



No. 1151:
HUMAN POPULATION

by John H. Lienhard

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Today, an old, but still useful, estimate of Earth's carrying capacity. The University of Houston's College of Engineering presents this series about the machines that make our civilization run, and the people whose ingenuity created them.

Demographer Joel Cohen says it's again time to ask how many people Earth can hold. As he weighs the question, he tells about an ecologist, an economist, and a statistician who went hunting deer with bows and arrows. The ecologist loosed his arrow and it fell five yards in front of the deer. The economist's arrow fell five yards behind the deer. At that point the statistician joyfully shouted, "We got it! We got it!"

So if we say Earth can hold ten billion people with 20 percent of us living five yards ahead of the starvation level and 80 percent of us one yard behind it, that's pretty unsatisfactory.

Cohen quotes an estimate made in 1679 by the same Antonie van Leeuwenhoek who built microscopes and discovered germs. Leeuwenhoek applied Holland's population density to the land area of Earth. (I wonder if his germs made him think of doing that!)

The trouble is, 17th-century Holland was a wealthy trading country served by thinly-populated colonies. Leeuwenhoek estimated Earth could support 13.4 billion people, and we've already reached 5.7 billion. We're almost halfway there! And here's another number to think about: If we were to keep increasing Earth's

population until the year 2150 at the 1990 rate of population increase, we'd reach 700 billion people. Of course we can't possibly sustain that rate because nature will take responsibility for reducing population if we don't.

Suppose, on the other hand, we immediately convinced all the people in the world to parent only the children needed to replace them when they died. Earth's population would still keep increasing as today's children produced children, then grandchildren. It would level out at 8.4 billion by 2150 -- dangerously close to Leeuwenhoek's estimate.

But how seriously should we take a 300-year-old number? Other people made estimates during the 18th century -- all close to Leeuwenhoek's. Then the 19th-century notion of progress took over. Surely progress, abstract and undefined, would somehow solve the problem! In this century, demographers have said little about the question. They realize by now that the number of people Earth can hold will vary with the quality of their lives. The highest population will be one that's constantly eroded by famine and disease -- just as population growth is already being eroded today.

So what does drive population? The Catholic Church catches plenty of flak, but Catholic Spain and Italy are tied for the lowest fertility rate in Europe. The culprit isn't religion; it isn't race. The two factors that consistently yield high population growth are poverty and the denial of education for women. Until we solve those problems, we'll keep hurtling toward that 300-year-old -- doomsday number.

I'm John Lienhard, at the University of Houston, where we're interested in the way inventive minds work.

(Theme music)

Cohen, J.E., How Many People Can the Earth Support? *The Sciences*, November/December, 1995, pp. 18-23.

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