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National Geographic Society

1145 17TH STREET, NW

WASHINGTON, D. C. 20036-4688

EDUCATIONAL MEDIA DIVISION

September 30, 1993

Trey Lindseph
Office of The Vice President
Old Executive Office Building
Room 360
Washington, D.C.

Dear Trey:

Earlier this year you expressed interest in National Geographic Kids Network, so I thought you'd like to see the enclosed article from last week's *Fortune Magazine*, highlighting NGS Kids Network as "the largest and most sophisticated" of the networks.

Again, if you'd like to see NGS Kids Network in action in a local classroom, do let me know. I can be reached at (202) 828-5664.

Sincerely,

Sarah W. Clark
Manager, Public Relations
Educational Media

WHY KIDS LOVE COMPUTER NETS

Using technology to escape the bounds of the classroom, children are learning to work in ways you never dreamed of when you were their age. ■ *by Elizabeth Corcoran*

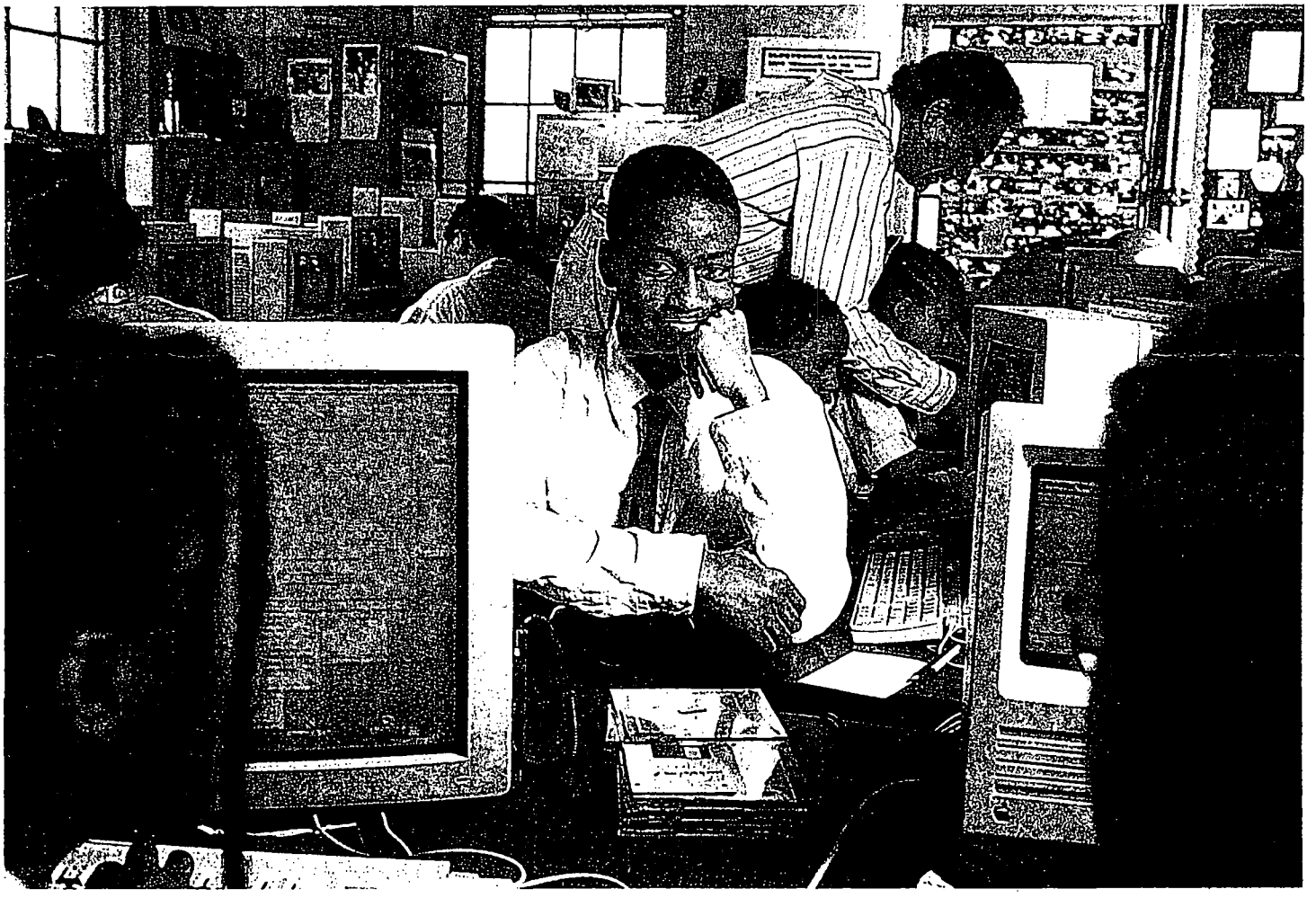
THE RALPH BUNCHE public school sits squarely in Harlem, surrounded by the splintered glass and concrete trappings of inner-city life. Nearby avenues echo with police sirens, blaring music, and angry shouts. But upstairs in room 409, Hamidou Diori is exploring another world altogether—by way of electronic networks.

On the Macintosh screen before him, the 13-year-old seventh-grader maneuvers his computer mouse across a collection of icons that represent stored files and programs. With a few quick clicks, Hamidou has hooked into Internet, the sprawling electronic highway system that by a recent estimate connects more than 15 million people and thousands of universities, government offices, and businesses in 60 countries. Another click and Hamidou has called up a gopher, a kind of electronic guide. Once programmed to search for information on a given subject, it will burrow through databases and bulletin boards that are connected to Internet but reside on computers scattered around the globe.

Hamidou's goal: Find a topic for a science project on recycling. He gives the gopher a few key words; in seconds the

REPORTER ASSOCIATE *Jacqueline M. Graves*

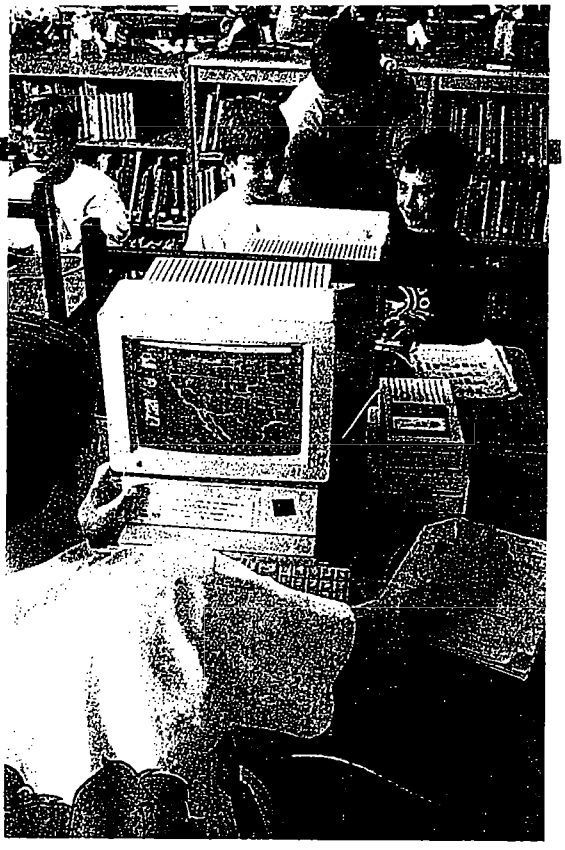
Hamidou Diori, 13, of Harlem has become his school's expert in tracking down information on electronic bulletin boards and databases around the world.



PHOTOGRAPH BY NINA BARNETT

ANNIE GRIFFITHS BELT

FAIRFAX, VIRGINIA: Trash weigh-in for a science project on National Geographic Kids Network



NEIL MACDONALD

LAKE FOREST, ILLINOIS: Onscreen map helps pinpoint locations of other trash-project teams.

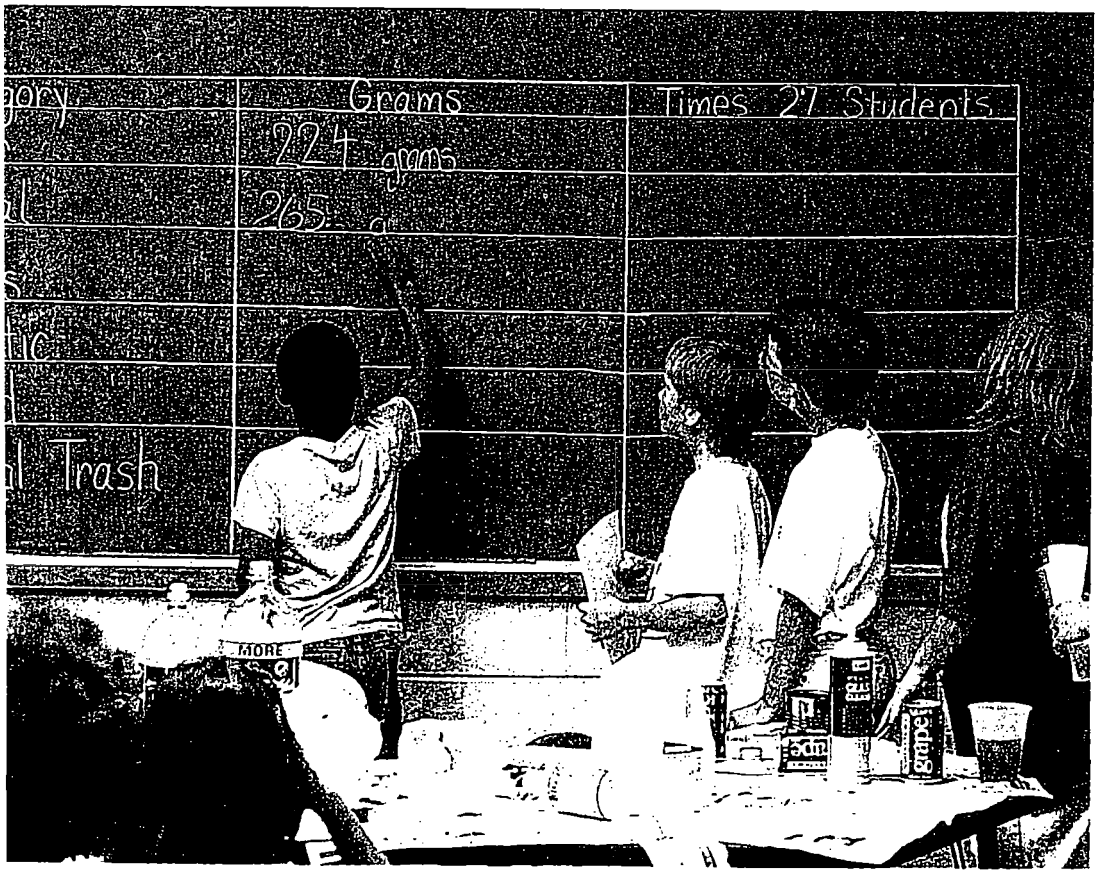
program makes a preliminary search and flashes a list of possible sources on his screen. Soon Hamidou is scanning feisty, fact-filled messages posted on the bulletin boards by graduate students, professors, and managers in many countries, debating the merits of recycling. If those exchanges don't provide the inspiration Hamidou needs, he will float a few questions of his own across the network. "I use a whole bunch of databases," he nonchalantly tells a visitor. "You ask these people for help—and they give it to you."

From Harlem to Honolulu, electronic networks are sparking the kind of excitement not seen in America's classrooms since the space race. That contest in the 1960s inspired a generation of students to become scientists and engineers. The advent of computer networks could have even more profound effects. In scores of programs and pilot projects, networks are changing the way teachers teach and students learn.

Last spring, for example, instead of merely reading about life in Russia from outdated books, schoolchildren in Minnesota exchanged electronic mail with their peers on the Kamchatka Peninsula in eastern Siberia. Students across America tracked the progress of four men biking 10,000 miles in Africa, via reports filed by the riders on an international teachers' network. In the process, the kids learned the continent's geography. Still others got a taste of scientific collaboration by measuring the oxygen in local lakes and comparing results with peers around the world.

By tapping into the nets, kids discover ways of working and communicating that weren't available to their parents—and that will powerfully enhance their prospects when they join the work force of the 21st century. The networks may also play a key role in helping U.S. schools overcome their notorious weakness in teaching math, science, and geography. That's partly why network projects have grants from influential high-tech donors such as IBM, Boeing, AT&T, and Xerox.

SILER CITY, NORTH CAROLINA: Compiling data from an analysis of household trash for the network project



FRITZ HOFFMANN—JB PICTURES

Bob Hughes, Boeing's corporate director of education relations, looks to computer networks as a key to turning out students who adapt readily to change and who solve problems by seeking out and applying new ideas. The traditional classroom, he says, is singularly ill suited to producing lifelong learners: "Right now, you've got 30 little workers who come into a room, sit in rows, follow instructions from a boss, and can't talk to one another. School is the last time they'll ever see that model."

As many as 750,000 U.S. lower, middle, and high school students took part in networking projects during the past school year, estimates Seth J. Itzkan, an

educational technology consultant in Houston. National Geographic Kids Network, the largest and most sophisticated, helped students in more than 10,000 elementary school classes plunge into science by conducting experiments and then pooling data with kids doing similar work in other parts of the world. Some 35,000 kids plugged into the Learning Network, a 23-nation social studies and literature program run by AT&T. Tens of thousands of students traded electronic messages and did research using Internet and education networks managed by state and grassroots organizations.

RANDALL COSCO

BOWEN ISLAND, BRITISH COLUMBIA: Kids reach the network by selecting the phone icon onscreen.

IS NETWORKING just another fad? For decades, educators have fantasized about computers as a classroom cure-all: a way to engage slow and hard-to-reach students while letting smart kids race ahead. But each wave of techno-enthusiasm has led to disappointment. Too often schools scrimped on teacher training, software, and maintenance, ensuring that the technology remained alien to all but a few. After the hoopla subsided, the computers wound up as institutionally approved videogames or dusty, unused fixtures in classroom closets.

But connect a computer to a network, and the technology can come to life, bringing children the excitement of the outside world. "I have kids nudging each other to get off the computer," says Sandra McCourtney, who runs a computer lab at Sarasota High School and co-founded Egret International, a nonprofit network in Florida. The networks also offer much-needed help in an age when teachers often feel overwhelmed by large classes and the problems that many kids lug to school instead of a brown-bag lunch. Says Fenn Ketchoyian, who has spent nearly 12 years teaching inner-city kids at East High School in Salt Lake City, and whose students got access to

WHO WILL PAY TO PUT KIDS ON-LINE?

Hooking into a network isn't cheap: Classrooms rarely have the necessary computers, modems, or even telephone lines, not to mention cash to cover phone bills and network connection fees. Add to that the cost of teacher training—a crucial expense. Says Beverly Hunter, a former program director at the National Science Foundation: "Just connecting people up doesn't work."

To get their students on-line, many teachers dig into their own pockets or scrape together grants and donations from the National Science Foundation, nonprofit organizations, and businesses. The Issaquah, Washington, school district got high school computerphiles to build its network. The students wired the school buildings, installed network cards in personal computers—and even taught their teachers to use E-mail.

Schools don't always have to start from scratch. "You already have a lot of technology in place," says Denis Newman, a scientist at Bolt Beranek & Newman, an R&D firm in Cambridge, Massachusetts. He's doing a national study of school networks. Newman finds that many districts operate computer links that let administrators in different schools pool accounting information, student records, and other data. Those networks, he says, have enough capacity to support student traffic too; administrators need to design their systems so records are safe from tampering and classes also have access.

Harry Miller, an official at New England Telephone in South Burlington, Vermont, thinks getting schools on-line shouldn't mean pumping up budgets. He tells school administrators in his area to tighten their belts before looking for handouts. "We can do more with less, though teachers and schools don't like to hear that," he says. One of Miller's proposals: Rather than employing specialists to teach health, say, or art, schools should recruit "master teachers" with broad expertise. Yet when a school district comes up with a thoughtful plan for using technology, businesses ought to pitch in, he believes: "From now on, we'll just have a different kind of school, one where the business community provides certain resources on a sustained basis."

Voters also show surprising willingness to pay for classroom high tech. Last spring voters in the Colchester, Vermont, school district approved a bond issue to raise $625,000 over five years to upgrade computing and communications gear at five elementary schools. At the same time, to show their displeasure with the rising cost of salaries and health benefits for teachers and other school-district employees, they voted down the budget for the coming academic year.

Internet this year for the first time: "I have never seen my students so involved, interested, and excited. Using networks may be a way to really hook these students into staying in school."

As students join communities outside their classrooms, too, the role of the teacher changes. "You need to be a manager, not a dispenser of information," says Ed Barry, who jointly teaches 50 sixth-graders at the School Street School in Milton, Vermont, a serene, red-brick building perched on a small rise not far from dairy farms and maple trees. Half a dozen Macintoshes ring Barry's classroom. Two have modems, connecting the class to the Vermont EdNet, a state-funded network for teachers and students. "I have sources all over the state," Barry says. "If I can't answer a question, someone else can."

Since putting his students on-line, Barry has spent less time lecturing and more time coaching students in where to find answers. When the class studies Egypt and the flooding of the Nile, Barry sends the kids to the office of the town clerk to ask how the cycles of the nearby Lamoille River affect zoning and to the computer network to collect data on how the Lamoille affects other towns. "Physically the students go into the local community, and electronically they go into the world," he says.

Network-assisted teaching is demanding. Barry had to provide most of the equipment himself, and put in long hours figuring out how to use it. Even so, he says, he often finds himself having to admit to students how much he doesn't know. Increasingly the students learn as much from one another as they do from any adult.

On the AT&T Learning Network, elementary, middle, and high school classes take part in creative writing groups, contribute to an international student newspaper, and learn about other governments and cultures. AT&T organizes activity on the network in six- to 15-week "sessions" that have names like Society's Problems and Computer Chronicles (cost per 15-week session: $375). Students swap essays with their peers around the country and abroad, and then questions—and critiques—fly back and forth. At the end of each session, the program publishes the best work in a booklet mailed—the old-fashioned way—to participating classes.

THE EXCHANGES spur students to work hard on their writing, according to Margaret M. Riel, a consultant in Encinitas, California, who helped develop the network. "When kids are writing for their peers, they take on a different style," she says. In a study she conducted with colleagues in Israel, Riel found that students typically wrote more clearly and carefully when they knew that other students would scrutinize their work.

National Geographic Kids Network aims to teach by propelling children into the thick of scientific debates. In the past four years, well over a half-million elementary school children have taken part. Each class pays about $450 for teaching materials, software, maps, and on-line time in an eight-week course; among this year's offerings was an ecologically minded project called Too Much Trash. Students started by defining trash and plotting their own location and those of their network teammates on a map. In the weeks that followed, each class analyzed its own garbage output and cooked up schemes for generating less of it. (A typical task: "Calculate the weight of the trash generated per student in each trash category . . . [and] send trash data to your research team.") Besides having fun, students experienced the thrill of real science: collaborating internationally to piece together new knowledge.

Kids Network is the brainchild of Bob Tinker, chief scientist at Terc, a nonprofit science and math education organization in Cambridge, Massachusetts, which developed the network and in 1989 turned it over to National Geographic. Earlier attempts to get kids on-line had fizzled, largely because teachers lacked the time and motivation to struggle with what seemed like fancy pen-pal systems. Tinker made networking easy by structuring the program like a regular lesson plan. Teachers get detailed instructions about how to run the science projects; the network serves mainly as a tool for sharing data and getting answers to questions.

Tinker and his colleagues are now experimenting with a high school program called Global Lab. During last December's winter solstice, students around the world took part in a pilot project, rising before dawn to measure air and soil temperatures. Later they tapped into the network to analyze how their data reflected their geographic locations. Tinker recalls, "One student wrote, 'I know the solstice is too big to grasp, but I feel like I touched it a little bit.' "

A growing number of on-line experiments partially funded by the National Science Foundation are putting kids in direct contact with scientists. Last year the Institute for Research on Learning, a nonprofit group in Palo Alto, California, founded by Xerox, helped middle-school math teachers work with scientists from the Sandia National Laboratories to develop a curriculum based on designing a mock research station in Antarctica. The object, says director Shelley Goldman, was "to attract kids who traditionally drop out and make them feel confident that they could see the world mathematically."

When 160 seventh- and eighth-graders in the San Francisco Bay Area drew up blueprints and built models of their Antarctica research stations this spring, once vague concepts like proportion became real. As the students spent time converting polar temperatures from Fahrenheit to Celsius,

WHERE KIDS CONNECT

FORTUNE TABLE

	KIDS ON-LINE*	PRICE	FOCUS
National Geographic Kids Network 800-368-2728	310,000	$450 8-week session	Fourth-, fifth-, and sixth-graders conduct science projects and swap data with classes throughout the world.
Frednail (Free Educational Mail) 619-475-4852	150,000	Free	Students and teachers exchange messages and work on joint projects in a federation of over 200 bulletin boards.
FIDOnet 315-331-1584	N.A.	Free	Ad hoc international network of over 24,000 bulletin boards. K12Net is a subset for educational curriculums.
AT&T Learning Network 800-367-7225	35,000	$375 15-week session	K–12 students take part in sessions on societal issues and share essays, poems, and stories.
Global Lab 617-547-0430	3,000	$450 per year	Over 100 schools from 17 countries collaborate on science projects on local and global environmental issues.

*Estimates.

negative numbers finally made sense to them. Rather than thumbing through textbooks to resolve questions, classes consulted the Sandia scientists via electronic mail.

Like many experts, Goldman believes that networks have powerful social potential: They put students of all backgrounds on an equal footing. At the Ralph Bunche School in Harlem, the computer center is the focus of a school-within-the-school for 160 volunteers from the fourth, fifth, and sixth grades. Teacher Paul Reese says angry youngsters often cool off and come into their own when they work with the machines. Adds David Sherwood, a Columbia University sophomore who is a volunteer tutor at Ralph Bunche: "Access to the network seems to give some kids their own space and make them feel powerful."

When he first began putting students online, Reese recalls, he wasn't convinced they could learn to navigate the networks. Many still need guidance. "It's not just having the technology," says Reese. "You need a good teacher." But the students' excitement when they uncover a new source of information or make a faraway friend sold him on the power of the nets. Communicating via computer, he says, equips kids with skills that will help them thrive in the work force—and gives them a vision of a future beyond the city streets. F

E-MAIL FROM THE YOUNGER GENERATION

FORTUNE *posted messages on the AT&T Learning Network, the Global Lab, and Internet, asking kids to talk about using computers. Among the replies that streamed in by E-mail:*

At first I was hesitant about the idea of E-mail. Before long I was hooked. When going up to the computer I would think, "Did I get a message? Did I get a message?" The "beep" and writing stating "Cecily, you have mail waiting" were like heaven. I got messages from across the world. *Cecily Lin, 14*
Taipei, Taiwan

I really enjoy being on the Net and talking to people without being stereotyped as a "typical teenage computer geek." When the person on the other end only knows me by my E-mail address, I can be whoever I want without fear of being told I'm not old enough to be saying that. *Andy Wilson, 17*
Indianapolis

I'm the king of the computer in the family. *Minh Ngo, 9*
Milpitas, California

I'm more experienced than my parents. It's great to know that the people who taught you almost everything you know can now learn something from you. Doing something my parents do not understand makes me feel smarter. Ha! *Amanda Wagoner, 14*
Aspermont, Texas

I don't like these technologies when I have a problem with them and can't find the solution. With a horse you can always figure out why he is acting up, but with a computer one may never know. *Bay Hecht, 14*
Aspermont, Texas

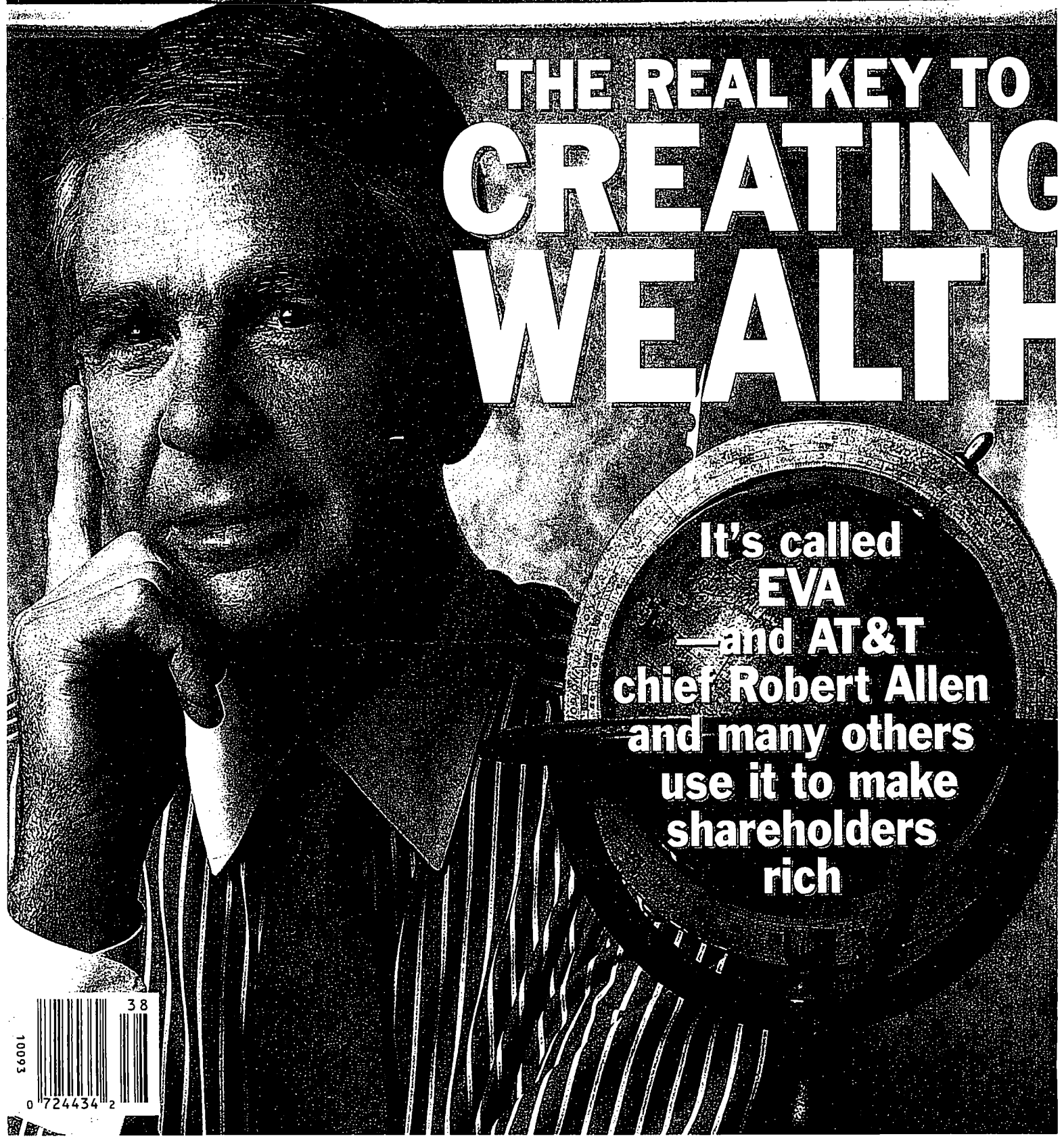
I feel sorry for my parents having to use handwriting or manual typewriters to do their essays and projects, and especially sorry that the only way they could communicate abroad until now was by either mail or telephone. It's good to see that they will at least get to experience what I am experiencing for some of their life. *Duncan Clark, 16*
Calgary, Alberta

Whenever there's a problem with the computer at my father's office, he calls me. I can usually fix the problem without even leaving home. We use a program that allows me to remotely access his system and take full control of it. I've gotten him out of a few jams. *Lon Seidman, 16*
Westbrook, Connecticut

Our teachers tell us that we will be able to tell our kids that we were the first to communicate with other classrooms around the world without leaving our desks. This is more than just a school project, it's a sign of hope. What else can you call an exchange of ideas between three different countries and six different states? *Scott Wilson, 17*
Harrisburg, Pennsylvania

SEPTEMBER 20, 1993

FORTUNE



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