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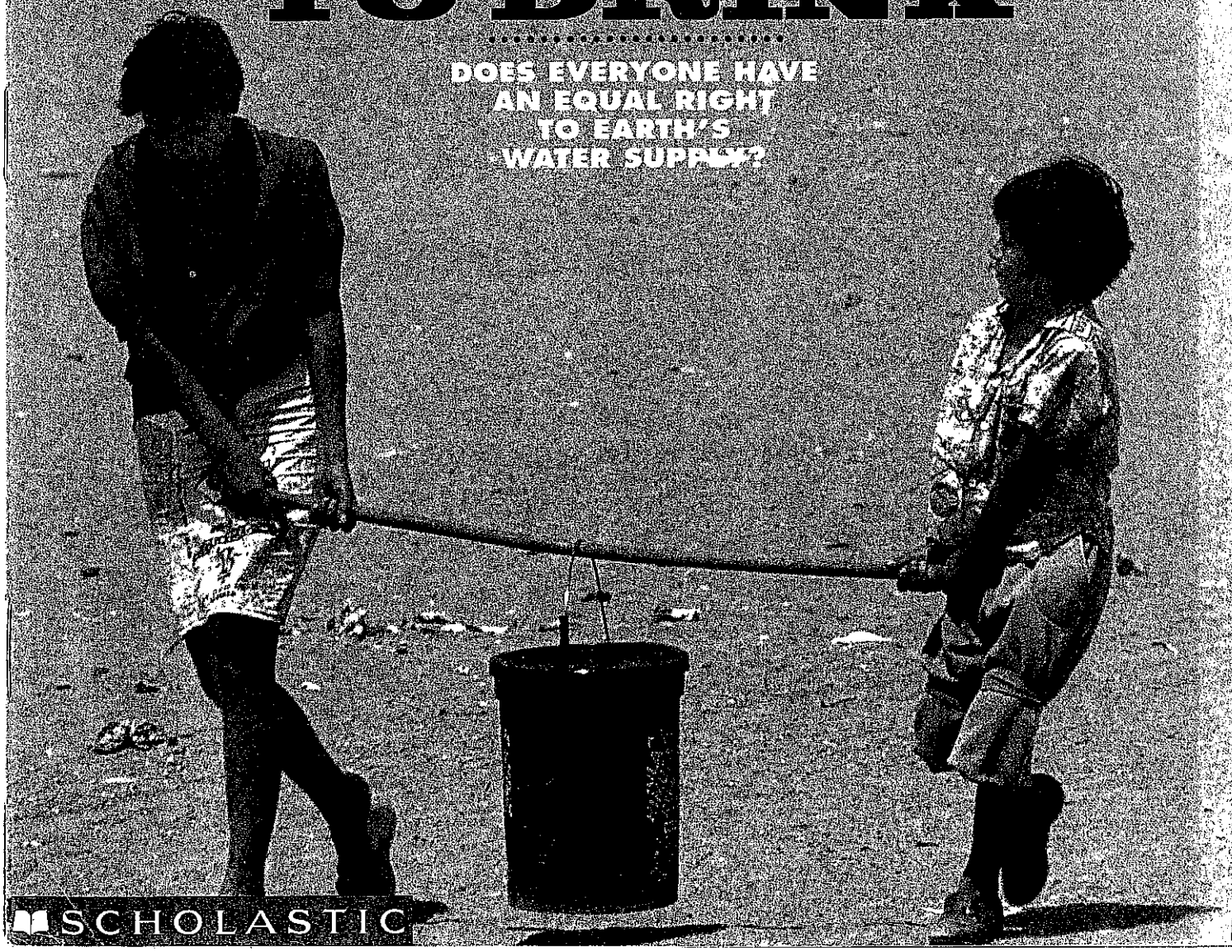
A DROP TO DRINK

DOES EVERYONE HAVE AN EQUAL RIGHT TO EARTH'S WATER SUPPLY?

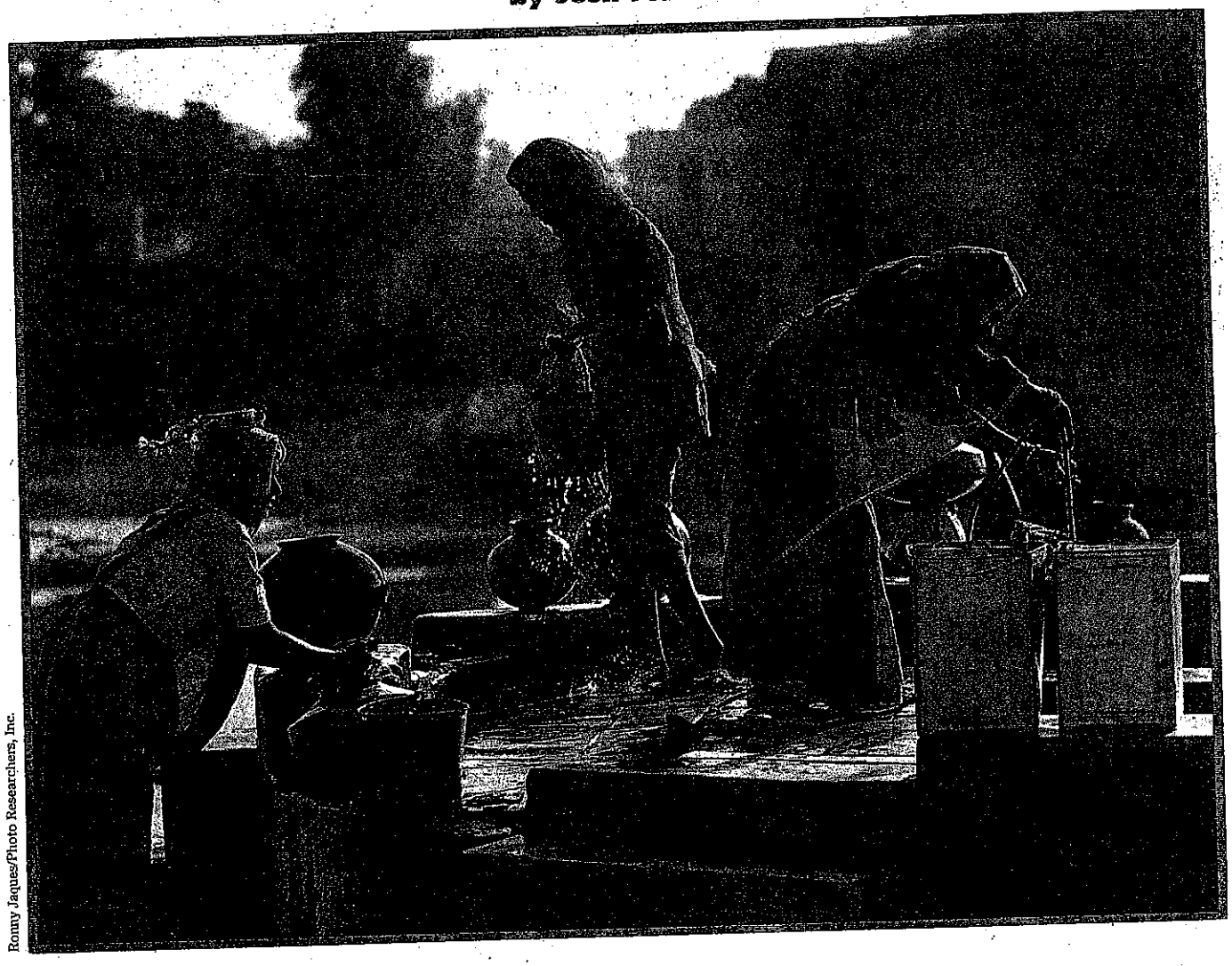


SCHOLASTIC

A WORLD OF THIRST

Clean water: Not having it kills more people each year than cancer or AIDS. Why must some go without this basic human need?

by Josh Plaut



Ronny Jaques/Photo Researchers, Inc.

Yoav Levy/Phototake NYC

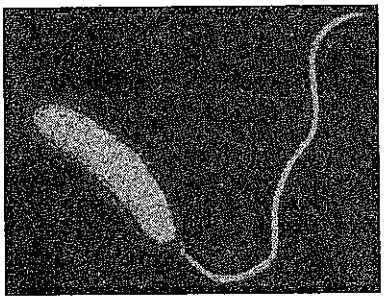
Where water is scarce, getting it can be a full-time job *(opposite page)*. Imagine being able to wash your hair only twice a year *(above)*.

For African teenager Abdullah Mahmoud, every day is pretty much the same. "I go to school some days, but mostly I take the donkey to the well to bring back water for my family," he says.

A citizen of the North African desert nation of Mauritania, Abdullah lives in a village that is bone dry. To collect enough water for his mother and younger siblings, he must journey to a distant well several times a day. It's the only source of clean drinking water around.

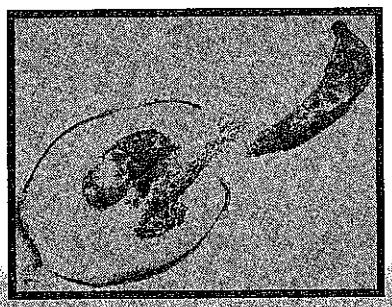
Sadly, the Mahmoud family's water troubles are far from unique. More than a billion people, most of them living in the world's least affluent nations, struggle to find the two liters of clean drinking water that their bodies need each day. And worldwide, dehydration kills more people each year than either cancer or AIDS.

Many learn the need for clean drinking water the hard way. A girl in Yemen, for example, once decided not to make the long journey to a clean well. Instead, she brought back water from the nearby watering hole where women wash laundry, children swim, and cattle bathe. Shortly after drinking some of this dirty water, the girl's sister was struck by a near-fatal case of diarrhea.



Moredun Animal Health Ltd./Photo Researchers, Inc.

In countries with poor sanitation, water-borne microbes like the cholera bacterium *(above)* can kill. Milwaukeeans got sick when the *Cryptosporidia* protozoan *(below)* eluded their water-treatment system.



London School of Hygiene & Tropical Med./Science Photo Lib./Photo Researchers, Inc.

This situation—the shortages and illnesses—must stop, say health officials and politicians around the world. "Water is a basic human need for health," says United Nations official Nikolai P. Napalkov, "and therefore, it is not an exaggeration to call it one of the basic human rights."

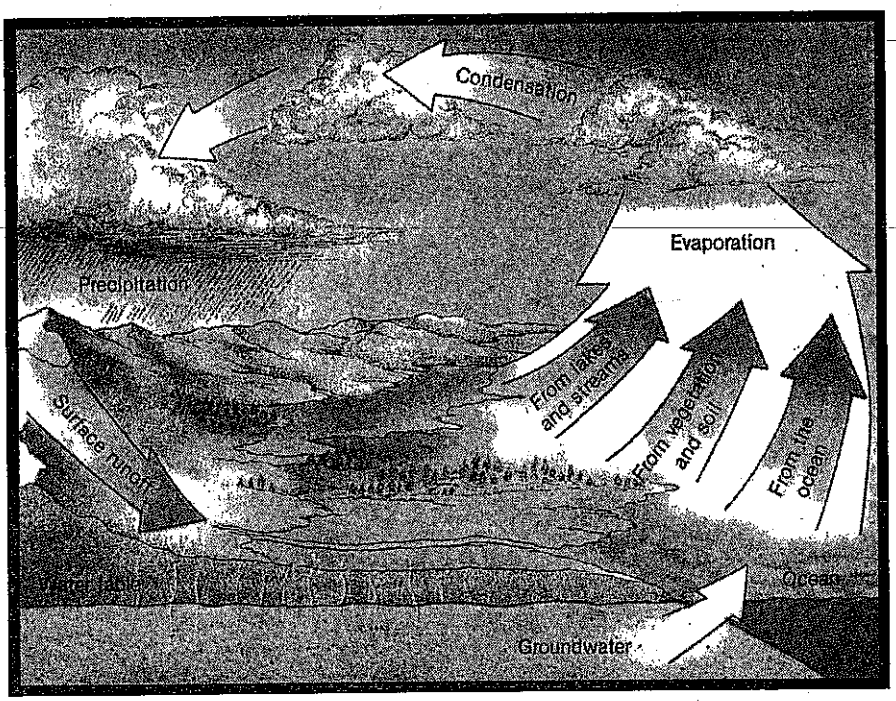
In other words, he says, every government has an obligation to assure that its people have enough clean water to drink. Last summer, leaders from more than 129 countries vowed to work together to fulfill this obligation. The key to their success will likely be a sharing of technologies that make the most of Earth's limited water supply.

JUST A DROP

The news that water is scarce may surprise you. After all, we live on the "Blue Planet"; water covers

EARTH'S WATER CYCLE

Earth's water is constantly recycled. How can we insure that every one of the five billion people on the planet taps into the two liters of fresh water we need to drink each day?



two thirds of Earth's surface.

But 97 percent of this supply is salty—undrinkable—ocean water. And the vast majority of Earth's fresh water is trapped in polar ice caps and glaciers. We humans, all five billion of us, must get by on the remaining fraction of the planet's water supply—less than one percent.

And people aren't the only ones vying for this limited supply. Wherever you find fresh water, you'll find all sorts of organisms—everything from mountain lions to mosquitoes to microbes, doing everything from drinking to breeding to defecating in it.

Some of the microorganisms living in water and in animal wastes can cause diseases like cholera and dysentery. As a result, the water in many rivers, lakes, and streams is undrinkable.

WORLDS APART

In wealthy countries like the United States, state-of-the-art plumbing systems carry drinkable water many miles from remote reservoirs to thirsty towns. In cities, high-tech water treatment plants make river and lake water

THE POPULATION PREDICAMENT

The world's population is growing by more than 90 million people each year, faster than at any other time in history *(see graph, right)*. Many observers say this growth has to stop. Otherwise, they warn, Earth's limited supply of natural resources, including water, will soon run dry.

But others say it's not right to curtail human reproduction. For one thing, efforts to control world population might disproportionately harm the poor. In non-industrialized countries, for example, where people rely on agriculture to support themselves, families need children to help grow food and do other work. In addition, children provide "social security" for the elderly in societies where no government-run welfare programs exist.

When you consider that rich nations have used and degraded more of Earth's resources than poor ones, it's especially unfair for poor nations to suffer the "punishment" of population control, some officials of these nations say.

Other people are opposed to population control on religious and moral grounds. And some religious and ethnic groups say it's their right—and in some cases, their duty—to increase their own numbers.

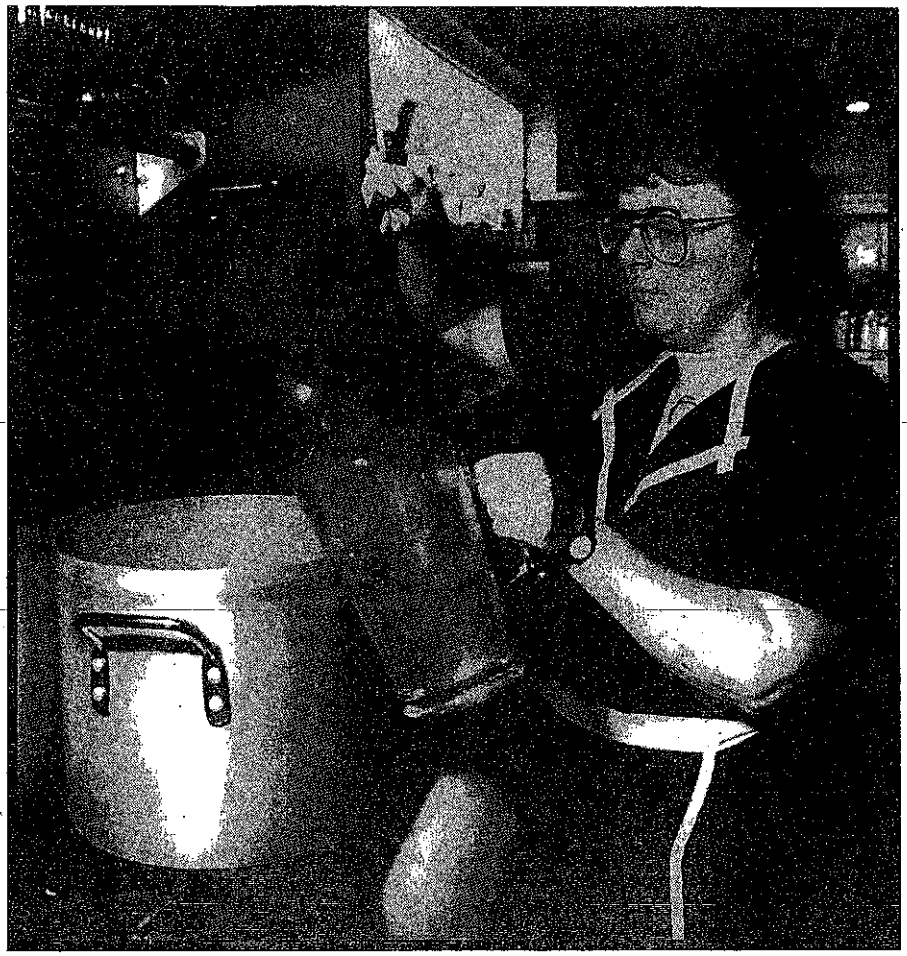
From a biologist's standpoint, that might make perfect sense. After all, *natural selection*, the driving force of evolution, favors individuals who pass on their genes. In fact, many have argued that this is the main goal of every living thing: to maximize *reproductive success*. If so, do you think humans could ever—should ever—be convinced to limit theirs? —K.M.

drinkable by filtering out chemical and biological contaminants. And modern sewage treatment plants prevent disease-causing wastes from mixing with drinking water.

Because most Americans can go to the drinking fountain anytime they like, we don't realize how important these technologies are—until they fail, as happened last spring in Milwaukee, Wisconsin. When a waterborne parasite eluded the water-treatment system there, more than 100,000 people suffered from severe diarrhea. Nine people, some of them weakened by prior illness, died as a result. Victims of last summer's floods in the Midwest faced similar problems when their water-treatment systems broke down.

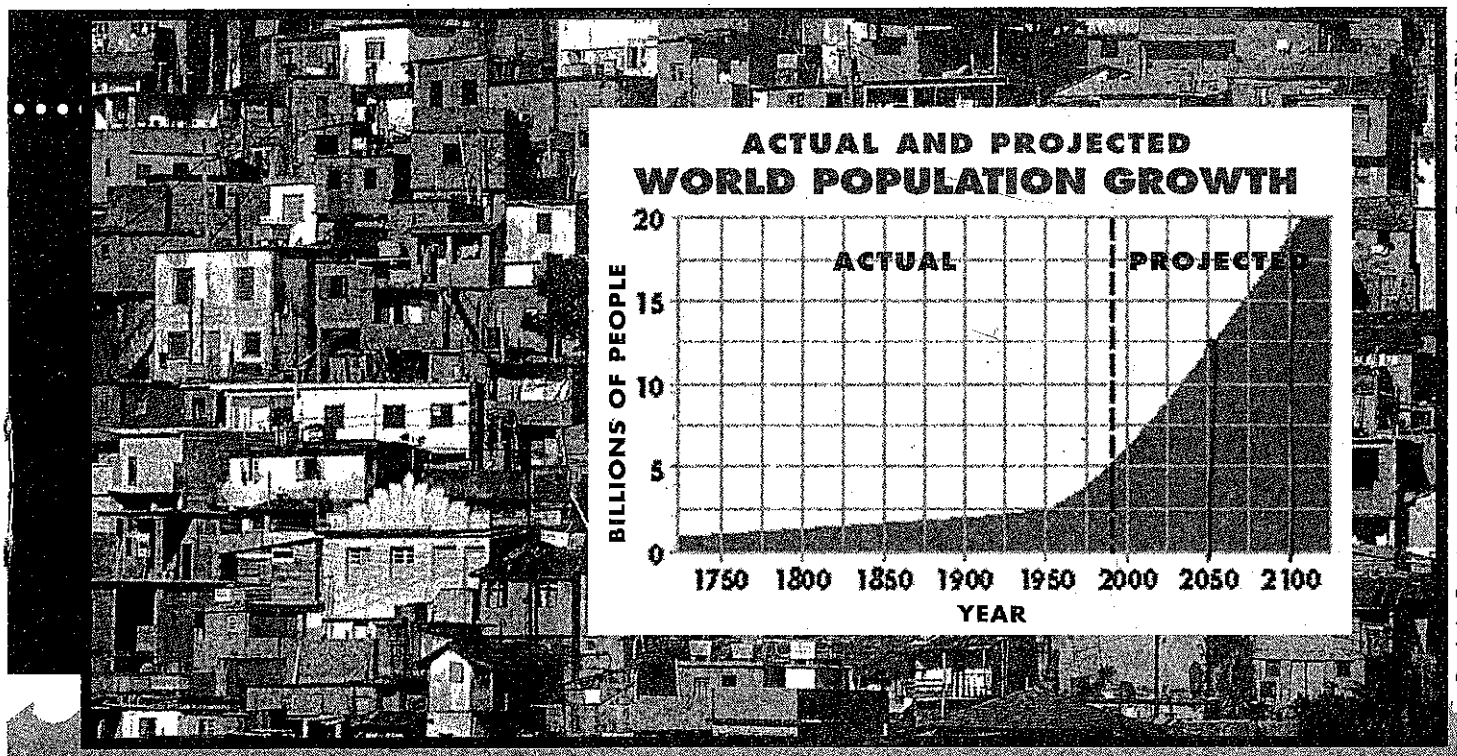
Unfortunately, what spells rare disaster in the U.S. is a situation poor countries face all the time. These countries often can't afford elaborate water-treatment technology, says hydrologist Martin Beyer, who runs the U.N.'s water-relief efforts. The poor nations' best hope: Take advantage of Earth's own plumbing system.

(Continued on page 24)



Milwaukee Journal Photo

Milwaukee residents had to boil water to kill disease-causing microbes when a treatment plant there failed last year.



Gustavo Gilabert/JB Pictures

Source: *Population Reports*

(Continued from page 13)

Nearly every nation sits atop large stores of untapped fresh water, Beyer says. In fact, there's more fresh water—thirty times more—in the ground than in all of our rivers and lakes combined.

"Earth's crust acts like a giant sponge," Beyer says. Slowly and steadily, it absorbs much of the rainwater and melted snow that washes across the surface. In the ground, this water collects in porous soil or rocky crevices called *aquifers*.

HOPE UNDERGROUND

In developing nations, where there is little industrial pollution, such groundwater supplies are clean, Beyer says. "The aquifer naturally filters the water." As the water slowly percolates through, the rocks and soil clear out chemical impurities and harmful microorganisms.

One catch: Aquifers are often buried beneath thousands of feet of dry rock. And even the meager equipment needed to tap these resources is expensive to a nation struggling to survive. As a result, poor nations continue to go thirsty. But that is starting to change.

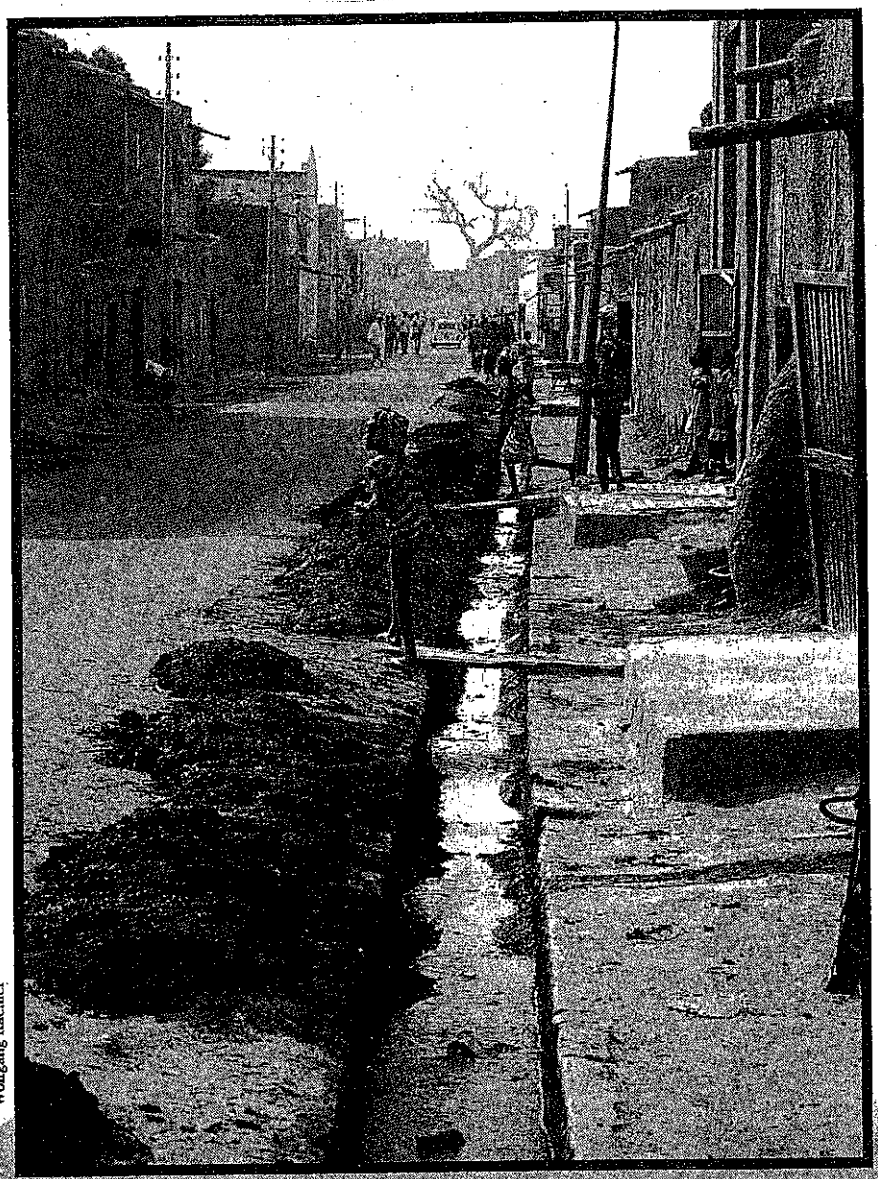
In recent years, the U.N. and other international organizations have started supplying poor countries with modern drilling technology, says Beyer. With such equipment, a well that will satisfy the daily needs of 250 people can be dug in just six hours. That means more wells can be dug closer to the many communities, like Abdullah Mahmoud's, where they are needed.

The results of such programs have been encouraging, say U.N. officials. Since 1980, 1.3 billion people—most living in rural areas in developing nations throughout the world—have gained access to clean drinking water.

FUTURE CHALLENGES

Meeting the challenge of supplying clean water to the cities of developing nations will be a greater struggle. In the world's most impoverished nations, poor people have flocked to cities in search of work, overwhelming local water-supply systems. In Mexico City, the fastest growing urban area in the world, millions of people live in slums with no plumbing at all.

Many public officials say the most important step in solving this problem is to get the world's exploding population under control, a controversial suggestion *(see "The population predicament," p. 12)*. "There is enough water on this planet for all of our five billion people," says U.N. spokesperson Rajeswary Iruthayanathan—that is, if all people have the technology to get it. "But there is not enough for 15 billion." If our population reaches that level—perhaps as soon as 2075—will technology alone solve the problem? ■



Wolfgang Kaehler

Lack of sanitation threatens water supplies in many overcrowded cities.

Name:_____ Period:_____

A Drop to Drink

Pre-Knowledge: Before you begin the reading, answer the following questions in full sentences.

1. Describe the freshwater biome.

2. Explain why it is unsafe to drink water that is not filtered or cleaned. Predict what would happen if you were to drink pond water.

3. Why might people be warned to drink bottled water in Mexico rather than water from the sink?

Knowledge from the Reading: Read the article. As you read, answer the following questions in full sentences.

1. How much water to people need to survive? How many people in the world do not have enough water to survive?

2. What is responsible for killing more people each year than cancer and AIDS?

3. If two thirds of the Earth's surface is covered by water, why can't millions find enough to drink?

4. Describe the technologies that allow Americans to have safe drinking water.

5. Explain why safe drinking water is more readily available in developed countries.

6. What is groundwater? Why is groundwater often cleaner than surface water?

7. How has the UN been helping poor nations get clean water?

Reflections: After reading the article, answer the following questions. For each question, you must write at least 3 full sentences.

1. What role does poverty play in the exposure to microorganisms?

2. Why is clean drinking water important enough to be considered a human right?

3. Describe the changes your family might make if each member were limited to two liters (the amount in 1 two liter soda bottle) of clean drinking/cooking water per day.

Knowledge from the Pictures, Captions, and Graphics: Examine the pictures, captions, and graphics throughout the article and answer the following questions in <u>full sentences.</u>

1. Looking at the pictures and captions on pages 10 and 11...How does the lack of clean water affect the **daily** lives of the people in poor countries?

2. Examine the graphic of the water cycle on page 12...Explain how salt water from the ocean becomes precipitation (rain). You may describe it in words or draw a picture.

3. Read the Population Predicament on page 12...How can population control efforts hurt the poor?

4. Examine the graph on page 13...Approximately how many people are projected to be on Earth in 2050? 2100?

5. Looking at the picture on page 24...How could the lack of sanitation and plumbing affect people who live in poverty?