> Such vehement antipathy toward any corner of the living world should have given us pause. Through our related mistakes in the world of higher animals, we should have gained the evolutionary wisdom to predict the outcome.
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though many factors influence the growth of resistant bacteria, the most important are ecological.

Throughout our history on this planet, our species has lived in an ecological balance with many other life-forms, including the bacterial. Epidemic diseases did flash through the human population from time to time, usually in response to local overpopulation or unsanitary conditions. But epidemics like the bubonic plague that decimated Europe were relatively uncommon. At the end of World War II, this relationship was significantly altered when antibiotics were introduced. For the first time in human history, the microbial world was intentionally being affected on a large scale. In the heady euphoria of discovery, an ancient human hubris again raised its head when science declared war on bacteria. And like all wars, this one is likely to cause the deaths of thousands, if not millions, of noncombatants.

Evolution of Antibiotic Use

Though it is not commonly known, our ancestors had used both penicillin and tetracycline in raw form, as bread mold or as soil fungi, directly on wounds or even ingested to treat disease. As physician Stuart Levy reveals in his book *The Antibiotic Paradox,* thousand-year-old Nubian mummies have been found to have significant amounts of tetracycline in their systems. Even though several of the antibiotics we now use come from such naturally occurring organisms, they are usually refined into a single substance, a silver bullet, a form not normally present in nature. And the quantities being produced are staggering.

In December 1942, almost the entire manufactured supply of penicillin — 8½ gallons (32 liters) — was used to treat the survivors of the Coconut Grove restaurant fire. By 1949, 156 thousand pounds (70,762 kg) a year of penicillin and a new antibiotic, streptomycin, were being produced. By 1992, *in the United States alone,* this figure grew to an incredible 40 million pounds (18,144,000 kg) a year of