Essential Biology

The grain of the brain

There is not much that today's children don't know about human biology, but there is an awful lot about the neuro-biology of human learning that politicians don't seem to understand... simply to teach a child something is no guarantee that it will be learnt.

To appreciate the difficulties experienced in today's schools it is necessary to go back four million years to the time when our ancestors first came down from the trees. Being able to see more than their forbearers, the first humans started to use their brains so much that they got progressively bigger. Bigger brains necessitated bigger skulls; the bigger the skull the more difficult it was for the baby to get down the mother's birth canal as she struggled to balance precariously on only two legs.

Over a thousand generations evolution reached an extraordinary compromise: whereas other mammals give birth to their young with their brains almost fully formed, today's human babies are born with brains only some 40% structurally formed. At birth humans are more vulnerable than any other species with their brains not reaching structural completion until the age of three.

So, with such an inauspicious start to life, how do babies not only survive, but thrive? It comes down to three factors. Humans are born inquisitive; from the darting eyes of the youngest child to the endless questions of a two-year-old each is setting out to make their own sense of the world. They 'make sense' by activating a whole series of genetically transmitted 'preferred ways of doing things' which enabled their ancestors to survive – like the extraordinary innate ability to learn a language and to structure words into a sequence that transmits meaning. And, thirdly, as any parent knows, the baby awakens in adults the strongest possible imperative to protect and succour.

Nature doesn't act on its own, it is activated through Nurture. If that nurture is missing, or only partially expressed, many of those genetically transmitted predispositions simply disappear. The greatest incentive to learn is to develop control over one's future; children play at being parents because, at a deeply intuitively level, they know that is what life is all about – passing on the nurture that earlier helped them to be the person they think they now are. Until the age of eight or nine children are clone-like learners... they copy, and (largely) are anxious to please.

What works well below the age of ten or eleven is often totally inappropriate for twelve and above. Here is the rub that so often escapes policy makers. For children to remain clone-like in their learning would mean that the next generation would only be fitted for their parent's world. Adolescence is a biological predisposition which, however unpleasant it may be for parents, is a biological necessity... this is the stage when the youngster, able to build on the earlier skills and clone-like learning of the school child, starts to break away from his dependence on somebody else's thinking.

Adolescence is as much a time-limited predisposition as well as was the earlier ability to use language. If modern society, fearing that adolescence will upset its comfortable and predictable world, tries to 'overschool' those young people whose natural urge is to 'get out and do it for themselves', then today's politicians will be in danger of fossilising a whole generation, making them forever dependent on someone else to tell them what to do. That would be a travesty of our biology and a tragedy for our society.

See Actions 1 and 8 of the Briefing Paper