

The Age of Heroes

Foundational stories of the origins of peoples and cultures always exalt the past in order to validate the present, but we know that the here-and-now never quite measures up to the grand mythical past from which it supposedly descended. Heroic bygone days always give way to a mundane present, and not even the greatest historic rulers of ancient Greece had quite the stature of the legendary kings of the house of Atreus, or of Achilles and Odysseus, Homeric heroes of divine lineage. The latter heroes, for all their courage and wile, were in turn not the equals of their predecessors, the mythical gods who, in the beginning, shaped the world in blood-drenched acts of creation.

Our contemporary techno-scientific culture, which is close to being *the* global culture, has no foundational myth written in a great epic and chanted down the generations, but it does have a popularly accepted foundational narrative, which is retold in countless books on popular science, and which aims to explain science's origins and validate its purpose. In this essay, we will briefly relate this narrative, and we will examine its transition into present-day science, a contemporary human endeavor for which the narrative still functions as the story of origin.

At the risk of being somewhat Eurocentric, by science we mean a systematic and uncompromising application of rational empirical inquiry to the material world. Of course, empirical inquiry is as old as the human kind, but its transformation into a fundamental outlook on the world, that is into "science," took place in the 16th and 17th century Europe. Men who stand as symbols of that awakening are mainly the early astronomers: Nicolaus Copernicus, Tycho Brahe, Giordano Bruno, Galileo Galilei; in popular imagination they live on as Promethean figures who defied authority and brought the gift of light to humanity, and some of them, like Prometheus himself, did so at great personal cost.

European Enlightenment of the 17-18th century, and the Industrial Revolution, stretching through 19th century, is the Age of Heroes of classical science. This is the time of larger than life figures, "fathers" of scientific fields: Newton (mechanics and calculus), Boyle and Lavoisier (chemistry), Kelvin (thermodynamics), Darwin (evolution), Faraday (electromagnetism); mathematicians Leibniz, Euler and Gauss also belong here. And so on: our purpose is not to produce a full list of credits, but to sketch out the popular narrative, incomplete as it inevitably is. The later part of that period, the 18th and 19th century, could also be called more prosaically the Age of Progress: many of the scientific names and discoveries from that time enjoy little popular recognition, but that was the period in which

the breakthroughs of the heroic age matured into a way of life and formed the foundations for today's technology-based society.

Early 20th century saw another, late heroic period, belonging to atomic physics and the theory of relativity; in popular imagination, this period in science's history is represented by the slightly idiosyncratic visage of Albert Einstein, and by the mushroom cloud. The foundational narrative of science, as we outline it here, ends with the Second World War and the development of the atom bomb. This is the time when heroic ages come to a close, and science comes under the sway of earthly rulers, of history, and of politics.

Now, it is certainly true that scientific progress provided useful help to state power well before the atom bomb, and in any case heroic ages are always more allegorical than factual. But the development of the nuclear weapon is a historical marker of the changed status of science in society, since the magnitude of the bomb's power made it clear that the very survival of nation states would depend on the national prowess in that application of empirical inquiry that we call science. Science would from then on be co-opted, managed and circumscribed by political powers.

Intellectual status of the scientist changed at the same time: he would no longer be the autonomous, intellectually esteemed and perhaps marginally irrelevant pursuer of esoteric quests, and would become society's artisan, maker of useful things. Again, history is gradual, but two historical episodes serve as useful markers of that change:

Toward the end of the Manhattan Project, a sizable group of scientists who were involved in the development of the bomb, led by Leo Szilard, petitioned the United States government for restraint in its use. They were summarily ignored, and the bombing of population centers in Japan went ahead. The shiny new weapon that they had provided was not theirs to dispose of or haggle about – they were the craftsmen, not the decision makers.

After the war, Julius Robert Oppenheimer, a highly prominent scientific figure in the Manhattan Project, was accused of "communist sympathies," investigated, and disgraced. Historians may argue about the merits of the charges, but this certainly was a cold-hearted destruction of a man who had contributed much to the technological basis of America's nascent superpower status. Whether intentionally or otherwise, the Oppenheimer episode made it clear who was dispensable and who was not, in the emerging techno-scientific order.

Ironically perhaps, the fate of Oppenheimer wasn't even a novel one. Long before him, mythical inventor Daedalus also discovered that skill and mastery over matter did not guarantee power, or even protection, in the world of men: disregarding his good service, the story tells us, Minos of Crete imprisoned and abused him in a fit of anger. He, Daedalus, was an artisan, maker of useful things; Minos was king.

Significance of the foundational narrative that we outlined above reaches beyond popular science classes. Today, the practitioner of science is almost without exception an employee of a larger corporate entity (a university or a company) or of a national government. He is hemmed in by the tangible constraints of his terms of employment and funding, and by the less tangible ones of departmental, institutional and funding politics. He labors in a crowded field, in which there are increasingly fewer stones left unturned, and he climbs the ladder of corporate seniority until he retires.

Since scientific development is fundamentally important to the well-being of modern societies, it is easy to see the benefits of exalting this decidedly un-adventurous walk of life with the help of a heroic foundation story. In the eyes of the supporting public, and in those of prospective practitioners, present-day science is the heir and descendant of the heroic achievements that dispelled the darkness of superstition, changed our image of the universe, and wonder-worked what we today know as the industrial world. And so it is, but we should examine the heir on his own merits.

Incidentally, science proper isn't the only one claiming heroic validation. Industry based on science is eager to convince us that the past isn't really over: heroic times are still with us, we are told that we now live in the "digital" age, and its tycoons are quick to claim the title of "genius," closest modern equivalent of demigod. We should feel uneasy about these latter-day claims to heroic-age continuity: when king Alexander of Macedon elevated himself to divine status, that was an embarrassing overreach of a great man; when emperor Caligula did the same, it was the delusion of a fool.