Households and Communities: Evolution in *Homo sapiens*

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Prologue

Recent developments in the theory of social evolution advance arguments that the overall pattern of human evolution can be seen as resulting from three mechanisms—biological, cultural, and social—which arose sequentially. This evolutionary framework is applied in an overview of the *intimate group* and the *community*, biologically based structures of residence and group defense, respectively, within primate species. For *Homo sapiens*, the intimate group took the form of a *household* led by a pairbonded couple. The opening section provides a narrative of the intimate groups and community groups within hominin species that preceded *Homo sapiens*. The second section summarizes basic models for each of the three evolutionary regimes, in terms of Darwinian variation, reproduction, and selection. Each regime explores species through the behavior of individuals as well as types of group behavior. In the third section, theories and narrative are combined to propose causal steps in historical transformation, leading to the human household. The last two parts explore the changing roles of households in the era of agriculture and the long-term transfer of laborers from the household to the community sector, a process gradually expanding the productivity of each sector.

Essay

The household, an intimate social group, provides the residential social structure of humans today. Most commonly, the household consists of pairbonded adults—likely united in marriage—with their co-resident children and perhaps other kin and associates. Censuses throughout the world tally populations in terms of households, treating them as the basic groups from which to assemble totals. A 1972 scholarly volume, *Household and Family in Past Time* (Laslett and Wall) confirmed the consistency of households in their size and function throughout the modern world. Its researchers found an average of five persons per household for Europe, Asia, North America, and Africa, from the sixteenth to the twentieth centuries. This book, the principal twentieth-century review of households, was an interpretive triumph of the newly expanding field of social history.[1] Its achievement was in documenting the household's consistency even when it was still widely thought that humanity was fragmented by divisions of race, economy, empire, and civilization.

In the half century since *Household and Family in Past Time*, research in numerous disciplines has shown that the household can be traced far back in time, even to the founding communities of *Homo sapiens* in Africa. The household can now be seen as a basic and biological structure of human life—the locus of feeding, sleep, and rest for adults and nurture for children, headed by a paired female and male. While the household has undergone modifications through influence of laws and institutions such as taxes and marriage contracts, it remains at its core a biological structure inherited from the ancient past. As I argue, the successful functioning of the household is an important reason for expansion and elaboration of human society. This is a world-historical overview of the household.

The human household is analogous to the intimate groups of the primate species to which we are most closely related—great apes, monkeys, and lemurs.[2] For all these species, the intimate social group, mostly with from three to seven members, provides basic comfort and nurture. Further, humans and other primate species consistently combine their intimate groups into community groups of 40 or more members. The primate community serves as the framework for networking among the members of these highly social species and for defense against attacks from outside. Within this general primate pattern, the specific

[1] Laslett and Wall 1972, Haraven 1975. The *Journal of Social History* first appeared in 1967; *Social History* appeared in 1976.
[2] The term "intimate group" is used here in to ensure that it refers specifically to the residential and reproductive group; the term "family," widely and comfortably used, is applied at many levels and is not used here because it might be confusing.

character of human society emerged some 400,000 years ago, with households led by pairbonded couples, with communities of 150 members, and perhaps with a newly emergent Merge capacity for mentally combining two concepts and linking them to a third (Scerri 2018; Gowlett, Gamble, and Dunbar 2012; Berwick and Chomsky 2016). From 70,000 to 20,000 years ago, these households and communities spread across the world. With agriculture, communities gave way to societies that became steadily larger. In today's societies, households remain the intimate structure of humanity, while communities of 150 still play important roles (Manning, 2020a, Dunbar 2020*c*).

This story opens with background on intimate and community groups among primates, including the ancestors of humans. The essay then highlights theoretical knowledge, classified as regimes of biological, cultural, and social evolution. A second narrative, from 500,000 to 20,000 years ago, presents many aspects of evolution in hominin species, including fire, material culture, the household, communities, creation of spoken language, collaborative social institutions, and migration worldwide. The essay concludes with the place of households in recent centuries of global travel and industrial development.

Humans as Primates

The past half-century of research and discovery in human evolution has combined the studies of numerous and overlapping disciplines: primatology, paleontology, archaeology, genomics, ontogeny, anthropology, linguistics, and history.[3] Of these advances, the framework of primate evolution appears to be especially helpful. It identifies the specific factors that were most important in developing the group-oriented, socially networked, and large-brained primate species, especially the subgroup of hominin species from Australopithecenes to *Homo sapiens* over the past four million years.[4] Here we explore primate evolution up to 500,000 years ago.

The social brain hypothesis

The "social brain hypothesis" is the center of this interpretation; the term has been advanced most energetically by primatologist and psychologist Robin I. M. Dunbar. The hypothesis draws on a wide range of disciplines yet works firmly within the framework of Darwinian natural selection.[5] Primates participate in the activities of relatively stable groups throughout their lives—from intimate, familial groups to community groups, with "bands" and other groups in between, linked by networking processes including grooming.[6] The intimate group has a relatively standard size for most species but varies in its social organization. The community group varies in size by species, becoming relatively larger as the social networking among community members becomes more complex. Aiello and Dunbar (1993) reported a correlation in the brain size of primate species and the size of their community groups; Dunbar refined these estimates thereafter (Gowlett, Gamble, and Dunbar 2012; Dunbar 2020*a*).[7] Further, the social brain hypothesis emphasizes the psychology of group links, identifying levels of intentionality (perceptions of the thinking of others) that deepened with growing social complexity and brain size.

Intimate groups and their structure

The great apes of today—parallel to humans in their evolution—live in such intimate groups and communities. Chimpanzees and bonobos, established north and south of the Congo River, respectively, live in communities averaging 45 members, made up of intimate groups of from three to 10 members, headed by mothers or

[3] Examples of major contributions, by field, include Dunbar (1988) in primatology; Tattersall (2012) in paleontology; Cann, Stoneking, and Wilson (1987) in genetics; Tomasello (2019) in ontogeny; Bickerton (2009) and Berwick and Chomsky (2015) in linguistics; and Boyd and Richerson (2005) in cultural evolution.

[4] The term "hominid" was previously applied to all great apes; more recently, the term "hominin" is applied to all species more closely related to humans than to chimpanzees.

[5] Dunbar, Gamble, and Gowlett (2014).

[6] See Crook (1976) for a clear statement of research design for primate studies.

[7] With appreciation to Robin I. M. Dunbar for confirming recent estimates of primate community sizes by personal communication.

grandmothers. They collect food, mostly fruit, and sleep in nests created daily within the range of the group and the larger range of the community.[8] In addition, their intimate group communication relies on grooming (physical touch), including with friends outside the group. Males, significantly larger than females and residing separately, maintain rank within a hierarchy that is greater for chimpanzees; females of both species have multiple sexual partners. The community protects its range and resists attack from its own or other species.[9]. For gorillas, adult males are roughly double the body mass of females and maintain relatively permanent relationships with females of their harem; harems are limited to five adult females, to maintain their fecundity. Mothers care for their offspring in sub-families; junior males live as individuals.[10] Gorilla communities exist separately from each other, though individual males and females migrate across community lines or are sometimes forced to do so.

A comparison among these living species (Goodall 2010, Fossey 1983, de Waal 2006) gives an idea of the intimate pattern of their last common ancestors, 6–7 million years ago. Those ancestors were tree-climbing and fruit-eating foragers, with significant sexual dimorphism, as larger senior males dominated several females, who raised their offspring in female-headed groups. Males competed for leadership and access to multiple females, perhaps including promiscuous relations. In the long history of hominin evolution since then, species may have modified their intimate groups repeatedly. Overall, the change was not a progression but a selection among possibilities—for instance, pairbonding exists among some monkey species. For *Homo sapiens*, the revised intimate group was a pairbonded household, which maintained the established functions but made changes to fit the needs of a somewhat different existence.

Community groups and their size

Large brains arise in animals that live in long-term groups and maintain complex social relationships. Thus wolves, living in groups, have relatively large brains; cats, who have equal intelligence but do not live in structured groups, have smaller brains. For primates in general and especially the hominid lineage of great apes, community size is closely related to the size of prefrontal cortex, in a clear progression. For living gorillas, chimpanzees, and bonobos, one may measure the average brain size and community group size. Gorilla brains average 500 cc in volume, chimpanzee volumes average 400 cc, and bonobo brains average 350 cc. The ratio of brain to body size in each is roughly similar, and the community groups of each average 40 members.

For extinct species, one must measure the brain capacity of fossil skulls. For *Ardipithecus* (over 4 million years ago), brain size was 350 cc. For *Australopithecus* (since 4 million years ago), brain size averaged 500 cc, but group size was 40–45, similar to that of other apes. With *Homo habilis* (from 2.5 million years ago), community group size group size remained at 45–50. With *Homo ergaster* (from 1.9 million years ago), brain size grew and group size rose to 70. With *Homo erectus* (closely following *H. ergaster*), group size rose modestly to 70–75 (Dunbar 2020*b*) Thus, a hint of changing brain size came with *Homo habilis*, but the significant expansion of brains and community groups began with *Homo ergaster*.

Changes in stature, psychology, and technology

Beyond changes in social groups, many other aspects of hominid phenotype changed under the influence of social and natural environments and the process of natural selection. With shifts in climate and environment, some groups found their habitat changing from forest to savanna, making it necessary to seek out a new diet to replace forest fruits.

In stature, *Ardipithecus* was perhaps the first bipedal hominid, retreating from tree climbing as their lands became forest-savanna fringe some four million years ago. Foraging on savanna fruits and perhaps grasses, these beings changed lifestyle but experienced no increase in brain size (Harcourt-Smith 2010).

[8] Dunbar 1988.
[9] Goodall 2010, Fossey 1983, De Waal 2006
[10] On mountain gorillas, Fossey's study area on Mt. Visoke included a population of roughly 70, divided into four silverback-led groups of with an average of 4 mature females each and an average population of 16, including infants. Fossey 1983: xix–xxii, 10, 50, 231–38.

Bipedalism was fully documented with the skeleton of Lucy (*Australopithecus afarensis*, 3.3 million years ago). A sudden change in stature came with *H. ergaster*: height and brain grew significantly, gut became smaller, and individuals were better able to run (Tattersall 2012). The rise of *H. erectus*, soon after *H. ergaster*, brought further gradual increase in brain size and group size. In another change in stature, the degree of sexual dimorphism declined with time. *Australopithecus* adult males may have been twice the weight of females, yet various measures (body size and foot size) suggest that this ratio declined for *Homo erectus* to males just 15–20 percent larger than females, close to the present human ratio.[11] The relative increase in female height may have changed the distribution of food by sex. In another ratio, a low ratio of second to fourth digit length is argued to correlate with polygamous sexual relations, while a high 2D:4D ratio correlates with pairbonding and monogamy: these results suggest that hominin species maintained forms of polygamy (Nelson 2011).

Psychological studies have shown that networks, grooming, and friends were a part of all primate behavior, but became more intensive with increases in brain size and community size. The concept of *intentionality*, developed in philosophy and evolutionary psychology, has been applied in slightly differing forms to the varying degrees of understanding and mindreading among primate species (Searle 1983, Dennett 1987, Gowlett, Gamble, and Dunbar 2012; Tomasello 2019).

Larger group size was facilitated perhaps by such social connections as laughter and perhaps by changing diet and technology. Successive changes in diet, scavenging for meat, and creation of stone tools provided new capabilities for hominin species. Acheulean tools (hand axes valuable for butchering carcasses) brought changes to diet; they also required long work at the site of the stone to create the tools. While hearths are rarely found, initial control of fire and cooking are implied indirectly by the shrinkage of the gut in *H. ergaster* and after (Wrangham 2009, Dunbar 2020*c*).[12]

The intimate group was influenced by these evolutionary changes. Brain growth influenced birth and nurture of offspring, By the time of *Homo ergaster*, the long legs required an adjustment in shape of the pelvis. The result reduced the size of the birth canal even as the heads of newborns were becoming larger, making birth painful and life-threatening. In compensation, birth took place at an earlier stage and newborns underwent more development after birth. Intimate groups had to seek solutions to these problems.

The balance of intimate and community groups shifted gradually. New community activities—creating stone tools, scavenging, use of fire and collection of wood—were added to the inherited tasks of group protection, networking, and mating. In intimate groups, new activities—creating domestic tools and shelters—were added to the inherited activities of foraging, nurture, and networking. I label these new tasks as “labor” to point out that labor for new tasks could only be supplied by reproduction of offspring in intimate groups. While some tasks were shared between intimate and community groups, the overall transfer of labor from intimate to community sectors became a recurring process for hominin species.

Development of these species depended fully on natural selection. The changes in *Homo erectus*, perhaps imperceptible to individuals, were rapid in evolutionary terms. Yet *Homo erectus*, while matching the stature and the gait of humans today, lacked many capabilities that were to emerge later. Future changes, facilitated by processes of cultural and social evolution, are discussed below. Research is showing, however, that the lives of *Homo erectus* revealed hints of later developments—some use of fire, beginnings of hunting, basic use of voice, hints of material culture, and some growth in community activities—that would be greatly amplified.

[11] On the difficulties of quantifying dimorphism in size, see Plavcan 2012, Antón 2016, Villmoare 2019.
[12] The development of laughter, linking groups of three individuals, may have been an alternative device for expanding networking behavior, in case use of fire did not expand until later (Dunbar 2020*a*).

Theoretical Regimes for Human Evolution

The theory of biological evolution relies heavily on the groundbreaking analysis of Charles Darwin (1859), yet it has become steadily more complex with time. To present this evolutionary overview of the household and its ancestry, I rely on three widely known terms: biological evolution, cultural evolution, and social evolution. These terms combine the many disciplinary advances in study of family and community life into three categories, to highlight the core mechanism of change in each. Within each of these evolutionary regimes, I explore the three Darwinian elements of evolutionary change: the mechanism for *variation* of biological traits, the process of *reproduction* of each trait from generation to generation, and the process of *selection* according to which some innovations survive and others do not. A further aspect of selection is the resulting *fitness* of each innovation—the degree to which it is reproduced in later generations. This three-by-three structure (three regimes of evolution and three processes to each regime) portrays many issues in hominin evolution. Of course, it is not airtight. Numerous perspectives arise from consideration of the many variables, and this discussion will note alternative perspectives at several points.

Biological evolution

Background. Evolutionary thinking arose from the effort to find a unifying concept for the expanding studies of fauna and flora. It relies on the mechanism of **natural selection**. At much the same time, successful theories also arose in fields of geology, physics, and chemistry—all appearing to emphasize positivistic logic. Darwin's detailed theory of natural selection balanced three dimensions of change: *variation* of biological characteristics, *reproduction* of each characteristic from generation to generation, and *selection* in which some innovations survive and others do not. His vision of natural selection, logical yet not highly specific, pointed toward the genetic mechanisms that were later to confirm his theory: Mendelian genetics, population genetics, the place of DNA in the genome, and epigenetics. In humans, no conscious behavior is involved in biological evolution (Bowler 2003; Dobzhansky 1937; Morange 1998).

Variation. The phenotype, for biological evolution, is treated as the physical and behavioral characteristics of individual organisms, intermediate groups, and the species as a whole. In the human genome, variation takes place through mutation (usually random changes) of genetic constituents—that is, changes within groups of three DNA nucleotides that lead to selection of a different amino acid, thereby creating a change in proteins that then yield varying sorts of bodily functions (Bowler 2003).

Reproduction. The genome, as it replicates each strand of DNA within cells, thereby preserves each mutation. The sequence of reproduction runs from DNA to RNA to proteins and to the creation and modification of organs and practices, ultimately including households and communities. It is not known which specific elements of the genome are responsible for provoking changes in intimate groups or households, but the issues involved include size and shape of teeth and hands, brain size, the birth process, extended nurture, relations between mates, keeping kin together, and the tools and techniques for foraging.

Selection. The preservation of each genetic innovation that is valuable to the organism—rather than the deletion of the revised version of the genome—takes place at the molecular level of the genome but also at other levels. At the molecular level, some DNA mutations fail to code for amino acids or code for amino acids that create non-functioning proteins; those mutations disappear. At the level of bodily organs, a genetic innovation may cause disease or malfunction in organs; those mutations will remain rare. At the organism level, the genetic innovation and its phenotypical consequences may strengthen or weaken the organism's ability to feed and reproduce itself; natural selection also determines group behavior for each species. Environmental changes such as competing species, shifts in edible plants, or climate change may have positive or negative effects on the survival of the organism. Fitness of the revised organism is reflected in the rate of its reproduction of offspring in later generations.

Complications and Debates:

Epigenetics. Darwinian theory, for many years, had no sustained connection to the field of embryology or the study of life-course development. Yet the Darwinian genomic mechanism allowed only for gradual phenotypical change, while paleontological research showed more and more cases of rapid

phenotypical change. The issues were combined when it became known that the methylation of DNA—replacing certain exposed DNA molecules of hydrogen with larger methyl groups—resulted in changing the pace or even the functioning of DNA duplication of RNA molecules and subsequent protein production. The newly recognized process, labeled epigenetics, linked DNA to life-course development and reinvigorated life-course analysis (Gould 1977; Tattersall 2012; Tattersall 2015; Antón 2016; Gockman 2014; Zhenilo 2016).

Ontogeny or life-course development. As knowledge of epigenetics led to expanded study in ontogeny, laboratory experiments on young chimpanzees and humans showed the life-course development of each. The experimentally recognized steps in life-course development on humans and primates under age 5, when compared with data in archaeology and paleontology, yielded projections of the species and timeframe for which the various steps first took form. Tomasello has argued that the use of gestures for communication developed among hominin species and calls attention to eye contact as a mechanism for building ties among mates. These studies became closely associated with the literature on cultural evolution (Tomasello 1993, 2012, 2019; Boyd and Richerson 2005).

Genomic studies. From the 1980s, empirical analysis yielded immense amounts of information on primate genetic evolution, notably in studies of early human migration. Successive techniques arose, in order, for analyzing the sequence and timespan of mitochondrial DNA, Y-chromosomes, somatic DNA, and ancient DNA studies of whole genomes, each providing valuable information (Cann, Stoneking, and Wilson 1987; Reich 2018).

Cultural evolution

Background. Cultural evolution, a term developed in the 1980s by analysts of the newly discovered biological processes of *epigenetics* and *kin-selection*, came to have the meaning that individual human decisions, in addition to natural selection, could affect evolutionary change through **social learning**, which requires input from others (Manning *2020b*:141–150).[13] Cultural evolution theory emerged most explicitly from the population-genetics logic of kin selection (or inclusive fitness), emphasizing the expansion of altruism in a mechanism of **dual inheritance** (Hamilton 1964; Boyd and Richerson 1985). Social learning affects both the stages of variation and reproduction, while dual inheritance centers at the stage of selection. Dual-inheritance theory arose as two research groups developed approaches centering on social learning, passed from brain to brain, that interacted with genetic change to expand human skills and cooperation (Cavalli-Sforza and Feldman 1981; Boyd and Richerson 1985; Manning 2020*b*). The group led by Richerson and Boyd has since maintained a high level of activity (Richerson and Christiansen 2013). While the notion of social learning has been explored in many areas of biology, its application to hominin focuses especially on the period after 400,000 years ago.

Variation**.** The phenotype, for cultural evolution, includes observable characteristics arising not only from the genome but also from the characteristics of individual learning behavior and its influence on the community. Cultural evolution, in its dual-inheritance formulation, results from variations at both individual and genomic levels. The thesis of **social learning** posits individual learning through observations of each other or instruction by others—as in nurture of children or techniques for creating or using tools (Bandura 1971; Boyd and Richerson 1985). At the genomic level, random mutations may yield changes that provide support for the newly learned activities—as indicated in the kin-selection analysis of Hamilton—or they may undermine the new techniques (McElreath and Boyd 2007; Hamilton 1964).

Reproduction. Newly learned activities achieve reproduction at individual and genomic levels. The innovation, once learned, is stored in the brain of the learner. It must then be retrievable at later times by the same individual and must be passed on to other individuals before the end of a generation. Reproduction of this learning requires accurate learning and retention by each party. At the genomic level, the expansion of phenotypical cooperation builds pressure for genetic mutations reinforcing the higher level of learning in individuals (Boyd and Richerson 1985).

[13] In its focus on analyzing group behavior through individual agency, dual inheritance was parallel in logic to the contemporary social-science analysis of rational choice (Becker 1976:3–14, Coleman 1986).

Selection**.** At the brain level of the organism, selection of innovative practices requires consistent support by individuals, relearning the same lessons and developing abilities to store and retrieve information. Boyd and Richerson advance mechanisms argued to bring about inheritance of greater tendencies toward altruism (willingness to sacrifice oneself for the benefit of a close relative), which in turn advanced the rate of social learning (Boyd and Richerson 2005). The process of dual inheritance requires that the individual-level and genome-level dynamics equilibrate with each other, so that collective behavior is gradually reinforced. In a process known as multi-level selection or cultural group selection, individual-level cultural evolution can lead to formation of tribes or ethnic groups that have high levels of genetic similarity and collective behavior.[14] The analysis also focuses on evolution of punishment to reaffirm cooperation (Boyd 2003).

Complications:

Cultural evolution began with a specific, dual-inheritance model. After further research, this framework is best seen as including additional types of conscious behavior interacting with genetic and ontogenic change, including language development. The various research groups were all investigating changing human capacities during the Pleistocene Epoch, especially from 500,000 to 50,000 years ago (Barrett 2002: 351 –383; Mesoudi and Thornton 2018).

Vocal communication and spoken language. Bickerton, assuming that sequential biological capabilities led to language, identified eight conditions necessary for syntactic language to emerge (Bickerton 2009). He hypothesized a shift in foraging by *Homo erectus* from catchment scavenging to territorial scavenging, with reliance on voiced recruitment signals, that initiated the genetic changes eventually leading to language capability. He then proposed gradual emergence of "protolanguage," consisting of small numbers of words, symbols that were vocalized in the order of their conceptualization, without syntax. Bickerton argued that a rapid shift to syntactic language eventually took place among *Homo sapiens*—as much as 200,000 years ago—and offered conditions but not a mechanism for the change (Bickerton 1990; Maynard Smith and Szathmáry 1995; Bickerton 2009).[15] Tattersall (2017*a*) later argued that syntactic speech began after 100,000 years ago.

Social evolution

Background. Because Darwin's theory did not explain the complexity of large-scale human society, nineteenth-century social scientists sought immediately to develop parallel theories of social evolution. Their studies achieved a valuable analysis of kinship terminology but otherwise located no mechanism for change that was more specific than acts of human will.[16] Anthropologists in the twentieth century collected extensive ethnographic data, summarizing them with individualistic narratives of hierarchy and progress (Trigger 1998). In the late twentieth century, psychologist Donald T. Campbell raised a call for studies of social evolution, combining group behavior with Darwinian variation, reproduction, and selection, but did not come up with a specific mechanism (Campbell 1975).

In the twenty-first century, concern for global inequality and ecological crisis provoked a world-historical search for links of modern social change to human biological ancestry. Neither natural selection nor dual heritage had been able to offer specific explanations for syntactic language or collaborative institutions, two of humanity's most important phenomena. This led to direct studies of language and group behavior (Hurford 1999; Berwick and Chomsky 2016; Fitch 2010; Bickerton 2009; Manning 2006). Philosopher Raimo Tuomela's vision of the we-mode of collective intentionality included an intention to act together as a group. He argued that group behavior and group agency are "irreducible" in that they cannot be expressed in terms

[14] The model builds on individual-level behavior at the genomic level yet yields group behavior at the phenotypical level, though without conscious group decisions (Boyd 2019; McElreath and Boyd 2007; Shennan 2003:239–244).
[15] Rapid rise of speech is hypothesized by Bickerton (2009), Berwick and Chomsky (2016), and Tattersall (2017*b*, 2019). Gradual development of syntactic language is apparently assumed by Boyd and Richerson (2005), Tomasello (2019), Dunbar (2020), Shennan (2003), and Colapinto (2021).
[16] Morgan analyzed kinship terminology with skill and insight; both Tylor and Morgan saw matrilineal or matriarchal structures as a possible basis for social change (Trigger 1998).

of individual agency (Tuomela 2013; Preyer and Peter 2017; Jankovic and Ludwig 2018).[17] Application of this reasoning to long-term human history led to the hypothesis of institutional evolution, in which group play by youths led simultaneously to syntactic language and creation of other institutions (Manning 2020*a*).

Variation. The phenotype, for social evolution, expands observable human characteristics to include individual and group behavior of a human community, including networks and collaborative social institutions. In social evolution, innovations arise from the ideas of individuals, who seek collaboration with others to achieve a task of common interest. The innovative variation is that individuals consciously select and construct group behavior: this is the we-mode of collective intentionality**.** For language, this process required that individuals begin sharing words and sentences, structured by an agreed-upon syntax, with exchange in speech and listening. It is assumed here that the first steps in syntactic speech occurred among juveniles in groups of about 15 members as they played, combining learning skills, innovation, memorization, and extending language to the next cohort—until they moved into adult roles yet continued speaking (Tattersall 2017*a*; Tattersall 2017*b*; Manning 2020*a*; Manning 2023). On the logic of Aiello and Dunbar, the optimal size of the institution of human language community is 150 members; it is also linguists' view on the population necessary to sustain a language.

Reproduction. **Institutional evolution** takes place through reproduction of social institutions, beginning with the institutionalization of syntactic language via reproduction of an archive of vocabulary and the norms of syntax.[18] Syntactic language was thus the first institution. The archive of language was distributed among the brains of speakers: shared vocabulary and syntax were passed to the next generation by discussion at all levels. Another type of early institution was ritual to sustain the community. But for the ritual institution, leaders were required to organize and direct ritual activity. Reproduction of ritual institutions required one archive on the details of leading ritual practices and a second archive on how to pass institutional principles and norms to the next generation.

Selection. Social selection takes place at the community level rather than the individual organism level. Which social institutions, created by common effort, were to be propagated into the next generation? What practices were to be maintained within institutions? **Institutional fitness** was assessed in terms of **social welfare**—the institution's benefits (over generations) to the capabilities and the resources of the community and its members. Over the longer run, institutional fitness was also reflected in the population of the species, yet the intermediate changes in capabilities and cooperation were relatively important as compared with biological and cultural fitness. Institutions that were seen as unsatisfactory to the community could be removed or at least revised substantially—especially at the time of generational change and the selection of new leadership.

Complications

Social evolution is a distinctive process in that it takes place through group decision-making at the community level; the fitness of its institutions is assessed by changes in community capabilities more than by relative numbers of offspring. An evolutionary mechanism of this sort is arguably necessary to explain the rise of syntactic language and the succession of institutional changes that followed on language. This argument appears to claim that collective intentionality in its we-mode, implemented through construction of institutions, has specific characteristics beyond the generally high level of conceptualization attributed by Tomasello to "collective intentionality" and by Dunbar et al. to Level 5 intentionality (Tomasello 2019, Gowlett, Gamble, and Dunbar 2012). Among the additional characteristics are the investment in the practice of joint learning or, as Tuomela specifies it, participants recognizing their shared objective, their common interest, and

[17] In an important nuance, Tomasello (2019) uses the term "collective intentionality" similarly but treats it as a high level of conceptualization rather than the act of forming an institution. Dunbar (2012) also treats "Level 5 intentionality" as a high level of conceptualization.

[18] A theory of institutional evolution requires a coherent definition of institution—I term it as an organization composed of members who share a common set of practices and objectives. But definitions of institutions differ widely, at many scales and with reference to a wide range of criteria. (Similarly, the notion of culture has famously yielded more than a hundred definitions within the discipline of anthropology alone.)

agreeing to act for the interest of the group.[19] Further, within social evolution, one must assume the coexistence and interaction of formal and informal interest groups, as well as ideological debates in selection or restructuring of institutions.

The general problem of community-level cooperation

The three regimes of evolutionary theory each address the growth of cooperation in hominin species, but with different analytical processes.[20] Each evolutionary regime can be expressed through its characteristic dynamics of variation, reproduction, and selection of innovations but with complications and variants. Biological evolution traces primate cooperation at the phylogenetic level—at varying levels of intentionality for intimate and community groups. Cultural evolution focuses on social learning at genetic and ontogenic levels to create or strengthen the community group and build its genetic unity. Social evolution adds to the previous processes, establishing a level of group behavior with self-conscious group-level decisions that create social institutions and modify intimate groups.

There remains a need to clarify the relationships among various types and theories of group behavior in humans and other animals. The analysis of G. C. Williams (1966) argued that natural selection based on innovation within coherent groups (rather than individuals) could survive only in rare circumstances; D. S. Wilson (2019) responded with a counterargument defending group evolution. McElreath and Boyd (2007), relying on dual inheritance and Hamiltonian kin selection, articulated a multi-level group analysis. John Searle and Daniel Dennett developed the philosophy of human intentionality (Searle 1983, Dennett 1987). Dunbar (2012) emphasized a phylogenetic approach to groups, showing that persistent small and large groups exist in primates and some other groups through natural selection; he also theorized five or more levels of intentionality by which individual organisms recognize the thinking of others. Tomasello (2012, 2019), referring to genus *Homo*, treats small and large groups as voluntary associations; he proposes two levels of intentionality (parallel to Dunbar's levels 2 and 5). In the latter, the group-mindedness of collective intentionality creates cultural conventions, norms, and institutions. Tuomela (2013) offered proof that decisions of collaborative institutions are irreducible to individual decisions. Manning extended collective intentionality for institutions to historical change but also assumed conditions of admission to institutions (Manning 2020*a*, Dunbar 2020*a*). The overlaps and debates in understanding of community-level cooperation appear in the following narrative of evolutionary change after 500,000 years ago.

Evolutionary Transformations, 500,000–20,000 years ago

This section, in narrative form, advances hypotheses on the steps in evolutionary causation of households, communities, and other aspects hominin life. Evolutionary change took place under the fluctuating environmental influences of periodic ice ages: the high-temperature peaks took place at five moments beginning 500,000 years ago.[21] Yet of the five major hominin species that entered this period, only one—*Homo sapiens*—survived it.

Biological evolution of new species, c. 500,000 years ago

Biological evolution arguably accelerated in the era known in archaeological terms as the Middle Paleolithic (MP) for Eurasia and, somewhat later, as the Middle Stone Age (MSA) for Africa.[22] From 600,000 years ago, *Homo erectus* began to be replaced by a new hominid species, known as *Archaic Homo sapiens* or as *Homo heidelbergensis* after its first discovery in Germany. *Homo erectus* persisted in eastern Asia until 300,000 years ago, but not in the west. At the start of this period, *Homo heidelbergensis* became the principal hominin

[19] For parallel visions of institutions see Searle 1995 and Tuomela 2013. For contrasting definitions of institutions see Boyd 2018, North 2009, and Turner 2003. For a survey of institutions in human history, see Manning 2020*b*: 63–74.
[20] "Cooperation is, in many ways, the key to complex social life" (Dunbar 2020*a*:180).
[21] From a peak of temperature at 500,000 years ago, the low points of temperature were at 430,000 years ago, 340,000 years ago, 250,000 years ago, 130,000 years ago, and 20,000 years ago.
[22] Labels for the period remain separate because the human record diverged for the two regions. MSA ranged from 280,000 to 50,000 years ago, MP from 500,000 to 40,000 years ago.

species in Africa and then in Europe, while the numbers of *Homo erectus* declined (Mounier, Marchal, and Condemi 2009).

The brain capacity of *heidelbergensis* was significantly greater than *erectus*, so that the projected community size rose sharply from 70 to 110–120. (It appears that intimate groups changed little.) This species appears to have been dominant until roughly 250,000 years ago. Its material culture, initially similar to that of *Homo erectus*, eventually brought important innovations. *Homo heidelbergensis* demonstrated an expanded control of fire and the initial use of wooden spears, making it the first species to routinely hunt large animals, the first to build shelters out of wood and rock, and the first wide users of prepared-core stone technology (Tattersall 2012; Thieme 1997, MacDonald 2021).

Genetic information indicates that, thereafter, two new species emerged in Eurasia: By 500,000 years ago, Neanderthals arose in Europe and West Asia, while Denisovans arose in Central Asia soon after. Their stature was similar to *H. erectus* but their crania, brains, and faces were different. Full brain sizes of Neanderthals have been measured at 1500 cc, the largest of any hominin species, but some of that brain capacity was focused on building visual abilities in relatively dark northern territories, so that the projected community size for Neanderthals was 120.[23] Another branch in speciation at about 500,000 years ago eventually gave rise to *Homo sapiens*, which spread throughout Africa in communities of 150 members.

Patterns in cultural evolution, c. 300,000 years ago

The theorists of dual inheritance argue that the interaction of cultural and genetic evolution strengthened the genetic unity of ethnic or tribal groups that competed for opportunities to grow. For evolutionary biologist Joseph Henrich, the emergence of *Homo heidelbergensis* was effectively crossing the Rubicon in both Africa and Eurasia. This was the point at which a long process of social learning and kin selection had built group cooperation to the self-reinforcing level of cumulative cultural evolution, which brought technical advances to *H. heidelbergensis* (Henrich 2016:92–94; Boyd and Richerson 2005:99–132; Tomasello 1993). This approach emphasized male and community-level activities as the engine of cultural evolution—a tradition of intergroup competition that would continue until the Holocene epoch, when a subsequent set of changes would emerge.

Archaeological studies show that prepared-core techniques for stone tool manufacture expanded sometime after 300,000 years ago—a major change in lithic technology, associated with an increased effectiveness of hunting as wooden spears came to be hafted with stone tips. Both large and small hearths appeared in profusion in this era (Tattersall 2012: 135–142). Gestures and voiced calls in communication may have led to the initiation of dance and singing. In group meals at hearths, one can imagine that neighboring households joined together for occasional feasts and celebrations.

Derek Bickerton hypothesized that hominin had used vocal signals from the time of *Homo erectus* but that these changed very slowly. He argued that new types of neural links and neural bundling had to develop in brains before the capability for syntactic speech could exist (Bickerton 2009: 223, 232). He then proposed gradual emergence of protolanguage, in which individuals voiced isolated syllables to express meanings that they chose. But the combination of small vocabulary, arbitrary word order, individual choice of meanings, and small networks of conversation held protolanguage to a minimal and local level. Bickerton was not specific on the breadth of the community sharing a vocabulary, but Dunbar (2020*c*) argues that most networks included 15 members or less, a limit to the spread of words. Without syntax, protolanguage could not relate stories but might give hints that could inspire imagination in the listener. Bickerton argued firmly that the non-hierarchical use of words in protolanguage could not lead directly to syntactic language: arbitrary word order could not fit the hierarchical forms of noun phrases and verb phrases on which syntax relies. Yet he concluded that syntactic language emerged suddenly among *Homo sapiens*, as early as 200,000 years ago (Bickerton 2009; Tattersall 2017*a*; Colapinto 2021; Dunbar 1996, 2020*c*; Christakis 2019).

[23] Dunbar, personal communication. Denisovans were genetically close to Neanderthals but skulls are not yet available for estimating group size.

The ontogenic model of Michael Tomasello proposes two stages of change within the Middle Stone Age. First, ontogenic change brought the emergence of "face-to-face collaboration," about 400,000 years ago (Tomasello 2019:loc. 267). This process was not limited by kin selection in the same way as the dual inheritance model, so that it could arguably have spread its influence more rapidly. Accompanying changes in intimate groups might have included tools for more efficient foraging and improved communication through gestures and eye contact. Second, Tomasello postulates but does not document rapid population growth as of 150,000 years ago, leading to conflict among social groups. He argues that, by 100,000 years ago, these interactions led to the emergence of collective intentionality, seen as fully modern levels of cognition and sociality. Tomasello identifies spoken language as one element of this modern, collective intentionality but does not highlight a mechanism by which the years of invention, practice, and learning of language would be accomplished (Engelmann and Tomasello 2018; Tomasello 2019:loc. 404–499).

Domestic activities are seen to have expanded during this period, as with cooking, clothing, protolanguage, decoration with ochre and beads, and expanded child care, each requiring additional labor. To respond to growing demand for labor on both household and community fronts, individuals might have labored more hours per day, or foraging for food might have grown in efficiency, freeing up time for other activities. Despite such adjustments, one may argue that the need for expanded labor supply had to be met by an increased number of surviving children from the households.

Household: biological change among Homo sapiens, c. 400,000 years ago

New analysis of human remains and Middle Stone Age artifacts at Jebel Irhoud, Morocco, proposes a date of some 300,000 years ago for the earliest *Homo sapiens* (Richter 2017). This date, combined with genetic indications of early *Homo sapien* communities throughout Africa (Tishkoff 2009, Lipson 2022), opens the possibility that the species may have arisen as early as 400,000 years ago and may have spread to much of the continent—and to Southwest Asia—by 300,000 years ago (Scerri 2018, Groucutt 2021).

First, among *Homo sapiens*, the household arguably crystallized as a new biological development during the period dominated by cultural evolution. The household, like other forms of primate intimate groups, arose through natural selection. The change required major changes in habits; with less individual-level social conflict as males shifted their energies from competing with each other to maintaining paired relationships. Leading males had smaller numbers of offspring as polygyny declined, but larger numbers of males had offspring whose survival rates increased because of additional care. Males resided mostly in households and may have taken on domestic tasks.[24] More young adults became available to address all of the new social and technical projects that arose under cultural evolution. How far and how fast did households spread? It may be that households arose early in the emergence of *H. sapiens*, thus increasing the effectiveness of expanding its range, so that they populated all five of the African regions, as indicated by genetic evidence (Tishkoff 2009, Lipson 2022). Archaeology too shows small differences in regional African populations and their material culture, clarifying further distinctions in physical characteristics and lithic traditions of *Homo sapiens* that developed in the continent's main regions: east, south, north, central, and west (Scerri 2018, Ehret 2015*b*).

Second, the emergence of the logical characteristic known as Merge may also have taken place among early *Homo sapiens* and spread throughout the species. This mutation is hypothesized to have enabled organisms to expand their internal logic by combining any two concepts into a unit and then linking it to another concept. That conceptual process, if applied recursively, had great power to strengthen categorization. It would have strengthened the logical capacity of early humans and would eventually have been linked to voice, social exchange, and the emergence of syntactic speech (Berwick and Chomsky 2016, Tattersall 2019, Manning 2020).

Material culture became evident with the expanded creation of decorations through ochre for coloring and beads from maritime and avian shells. There is evidence of clothing, fabricated from animal and

[24] So far, paleontology gives information on Neanderthal mating and descent but little on household relations (Goldfield 2019).

vegetable materials, in Africa, where it served arguably for decorative purposes more than for warmth.[25] Communication relied on grooming, including with friends outside the household, and gradually expanded through gestures of hands and eyes, along with voicing (Dunbar 1996; Tomasello 2019; Bickerton 2009). Relationships of male-female couples—long-term but not necessarily permanent—relieved males of effort previously spent in competing to dominate females. When one or both parents survived to advanced age, they likely resided in the household of one of their offspring.[26] While various sorts of polygamy are known to have rebounded in later times, households remained the dominant form of intimate group and provided a solid base for expansion of the human order.

Social evolution: language and institutions, c. 70,000 years ago

Populations of *H. sapiens* throughout Africa continued to undergo small physical changes in head and throat, bringing emergence of the chin, forehead, and an improved ability to make sounds (Lieberman 2007, Hurford 1999). I argue that, in social terms, these humans expanded experiments with protolanguage, and expanded networks and material culture. Then a further, qualitative change emerged: a we-mode of collective intentionality, in which a group formed for the specific purpose of precise articulation of vocal expression (Manning 2020*a*, 2023). The new group opened a dynamic that relied on high levels of group consciousness and the formation of social institutions, working by a logic that could not be reduced to individual behavior.[27] Communities of *Homo sapiens* thus developed syntactic language, enabling spoken communication in complete sentences.

The processes of creating syntactic language and social institutions took place at once, in interaction with each other. I argue that the daunting problem of syntactic language was solved just once. Thereafter, spoken language, the instrument of we-mode collective intentionality, spread widely. Without syntactic language, people did not have the verbal tools to explicitly agree on the task at hand or the shared, conscious commitment of members to the task. That is, since speech was necessary for explicit agreements, the moment of creating syntactic language was also the moment of creating advanced and collective intentionality (Manning 2023; Tattersall 2019; cf. Engelmann and Tomasello 2018, Tomasello 2019:loc. 404–99; Dunbar 2020: 169–72).

I have argued above that virtually all *Homo sapiens* had inherited the Merge capacity, which enabled them to combine pairs of concepts into a unit and then link them to a third concept. This capacity, valuable at the level of individual thinking, did not do much to advance community-level communication until it became linked to a sophisticated device for interpersonal exchange. The creation of syntactic language required years of work by young speakers, working within the we-mode of collective intentionality, until they ultimately solved the complex problems of articulating complete sentences with coherent syntax and phonology—and relying on Merge. The essential step was regular gatherings of juveniles aged 8–15 (the ages of highest skill in learning speech). In what began as a game, their spontaneous agreement to create phrases linking words in complete thoughts led to their persistence over years. It must be assumed that the children were sufficiently engaged to maintain their attention over a long period of time. If the assumption is granted, the group of young speakers is seen to have carried on this extended game that became a campaign until they built a language for which consistent vocabulary and syntax could convey precise meanings from speaker to listener (Manning 2020*a*). Further, their years of experience in collective intentionality yielded decisions, actions, and habits—not only a spoken product beyond what they could achieve as individuals but also the individual habits of compromise and memorization that enabled creation of other institutions (Tuomela 2013; Manning 2020*a*; Manning 2023). Early work in visual art reveals results of such close and specific verbal communication (Aubert 2018).

[25] Indirect evidence on early clothing in Africa, dated through archaeological study of leather-working tools in Morocco and genomic studies of body lice, gives dates ranging from 70,000 to 170,000 years ago (Hallett 2021; Toups 2011; Kittler 2003).

[26] While households were mostly composed of individuals sharing strong biological or pairbonded ties, they could also include co-resident non-kin as equals or subordinates.

[27] Within the framework of natural selection, debate is sure to continue on whether syntactic language was a crucial factor in human social change and on whether it arose rapidly within the past 100,000 years or gradually over a longer time.

Households persisted, with some modification, as language came to be spoken. The household remained a biological structure, maintaining its previous functions of nurture, eating, and sleeping; yet adding syntactic language to its previous internal communication and taking on the role of instructing children in the basics of syntactic speech. In another interaction of household and community, the naming of social groups enabled families to develop the institution of marriage. What had been the biological mating of two individuals could now become social marriage, linking two families to the couple and to each other by agreement and ceremony. Marriage agreements included adopting one of the many options on residence and gender roles for the couple (Ehret 2008, Hrdy 2009). Extending similar logic over the course of millennia and the lands of the Earth, household members became involved in additional institutions of steadily greater complexity—but the household still provided the comforts of home.

Pleistocene expansion of Homo sapiens communities, c. 60,000–20,000 years ago

The creation of language and linguistic communities arguably took place in a region just north and east of the great lake that is the source of the Nile, Lake Victoria, or Nyanza (Ehret 2015*b*). By 60,000 years ago, the consequences brought out-migration of speaking humans in several directions (Ehret 2015*a*, Manning 2020*a*). While the processes of biological and cultural evolution continued unabated, the dramatic demographic and geographic expansion of *Homo sapiens*, provoked by social evolution, transformed the framework in which biological and cultural evolution operated.

There is ample documentation of an acceleration of migration by *Homo sapiens* from this region starting as early as 65,000 years ago (Ehret 2015*b*). As of 50,000 years ago, African migrants are known to have settled far to the east in Oceania, in the Levant to the north, in India, and then in regions throughout Eurasia (Ehret 2015*a*, Manning 2020*a*). By 20,000 years ago migrants had penetrated far into the Americas, by sea and by land (Bennett 2021, Manning 2020a). While details remain to be worked out on the relations between households and communities in these migrations, it seems clear that the migrants spread, settled in new environments, then dug into their niches—meeting and gradually absorbing localized hominin populations in both Africa and Eurasia (Odling-Smee, Laland, and Feldman 2020). Further, the migrations are associated with rapid technological change—in small-scale stone implements, bow and arrow, needle and thread, boating, clothing, and visual art (Ehret 2015*a*, Manning 2020*a*).

While dual inheritance and ontogenic theories treat communities as ethnicities that formed gradually, the approach of social evolution suggests more rapid and intentional formation of communities by reformulating pre-existing communities and redefining them by the unique language of each. For the first forty millennia of syntactic speech, most language communities arguably remained at the size of roughly 150 members. These communities of language and ethnicity populated the Earth, developing ecological specializations to fit each region of settlement. In a further contrast, the analyses of cultural evolution and ontogenic collective intentionality emphasize genetic and social unity within communities or ethnic groups (Turchin 2016; Tomasello 2019), while social evolution emphasizes the benefits of diversity in communities through cross-community migration and multiple institutions, balanced by the unifying influence of language (Manning 2020*a*).

Households and Societies in the Holocene Epoch

By twelve millennia ago, as the Holocene Epoch opened with rapid warming, the hominin lineage had become restricted to *Homo sapiens*. Groupings of our species continued their social and institutional development, adopting new technology in agriculture and animal husbandry. Towns and chiefdoms formed along with expanded networks in economy and culture (Hodder 2011). Such transformations, already written up in narratives of social anthropology (Flannery and Marcus 2012) and history (Lucassen 2021), are coming to be theorized increasingly in terms of biological, cultural, and social evolution. While all the theoretical approaches to the Holocene assume the existence of households, syntactical language, and social institutions, only social evolution theorizes the origins of each.[28]

[28] But see Dunbar (2011) for constraints on evolution of institutions.

A theoretical review of Holocene-era communities and societies must account for the deep existence of hominid communities, along with the biological evolution that sustained communities and their intimate groupings. Nevertheless, the scale of social organization increased decisively in the Holocene era. Even before the Holocene and agriculture, it may be argued that the ecological disruptions of the Last Glacial Maximum led to consolidation and confederation of some communities (Mithen 2006, Manning 2020a). While the minimum size of language groups remained at about 150 speakers, the maximum limit was decisively overcome in the Holocene. Communities of 150 members were widely superseded and absorbed by progressively larger units since labeled as tribes, societies, and states (Coward and Dunbar 2014).[29] Yet community-sized social groupings of about 150, still favored by deep-seated biological ancestry, continued to exist and function in various ways, for instance as clans within societies. Households, more basic to the human order, continued to persist visibly, though they too were incorporated into larger social units.

Households underwent additional changes as agricultural production gradually expanded. The work of cultivation had both household and societal dimensions: households maintained gardens near at hand, while the work of clearing fields and harvesting involved community-level cooperation. A tighter spacing of childbirth, well known for agricultural societies, expanded household size but also added laborers for community and society levels. In an interpretation of Holocene cultural-evolutionary change, Peter Turchin has argued that ethnic groups, having become genetically and socially unified through dual inheritance, battled each other in the Neolithic era until agriculturists and state-builders won out over foragers; thereafter, the expansion of states created a return to social peace within political borders (Turchin 2016, 2017). In a contrasting social-evolutionary approach to the same era, this author has emphasized the prominence of cross-community migration and the agency of social institutions as factors reinforcing social and genetic diversity. Such a story of communities in the Holocene era assumes an accelerating profusion of institutions including states, markets, kinship, armies, metallurgy, horse culture, water management, maritime travel, and religious and cultural structures, with a balance of hierarchy and network (Manning 2020*a*).

Households during the past 4,000 years

During the last four millennia, even as many societies became large and complex, households have maintained their structure and their autonomy but have taken on new tasks. Not only do households remain the principal venue for eating, sleeping, child care, and repose, but they have taken on expanding activities in dress, personal hygiene, and connection to popular culture (Haviland 1972, Liao 2001). Beyond these additional tasks, one may posit two general patterns by which households have undergone modification: *partnerships* of household and society and *displacement* of households by society. In recent partnerships, the use of industrial equipment for household chores eases household work but at the cost of payments out of earnings.[30] Second, community activities have displaced households: the institutions of monasteries, prisons, and military housing displaced households in providing homes for their wards; the recent growth of nursing homes plays a similar role. Households are finding that restaurants and even home delivery of food are cutting into their function of feeding household members.

In further modifications during recent centuries, households have persisted despite slavery, mortality decline, schooling, and citizenship. The large-scale expansion of slavery from the fourteenth to the nineteenth centuries expanded polygyny, making slave women into single heads of households; their children belonged to their owners, who may or may not have been the fathers. The global mortality decline of the nineteenth and especially twentieth centuries caused household size to grow rapidly, so that households were pressed to sustain this population. Yet the expanded labor force ultimately built great cities and industries. Schools took over the later nurture of children, while women increasingly worked both in and out of the household. In the era of nations, households participate in balancing citizen and society. The citizenry of the nation is basically

[29] The societies of foraging peoples today, though relatively small in size, commonly have populations close to 1500. It may be that they expanded their scale in the early Holocene along with agriculturists.
[30] In a truly ancient example of household-community partnership, marriages linked couples within households at the same time as they linked the couple's household to the households of their parents and wider kin nets.

the population of the households, recognized by political institutions; households provide the basis for voters to cast ballots.

Contemporary Households and Social Labor

This survey of households and their interaction with communities and societies is traced from the bottom up. Such an intimate perspective addresses basic groups of the human order and argues that they continue to structure the full range of human existence. To complete this interpretation, I redefine *social labor* as an expanded level of community labor: social labor emerged in the Holocene era as societies expanded, incorporating communities within them. In an issue first hinted at in the time of *Homo erectus*, laboring activities outside the intimate group could only be completed if households were able to reproduce enough young adults. With time, society-level activities expanded more rapidly than household activities, while households took on more productive work as well as the reproduction of more offspring. Formation of the human household was one important step in expanding reproduction of offspring. Creation of spoken language and then of collaborative social institutions expanded the productivity of community and then of society. That is, the household and the community each expanded their characteristic productivity over time.

As societies grow in complexity—adding institutions relying on both social structures and physical capital—they require growing amounts of labor to carry out their tasks. Households too upgrade their technology, relying either on additional labor or purchasing household equipment. Somehow, through efforts in these two directions, households have generated and sustained the labor needed to support both the community and the household itself. This increase in household productivity—or what could be treated as an increase in the exploitation of households by society—presents a major issue in the understanding of household evolution.

Earlier analyses of households, while they address internal household functions, leave aside the transfer of labor from household to society. Anthropological studies document the existence of households and their short-term interplay with larger social groups (Hawkes, O'Connell, and Blurton Jones 1997; Flannery and Marcus 2012; Antweiler 2016; Roberts 1991). Sociological studies document the household as a residential unit, overlapping with the family. Friedrich Engels' analysis of households divided them into classes and noted the way in which privileged families passed on their wealth to later generations. Alfred Marshall spoke of the economics of the family with concern both for productivity and family ethics. Hans Medick launched studies of protoindustrialization in early modern Europe, centering on household manufacturing that preceded factory production (Medick 1976). For twentieth-century households, Gary Becker traced short-term issues in the optimization of consumption issues, relying on the theory of the firm (Becker 1976:3–14). These studies, however, did not explore structural relations between household and society, especially the generational transfer of labor from household to society-wide activities. On the long-term history and functioning of the household, the most important contribution is Jan Lucassen's 70,000-year history of labor, which provides systematic balance between households and other workplaces (Lucassen 2021). For the Neolithic era, he documents household interactions with other social sectors, including the rise of inequality within households. He traces the relative expansion of social workplaces and their productive activity in comparison with households, combining home production with social reproduction. This broad analysis also touches on households as the source of social labor, arguing for instance that households formed the organizational heart of early modern China (Lucassen 2021:189, 177–181).

The human household is presented here as a biological structure that took form in a specific historical situation some 400,000 years ago. I have emphasized the continuity and stability of intimate groups, including households, from their formation to the present, even as natural selection and two new regimes of evolution transformed the human order to an immense degree. On the other hand, the household is also argued to have undergone significant changes, especially in providing absolute and relative increases in the labor that it transfers to the larger scales of the community. One can see that community activity was always there, that it has grown relatively, and that it relies on a labor force born and nurtured in households.

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