

Role of Human Societies in the History of the Biosphere: A Review

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Abstract - Development is frequently implicated in environmental change but human-induced change in the biosphere has only become thinkable, achievable and measurable comparatively recently. Humans have always altered their environment, but the environmental impact of earlier hunter-gatherer and agricultural human populations pales into insignificance alongside those of industrial societies over the past three hundred years and in the twentieth century in particular. The effects of environmental change are neither evenly spread nor experienced, the benefits tending to accrue to a privileged minority and the costs to be borne by an impoverished majority, groups which might both live alongside each other in the same society or in different societies altogether. The definition and evaluation of environmental change are infinitely subjective and always reflect the cultural preferences and prejudices of the individual making the judgement

Keywords: Humanity, Environment, Change, Hunter-Gathering, Agriculture, Population, Society etc.

I. INTRODUCTION

Human beings have always transformed their environment through a unique combination of culture and technology, but not always at the same pace or on the same scale. The pace and scale of such human-induced change has accelerated markedly over the past three hundred years and the twentieth century is without precedent in humanity's history on the planet. Views on the merits of this process are sharply divided between "catastrophists" and "cornucopians".

'Catastrophists' point to the natural finiteness of resources as setting absolute physical limits to sustainable expansion that have already been exceeded. 'Cornucopians' emphasize the power of innovation as a response to apparent scarcity; every generation, they assert, far from living at the expense of the future, has made future generations richer by its investment in modifying the earth. In the eye of the beholder environmental change is seen in terms of emotion-charged and value-laden decisions about whether it constitutes "degradation" or "improvement". There are no independent norms or standards by which change may be either measured or judged and attempts to assert the interest of "nature" as final arbiter is itself an ideological construct reflecting a particular set of cultural preferences and prejudices.

Changing Ideas about Humanity's Place in the Biosphere
The question of humanity's impact on the biosphere has only slowly intruded on human consciousness over the past one hundred and fifty years. Prior to this, the western European cultural tradition accepted the Biblical narrative of divine creation as orthodoxy. This posited a designed earth, put the date of creation at 6000 BP (before present) and gave humanity stewardship of the product, nature. The inherited earth, however, was deemed a world in decay, the result and constant reminder of Adam's original sin and the casting out of humanity from Eden. Within this moral schema the influence of nature on humanity, not humanity on nature, was the primary concern. The great cultural variety met with both in Europe and in the rapidly expanding world revealed by the voyages of European seafarers was believed to be a product of their different associated environments. Environmental determinism found expression in the work of both Malthus and Darwin and its antithesis in the alternative philosophy of "possibilism" which acknowledged humanity's environmental envelope, but stressed the ingenuity of human culture in making a variety of adjustments possible for any set of given natural constraints. The nineteenth century revolutions in geology and biology shattered the authority of the Genesis narrative by dating the age of the earth in hundreds of millions rather than thousands of years and toppling humanity from its divinely-ordained pedestal into a struggle for survival against a morally neutral nature. The European industrial revolution drew on these new notions to redefine nature as natural resources and stewardship as profitable exploitation. This new secular ideology of capitalism was in turn exported around the globe by European colonialism and entrenched through the establishment of settler colonies or Neo-Europes in the temperate zones. The rapid transformation of European and extra-European landscapes wrought by the application of this ideology provided stark and abundant evidence for the first time of humanity's ability to alter environment on a grand scale. These changes were initially most readily visible in the island environments of the imperial periphery, prompting the first efforts at environmental management there and a growing pessimism about progress and fear that humanity had through its efforts at development upset the balance of nature. The marriage of state, science and industry in the advanced capitalist countries produced advances in every sphere of production and shaped mass consumer societies that drew every corner of the planet into a global market to feed their insatiable appetite for raw materials and commodities. The end of formal colonialism in the mid-twentieth century triggered a

wave of efforts by late-developing countries to close the gap with the industrialised north through the adoption of various crash industrialisation programmes under the often intertwined banners of socialism and nationalism which routinely discounted nature in pursuit of this goal. The associated Cold War also initiated a nuclear arms race that raised the prospect of human planetary annihilation and initiated social movements in the north which demanded a reckoning of capitalism's account with nature. The issue of the human impact on the biosphere thus entered both the global popular consciousness and international political arena.

II. STAGES IN HUMAN DEVELOPMENT

Population

The earliest humans first appeared some three million years ago in the Rift valleys of East Africa, but spread from there over almost the entire surface of the planet only in the past 350,000 years; first into Eurasia and Australasia, then the Americas and finally the large archipelagos and islands. Prior to the agricultural revolution some 10,000 BP humans lived by hunting and gathering and their global population is estimated to have numbered around 5 million people. The agricultural revolution facilitated population expansion to 200 million by the time of Christ and 500 million by 350 BP. Since 1650 the scientific and industrial revolutions and their global export through colonialism have triggered a human population explosion. There were an estimated 700 million humans on earth in 1700, today there are seven times that number or 5 billion. Less than 10% were urbanised then, nearly half are now. The largest city in 1700 was Istanbul with a population of 700,000, the largest modern urban complex, Tokyo, numbers 23 million and hundreds of others easily exceed early modern Istanbul in size. This massive growth in human population is itself an important factor in transforming nature, but has been further enhanced by the growth and development of culture and technology. Culture or the systematic manufacture of implements as an aid to manipulating the environment, is humanity's chief defining feature. Human cultural evolution can usefully be divided into three main eras: hunter-gathering, agriculture and industrialisation

III. CONCLUSION

All species have complex interactive effects on ecosystems. Humans, with their unrivalled capacity for ecosystem engineering, have outsized effects and add even greater complexity and novelty by acting both as individual agents of change and collectively as human systems with adaptive social learning networks. A single human being can intentionally transform a pristine forest to pasture using fire and livestock or unintentionally by introducing an invasive species. Human systems can sustain cities in the desert and convert factories to woodlands. Yet human transformation

of terrestrial ecology is always incomplete: some native species flourish even in the mostly densely populated cities.

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