1 *The Origins of Institutions*

'During entire aeons a man's lot was identical with that of the group, of the tribe he belonged to and outside of which he could not survive. The tribe, for its part, was able to survive and defend itself only through its cohesion. Whence the extreme force of the inward coercion exerted by the rules that organised and guaranteed such cohesion.'[1] In this chapter I synthesise evidence from all the evolutionary sciences into a plausible interpretation of the evolutionary emergence of this force of cohesion in the histories of humankind and its predecessors.

The origin of institutions is lost in the mists of time. From the beginning of the genus *Homo*, about 2.5 million years ago, until about 3,000 years BCE, the normative patrimony was made up of orally transmitted norms. We have few insights into how the very early systems of elementary norms began to be articulated into complex and interconnected institutions, and there is limited archaeological and anthropological evidence of this process. Undoubtedly, symbolic thinking and feelings about sanctified places, prophecies and ethics relating humanity to supernatural, transcendental or spiritual elements played an important early role. By the time our ancestors painted the Cave of Altamira (in modern Cantabria) about 13–18,000 years ago, their world vision was already dominated by symbols and related norms. The mysterious circular and T-shaped anthropomorphic pillars of Gobekli Tepe, built between 10,000 and 11,600 years ago in the core area of the Fertile Crescent near the city of Urfa (perhaps the Ur of Genesis?), the most ancient monumental architecture in the history of humankind, were a site of worship for the hunter-gatherer. They required more than 100 years and enormous resources to be built and point to a symbolic patrimony, temples, figures and sophisticated set of

[1] Monod, J. (1971), *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology*, New York, Alfred A. Knopf, p. 166.

https://doi.org/10.1017/9781009206303.002 Published online by Cambridge University Press

norms.[2] When humans began to domesticate cereals and cattle in the Fertile Crescent about 6–7,000 years BCE, the normative dimension of their social life complexified in connection with the new demands of sedentary life and the organisational problems of agriculture and breeding. When recorded history emerged thanks to the invention of writing around the fourth millennium BCE, we find a world densely populated by a variety of institutions, most of which were taken for granted.

Since then, we have evidence of the early attempts at codification of this accumulated normative world, mostly in Mesopotamia and Asia Minor.[3] Some of the collections achieved a wide audience throughout Mesopotamia for centuries; others were scribal exercises limited to a local school centre. The best known of these codes are, in chronological order, the Code of Urukagina (2380–2360 BCE); the Sumerian Code of Ur-Nammu (c.2100–2050 BCE); the Babylonian Code of Hammurabi (c.1760 BCE); the Laws of Eshnunna (c.1930 BCE); the Code of the Nesilim (c.1650–1500 BCE); the Law of Moses (fourteenth century BCE); the Assyrian Laws (c.1075 BCE); the Draconian Constitution (seventh century BCE); the Twelve Tables of Roman Law (450 BCE); the Edicts of Ashoka of Buddhist law (269–236 BCE); and the Law of Manu (c.200 BCE).[4] Greek civilisation, which was so crucial for the Western cultural tradition, codified less than expected, and its norms, most often ritual, emanate from many different sources.[5] Next to these ancient codified rules we find textually encoded norms that derive from various sources: sacred books, handbooks of rules and regulations, foundations of organisations (for

[2] Gobekli Tepe was discovered and excavated at the beginning of the 1960s. Attendance at these edifices ended about 10,000 years ago with their voluntary burial, as if the actors had decided to conclude a specific experience. See Schmidt, K. (2006), *Sie bauten die ersten Tempel. Das rätselhafte Heiligtum der Steinzeitjäger*, Munich, C. H. Beck.

[3] Roth, M. T. (1995), *Law Collection from Mesopotamia and Asia Minor*, Atlanta, GA, Scholar Press. The law collections in this volume are compilations varying in legal and literary sophistication recorded by scribes in the schools and royal centres of ancient Mesopotamia and Asia Minor from the end of the third millennium to the middle of the first millennium BCE.

[4] These are the most important and best known. The list is incomplete.

[5] A large project aims to collect all Greek norms: The Collection of Greek Ritual Norms (CGRN) project, directed by Vinciane Pirenne-Delforge. See Carbon, J.-M., S. Peels and V. Pirenne-Delforge (2018), *Collection of Greek Ritual Norms*, 2 vols, Paris, Editions de Boccard.

instance, bureaucracies) and rules for applying technologies in a given setting.

These ancient rules have common features. They share a religious origin, Deuteronomy being the most conspicuous example;[6] they encourage people to sacrifice their selfish interests for the good of the broader group; and they share a rather universal moral grammar, prohibiting inflicting costs on the innocent, taking more than a fair share of resources and contributing less than other members of the group. They all include rules of conduct (how to organise a sacrifice or the prohibition of marriages between women and their stepsons), together with definitions of the roles and authorities in charge of defending, implementing and interpreting these norms/rules. In this early production, we already find the problem of a divergence between written and often codified rules and less formal norms. In short, they already address the whole problem of institutional analysis.

There is also limited knowledge of the origins of political institutions. We know little about how the centralised Egyptian pharaonic political structure evolved from what previous arrangements and through which means; how the passage from loose structures among allied tribes, gens, lines of descent – the Jewish tribes, the Greek *oikos*, the Roman gens or similar – slowly evolved into centralised kingdoms. The vast empire that the Mexica discovered in the fourteenth century in the valley of the city of Teotihuacán was constituted at the beginning of the Common Era and rapidly collapsed five centuries later. This civilisation is rich in archaeological remains, but without a name, without writing and without history. Archaeologists debate whether its political institutions were those of a powerful and centralised monarchical state or those of a mercantile decentralised structure based on shifting alliances among prominent trading families.[7]

[6] Mille, P. D. (2011, reprint), *Deuteronomy*, Westminster, John Knox Press.

[7] For the thesis of a mercantile decentralised political structure, see Sugiyama, S. (2005), *Human Sacrifice, Militarism and Rulership: Materialization of State Ideology at the Feathered Serpent Pyramid, Teotihuacan*, Cambridge, Cambridge University Press. For the powerful kingdom thesis, see Manzanilla, L. R. (2009), 'Corporate life in apartment and barrio compounds at Teotihuacan, central Mexico', in Manzanilla, L. R. and C. Chapdelaine (eds.), *Domestic Life in Prehispanic Capitals: A Study of Specialization, Hierarchy, and Ethnicity*, Ann Arbor, University of Michigan Museum of Anthropology, pp. 21–42.

In short, even leaving aside our ancestor hominids,[8] the genus *Homo* has accumulated 2.5 million years of 'norms' and only a few millennia of (partial) 'rules'. Therefore, to discuss the origins of early institutions, we need to chart the indirect evidence that archaeology, evolutionary paleoethology, anthropology, psychology, and neuro and brain sciences offer us.

1.1 Hunting and Early Normative Orientation

The *Homo* and chimpanzee evolutionary lines separated between 7 and 8 million years ago, the exact date being the subject of debate.[9] About 3 million years ago the vast forests in which our ancestors could easily find fruit, leaves and other vegetables began to recede, leaving room for open grasslands. In these, finding food became difficult and risky, and hominids had to adapt. One line (the robust australopithecines) adapted by developing massive jaws and teeth suited to grinding herbs and other hard foods. The line which was to be our own followed a different path about 2.6 million years ago: it enlarged its diet from an exclusively vegetarian one to one using animal fats and proteins. For a long time both approaches seemed valid adaptations, but about 1 million years ago the australopithecines became extinct. Scientists have no agreed explanation for this extinction. It seems, nevertheless, that the solution of searching for sustenance in other animals provided an advantage.

Paleo-anthropological research shows that several species of hominids lived on Earth at the same time over the last 4 million years. Even our recent history of the last 100,000 years is characterised by this co-evolution of several *Homo* species: the Neanderthals, the Denisovans, the Floresiensis and the Erectus (or Ergaster), the first species to leave Africa and populate South East Asia and Europe.

Progress in hunting depended on key elements in our evolution. Several physical transformations distinguishing us from our nearest

[8] The use of the term 'hominid' has varied over time. The original meaning referred only to humans (*Homo*) and their closest extinct relatives. This restrictive meaning is now indicated by the term 'hominin', which comprises all members of the human clade after the split from the chimpanzees.

[9] The most recent research tends to locate the separation at 10–12 million years ago. See Katoh, S. et al. (2016), 'New geological and paleontological age constraint for the gorilla–human lineage split', *Nature*, 530: 215–18, doi: 10.1038/nature16510.

great ape relatives – the capacity to run long distances, an extra-large brain, arms suited to throwing objects long distances because of the flexibility of the shoulder joint – developed as a function of our specialisation as hunters. They also possibly influenced the emergence of material culture in the form of primitive stone tools about 2.4–2.6 million years ago before the emergence of the genus *Homo*. These hominids preyed rather than eating abandoned carcasses or stealing prey from other carnivores.[10] Their type of hunting targeted big mammals by stalking and waiting for them in appropriate places where they were expected to rally.[11] For about 2 million years, hunting dominated the life of the genus *Homo*.[12]

The impact of the shift to a carnivorous diet can hardly be underestimated. Better food quality implied brain accretion, which in turn fostered new techniques for hunting, further generating better food quality and brain growth. Between 200,000 and 2 million years ago, the *Homo* brain grew from the average 600 cubic centimetres of the first *Homo* to the average 1,300 cubic centimetres of *Homo sapiens*. The explanation for the rapid development of the brain preferred by evolutionary psychologists – detected in at least three independent offspring lines of *Homo*: the *neanderthalensis* in Europe, the *erectus* in Asia and the *sapiens* in Africa – takes the name 'gene–culture coevolution'. It involves strong positive feedback between innovations in the spheres of biology and culture: a bigger brain, more intelligence, better tools and better adaptation to the environment.

With the growing size of the brain and the need to feed a larger population, hominids began to develop strategies for capturing their prey, and these hunting circumstances exercised a strong selective

[10] I rely on Ferraro, J. V. et al. (2013), 'Earliest archaeological evidence of persistent hominin carnivory', *PLoS ONE*, 8, 4: article N.162164; Bunn, H. T. and A. N. Gurtov (2014), 'Prey mortality profiles indicate that early Pleistocene Homo at Olduvai was an ambush predator', *Quaternary International*, 322/323, 16: February; Wong, K. (2014), 'L'ascesa del predatore umano', *Le Scienze*, 554: 54–9.

[11] See Lee, R. B., I. DeVore, L. Sherwood Washburn and C. S. Lancaster (1968), 'The evolution of hunting', in Lee, R. B. and DeVore, I. (eds.), *Man the Hunter*, New York, Aldine Publishing Company, ch. 32.

[12] The controversial book by Ardrey, R. (1976), *The Hunting Hypothesis*, London, William Collins Sons & Co., popularised the impact of hunting on human development. The controversy was not about the importance of the hunting step but the author's deductions deriving from it on violence and human nature.

pressure towards cooperation. Any component of a group of hunters unable to work in a team on complex hunting strategies would be excluded from subsequent hunting expeditions and would face a bleak future. Being side-tracked by the individual search for a rabbit, rather than the collective effort to hunt a mammoth, was very risky.

Venatorial life not only requires a division of labour, but it is also made possible by the use of weapons and is completely different from hunting by other mammals. Hunting voluminous prey and storing and sharing the resulting supply of meat led to a growing social organisation and division of labour. From the beginning, females gathered and males hunted. Food was then shared not only among relatives but also among unrelated members of the same group.[13] Everybody helped everybody else. Mothers helped each other to find food and to raise their children; fathers helped each other to hunt, to build shelter, to defend resources and so on.[14] This cooperation required cognitive skills. To cooperate effectively, it is necessary to guess what another person is thinking, to communicate with some language, to reason, to suppress your own immediate needs, to plan activities and to limit in-group aggressiveness. Internal conflicts must be resolved before a band of hunters gets underway. From this arose attention to equality and reciprocity. 'In the very collaborative world of the hunter-gatherer, to refuse to share and a lack of propensity to cooperate could make the difference between life and death.'[15]

Experimental research has revealed the special human capacity to engage with others to achieve or attain a common goal through a 'shared intentionality'.[16] Mutual understanding of what was needed to reach a result set the basis for the beginning of social interactions and a culture based on cooperation. The development of cognitive skills permitted the use of new practices of hunting, fishing and harvesting plants that transformed into *social conventions*. A system of social

[13] Stiner, M. C. et al. (2009), 'Cooperative hunting and meat sharing 400–200 kya at Qesem Cave, Israel', *Proceedings of the Natural Academy of Sciences*, 106, 32: 13207–12.

[14] Schipman, P. (2014), 'How do you kill 86 mammoths?', *Quaternary International*, 30: 1–9.

[15] Lieberman, D. E. (2014), *The Story of the Human Body: Evolution, Health and Diseases*, London, Penguin, p.85.

[16] Tomasello, M. (2014), *A Natural History of Human Thinking*, Cambridge, MA, Harvard University Press.

norms requires everyone to be aware of the values shared by the group, of the group mentality. Social norms then led to moral principles, which eventually constituted the foundations of an institutional structure for respect for the group's norms of coexistence.

Hunting was also related to other crucial developments. The key innovation of non-seasonal sexual receptivity of females is probably linked to the bipolarity resulting from the division of labour concerning hunting. The male role of caterer, the bipolar society partially segregated from the sexual point of view and the female role of defender of the home area are unknown to vegetarian primates. A monogamic tendency and extended social ties were further elements in our development. Scientists do not agree on when humans became monogamic, but three factors are considered crucial: (1) spatial separation, with females making it difficult for males to find and keep a mate; (2) threats to the life of children, requiring double protection; and (3) the role of the male and his contribution to parental care.[17]

In particular, the cost of raising children was so high that it eventually required a collective effort including parents but also allogeneic parenting. A *Homo erectus* female needed 3,000–4,500 calories a day during nursing and post-weaning. The exorbitant quantity of 12 million calories is necessary for a child to become an adult – twice as many as are needed by chimpanzees. No child could survive in the absence of high levels of investment and patience among the adults of the group.[18] The quantity of time and energy that females and males needed to invest in their offspring had important consequences for the social behaviour of our species. This style of allogeneic parenting required cognitive capacities for cooperation and communication, altruism and reciprocity. The couple helped to develop social ties and family ties from both parents, widening family links and bonds across generations. *Homos* became hyper-social primates, embedded in community networks, with isolation and a lack of social support being crucial risk factors.[19] In short, about 1.5 million years ago the capacity

[17] Chapais, B. (2013), 'Monogamy, strongly bonded groups and the evolution of human social structure', *Evolutionary Anthropology*, 22: 52–65.

[18] I draw the information in this section from Lieberman, *The Story of the Human Body*, pp. 62, 64–5, 86, 93, 111.

[19] Smith, H. J. (2005), *Parenting for Primates*, Cambridge, MA, Harvard University Press; Kappeler, P. M. and J. Silk (eds.) (2010), *Mind the Gap: Tracing the Origins of Human Universals*, Frankfurt, Springer.

to carry food in the hand, feeding in a biped posture, the concealment of external signals of female ovulation and the creation of couple bonds brought about family bonds that extended to the relatives of both parents and an expansion of the social circle.[20]

Even the special value attached to territory as a 'defended area' could be related to hunting at a time in which territory became scarce and the various groups came into more frequent and closer contact. From the evolutionary point of view, it is logical that if the territory has a survival value, then one will be territorial; otherwise not. In our passage from forest to savannah, the need for an exclusive hunting territory may have increased, although, given the immensity of the early African spaces, social groups rarely came into contact. Mutual avoidance was perhaps enough. In any case, territoriality always involves the same features: isolation in a private reservation, intolerance of neighbours, attention to boundaries and resistance to invasion. Perhaps *Homo* is a territorial genus, but it is not proven that territoriality is genetically embedded.[21]

Some of these cooperative behaviours are also typical of other non-kinship-linked primates.[22] They are based on reciprocity and motivated by 'empathy', a feature of all mammals that implies that we identify with others in moments of pain or need.[23] Primates, and particularly great apes, help each other even in cases of significant losses (e.g. they adopt orphans and defend mates from leopards). These tendencies probably evolved starting with the maternal care required for all mammals and were later enlarged to other relationships. However, the behavioural combination of eating meat, sharing and cooperating with strangers, fabricating instruments and preparing food is specific to hominids and *Homos*. The way in which hominid communities allow foreigners to cross their territory, share food, exchange goods and gifts, and coalesce against a common enemy is an uncommon behaviour among other primates. Hominids were able to establish complex hierarchical structures for the realisation of

[20] Lovejoy, C. O. (2009), 'Reexamining human origins in light of *Ardipithecus ramidus*', *Science*, 326: 74–8.

[21] Wilson defines territoriality as a set of behaviours evolved independently (and occasionally lost and evolved again) during relatively short evolutionary periods to meet specific environmental needs; Wilson, H. E. O. (1975), *Sociobiology*, Cambridge, MA, Harvard University Press.

[22] De Waal, F. (2005), *Our Inner Ape*, New York, Penguin Books.

[23] This thesis is argued in De Waal, F. (2010), *The Age of Empathy: Nature's Lessons for a Kinder Society*, Portland, OR, Broadway Books.

projects, while cooperation among most animals does not seem to be coordinated from above but is auto-organised.

1.2 *Homo sapiens* and Symbolic Cognition

The roots of our species, *Homo sapiens*, can be traced back to Africa between 200,000 and 300,000 years ago. A subgroup of *Homo sapiens* dispersed outside Africa between 80,000 and 100,000 years ago. Modern humans appeared for the first time in the Middle East, Europe, Asia, New Guinea and Australia between 40,000 and 80,000 years ago. Archaeological evidence suggests that we managed to cross the Bering Strait and began to colonise the Americas between 15,000 and 30,000 years ago.[24] *Sapiens* hunter-gatherers lived in small groups, possibly twenty-five to fifty people, seven to eight families, in areas of approximately 250–500 square kilometres. It is estimated that our brains evolved to deal with about 100–130 people, about the number that a typical hunter-gatherer would have encountered in their life. Given their small size, these groups must have been strongly egalitarian. The sharing and exchange of food was 'a daily activity fully institutionalised'.[25]

In about 170,000 years, *Homo sapiens* evolved in Africa and colonised all parts of the world with the exclusion of Antarctica. Wherever *Homo sapiens* diffused, all other archaic *Homos* disappeared: the Neanderthals, the Denisovans, the hobbits of Flores and the many descendants of *Homo erectus*. Ours is the only human species that survived on the planet. Notwithstanding our slowness, physical weakness and absence of the formidable teeth and claws of other carnivores, humans have brought to extinction all other big predators and have been the most effective and lethal predators on Earth for a long time. Our special ability to cooperate is the only credible answer to how this was possible. We were too small and vulnerable to dominate. The scientific evidence so far accumulated

[24] Oppenheimer, S. (2003), *The Real Eve*, New York, Carroll & Graft, pp. 70–1. This is a study of migration based on the world distribution of mitochondrial DNA. The predominant trip direction was from the Horn of Africa through the Yemen Strait to the Arabian coast and then to India and Indonesia. This migration took about 10,000 years.

[25] Tharakan, G. (2007), 'The Maduga and Kurumba of Kerala, South India, and the social organisation of the hunting and gathering', *Journal of Ecological Anthropology*, 11: 12–13.

suggests that *sapiens* developed with a mixed set of predispositions. These included a natural egoism that presided over individual survival combined with a necessary and evolutionarily fitting tendency to in-group cooperation and aggressive predispositions in out-group relationships.

A capacity for *symbolic cognition* developed quite late, no more than 100,000 years ago. The first objects which are clearly symbolic were discovered in South Africa and date to 77,000 years ago. About 50,000 years ago the *Homo sapiens* of the Upper Palaeolithic engaged in making bone tools, fishing tools, flutes and so on, building more complex settlements and developing manufactured goods that did not have a direct practical use and that we may define as artistic or symbolic. This represented a turning point in the invention of culture; that is, in the capacity and inclination to innovate through 'culture'.

Cultural creativity is a force which is stronger, more exuberant and faster than biological evolution. In the last 600 generations at most, *Homo sapiens* invented agriculture, sheep farming, writing, the city, inanimate energy sources, antibiotics, computers and the Internet. In this period, human genetic endowment has not changed.[26] The scope of cultural evolution has become incommensurable with that of biological evolution. A unique advantage has resulted from the acquisition of an exclusively human characteristic, the highest symbolic activity: language. Unfortunately, there is no source of evidence that can help to identify this crucial passage, but evolutionary biologists are sceptical about the claim that syntactic knowledge is transmitted in the human genome.[27] Although natural selection never stops, in the last millennia it had only local and limited effects on human biology. Undoubtedly, cultural developments have helped human beings to go beyond the slow pace of natural selection.

[26] Tomasello, *A Natural History of Human Thinking*, p. 168.

[27] There is ongoing debate over whether our ability to use language was an evolutionary process and the skill is passed down genetically or, on the contrary, it is a cultural achievement entirely due to learning on the basis of general but not language-specific skills. See Tomasello, M. (2003), *Constructing a Language: A Usage-Based Theory of Language Acquisition*, Cambridge, MA, Harvard University Press. Another hotly debated issue is whether the biological contribution includes capacities specific to language acquisition, referred to as universal grammar, as Noam Chomsky has argued: Chomsky, N. (1965), *Aspects of the Theory of Syntax*, Boston, MA, MIT Press.

1.3 Agriculture

Hunting and gathering subsistence, small populations and dispersed resources meant that relatively few people could be aggregated together in any time and place. The improvement of the climate at the onset of the Holocene was followed by the beginning of plant-intensive resource exploitation, and increasing agricultural subsistence meant a rising population.[28] About 12,000 years ago, some groups of individuals began to establish standing communities. In the course of a few millennia, villages developed from small boroughs of a few houses in the Natufian to Neolithic villages with fifty houses to become, about 7,000 years ago, villages with 1,000 inhabitants or more. Five thousand years ago, some villages exploded into true cities such as Ur and Nohenjo with tens of thousands of inhabitants. Why this happened is not clear. Perhaps climate change and an increasing population made gathering and hunting difficult. There is no comprehensive and agreed explanation for why these developments were so late, so rapid, so decisive and so irreversible.

The area in which cereals and livestock were first domesticated in the Neolithic is a region in south-east Turkey between the upper courses of the rivers Tigris and Euphrates, in the central area of the Fertile Crescent. The slopes of the Karaka Dag offered fields of wild Gramineae and an abundant fauna. The domestication of einkorn wheat (*Tricum monococcum*) was probably the first, about 10,000 years ago.[29] Then sheep, goats, pigs and at least one of the four genetic lines of the current cattle were domesticated.[30] The 'Neolithic

[28] Richieston, P. J. and R. Boyd (2001), *Institutional Evolution in the Holocene: The Rise of Complex Societies*, in Runciman, W. G. (ed.), *The Origins of Human Social Institutions*, Proceedings of The British Academy, New York, Oxford University Press, pp. 198–234, 216.

[29] This result was achieved by genotyping the DNA of a group of wild diploid einkorn wheats. Durum wheat and spelt come from the same region. Abbo, S. et al. (2006), 'The ripples of "The Big (Agricultural) Bang": the spread of the early wheat cultivation', *Genome*, 49: 861–3; Salamini, F. et al. (2002), 'Genetics and geography of wild cereals domestication in the Near East', *Nature Reviews Genetics*, 3: 429–41; Bar, Y. O. (2002), *The Natufian Culture and the Early Neolithic: Social and Economic Trends in Southwest Asia*, in Bellwood, P. and C. Renfrew (eds.), *Examining the Farming/Language Dispersal Hypothesis*, Cambridge, McDonald Institute for Archeological Research, pp. 113–26.

[30] Zeder, M. A. (2007), 'The neolithic macro (re)evolution: macroevolutionary theory and the study of culture change', *Journal of Archeological Research*, 17: 611–63.

revolution'[31] affected agriculture, a sedentary lifestyle, social stratification generated by an agricultural food surplus from which oppression and slavery perhaps emerged, and the development of civilian and priestly rituals. In a few millennia, the increase in the number of peasants determined the expulsion or extermination of the hunter-gatherers.

Denser societies made possible by agriculture realised considerable returns by exploiting the potential for cooperation and the division of labour, but this also required the development of appropriate and more complex institutions. In fact, the trajectory of institutional evolution is similar. States evolved first in the Mesopotamia area about 5,500 years ago, and in many other areas at a later stage, perhaps ten or more times in various parts of the world. This area was also where monotheist religions emerged.

The sedentary lifestyle was not due exclusively to agriculture. In Asia Minor, climate change and a decrease in big prey stimulated and preceded the social novelties of the Neolithic. Sedentary villages were already present in the early Natufian, about 24,000 years ago. During the period of cold known as the 'Younger Dryas' (12,800–11,600 years ago), the pre-agricultural villages of Mureybit and Abu were already sedentary, although they did not practise agriculture. Stone instruments to grind wild cereals can be dated to 24,000 years ago and about 13,000 years ago were present in the entire Fertile Crescent. It is likely that agriculture and a sedentary lifestyle were not immediately seen as superior in the eyes of the hunter-gatherers. Scholars use the term 'frailisation' to describe the conditions of the population of the agricultural Neolithic, who, compared with the population of hunter-gatherers, were worse off and subject to more illnesses and bone deformations due to higher workloads.

From an anthropological point of view, the shortness of the period during which these momentous changes took place implies evolution by jumps rather than at a gradual pace. After hundreds of thousand years of subsistence linked to hunting and gathering, the advent of the late Neolithic brought about elements of economy, urban planning and social and ideological action in communities and confederations. Favourable climatic changes have been documented. However, other

[31] The term was popularised by Cole, S. (1970), *The Neolithic Revolution*, London, Trustees of the British Museum.

contingent factors must have triggered, in a few thousand years, a process that repeated itself in north and south China, sub-Saharan Africa, the eastern United States, central Mexico and the south-central Andes.

1.4 Reciprocal Altruism

Neo-Darwinian evolutionary biology has gone beyond mere egotism, suggesting the 'inclusive fitness' theory.[32] Altruistic and cooperative behaviours can develop if they contribute to the fitness not only of the individual themself but also that of related individuals, taking as a reference point the capacity of a gene to duplicate itself, therefore making the object of fitness not the single individual but genes.[33] However, the inclusive fitness idea only explains cooperation among related individuals, while the evidence suggests that humans and their predecessors already cooperated in large numbers and in large numbers of unrelated individuals. Let us, therefore, discuss other evolutionary mechanisms that may be invoked to interpret these rapid and colossal changes in our social life.

A second mechanism introduced to explain the emergence of cooperation is 'reciprocal altruism'. Reciprocal altruists are 'conditional cooperators' who cooperate with cooperators and refuse to do so with non-cooperators, opportunists and cheaters: 'given the universal and nearly daily practice of reciprocal altruism among humans today, it is reasonable to assume that it has been an important factor in recent human evolution and that underlying emotional dispositions affecting altruistic behaviour have important genetic components'.[34]

Reciprocal altruism requires a few conditions. Humans must be able to recognise other individuals as reciprocators or non-reciprocators. For this, they must interact frequently to check reciprocation credentials, with frequent reversals of donors and recipients, and must remember past interactions with other group members. Chronic

[32] Hamilton, W. D. (1964b), 'Genetic evolution of social behaviour', II, *Journal of Theoretical Biology*, 7: 17–52; Williams, G. C. (1966), *Adaptation and Natural Selection*, Princeton, NJ, Princeton University Press.

[33] From which comes the gene-centred view of Dawkins, R. (1976), *The Selfish Gene*, Oxford, Oxford University Press.

[34] Trivers, R. L. (1971), 'The evolution of reciprocal altruism', *Quarterly Review of Biology*, 46, 35–57: 48.

cheaters can maintain their strategy only by frequent changes of location, meeting and cheating a series of grudgers susceptible to one-off deception. The mechanisms for detecting cheats are primarily emotional. Emotions are a pan-cultural involuntary and invasive limbic system override shaped by natural selection which adjusts our behaviour in social situations. They animate, focus and modify neural activity in ways that lead us to choose certain responses over other possible responses to the stream of information we constantly receive.[35] Emotions move us to behave in ways that enhanced our distant ancestors' reproductive fitness by 'overriding neocortical decisions suggesting alternatives (i.e. cheating); such alternatives may have been more rational in the short term, but ultimately reduced fitness'.[36]

Because reproductive success is the principal reason for the existence of all sexually reproducing organisms, the emotions accompanying the acquisition or loss of resources that facilitate this goal became the basis for detecting cheats. We feel contentment and joy when we acquire resources, sad and frustrated when we do not, envy when others have more and anger when others try to take them away from us. When we cooperate with others to obtain resources, we experience a sense of friendship and obligation that enhances future cooperation. We feel angry when we cooperate and others cheat, and the cheater also feels anxiety and guilt. The emotions accompanying cooperation are rewarding and those accompanying defection are displeasing. Emotions thus work to keep our temptations in check by overriding rational calculations of immediate gain.

Despite these evolved emotions, the desire to punish that they generate and the grudging strategy followed by most human beings, the continued presence of chronic cheaters among us indicates that our ability to detect and punish them is less than perfect. Because cheating in some circumstances confers fitness benefits, it is unlikely that natural selection can eliminate it.[37] Cooperators undergo evolutionary tuning of their senses for detecting cheats and cheats evolve mechanisms that serve to hide their true intentions. The size of a group in which cooperation is based on reciprocal altruism is limited by memory and knowledge of other people's behaviour. This is true even in modern societies.

[35] Wilson, *Sociobiology*, p. 851.
[36] Walsh, A. (2000), 'Evolutionary psychology and the origins of Justice', *Justice Quarterly*, 17: 841–64, 851.
[37] Ibid., pp. 851–2.

Small groups maintain a stronger capacity for emotional solidarity that makes free riding considerably harder and punishment through discontinued cooperation easier. Therefore, 'inclusive fitness' and 'reciprocal altruism' do not add up to a satisfactory explanation of the human capacity for large-scale cooperation in town-size and larger settlements, which remains a puzzle.

1.5 Punishment and Strong Reciprocity

To fill the gap between forms of reciprocal altruism and the normative requirements for cooperation in large-scale societies, *stronger reciprocity* is needed.[38] Experimental evidence suggests that humans are conditional cooperators and also willing to bear costs to punish unfair behaviour. The willingness to punish is a constant in humans. In small groups, punishment is easy as it is the same thing as non-cooperation and bears no or minimal additional costs. To be excluded from common rituals and the common distribution of food resources is already a punishment leading to physical suffering, lower reproduction capacity and even death. It took a long time for the option to develop for an individual expelled from his/her own community to be able to survive by being accepted and hosted in a different community. In the new community, however, the same problem of ostracism of opportunists had to be faced. Strong reciprocators have a disposition to incur costs to punish the violation of social norms. Potential punishment discourages the individuals who try to cheat the system of cooperation. In this case, the advantages of free riding diminish rapidly. There is some disagreement about when the human disposition for strong reciprocity and altruistic punishment emerged.[39]

If reciprocal altruism generates positive emotions that reinforce cooperation, negative emotions accompany being cheated: '[a] taste

[38] See Gintis, H. (2000), 'Strong reciprocity and human sociability', *Journal of Theoretical Biology*, 43: 169–79; Dubreuil, B. (2008), 'Strong reciprocity and the emergence of large-scale societies', *Philosophy of the Social Sciences*, 38: 192–210.

[39] Some research locates the emergence of strong reciprocity at the time of the speciation of *Homo ergaster*, *erectus* and maybe *habilis* more than 2 million years ago. Other scholars locate this development in the last half of the Pleistocene (about 800,000 years ago) in connection with the rapid cephalisation of *Homo heidelbergensis*, *neanderthalensis* and *sapiens*. Dubreuil, 'Strong reciprocity and the emergence of large-scale societies', pp. 196–7.

of revenge is the other side of the coin of reciprocity'.[40] Victims are angry and hurt at being treated unfairly and feel frustration and confusion at losing the expectation of predictability. The sum of these evolved emotions amounts to 'moral outrage'. Without moral outrage, there would be no motivation to react against those who violate the norms of reciprocity, cheats would have thrived in our ancestral environment and we might have evolved as conscienceless psychopaths. From the evolutionary point of view, it is no use feeling angry and hurt when victimised if these feelings do not generate behaviour designed to prevent their recurrence. Such negative feelings are assuaged by punishing violators. Punishment signals the restoration of fairness and predictability. Punishment must be inflicted collectively; it must be a lynching because the essential element is not the punishment itself but the fact of gathering united in the punishment. In this act, the community not only punishes but also recognises itself as a community and recuperates its sense of orientation.[41] In this case, the role of punishing goes against a rationalistic parading of individual sanctioning.

Therefore, the explanation of cooperation on a large scale is linked to the development of more complex institutions for punishment that make control of the cost and efficiency of punishment possible.[42] Such institutional control requires punishment to not be mere revenge, which can degenerate into a cycle of blood feuds. The urgency for vengeance is not adaptive in social groups much larger than the hunter-gatherer band.[43] The struggle to contain 'revenge'[44] has been conducted at the highest level of moral and civic awareness in each stage of the development of civilisation. This effort is expectable in view of the persistent state of tension between uncontrollable vengeance as a destroyer and controlled vengeance as a component of justice. Moral outrage responses are universally guided by evolved mental mechanisms, but the way in which we respond to wrongdoers is shaped by culture.

In some circumstances, a measure of forgiveness helps to overcome the destructive effects of a pure tit-for-tat strategy and avoids losing

[40] Walsh, 'Evolutionary psychology and the origins of justice', p. 853.
[41] Girard, R. (1972), *La Violence et le Sacré*, Paris, Grassett (English translation: *Violence and the Sacred*, Baltimore, MD, Johns Hopkins University Press, 1977).
[42] Dubreuil, 'Strong reciprocity and the emergence of large-scale societies', p. 203.
[43] Walsh, 'Evolutionary psychology and the origins of justice', p. 855.
[44] Jacoby, S. (1985), *Wild Justice: The Evolution of Revenge*, London, William Collins.

valuable cooperation over an accidental cheating event, in which cases punishment can be disintegrative rather than reintegrative. Forgiveness is contingent on the wrong not being too egregious, payment or restitution, apologies, assurances and so on. If the urge to punish has become inherent in human nature and it serves an expiatory function, we can also temper it with sympathy. Culture may engage the emotions that temper punishment with mercy but it also allows vengeful passions to turn wild. Culture may help us go from repressive to restitutive justice, based more on deterrence.

Therefore, to go along the path of strong reciprocation, institutions are necessary to *facilitate punishment*, *lower the individual costs of punishing rule-breakers* and, at the same time, *discipline revenge*. As cheating is vital for the evolution of cooperation, so deviance is necessary for social solidarity (a synonym for cooperation). The rituals of punishment reaffirm the justness of the social norm.[45]

In conclusion, simple tit-for-tat reciprocity is effective for generating cooperative behaviour in small groups; tit-for-tat modified by punishment is effective against defectors in large groups. Strong reciprocation is the more robust candidate to explain the unique level and patterns of cooperation among humans. The overwhelming anthropological evidence of violence being used and legitimated against rule-breakers also seems to confirm this. Both punishers and non-punishers benefit from the punishment of non-cooperators because the whole group benefits by changing cheating into cooperation. But even if punishment is institutionalised, and its cost is therefore reduced, why should some members of a group punish non-cooperators for the benefit of other members? How does this act increase the punishers' fitness?

1.6 From Strong Reciprocity to Morality

Punishment and revenge are not enough to establish the normative universe. The problem of human morality is more complex than that of cooperation based on inclusive fitness, conditional reciprocation or even strong reciprocation. Human morality consists of a sense of responsibility that humans feel for non-relative others. For individuals interdependent in the search for daily sustenance, the choice of

[45] Spitzer, S. (1975), 'Punishment and social organization: a study of Durkheim's theory of penal evolution', *Law & Society Review*, 9: 613–38.

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companions was essential. Individuals unable to cooperate at the cognitive level (the capacity to understand common objectives or to communicate efficiently with others) were not chosen as companions and had more difficulties in finding food and reproducing. Individuals socially and morally non-cooperative in their interactions with others were left out and alone and their reproductive chances were reduced. If the environment in which behaviours must be fitting is cooperative, then a selection emerged favouring individuals who were more competent, motivated and skilled in cooperation. Their better reproductive capacities slowly made them prevail within the group's population.

These same results can derive from a group selection capacity rather than exclusively from individual genetic selection. Individuals who live in an interdependent and cooperative social group have an interest in caring about the well-being of others.[46] If somebody depended on somebody else, it made sense to help them whenever necessary so that they could be in good shape for the next cooperation. The strong motivation to cooperate led to experiencing sympathy and helping new or already acquired companions. Given that the survival of the individual depended on others considering him or her a good mate, individuals began to worry about how others perceived them. We became oversensitive to the opinions of others.

Laboratory research reveals that human beings involved in cooperation tend to treat others not only with sympathy but also as mates worth equal consideration, with a sense of equity based on the understanding of an equivalence between themselves and others.[47] Mates understood that they could take whatever role they wished in the cooperation, and this helped the development of a sort of 'common mental field' that defined the best way for people to perform their roles.[48] These expectations are 'impartial' in the sense that they specify what each abstract companion has to do to behave correctly. When selecting mates for a cooperative effort, humans wanted to have an individual able to perform an expected role, and those who deviated from what was expected would find it difficult to acquire mates and

[46] See Tomasello, M. (2018), 'L'origine della moralità', *Le Scienze*, November, pp. 66–71.

[47] These results derive from experimental game theory, neural region activation research and studies concerning other emotions such as shame and guilt.

[48] Tomasello, 'L'origine della moralità'.

would eventually develop a sense of guilt. In this way, a morality emerged based on the idea that the 'we' was even more important than the 'I'. In cooperation to defend the group from external threats, these moral prerequisites and the expected performances were even more important. Groups of individuals better equipped with these orientations tended to prevail over groups without them.

Learning to conform was the basis of cumulative cultural evolution. Behavioural studies on three-year-old children show that the fundamental psychological characteristic of individuals adapted to cultural life is the group mentality in which they learn and adopt the cognitive perspective of the whole group.[49] Common goals and the cultural unity of the group help to create an 'objective' perspective; that is, a perspective which is not 'mine' but 'our', of the entire group. Human morality developed the characteristics of an objective form of 'right' and 'wrong'. Of course, individuals could choose to act not according to morality and shared aims, locating themselves outside the values and practices shared by the group, and eventually this could lead to their exclusion from it.[50]

Such an agent-neutral grasp of social norms develops very early in human ontogeny. Children often spontaneously protest against, criticise and teach wrongdoers even in pretend games and scenarios. Recent research also suggests that children pick up social norms quickly, easily and in a systematic and flexible way, and that they learn them from more competent members of their culture. Finally, children make quick inferences from single-action observations about the general normative structure of a type of action. Children swiftly learn about novel norms, follow such norms, enforce them in others in an agent-neutral way, understand some of their essential logical properties and reason about them systematically.

Different disciplines from child development to linguistics offer empirical evidence that human beings are born with a moral grammar hard-wired in their neural circuits.[51] The literature on early

[49] See Schmidt, M. F. H. et al. (2012), 'Young children enforce social norms', *Current Directions in Psychological Science*, 21: 232–6.

[50] See Tomasello, M. (2016), *A Natural History of Human Morality*, Cambridge, MA, Harvard University Press.

[51] See Monroe, K. R., A. Martin and P. Ghosh (2009), 'Politics and an innate moral sense: scientific evidence for an old theory?', *Political Research Quarterly*, 62: 614–34.

cognition[52] suggests that social cognition is not only based on learning and understanding but also incorporates a normative stance. It could not have been any other way if we consider that probably for 6–8 million years our best evolutionary assets were 'cooperative' skills and capacities.

Conventional social norms share several features:

(1) *Normative force and generality*: they stand as standards of correctness and appropriateness. They are agent-neutral in the sense that they are applied to any participant in equivalent circumstances. Such norms can figure as reasons for acting and also as a basis for evaluation and criticism of others' acts.
(2) *Context sensitivity*: most of these social norms apply only to specific social contexts in which their validity prescribes what is appropriate. Children understand that a behaviour is a mistake if performed in the context of a game, but it is perfectly appropriate outside the game context.
(3) *Conventionality*: they exist because of shared assignment and acceptance; they are brought about by the shared intentionality of a community.

The crucial point is that the evolution of morality takes place not only in the field of natural selection but also in that of social selection. Behavioural genetics focusses on the extent to which differences among individuals can be related to their genetic patrimony. Evolutionary psychology focusses on the universal features shared by the members of our species. Evolutionary psychologists are aware that there are genes underlying human traits because we all share a uniform human genotype, but they tend to explain behavioural differences among individuals in environmental, not genetic, terms. Geneticists will not find a justice gene or a cooperation gene somewhere among our chromosomes, much as they will not find an egoistic gene. Genes are strands of DNA that code the acid sequence of a protein or the base sequence of an RNA molecule. They do not code for any kind of behaviour, feeling or emotion, particularly not one as complex as a sense of justice. The protein products of gene activity such as enzymes and hormones (including neurotransmitters) have much to do with how we behave and feel but they do not *cause* us to behave or

[52] See Rakoczy, H. and M. F. H. Schmidt (2013), 'The early ontogeny of social norms', *Child Development Perspectives*, 7: 17–21.

feel a certain way; they facilitate our behaviour and our feelings. These substances produce tendencies or dispositions to respond to the environment in one way or another.[53]

Gene–culture evolution is an important and adaptive way of achieving and maintaining within-group conformity and cooperation (thus enabling processes of genetic and cultural group selection). Norm psychology also enables the diachronic stability necessary for cumulative cultural evolution. Although some form of social expectation exists in non-human primates, no other species shows signs of following social norms and enforcing them in agent-neutral ways on others.

This interpretation is valid for any type of theory of human action: those that see social norms as explanations of behaviours without considering intentional stance information; those that see intentional stance information as influencing the normative evaluation of actions; and those that see the normative evaluation of an action as affecting its intentional interpretation.[54]

1.7 Complex Normative Structures and Early Political Institutions

Hunting and gathering societies in the ethnographic record always have tribal-scale institutions. In a successive phase, bigger social groups faced new challenges or tasks for their survival and attainment of their goals. This generated needs and interests that became conflicting for a confined community. These conflicts were potentially dangerous for

[53] Recently, a number of politics scholars have argued the contrary; that is, that there is a genetic determination of political attitudes. Political behaviour, including political ideologies, pre-dispositions towards liberalism and conservatism, and voting participation, is seen as genetically inheritable. These researchers usually study twins' attitudes. See Alford, J. R., C. L. Funk and J. R. Hibbing (2005), 'Are political orientations genetically transmitted?', *American Political Science Review*, 99: 153–67; Dawes, C. T. and J. H. Fawler (2009), 'Partisanship, voting, and the dopamine D receptor gene', *Journal of Politics*, 71: 1157–71; Fawler, J. H., L. A. Baker and C. T. Dawes (2008), 'Genetic variation in political participation', *American Political Science Review*, 102: 233–48; Fawler, J. H. and C. T. Dawes (2008), 'Two genes predict voter turnout', *Journal of Politics* 70: 579–94; Alford, J. R. and J. R. Hibbing (2004), 'The origin of politics: an evolutionary theory of political behavior', *Perspectives on Politics*, 2, 4: 707–23.

[54] See Granovetter, M. (1985), 'Economic action and social structure: the problem of embeddedness', *American Journal of Sociology*, 91: 481–510.

the group. More complex normative structures made possible a preventative channelling of behaviour and expectations; the possibility of resolution of conflicts; the setting up of organs for the direction of the group; and the setting up of specific procedures to generate imperative measures.

The timetable of this institutional development can be summarised as follows:

(1) The establishment of multi-male/female communities operating a small-scale fission–fusion system[55] held together by male residence and kinship dates to common ancestors of chimpanzees and hominins about 5 million years ago.
(2) The development of a more expanded fission–fusion system and the following spatially segregated communities that were held together by social relationships at a distance, and perhaps even including more exclusive male–female bonds, can be dated to about 2 million years ago and to *Homo ergaster*.
(3) While the oldest social institutions were maintained largely by physical mechanisms, the development of greater capacity for symbolic communication produced a greater variation in the institutional systems in the population that was ancestral to the Neanderthals and modern humans around 300,000 years ago.
(4) The development of larger, more ethnically identified communities with wider socially recognised networks occurred sporadically among the early modern human populations, but they developed extensively in the later Pleistocene hunter-gatherer populations between 100,000 and 20,000 years ago.
(5) A further step is the development of institutions related to aggressive/cooperative inter-group relationships, which were more likely to promote hierarchies. This change is clearly associated with changes at the end of the Pleistocene, although it may have developed sporadically before. These institutions

[55] A fission–fusion society is one in which the size and composition of the social group change as time passes and animals or hominins move throughout the environment, merge into a group (fusion) – for example, sleeping in one place – or split (fission) – for example, foraging in small groups during the day. For species that live in fission–fusion societies, group composition is a dynamic property; see Aureli, F. et al. (2008). 'Fission-fusion dynamic', *Current Anthropology*, 49: 627–54.

included egalitarian counter-balances preventing people from appropriating disproportionate shares of food; more formal political leadership including chieftainship; marriage in the form of contracts between families; kinship systems regulating social relationships between families; and monogamy and polygamy.[56] Humans' Pleistocene evolutionary experience did not prepare us to tolerate more than minimal command and control institutions and neither were we prepared to tolerate much inequality.[57] The punishment of deviant behaviour and norm violation effective within the family and kinship structures constituted by itself a principle of stratification based on subordination, age, grade or other stratarchical principles defining who has the duty to punish. In subsequent group-societies defined as trans-egalitarian, both private property and institutionalised hierarchies exist based on economic factors but in an attenuated form. Equality among families is often prized and excessive ostentation is regarded as unbecoming, but in fact inequalities are visible in banquets, funeral rituals and burials, and the worship of the dead and ancestors. Therefore, it is likely that some inequalities developed before agriculture and anthropologists tend to locate this at about 15,000 years ago.

(6) Then, agriculture brought about sedentary life, the possibility of exclusive land control, its hereditary transmission and the development of socio-economic inequalities. This was the beginning of highly stratified societies with pronounced productivity, high population density, economic competition and status differences.[58] The creation of village-size settlements related to increasing social differentiation and internal ranking. Hierarchical authority emerged, leaders acquired great power to coerce other citizens and people in high positions of command and control acquired a disproportionate

[56] Foley, A. R. (2001), 'Evolutionary perspectives on the origins of human social institutions', in Runciman, *The Origins of Human Social Institutions*, pp. 192–3.

[57] Richieston and Boyd, *Institutional Evolution in the Holocene*, p. 207.

[58] On the emergence of inequality and social stratification I rely on the evidence discussed in Hayden, B. (2011), 'Feasting and social dynamics in the Epipaleolithic of the Fertile Crescent', in Aranda Jimenez, G., S. Monton-Subias and M. Sanchez Romero (eds.), *Guess Who's Coming to Dinner: Feasting Rituals in Prehistoric Societies of Europe and the Near East*, Oxford, Oxbow Books, pp. 30–63; and the special section on good transmission and inequalities in pre-modern societies in *Current Anthropology*, 51: 7–126.

share of society's rewards. The creation of cities and settlements of tens of thousands of people introduced the 'centralisation of power' and a differentiation between the centre and the periphery.[59] At this stage there was an institutional objectification of the punishment function, at least for those offences that concerned the whole group of society. This is a process of delegation of the duty to sanction from personalised authorities to functionally specific roles through institutions.

Command and control institutions have always existed. What was new after the Neolithic revolution was their complexification and differentiation. At the new larger scale, command and control institutions had to prevent selfish temptations to expropriate advantages, nepotisms, cabals of reciprocators, organised predatory bands and classes or castes with special access to means of coercion. Further institutions developed to tame coercion and its use for narrow advantage. Some institutions balanced this situation by somehow policing the police so that they could act to the advantage of larger interests, to a certain degree at least.

The creation of political hierarchies is probably linked to the need for large-scale societies to control the rising costs and complexity of punishment.[60] The emergence of complex, specialised and differentiated institutions for the punishment of opportunistic behaviour could be the consequence of new general cognitive resources allowing *Homo sapiens* to fully represent the point of view of others. Human species prior to *Homo sapiens* were probably not able to share the duty of punishment even if the populations of *Homo ergaster*, *erectus* and *neanderthalensis* could already be composed of strong reciprocators, which explains why they were unable to live beyond small-size bands.

However, the early development of political hierarchies and of institutions of command and control should not be seen exclusively in the light of the in-group control of opportunist and deviant behaviours in enlarged groups. The *internal dimension* of enforcement problems – fostering cooperation, limiting free riding, punishing non-reciprocators and so on – could be solved satisfactorily by customary and social

[59] Earle, T. K. (1997), *How Chiefs Came to Power: The Political Economy of Prehistory*, Stanford, CA, Stanford University Press.

[60] Dubreuil, 'Strong reciprocity and the emergence of large-scale societies', p. 205.

norms. Moreover, these internal problems of the group were unlikely to overcome the fears and costs associated with the setting of stronger political authority in egalitarian groups. The monopolisation of political authority was an enforcement improvement for the traditional norms regulating internal life and disputes, but this was not its main functional reason.

Anthropology and primatology studies suggest that although we may have a deeply rooted instinct to exert power over others, we also have a strong aversion to abuses of power, along with some natural tendencies to punish people who commit such abuses. This belief was strong, and males who turned into selfish bullies, or tried to boss others around, were treated brutally as moral deviants. Despite these strong egalitarian beliefs, hunter-gatherers faced bullies or self-aggrandising political upstarts and had to be vigilant against inequality. Otherwise, they would soon have turned hierarchical, as in fact they did in the phase of sedentary life and agriculture. However, strong resistances to authority existed within the group that could only be overcome by even stronger threats to physical integrity. The 'monopolisation' of political authority took place not (only) to curb and punish in-group opportunism but primarily to effectively survive as a group in a violent world.

Although it is well known that animals can kill members of their own species, within the world of vertebrates there are no instances of the large, deliberate, organised massacres possible among humans. However, the tendency towards violence as an inherited genetic feature is contested. For most scientists, human nature may embrace motives that lead to aggression but also motives like empathy, self-control and reason, which, in the right circumstances, can outweigh the aggressive impulses.[61] Because of the absence of long-range weapons, it seems that war, in the sense we understand it today, was impracticable until about 40,000 years ago. Studies that consider both ethnographic and genetic data conclude that the people of the *sapiens* who left Africa were carriers of a culture that was both violent and inclined to war. This is witnessed not only by violent behaviours but also by the presence of certain traditions (such as competitive sports, ritual fights and wrestling games) that are usually associated with violent cultures. The

[61] See the discussion of the issue in Pinker, S. (2011), *The Better Angels of Our Nature*, New York, Viking.

evidence of the innate aggressiveness of humans remains uncertain but, for that concerning the early 'out of Africa', it is more convincing.[62]

The relationship between *Homo sapiens*, *Cro-Magnon* and *neanderthal* is a good test case. The latter two species coexisted for about 60,000 years in the Levant and perhaps for longer around modern-day France. We share elements of DNA with the Neanderthals.[63] It is argued that the *Cro-Magnon* were the cause of the Neanderthals' extinction. About 15,000 years ago at the end of the last glaciation, the *Cro-Magnon* also disappeared. The artifices of the caves of Altamira and Lascaux left room for new populations coming from the highlands of modern-day Anatolia, Iraq and Iran. Were they responsible for this quick extinction of the previous species? There is no concluding evidence, although these extinctions increase the doubt concerning the peaceful orientation of modern *Homo sapiens*.

It seems that our daily life within groups tends to be quiet and non-aggressive, while we are extremely aggressive towards other groups. The explanation is that we are a domesticated species; we are dogs, not wolves. We have auto-domesticated in the sense that to live together we began to select lower aggressiveness traits and to eliminate those who used violence to their advantage within the group and did not conform to the norms and rules of the group. The paradox is that our in-group docile and cooperative nature has evolved thanks to our past capacity to be out-group organised murderers.[64] After all, to be an organised murderer, one needs a high level of in-group cooperation. Next to egalitarian internal drives, *Homo* evidences aggressiveness in inter-group relations superior to that of other primates. As far as out-group relationships were concerned, we were not selfish but instead aggressive and orientated to the physical annihilation of the adversary.

Scholars disagree on whether war and mass killing are an evolutionary tendency of humans to eliminate competitors or a phenomenon

[62] Moreno, E. (2011), 'The society of our "Out of Africa Ancestors" (I): the migrant warriors that colonized the world', *Communicative and Integrative Biology*, 4: 1–9. The study also concludes that many other hunters and gatherers, such as the African Bushmen and Pygmies, among the most ancient genetic ancestors, were clearly non-violent cultures.

[63] Green, R. E., J. Krause, A. W. Briggs et al. (2010). 'A draft sequence of the Neandertal genome', *Science*, 328, 5979: 710–22.

[64] This thesis is documented in Wrangham, R. (2019), *The Goodness Paradox: The Strange Relationship Between Virtue and Violence in Human Evolution*, New York, Pantheon Books.

that only emerged in recent millennia, when changes in social and environmental conditions offered both the logistics and motivations for mass killing. One line of research argues that there are almost always archaeological proofs of bellicose episodes, and that to attribute about 25 per cent of all deaths to wars could be a conservative estimation.[65] A different line insists that, although humans have an obvious capacity to wage war, the instinct to identify and kill adversaries is not ingrained in their brains. Only the increase in size and complexity of human groups and the development of agriculture saw the emergence of lethal attacks.[66] If the question of the natural aggressiveness of humans remains controversial, the idea that intense violence and a high number of victims characterised the prehistoric period is widely shared: 'Most ethnographically reported chiefdoms seem to be involved in constant warfare.'[67]

Anthropologists and archaeologists disagree and hesitate to attribute the development of political institutions to the constitutive role of warfare and physical insecurity. The reason is that war activities are less documented than bureaucratic developments.[68] It is, however, likely that local hierarchies were under constant threat of being ousted by alternative ones, and that subjects were under constant threat of being conquered, killed and dispossessed in a lost war. Groups without an efficient defence/aggression command would fail to deploy the defence mechanisms that could ensure their survival when facing groups which had such institutions. The primordial development of a monopolistic provider of behavioural compliance was a fitting solution for group survival, providing evolutionary advantages in a situation of inter-group violence.

[65] LeBlanc, S. A. with K. E. Register (2003), *Constant Battles: The Myth of the Peaceful, Noble Savage*, London, St Martin's Press.

[66] Mead, M. (1990 [1940]), *War Is Only an Invention – Not a Biological Necessity*, in *The Dolphin Reader*, 2nd edition, Boston, MA, Houghton Mifflin Company, pp. 415–21.

[67] Wright, H. (1977), 'Recent research on the origin of the state', *Annual Review of Anthropology*, 6: 379–97, 381–2.

[68] Archeologists use four types of evidence to ascertain war activities: (1) art works on the walls of caves showing people at war; (2) evidence of armaments; (3) ruins of defensive settlements; (4) skeleton remains and signs of wounds (although it is often difficult to say if they come from war or simply local violence). See Ferguson, B. (2018), 'Perché combattiamo?', *Le Scienze*, 603, November, pp. 72–7.

In conclusion, the process of 'monopolisation' of political authority was greatly facilitated by the need for effectively surviving as a group in a violent world. Fundamental political predicaments which are unmanageable theoretically and impossible to solve on a rationalistic cooperation basis are easier to overcome in the face of the colossal stakes of inter-groups conflicts. Political institutions emerged very early and did not derive from the customary and social ones that served the function of internal disciplining and punishment (I shall return to this point in Chapter 7).

Therefore, in the development of political institutions, we should distinguish four distinct mechanisms: (1) internal punishment; (2) external survival; (3) protection from rulers; and (4) defence against private predation.

(1) The first political institutions for the life of a group must have been rules about the *punishment of internal opportunists*. These mechanisms required minimal institutional development in the form of customary norms and enforcement was easy (withdrawal of cooperation, expulsion from the group, exile, ostracism).
(2) Pre-human and human groups developed effective norms/rules *to ensure the external security and survival* of the group itself. Defence/offence needs were an important push towards the acceptance of the increasing capacities and powers of rulers. Effective leadership in times of harsh confrontation was a necessity that required selection rules.
(3) A third institutional development regarded institutions for the internal *protection of the ruled from the rulers* when the role of the latter and the instruments of rulership at their disposal developed to such an extent that they could generate risks of predation. Both institutions punishing opportunists and institutions offering effective defence from external threats can be abused by those who administer them, particularly when the size of the group grows and when reciprocation mechanisms and credentials are no longer based on face-to-face relations.
(4) The fourth mechanism concerns *protection against private predatory activities of other individuals and groups*, particularly at a stage in which pronounced inequalities emerge in the enlarged society. Protection of the members from the consequences of the internal asymmetries of resources becomes crucial. As much as one

> fears that rulership pursues its own goals without consideration of the interests and preferences of subjects, one also fears that other groups may influence it to their disadvantage.

These four different drivers all rest on and require a positive disposition towards cooperation. They imply, nonetheless, that institutions, and particularly political institutions, did not emerge in the same way and in response to a unique functional problem. They may be a response to foster cooperation and reduce transaction costs, but they may be a response to the need to militarily defend or expand territories and subjects. They may emerge to limit a ruler's predatory activities or they may also reflect aspirations for domestic equality and safety from predation by another domestic group.

The drivers of these four processes of institutional emergence introduce more dynamics and breadth into the history of government than any single functional explanation can ever do. They help explain the process of political institution innovation. We may have (1) a spontaneous generation of institutions from repeated and customary agreements among a set of qualified actors not subject to external interference; (2) transformation over time into consolidated institutions of practices imposed or initiated by rulers; (3) the creation of new institutions by qualified political institutions; and (4) revolutionary political innovations at times of discontinuity in territorial polities and regimes.

Moreover, the four different drivers are important in explaining variations: to explain why societies in some parts of the world evolved more rapidly than others; why the trajectories are many and not identical; why the pace of change is differentiated; and why we observe so many examples of declines, collapses and setbacks. The interactions between the four mechanisms better explain a feature of the history of government: political innovations were generated again and again in different parts of the world at different times and suffered decay again and again, and were rediscovered and readapted and decayed again and again. This is less likely if one single functional pressure and a single generation mechanism are at work. For instance, if limiting the predatory ambition of the ruler was the primary reason for institutional innovation, it would be difficult to understand the frequent deinstitutionalisation and decay of rather effective institutions. Instead, it makes sense to hypothesise that whenever the concern for a military enterprise of a defensive or

offensive nature became predominant and the extraction/coercion mechanism was triggered to this effect, the effective institutional arrangements for limiting the predatory ambitions of the rulers suffered deinstitutionalisation and decay. Writing a history of government dealing with the interaction among the four political institution development mechanisms is a fascinating exercise, with a high explanatory potential.

1.8 Conclusion

A few million years ago, our ancestors lived in very small communities organised around kinship and reciprocity. Today we observe societies regulated by many complex institutions. The big bang in this normative structure occurred during the last 20,000 years. Since then, humans organised in groups have developed the ability to bring to success colossal operations, generate a complex morality that emphasises responsibility towards others and is enforced through reputation and punishment, and exterminate other species and their own.

Evolutionary anthropologists, palaeontologists and psychologists agree that the key social institutions predate the anatomically modern *Homo sapiens*. Some of them, such as communities, male kin-bonding, exclusive mating patterns and possibly descent groups, were probably in existence long before the origins of our species. Others developed thousands of years after the first *Homo sapiens*. However, the tendency to cumulatively build ever more complex institutions did not appear until the end of the Pleistocene.[69] Human civilisation probably began when humans conceived of the community as their best instrument for survival in the awareness that a group represents an apparatus far superior to the individual for supplying goods. Population growth and civilisation are associated with and perhaps caused by the complexification of institutions. Our propensity to cooperate and our willingness to punish defectors have, therefore, very old evolutionary roots and are the distinctive evolutionary mark of our species.

Overall, evolutionary biology is critical of cultural and group selection as important forces in nature. Hamilton's idea of 'inclusive fitness' suggests that altruistic and cooperative behaviours can develop if they

[69] Foley, *Evolutionary Perspectives on the Origins of Human Social Institutions*, p. 191.

contribute to the fitness not only of the individual but also of related individuals.[70] Organisms should engage in altruistic and cooperative acts only when the benefit to the recipient exceeds the costs to the provider by a factor greater than the reciprocal of the relatedness by common descent between them. The theory predicts that altruism will be rare and decidedly unfitting. Group selection is not an important force as it is not 'an efficient way to select for traits, like altruistic behaviour, that are supposed to be detrimental to the individual but good for the group . . . group selection for altruism would be unlikely to override the tendency of each group to quickly lose its altruists through natural selection favouring cheaters'.[71]

However, many evolutionary biologists accept that human development presents particular features and that 'human social groups represent an almost ideal model for potent selection at the group level'.[72] Studies that focus on natural selection in conditions of the fight for survival in the wildlife of the forest have difficulty in considering other kinds of environments such as those predominating in the conditions of the life of *Homo*. Darwin suggested a group theory in his late work, arguing that the evolution of groups could affect the survival of individuals.[73] In his rarely

[70] Hamilton, W. D. (1964a), 'The genetical evolution of social behaviour', I, *Journal of Theoretical Biology*, 7: 1–16.

[71] Coyne, J. A. (2011), 'Can Darwinism improve Binghamton?', *New York Review of Books*, 9 September. See also Wilson, *Sociobiology*. Wilson's positions have, however, changed over time. See Wilson, D. S. and H. E. O. Wilson (2007), 'Rethinking the theoretical foundation of sociobiology', *The Quarterly Review of Biology*, 82: 327–48 and Symons, D. (1989), 'A critique of Darwinian anthropology', *Ethology and Sociobiology*, 10: 131–44.

[72] 'First, the human species is (and possibly always has been) composed of competing and essentially hostile groups that frequently have not only behaved toward one another in the manner of different species, but also have been able quickly to develop enormous differences in the reproductive and competitive ability because of cultural innovation and its cumulative effect. Second, human groups are uniquely able to plan and act as units, to look ahead and purposely carry out actions designed to sustain the group and improve its competitive position . . . in seeking to define the adaptiveness of culture, to analyse directions of cultural change, and to identify the sources of cultural rules, we cannot ignore or downplay effects significant at the group level. On the other hand, the existence of group functions does not erase functions at the individual and family levels, and therefore does not preclude a significant within-group reproductive function.' Alexander, D. R. (1974), 'The evolution of social behavior', *Annual Review of Ecology and Systematics*, 5: 325–83, 336–7.

[73] Darwin, C. (1871), *The Descent of Man, and Selection in Relation to Sex*, London, John Murrey, p. 87.

cited work devoted to the selection of domestic animals and plants, reproducers are not selected according to their best-fitted predominance but because of choices based on economic, aesthetic or other reasons.[74] The human-dominated environment radically modifies natural selection mechanisms and produces results that are very different, if not opposed, to those that natural selection would retain in the wild and over a much longer timeframe. Many Darwinist scholars pay much attention to the possibility of human group selection.[75] Some continue to support group selection to explain the rapid rise of human civilisation and see direct group selection on genes as a process that could give human groups a degree of integration.[76] Other scholars go completely beyond genetic selection and argue that processes related to culture are prone to group selection.[77]

Legitimately, geneticists and evolutionary biologists ask their own question: 'what does the evolution of genes explain?' They do not ask the different question: 'what explains institutions?' The fact remains that inclusive fitness and conditional reciprocation can only explain cooperation among related individuals and in small groups, while large-scale human societies are a theoretical puzzle for only-genes evolution models because they include more cooperation between distantly related people than one would expect. Moreover, the colossal development of humans' normative structures in a relatively short period of 15,000–20,000 years, during which genetic selection has no role, remains mysterious. Genetic theories encounter considerable problems in explaining the origins of punishment and revenge, not to mention morality or complex institutional structures. If 'evolution' means that every individual tries to maximise his own fitness, how did we manage to feel obliged to be honest with others and help them? Similarly, who would incur the costs of punishment if they do not increase individual fitness?

[74] Darwin, C. (1868), *The Variation of Animals and Plants Under Domestication*, vol. 1, London, John Murrey.

[75] See the review of the debate about individual and group selection in Kramer, J. and J. Meunier (2016), 'Kin and multilevel selection in social evolution: a never-ending controversy', *F1000Research*, 5: 776.

[76] Wilson, D. S. (2015), *Does Altruism Exist? Culture, Genes, and the Welfare of Others*, New Haven, CT, Yale University Press; Nowak, M. A., C. E. Tarnita and H. E. O. Wilson (2010), 'The evolution of eusociality', *Nature*, 466, 7310: 1057–62.

[77] Richieston and Boyd, *Institutional Evolution in the Holocene*.

Evolution is based on random mutations, their fitness to the environment and the deriving reproductive success. Organisms may become extinct because of an unfavourable development in the environment, while others may get an evolutionary bonus from the same change.[78] The question is what the proper *environment* to evaluate fitness is. If we restrict the environment to the natural conditions of the forest, it is difficult to depart from pure gene-based evolution and from its limited capacity to generate cooperation. On the contrary, if we consider that hominids and early *Homo* evolved in a complex and demanding social environment made up of a dense framework of norms and institutions, this was the environment in which the fitness of random mutations and the reproductive capacities of individuals were decided. Those individuals that more easily adapted to the predominant norms were then more likely to be regarded as best mates and spouses and enjoy the reproductive advantages of such a situation.

Together with genetic selection based on the uniquely cooperative group environment of our hominid and *Homo* ancestors, we need to consider the extraordinary force of cultural selection that operated next to it. Our early and inherently advantageous predispositions to cooperate became objectified, contributing to our revolutionary capacity to always generate new institutional frameworks. This indicates that we have complex and strong imitating capabilities and we are highly sensitive to the positive or negative response of relevant others. Cultural transmission means that the behaviour of the individual largely depends on the behaviours common to the population she lives in and from which she acquires her beliefs. Parents, teachers and peers can shape human behaviour rapidly and easily. We get our genome all at once and it remains unchanged for our entire life, while the acquisition of the adult cultural repertoire takes at least two decades and remains open to further elaboration and change. What one person invents another can imitate, unlike gene transmission. We have a higher possibility of picking and choosing among potential cultural variants and we can modify them. We shape our behavioural repertoire by imitating others, making somewhat biased choices among the cultural variants

[78] Biological evolution theory never refers to perfection or efficiency. Evolution is a functional selection mechanism that tolerates imperfection and even inutility. Darwin was worried by organs that were highly imperfect or totally useless, and also by those that were almost too perfect (like the human eye).

we observe and sometimes contributing independently with new adaptive behaviours. However large the diversity of cultural traits is, we are bound to learn those of the culture of our environment and of our time. Cultural evolution has its own particular adaptive properties and particular maladaptation. Rapid social learning allows humans, and only humans, to accumulate innovations more rapidly than individual genetic selection alone could. This may take generations, but it takes place much more rapidly than organic evolution.

How did we develop instruments of cooperation like institutions? We had 7 million years to solve this problem. It is likely that our relatively new status of living in overcrowded communities has exacerbated problems of coordination and cooperation that were not crucial during the long period in which our biological evolution and our brains were shaped. It might well be that in their recent cultural evolution humans have developed more individualistic and egoistic orientations, but based on existing evidence it is difficult to believe that in their long-term biological evolution they have survived thanks to these orientations.

The 'state of nature' and ego-driven evolution remain the premise of rational choice methodological individualism in the social sciences. This envisages an (individual) actor primarily, if not exclusively, concerned with her own advantage and unilateral action, unencumbered by any evolved and embedded normative orientation, endowed with cognitive skills to evaluate the advantages of cooperation from egotistic premises and, therefore, constantly struggling with the problem of cooperation which is excluded from her evolutionary patrimony. This perspective consequently understands norms deductively as resulting only from the rationalistic capacity of humans to devise equilibrium situations and self-enforcing outcomes.[79] It does not engage with the empirical evidence about the evolution of *Homo* and their ancestors and it is, therefore, impossible both to sustain and to falsify it with empirics. However, none of these premises correspond to the available evidence offered by the evolutionary sciences of biology, psychology, palaeontology, anthropology and neurosciences. We should not reify human nature, but remain open to the new contributions of these

[79] On the origin of norms in this perspective, see Margalit, E. U. (1977), *The Emergence of Norms*, Oxford, Oxford University Press.

disciplines. We should not resort to the hypothetical 'state of nature' if our evolutionary history does not support this hypothesis. The fact that opportunists exist does not justify the choice to take them as the ontological reference for human nature against all the accumulated direct and indirect evidence of our ancestral cooperative orientation.

An approach combining genetic influence with cultural influence over several recent (from a biological point of view) generations seems necessary, and a model showing gene–culture co-evolution appears a more realistic hypothesis. Theories of human evolution need to take on board the fact that the environment in which it operated was for millions of years a cooperative environment. From the factual point of view, in one way or another, we have adaptively evaded the Hamiltonian rule.