

The aim of education is knowledge, not of facts, but of values
William R. Inge (Lloyd, 2000)

THE MICROBE EXPERIMENT

Remember in Introductory Microbiology when you prepared a nutrient agar, put it in a petri dish, inoculated it with a microbial solution, and then measured the production of CO₂ as a surrogate for population growth? At first not much production, then some, and suddenly a rapid rise indicating that the microbes liked their environment and were rapidly reproducing. Eventually the rate of increase leveled off, and the sudden decrease of CO₂ production was about as exponential as had been the prior increase. The population quickly fell to levels lower than the initial concentration.

What happened? The biological exponential growth phenomena happened – the famous S-curve response to a non-renewable resource followed soon after by the collapse and a new quasi-equilibrium as adjustment of demand and supply occurred. Someone once remarked that growth for the sake of growth is the ideology of the cancer cell. This little experiment illustrated what may well be a universal reaction – be it biological, physical, chemical, industrial, economic, or social. There are limits – there are boundaries – and it is worthwhile to know something about such horizons and thresholds.

EASTER ISLAND

One of the most remote places on this planet is Rapa Nui – Easter Island (Hyerdahl, 1958). Sometime before 800 AD a few people reached this semi-arid, cool, isolated paradise forested with the huge Chilean wine palm and several other species, a few birds, but no large animals. The forest was cleared for gardens, the trees provided canoes to go to sea, and dolphins became the main animal food. The population grew. Tribal chiefs, convinced of their lineage to God, wanted statues to honor themselves (Diamond, 2004). Huge statues were hand-carved out of the volcanic lava formations, trees were used as rollers to haul the statues many kilometers and by clever engineering the 10-15 meter high statues were raised. Prosperity was good, the volcanic soil fertility was replenished by organic debris, fishing was great, and as the population increased so did the chiefs' desires for more statues. But around 1600 shortages began to occur – fresh water, food, and fuel were in short supply – yet each was necessary to carry out the demands of the chiefs.