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HEADLINE: Betting the planet: Ten years ago, an ecologist and an economist with bitterly opposing world views made a Dollars 1,000 wager over an old question: was the earth's growing population running out of natural resources? It was the doomster against the boomster, and a few weeks ago one of them had to pay up

BYLINE: By **JOHN TIERNEY**

BODY:

IN 1980 an ecologist and an economist chose a refreshingly unacademic way to resolve their differences. They bet Dollars 1,000, specifically over the future price of five metals, but at stake was much more a view of the planet's limits, a vision of humanity's destiny. It was a bet between the Cassandra and the Dr Pangloss of our era.

They led two intellectual schools sometimes called the Malthusians and the Cornucopians, sometimes the doomsters and the boomsters that use the latest in computer-generated graphs and foundation-generated funds to debate whether the world is getting better or going to the dogs. The argument has generally been as fruitless as it is old, since the two sides never seem to be looking at the same part of the world at the same time. Dr Pangloss sees farm silos brimming with record harvests; Cassandra sees topsoil eroding and pesticide seeping into ground water. Dr Pangloss sees people living longer; Cassandra sees rainforests being decimated. But in 1980 these opponents managed to agree on one way to chart and test the global future. They promised to abide by the results exactly 10 years later and to pay up out of their own pockets.

The pair who have never met in all the years they have been excoriating each other are both 58-year-old professors who grew up in the Newark, New Jersey suburbs. The ecologist, Paul R. Ehrlich, has been one of the world's better-known scientists since publishing *The Population Bomb* in 1968. More than three million copies were sold.

When he is not teaching at Stanford University or studying butterflies in the Rockies, Ehrlich can generally be found on a plane on his way to give a lecture or to collect an award. He is the pessimist.

The economist, Julian L. Simon of the University of Maryland, often speaks of himself as an outcast, which isn't quite true. His books carry jacket blurbs from Nobel laureate economists, and his views have helped shape policy in Washington for the past decade. But Simon has certainly never enjoyed Ehrlich's academic success or popular appeal. He is the scourge of the environmental movement. When he unveiled his happy vision of beneficent technology and human progress in *Science* magazine in 1980, it attracted one of the largest batches of angry letters in the journal's history.

In some ways, Simon goes beyond Dr Pangloss, the tutor in *Candide* who insists that 'All is for the best in this best of possible worlds.' Simon believes that today's world is merely the best so far. Tomorrow's will be better still, because it will have more people producing more bright ideas. He argues that population growth constitutes not a crisis but, in the long run, a boon that will ultimately mean a cleaner environment, a healthier humanity and more abundant supplies of food and raw materials for everyone. And this progress can go on indefinitely because 'incredible as it may seem at first,' he wrote in 1980 the planet's resources are actually not finite.

An irate Ehrlich wondered how the *Science* article had passed peer review at America's leading scientific journal. 'Could the editors have found someone to review Simon's manuscript who had to take off his shoes to count to 20?' Ehrlich asked in a rebuttal written with his wife Anne, also an ecologist at Stanford. They provided the simple arithmetic: the planet's resources had to be divided among a population that was then growing at the unprecedented rate of 75 million people a year. The Ehrlichs called Simon the leader of a 'space-age cargo cult' of economists convinced that new resources would miraculously fall from the heavens. For years the Ehrlichs had been trying to explain the ecological concept of 'carrying capacity' to these economists. They had been warning that population growth was outstripping the earth's supplies of food, fresh water and minerals. But they couldn't get the economists to listen.

'To explain to one of them the inevitability of no growth in the material sector, or .. that commodities must become expensive,' the Ehrlichs wrote, 'would be like attempting to explain odd-day-even-day gas distribution to a cranberry.'

Ehrlich decided to put his money where his mouth was by responding to an open challenge issued by Simon to all Malthusians. Simon offered to let anyone pick any natural resource grain, oil, coal, timber, metals and any future date. If the resource really were to become scarcer as the world's population grew, then its price should rise. Simon wanted to bet that the price would instead decline by the appointed date. Ehrlich derisively announced that he would 'accept Simon's astonishing offer before other greedy people jump in.' He then formed a consortium with two colleagues at the University of California at Berkeley specialising in energy and resources.

In October 1980 the Ehrlich group bet Dollars 1,000 on five metals chrome, copper, nickel, tin and tungsten in quantities that each cost Dollars 200 in the current market. A futures contract was drawn up obligating Simon to sell Ehrlich and his colleagues these same quantities of the metals 10 years later, but at 1980 prices. If the 1990 combined prices turned out to be higher than Dollars 1,000, Simon would pay them the difference in cash. If prices fell, they would pay him. The contract was signed and Ehrlich and Simon went on attacking each other throughout the 1980s. During that decade the world's population grew by more than 800 million, the greatest increase in history, and the store of metals buried in the earth's crust did not get any larger.

IT IS such an obvious proposition in a finite world: things run out. It must have occurred to Homo habilis while searching for rocks to make the first tools 2.5 million years ago. Aristotle and Plato shared the same concerns. The American Indians put it nicely in a proverb that has been adopted as a slogan by today's environmentalists: 'We do not inherit the earth from our parents. We borrow it from our children.' The idea shapes our personal actions when we bundle newspapers to avoid running out of wood for paper and land for garbage dumps. It affects our national policies when we send soldiers to the Gulf to prevent Saddam Hussein from getting a 'stranglehold' on the dwindling supplies of oil.

The counter argument is not nearly as intuitively convincing. It has generally consisted of a simple question: why haven't things run out yet? The ones asking this question now tend to be economists, which is a switch, since their predecessors were the ones who initiated the modern preoccupation with resource scarcity. Economics was first called 'the dismal science' in the last century because of Malthus's predictions of mass starvation. He had many successors, from the

Englishman William Stanley Jevons, whose book *The Coal Question* concluded in 1865 that 'our present happy progressive condition is a thing of limited duration and that coal would run out.' There was, too, an energy crisis in the middle of the 19th century, when the dwindling supply of whales drove up the cost of lighting homes with oil lamps and tallow candles. In 1905 President Roosevelt warned of an American 'timber famine,' a concern that prompted a proposal to ban Christmas trees. In 1926 the Federal Oil Conservation Board announced that the United States had a seven-year supply of petroleum left.

Naturalists gradually replaced economists as the chief doomsayers. They dominated the conservation movement early this century, and in 1948 two of them Fairfield Osborn, the president of the New York Zoological Society, and an ornithologist named William Vogt started a national debate by publishing popular books: *Our Plundered Planet* and *Road to Survival*. Both men warned of overpopulation, dwindling resources and future famines. Vogt's book lamented the loss of 'such irreplaceable capital goods as soils and minerals.'

Both books made an impression on the teenage Paul Ehrlich. He was already a naturalist; he married Anne in 1954 while in graduate school at the University of Kansas, and they put their Malthusian principles into practice by limiting themselves to one child. Ehrlich had a vasectomy in 1963, shortly after joining Stanford.

In the mid-Sixties, Ehrlich started giving public lectures and then, just in time for the 1968 Presidential election, Ehrlich produced what may be the all-time ecological best seller, *The Population Bomb*. It began: 'The battle to feed all of humanity is over. In the 1970s the world will undergo famines hundreds of millions of people are going to starve to death.' It continued: 'nothing can prevent a substantial increase in the world death rate' and that America's 'vast agricultural surpluses are gone.'

SIX years later he raised the death toll. *The End of Affluence* told of a 'nutritional disaster that seems likely to overtake humanity in the 1970s' (or at least the 1980s). 'Due to a combination of ignorance, greed and callousness, a situation has been created that could lead to a billion or more people starving to death'. He predicted that mankind would enter an age of scarcity in which the accessible supplies of many key minerals will be nearing depletion. Shortages would be felt in America as well as the rest of the world. The cost of feeding yourself and your children will continue to increase.'

Erlich was right about one thing. The world's population did grow. It is now 5.3 billion, 1.8 billion larger than when he published *The Population Bomb*. Yet somehow the predicted rise in the world death rate has yet to materialise infant mortality has declined and life expectancy has increased, most dramatically in the Third World. There have been families in countries afflicted by war, drought and disastrous agricultural policies, but the number of people affected by famines has been declining steadily during the past three decades. In fact, the number is much lower than it was during the same decades of the last century, even though the world's population is much larger. Experts argue about how much hunger remains in the world, but they generally agree that the average person in the Third World is better nourished today than in 1968. Food production has increased faster than population since the publication of *The Population Bomb*, just as it has since the books of Vogt, Osborn and Malthus.

Simon started out as a Malthusian. After studying psychology at Harvard he began publishing papers on using marketing tools and economic incentives to persuade women to have fewer babies. But then he came across work by economists showing that countries with rapid population growth were not suffering more than other countries. In fact, many were doing better. He also came across a book, *Scarcity and Growth*, published in 1963 with the help of Resources for the Future, a conservation group dominated by economists.

The book was a revelation to him: it provided the empirical foundations of Cornucopianism. The authors, Harold J. Barnett and Chandler Morse, tracked the price of natural resources back to 1870 and found that the price of virtually everything had fallen. The average worker today could buy more coal with an hour's pay than he could in the last century, just as he could buy more metals and more food. Things were actually getting less scarce as population grew. The evidence inspired the boomster view of history.

Often the temporary scarcity led to a much better substitute. The Greeks' great transition from the Bronze Age to the Iron Age 3,000 years ago, according to some economists, was inspired by a disruption of trade due to wars in the eastern Mediterranean. The disruption produced a shortage of the tin needed to make bronze, and the Greeks responded to the bronze crisis by starting to use iron. Similarly, timber shortages in 16th-century Britain ushered in the age of coal; the scarcity of whale oil around 1850 led to the first oil well in 1859. Temporary shortages do occur, but Cornucopians argue that as long as

government doesn't interfere by mandating conservation or setting the sort of price controls that produced America's gas lines of the 1970s people will find alternatives.

'Natural resources are not finite. Yes, you read correctly,' Simon wrote in his 1981 manifesto, *The Ultimate Resource*. The title referred to human ingenuity, which Simon believed could go on indefinitely expanding the planet's carrying capacity. This idea marked the crucial difference between Simon and Ehrlich, and between economists and ecologists: the view of the world not as a closed ecosystem but as a flexible marketplace.

Of course, men can also produce more pollution than jayhawks, and Simon conceded that the marketplace did need some regulation. But he insisted that environmental crises were being exaggerated. He and another leading boomster, Herman Kahn, edited a book in 1984, *The Resourceful Earth*, rebutting the gloomy forecasts of the Government's 'Global 2000 Report' prepared under President Carter. Their book was replete with graphs showing that, by most measures, America's air and water had

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been getting cleaner for decades, thanks partly to greater affluence and partly to the progress of technology. Simon asserted that innovations would take care of new forms of pollution, and he set about disputing the various alarming estimates of tropical deforestation, species extinction, eroding topsoil, paved-over farmland and declining fisheries.

'As soon as one predicted disaster doesn't occur, the doomsayers skip to another,' Simon complains. 'There's nothing wrong with worrying about new problems we need problems so we can come up with solutions that leave us better off than if they'd never happened.'

Simon's fiercest battle has been against Paul Ehrlich's idea that the world has too many people. The two have never debated directly Ehrlich has always refused, saying that Simon is a 'fringe character' but they have lambasted each other in scholarly journals. Simon acknowledges that rising population causes short-term problems, because it means more children to feed and raise. But he maintains that there are long-term benefits when those children become productive, resourceful adults. He has supported making abortion and family planning services available to women to give them more

freedom, but he has vehemently opposed programmes that tell people how many children to have. He condemns Ehrlich for suggesting that governments should consider using coercion to limit family size and for endorsing the startling idea that the US should consider cutting off food aid to countries that refuse to control population growth.

Among academics, Simon seems to be gaining in the debate. Many scientists are still uncomfortable with his sweeping optimism about the future there is no guarantee, after all, that past trends will continue and most population experts are not sure that the current rate of population growth in the Third World is going to bring the long-term benefits predicted by Simon. But the consensus has been shifting against Ehrlich's idea of population growth as the great evil. Simon's work helped prompt the National Academy of Sciences to prepare a 1986 report, which noted that there was no clear evidence that population growth makes countries poorer. It concluded that slower population growth would probably benefit third world countries, but argued that other factors, like a country's economic structure and political institutions, were much more important to social well-being.

THE bet was settled last month without ceremony. Ehrlich did not even bother to write a letter. He simply mailed Simon a sheet of calculations about metal prices along with a cheque for Dollars 576.07. Simon wrote a thank you note, adding that he would be willing to raise the wager to as much as Dollars 20,000, pinned to any other resources and to any other year in the future.

Each of the five metals chosen by Ehrlich's group, when adjusted for inflation since 1980, had decline in price. The drop was so sharp, in fact, that Simon would have come out slightly ahead overall even without the inflation adjustment called for in the bet. Prices fell for the same Cornucopian reasons they had fallen in previous decades entrepreneurship and continuing technological improvements. Prospectors found new lodes, such as the nickel mines around the world that ended a Canadian company's near monopoly of the market. Thanks to computers, new machines and new chemical processes, there were more efficient ways to extract and refine the ores for chrome and the other metals.

For many uses the metals were replaced by cheaper materials, notably plastics, which became less expensive as the price of oil declined (even during this year's crisis in the Persian Gulf, the real cost of oil remained lower than in 1980). Telephone calls went through satellites and fibre-optic lines instead of copper wires. Ceramics replaces

tungsten in cutting tools. Cans were made of aluminium instead of tin, and Vogt's fears about America going to war over tin remained unrealised. The most newsworthy event in the 1980s concerning that metal was the collapse of the international tin cartel, which gave up trying to set prices in 1985 when the market became inundated with excess supplies.

Is there a lesson here for the future? 'Absolutely not,' says Ehrlich. 'The bet doesn't mean anything. Julian Simon is like the guy who jumps off the Empire State Building and says how great things are going so far as he passes the 10th floor. I still think the price of those metals will go up eventually, but that's a minor point. The resource that worries me the most is the declining capacity of our planet to buffer itself against human impacts. Look at the new problems that have come up, the ozone hole, acid rain, global warming. It's true that we've kept up food production I underestimated how badly we'd keep on depleting our top soil and ground water but I have no doubt that sometime in the next century food will be scarce enough that prices are really going to be high even in the United States. If we get climate change and let the ecological systems keep running downhill, we could have a gigantic population crash.'

Simon was not surprised to hear about Ehrlich's reaction. 'Paul Ehrlich has never been able to learn from past experience,' he said, then launched into the Cornucopian line on the greenhouse crisis how, even in the unlikely event that doomsayers are right about global warming, humanity will find some way to avert climate change or adapt, and everyone will emerge the better for it. But Simon did not get far into his argument before another thought occurred: 'So Ehrlich is talking about a population crash,' he said. 'That sounds an even better way to make money. I'll give him heavy odds on that one.'

This article first appeared in New York Times magazine. John Tierney's book, *The Crisis Crisis*, is published in the new year

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