: their need for my pre-writing structures and post-writing strictures.

When Bread Loaf ended and school started again, I went right back to my program. But this time around I tried to open up the structures and strictures. I gave kids more options and made my assignments more flexible—now they had a choice of four role-play situations and could write the required monologue as any one of six fictional characters. And this time around I started writing with my students, taking on the tasks I gave them. It was a daunting experience.

My assigned poetry was formulaic and cute. My assigned narratives never went beyond first draft; I wrote them at the breakfast table the day they were due. My assigned essays consisted of well-organized and earnest clichés. But the worst was the assigned daily journal write. Every English class started with an enforced ten-minute "free" write, and I either had nothing to say or so much that ten minutes was far too brief a stretch.

All the while I was writing this awful stuff I was conducting research. I wanted to show the beneficial effects on their writing when students viewed their teacher as a writer. But I wasn't writing; I was performing. I did my real writing at home, mostly poetry and letters for me and for people I cared about. I wasn't even conducting research; I was method testing, trying to



Students learn the hard work of revising and make good use of scissors and tape to re-organize the pieces.

prove the integrity of my creation. In January, I called off my research project and buried my writing portfolio in the back of a file drawer.

I'm a good rationalizer, and I rationalized hard that winter. What I needed were even more creative, more open topics. I needed thrilling pre-writing activities. I needed better students—kids who could consistently make my assignments their own, who didn't "revise" by recopying and changing three words, who came to me prepared by their teachers to write well. I needed better colleagues.

This last was my favorite rationalization. I assumed the classic stance of secondary English teachers everywhere: If you elementary teachers had taught properly, I wouldn't have to work so hard. On our language arts curriculum committee, I made an officious case for more creative writing in the elementary grades. The chief beneficiary of all this creative writing would, of course, be me. If someone else moved these kids to show some imagination and take some initiative before junior high, all I'd have to do when they came to me was frost the cake. So I passed around copies of my best creative writing recipes and held forth about THE composing process, that lockstep sequence I orchestrated every Monday through Friday. And I was generally, justifiably ignored.

Not one of my colleagues—and some had master's degrees plus forty hours—had ever attended a course or workshop concerned with the teaching of writing. In that respect, their undergraduate and graduate training was typical: In an informal survey of thirty-six New England universities, Graves found 169 courses dealing with instruction in reading and only two courses in teaching writing.¹ Teachers needed information about writing, but the information I shared and the way I shared it didn't help them. Boothbay's K-7 students continued to not write. Their teachers continued to follow—or not—a language arts curriculum consisting of grade-level skills lists patched together from textbooks and other schools' curriculum guides. And I continued privately, and not so privately, to lay blame.

IN THE early spring of 1980, we started a new round of curriculum development. Eight of us from grades K-8 volunteered to serve on a language arts committee whose task was to produce a new curriculum guide. Gloria Walter, our chair, suggested that we begin by posing questions the committee could investigate. So we posed questions, settling finally on the query: How do human beings acquire language? An obviously over-ambitious question, it at least put us on a new track. I couldn't lecture or condescend (although I did feel pretty confident that the answer would point toward a writing program rather like my own). We couldn't exchange gimmicks, borrow philosophies, or draw up skills sequences. Instead, the committee began looking for resources that could help us find answers. Remembering a paper I had read a year or so earlier by Donald Graves of the University of New Hampshire, I sought him out. He responded by sending us Susan Sowers.

Graves, Sowers, and Lucy Calkins were then nearing the end of their second year as researchers in residence at Atkinson Academy, a public elementary school in rural New Hampshire. Under a grant from the National

Institute of Education, they spent these two years following sixteen first- and third-grade writers and their teachers.² They observed students in their classrooms *in the process* of writing in order to discover how children develop as writers and how schools can help.

Susan came to our curriculum committee with copies of reports from their project. She also brought her authority as a teacher and researcher, a wealth of knowledge—and patience. What she had to say was not what I wanted to hear. According to Susan, children in the Graves team's study learned to write by exercising all the options available to real-world authors, including daily time for writing, conferences with teachers and peers, pacing set by each individual writer, and opportunities to publish their writing. Most significantly, these students decided what they would write. Because the topics were their own, children made an investment in their writing. They drafted and revised and edited; they cared about content and correctness. They wrote on a range of topics and in a variety of modes wider than their teachers had dreamed of assigning. And their teachers had come out from behind their own big desks to write with, observe, and learn from young writers.

Atkinson Academy sounded a lot like Camelot. As

Susan extolled its merits, I rolled my eyes and ground my teeth. I wanted to leave our meeting nearly as much as I wanted *her* to leave. As it worked out, however, I kept Susan at the school that day much later than she intended to stay, arguing.

"But Susan, what if I have my class come up with a chain of memories, talk about them, choose one, and write it?"

"Well, that sounds very nice," she answered. "But that's really an exercise."

"Okay . . . but what if I give them a choice of four really funny dramatic monologues, and they get to role play these, then choose one to write up?"

"Ummm, I guess I'd call that an exercise, too."

"Wait, wait. I haven't told you my best. . . ."

It was an exercise. They were all exercises.

For the next week I explained to anyone who would listen how Susan's findings couldn't possibly apply to me and my eighth graders, how all my classroom experience and secondary English teacher expertise argued against the certain anarchy Susan had advocated. I railed at the art teacher: "Sarah, can you imagine what would happen if someone said kids should come into the artroom, check out the materials you've got here, and

EXPECTATIONS FOR GRADE EIGHT WRITING

Students need to learn how the workshop works—what I expect of them and what they can expect of me. One of my first lessons is a straightforward explanation of expectations.

I don't expect that my kids will do everything listed under "Your Role" the first week or even month of school. This is a general statement, background on which they and I will build together. It's also a helpful summary for parents, one I distribute during Open House in September.

Part I: Your Role

1. To come to class each and every day with your daily writing folder, in which you'll keep all drafts of your pieces-in-progress.
2. To take care of your folder: It's your text for this course.
3. To write every day and to finish pieces of writing.
4. To make a daily plan for your writing and to work at it during class and at home.
5. To find topics you care about.
6. To take risks as a writer, trying new techniques, topics, skills, and kinds of writing.
7. To draft your prose writing in paragraphs.

8. To number and date your drafts of each piece.

9. To work hard at self-editing your final drafts and to self-edit in a pen or pencil different in color from the print of your text.

10. To maintain your skills list and to use it as a guide in self-editing and proofreading.

11. To make final copies legible and correct with decent margins.

12. To take care with the writing materials and resources I've provided you.

13. To make decisions about what's working and what needs more work in pieces of your writing; to listen to and question other writers' pieces, giving thoughtful, helpful response.

14. To not do anything to disturb or distract me or other writers.

15. To discover what writing can do for you.

Part II: My Role

1. To keep track of what you're writing, where you are in your writing, and what you need as a writer.

2. To grade your writing four times this year, based on your growth and effort as a writer.

3. To write every day and to finish pieces of writing.

4. To prepare and present mini-lessons based on what I see you need to know next.

5. To help you find topics you care about.

6. To provide a predictable class structure in which you'll feel free to take risks as a writer.

7. To organize the room so it meets your various needs as a writer.

8. To help you learn specific editing and proofreading skills.

9. To be your final editor.

10. To give you opportunities to publish your writing.

11. To photocopy finished pieces you want photocopied.

12. To provide you with the materials you need to write.

13. To listen to you and to respond to your writing by asking thoughtful, helpful questions; to help you listen and respond to other writers' pieces in thoughtful, helpful ways; to make a record of what happens in my conferences with you.

14. To make sure no one does anything to disturb or distract you when you're writing or conferring.

15. To help you discover what writing can do for you.

N.A.



"Figuring out how to accommodate both writers' need for quiet and their need to talk about their writing presented our biggest headache in arranging the room as a workshop," recalls Atwell. The solution: four "Conference Corners" formed by the lockers and coat racks that run along one wall.

come up with their own projects?" I raged in the local service station: "Mr. Andrews, what if someone said customers should come into your garage, borrow your tools, and repair their own cars?" Sarah and Mr. Andrews and everyone just shook their heads.

But all that week, on my free periods and in the evening, I waged a silent, losing battle with Susan Sowers as I read and reread the manuscripts she had left behind. Eventually I saw through my defenses to the truth. I didn't know how to share responsibility with my students, and I wasn't too sure I wanted to. I liked the vantage of my big desk. I liked setting topic and pace and mode, orchestrating THE process, being in charge. Wasn't that my job? If responsibility for their writing shifted to my students, what would I do?

WHAT I did, finally, was talk to my kids. One day in March I gathered my courage and closed my door. I told my English classes about this elementary school in New Hampshire where children came up with their own topics and wrote for all kinds of real audiences, where writers got response from their friends and the teacher *while* they were writing. Then I asked, "Could you do this? Would you like to?"

Yes. Some said it tentatively, some resoundingly, but they all said yes. Together we had made an amazing discovery: They did have ideas for writing. Even more amazing, given the nonsense I'd had them writing for the past six months, they had good ideas.

Brooke wrote a short story about the slaughter of baby seals. Doug wrote about duck hunting, and Greg told about deep-sea fishing. Shani described the night she heard the news that her brother had died in an automobile accident. Evie wrote letters of inquiry to private high schools, and Ernie wrote a parody of Stephen King. One of my Sarahs told about her experiences learning to drive a junked Oldsmobile in her parents' driveway; the other Sarah took her reader-friends on a bus trip through Harlem that had shaken her small-town complacency. Eben's short story about the aftermath of a nuclear holocaust went through three drafts to become a letter to the editor of the *Portland Press Herald* objecting to the reinstatement of Selective Service registration. Melissa's letter to the Society for Animal Protective Legislation was forwarded as evidence to a congressional subcommittee. Lauren's letter to the local YMCA resulted in expanded gym hours for junior high kids. Erin's letter to Louis L'Amour questioning the credibility of one of his plots brought a long letter from L'Amour explaining his historic source.

When a Maine dairy announced a Down East story-writing contest, a group of eighth graders decided to enter. They listened to Marshall Dodge's "Bert and I" albums over and over again, making notes about dialect and story structure, and they wrote draft after draft. Roy won the contest and a \$250 scholarship; five of his classmates were runners-up.

There weren't six top writers in each class anymore. Every student could seek help in conferences, spend sustained time on single pieces of writing, and discover that writing well isn't a gift. Their commitment to their topics made them work hard; their hard work made good writing happen.

After the novelty of self-selected topics faded, the writing didn't always come easily. In April some students begged, "Just tell me what to write. Anything. I'll write it." But I held firm. Those days had ended. Instead I questioned, modeled, and insisted, "Write about what you care about. What do you care about? What do you know? What do you know about that I don't know?"

After the novelty of no lesson plans wore off, the teaching didn't always come easily, either. But in spite of blocked writers, my uncertainty about what to say in conferences, big administrative questions about grading, recordkeeping and classroom management, I couldn't wait to go to school in the morning to see what my kids would do next.

I saw them taking chances, trying new subjects, styles, and formats. I saw them taking responsibility, sometimes judging a single draft sufficient, other times deciding the sixth draft represented their best meaning. I saw them taking care, editing and proofreading so their real readers would attend to their meanings, not their mistakes. I saw them taking time, writing and planning their writing outside of school as well as in. I watched as my English classroom became a writer's workshop. Suddenly, the pieces fit.

LEARNING IN EARNEST: THE BOOTHBAY WRITING PROJECT

One afternoon last spring, five years after Susan Sowers came to Boothbay Harbor, Tracy and her friend Kristen were talking about what they'd like to be when they grew up. As I walked past their desks, Tracy stopped me and said, "You know, Ms. Atwell, I think I'd like to be an English teacher."

This doesn't happen a lot, not with junior high kids anyway. So I asked why.

"Well, it's so easy," she answered.

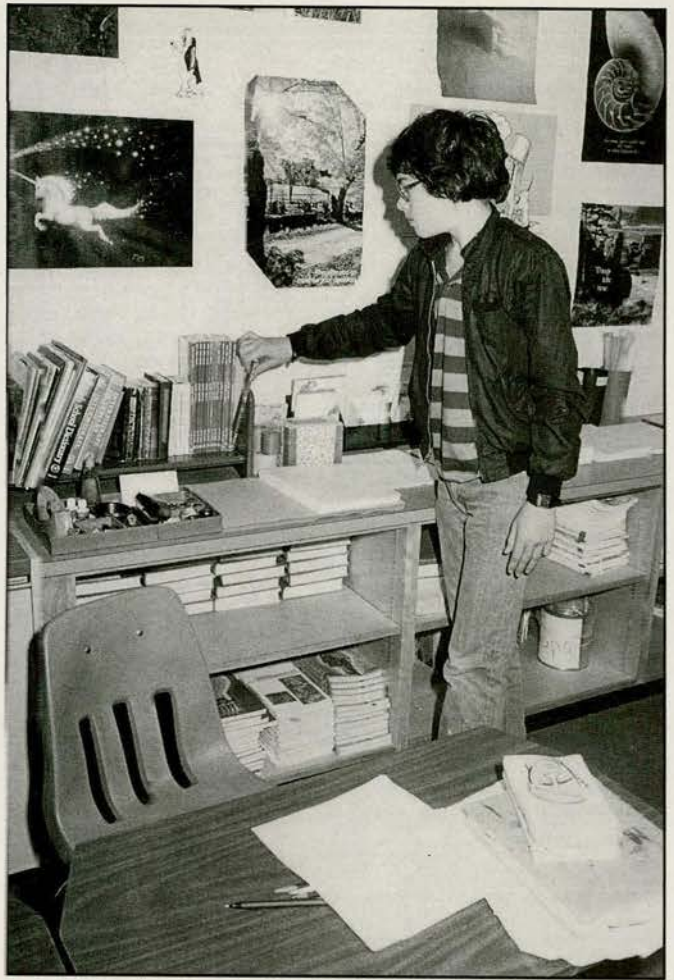
"Easy? Tracy, do you know. . ."

But she stopped me again, blushing. "No, I mean, I see what you do," she explained. "It's all just writing and reading and talking about them. I wouldn't mind doing that for a living."

I love it that Tracy doesn't (or, at least, didn't then) view English teachers as lecturers, assignment-givers, test-makers, paper-correctors, or Ditto-designers. English teachers make their living doing the good stuff—writing, reading, and talking about them. But the underpinnings of this job Tracy fancies don't show—all the hard thinking that led me to abandon lectures, assignments, tests, and Dittos as ways of teaching, and all the hard work of discovering how writing, reading, and talking about them could become practical ways of teaching. I didn't get here alone.

Much of what happens in my writing workshop is informed by the work of Donald Graves, Donald Murray, Lucy Calkins, Susan Sowers, and, especially, Mary Ellen Jacobbe. And much of what happens is informed by the work of my colleagues, the teachers who became the Boothbay Writing Project.

In the early summer of 1980, still reeling from the miracle of the final months of that school year, I submitted a proposal to the old Title IV-C, requesting funding for a local inservice program on the teaching of writing.



The workshop materials center contains everything a working writer might need, from all different types of paper and writing instruments to usage handbooks, models of standard format, and a card file of professional publications that feature children's writing.

The time was ripe for Boothbay's K-7 children to write—and this time not for my benefit, but so they too might find their voices and exercise the power and freedom that I'd learned young writers would enjoy. And by then, I knew exactly what I didn't want to do by way of helping develop a K-8 writing curriculum for our school.

I didn't want to dictate methods to my colleagues. Nor did I want to engage in any more swapping, borrowing, or secondhand philosophizing, all in the name of saving labor. Nor did I want to depend for the most part on outside experts' counsel to change our ways; except for me and Gloria Walter, whose seventh graders briefly experimented with self-selected topics, Susan Sowers' visit had been a fizzle.

Instead, we needed to find a way to break with the fine old tradition that had governed our previous curriculum efforts, the one that bore the motto, "Let's not reinvent the wheel." To do that, I needed to climb down from my secondary English teacher high horse and find a way to learn with my colleagues just as I was learning with my kids. When Title IV-C awarded us funding in August 1980, Dixie Goswami helped us develop a process for learning together.

First, we gave ourselves time. We couldn't expect to come to serious understandings of writing in a few, quick-fix committee meetings. So we devoted two years to writing process, meeting for a week each August, two or three times each month after school, and on regular half-day released time for project teachers, paying our subs from the grant.

Next, we gave ourselves authority. Only those teachers interested in writing and its teaching joined the project, and we alone implemented the curriculum we developed. To his great credit, Bob Dyer, our principal, didn't mandate full-staff participation. I talked to all the teachers at my school about the proposed project and, starting with my three closest friends, fourteen teachers of grades K-8 eventually joined me that first year. By the end of the second year, we numbered twenty-two. A half dozen or so teachers at my school continued to go their own ways. To ask that they do otherwise would be to revert to one of the worst of the fine old traditions: across-the-board curriculum adoption. Our authority as teachers of writing can't be adopted by others on an administrator's command; it comes from the knowledge we've gained through diverse personal experience.

Finally, we gave ourselves opportunities for diverse personal experiences of writing. We read writing research, especially the ground-breaking reports by Graves, Calkins, and Sowers from the Atkinson study. We started attending professional conferences. When we had particular questions, we sought consultants who had answers; Mary Ellen Giacobbe, then a first-grade teacher at Atkinson, spent an invaluable Saturday with us talking about writing conferences.

To these data we added our own information. Borrow-

ing ethnographic methods from the Graves project and Glenda Bissex's case study of her son's writing and reading,³ we conducted year-long case studies of one or two of the writers in each of our classrooms. We also kept logs of observation, notebooks in which we recorded what our student writers said and did, along with our questions and speculations. We conducted self-research, looking long and hard at ourselves as writers, at our own writing processes and our histories as writers learning to write. We compiled portfolios of our writing on topics of our own choosing. And we met to share our writing and talk about the implications of all these activities for our teaching. Finally, I arranged with the state department of education for writing project teachers to receive recertification credit for their studies.

The process worked. It worked because it was so complex. Layer upon layer of experience accumulated to form a body of shared knowledge and expertise. No one handed us a program from on high; in intense and personally meaningful collaboration, we invented our own wheel. Together we learned from ourselves, each other, and our students.⁴

WRITING WORKSHOP was the end product of this process, and the wheel we invented daily revolved with the energy generated in our twenty classrooms. Our new curriculum wasn't a neat formulation of grade-level skills and methods. It was messy, as thinking often is; as we learned more it changed, as thoughts often do. Always, though, a fixed framework of shared beliefs undergirded this messy enterprise, seven principles that constantly informed our teaching and our students' learning:

1. *Writers need regular chunks of time*—time to think, write, confer, read, change their minds, and write some more. Writers need time they can count on, so even when they aren't writing, they're anticipating the time they will be. Writers need time to write well.

2. *Writers need their own topics.* Right from the first day of kindergarten, students should use writing as a way to think about and give shape to their own ideas and concerns.

3. *Writers need response.* Helpful response comes during—not after—the composing. It comes from the writer's peers and from the teacher, who consistently models the kinds of restatements and questions that help writers reflect on the content of their writing.

4. *Writers learn mechanics in context,* from teachers who address errors as they occur within individual pieces of writing, where these rules and forms will have meaning.

5. *Children need to know adults who write.* We need to write, share our writing with our students, and demonstrate what experienced writers do in the process of composing, letting our students see our own drafts in all their messiness and tentativeness.

6. *Writers need to read.* They need access to a wide-ranging variety of texts, prose and poetry, fiction and nonfiction.

7. *Writing teachers need to take responsibility for their knowledge and teaching.* We must seek out pro-

(Continued on page 45)

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MINORITIES IN MATHEMATICS: A FOCUS ON EXCELLENCE, NOT REMEDIATION

BY ALLYN JACKSON

Joe was a conscientious and promising black student who in high school centered his social life on church activities. He was recruited to the University of California at Berkeley, where he intended to major in computer science. When Joe received D's on his calculus and computer science midterms, he was stunned. He resolved to intensify his studying, but to little avail. When he failed both his chemistry and computer science finals, Joe decided to refrain from all social activity and devote even more time to studying. The new regimen had little effect on his midterm grades the next semester. Disappointed and depressed, Joe quit attending class altogether. At the end of the academic year, he withdrew from the university and enrolled in a community college the next fall.

Socially isolated on a campus that has historically been predominantly white, Joe failed not so much from lack of ability as from ignorance of the steps he needed to take to succeed. His story is typical of many minority students: The attrition rate from freshman year to a bachelor's degree four years later is 70 percent for black students and 56 percent for Hispanic students, compared to 32 percent for all freshmen¹. Retention of black and Hispanic students is especially poor in engineering, mathematics, and the "hard" sciences. For example, in 1988, out of about 800 Ph.D.s in mathematics, four went to black Americans and five went to Hispanic Americans². Out of four thousand doctoral degrees awarded in 1987 to Americans in mathematics,

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engineering, and the physical sciences, barely 1 percent went to blacks, 2 percent to Hispanics³.

These bleak statistics, familiar anecdotally or numerically to most educators, are now commanding a new attention in college and university administrations, at all levels of government, and in business and industry. The nation is realizing that it cannot fill its need for college graduates in science, mathematics, and engineering from the traditional talent pool of white males. Linked to the drive to make the U.S. more "competitive" internationally, the need to increase the participation of minority students in science has received unprecedented attention. Suddenly, the problem of underrepresentation of minority students is in the limelight.

Enter Uri Treisman, a mathematician by training, who has for the past ten years been the inspiration behind the Mathematics Workshop, a project of the Professional Development Program (PDP) at the University of California at Berkeley. The workshop is designed to improve the performance of minority students in calculus, the gateway to a variety of science and engineering majors.

The effectiveness of the workshop is impressive:

- Before the workshop was instituted, the failure rate for black students in calculus was 60 percent. Now only 4 percent of the students in the workshop fail the course.

- 25 percent of black students not in the workshop drop out of first-semester calculus; the figure for workshop students is just 3 percent.

- Between 1978 and 1985, 55 percent of the workshop's black students earned a B- or better in first-year calculus, compared to 21 percent of the black students not in the program.

- 44 percent of the black students who entered the program in 1978 or 1979 received bachelor's degrees in mathematics-based fields, compared to 10 percent of the non-workshop black students.



Professor Uri Treisman confers with students in the mathematics workshop.

- Two-thirds of the black students in the workshop graduated from U.C. Berkeley; the figure for non-workshop blacks is less than 50 percent.

In addition, thirteen students from the program have gone on to pursue graduate study in mathematics. Perhaps the premier workshop student is Michele DeCoteau, who last year received a Rhodes scholarship to study materials science.

Clearly, Treisman's is not just another remedial program. The prestigious Charles A. Dana Award for Pioneering Achievement in Higher Education, presented to Treisman in 1987, brought his program national visibility and recognition. Since then, Treisman has been busy explaining to eager college and university faculty and administrators how they can adapt his program to their institutions. And with a \$720,000 grant from the Dana Foundation to start the Dana Center for Innovation in Mathematics Education, the program seems destined for even more widespread growth. Everyone is clamoring to know: Who is Uri Treisman and what are the secrets of the workshop's success?

TREISMAN'S STORY

The first things one notices about Uri Treisman is his expansiveness and lively good humor: He is as comfortable talking about where to get good barbecue as about pedagogy in calculus. After a few minutes of conversation, one perceives the intensity and sense of purpose that have the quality of a mission. A few minutes more reveal his command of facts and figures and his keen political understanding, which give him an unusually broad grasp of the educational issues concerning minority students. But above all, one senses that Treisman has a love for mathematics and a sincere concern for the students.

A New York City native, Treisman studied mathematics at the University of California, Los Angeles,



PHOTOGRAPHS BY JANE SCHERR

receiving his bachelor's degree in 1969. He jokes that he must have set some sort of record for the length of time between bachelor's and doctoral degrees, for he received his Ph.D. in mathematics and mathematics education 16 years later in 1985. During part of that interim, he worked as a horticulturist and landscape architect and continued to pursue his interest in mathematical research. In graduate school, he was a promising student in the highly abstract field of algebraic geometry when he initiated a program to train new teaching assistants.

As Treisman became more involved in teaching, he began to notice that two minority groups did not display the same range of achievement in calculus as did the general student population: Chinese students consistently excelled, and black students consistently failed. Statistics about the black students' performance are chilling: In 1975, before Treisman's program began, only two out of twenty-one freshman black students who enrolled in first-term calculus completed the final course in the sequence with a grade higher than C.

To try to understand the situation, Treisman spent eighteen months studying in detail the way these two groups of students spent their time. He recalls his search for an explanation for the apparent difference in performance:

I questioned twenty black and twenty Chinese students about their study habits, methods of preparing for examinations, the use they made of instructors' office hours—in short, about anything that I suspected might have a bearing on their course performance. In addition, I asked the students to reconstruct from memory detailed accounts of their activities on each of the three days preceding the questioning. From these accounts, I tabulated such items as the number of hours per day the students devoted to homework and review and the frequency with which they studied together with classmates or friends.

Intrigued by my findings and seeking still more information, I asked the students if I might observe them while they were studying and working on their mathematics assignments. Many agreed, and over a period of eighteen months I accompanied these students to the library, their dormitory rooms, and their homes in the hope that I might see firsthand how they went about learning, and doing, mathematics. I was particularly interested in learning about the use they made of their textbooks and classroom notes and about their approach to homework and review problems that, at least on their first try, they could not solve.

The visits rarely went as planned. Few students could work in their natural fashion with me peering over a shoulder—their strain was often quite apparent, as was the futility of my naïve attempt at detached observation. The students typically responded to their discomfort by asking me questions, and I to mine by rolling up my sleeves and helping them with their homework. This reestablished the more comfortable relationship of teacher to student. Then, I would again pose the questions that I had asked in my initial interviews,

but now, on their own turf, the students seemed more open. They were more willing to discuss such delicate matters as the reasons for their success or failure on a particular examination and the effect that coming to Berkeley had had on their self-esteem and on their relationships with family and friends.⁴

Treisman found that the Chinese students combined the academic with the social by studying together in supportive groups they called "study gangs." "Because they routinely critiqued each other's work, they got used to kicking problems around," he says. "There was a friendly competition among them, but in the end, they shared information so that they could all excel." The students also discussed matters pertaining to campus life. "The Chinese students would ask each other questions ranging from whether you could write in pencil on a test to how to circumvent certain university financial aid regulations." They were able to clarify among themselves what the university expected of them.

By contrast, Treisman says that, academically, the black students were "real loners." In his study, he describes the way many black students approached their calculus homework:

On many occasions, I would observe a black student working alone confront a discrepancy between his answer to a homework problem and that given in the back of the textbook. Typically, the student would begin what appeared to be a ritual search, reviewing his solution, hoping—perhaps praying—that he would find the source of the discrepancy in an arithmetic error. If, after two or three passes through his work, no error was found, he would then begin examining the examples in the textbook, working slowly backward from the problem set to the beginning of the relevant section in search of a model for his next effort. If this tack also met with failure, the student was at an impasse. At this stage, breakthroughs were rare and frustration, great.

Treisman began his study with the expectation that such factors as weak home lives, low socioeconomic status, or lack of motivation would explain the black students' lack of success in calculus. Several months into the study, however, he found that the students were, in fact, highly motivated and came from families that stressed education. "Their families were organized around helping these kids get to college," he says, noting that about 60 percent of their parents were teachers or worked in public schools. "The stereotype of the weak, low-income ghetto families just wasn't true." In addition, the common assumption of poor academic preparation did not explain the black students' difficulties in calculus. Studies at Berkeley and several private universities have revealed many "unexpected failures" among students who did well on the mathematics portion of the Scholastic Aptitude Test or other "predictors" of success in mathematics.

What, then, caused the black students to fail calculus at Berkeley? One major theme to emerge from Treisman's study was the rigid separation most of these students maintained between their academic and social

lives. The causes of this behavior can be complex, so making generalizations about them is difficult. However, Treisman points to two typical reasons. First, he notes that there is a strong and pervasive emphasis on self-reliance in the black community, and this can work to the students' disadvantage. Like Joe, whose story was told earlier, the black students' typical response to their poor performance in calculus was not to seek help but to redouble their efforts and concentrate harder. "The self-reliance that was an essential strength turned into a debilitating weakness," says Treisman.

The second reason the black students separated their academic and social lives was that this strategy worked for them in high school. As the highly motivated "exceptions" in their high schools, these students knew they would never get to college if they mixed socializing and scholastics, so, to survive academically, they learned to separate the two. But this strategy spelled isolation and frustration as these students faced the heightened academic demands of the university. They were often in the dark about what was expected of them and what steps were needed to succeed. Viewing themselves as high achievers, they found their lack of success puzzling and frustrating. "If a letter offering help came from the university administration, some would take it as evidence of institutional racism, but most would just think the letter had come to them in error," says Treisman.

Out of this study of black and Chinese students grew Treisman's workshop program, which he originally based on the Chinese students' study gangs. Joining the PDP staff in 1978 allowed him to experiment with innovative teaching ideas and various means of improving the performance of black and Hispanic students.

HOW THE WORKSHOP IS RUN

The Mathematics Workshop is based on a precept familiar to all good teachers: Students live up to, or down to, what is expected of them. One of the problems with most programs for minority students is the focus on remediation, rather than on excellence. "This is an honors program emphasizing the students' strengths, not their weaknesses," says Treisman. "We have created a high-quality educational environment in which students are challenged. We expect them to succeed, and we give them the tools to do so."

"The remedial approach is based on poor psychology and poor understanding," says Dick Stanley, a mathematician doing curricular work for PDP. "It's not so much an academic problem as a problem of merging into life on a largely white campus. Uri astutely recognized this fact and designed a program for students who just need the opportunity to work together in an environment in which academic achievement is valued." In an area that often becomes politically charged because of racial issues, Treisman's clearheaded approach is both effective and refreshing.

In focusing on calculus, Treisman's program actually addresses the broader issue of retaining minority students in science and engineering, for calculus is the gateway (some call it a "filter") to a variety of such majors. At U.C. Berkeley, the typical calculus class has several hundred students. A professor lectures to the entire class for three hours weekly, and graduate student teaching assistants run smaller discussion sections of perhaps twenty-five students. Many students who excelled in high school mathematics find calculus at

NOT 'YOU MIGHT,' BUT 'YOU WILL'

Lloyd French, a black senior in mechanical engineering, grew up in Oakland, California, in a family that stressed education: Both his parents have college degrees and work in the public schools. In high school, he enrolled in the PDP summer program and joined the Mathematics Workshop when he attended U.C. Berkeley. Now working in PDP as a tutor for the Macintosh computer laboratory as he finishes his degree, Lloyd has been with the program for almost nine years. "It's like family here," he says. "It's like a home away from home. It's a place to come and get your work done, but the most important part is being able to meet other students of your peer group, make connections."

Lloyd says that the high expectations of the program encourage students to achieve. "There is that positive reinforcement that yes, you



PHOTO: STEVEN CHIN

can do it. No problem. Not, 'you try,' or 'you might,' but 'you will.' Success will actually happen." And Lloyd is a case in point: He is currently working with a professor in the mechanical engineering department on particle suspension research in fluid dynamics and analysis and is taking a graduate course in robotics. Several professors have been encouraging him in such

diverse areas as patent law and biological controls, but Lloyd says his major goal is to become an astronaut. He plans to go to graduate school and has a cooperative internship at Jet Propulsion Laboratory, a NASA organization that conducts interplanetary and space research.

The social aspects of the program are crucial to its success, he says. "I think it's very important to pay attention to the social part, to incorporate that into academia. So many people would have a hard time dealing with the competition without this program. It's a hub, a large wheel of connections and ideas. This is where you get your connections so you know what's going on in the academic and job fields. You have people talking loud and laughing and kidding around, but there is serious networking and communication going on." □

Berkeley a different world: They are often shocked to find that "cookbook" methods of problem solving and rote memorization no longer suffice. And while some of the textbooks used in Berkeley calculus classes emphasize rote learning and a formulaic approach, the examinations, usually prepared by the professor, typically require a higher level of mastery. Minority students, many of whom lack a social network for support, have historically been especially prone to failing calculus at Berkeley.

PDP, which administers a number of programs for minority students, is designed to promote academic excellence among underrepresented minority students and to encourage them to pursue careers in academic research and teaching. The Mathematics Workshop, one of PDP's larger programs, consists of two 2-hour sessions each week and is in addition to the students' regular commitments in the class, such as lectures, discussion sections, quizzes, and examinations. The workshops are centered on carefully prepared sets of challenging mathematical problems. Few of the problems are routine, and almost all require more than a direct application of formulas and algorithms from the textbook. The sets contain problems designed to shed light on major concepts in calculus rather than simply to exercise the students' facility with formulas. Some of the problems are intended to reveal deficiencies in the students' backgrounds or understanding of major concepts. In addition, the problems help students to master computational "tricks" or shortcuts known to the best students but not revealed in the textbook or by the instructor.

During a workshop, students work collaboratively in small groups. The workshop leaders are chosen for their mathematical training and their commitment to teaching; many have been graduate students in the mathematics department. In contrast to the more traditional lecturing mode, a workshop leader facilitates discussion among the students, provides hints and clues, and encourages the students to experiment, rather than simply presenting the "right" way to do the problems. In this way, the workshop leader's role is more that of a catalyst to learning than a presenter of information. "This supportive and challenging atmosphere combines the academic and the social so that the students feel comfortable asking questions and bouncing their ideas off their peers," says Treisman. "The goal is to help them be independent but not isolated learners."

The workshops form part of a coordinated effort to help students build a social circle based on academics. Social activities such as parties, picnics, ski trips, and intramural sports are integral parts of the program. Students are also encouraged to participate in community activities such as on-campus black and Hispanic student organizations, the student senate, and tutoring programs in local schools. The PDP staff provides counseling and support services and has often interceded when students become ensnared in the bureaucratic tangles common on this enormous campus of more than thirty-thousand students.

One measure of success of this kind of program is its reproducibility: Can these ideas be utilized in other institutions? From this perspective, the Mathematics Workshop is truly successful: The model has been



adapted at about twenty schools in California. Some of these schools are quite different from U.C. Berkeley, which tends to be a fairly elite institution. For example, California Polytechnic State University in Pomona runs a highly successful workshop program based on the PDP model. CalPoly Pomona has a commuter student body, many of whom come from blue-collar families and are the first in their families to go to college. In addition, Stanford University and the University of Texas at Austin have launched pilot programs, and the University of Illinois at Chicago and the University of Georgia at Athens are in planning stages for programs using the workshop model.

ON LOCATION AT PDP

The PDP workshops⁵ are held in a large room with several tables and blackboards on wheels. Students wander in and out freely: This is their space and they use it. On one side of the room is a computer laboratory with Macintosh computers for homework and other assignments. Students frequently stop by to chat with Lana Fukasawa, whose cubicle is tucked in a corner near the entrance. Fukasawa, who has been with PDP since its inception in 1974, is the staff member having the most direct day-to-day contact with the students. She is thoroughly versed in campus life and the university bureaucracy, and students talk with her about anything and everything: class schedules, graduate programs, their personal lives.

As a workshop began one day, there were twelve

students distributed among the tables. Their ethnic diversity is evident: On one side table, a couple of Hispanic students sit with an Asian student as they work on homework. At another table, a black man whose features show a mix of races joins a close group of black and white students who live in the same dorm and study together outside the workshop. A woman whose ethnic background includes Native American and Chinese, a white man, and a Hispanic woman sit working at the front table. At the desk in the back of the room, a black man and a Hispanic man who regularly study together sit with a local mathematics teacher who is developing a high school adaptation of PDP.

Dick, the workshop leader, comes into the room and distributes the problem set for this workshop session. Silence falls over the room as the students begin to read the problems. Alicia, the workshop assistant, is a Hispanic senior in mathematics who went through the PDP workshops. Dick and Alicia circulate among the tables, ready to answer questions and provide clues. Slowly conversation picks up. "How does the mean value theorem work here?" one woman asks her neighbor. "What about the first problem?" Dick asks one student. "Any ideas?" "Use the mean value theorem on the function $\sin x$?" the student asks. "Okay," Dick replies. "How do you decide which interval to use?" Guiding the students through questioning, Dick begins to draw a sketch to help the students visualize the problem.

As Dick leaves the table, the conversation remains animated as the students review the problem. "Okay, that's that," says one student. "Now explain it to me." His partner begins to go through the steps, but is cut off in midsentence. "But that doesn't work right," the first student says. "The mean value theorem has an equality and we have to prove an inequality." Overhearing this, a student at another table puts in, "But you can get the inequality from the fact that $\cos x$ is always less than 1 in this interval." This kind of cooperation makes the group self-correcting and tends to move all the students toward better understanding.

More students enter the room, and in half an hour the noise level is high, unlike a classroom. Alicia is at one side of the room, working with two students at the board. Lana walks through, announcing a midterm review on Sunday to be followed by a softball game. "Bring your mitts!" she reminds them. For a few minutes, conversations dwell on the review and the upcoming midterm, then wind their way back to the problem set. "Everyone, pay attention to this for a minute," says Dick, hushing the group temporarily, and he works the first part of problem 2 on the board. Not all of the students have reached problem 2, some have already completed it, but all pay attention. Dick is using his earlier interaction with the students on problem 2 to clarify a common point of confusion.

One woman is sitting at a side table talking through the problem with a friend. She begins to raise her hand for help, then sees the example on the board and her

face changes from frustration to excitement. "Oh, I'm wrong, I see it, never mind," she says. A moment later she shoots both fists into the air, exultant: "All right, I got it! I don't believe it! Look at this!"

As the students continue to discuss the problems, their conversations weave in and out of the mathematics. At one point several students animatedly discuss an upcoming Eddie Murphy concert for about ten minutes, and then the conversation shifts back to their work, with no clear demarcation. These conversational "breathers" permit the students to approach the problems with a fresh eye and allow time for concepts to sink in. During the workshop, there has been no clock watching, no restless fidgeting: The students come to work on mathematics, and they use their time well. At the end of the two hours, as students begin to pack up their things and leave, one of them asks Dick a question. They are joined by another workshop leader, and the three spend an extra fifteen minutes working on the problem.

NEW DIRECTIONS

The workshop program has continued to evolve over the years. At various times, PDP has offered workshops for precalculus, physics, and chemistry. The School of Engineering at Berkeley offers its own calculus workshops based on Treisman's model. This fall, PDP has begun experimenting with integrating the workshops more closely with the calculus discussion sections as part of a long-term effort to make the workshops part of the mathematics department. Treisman is also working on a high school program for minority students. In addition, he has obtained funding from the Sloan Foundation to run a special summer program for minority students. The program will put mathematically talented undergraduates into contact with mathematical researchers for a six-week session of seminars.

PDP has grown over the years, but the emphasis remains on personal interactions. "We are small enough so that we can get to know the students well," says Fukasawa. "We see ourselves as advocates for the students. There is a conscious effort, a policy of being there for the student." Although the program's success is due, in large part, to its careful and innovative conception, the primary factor is the students themselves. "The program has been successful because of the students," says Fukasawa. "We've had some damn good students, some strong, good, wonderful students that have come through here." □

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- ⁵ Material in this section was adapted from "The Mathematics Workshop: A Description," by Rose Asera, Ph.D.

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SMALLER IS BETTER

*How the house plan can make
large high schools less anonymous*

BY DIANA OXLEY

AMERICAN HIGH schools regularly enroll two thousand, three thousand, or four thousand students. The institution has become enormous.

The excessive growth in our high schools was based on two arguments popularized in the '50s and '60s: First, large size supposedly guaranteed an audience for the specialized classes, expensive labs, and diverse extracurricular activities that every good high school was said to require. (This argument is most associated with the well-respected educator James Conant. Ironically, he claimed that a senior class should be [only!] as large as 100 students to support the desired level of curricular variety.) Second, large schools were believed to provide an economy of scale.

But recent research is providing strong evidence that, contrary to these arguments, big is not only not better, it is worse. The research shows, for example, that across the country, dropout rates of high schools with over two thousand students are twice as high as those of schools with six hundred or fewer students.

Why have large schools failed to keep their promise?

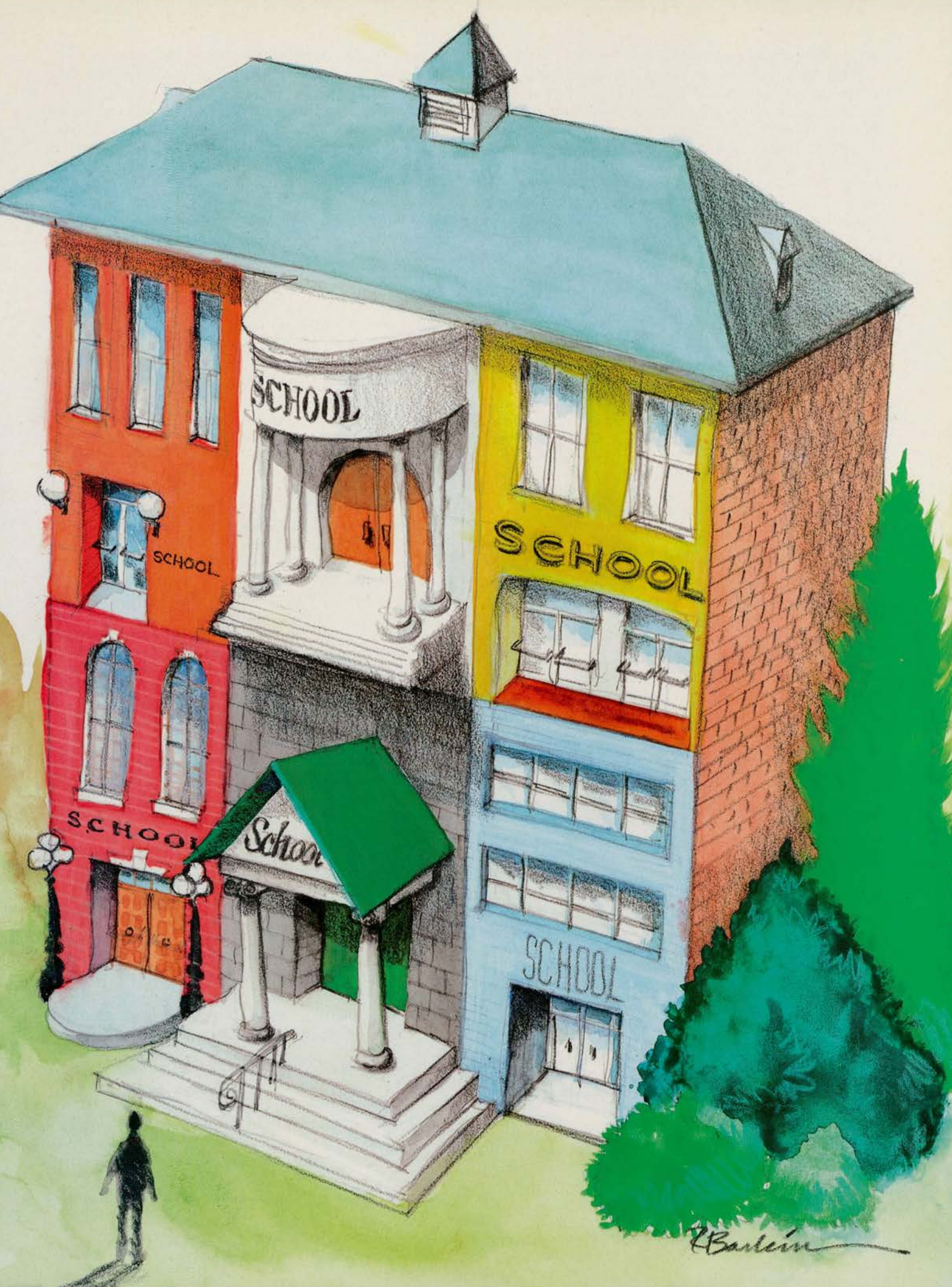
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In part, because only small percentages of students (not more than 12 percent it has been shown) tend to take specialized courses. Also, the large number of extracurricular activities found in large schools is deceptive. There are, in fact, fewer extracurricular opportunities for students on a per-capita basis in large schools than in small ones.

With regard to the supposed economy of scale, much of it results from providing proportionately fewer support staff and extracurricular activities, and providing less space for these items. However, these savings also represent costs in terms of dropout rates, poor attendance, vandalism, etc. If the financial costs associated with the negative effects of large schools were accounted for, an economy of scale probably would not be evident.

But the great failing of large schools is that they create an unfavorable social climate for learning. When enrollment exceeds five hundred, teachers and administrators no longer know all the students by name; and at one thousand, staff is unable to distinguish an intruder from a student. Students are more remote from staff; they rely on their own friendship circles for support. A strong, shared sense of community does not exist between staff and students or even among students. It is not difficult to understand why destructive student subcultures often emerge.

Research studies document that at-risk students suffer the consequences of large school size most. They are the least likely to capture the rewards that large schools hand out. In large, inner-city schools with high percentages of poor and low-achieving students, a culture of poor attendance, class cutting, dropping out, noninvolvement in extracurricular activities, and more



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threatening acts of vandalism and violence is the norm.*

Teachers, of course, confront the effects of a poor social climate in their classrooms and hallways and also in their work with colleagues. A large student body requires a large faculty and a more elaborate administrative hierarchy. Teachers are far removed from the decision making that takes place at the top of the hierarchy. The informal means of sharing information that suffice to keep teachers informed in small schools are curtailed: Teachers do not see most administrators and other teachers during the course of the day in a large school, for example. They interact mostly with others in their program or department, and a shared sense of school purpose is lost.

Moreover, reducing the size of schools is a prerequisite to other educational reforms. It is the very scale of the educational enterprise that makes teacher involvement in decision making, more flexible scheduling, the integration of curriculum, etc., so difficult.

The evidence is compelling: Smaller schools make effective education more possible. In communities with growing school enrollment, new smaller secondary school buildings can be built. But what about the thousands of existing huge high school buildings around the country? The most practicable and speedy solution is to divide existing schools into smaller units.

THE HOUSE PLAN AS SOLUTION

The idea of breaking large, anonymous schools into smaller communities called "houses" comes from Britain's elite, private schools (known as public schools). In the classic British system, from the moment students enter the school at the age of eight until they leave at age eighteen, they are clustered together for all extracurricular activities in a multi-age-level "house." As the students play together in intramurals and other activities over the years, a very tight social group is established; strong relationships are developed among the students and, also, between the students and the housemaster, who is paired with the same group of students during the students' entire school career.

The house plan is not new or untried in this country. It has been used sporadically as an antidote to the school and school district consolidation trend that produced today's large academic comprehensive high schools.

But in the last few years, as more attention has been paid to the role of school climate, and as evidence has mounted that the chance for a healthy school climate increases as school size decreases, American interest in the concept has grown. Last year, New York City mandated that each ninth grade in the city be subdivided into more manageable, intimate houses; Rochester, New York, this year asked all of its middle and high schools to create house systems; and a number of schools that are

experimenting with school-based decision making, including at least two in Dade County (Miami), Florida, have instituted house systems.

Under a house plan, a portion of the student body and the staff is grouped together for more or less exclusive interaction over some period of time. Exactly how this interaction is organized varies from house plan to house plan with different schools or districts adopting various features and configurations: maintaining the same groups for longer or shorter periods of time; including different numbers of students and staff; and folding into the house structure different pieces of the school program.

THE BRITISH plan, described earlier, is a classic vertical house plan: A housemaster is paired with a multi-aged group of students throughout the students' careers. Among its great strengths is the multi-age grouping, which provides opportunities for older students to serve as mentors. In the American setting, help from such mentors would be especially useful for those students who are just moving into junior, middle, or senior high and who could benefit from the advice of students who already know the ropes.

A variation of this model, the pastoral system, was adopted by the British state school system (the equivalent of our public schools) in the sixties and is similar to that used by South Dade High School's ninth-grade house. Under the pastoral model, teachers within houses meet with students to provide guidance on a regular basis and report to a house coordinator. At South Dade, in the ninth-grade house, all teachers who instruct house students report any problems they are having with their students to one of two house coordinators. This arrangement helps assure that any student with a problem—whether he's abusing drugs, being battered by his parents, constantly teased by students, or chronically truant—is quickly identified and provided with immediate help.

Don Shipp, one of South Dade's two ninth-grade coordinators, says he and his co-coordinator have the authority and information to get immediate response for teachers or on behalf of students. One morning, he says, a teacher told him of being cussed out by a student in the hallway. In the old days, says Shipp, the teacher would have had to file a referral and wait until the assistant principal had time to act. Now Shipp is able to talk to the student, arrange a meeting with his or her parents, and take disciplinary action all before 10 A.M. the same morning. The students see instant results and so do the teachers.

Shipp believes his students are also less likely to fall through the cracks. If a student is having problems, Shipp or his coordinator will visit the student's home and, if necessary, refer him or her to an appropriate professional.

Houses need not limit themselves to coordinating social services and house activities. In Germany's comprehensive schools and in some American schools, the house system embraces instruction as well, and thus teachers, as well as pupil support staff, are assigned to each house. At the Köln-Holweide school in Cologne, Germany, for example, a cluster of students is taught by the same group of about five teachers from the time they

*It is in this context that dropout prevention programs are frequently introduced. But while these programs deliver extra support services and modified curricula, they exist in an unaltered school environment from which at-risk students are never completely divorced and to which they are returned upon improved performance. The disappointing results of dropout prevention initiatives around the country are a major source of impetus for schoolwide restructuring.

enter comprehensive school in fifth grade until they reach "leaving age" at about age sixteen. The teachers and students get to know each other extremely well. Just as importantly, the teachers, who have common planning time, get to know each other very well and are able to work together to tailor curricula to their students' needs and to develop policies and programs to meet the needs of their house students.

Parents find it easier to negotiate a large school when they interact with the same staff time after time.

Filer Middle School, also in Dade County, employs a modified version of this Köln-Holweide model. In the seventh grade, a team of five teachers, one each for math, science, social studies, language arts and reading, works exclusively with a cluster of about one hundred fifty students for one year. The grade has three such teams that together make a *casa* (Spanish for house). The *casa* is supervised by its own assistant principal and served by its own counselor. In the eighth grade, the group of students remains clustered under the supervision of both the A.P. and counselor and is matched with a new faculty team.

IN DEVELOPING a house plan, several issues need to be considered: How many students and how many staff should be in each house? What kind of staff should be attached to each house and what should their roles be? How will the house be managed and in what areas will it have authority? How will students be selected for each house? How will the physical plant be organized?

Size and Staffing: The optimal number of students in a house depends on many factors, especially what type of house it is. Based on the research cited earlier, however, a ceiling of five hundred students can be recommended. If the house includes an instructional component, the number of students should be large enough to support a full complement of core course teachers thus allowing students to take most or all of their core courses within the house. This number could range from eighty to one hundred fifty, depending on what a school believes is an affordable staff-student ratio.

A sufficient number of guidance counselors and, possibly, social workers and paraprofessionals should be assigned to each house to permit students to meet most of their needs within the house, thereby increasing student-staff familiarity and the continuity of staff's interventions. The staff must include at least a coordinator and/or a supervisor who can organize house activities and coordinate whatever services are provided through the house. Often the person is an assistant principal, but it need not be; at South Dade, house services are coordinated by two teachers who are on release from several of their regular classes and supplemented for additional

periods. Paraprofessionals, who often come from the same communities as their students, can be invaluable house staff, often making effective visits to the homes of students with problems.

House Management. Unless the school's decision-making process is somewhat decentralized, giving houses a degree of authority over program and internal organization, houses will be unable to simulate the less-hierarchical governance of a small school. At Filer Middle School in Dade County, each *casa* has enormous decision-making authority. Each *casa* has an assistant principal who, in concert with his teaching and counseling staff, advises the school decision-making committees on matters relating to discipline, student services, attendance, instruction, guidance and even the allocation of a portion of the school's budget.

In addition, the teachers on each of the *casa's* three teams have a common daily planning period during which time they can coordinate curriculum, develop house activities, and address particular house concerns—for example, how to elicit greater parental involvement. Frequently, the team teachers are also able to meet with the *casa* guidance counselor and further discuss how to address the needs and problems of particular *casa* students.

Ideally, students and their parents would participate in house governance, too. The house system facilitates parent involvement since staff get to know parents better through getting to know students better; also parents find it easier to negotiate a large school when they interact with the same staff time after time.

Extracurricular and Co-Curricular Activities. As noted at the beginning of this article, extracurricular participation has emerged from the research as one of the clearest advantages of small schools; it affords students, especially those who are academically marginal, the means to develop other useful competencies and self-esteem. Whereas a school or grade has only one football team, one newspaper, or one set of student council representatives, each house can have its own, opening up additional opportunities for student leadership and student participation. Interhouse competitions can be organized as a way of strengthening students' identification with their own house. It may also be important to organize cooperative enterprises among houses.

If the house includes a teaching team that meets together regularly, co-curricular activities become easier to organize, and interdisciplinary activities can be brainstormed and time blocked for them.

Heterogeneous Grouping. To avoid stigmatizing some students and separating groups of students who mutually benefit from interaction, houses should contain heterogeneous groups of students.

In New York City's district-devised house plan, schools were asked to create curricular themes for their houses. The hope was to create distinctive programs that would capture students' attention and attract students from the private and magnet schools. While such an approach sounds good on paper, it can inadvertently

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EDUCATING THE TWO SIDES OF THE BRAIN

Separating Fact from Speculation

BY SALLY P. SPRINGER

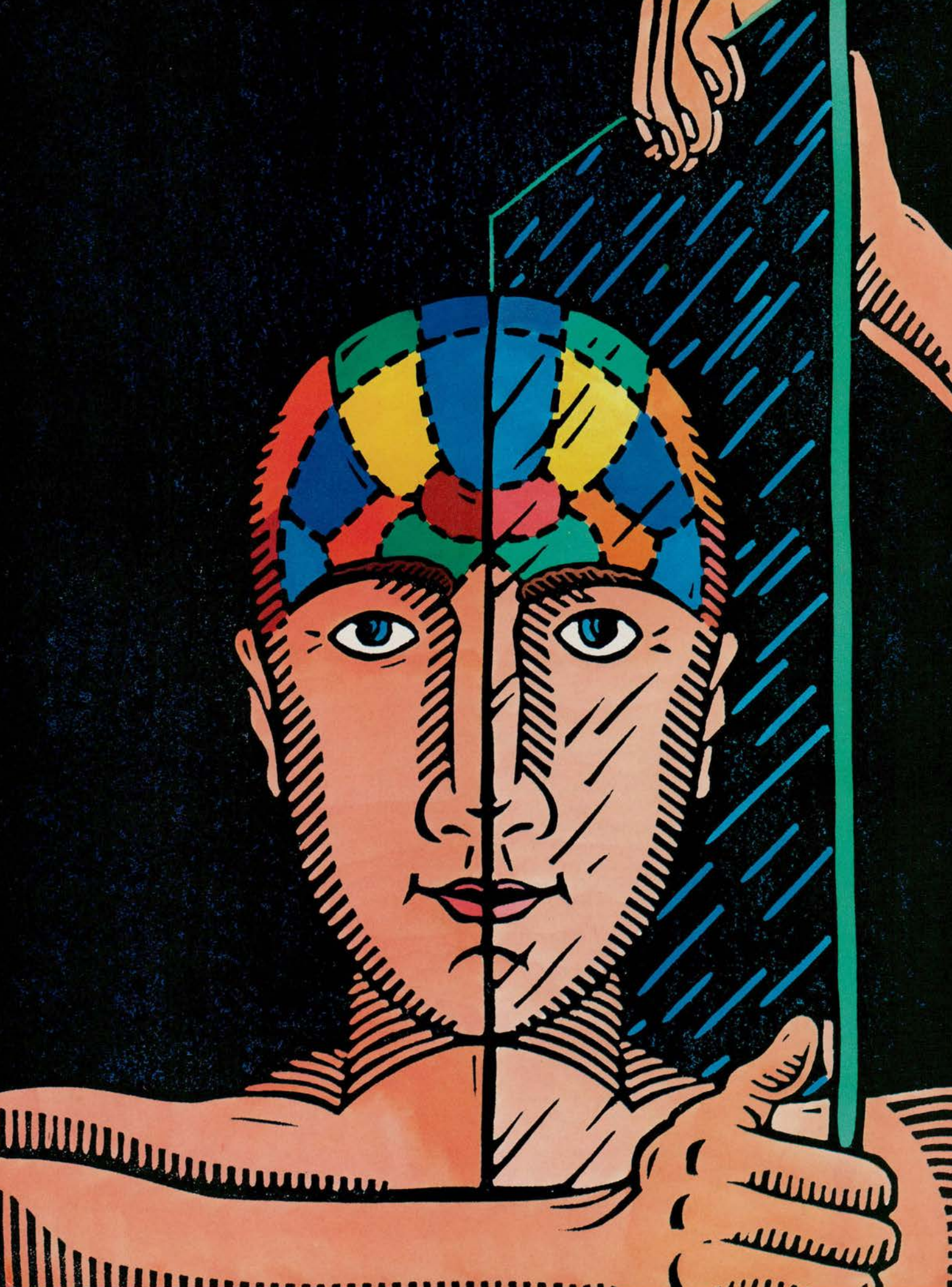
THE CONCEPT that the human brain is divided into halves, or hemispheres, each with specialized functions, is now firmly entrenched in popular culture. Cartoonists, as mirrors of our society, have been quick to capitalize on left-brain/right-brain humor. In one cartoon appearing in a widely read magazine, an attractive woman sitting in a bar announces to her suitor, "My left brain says yes, but I'm waiting to hear from my right brain." In another, a stately country club has a small, unobtrusive sign placed on the front lawn declaring "Left Hemisphere People Only." Still, in a lighthearted but somewhat more serious vein, we see Madison Avenue advertising agencies embracing the idea of hemispheric differences in ads that claim to speak to "both sides of the brain." Such ads usually have two parts—the

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part designed to appeal to the left brain contains written or spoken narrative describing the product's virtues in great detail, while the part addressed to the right brain is typically a full-color picture of the product or a jingle set to catchy music.

Examples of such popularization are not limited, however, to cartoons and advertisements. Magazines have articles with paper-and-pencil tests designed to help readers determine if they are "left brained" or "right brained." Knowing one's "hemisphericity," or preferred pattern of hemispheric usage, the authors claim, will be valuable in making a wise vocational choice. Along similar lines, consulting services and traveling workshops purport to help personnel managers select the best person for key executive positions by matching the hemisphericity of the candidates to the job requirements. Aspiring executives, in turn, can get help in developing an appropriate pattern of hemispheric usage to land the job of their choice by reading the books and taking the training courses that are becoming increasingly common.

The most far reaching of all the popular extensions of the brain asymmetry concept, however, are those that address our contemporary educational systems. By emphasizing verbal proficiency and analytic thinking, it has been argued, such systems are geared to teach only the left half of the brain, while ignoring the creative, artistic right hemisphere. The idea that half—more precisely, the right half—of our mental capability is neglected has been appearing with increasing frequency in educational journals, self-help manuals, and a



variety of other publications. Articles typically include a background summary of some of the data on laterality along with the author's personal interpretation of what the data mean. Some end with advice about "boosting right-hemisphere thinking" or "training the right hemisphere."

Others argue that what is needed is a total revamping of our educational programs to permit adequate development of the sadly neglected right hemisphere. At stake, they imply, is the very foundation of our society. We are greatly in need of creative solutions to complex, difficult problems, the argument goes, and cannot afford to waste any brain power as we prepare the next generation for the tasks at hand.

Clearly, the education of our children is an undertaking of the greatest importance. If there is merit to the assertions outlined above, few would argue against taking appropriate action by modifying educational practices. Precisely because the issues are so important, however, we should be sure that the assertions have a sound, scientific basis before proceeding. What is the basis, if any, for these claims that have such far-reaching implications for the educational process? Has knowledge about the brain advanced to the point where we can meaningfully talk about how to educate one side of it to enhance specific abilities? How much of the popular view of hemispheric differences may be considered to be fact, and how much is, at best, speculation about what might be? To answer these questions, we have to turn to what is currently known about brain asymmetry and how we came to know it.

OUR KNOWLEDGE of the differences in function between the hemispheres has come, basically, from three sources. The first is clinical work in which the effects in injury to different parts of the brain are studied. Patients with strokes or traumatic injuries to the brain, such as gunshot wounds, are the major source of data. Although not the only one to make such observations, a French surgeon named Paul Broca working in the mid-1800s is credited with being the first to see the significance of the association between injury to part of the left hemisphere of the brain and loss of speech. Up to Broca's time, the prevailing view was that the brain was equipotential, i.e., functions were not dependent upon particular parts of the brain: Rather, the brain functioned as a whole. The idea that speech was controlled by the left hemisphere was radical, but it was one quickly borne out by further clinical observations showing deficits in the ability to speak, understand speech, write, and read, all of which accompanied injury to different parts of the left hemisphere.

That this striking asymmetry had been missed for so long was indeed surprising. Once the idea of asymmetry took hold, however, it quickly spread and emerged as the concept of cerebral dominance: that the left hemisphere is dominant for speech and language functions and, by extension, for other high-level cognitive functions as well. Broca believed that there was a link between handedness and cerebral dominance. Left-hemisphere dominance would be found in right-handers while right-hemisphere dominance would be observed in the left-handed population. Although Broca

How much of the popular view of hemispheric differences may be considered to be fact, and how much is, at best, speculation about what might be?

was correct in seeing an association between handedness and brain asymmetry, it was not the simple one he envisioned. We now know that about 70 percent of left-handers have left-hemisphere speech, just as do over 95 percent of right-handers. About 15 percent of left-handers have right-hemisphere speech, and another 15 percent have speech controlled by both hemispheres.

Just as the observations pointing to left-hemisphere specialization for speech had been ignored while equipotentiality was the accepted view of brain organization, observations pointing to right-hemisphere specializations continued to be ignored as the concept of cerebral dominance became accepted. Although the great British neurologist John Hughlings Jackson commented on the possibility of right-hemisphere specializations shortly after Broca's work, the clinical data pointing to right-hemisphere specialization for tasks involving spatial and musical abilities did not gain widespread recognition until the 1930s. Just as damage to the left hemisphere could produce loss of speech, damage to the right hemisphere might result in spatial disorientation (patients might have inordinate trouble finding their way around familiar surroundings) or the

inability to recognize melodies.

These findings led investigators away from the notion of cerebral dominance to the idea of complementary specialization—there is no one dominant hemisphere but rather the two hemispheres complement each other with their different specialized functions. While the clinical evidence proved to be very valuable, however, it was not by itself sufficient to understand the role of asymmetries in the normal, undamaged brain. Imagine trying to infer the function of a component in a portable radio by removing it from the circuit. There would probably be an effect, but it would not be sound logically to conclude that the component's function in the radio was simply to control the function disrupted by its removal. Ideally, one would want to study it while the radio was operating. Similarly, in the study of brain asymmetries, investigators have sought to study the function of the hemispheres while they are intact.

A unique opportunity to do just that arose as a result of a surgical procedure designed to help certain persons suffering from a form of epilepsy that could not be controlled with drugs. The operation, called a commissurotomy, surgically separated the two hemispheres in an effort to isolate the region of the brain responsible for the seizures. Neurosurgeons Joseph Bogen and Philip Vogel began performing the surgery on a limited number of patients in southern California in the early 1960s. Surprisingly, the operation produced few negative aftereffects in everyday functioning and was very helpful in reducing seizures in selected cases.

At nearby California Institute of Technology, biologist Roger Sperry and then-graduate student Michael Gazzaniga realized the tremendous opportunity this surgery presented for studying the functions of the two hemispheres. Since the surgery cuts the pathways by which the two hemispheres communicate, they reasoned, it should be possible to compare the abilities of the two sides by presenting information separately to them. In a series of ingenious experiments, Sperry, Gazzaniga, and others working in the same lab dramatically confirmed the asymmetries revealed by earlier clinical work. "Split-brain" patients, as they came to be known, when asked to identify an object held in their right hand but out of view, could readily do so. The same object held in the left hand, however, was not correctly named. This finding fit nicely with what was known about hemispheric differences from clinical work. Tactile information from each side of the body is sent to the hemisphere on the opposite side, so information about an object held in the right hand reaches the left hemisphere where speech is controlled. Thus, a split-brain patient has no difficulty naming the object. Information about an object in the left hand, however, is sent to the right hemisphere, which lacks the ability to control speech. Since the fibers connecting the right hemisphere to the left side are cut, even if the right hemisphere knew what the object was (as was shown in other tests designed to let the patient respond nonverbally by pointing to a picture of the object), it would not be able to name it!

VISUAL STIMULI, both words and pictures, have also been extensively used with commissurotomy patients. Because of the anatomy of the visual pathways,

stimuli presented very briefly to the left or right side of where a person has fixed his or her gaze are projected to the right or left hemisphere, respectively. It was found that the left hemisphere had no difficulty naming pictures or reading words flashed to it, while the right hemisphere could not perform either task. When given the opportunity to respond nonverbally, the right hemisphere did much better. Its ability to "read," however, was still not as good as the left hemisphere's, even when the subject could respond by pointing to an appropriate object. Emerging from these findings was the view that the left hemisphere is indeed superior for speech and language functions and that, in general, speech itself can only be controlled by the left side of the brain. Other language functions, such as reading and understanding speech, are also performed better by the left hemisphere, but the right hemisphere has some ability in these areas.

One of the earliest tests of right-hemisphere specialization in commissurotomy patients involved having patients arrange a number of colored blocks so that the pattern formed by them matched that of an illustration. This test, known as Kohs blocks, is a standard part of certain intelligence tests. When asked to arrange the blocks with the left hand, patients had no difficulty and did so within a reasonable period of time. However, when asked to work with the right hand, they failed miserably. Again and again, the right hand would try to match the pattern, without success. In a film of one such patient working with the blocks, we see his left hand trying to assist the right hand, only to have the experimenter place it behind the patient's back in order to continue with the experiment. This type of observation fit nicely with the view that the right hemisphere is specialized for visual functions that are spatial in nature.

Later studies with split-brain patients tended to highlight the different ways in which the two hemispheres process information. For example, it was shown that the two hemispheres recognize faces in different ways. The left hemisphere looks for special features, such as glasses or a long nose; the right hemisphere tends to view the face as a whole without breaking it down into parts. Research has shown that the right hemisphere is better at face recognition than the left, although the left hemisphere can indeed do the task in its own way.

The third source of information about the differences in function between the hemispheres has involved normal subjects with intact brains. Although the work with split-brain patients has been extremely valuable, it can be criticized on the grounds that the patients who undergo the commissurotomy operation do not have normal brains to begin with. The years of epilepsy that preceded the operation may well have caused some reorganization of functions within the brain, making it difficult to extend findings from them to persons without such a condition. Happily, it turns out that many of the experimental procedures used with commissurotomy patients can be adapted for use with normal subjects. Since the fibers connecting the hemispheres are present, the effects obtained are much less dramatic, but nevertheless they reveal similar kinds of results.

For example, when words are flashed briefly to the

left or right of a subject's fixation point, a typical right-handed subject will be able to identify material in the right visual field (projected to the left hemisphere) slightly more accurately and somewhat more quickly than he or she would identify the same word presented in the left visual field. Similarly, pattern-matching tasks and face recognition are done more quickly and accurately when they are presented in the left visual field, i.e., to the right hemisphere. The effects observed with normal subjects tend to be very small. Speed of response differences, for example, may be just a few thousandths of a second, but they are believed to reflect the same differences in function between the hemispheres as the much larger effects found with split-brain subjects.

Work with neurologically normal subjects has been very popular with investigators and has provided additional evidence for the view that the hemispheres process information in different ways. Some investigators looking for a common thread linking the stimuli and tasks performed better by each hemisphere suggest that information processing underlies the differences that are found. The left hemisphere, they argue, tends to process information serially and analytically, while the right hemisphere is holistic in its approach, working with information in parallel.

THE WORK just reviewed points to the existence of very real differences between the hemispheres, particularly in the areas of language and spatial abilities.

At the same time, however, it is important not to overlook the findings, often from the same studies, that set limits on the extent of those differences. The left hemisphere is superior at reading. The same studies show that the right hemisphere can read, too, only not as well. The right hemisphere is better than the left at recognizing faces. As we have seen, however, the left hemisphere can recognize faces using a different, but less accurate, strategy. These are but two examples of a point that needs to be emphasized: Hemispheric differences, although very real, are not the all-or-none, black-or-white differences that some of the more exaggerated claims about them would have one believe.

A variety of new techniques designed to measure brain activity itself have also been used to study asymmetries. These include recordings of brain electrical activity (e.g., electroencephalogram), mapping the blood-flow patterns in the brain (regional cerebral blood flow), and a technique known as positron emission tomography (PET scan), which provides images that reflect brain metabolism in different regions. Recordings are made as subjects engage in different mental tasks, and left- and right-hemisphere activity is compared. This work is exciting because it holds the promise of actually seeing, in some form, brain activity itself. In a sense, it allows the investigator to get closer to what he or she is studying.

These new measures of brain activity during behavior have also called into question rather dramatically the all-or-none view of hemispheric differences. There is little

WHAT IT WOULD TAKE TO PROVE A LINK TO HEMISPHERIC ENHANCEMENT

Let's say, for instance, that a new technique for training the supposedly more "creative" right hemisphere is developed by an educator on the basis of our knowledge of differences in left-right hemisphere functioning. Lo and behold, students do better learning to draw with this technique than with traditional teaching techniques. The educator might then claim that this new technique was more successful because it enhanced the use of the right hemisphere. No such claim is justified. All that has been shown is that the new technique is a better teaching method than traditional methods. An appropriate test of this claim could be made, but it would require the expertise of neuroscientists. In such an experiment, for instance, two groups of students would be formed who were matched for factors such as sex, handedness, familial handedness, and age, which are known to be related to differences in brain func-

tion. (In fact, it might be well initially to test only strongly right-handed males with no left-handers in their families.) The groups would also be matched on artistic ability, and none of the subjects would have received any formal artistic training. Both groups of subjects might be given the same creative drawing task to do individually. Metabolic activity in the various regions of the brain associated with performing this task would be determined using position emission tomography. Then one group would serve as the control group receiving traditional artistic training for a specified number of sessions. The other group would serve as the experimental group receiving the presumed "right brain" artistic training technique for the same number of sessions. Following the training period, evaluation of metabolic activity in the brain would again be determined for each subject individually following the performance of the same

creative task. To support the claim that the "right-brain" teaching technique was a better teaching technique because it enhanced the creative activity of the right hemisphere, it would have to be shown that metabolic activity in the right hemisphere of the experimental group was enhanced more than that in the left hemisphere from pre-training to post-training metabolic measurements and furthermore that there was greater right-hemisphere enhancement for the experimental group than for the control group receiving a traditional training technique. To our knowledge, this kind of research has not been conducted by advertising agencies, management consultants, or educators. □

Excerpted with permission from "Cerebration: About the Human Brain" by H. Julia Hannay and Harvey S. Levin, from the Spring 1987 issue of National Forum: The Phi Kappa Phi Journal.

There is very little evidence to support the claim that the right hemisphere is specialized for creativity.

in this work to support the notion that one hemisphere turns on to perform a task all by itself. Each measure points to the involvement of both sides of the brain, even in the simplest tasks. There are asymmetries in function, to be sure, but we have much to learn about how these asymmetries contribute to the integrated activity of the brain.

What are the implications of the data we have just reviewed for the popular extensions of brain asymmetry findings? To start, if taken at face value, the claim that as a society we educate only one hemisphere is clearly wrong. By all of our current measures, including the newest ones, both hemispheres are active and involved in any situation, regardless of the nature of the stimuli or tasks involved. The pattern of activity across the hemispheres does appear to be task and stimulus related, but both hemispheres appear to play a role. To talk in terms that suggest otherwise is to misrepresent what is known about brain asymmetry.

But what about the more moderate claim that we pay more attention to the left hemisphere than to the right? Our educational system does place an emphasis on verbal, analytic processes—isn't that sufficient to claim it is neglecting the right, creative hemisphere? Here, too, a review of the evidence says such claims are unwarranted. As we have seen, each hemisphere may be

involved in almost any task. While it is true that there are hemispheric specializations, we have no basis for believing that presenting stimuli or tasks for which one hemisphere is specialized builds up that hemisphere at the expense of the other. Moreover, there is very little evidence to support the claim that the right hemisphere is specialized for creativity. This is often taken as a given in popular discussions of asymmetry, but it is not based on any convincing evidence. At best (and some conservative investigators would even argue this point), all we can say based on current evidence is that the right hemisphere is specialized for holistic, parallel processing. To extend this to creativity as a whole is a giant leap of faith that is as yet unsubstantiated by fact.

A specific example of an attempt to relate teaching practices to right-hemisphere specialization is a popular method of teaching drawing. Proceeding from the assumption that under ordinary conditions it is the right hemisphere of the brain that has the ability to draw, the method of instruction is designed to reduce the amount of left-hemisphere involvement or interference in the drawing process. The techniques range from exercises in which students copy a drawing of a person held upside down (the picture is then no longer easily recognizable and it is difficult to label, using the left hemisphere, any part of it) to verbally reassuring the left hemisphere that it is not being abandoned and that a new technique is being tried out just temporarily.

The overall method appears to be effective in improving drawing ability. But does it work for the reasons that have been offered? There is little in the way of supportive evidence. Studies of brain injury to certain areas of either the left or right hemisphere show effects on drawing ability—the effects differ, however, as a function of which side is damaged. This suggests that the normal drawing process requires contributions of both hemispheres, a conclusion that should not be surprising in light of the research findings reviewed earlier.

What about the notion of "hemisphericity" that holds that each person has a natural pattern of hemispheric preference that makes some of us "left brained" or "right brained"? Here, too, we find little evidence to support such claims. Attempts to compare groups of individuals, such as creative artists and lawyers, on different measures of hemispheric asymmetry have not produced consistent findings. We do not have any good data to support the idea of individual differences in patterns of hemispheric usage, nor do we have evidence that such patterns, if they did exist, could be modified by training.

Few would disagree with the claim that people vary in the way they approach and solve problems. The concepts of cognitive style and learning style have become important ones for educators who realize that individuals differ in the way they absorb and process information. Two commonly identified styles—spatial, holistic processing and verbal, analytic processing—do seem to fit in a loose way with ideas about right- and left-hemisphere specializations, respectively. Where neuropsychologists and the popularizers disagree, however, is in the presumed link between these learning style differences and brain asymmetry. The popularizers claim there is a link—that learning styles reflect a biologically based dichotomy—and use that claim as a basis for their

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RECRUITING THE NEXT GENERATION OF TEACHERS

*Conversations with
High School Sophomores*



BY BARNETT BERRY, CHRISTINE MCCORMICK, AND TOM BUXTON

Between now and 1993, due to increasing enrollments, retirements, and other causes of turnover, our schools will need to hire over 1 million new teachers. Filling these vacancies will be a daunting task. Between 1966 and 1985, there was a 71 percent decline in the number of college freshmen who intended to pursue a teaching career. Specifically, the number dropped from 21.7 percent in 1966 to 6.2 percent in 1985. That number has now drifted up to 8.2 percent. But to properly staff our classrooms in the coming years, the teaching profession will have to attract 23 percent of the next five years' college graduates.

Much has been written about the need to increase teacher salaries and to begin early to identify and recruit talented students into the profession. But a new study shows that students' disinclination to teach runs so strong that it is unlikely to be eased by either of these initiatives, though both are clearly necessary.

The premise of the new study, which was commissioned by the Southeastern Educational Improvement Laboratory and conducted by the South Carolina Educational Policy Center (SCEPC), is that students know a great deal about teaching; they see it up close and constantly in a way that they see no other profession.

Thus the SCEPC researchers went directly to these students—the nation's future teacher pool—and, using focus-group interviews, asked them about their career expectations and their perceptions of teaching.*

The findings are dramatic—and depressing. Students are intensely aware of the poor conditions under which teachers work; they are, consequently, dismissing any thought of entering the teaching profession. The report makes clear that the nation's ability to staff its schools will depend on radically changing the teacher's work environment.

The SCEPC researchers conducted their interviews with 375 tenth graders from Georgia, North Carolina, and South Carolina. The interview sample was balanced by sex and race; included students from inner-city, small-city, rural, isolated rural, and suburban schools; and students from advanced and general academic tracks.

—Editor

*In a focus group, researchers bring together a small group (eight to fifteen) of people to discuss selected issues in-depth. It is a technique that allows pollsters to gather more qualitatively rich data than can be gathered through traditional polling techniques.



ILLUSTRATED BY DAN SHEREO

THE FOCUS-GROUP discussions[†] that we conducted turned up remarkably similar views across types of schools and students. Not surprisingly, students were quick to say that they wanted careers that would allow them to make “lots of money.” Importantly, though, many students—especially those enrolled in the advanced classes—preferred jobs that would be challenging, fun, flexible, and allow them considerable autonomy and opportunity for advancement.

Unfortunately, these career expectations are totally at odds with their perceptions of the teaching profession. Most of the students interviewed—irrespective of

school location, race, or gender—viewed teaching as a very low-paying job that is characterized by thankless, frustrating, and routine tasks. These students generally viewed teachers as lower-level functionaries who must meet unreasonable demands placed on them by contentious students, administrators, and parents. It is no wonder that so few of these young people could conceive of themselves as teachers.

This article is adapted from a research report commissioned by the Southeastern Educational Improvement Laboratory, one of nine federally funded laboratories that provide assistance to elementary and secondary educators, policy makers, and others. SEIL serves six southeastern states. The report was conducted by the South Carolina Educational Policy Center based at the University of South Carolina. The principal investigator was Barnett Berry, associate director of the SCEPC. Christine McCormick is associate professor of educational psychology, and Tom Buxton, a professor of curriculum at the University of South Carolina. To order the full report, send \$6 to SEIL, P.O. Box 12748, Research Triangle Park, NC 27709 and ask for research report 08-005.

[†]The focus-group method was used for several reasons. First, student attitudes do not develop in social isolation: Attitudes are developed, in part, by interaction with others. Also, high school students are known to be greatly influenced by their peers. Focus groups enable researchers to capture the development of group attitudes toward teaching. Second, focus groups have high face validity. Studies demonstrate that participants are more likely to share certain insights with researchers in a focus-group setting than they would on a survey or even in individual interviews.¹ Finally, in the case of limited time and funding, focus groups make it possible to increase the number of respondents in a timely and cost-effective manner.

When asked, "What would be the one thing that would get you to enter teaching?" students systematically gave responses like "nothing" or "\$100,000 as a starting salary." Those few students who spoke positively of teachers and teaching were usually females enrolled in rural schools.

Students' Career Choices

Among those few students (10 percent, or thirty-seven) who reported that their overall grade average was an "A," only one planned to enter teaching. Of the entire sample of students interviewed and surveyed ($n=375$), only 275 students planned to enroll in college following high school graduation. Of these college-bound students, only 5.8 percent ($n=16$) indicated some interest in becoming a teacher. These few students can be characterized as fitting a "typical" profile of teachers.² They were generally white (75 percent) and female (88 percent), from "blue-collar" backgrounds, and have demonstrated "average" academic ability. In fact, 69

percent of these sixteen prospective teachers were enrolled in a "regular" academic track. They also generally characterized themselves as "C+" students.

Fifty of the students had parents who taught. Of these fifty students, forty-eight planned to enter business and the professions (e.g., engineering, law, medicine). Only two planned to teach. Several of these students commented that their parents have specifically discouraged them from becoming teachers.

My mother is a teacher, and she has been telling me the last few years, "just don't be a teacher, just don't be a teacher." She has not seemed very happy with teaching and I guess she just wants me to be happy when I start work. . . . She tells me I would be a great lawyer.

Students' Career Expectations

Without question, these focus groups showed that money was foremost on these young people's minds. But definitions of "good money" varied. Not sur-

PERSPECTIVES FROM ELSEWHERE: EQUALLY DIM

By and large, the high school sophomores we interviewed loathed the idea of becoming a teacher. Just as clearly, their aversion grows directly from what they perceive to be their teachers' working conditions. Are their perceptions accurate? Do the conditions they witness in their classrooms exist beyond the three Southeastern states in which our interviewees lived? Three recent reports say the answers are definitely "yes."

The Carnegie Foundation for the Advancement of Teaching, for its "Report Card on Reform," surveyed 13,500 teachers from around the country in 1988. Carnegie discovered that since the onset of the 1980's educational reform movement, critical teacher working conditions have deteriorated. For example, at least 70 percent of the teachers reported that working conditions related to classroom interruptions, freedom from non-teaching duties, class size, time to meet with other teachers, daily preparation time, daily teaching load, parental support, and community respect had either worsened or had not changed since 1983. In addition, of the teachers responding:

- 64 percent reported that fiscal resources available to their school

had worsened or had not changed;

- 59 percent reported that political interference had increased (with only 4 percent noting a decrease);

- 57 percent reported that state regulations had increased (with only 4 percent noting a decrease);

- 52 percent reported that the burden of bureaucratic paperwork had increased (with only 8 percent noting a decrease); and

- 49 percent reported that teacher morale had worsened.

While teachers noted recent improvements in the leadership provided by principals, in technology available for teaching, and in the quality of instructional materials, they have remained "dispirited, confronted with working conditions that have left them more responsible but less empowered" (Carnegie Foundation, 1988).

THE INSTITUTE for Educational Leadership studied thirty-one urban elementary, middle, and high schools. In their report, "Working Conditions in Urban Schools," they tell of teacher working conditions that best can be described as "bleak," "substandard," and "intolerable." Many teachers were working in dilapidated buildings (dirty and in ill repair), without

classrooms of their own, and without basic instructional materials like textbooks, Ditto fluid, pencils, blackboards, and paper.

"Some schools ration paper or keep it locked up," reports the IEL. In fifteen of the thirty-one schools, access to computers, copiers, telephones and A.V. equipment was limited. In one school, there was one copier for sixty-five people. In another, teachers said they had "to sneak to use the Xerox machine."

Physical conditions were such that they would be tolerated by no other profession. "In some schools, storage space has been eliminated to provide needed expansion for other uses." As one elementary teacher indicated, "Closets are being used for classrooms. The Ditto machine is in a women's restroom." Another added, "The special education cadre is off in an unsafe closet with no ventilation, no windows, and exposed heating pipes." Poor working conditions were the norm rather than the exception.

Teachers rated only three of thirty-one schools as offering better than a moderate influence over decision making; only five were rated as permitting a better than average degree of collegiality. As one teacher said, "Real participation—No. Real decision making—

prisingly, students from urban and suburban schools had higher salary expectations than did those from small-city, rural, and isolated rural schools. For many students, \$100,000—or even \$1,000,000 a year—was the kind of salary they felt would afford them the “good life.” Other students, especially those from the regular classes in the rural schools, believed that “\$200 a week would be great.”

But especially among blacks and females, and especially among those blacks and females in the advanced classes, students sought careers that would allow them to help others. These students planned to seek good salaries, but earning a “good salary” was not their sole career objective.

Of course, it has to be a career that will allow me to help support my family. But, I truly want a job that will allow me to help others and where I can feel I am making a difference.

I really want to be a lawyer. . . . It all started a few years ago when I realized that I could do some-

thing good in this world. And lawyers can do that. . . . They can do good, plus they can make a good living, a real good living.

The students enrolled in the advanced classes were also more likely to seek careers that would allow them to develop technical skills and fulfill personal interests and that would provide considerable autonomy, opportunities for advancement, and self-respect.

I want to do something that not anyone can do . . . something which would give me a sense of accomplishment. Few people know how to take out a spleen or something like that.

I'd like everyone in my community to think that I have accomplished something. . . . I want something that I can be proud of.

Black males, in particular, especially those seeking professional careers, seemed sensitive to the workplace issues of autonomy and control.

Another thing I like about being a lawyer is that not

No. There is lots of pseudo-decision making, but it's not real.” Another says, “Participation is a shell game. . . . No one listens to what we say; we don't count.” And another, “If the principal is not in agreement, he does exactly what he wants to do.”

FINALLY, IN THE widely recognized educational reform state of South Carolina, a survey of four thousand teachers (and in-depth interviews with 108 teachers) conducted by the South Carolina Educational Policy Center found that while some reforms were well received, teachers reported extraordinarily high levels of emotional exhaustion. Eighty-one percent of those surveyed reported that they often felt “used up at the end of the work day.” Seventy-two percent often felt “emotionally drained from [their] work.” The SCEPC researchers found that the teachers' high levels of emotional exhaustion were linked to the following:

- excessive paperwork;
- lack of time to prepare for classes and to meet with other teachers;
- lack of opportunity for creativity in the classroom;
- excessive nonteaching duties; and

- role conflict in terms of having to do unnecessary job tasks.

Teachers spoke specifically about overly prescriptive and rigid state and district mandates, especially related to standardized curriculum and testing. One teacher summed up the problem in the following manner:

I am being made into a machine, and my students are being made into machines. . . . I am a factory worker, that is what I feel like here. . . . I guess I went to college to become a file clerk [referring to the required documentation related to the curriculum and testing]. . . . Each day I have to come in with their objectives and the skills I must teach. . . . Sometimes I know I am pushing it down their throat—just like pumping gasoline.

Thus the students' disparaging words about the teaching profession are hauntingly consistent with the workplace realities expressed by teachers and repeated in recent studies.

Dan Lortie, in his consummate sociological analysis of the teaching occupation, concluded that many teachers chose to teach because

they identified very strongly with their own teachers while students in the public schools. Other research has demonstrated that the teacher-mentor role can be such a powerful recruitment tool that many teachers generally will end up teaching at the same grade level and in the subject area in which they were influenced as students (Berry, 1984). Sadly, in this era of educational reform and the plethora of policy making directed at the teaching profession, teacher working conditions have deteriorated and, concomitantly, today's teachers have become negative recruiters—telling their students through words and actions, “DO NOT BECOME A TEACHER.”

If serious changes in working conditions are not made soon, we will only attract those to teaching who will put up with dilapidated buildings, no supplies, overloaded classrooms, low salaries, little administrative and parental support, excessive paperwork and menial chores, and little opportunity to teach what they believe is best for their students. To be sure, those individuals who would put up with these working conditions will not be the teachers our nation and our children need.

B.B.

For them, teaching was 'just too much work for such little pay.'

only can you help somebody but you can be your own boss.

Authority and flexibility also were desired. For some, authority simply meant "not being bossed around." To others, authority meant "being able to do what you think is best" and "determining your own work hours." Overall, these latter career expectations were more likely to be held by advanced male students.

Students' Perceptions of Teaching

Students' perceptions of teaching as a career came primarily from their own recent public school experiences. Students complained most loudly about the following aspects of teaching: 1) boring and routine work, 2) lack of autonomy, 3) poor pay, 4) limited opportunities for advancement, and 5) poor working conditions. These five factors were the foundation for students' negative attitudes toward teaching as a career alternative.

Teaching as Boring and Routine Work. Many students were not excited or challenged by the education they were receiving. Thus, they did not see the work of teachers as exciting or challenging.

School is boring for us. . . . It was not so bad at first during elementary school. But, now, teachers seem to teach the same thing every day over and over . . . and we have to do the same thing—like worksheets—over and over.

Students perceive teaching as boring work in part because they saw their teachers being told what to teach and how to teach it. They did not believe that teachers were given opportunities to make independent judgments, and they perceived their teachers' resulting dissatisfaction.

Teaching is boring work. . . . Teachers have to follow the state curriculum. I do not think I could work like they do, having to do something step by step . . . exactly what [administrators] say. I would rather want to be able to reach students my own way. I wouldn't teach in the public schools because they limit you too much and you have to be careful about what you say. . . . If I teach, I will teach in a private school where you can teach what you think is appropriate and you can put in everything [in the curriculum] that you need to or that is

important. . . . In private schools, there is a good chance to broaden [students'] horizons.

My teachers gripe to our class all the time that we have to do this today and that tomorrow, that today and this tomorrow. I tell you one thing, they sure don't like it—not one bit.

Students did not even mention skill and technical expertise when asked to describe what it takes to be a teacher. At the same time, many of the advanced students were clearly attracted to careers that require skill and technical expertise.

I want to be a psychiatrist because you learn how to help people, and people come to you because they want to be helped. . . . It does not take that much learning to be a teacher—you just have to have the patience to deal with a lot of people who do not want to be helped.

Some students, especially from the advanced classes, did recognize the important role that a few teachers had played in their own academic development and in ensuring their future success in college and the workplace. A few students even recognized the creativity necessary for effective teaching. Some students felt that teaching was "potentially exciting" because of the "opportunity to watch kids develop." Others described their good teachers as being flexible, able to relate to students, and willing to provide "information that was not in the book." For these students, teaching could be a challenging job. Perhaps because students could only describe a few "good" teachers, however, they could not translate their few positive experiences into a positive image of the teaching profession overall.

Lack of Autonomy. In many instances, especially in urban and suburban school districts, students perceived their teachers as impotent and "underlings."

Teachers can only boss kids and, then, only to a certain extent. . . . They have to do what the principal tells them. . . . They always have to get permission from the principal. . . . Teachers have to follow rules. . . . They even have to do what parents say.

These students were quick to point out that teachers "get pushed around," which meant not only "being told what to do by the principal" but also "not having [other teachers] listen to them." But, perhaps more importantly, these students spoke about their teachers "getting pushed around by their students."

As one student said, "Some students at this school just want to beat up teachers." Another asserted, "Somebody is always telling teachers what to do." As described previously, students were aware, either through direct observation or through teacher complaints, that teachers were limited in their capacity to teach what they believed was necessary or appropriate. One student, paraphrasing his history teacher, said, "I cannot help it. . . . I know the textbook is boring, but we have to use it." Some students perceived that teachers always had to react to someone else's initiative. Thus, when compared to other professionals, teachers were more likely to appear "stifled" in their efforts to teach.

Poor Pay. Given that most of the students were interested in pursuing careers that would provide very comfortable, even lofty, salaries, it was not surprising that they lamented the low salaries earned by teachers. But, more often than not, these students did not possess very accurate information about teachers' salaries.

To understand systematically how these students viewed teacher salaries and salary expectations in general, the researchers asked them to estimate starting, middle and top salaries for ten different occupational categories.

TABLE 1

Median Annual Salaries Estimated By High School Sophomores (n = 375)

Occupation	Starting Salary	10 years' Experience	Highest Salary
Doctor	\$33,000	\$55,000	\$85,000
Lawyer	30,000	45,000	65,000
Engineer	26,000	34,000	50,000
Accountant	20,000	30,000	45,000
Business Manager	20,000	28,000	38,000
Nurse	15,000	24,000	33,000
Mechanic	15,000	20,000	26,000
Plumber	15,000	20,000	25,000
Teacher	14,000	19,000	24,000
Assembly Line Worker	13,000	18,000	22,000

Some students had unrealistic perceptions. Some estimated that a doctor makes \$1,000,000 a year initially or that a plumber makes \$400,000 a year after ten years on the job. Given this, the averaging of their responses paints an unclear picture. But an examination of the median responses for each of the ten occupational categories reveals more accurately what students expected. (See Table 1.)

In general, both the survey and interview data showed that students had a good idea of what some professionals earn. If there was one line of work for which students consistently underestimated salaries, however, it was teaching. The median responses indicate that students thought teachers could earn only \$14,000 initially, \$19,000 after 10 years of experience, and a maximum of \$24,000 a year.**

When I was in elementary and middle school, I wanted to be a teacher. But, then I heard how bad the pay was in teaching. So, now I am planning to become a physical therapist.

Although teachers' salaries still lag behind other professions, they have dramatically improved over the last five years.³ Unfortunately, many of these high school students did not know this.

**Students' estimates of teachers' salaries were off by \$4,000 to \$13,000. In 1987-88, the average beginning salary for the country was \$18,557, the average salary (roughly equivalent to ten years' experience) \$28,085, and the top salary about \$37,114.

No Advancement. Related to the problem of poor pay, these students saw virtually no opportunity for advancement in teaching—a career expectation that was dear to their hearts and pocketbooks. As one student noted, "Once a teacher, always a teacher."

[A woman] can become a secretary and have a better job because, at least as a secretary, she can get promoted.

Some students regarded the principalship as a possible "step up" on the teaching career ladder, but virtually no student saw the principalship as an attractive alternative. A few students considered a move from elementary to secondary school teaching as a "step up." But, their dismal description of teaching "bossy" teenagers "with an attitude" suggested that secondary school teaching also was not viewed as an attractive mobility route in teaching.

Perhaps the most potent forms of advancement within teaching that did appeal to the advanced students in particular were being able to teach "only the bright kids" or being able to leave the public school classroom to teach in a college or university.

If I taught I would only want to teach the [advanced placement] kids—at least they want to learn and they usually do not act out or get too bossy for their own good.

I can see myself teaching in college one day after I make a ton of money in engineering.

Poor Working Conditions. Because of teachers' lack of efficacy in dealing with disruptive students, students themselves were perceived to be the main source of poor working conditions for teachers.

Teachers have to put up with people like me. That is not easy. I would not put up with me. It has to make for a very stressful job.

With this in mind, other students articulated their vision of the work life of teachers as: 1) enduring the futility of working from 7:30 A.M. to 3:30 P.M., with intransigent students; 2) going home in the afternoon with "headaches," endless paperwork, and lesson plans; and 3) "dying" prematurely because of stress-related "heart attacks." Some students spoke about stressful working conditions to the point of characterizing teaching as "terrifying." For them, teaching was "just too much work for such little pay" and there were "easier jobs which pay more and are more rewarding." Students from an affluent suburban high school also spoke of teachers' "rigid hours" and the fact that they "even have to stay at school during lunch." In addition, some students pointed out that their teachers worked in "run-down" and sweltering buildings.

Incentives for Choosing Teaching as a Career

When asked, "What would be the one thing that would get you to enter teaching?" students systematically gave answers such as "nothing" or "no way."

At best, only a handful of the 375 interviewees knew



Rita Irene Esparza, RSM
Vice Principal-Teacher
St. Joseph's
Elementary School
Sacramento, Calif.

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anything about their respective state's efforts to make teaching more attractive (e.g., college loan programs for students, increased base salaries, and merit pay). In fact, when a series of questions concerning teacher incentives was asked, many of the focus-group discussions became hushed. The students' lack of knowledge concerning college loan programs for prospective teachers was especially disconcerting, given the attractive and well-funded programs in South Carolina, North Carolina, and Georgia.

Of the students who did know something about teacher incentives in their states, most saw the reforms "only making the schools look better" rather than truly improving education or the profession. For them, the new reforms in curriculum and standards for both students and teachers were further examples of the "pain" teachers endure. In many cases, students listened to their own teachers lament about school and teaching reforms of the 1980s.

FROM THE perspective of high school sophomores, state policy-making efforts to make teaching a more attractive profession have a long way to go. Of the 275 college-bound students interviewed, only 5.8 percent indicated an interest in becoming a teacher. Of the 170 advanced students interviewed, only 2 percent ($n=4$) indicated an interest in teaching as a prospective career. Professions such as business management, medicine, law, and engineering are the careers of choice—especially for the advanced students and those whose parents are public school teachers.

The students—sounding like recent research and position documents criticizing teacher policy of the 1980s—voice clear complaints regarding teachers' boring and routine work, their lack of autonomy, their poor pay, their limited opportunities for advancement, and their frustrating working conditions. Irrespective of race, gender, or school location, these five factors dominated our conversations with the students and were the foundation for their negative attitudes toward teaching as a career alternative.

Teachers are an effective conduit for delivering information to students about school reforms and incentives to enter teaching. Unfortunately, the message they send often paints a pitiful picture of the teaching profession and efforts to improve it. Therefore, making teaching attractive to young people will require making teaching attractive to today's teachers. □

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WRITING WORKSHOP

(Continued from page 21)

professional resources that reflect the far-reaching conclusions of recent research into children's writing. And we must become writers and researchers, observing and learning from our own and our students' writing.

Some of the specific practices of writing workshop evolved in response to student needs: helping writers discover topics and helping blocked writers become unblocked; learning how to talk to writers in sensible, sensitive ways and giving them ways of conferring with each other; figuring out effective means of helping kids control format and mechanics; making room for audiences other than the teacher by developing ways young writers could go public; and organizing our classrooms so they allowed the time writers need to write well, accommodated all the activities in which writers engage, and offered all the materials writers use.

Some writing workshop practices evolved in response to our needs as teachers and the needs of the school system: keeping track of each writer's activity, accomplishments, problems, pacing, and growth; knowing what, how, and when to teach about process, genre, technique, and conventions; and putting grades on report cards that reflect what we ask of the writers in our classrooms.

In the Middle describes solutions to these writing workshop questions, but solutions grounded in the particular experience of junior high school teaching. In many ways, eighth graders' writing workshop looks the same as first graders'; in other ways, because of the nature of junior high kids, it has a look all its own. I'm convinced that writing workshop is as appropriate at junior high as at every other level, and I'm certain it's more appropriate than what typically happens in junior high English classes.

IN MOST junior high language arts programs, the status quo combination of ability groupings, passivity, and solitary effort takes its own peculiar forms. "English" becomes a content course. It involves listening to teachers talk about English, writing an occasional theme about the English teacher's ideas, reading assigned literature texts, memorizing vocabulary definitions, correcting errors of usage and punctuation in English handbooks, and drilling assorted "facts" about static, inaccurate versions of English grammar (not to be confused with the complex systems linguists invent, refine, and re-invent). Students in the lower tracks get a watered-down version of this content, consisting of "skills" (generally the very same, very deadly skills, such as names of parts of speech, year after year) and "fundamentals" (workbooks, low-level readers, and few actual stories or whole pieces of real literature).

Goodlad found this same content in junior high English classrooms throughout the U.S. in every kind of community. This consistency may account for another of his findings: The subject rated "interesting" by the fewest number of students at both junior and senior high levels is English.⁵

It doesn't have to be this way. When the content of a junior high English course is ideas—thinking and learning through writing, reading, and talking—and when

students in the course pursue their own ideas in the company of friends and their teacher, the junior high English classroom has the potential to become an interesting place. This place is a workshop, a way of teaching and learning uniquely suited to junior high students of every ability. Workshops accommodate adolescents' needs, invite their independence, challenge them to grow—and transform the junior high school status quo.

When Susan Sowers told me about Atkinson Academy's writing classes, I'd traced and retraced two words on the cover of my notebook: *naive* and *permissive*. A workshop struck me as exactly the wrong approach to take in an eighth-grade English class. In fact, it struck me as dangerous: All those big, unpredictable kids suddenly let loose to set their own agendas, moving around my classroom, talking with their friends, writing about adolescent ideas and concerns. Given even the limited knowledge of junior high students I'd gleaned by then from the perspective of my big desk, the prospect of twenty-seven eighth graders engaged in a workshop made the junior high status quo look pretty good.

Now, as I constantly learn more about eighth graders, I continue to learn about the ways a workshop approach is exactly right for them. I'm learning that the behaviors I anticipated with such dismay are exactly those in which active learners engage. I'm also learning that because they do engage, there's little danger. My students are busy going about the business of the workshop—writing, reading, and talking about writing and reading. As we let junior high writers and readers assume control, they assume responsibility, too, for the hard work of considering and shaping their ideas.

II

WRITERS AT WORK

The day after Labor Day, the routine begins.* My students start out with what writers need, the interdependent triad of time, ownership, and response. All three have to be there in full measure—regular, sustained time, writers' own decisions about their processes and products, and opportunities to confer about works in progress—if eighth graders are to become writers.

Writing class follows a predictable pattern of five-minute mini-lesson, quick status-of-the-class check (three minutes of whole-group time during which I record each writer's workplan for that day), at least half an hour for the workshop's main business of writing and

*In accordance with Maine practice, the author saw her school's three sections of eighth graders twice each day, once for a course officially known as English (transformed by her into writing workshop) and once again for reading (transformed by her from a traditional "lit-crit" format into a reading workshop, a full description of which appears in *In the Middle*). Meeting twice a day is not essential for the approach to teaching writing set forth in this article, says Atwell; for traditional once-a-day "English" schedules, three days would typically go to writing workshop, and two to reading workshop.

—Editor

conferring, and five or ten minutes for the concluding whole-class share session. The routines may require time to take on meaning, but the structure they provide is in place from the start.

Writing can vary—and writers can grow—when the environment is unvaryingly reliable. The predictable schedule, physical arrangement of my classroom, and patterns of my response combine with the predictable structure of each day's class so that writers' minds can range. The workshop is constant, but it's rarely monotonous.

Last year near the end of the school year Brian said, "You know what I like best about this class? Anything can happen in here." He explained, "I never know what Danny or Eric or Mike have come up with when they ask me for a conference. What's even better is, I never know what I'll come up with." I organize the classroom in August so Brian can surprise himself all year long.

THE MINI-LESSON

Lucy Calkins came up with the idea of mini-lessons, a brief meeting that begins the workshop where the whole class addresses an issue that has arisen in previous workshops or in pieces of students' writing.⁶ It might be an editorial issue—how to punctuate dialogue or set up a business letter. I also use this time to talk about issues of process or technique—the difference between revising and recopying, or how to show rather than tell—and to introduce different modes and genres writers might want to try out for themselves, usually by reading short selections aloud. At the beginning of the school year, my mini-lessons deal with procedural issues—how to use the daily writing folder, what resources and materials are available to writers, how to self-edit and where to put writing ready to be teacher-edited, what to do in conference corners. In a mini-lesson on conferences, I'll discuss helpful ways of responding and role-play good and bad conferences with a couple of my kids. At first I lead the discussions, but as the year progresses, students share their expertise, too. Mini-lessons generally last between five and ten minutes, just long enough to touch on some timely topic.

Mini-lessons are a relatively new element in my classroom. When I first made the shift from writing assignments to writing workshop, I stopped lecturing and abandoned whole-group instruction. I moved out of the driver's seat and observed as my students sat behind the wheel and took control. I had to stay out of their way for a while and learn from them, another necessary step in my evolution. But a time came when I felt confident of my new expertise and ready to move back up front, sharing control now with my kids. I learn from them and I share my knowledge when something I've learned will help them. One of the occasions when I share what I know is the conference; another is the mini-lesson.

And that's the point of the mini-lesson: sharing personal knowledge of writing. The problems my students come up against mirror problems I confront in my own writing; these are professional writers' problems, too. We all struggle with leads that will invite a reader's engagement, with dialogue that will express character, with the subtleties of transitions and the complexities of

punctuation. In mini-lessons I share my own, professional writers', and students' real solutions to these real problems. When I see kids struggling to come up with satisfying titles for finished pieces, I'll show them on an overhead how I tried Donald Murray's technique of brainstorming many titles, grounding my mini-lesson in practical experience.⁷ I offer the technique as an option they may wish to try. I don't require "mastery" of mini-lesson information; I don't expect every one of my students is going to take to heart every word of the mini-lesson and put it immediately into effect. Even in my old writing assignment days, when I taught pull-out-the-stops, forty-five-minute maxi-lessons, that never happened.

Instead, the mini-lesson creates a communal frame of reference. Shelley Harwayne compares the mini-lesson to the roll call officer's spiel that begins every episode of *Hill Street Blues*.⁸ An announcement about an at-large felon might at first seem completely irrelevant to a particular cop on the beat, but a few weeks later, when the officer catches sight of a familiar face through the windshield of her cruiser, she'll probably make the connection. The mini-lesson exposes kids to sensible, relevant information in this same way, enabling me to say to a particular writer, "Remember a few weeks ago when we talked about Don Murray's method of brainstorming to find a title? Why not give it a shot?"

Writing can vary—and writers can grow—when the environment is unvaryingly reliable.

WRITERS' WORKSHOP

Writers' workshop is the heart of the writing class. The mini-lesson, status-of-the-class check, and group share meeting exist to support what happens here. Of a typical fifty-minute class period, writers' workshop consumes about two-thirds; during this chunk of time, within the structure of the workshop environment, writers are on their own, calling their own shots.

On the first day I lay the foundation of this structure. At the mini-lesson's conclusion, I quickly introduce the workshop procedures we'll follow all year, again understanding that I'll need to review and reinforce these procedures over the next days and weeks. I owe my basic workshop guidelines, too, to Mary Ellen Giacobbe and Lucy Calkins.

"Let's begin. This year, we're going to have a writers' workshop every day. Every day all of you will be working in some way on your writing. And in this writers' workshop, we're going to have certain rules.

"First, there's no erasing. Save that record of your thinking and how it has changed. I'm interested in how writers think and change their minds.

"You should also date and label everything. By label, I mean mark it DRAFT #1, DRAFT #2, and so

on. Or NOTES, which is how I'd label the ideas for stories you just jotted down.

"The next rule is, speak in quiet voices only. Beyond all else, writing is thinking. It's hard to think as a writer thinks when your thoughts are interrupted. During writing time I'll always speak softly and expect you to do the same. If you'd like to read your writing to a friend, there are places to go to quietly confer. All your writing conferences with each other will take place in the four conference corners.

"And the final rule of writing workshop is, *work really hard.*"

Then I sit down at an empty student desk—so kids can clearly see what I'm doing—with my favorite white paper and my favorite Flair pen. I label my manuscript DRAFT #1, put my head down, and start writing one of the stories I'd considered in the mini-lesson. I don't look up. I'm not watching to see who's writing and who isn't. I'm busy, I mean business, and my posture demonstrates that I'm expecting everyone else will become a writer and join me.

And they do. After ten minutes or so, when I finally look up from my own writing, everyone is writing. Always. That's when I begin to establish another of my workshop rules. I put my own writing aside and begin to move among my students, quietly conferring. If ever a student were still not writing by then, I'd move there first and conduct a brief topic interview.

I wish I had long enough class periods that I could write with my students every day. I can't, especially at the beginning of the school year when they need me most and our writer-to-writer dialogues are just getting off the ground. As the year progresses, I'll find pockets of time when no one needs me and when I trust that they don't. Then I can sit at an empty desk, pull the latest draft of a story or poem or article from my bookbag, and write among the writers. More often I'll bring to the workshop for student response something I've written the night before—possibly an even more effective demonstration of my seriousness as a writer since it involves homework. Always, though, my primary responsibility in writing workshop is conferring—from day one I'm circulating quietly, listening hard, telling back, waiting, moving on.

THE BEFORE, during, and after of my conferences with my students quickly become a predictable pattern, one writers can anticipate as well as repeat in their conferences with each other.

One constant is immediacy of response. Students know I'll respond in person during the writing rather than in written comments at the end. The purpose of writing workshop is to help kids develop their abilities as writers, not to assign sink-or-swim tests of writing ability, denying help along the way. After-the-fact response comes too late to do a writer much good; it assumes that students will not only hold the teacher's advice in their heads until the next piece and transfer it to an entirely new situation but also that they actually read teachers' written comments. All of us who've ever spent entire, dreaded Sundays commenting on class sets of compositions have suspected on occasion that we're

shouting down a hole. Don Murray's suspicions were so strong he conducted a small experiment one Sunday afternoon, writing purposely bad advice all over his students' papers: "Do this backward," "add adjectives and adverbs," "be general and abstract." When Murray passed back the papers not one of his students questioned his comments.⁹

I never write comments on students' writing. My marks are limited to straight editing of final drafts—either correcting or indicating the errors students missed when self-editing. I never have dreadful Sundays. Because writers are working and finishing pieces at their own paces, usually no more than five or six papers are submitted for my editing each day from each class: a half-hour's routine each afternoon after school. Writing workshop provides time in school for students to work on their writing; it provides time in school for me, too, to work *with* students on their writing.

Another conference constant is *where* I work with students. I go to them, to their desks. I move because I'm trying to keep conferences brief and see many students each day. I started out with a special conference table at the front of the room where I sat for the duration of the workshop, meeting with writers one or two at a time. There were problems. I couldn't get rid of students once they'd joined me at the table: They had Ms. Atwell at their disposal until they decided to return to their seats, and they had me taking too much responsibility for listening to whole pieces of writing, identifying problems, and coming up with solutions. I saw just six or seven writers each period and I was constantly distracted by what the kids in line for the conference table seats were up to, not to mention the behavior in the far corners of the classroom.

When I move, I can better control the length of the conference, see almost every writer every day, and monitor classroom behavior in general. At Lucy Calkins' suggestion, I move in a zig-zag fashion around the room so my kids always know I could be anywhere in the room in a second.

IMOVE carrying my mandatory piece of writing conference equipment, the plastic, primary student's chair I liberated from the kindergarten storage area. For the first two years of writing workshop, I knelt alongside students' desks. By the end of the second year, my knees had given out—I could still get down but getting up again was another story. Now I carry my tiny chair, park it for each conference, and look up into my kids' faces.

I need to look at writers' faces because I'm an inveterate English teacher. If I look at a draft-in-progress, it's all over. While writers are drafting, their primary and overriding concern is with meaning, and when a writer reads or talks to me about a piece, I can focus on his or her meaning. When I read a draft, my eyes are drawn inexorably to errors. I'll want to focus on errors eventually, but only after the meanings are worked out and the student has submitted it to me to edit. So as I move I avoid looking at the writing and, early on, if a student hands me a piece-in-progress and says, "Read this and tell me what you think," I hand it right back saying, "I don't read drafts. I need to listen. Why don't you tell me what *you* think?" When I accept the piece to read, I've accepted responsibility for it; worse, I've established a

pattern, and kids will expect me to read their pieces and take responsibility again and again.

As much as possible, responsibility for the conference transaction rests with the writer. My students know I'm going to ask them to describe or assess their writing, that I'll open every conference with one of the two open-ended questions that are a writing teacher's stock in trade: "Tell me about your piece," and "How's it coming?"¹⁰ By November I often don't have to say a word. When I pull up my chair the writer starts right in telling me how it's going or reading the part that needs more work or the section that's working well. And the conference proceeds in an equally predictable fashion: I wait, listen hard, tell what I heard, ask questions about things I don't understand or would like to know more about, ask what the writer might do next, and offer any options I might know of.

The purpose of our talks isn't to get the writer to revise. I confer with them about their content to help writers consider what's working, what needs more work, and what—if anything—they might do next. One aspect of content at a time and, later on, one skill at a time, we build together on what the writer knows. My goal is what Vygotsky termed "mediated" learning: "What the child can do in cooperation today he can do alone tomorrow."¹¹

One day at a time I build a predictable pattern of response to my students' writing—always beginning with the writer's meaning, with ideas and information, then reflecting, concentrating on one or two concerns, nudging, waiting, coming back. They can count on me—and they keep coming back.

EDITING CONFERENCES—TEACHING MECHANICS IN CONTEXT

Charles Cooper recently wrote, "It's easier to persist with commas if you know you're engaged in some fundamentally important human activity that has very great consequences for your full development as a human being."¹² It is my favorite quote about editorial issues, funny and absolutely the truth. When students understand the importance of what they're trying to say as writers, they also care about how their words go down on the page. They know that in the end, what they've said and how it looks each contribute to a reader's appreciation of text.

When I finish editing a piece of writing, I make two kinds of notes in my editing conference journal in preparation for the editing conference. I note the skills the writer has used correctly—what this writer knows and can do—and the new skills I'll teach in the next day's class during our conference. This record is crucial. I've learned that public relations-wise, it's not enough to announce to parents at conference time, "I teach skills in context." Parents deserve specifics. They want to know that their children are learning what students in an English class are supposed to be learning, and in my editing conference journal I can show exactly what their children are learning in the context of pieces of writing over the days and weeks of the writing workshop.

Figure 1 shows one page from one of my editing journals, a loose-leaf notebook containing four or five

pages for each student. The format is one Susan Sowers shared with Boothbay teachers when she visited our school. In the first column, I record the title of the piece, the date, the mode, and any observations of interest to me. This last is strictly for my purposes as a teacher-researcher: The journal gives me a place to capture interesting goings-on in the behavior of individual writers. The second column is a record of skills I see the student is using correctly. This column forces me to focus on, and then celebrate, what my kids can do, rather than falling back into my old deficit-model perspective. An arrow in the "Skills Used Correctly" column shows me the writer is applying a skill I taught in a previous conference. In the third column, I jot down the areas I plan to address with that student the next day in our editing conference. A circled number in the "Skills Taught" column signals that this is a skill I'm having to re-teach.

THE EDITORIAL issues I teach in individual conferences run the gamut, from syntax to usage to spelling, punctuation, format, and stylistic concerns. There is no one set of editorial concerns, no grade eight skills scope and sequence. There are individual writers with varying degrees of editorial expertise. By teaching in context, one to one, I can go right to the heart of what an individual writer needs. My job as a teacher of skills is to focus on the writing, on the individual piece, and make a judgment about where this writer has come from and where he or she needs to go next. It's surprisingly easy to make such judgments. As a reader first, I have expectations too, and the ways a writer eases my way, or disconcerts me, fairly jump off the page.

Since I started explicitly teaching skills in the context of pieces of kids' writing, not only are students more skilled at mechanics, but I'm more knowledgeable

Figure 1

TEACHER'S CONFERENCE RECORD FOR <i>Kelli</i>		
TITLE OF PIECE & DATE (COMMENTS)	SKILLS USED CORRECTLY	SKILLS TAUGHT (NO MORE THAN 2)
4/12 "My Mind" (poem) (K. published the final as a poster for the bulletin board)	Lines Rhyming words at ends of lines i; o; s Spelling fair Name, date, draft #	Edit in pen or pencil different in color Capitals on first, last, and important words in a title; no quotes
4/13 "Listening to Mr. Burgess" (poem) ↑ (Wrote both poems last night at home, so excited about reactions to "My Mind" poster.) ↓	Quotes around words said aloud; dialogue correctly punctuated Edited in a different color pen Caps on title, correctly Acrostic format	② No quotes around the title lie: people lie down Lay: people lay things down
4/13 "Sometimes in the Dark" (poem)	Lines and rhyming words at ends Stanzas	
4/22 "My Friend, My Victim" (p.e.n.) (Four kids in 8th grade wrote this same incident—two different views. Published together.) Kell asked me about this—about what it did—in her novel in reading last week	Caps on title, no quotes Edited for spelling, circling words not sure of Quoting & being dialogue * * * to show shifts in time and place Being used if applied when editing Apostrophes on possessives	Semi-colon between two sentences where she wants to show a relationship (comma splices)
4/30 "Day After Day" (poem—parody of Lynedi Laizer Song. Kell drafted this poem as a 8. My hunch: attempting a line-by-line parody of Laizer, presented more than one cd. handle at one time.)	Spelling end-stop (no comma splices) No quotes on title Dash to show abrupt change	Remind her: On a rhymed poem, no indents; rhyming words at ends of lines; stanzas

about how mechanics work. Because I have to explain conventions as to their function, I have to understand inside and out how mechanics function. For example, rather than parroting *Warriner's* rules about punctuation, I show kids why punctuation was invented—essentially to show readers what to do with their voices—and how the different marks work to that effect. Rather than reciting *Warriner's* seven models of paragraph formation (models seldom found, by the way, in the real world of published prose), I tell how paragraphs were developed to give readers breaks. I show how the paragraph symbol was inserted in early illuminated texts, before indentation became a convention, to make breaks for readers and signal new themes of information, and I ask writers of unparagraphed drafts to decide where to divide their prose so it's easier for a reader to take in. The following transcript of an editing conference illustrates a way of approaching a typical editorial issue—run-on sentences—from the perspective of function.

ATWELL: Sandi, there was one big problem I noticed last night when I edited this piece, and it had to do with periods and other end-stops. Can you tell me what a period does?

SANDI: It comes at the end of a complete sentence.

A: How can you tell a complete sentence?

S: If you have a complete subject and a complete predicate.

A: Right. So . . . What does that mean?

S: (long pause): I'm not sure. It's a rule we learned in sixth grade.

A: Well, let's take a look at "Body in Gull Lake" and see if you can learn a rule you can apply. Punctuation, like periods and commas and exclamation points, shows people how to read a piece of writing—what to do with their voices. A period usually shows a reader where to drop and stop her voice. Do me a favor. Read this paragraph softly aloud and listen: Where does your voice drop and stop?

(Sandi reads.)

A: Could you hear the periods?

S: Yeah. I see what you mean.

A: Without periods, what you've got here is called "run-on sentences." Your reader's voice just runs on and on. Periods are probably the single most important punctuation mark because they signal the stops. Would you add this skill to your list, that from now on you'll proofread softly to yourself and make sure you've put periods where your voice drops and stops?

S: Sure.

GROUP SHARE

Seven or eight minutes before the bell, I ask my students to finish the sentence or conference in progress and assemble with their writing at the front of the classroom. There, we push desks back to make a clearing on the carpet—the spot where our group meeting will daily unfold—and sit in a circle on the floor. During the first day's group share meeting, my students will also take possession of their daily writing folders.

I pass a folder to each writer, explaining:

This is your daily or working folder. I said writ-

ers save everything, and this is where you'll save it—all the drafts and notes for the piece you're currently working on. Bring this folder to class with you every day, starting tomorrow. Inside, I've stapled three forms for your records: a sheet for you to list the pieces you've written this year, another to list all the skills you learn this year, and a third headed "My Ideas for Writing," your official place to keep track of topics for future pieces. We'll be talking more about how to use each sheet. In the meantime, the most important thing for you to know is that your writing folder is your text for this course. Take good care of this folder and *do not lose it*.

Then it's on to the main business of group share. Group share is another means for helping writers improve their writing—and more. Calkins calls share meetings "a vehicle for helping children become good writing teachers."¹³ Here, I model for the whole group ways of listening and responding to writers; here we confer together about conferring, about responses that help and do not help writers.

One skill at a time, we build together on what the writer knows.

Writers use group share for many reasons, most of which evolve as the year progresses—auditioning something new for the group's ears, sharing a technique that worked, trying out on an audience alternative ways of approaching a problem, hearing a range of perspectives on a piece in progress, following up on information introduced in mini-lessons. On most days a couple of students share their writing. Sometimes writers request group share. Sometimes I invite writers to bring something to the meeting—another kind of nudge, when I think they need to hear reactions other than the teacher's—and they agree. I've learned to make these arrangements beforehand, while I'm circulating during the workshop. Otherwise I risk an embarrassed, deadly silent circle of eighth graders, and group share becomes a pointless game where I coax and they resist. In fact, some students will never arrange to share, and that's all right. Except for the first day, when my motives are a little different, whole-class participation isn't the point; the goal is selective sharing for specific reasons with a group of peers.

TWO IMPORTANT general purposes of group share are served right from day one: to bring closure to the workshop, and to find out what other writers in the workshop are up to. And right from day one I work especially hard to make the group share meeting a safe place. Eighth-grade writers—all writers—need to know when they read aloud that their ideas will be heard and that nothing bad will happen. So the very first group share has a different format from those that will follow. I

make this meeting an occasion for a fast airing of all the ideas the day brought us, saying to the circle, "Take half a minute to look at your draft and decide where the beginning ends. That's called a lead. Find the point where your lead ends—the point where a reader has a pretty good idea of what this piece will be about—and put a dot." That's a sufficient first explanation of a term we'll clarify for the rest of the school year. Then I tell the kids about behavior during group share, rules based on sensible guidelines Lucy Calkins and a group of Atkinson students modeled during a demonstration lesson,¹⁴ and invite a low-risk initiation into sharing with the group:

Group share is how our writing workshop will always end. We'll all meet every day to listen and respond to each others' writing. The rules will always be the same: Make a circle, sit with your bottoms on the floor, put your paper face down if you're not reading, look at and listen to the writer who's sharing. Usually one or two writers take advantage of the special help available in group share. Starting tomorrow, that will be our format.

Today I thought we'd take a few minutes to whip around the circle and hear what everyone came up with—what stories you decided to tell. We'll read our leads one right after another, right around the circle. Stop when you hit your dot. We won't stop between writers or make any comments. Instead, watch the face of each writer as we go around the circle, and listen to what he or she tells.

It takes no more than three minutes for all of us, including me, to read around the circle. Then I quickly sum up telling what I heard:

The writers in this workshop definitely have stories to tell. You know about little sisters, learning how to drive a jeep, babysitting, playing the trumpet, bad dogs, chasing cows, blacksmithing, motorcycle crashes, Monhegan Island, the Windsor Fair, what it's like to be a big eighth grader . . . you know a lot. I'm looking forward to learning from you. Tuck those drafts inside your folders, and I'll see you and your folders tomorrow.

In this one class period we established a rhythm for a year's worth of writing workshops. Each day we'll begin together, meeting for the mini-lesson; each day writers will have a sustained chunk of time to go their own ways, writing and conferring; each day we'll come back together again at the workshop's end. Each day we begin as writers, proceed as writers, and conclude as writers.

IN NOVEMBER 1985, my students participated in Maine's first assessment of the educational progress of all fourth, eighth, and eleventh graders in the state. For the language arts section of the test, students produced two writing samples, one narrative and the other persuasive, in response to assigned topics. The samples were read by trained cadres of Maine teachers and scored according to six criteria: topic development, organization, supporting details, correct and varied sen-

tence structure and syntax, vocabulary and usage, and mechanics (spelling, punctuation, capitalization, paragraphing, and form). In short, content and mechanics were given equal weight.

I was finishing the last chapter of *In the Middle* when the test results came back from Augusta. Our eighth graders, in this small school isolated at the end of the Boothbay peninsula, achieved Maine's second-highest scores in writing. We were beaten out only by Great Salt Bay, a district where Don Graves, Mary Ellen Giacobbe, and Boothbay Writing Project teachers provided training.

Results were reported as percentiles, and fully a fifth of Boothbay's eighth graders scored at the ninety-ninth percentile. This means that twenty percent of our kids did better than virtually every other eighth grader in the state. Almost half of our students scored above the ninetieth percentile; their mean score was at the eighty-seventh percentile. And the results included all the eighth graders—special education, Chapter I, everyone.

Perhaps this is the happiest story of *In the Middle*—not because of the test scores but because of the preparation for the test, all five years of it. Most of my students were third graders in 1980, the first year of the Boothbay Writing Project. Coming up through the grades, they had many writing teachers, teachers who learned about writing by writing, reading research, and conducting their own; teachers who came together one by one to finally stand together and say, "This is how we believe writing is learned and should be taught." Students don't become exemplary writers overnight or because of the efforts of one teacher. One teacher at a school can make a difference. Five or eleven or eighteen teachers at one school can move mountains. □

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SMALLER IS BETTER

(Continued from page 31)

lead to tracking. If, for example, a school subdivides into houses with themes of "English," "Science," "Sports," "Performing Arts," and "Business," the strongest students will troop toward the academic themes, and the weaker students to the others.

Another serious impediment to forming heterogeneous houses is posed by categorically funded programs. In schools with heavy categorical funding for special needs populations, the tendency may be to organize houses around existing categorical programs. (In New York City, dropout prevention *programs* became, overnight, dropout prevention *houses!*) Some of these programs already have support staffs and a specific location in the building, and their regulations often bar serving students in the mainstream or allowing funded personnel to serve other students.

Fortunately, some categorical programs now recognize that target students can, in some cases, be better served if greater co-mingling of funds is allowed. For example, the rules governing Chapter 1 and New York state's dropout prevention program, under certain conditions, now allow funds to be used for programs that will bring about schoolwide improvement. It should be possible to get waivers for house plans from other categorical programs as well, provided that, through the co-mingling, the education of the target students is enhanced.

Physical Resources: To maximize the community feel and the easy access students should have to house staff, house classes should be located close together and clustered near the offices of the house's support staff. Ideally, office space and possibly lounge space for house teachers should be in the same vicinity. Although it will usually not be feasible without major building renovations, it would probably help if such facilities as laboratories and restrooms could be located in each house's vicinity.

AS THE examples above suggest, house plans have certain common features, but there is no single blueprint for how to organize them. Each school's house plan should reflect its staff's strengths and interests and the needs of its students. Significant variations in strong plans may be found as the following brief profiles show:

At Erasmus Hall High School in Brooklyn, after a transition year during which ninth graders are placed in small residency groups and their teachers are relieved of one class daily to conduct student and family outreach, students choose to enter one of four subschools: humanities, science, business, and performing arts. Assistant principals in charge of the same academic departments also supervise the subschools; their department office serves as house headquarters. A teacher coordinator is also assigned to each house. Students take core courses only with other students in their house. The same core of courses is taught in each subschool, but interdisciplinary curricula, which schools are encouraged to develop, weave in topics relating to the house academic area. For example, in the science school, the topic of nuclear energy was pursued

in science, English, and math classes. Each house has its own co-curricular activities including house assemblies and field trips.

At Prospect Heights High, also in Brooklyn, the house plan is in early stages of implementation. Each of seventeen groups of thirty-four ninth graders is matched with a house teacher; one guidance counselor is assigned to every two houses. The students spend a two- or three-period block with their house teacher. One or two of these periods is used by the house teacher to pursue the house curricular theme; for example, in the science house, the single or, possibly, double period would serve as the science class. The remaining period is formally reserved for covering a "house" curriculum. Designed by the school's house coordinator, the curriculum includes activities designed to acclimate entering ninth graders to the school and the surrounding urban neighborhood; sessions on study skills; time for discussion of personal, academic, and social issues raised by students; and field trips to nearby museums. In fact, while some teachers found the curriculum useful and used it, other teachers adapted the period to the needs of their students, using it, for example, to help students—many of whom were several grades behind—catch up with other school work.

The purpose of the house system is to promote more personalized treatment of students.

Such discretionary use of the house period probably makes sense; after all, the purpose of the house system is to promote more personalized treatment of students. Providing teachers with house periods, as Prospect Heights High does, can enhance the house program; but teachers may feel ill equipped or uninterested in teaching a house period. If house policies are developed without full involvement and support of the staff, they are not likely to work as well as they could.

Prospect Heights High is now in the process of developing a set of larger houses for grades ten through twelve into which students will move after their more intensive ninth-grade house experience.

AS WITH SO many other promising educational innovations that have gone before it, whether a house plan succeeds has less to do with the soundness of the concept than with the capacity and will of schools to implement it. Four pitfalls that will limit effective implementation need to be avoided:

Inadequate support from the central office. The house plan represents a radical reform effort that requires a sustained commitment from the central office in several areas. Schools need planning time, probably over several years, to fully implement a house plan. They need general guidelines that they can adapt, training for new roles, sufficient staff to allow coverage of the

new roles, and funds to supply houses with key items. Very often shortages that exist on a schoolwide basis become more apparent under a house system; for example, a shortage of pupil support staff will prevent schools from assigning such staff exclusively to houses, thus eroding the integrity of the houses.

Lack of teacher involvement in planning. The house plan has consequences for where teachers work in the building, whom they work with, how they structure their curriculum, and which students they will instruct. Teachers should have a voice in the design of the houses. They must carry out the plan; therefore, it must work for them, not against them. If planning time is cut short, and/or principals simply lack the skills it requires to facilitate broad-based planning within the school, the effectiveness of the house will be undermined. Attention should be given to preparing both administrators and teachers to work constructively with staff committees and groups of students and parents. Districtwide mandates should allow for great flexibility at the school level.

Resistance to changing roles. Small schools require generalists, staff who can perform multiple roles. House coordinators will manage houses and student discipline and also teach; teachers will work more closely with pupil support staff and, perhaps, share some of their work. Layers of the administrative hierarchy that multiplied with increasing school size are unnecessary in small schools; deans and heads of academic departments may feel threatened by the authority vested in house leaders who may be teachers. Attention must be paid to preparing people for new roles, giving them some options, and structuring the relationships of house staff to avoid unnecessary conflicts. Shaping a fruitful division of work should be possible: The house system creates new positions of authority; provides for more active participation in house governance and collegiality; improves the climate for learning; and, thus, generally makes the work of teaching more satisfying.

The presence of other nagging school problems. Often reform policies require teachers to modify curricula and establish new programs, while the basic needs of staff and students are left unmet. Poor building maintenance, shortages of books and supplies, and overcrowding plague inner-city schools. Staff are understandably resentful of policies that seem to say the problem lies in what teachers are doing or not doing and have nothing to do with problems outside their control. The central office should recognize and address the fact that these problems affect staff's will to undertake reform and pose direct obstacles to implementing the house plan.

SUBDIVIDING SECONDARY schools into houses is a practical way to have a major impact on school climate and thus on student learning and teacher morale. It also makes possible a number of reforms that otherwise can be difficult to execute in large schools. It is a clear, obvious first step that we can take toward restructuring our schools to provide students significantly enhanced opportunities to learn. □

EDUCATING THE TWO SIDES OF THE BRAIN

(Continued from page 37)

ideas. Neuropsychologists conducting basic research point out that there is no empirical support for the link at present.

Claims that differences in cognitive style or learning style reflect hemispheric differences require supportive evidence that is based on more than loose inference. That evidence does not as yet exist. Lack of such evidence, however, does not detract from the potential importance of the cognitive style concept. It does, however, suggest that attempts to validate the idea on the basis of its supposed neurological foundations are suspect.

THE CONCLUSION emerging from our review of what is known about hemispheric differences is that those who seek to modify our educational systems and implement assessment and training programs based on our knowledge of brain asymmetry are indeed on shaky ground. It is certainly conceivable that our educational systems are deficient in some ways and may limit a broad spectrum of human capabilities. What is questioned here, however, is the division of styles of thinking along hemispheric lines. It may be that in some cases the formation of new ideas involves intuitive processes independent of analytic reasoning or verbal argument. Preliminary schemes ordering new data or re-ordering pre-existing knowledge might arise in some instances from even aimless wanderings of the mind during which a connection is seen between a present and a past event or a remote analogy is established. But are these right hemisphere functions exclusively? It would be surprising if it were as simple as that, and there is certainly no conclusive evidence to that effect.

Claims that research on hemispheric asymmetry should prompt fundamental changes in our educational programs are simply not based on scientific findings. It thus falls to the proponents of such programs to provide evidence for the value of their ideas, independent of an underlying neurological rationale. Perhaps our educational programs should place greater emphasis on spatial and intuitive skills. If so, it should be possible to evaluate the advantages and disadvantages of such changes independent of knowledge of which hemisphere might or might not be involved. Curriculum changes and special instructional techniques need to be evaluated on their own merits. Advocates of specific changes cannot fall back on "neurologizing" to bolster their ideas in the absence of hard data addressing the value of the changes that are proposed. Our current educational practices may miss training or developing half of the brain, but they probably do so by missing out on the talents of both hemispheres. □

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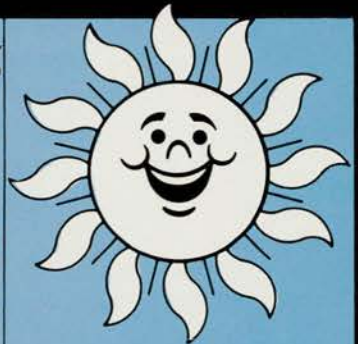
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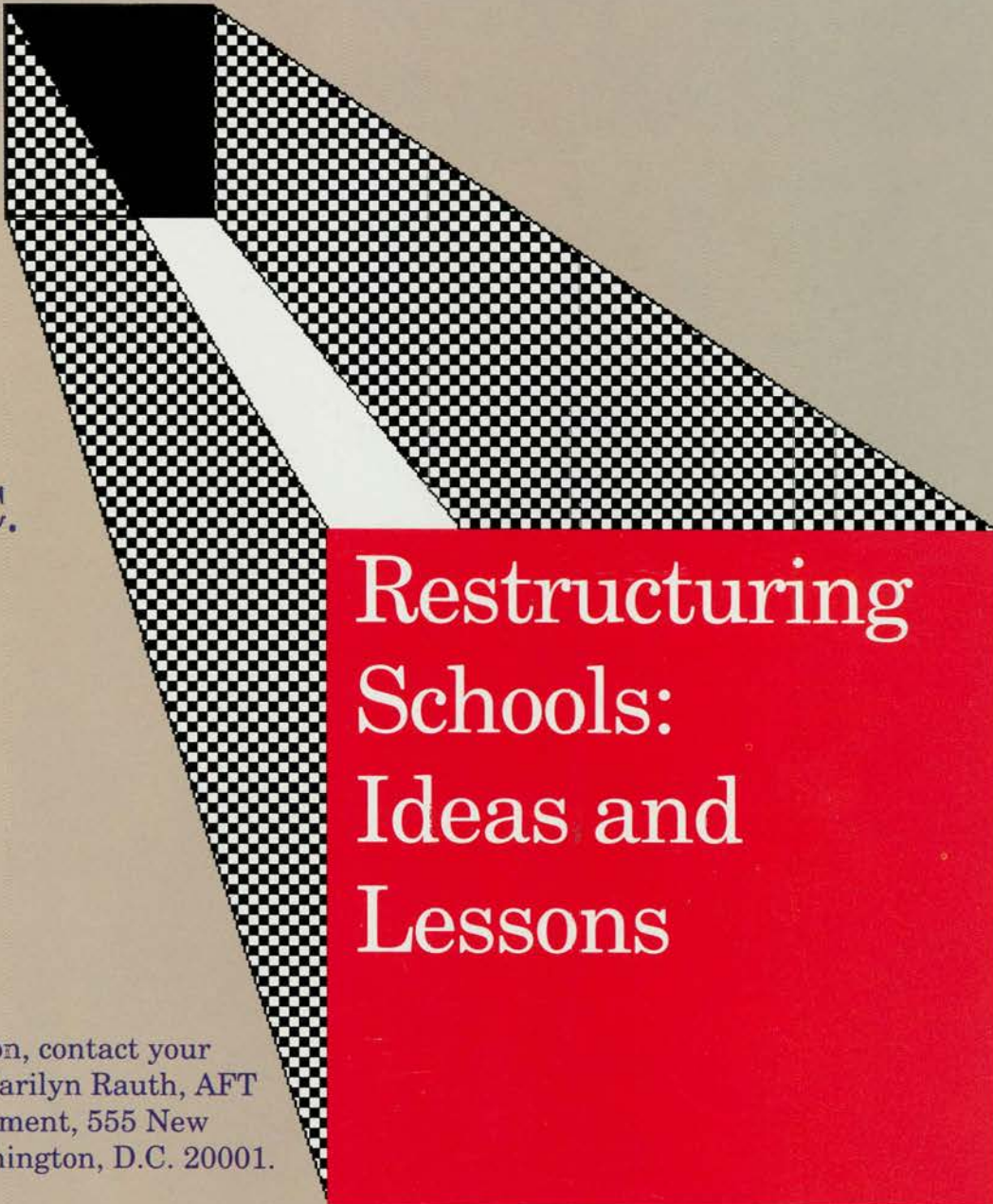
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