Our age reveres the specialist but humans are natural polymaths, at our best when we turn our minds to many things

I travelled with Bedouin in the Western Desert of Egypt. When we got a puncture, they used tape and an old inner tube to suck air from three tyres to inflate a fourth. It was the cook who suggested the idea; maybe he was used to making food designed for a few to go further. Far from expressing shame at having no pump, they told me that carrying too many tools is the sign of a weak man; it makes him lazy. The real master has no tools at all, only a limitless capacity to improvise with what is to hand. The more fields of knowledge you cover, the greater your resources for improvisation.

We hear the descriptive words psychopath and sociopath all the time, but here’s a new one: monopath. It means a person with a narrow mind, a one-track brain, a bore, a super-specialist, an expert with no other interests — in other words, the role-model of choice in the Western world. You think I jest? In June, I was invited on the Today programme on BBC Radio 4 to say a few words on the river Nile, because I had a new book about it. The producer called me ‘Dr Twigger’ several times. I was flattered, but I also felt a sense of panic. I have never sought or held a PhD. After the third ‘Dr’, I gently put the producer right. And of course, it was fine — he didn’t especially want me to be a doctor. The culture did. My Nile book was necessarily the work of a generalist. But the radio needs credible guests. It needs an expert — otherwise why would anyone listen?

The monopathic model derives some of its credibility from its success in business. In the late 18th century, Adam Smith (himself an early polymath who wrote not only on economics but also philosophy, astronomy, literature and law) noted that the division of labour was the engine of capitalism. His famous example was the way in which pin-making could be broken down into its component parts, greatly increasing the overall efficiency of the production process. But Smith also observed that ‘mental mutilation’ followed the too-strict division of labour. Or as Alexis de Tocqueville wrote: ‘Nothing tends to materialise man, and to deprive his work of the faintest trace of mind, more than extreme division of labour.’
Ever since the beginning of the industrial era, we have known both the benefits and the drawbacks of dividing jobs into ever smaller and more tedious ones. Riches must be balanced against boredom and misery. But as long as a boring job retains an element of physicality, one can find a rhythm, entering a ‘flow’ state wherein time passes easily and the hard labour is followed by a sense of accomplishment. In Jack Kerouac’s novel *Big Sur* (1962) there is a marvellous description of Neal Cassady working like a demon, changing tyres in a tyre shop and finding himself uplifted rather than diminished by the work. Industrialism tends toward monopathy because of the growth of divided labour, but it is only when the physical element is removed that the real problems begin. When the body remains still and the mind is forced to do something repetitive, the human inside us rebels.

The average job now is done by someone who is stationary in front of some kind of screen. Someone who has just one overriding interest is tunnel-visioned, a bore, but also a specialist, an expert. Welcome to the monopathic world, a place where only the single-minded can thrive. Of course, the rest of us are very adept at pretending to be specialists. We doctor our CVs to make it look as if all we ever wanted to do was sell mobile homes or Nespresso machines. It’s common sense, isn’t it, to try to create the impression that we are entirely focused on the job we want? And wasn’t it ever thus?

In fact, it wasn’t. Classically, a polymath was someone who ‘had learnt much’, conquering many different subject areas. As the 15th-century polymath Leon Battista Alberti — an architect, painter, horseman, archer and inventor — wrote: ‘a man can do all things if he will’. During the Renaissance, polymathy became part of the idea of the ‘perfected man’, the manifold master of intellectual, artistic and physical pursuits. Leonardo da Vinci was said to be as proud of his ability to bend iron bars with his hands as he was of the Mona Lisa.

Polymaths such as Da Vinci, Goethe and Benjamin Franklin were such high achievers that we might feel a bit reluctant to use the word ‘polymath’ to describe our own humble attempts to become multi-talented. We can’t all be geniuses. But we do all still indulge in polymathic activity; it’s part of what makes us human.

So, say that we all have at least the potential to become polymaths. Once we have a word, we can see the world more clearly. And that’s when we notice a huge cognitive dissonance at the centre of Western culture: a huge confusion about how new ideas, new discoveries, and new art actually come about.
Science, for example, likes to project itself as clean, logical, rational and unemotional. In fact, it’s pretty haphazard, driven by funding and ego, reliant on inspired intuition by its top-flight practitioners. Above all it is polymathic. New ideas frequently come from the cross-fertilisation of two separate fields. Francis Crick, who intuited the structure of DNA, was originally a physicist; he claimed this background gave him the confidence to solve problems that biologists thought were insoluble. Richard Feynman came up with his Nobel Prize-winning ideas about quantum electrodynamics by reflecting on a peculiar hobby of his — spinning a plate on his finger (he also played the bongos and was an expert safe-cracker). Percy Spencer, a radar expert, noticed that the radiation produced by microwaves melted a chocolate bar in his pocket and developed microwave ovens. And Hiram Maxim, the inventor of the modern machine gun, was inspired by a self-cocking mousetrap he had made in his teens.

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Despite all this, there remains the melancholy joke about the scientist who outlines a whole new area of study only to dismiss it out of hand because it trespasses across too many field boundaries and would never get funding. Somehow, this is just as believable as any number of amazing breakthroughs inspired by the cross-fertilisation of disciplines.

One could tell similar stories about breakthroughs in art — cubism crossed the simplicity of African carving with a growing non-representational trend in European painting. Jean-Michel Basquiat and Banksy took street graffiti and made it acceptable to galleries. In business, cross-fertilisation is the source of all kinds of innovations: fibres inspired by spider webs have become a source of bulletproof fabric; practically every mobile phone also seems to be a computer, a camera and a GPS tracker. To come up with such ideas, you need to know things outside your field. What’s more, the further afield your knowledge extends, the greater potential you have for innovation.

Invention fights specialisation at every turn. Human nature and human progress are polymathic at root. And life itself is various — you need many skills to be able to live it. In traditional cultures, everyone can do a little of everything. Though one man might be the best hunter or archer or trapper, he doesn’t do only that.

The benefits of polymathic endeavour in innovation are not so hard to see. What is less obvious is how we ever allowed ourselves to lose sight of them. The problem, I believe, is some mistaken
assumptions about learning. We come to believe that we can only learn when we are young, and that only ‘naturals’ can acquire certain skills. We imagine that we have a limited budget for learning, and that different skills absorb all the effort we plough into them, without giving us anything to spend on other pursuits.

Our hunch that it’s easier to learn when you’re young isn’t completely wrong, or at least it has a real basis in neurology. However, the pessimistic assumption that learning somehow ‘stops’ when you leave school or university or hit thirty is at odds with the evidence. It appears that a great deal depends on the nucleus basalis, located in the basal forebrain. Among other things, this bit of the brain produces significant amounts of acetylcholine, a neurotransmitter that regulates the rate at which new connections are made between brain cells. This in turn dictates how readily we form memories of various kinds, and how strongly we retain them. When the nucleus basalis ‘switched on’, acetylcholine flows and new connections occur. When it is switched off, we make far fewer new connections.

Between birth and the age of ten or eleven, the nucleus basalis is permanently ‘switched on’. It contains an abundance of the neurotransmitter acetylcholine, and this means new connections are being made all the time. Typically this means that a child will be learning almost all the time — if they see or hear something once they remember it. But as we progress towards the later teenage years the brain becomes more selective. From research into the way stroke victims recover lost skills it has been observed that the nucleus basalis only switches on when one of three conditions occur: a novel situation, a shock, or intense focus, maintained through repetition or continuous application.

Over-specialisation, eventually retreats into defending what one has learnt rather than making new connections

I know from my own experience of studying martial arts in Japan that intense study brings rewards that are impossible to achieve by casual application. For a year I studied an hour a day three days a week and made minimal progress. For a further year I switched to an intensive course of five hours a day five days a week. The gains were dramatic and permanent, resulting in a black belt and an instructor certificate. Deep down I was pessimistic that I could actually learn a martial art. I thought you were either a ‘natural’ or nothing. Then I saw natural athletes fall behind when they didn’t practice enough. This, shamefully, was a great morale booster.
The fact that I succeeded where others were failing also gave me an important key to the secret of learning. There was nothing special about me, but I worked at it and I got it. One reason many people shy away from polymathic activity is that they think they can’t learn new skills. I believe we all can — and at any age too — but only if we keep learning. ‘Use it or lose it’ is the watchword of brain plasticity.

People as old as 90 who actively acquire new interests that involve learning retain their ability to learn. But if we stop taxing the nucleus basalis, it begins to dry up. In some older people it has been shown to contain no acetylcholine — they have been ‘switched off’ for so long the organ no longer functions. In extreme cases this is considered to be one factor in Alzheimers and other forms of dementia — treated, effectively at first, by artificially raising acetylcholine levels. But simply attempting new things seems to offer health benefits to people who aren’t suffering from Alzheimers. After only short periods of trying, the ability to make new connections develops.

And it isn’t just about doing puzzles and crosswords; you really have to try and learn something new.

Onopathy, or over-specialisation, eventually retreats into defending what one has learnt rather than making new connections. The initial spurt of learning gives out, and the expert is left, like an animal, merely defending his territory. One sees this in the academic arena, where ancient professors vie with each other to expel intruders from their hard-won patches. Just look at the bitter arguments over how far the sciences should be allowed to encroach on the humanities. But the polymath, whatever his or her ‘level’ or societal status, is not constrained to defend their own turf. The polymath’s identity and value comes from multiple mastery.

Besides, it may be that the humanities have less to worry about than it seems. An intriguing study funded by the Dana foundation and summarised by Dr Michael Gazzaniga of the University of California, Santa Barbara, suggests that studying the performing arts — dance, music and acting — actually improves one’s ability to learn anything else. Collating several studies, the researchers found that performing arts generated much higher levels of motivation than other subjects. These enhanced levels of motivation made students aware of their own ability to focus and concentrate on improvement. Later, even if they gave up the arts, they could apply their new-found talent for concentration to learning anything new.

I find this very suggestive. The old Renaissance idea of mastering physical as well as intellectual skills appears to have real grounding in improving our general ability to learn new things. It is
having the confidence that one can learn something new that opens the gates to polymathic activity.

There is, I think, a case to be made for a new area of study to counter the monopathic drift of the modern world. Call it polymathics. Any such field would have to include physical, artistic and scientific elements to be truly rounded. It isn’t just that mastering physical skills aids general learning. The fact is, if we exclude the physicality of existence and reduce everything worth knowing down to book-learning, we miss out on a huge chunk of what makes us human. Remember, Feynman had to be physically competent enough to spin a plate to get his new idea.

Polymathics might focus on rapid methods of learning that allow you to master multiple fields. It might also work to develop transferable learning methods. A large part of it would naturally be concerned with creativity — crossing unrelated things to invent something new. But polymathics would not just be another name for innovation. It would, I believe, help build better judgment in all areas. There is often something rather obvious about people with narrow interests — they are bores, and bores always lack a sense of humour. They just don’t see that it’s absurd to devote your life to a tiny area of study and have no other outside interests. I suspect that the converse is true: by being more polymathic, you develop a better sense of proportion and balance — which gives you a better sense of humour. And that can’t be a bad thing.

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