

## Civilization's Demographic Journey

Demographically speaking, where are we now? Late in 1999, for the first time ever, world population reached six billion and we now find ourselves nearing seven billion. What milestones brought us to this point? And where is our momentum taking us? In this excerpt we trace major milestones in humanity's demographic journey over the past ten thousand years.

As we survey our demographic past, we will see that: (a) For most of history, *our population was quite small* compared to today's numbers; (b) *Our numbers began to soar sharply upward in the 1800s*, and, (c) Most of our population growth has taken place explosively in the lifetimes of persons now living.

### 8000 B.C.

Let us begin by visiting an early sunrise of civilization. If we travel back ten thousand years, we find ourselves in the year 8,000 B.C. Here and there are scattered small settlements where our forebears are experimenting with a new way of life called agriculture.

At this time, human population worldwide amounts to perhaps FIVE MILLION persons. We don't have to be exact about the year or the number. It is enough to understand that approximately five million people inhabited our planet sometime around 8000 B.C. This is approximately one-third the size of many of our large cities today.

### One A.D.

We now jump forward in time. Thousands upon thousands of years go by and we find ourselves in the Mediterranean basin in the year one A.D. Sometime around this period our worldwide numbers climb to about 250 MILLION. This number is smaller than the population of the U.S. or Europe alone in the modern world.

### 1650

As we board our time machine for the next section of our journey, we will travel forward to the year 1650. As the centuries peel away, we see the fall of Rome followed by the Middle Ages with their castles and plagues. We also see the splendor of the Renaissance and the great voyages of Magellan and Columbus. Finally we arrive in 1650, and find ourselves in the times of pirates and Spanish treasure fleets. The world is still largely wilderness, but human population now reaches a new historic high – we now number approximately 500 MILLION. It has been 1650 years since our last stop, but in the intervening centuries, our numbers have doubled from 250 million to 500 million. (Notice the “doubling time” that characterized our species during this period, when we needed nearly 1,700 years to double our population.)

### 1830 – One Billion

Our next leap brings us forward to 1830.\* This is a truly momentous milestone because, for the first time ever, world population amounts to approximately one BILLION individuals. By this time, of course, founders of our country such as Thomas Jefferson, George Washington, and Benjamin Franklin are all dead, and the United States is waging war against the Seminole Indians of Florida. At this pause in our journey, however, we notice that our numbers have once again doubled. This time, however, our doubling has taken place *in less than two hundred years.*

(\* Interpolated from U.S. Census Bureau and U.N. Population data.)

### **1930 – Two Billion**

On this stop we find ourselves in the year 1930 and our numbers rush past still another critical milestone. Here we are and the roaring twenties have ended, the stock market has crashed, and families everywhere are battling to make ends meet during the Great Depression. World War II and the music of Glenn Miller are only a decade away, and baseball games and radio broadcasts are the social threads that tie Americans together. And in this year, we find ourselves in a world that is home to approximately TWO billion people. *Many persons still living today were alive to witness the year when we first reached this unprecedented second billion.*

### **Dramatic Changes**

We need to make another observation involving 1930: Even though it took all of human history until 1830 for us to reach our first billion, we have just added our SECOND billion in only one hundred years. Something of utmost importance is happening: *A species whose population had taken millennia to reach one billion has taken only one hundred years to add a second billion.* Something about our journey has changed, and our rate of population growth has begun to accelerate. And this time, our doubling time has fallen to only one hundred years.

What has happened to cause this? Did families suddenly begin to have larger and larger numbers of children? No. The great demographic acceleration that began in the 1830s resulted from: (a) *advances in agriculture*, (b) *the industrial revolution*, and most importantly, (c) *from advances in medicine*. In the world of the 1830s, families had large numbers of children but death rates were high.

By the 1930s, families still had large numbers of children, but advances in medicine dramatically lowered the death rate so that more of these children survived. The number of births did not decline much, but death rates fell sharply. Fertility rates did not decline much, but *mortality* rates unexpectedly fell sharply.

### **1960 —Three Billion**

By now our demographic journey has brought us all the way forward in time to 1960. John F. Kennedy is elected president of the United States. The cold war between the Soviet Union and the United States is underway and the two superpowers have just begun a space race. And, with the help of antibiotics, pesticides, and a post World War II baby boom, our population has surged to THREE billion. This time it took only thirty years, from 1930 to 1960, to add the newest billion.

### **1975 – Four Billion**

It is significant that the stops on our journey are now becoming more and more frequent. By 1975 we find that human numbers continue to rocket upward. This time just fifteen years have elapsed since our last stop, and yet we have suddenly reached FOUR billion. At the time of our 1975 milestone, Gerald Ford is the president of the United States and both the Vietnam war and NASA's program of Apollo moon missions have ended.

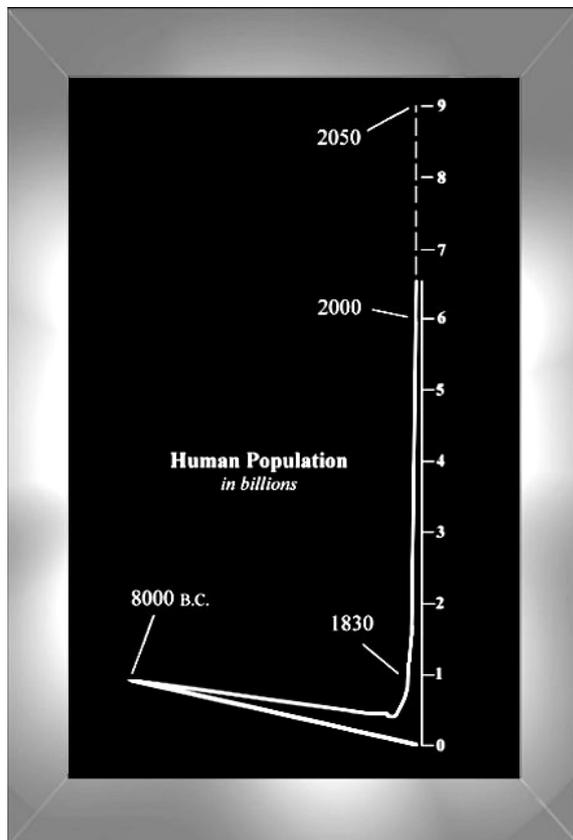
### 1987 – Five Billion

By 1987 our population continues to hurtle upward. In terms of sheer numbers, our rates of growth between 1975 and 1987 are unprecedented. Nothing like it has ever been seen in history. This time it has taken only twelve years to add still another billion to our numbers. Many people begin to notice that our roads, schools, and parks are increasingly crowded. Actually, we shouldn't be surprised since there are, in 1987, FIVE billion of us calling planet earth our home.

On the world stage dramatic changes are underway in Eastern Europe and the Soviet Union. And elsewhere, more and more nations must strive frantically to find food and employment for their rapidly-growing populations. In the poor and developing countries of the world, even leaders who are competent, honest, well-meaning, and effective find themselves sitting atop a potential powder keg. As populations in these nations continue to grow explosively, supplies of food and water, along with infrastructure, social conditions, jobs, and services begin to deteriorate, helping to breed chaos, dissatisfaction, radicalization, instability, lawlessness, and unrest.

### 1999 – Six Billion

Late in 1999, our journey brings us to our most recent milestone. As we near the year 2000, we reach our SIXTH billion – and keep right on growing. For all intents and purposes, just *forty years have been required* (from three billion in 1960 to six billion in 2000) to *DOUBLE our numbers from three billion to six billion.* And we have multiplied our numbers six-fold in less than 200 years.



Think for a moment of calamitous economic bubbles and then contemplate the trajectory depicted in this graph. It is not a business entity or an economy that may be at stake, but civilization, natural systems, and much of the biosphere itself.

Notice that we are rocketing upward along the y-axis of this progression. Also notice that essentially all of our growth has taken place in the last two hundred years. *Recent United Nations medium projections estimate that we will be somewhere near **nine billion** by 2050.* We address other graphs with this exponential shape in other Weeskaop chapters.

The World War II generation who began their lives in a world shared with only two billion other persons, now, in their older years, find themselves in a world that is three times as crowded as that of their youth. And in less than 100 years we have grown from 1.8 billion to 6.8 billion, adding five additional billions, and our impacts, to an already crowded planet. And we now seem fully prepared to add still further billions, unabated, again and again in the decades just ahead. On the near horizon we see looming at least a *seventh, eighth, and ninth* billion prepared to join us soon – and a tenth, eleventh, and twelfth billion are possible. That is where our momentum is taking us, and those are numbers that we will quite likely come to regret.

### **Asking Natural Systems To Adjust**

The two most recent milestones in our journey (between 1975 and 1987 and between 1987 and 1999) underscore the way in which our time in history is demographically *different* than any that mankind has ever known. And they underscore why we are such a dangerous force on our planet today when this has never been so in the past.

Even though it took all of human history until 1830 for mankind to reach its first billion, by 1987 we added a like amount in just twelve years. *And in the next twelve years we did it again.* Thus, while nature and earth's natural systems had all of human history until 1830 to adjust to the impacts of our first billion, we now demand that they make the same adjustments (and more, because we are industrialized) – repeatedly – every twelve to fifteen years. Joel Cohen summarized our current conditions this way: "the size and speed of growth of the human population today have no precedent in all the Earth's history before the last half of the twentieth century" (Cohen, 1995).

Today's overpopulation and our continuing, explosive, and runaway avalanche of additional growth is one of the defining characteristics of the times in which we live. In the face of this explosion, some writers seem complacent. But for many others, including some of the world's top scientists, the potential consequences are worrisome enough that many use terms such as "catastrophic," "urgent," and "collision course" when discussing it. Even though natural systems routinely respond to small changes over long periods of time, rapid and large-scale changes are typically catastrophic.

Thus, at this hinge-point in history, we find ourselves engaged in a gigantic experiment: How many people can the earth support in the near term and over the long run without suffering irreparable damage? Unfortunately, many of us now living may see this question answered in our lifetimes.

As citizens we can debate among ourselves important societal questions involving foreign policy, education, economics, politics, and the environment. However, no matter the outcome of our studies, talk-show discussions, and congressional debates, *the functioning of the natural world cares nothing about all of our talk --*

(Nor about markets, quarterly earnings or economic theory).

*Either such natural systems will continue to function or they will not.* If natural systems are stressed now, what can we expect as we add three or more additional billions in the half-century just ahead?

A continuation of today's demographic tidal wave *may constitute the greatest single risk that our species has ever undertaken.*

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