

## *Chapter One*

### A Fable; the Whole Story in less than 2,500 Words

Of all the animals in the woodland surely it is the deer that most excites human imagination? A peaceful herbivore, the deer's survival over aeons of time has depended on its ability to sniff out danger, and then to run off to safety faster than any other creature. Over millions of years it has developed the sleekest and most powerful combination of bone structure, muscle and tendon so making it a veritable icon of animal fitness.

It takes all of two years for the young fawn to learn enough about the art of survival from its mother to move off to live on its own. Once responsible for itself the young deer has learnt not to panic when danger approaches, but to stand stock still so as to attract no attention; to sniff the air for the scent of danger; to hold a leg just off the ground to detect the slightest vibration of an approaching predator, and to flex its ears to pick up the faintest of sounds. All those skills have been perfected by its ancestors over vast periods of time and have become part of the instincts that create the character of a deer. A powerful set of survival skills it seems. But now no longer quite enough.

Setting out on its own as dusk creeps over the woodland the deer comes on a clearing of unnaturally level and hard ground. Suddenly, around a corner approaching at high speed, comes a noisy contrivance sporting two bright headlights. The young deer does everything that its instincts have taught it to do - in an instant it becomes immobile, sniffing the air furiously, sensing the vibrations and testing its muscles for action – but unsure of where to go. Mesmerised by the lights the young deer remains rooted to the spot a split second too long, and that young prince of animals, the ultimate descendant of an ages-old line of evolution, is killed instantly as it is hit head-on by a car. The car is probably a write-off, and the driver - if he is lucky enough to survive - curses the animal for its 'lack of intelligence' in not getting out of his way.

Like the deer, humans too are the result of an incredibly long saga of evolutionary adaptations that has taken us to the point where we have the intelligence and motor skills to build a car, send a man into outer space, and to carry out phenomenally complicated medical operations using the power of the new nanotechnologies<sup>1</sup>. Because humans have evolved big brains, rather than a deer's athletic anatomy, it takes our young far longer to grow up<sup>2</sup>. Unlike the fawn, whose brain was nearly fully-formed at birth, human babies are born with incredibly premature brains so that two thirds of brain growth happens after birth, (an evolutionary compromise made necessary by the narrowness of the woman's birth canal resulting from our species learning to stand upright)<sup>3</sup>. So most human brain growth is shaped, not simply by instincts in the womb, but by the lessons we draw from real-life experience. Here is the secret of our phenomenal brain: every baby is born with a variety of inherited predispositions that enable it to so internalise such real-life experiences that it is able literally to

grow its own brain, (in a way that the fawn does not) and so reflect the increasing complexity of the environment in which it finds itself. Thus humans have the capability to adapt, in very quick time, to almost any environment - always providing they keep every one of their mental antennae alert to further environmental change<sup>4</sup>.

Within the past three hundred years (a mere split second on our evolutionary time-scale) our ancestors have developed a range of technologies that have enabled our species to spread out across the globe. There are now some twenty times as many of us as there were when the first steam engine was invented in 1728; ten times as many of us as there were in 1824 when the first railway engine enabled a man to go faster than on the back of a horse, and two-and-a-half times as many as there were at the start of World War II less than seventy years ago. This vastly inflated population (some would say a population waiting for Mother Nature to carry out a savage cull) has only been made possible by turning much of the world's population into 'specialists', people who so concentrate on the efficient production of the individual components of a machine or a process, that they have little or no understanding of how any of this actually comes together.

Within the past two hundred years ever fewer young people now learn about growing up through participating in what were until very recently family farms, businesses or community projects for which they had to learn how every subpart contributed to the usefulness of the final product. They had to know how things worked, for theirs was a world in which connectivity was obvious - the strength of a chain was well understood to be dependent on its weakest link, just as the speed of a convoy depended on the speed of the slowest ship. Ours is a world of information saturation where the power of computers doubles every eighteen months, and it is estimated that the world produces about five exabytes of new information per year (an exabyte is a billion gigabytes). That's about 37,000 times the amount of information held in the Library of Congress. This brings enormous opportunities: ten years ago who would have thought of "googling" an old friend and five years ago who would have known what a "wiki" was?

But it has also brought problems. In our search for greater material rewards, we seem to have decided that there is no longer any reason for young people to learn, as did the apprentices of old, by working alongside older people whose daily livelihood depended on the entire team completing a product that was needed, and was saleable. Instead, and especially in the past sixty years, we have decided that youngsters should spend even longer studying in ever greater detail, and in theory rather than practice, a single aspect of a sub-component, or a sub-discipline, as defined by somebody else. This, we are told, will enable the wonderful productivity of the present technological world to thrive.

In exchange for what was once the satisfaction gained from a job well done, as shipyard workers cheered when the boat they had built together for two or three years finally slipped into the water, people are now paid good money for a job that may have little or no intrinsic satisfaction. All it gives them is a wadge of twenty-pound notes to spend in their free time, but not the satisfaction of a job well done. Too many of us don't even realise how vulnerable this makes us, because we have too readily exchanged wealth today for any sense of personal responsibility for the future. Education for many has come to mean doing what you are told and not asking awkward questions.

"Cultural speciation" – cultural change requiring people to modify their behaviours and attitudes that is, – proceeds infinitely faster than does "biological speciation", the development of biological adaptations to changed sets of circumstances. In other words, what we are now expecting from individuals in our so-called advanced culture has far outrun those adaptations inherited from the past which, when properly utilised, streamline the operation

of the brain. While the human race is wonderfully empowered by its ancestors, it is certainly constrained as well. It seems that we are endlessly adaptable, but only up to a point. Being driven to live in ways which are utterly uncongenial to our inherited traits simply drives people mad<sup>5</sup>.

In the past twenty or thirty years scientists have learnt much about the grain of the brain. We now know that, because of our initial physical vulnerability we learn a whole raft of skills in the first seven or eight years of our lives through closely imitating the actions of our parents and teachers. Young children's learning is clone-like. It is entirely appropriate that a young fawn should grow up as a mirror of its parents. But for a human child to grow up merely as a clone at a time when the cultural and economic environment is changing so rapidly, would be nothing short of a disaster. In our time the next generation has to be equipped to go where no one has gone before.

To do this we must not forget the past, but at the same time we have to recognise that to twenty-first century man the past is only a partial clue to the future. The massive structural changes in the adolescent brain that scientists are now discovering through extensive functional MRI scans, apparently shake the internal mechanisms of a teenage brain to its roots. If this is true, and all the signs would suggest that it is, then these have to be essential evolutionary adaptations that ensure the survival of the human race by forcing teenagers to break away from their parents and teachers. "Get off my back", adolescents down the ages have pleaded, "Leave me alone. Give me space". Adolescence is about growing up and no longer thinking like a child. It's about ceasing to be a clone. Sitting still (if only for part of the time!) may be an appropriate learning environment for the pre-pubescent child, but it is largely inappropriate for adolescents whose biological pre-dispositions urge them to find out things for themselves.

And here is the crux of the present advanced world's dilemma. Little more than a hundred years ago American psychologists started to define this self-defining rebelliousness of adolescence as a disease, an aberration, something that had gone wrong, something that meant that teenagers were becoming a threat to themselves. Psychologists and educational bureaucrats alike concluded that something had to be done to prevent teenagers from screwing up. Because that was how they saw it. Adolescence seemed suddenly to be a threat to the careful and comfortable world that teachers of the earlier years had created<sup>6</sup>.

Educational administrators saw only one answer to the problem: put adolescents into school for longer and longer, and give them so much studying to do that they wouldn't have the time or energy to question what an adult society was actually doing to them. And we're still doing this today. So policy makers, with little background in the neurological processes, expected that, by about the age of twenty-two or twenty-three, the next generation of young people would have been 'broken in' to the currently-defined way of doing things. In this their thinking resembled that of horse breeders who, until very recently, thought it necessary to break in a young foal after it has run relatively wild for two years. Now horse breeders carefully study the temperament of every foal, and then define unique training programmes that build upon, and extend, what each can do naturally. Human adolescents crave and deserve no less. Deep down there stirs within them the urge to climb the mountains of the mind and see what possibilities lie before them; they are innately Big Picture thinkers, and frequently upset older generations by questioning the compromised lives so many of us lead. That is their nature. It is the apparently unreasonable dreams of adolescence that, years later, drive the progress of what we are proud to call our civilisation. It has always been so.

And yet, curiously, educators and politicians over decades have come to see schooling as a way of breaking children into what society defines as growing up, through becoming

complacent pupils dependent on instruction<sup>7</sup>. More recently society has so outlawed adolescence that most people simply accept the specialised roles that have been created for them, and have but a limited capability to look beyond their restricted world view to see the ecological, environmental and social crises that are hurtling towards them.

By trying to subvert the natural processes of growing up in order to fit more comfortably into our present economic state, we have created whole generations of young people and adults who are now mesmerised by the bright lights of a way of living that is hurtling, out of control, towards us. Like the young deer, we too are transfixed by the lights which are about to destroy us. Far too many of today's so-called 'educated' people know of no way to find a solution that has not already been prepared for them and described in a text book. It is because we have effectively told young people not to think for themselves, but to follow instructions. This could well be the end of the world which our ancestors laboured to create, and which we have inherited. If it is, it will be our fault for not using the power of our brains to avoid the fate either of the lemmings, or the dodo.

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The argument of this book is that the world crisis that is upon us is the unintended consequence of an education system designed at another time, and for another purpose<sup>8</sup>, and now utterly inappropriate to human and planetary needs<sup>9</sup>. To turn the tables in time to avert any or all of the four great crises facing humanity – climate change, terrorism, over-exploitation of resources and sheer mental collapse – we have to start educating people to think responsibly for themselves and to recognise the connections between phenomena that our educated specialists until now seem so incapable of comprehending<sup>10</sup>. In the recognition that adolescence is an opportunity, not a threat, lies society's best assurance of a positive future.