Second Nature

Economic Origins of Human Evolution

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1 Introduction

The propensity and capacity to exchange one thing for another between two traders – however unrelated to each other – is a profound distinguishing feature of human subsistence. Human beings are endowed with remarkable skills of trade which they deploy spontaneously when confronted with favorable opportunities; skills that lie dormant in the absence of such opportunities. As is true of other innate human abilities – such as the mastery of spoken language – basic skills of trade are taken for granted precisely because they are either inborn or acquired at a young age without conscious effort. Such skills are not as trivial as they may seem to a casual observer or, for that matter, to their very practitioners. Exchange requires certain levels of dexterity in communication, quantification, abstraction, and orientation in time and space – all of which depend (i.e., put selection pressure) on the lingual, mathematical, and even artistic faculties of the human mind. Moreover, exchange relies on mutual trust: predictable codes of conduct agreeable to the human sense of morality. Exchange, therefore, is a pervasive human predisposition with obvious evolutionary implications. The root cause of this predisposition and its evolutionary consequences in history, and prehistory, are the central concerns of this book.

Was exchange an early agent of human evolution, or is it a mere *de novo* artifact of modern civilization? The evolutionary literature treats the question with great caution. Many authors, starting with Charles Darwin and Alfred Russel Wallace, preferred to avoid the issue altogether. When the issue comes to the fore, the importance of exchange in recent industrialized societies is readily acknowledged. However, its importance in any but the most recent stages of human history is typically dismissed. In its present status, human exchange is in the same state of scholarly inquiry as human language was just a century ago (when conventional wisdom recognized sophisticated linguistic forms only in modern civilizations). Conventional wisdom today seems to suggest that human exchange is essentially an incidental by-product of previously evolved mental and social (or even cultural) structures, rather

than a distinct agent of evolution. The discussion throughout this book calls into question the merits of this article of conventional wisdom in view of, among other things, *Darwin's principle of utility* and *Wallace's independent proof*, two sources of difficulty in the study of human evolution from its very dawn in classical Darwinism.

Both Darwin and Wallace were keenly aware of certain structures and refinements of human intelligence which are (seemingly) unaccounted for by natural selection. Each in his own way made equally unsuccessful attempts to identify the missing agent. Wallace's attempt though, was bolder and in the end more embarrassing. The main difficulty was presented by what seems to be a premature and excessive advance in cognitive skills relative to prehistoric needs for human survival. What useful function could the higher faculties of the human mind (like mathematics and music) serve at the stages in human evolution in which they evolved? No good explanation compatible with the demands of natural selection was available either to Darwin or to Wallace, and none has yet been offered. Yet, all the while a plausible explanation was brewing within reach. The full account sounds much like a story of a missed opportunity (to be told in Chapter 3).

From its very inception, the theory of evolution by natural selection has been tormented by frustrating puzzles, not the least, the one just outlined. Many of these are clearly ascribable not so much to lack of evidence as to the availability of evidence that defies interpretation. With the great benefit of hindsight, it is now also clear that the failure in interpretation itself was on many occasions (but not always) due to lack of progress in adjacent fields of science. The age of the earth and the geographic distribution of species were two fiercely challenging puzzles that baffled Darwin to his last days. Both have since been fully resolved in his favor, albeit decades later – the former with the discovery of radioactivity and the latter with the discovery of plate-tectonics. Darwin's triumph (in bequest) was thus accorded, in these two particular instances, not so much by new evidence from within the field of evolution as by belated progress from without – in the fields of physics and geology, respectively. At issue in this volume are outstanding questions in human evolutionary history and the attempt to resolve them with the aid of insights from yet another field, perhaps not closely adjacent to evolution, but at least tangential to it: economics.

Some of the outstanding issues, and puzzles, in the field of human evolution possess a deep economic dimension that is not always fully recognized as such. Examples range from the most general issue associated with the evolution of the human intellect mentioned above to more narrowly focused issues that are equally puzzling, and equally unresolved. Consider some unexplained remarkable facts:

- An allegation of premature development is held not only against the higher faculties of the human mind, but also against the human faculties of making fire. Even by the most conservative estimates going back only 300,000 to 400,000 years (others put it at 1.5 million years and more) the deliberate use of fire by humans represents a considerable technological advance over stone tool manufacturing or, arguably, even over the invention of the wheel (dated, by comparison, only 5,000 years ago). In other words, domestication of fire seems to enter the record unexpectedly ahead of its time.
- Caches of finished stone tools as well as raw material from distant sources of flakeable rocks (10 kilometers or more away) were found in several early hominid East African sites dated between 1.5 and 2 million years ago. Could a hominid with a brain half the size of a modern human have the resources (and foresight) to maintain an inventory of raw materials? If so, what could possibly be the principle of economic organization under which such a practice was motivated, and such redundancy afforded?
- The human gut is markedly small relative to body size and in proportion to similar metabolically expensive organs in the human body: the heart, liver, kidneys, and lungs – not to mention the brain. In fact, it has been estimated (Aiello and Wheeler, 1995) that the total mass of the human gastrointestinal tract is only about 60% of that expected for a similar sized primate. By these standards, human gut dimensions are those of a meat-eater (Chivers, 1992). Yet, world wide, meat usually constitutes only a small proportion of the total human intake of food. This raises a serious question: the compatibility of an organ with its primary function.
- The Upper Paleolithic people (roughly, 40,000–10,000 years ago) greatly extended the geographic distribution of humankind to include easternmost Europe, northern Asia (Siberia), Japan, Australia, and the Americas. But the major thrust was largely inland rather than overseas with eastbound migration flowing from central Europe toward Asia and

northbound migration moving on both continents toward the arctics. Were these people heading in the wrong direction in the midst of an ice age?

- The *Iliad*, the first known masterpiece of western art (literary or otherwise), is a war story. Warfare in all its glory and horrors has been repeatedly depicted (and indicted) in future generations as well: *Henry V*, *Wellington's Victory*, *War and Peace*, *Battleship Potemkin*, *Guernica* – are but a few reminders that this theme is part and parcel of civilized artistic expression as much as warfare and interpersonal violence are part and parcel of civilization itself. Against all preconceptions, the theme is almost invariably absent from all expressions of prehistoric art. Cave paintings and contemporaneous portable art rarely show men or, for that matter, women in combat. Nor does the corresponding fossil record show much in the way of numerous broken human bones or any other compelling skeletal evidence for deliberate injury (these start to appear with any regularity only with agriculture). Is it safe to assume that these early hunter-gatherers "could not afford the kind of risk-for-limited-return involved in hunting their neighbors" (Klein, 1989)?

- No species has ever been observed to abruptly desert the niche it occupied in the environment in favor of another. Yet this is precisely what transpired in the great human transition to agriculture that took place almost simultaneously in widely separated parts of the world, for no apparent reason. Of these, the dual origin of agriculture (in the Old and New World) is the most puzzling of all.

- Husbandry is a labor-intensive undertaking. It takes in general more time and human effort to raise and slaughter a domesticated animal than to hunt and kill its wild counterpart. One lucky strike with an arrow can earn an expert hunter the same amount of meat and nearly all the byproducts (skin and fiber, though not milk) that a herder will obtain only by long hours of toil over months if not years in waiting. It is thus difficult to understand how pastoralism could have so completely displaced hunting to begin with. Why did humans for the first time, and of all times, choose to rely on domesticated stock precisely when (due to a climatic optimum) wild stock in many parts of the world was more abundant than ever?

To be sure, outstanding issues like these come with their own peculiarities and, as such, are treated in the pages of this volume on a case by case

basis: with evidence (when available), with logical inference (when applicable), and – only as a last resort – with conjecture. But they also share a common core that calls for a unified treatment and, perhaps, a unified explanation.

The difficulty in reaching a unified explanation can be traced in part to the relative neglect of economic reasoning in the way we tend, all too often, to approach the affairs of our own ancestors – however remote. Economic principles are not designed for the sole use of modern people. In the application of economic principles or, for that matter, evolutionary principles to the affairs of early humans it is useful to recognize two sweeping trends in their (and our own) evolution: the expansion of the brain and the expansion of the niche. The persistent expansion in brain size is by far the most impressive evolving anatomical trend that, by the very nature of the organ, far exceeds anatomy itself. The ever-expanding niche that humans occupy is the most impressive evolving trend from the viewpoint of economics, for economics is fundamentally the study of niche expansion. The remaining challenge is to make the necessary connection.