SURVIVAL, SOCIETY, AND ETHICS IN HUMAN EVOLUTION

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Summary

The human lineage presents a series of rather weak and frail creatures, poorly fitted for survival. Our success as the dominant, most widely distributed mammal stems from having exchanged learned behavior for instinct, and forming organized social groups. Within these, our ancestors invented artifacts and ways of using them as substitutes for the claws, fangs, fur, speed, and strength by which other animals wrest survival.
Learning is a far more versatile and plastic guide to behavior than is instinct. However, it carries a high organizational cost. Social groups must be stable and cooperation within them closely coordinated if teachers are to invest their time and energy in sharing their knowledge and skills. The learned technology of survival encompasses not only the manufacture of artifacts, but also the techniques and optimal conditions of their use. The development of language expanded the sphere of shared thought and action to incorporate elsewhere in time, space, and reality than the concrete present. It increased the learning load and the organizational need for establishing, maintaining, and constantly adapting agreed conventions of behavior and interpretation of experience so that group cooperation could occur within a common set of expectations and coherently explore new ones.

Social organization is as vital to human survival, and is as great an achievement, as is the technology that is produced and used within societies. The magnitude and complexity of the tasks of learning and remembering are mitigated by a series of

hierarchically ordered rules of progressively increasing scope, generality, and authority. At the apex of the hierarchy are ethics—the cardinal points by which society orients itself in determining whether, and to what extent, an action is right or wrong and, thus, in defining the point of balance between good and bad.

1. Humans Evolving

1.1. The Hypothetical Biological Human

Biologists raised in the tradition of judging evolutionary fitness in terms of a species' anatomical and physiological characteristics, with little or no consideration of its behavior, ought not to have expected much from early humans. By those limited, unrealistic criteria our distant ancestors showed very little indication of producing descendants who would become the most widely distributed mammal species, capable of defeating (at least temporarily) almost all other life forms in a contest for survival. A human is an animal without much strength for its medium to large size. Its soft, short claws are not fit for ripping open anything much more resistant than fruits and soft-skinned animals; its stumpy, blunt teeth, set in rather weak jaws, are little better. Only the best specimens of the species can manage a speed of 35 kph, but for no further than a couple of hundred meters. As a predator, this creature's capability is limited to slow, weak, and soft-skinned prey—such as some kind of unfortunate cross between a tortoise and a hare. The defensive capability of this fictitious naked, unarmed human would be sorely stretched by anything larger and fiercer than a medium-sized dog. Excepting sight, its senses have poor acuity and precision and only warn of very close danger or announce the presence of food at very short range. The almost-bald body limits the comfortable working zone to between 12°C and 30°C and is prone to sunburn, and other harm from solar radiation.

The species has some advantages: its eyesight is superior to that of most other mammals in acuity and range of distance accommodation, and in perception of color. Its gut is able to digest a broad variety of foodstuffs that is equaled by only pigs and a few other mammals. The bipedal hominid gait confers several benefits: first, in terms of energy-expenditure rather than speed, it is a very efficient way of getting around on land. Second, leaving the work of walking and running to the lower, or hind, limbs avoids the need to synchronize thoracic compression and extension (hence, breathing and heart rates) with exertion of the forelimbs in a tetrapedal canter or gallop, thus alleviating a significant amount of stress on lungs and heart. This gives us exceptional endurance, matched by few other mammals. Third, freeing the forelimbs from walking and running and making them available for grasping gives us greater mobility over a wider variety of obstacles than most mammals can manage. We are not the best runners, swimmers, or climbers, but star in this particular triathlon event. Fourth, we have been able to develop greater flexibility of movement of our forelimbs and manual dexterity than would have been possible had we still used them for locomotion. This enabled our ancestors to make and use all manner of artifacts. It also permitted a wide range of gestures, which may have been a vital step in the development of language.

These hypothetical humans would have been good scavengers and foragers. Able to economically cover large tracts of varied country and eat a wide range of plants and most fresh animal remains they came across, they could eke out an existence in open tropical and sub-tropical savanna and grassland where the relative ease of travel, the diversity of plant foods, and density and variety of fauna would favor their modest capabilities. When immediately threatened by predators or dangerous competitors for the spoils of scavenging they could escape by climbing trees and rocks. But it would have been a miserable existence. For breeders of small numbers of young that were, furthermore, highly dependent for their first three or four years, it would have been a precarious balancing act over the abyss of extinction.

In the traditional biologists' view, the enhanced efficacy gained from a species' anatomical and physiological specialization shortened the odds to favoritism. However, specialization is bought at the cost of evolutionary potential. Although this anatomical and physiological portrait of a hominid is of a rather sadly unpromising also-ran, it is also one of a generalized primate—not very good at anything in particular, but a versatile creature that could turn its nimble hand to almost any task, and able to adapt to a wide range of diets and habitats and vary its behavior accordingly.

1.2. Real Humans and Their Evolutionary Strategy

The preceding fantasy is, of course, invalidated by the omission of the social and cultural capabilities of even early pre-human hominids. They shared the common lot of all life forms of having to use the resources of materials, energy, and information available to them in their environment to resist the pressures with which their environment surrounded them: cold, heat, thirst, hunger, disease, predation, competition from other species, and other threats to their survival. Their puny claws and small, blunt teeth would, as I have shown, have been of limited use in food getting and defense.

The evolutionary strategy of most other animals is to change their genes to suit their environment and gain some advantage through anatomical and physiological adaptation. Our distant ancestors developed their life-support systems by changing their environment to suit their genes. In their adaptive strategy our forebears took a different course; they sought and contrived the technological fix even before becoming, strictly speaking, human. Instead of resorting to the conventional biological solution of waiting for genetic change to grow sharp fangs and effective claws, hominids of some two million years ago used their small manual strength to make tools and weapons that were substitutes for these. They devised techniques of sharpening sticks and bones, and of cleaving stone to form pointed and edged implements for cutting, crushing, and digging. Then, much later, they devised missiles that could stun and pierce and kill, and ways of launching them with enough force and accuracy to compensate for their own bodily frailty.

Humans are not, of course, the only users of tools. Who is not entranced by the sight of a sea-otter floating on its back, balancing a stone on its belly between its forepaws and using this stone as a hammer to smash open a crustacean or shellfish too tough to crack with its jaws? It is understandable that this should delight, for it is a neat and undeniably purposive sequence of actions. The otter first catches its prey and, holding it in its mouth, searches the sea floor for a suitable stone, which is grasped with paws and brought to the surface to break open the meal.

All otter species are playful creatures, a trait that increases the probability of their inventing novel sequences of action. It is less unsettling of our view of their intellect to ascribe the origin of this behavior to an accident of their play, subsequently spread by imitation, than to their having thought it all out. Most apes are also playful, although more ponderously so than are otters, and it is as plausible that early hominid Pithecanthropus also unintentionally played their way into the technology of making and using tools and other artifacts. Perhaps, like sea otters, they subsequently realized that they made survival easier and purposefully perpetuated the toys and tricks.
This is not to say that our species abandoned evolutionary genetic change. We do not appear to have altered our gross anatomy to any great extent; specimens of quite early *Homo sapiens* would probably, if suitably groomed and garbed, pass unnoticed among today's professors, princes, and politicians. But there has been significant genetic change to our fine anatomical structures and physiology over the intervening thousands of generations and there is no reason to suppose that it will cease. Not all of it has been to our obvious benefit. However, the principal human strategy has been to change our environment to fit our genes as expressed in our physical and mental makeup. It was a slow revolution over more than two million years.

One of their powerful early adaptive techniques was the control of fire. It gave them warmth to withstand some of the stress of cold and, in their cuisine, the means to make many foods more efficiently digestible, yielding higher amounts to energy than when eaten raw. Brain tissue is metabolically very expensive and the improvement to their energy supply that cooking brought may have contributed to the increase in brain size at this time. Furthermore, cooking neutralizes the toxins of many animal and plant foods, effectively expanding the spectrum of human food sources.

Technological development was initially slow. Tens of thousands of years passed with almost no changes until about the last hundred thousand years. A very important effect of technological development was to make available to its hominid users a growing proportion of the total amounts of materials, energy, and information contained in their environment. We now do this on so gigantic a scale and so rapidly as to threaten our (and countless other species') survival but, over our long history, it gave our ancestors an increasingly secure subsistence base and buffer against environmental pressures and better chances of survival. Technology has never been an infallible shield against environmental hazards; 20 or more other hominid species with comparable technology appear to have dwindled to extinction, as have more recent human populations (e.g. the fifteenth-century Danish settlers in Greenland). Many others perished or suffered dreadfully, but the steady trend has been to higher rates of survival and increasing populations—to the point at which the consequences of overpopulation now appear among the major hazards to the survival of our and other species.

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Biographical Sketch

George Silberbauer was born in Pretoria, South Africa, in 1931. Professor Silberbauer was educated at the University of Stellenbosch, University of London, Gray's Inn, the University of the Witwatersrand, and the University of South Africa, and completed his Ph.D. at Monash University, Australia. He served in the South African Air Force (Maritime Group), and in Her Majesty's Colonial Service in Botswana (formerly the Bechuanaland Protectorate) as the District Commissioner Ngamiland, Kasane, and Ghanzi and the Bushman Survey Officer. Professor Silberbauer was senior lecturer in the Department of Anthropology and Sociology at Monash University and Director at the Koorie Research Centre. He has been a distinguished visitor in anthropology and archaeology departments of several North American universities, and a visiting foreign fellow in the Department of Archaeology at the University of Cape Town. With the added experience of being a firefighter and the secretary of the Upper Beaconsfield Rural Fire Brigade, Professor Silberbauer has been a consultant to the Country Fire Authority in Victoria for the analysis of major bushfires, and to the Shire of Yarra Ranges in Victoria for fire warning systems. He is a member of the State Community Recovery Committee and the Yallock River Improvement and Rates Committee.

Professor Silberbauer's publications include *Bushman Survey Report* for the Bechuanaland Government (1965), *Hunter and Habitat in the Central Kalahari Desert* (1981), Cazadores del Desierto, *Editorial Mitre* (Barcelona, 1983) as well as numerous papers on Bushmen, Australian Aborigines, socio-ecology, government and indigenous peoples, conservation, ethics, waterway management, bushfires, disaster management, and recovery.

Besides his academic achievements, Professor Silberbauer's interest lies in maritime history, gardening, drawing unrecognizable caricatures, and doing the bidding of the cat in whose house he and his family live.