Intelligent Chips?

By
David Wasdell

In his book, 'The Mighty Micro', Dr. Evans, psychologist and computer scientist has provided an excellent treatment of the impact of the computer revolution. In its commentary this paper focuses on some of his important asides dealing with the philosophy of science, the nature of intelligence and the psychological and religious behaviour of man.[1980]

Produced By: Meridian Programme, Meridian House, 115 Poplar High Street, London E14 0AE,
Hosted By: Unit for Research into Changing Institutions (URCHIN), Charity Reg. No. 284542
Web-site: www.meridian.org.uk

Intelligent Chips?

[Notes on 'The Mighty Micro', the impact of the Computer Revolution by Christopher Evans, published by Gollancz, London, 1979]

Dr. Christopher Evans was a psychologist and computer scientist and begins his book with a review of the past history of the computer revolution from the earliest calculating machines up to the arrival of the transistor. He then reviews the present, the short-term future, the middle-term future and the long-term future, together with a digression on intelligent machines.

Quite apart from the book's excellence as an introduction to the subject, there are some important asides dealing with the philosophy of science, the nature of intelligence and the psychological and religious behaviour of man. For instance, referring to some of the resistance to the use and development of computers he writes,

> Page 65
>
> 'Another factor could be psychological inhibitors. By this I refer largely to negativistic feelings about computers which operate in the individual at an unconscious or, at best, vaguely expressed level They are not tied to computers but reflect a basic unease with science and technology itself. This unease may have deep roots, tracing back to Man's painful awakening to the fact that he lives in a dangerous universe where survival is dependent upon physical resources, and where magical or “spiritual” back-up tends to be unreliable. It may also be of more recent origin and not unrelated to the explosion of the first nuclear weapon at Hiroshima.'

This 'painful awakening' has much to do with the process of 'realisation' as distinct from the previous idealisation processes which gave rise to the religious Weltanschauung. The painful awakening appears to be another way of expressing the process of birth into reality, as distinct from the process of regression into the idealised good primal environment subsequently projected onto the cosmos.

Moving onto the question of the definition of intelligence, Christopher Evans leaves aside as inadequate most of the dictionary attempts and offers as 'the most basic and fundamental definition of intelligence that one can find':-

> Page 157
>
> 'Intelligence is the ability of a system to adjust appropriately to a changing world, and the more capable of adjusting - the more versatile its adjusting power - the more intelligent it is.'

Christopher Evans then isolates and identifies six factors which, taken together, constitute intelligence in animal, man or machine.

Page 165

'Data Capture Ability: An entity is intelligent to the extent that it can extract information from the universe around it. All other things being equal, the better its data capture (sensory) abilities, the more intelligent it is.

'Data Storage Capability: An entity is intelligent to the extent that it can store information once captured, which can be referred to on future occasions to improve its ability to adjust. The greater its data storage capacity, the more intelligent it is.

'Processing Speed: An entity's intelligence is partly a function of the speed with which its brain/computer can process information. This refers to the switching speeds of its basic units which in the case of most animals are neurones, and in computers, are microtransistors.

'Software Flexibility: An entity is intelligent to the extent that its software is rapidly and easily modifiable. This may be one of the most important of the factors.

'Software Efficiency: The way in which the system's software has been written will affect the entity's capacity to adjust to novel happenings in its environment. The more efficient the software (the quicker it runs, the less prone to errors and breakdowns, the less "program space" it occupies) the more intelligent the entity.

'Software Range: The bigger and wider the range of programs with which a system is equipped and with which its central processor can cope, the more intelligent is the creature.'

Those six factors represent the field agenda for the increase of intelligence in human beings. Changes in human behaviour and performance which affect in a positive direction one or more of these six factors will lead to increased intelligence. The factors can also be applied to institutional ability to adapt to a changing environment, leading to the concept of multi-humanoid intelligence or institutional intelligence. They can in fact be applied to any open system represented by an inside and an outside, a boundary and a transaction process.

Clearly the paranoid-schizoid defences against anxiety inhibit the attainment of potential intelligence in every single factor. Amelioration of these primitive anxiety defences can therefore be expected to lead to significant development in the capacity of human beings to relate functionally with their environment.

It is interesting to see, however, that Christopher Evans accepts the classical Freudian and Kleinian position that those characteristics which appear as innate or post-natal represent the unalterable datum of human behaviour. This would appear to be a direct import from his own psychological training and background. For instance, he writes,

Page 164

'What we casually term "intelligence" is an amalgam of a number of different faculties, all of which are innate - built into the organism and present at the time of birth. In the course of life these abilities are exercised as a result of the creature's interactions with the world around it, and it gradually becomes more and more able to cope in a frequently hostile, always changing environment. This means, incidentally, that one should discriminate between the being's innate intellectual endowment which it shares with all other members of its species, and its achievement or performance level, which will vary from individual to individual and which depends on its experience and opportunities throughout life..... The logic of this argument seems to be heading towards the controversial view that all members of the human species are, in terms of their intellectual endowment, more or less identical at birth, and that the vast differences which appear to exist in human intellectual performance are all to do with their experiences in life - the opportunities which the world has offered to their software.

> Tempting though it may be to follow this point through, it is not really relevant and we had better move on.....'

Such comments may be appropriate for a computer which has given circuitry, together with certain basic machine- code programs built into it at the factory and which are therefore 'innate' once it is delivered to the user. At this point user-programming takes over but the 'intelligence' of the machine is already fixed. Birth, however, does not represent the same kind of 'delivery'. The processes of introjection, projection, idealisation, and denial are laid down in the intra-uterine and perinatal fields of experience and represent therefore innate programming of the organic chip which constitutes the brain. In so far as response to externally applied stimuli reactivates the primitive anxiety defence traces just so far does this innate program matrix constitute a dysfunctional constraint on the achieved intelligence levels of the person concerned. The attribution of instinct, innate, or given qualities, to these fundamental programs places them beyond program modification and underlies Christopher Evans basically fatalistic attitude. Once the primal (intra-uterine and perinatal field is admitted for both analysis and therapy, then access is gained to a much wider range of re-programming capacity for the human module. In other words modification of the previously presumed 'innate' intelligence levels can be achieved by primal integrational therapy. The processes employed are those of cathartic abreaction of primal impingement and loss (which underlie the paranoid-schizoid mechanisms, namely, idealisation, splitting, projection, introjection, denial, reification), together with the annealing of the conflicted and ambivalent states underlying depressive anxiety. As the energy vested in sustaining primal splitting and denial is reduced and as the libido engaged in holding the balance between the previously ambivalent reactions of the depressive position is freed, so vastly greater levels of personal energy become available for learning, for management of change, and authentic interaction across the personal boundary with the environment. Annealing of the conscious/unconscious split also occurs, giving much greater conscious access to the symbol processing parts of the brain, i.e. those which handle high levels of data integration and conceptualisation.

Following this material through it would seem that achieved intelligence may well be a function firstly of the level of primal splitting and denial, reflecting the intensity of primal impingement, together with the opportunities provided during the developmental phase of life for re-integration of the primal splitting (as distinct from reinforcing of the primitive anxiety defences which, while leading to lessened anxiety, should not be confused with integration). These processes affect the 'programmability' of the module ('software flexibility'), while the quality and content of the learning environment to which the person is exposed will largely determine the content of further programming.

Turning to the purpose or underlying survival drive of human beings, Christopher Evans makes so me interesting comments with far reaching implications.

> Page 170
>
> 'Biological systems (which, until the advent of computers, were the only intelligent things around on this planet) are multi-purpose devices. Their principal purpose, as Richard Dawkins points out in his magnificent book The Selfish Gene, is not to give a whole lot of animals of varying degrees and complexity a good time for a few months or years of life, but rather to act as vehicles which ensure the survival and continued evolution of the gene - the package of coded information which all living things carry buried in every cell in their body. This horrendous concept - the total prostitution of all animal life, including Man and all his airs and graces, to the blind purposiveness of these minute virus-like substances - is so desperately at odds with almost every other view that Man has of himself, that Dawkins' book

has received a bleak reception in many quarters. Nevertheless his argument is virtually irrefutable.'

He then goes on to elaborate the complexity of sub-goals and their associated sub-sub-programs which accrete around this fundamental drive. One of the implications which he does not however bring out has bearing on his treatment of the Ultra- Intelligent Machine. If Dawkins' argument is accepted, then the underlying purpose of all sub-programs and enactment has to do with the survival and replication of the gene of the species concerned. Thus the machine-creating programs of the industrial culture, and more recently the cybernetic programs of the computer revolution, have as their underlying and fundamental purpose the furthering of genetic survival and replication of the human species. If that is so, then the underlying purpose of any man-generated machine must be that of the service of the gene base. Breakdown in this purposive dependence of the Ultra- Intelligent Machine would represent the point at which such hyper-intelligent devices ceased to be tools and became masters, taking on fundamental purpose goals independent of, and potentially at variance with, their human originators. If that point is reached, then we shall have acted as the creators of a new genetic species, albeit parasitically dependent on the organic ecosystem for certain of its functions, as indeed is man himself.

Page 171

'Whereas advanced biological intelligences have to carry round huge software packages simply in order to survive, computers are not bound by the same constraints. Their relative position on the macro-graph and their rather sluggish rate of progress give a highly misleading indication of their true status and potential. For example they do not, and I am sure never will, have to devote any software to support a complex reproductive system; humans kindly attend to all these matters for them. Nor does any software have to be given over to maintenance and repair functions, or to providing immunological defences against bacterial or viral assaults. Once again humans wait there in the wings to build and restore. Nor do they need elaborate suites of programs to enable them to hoist their bodies all over the place in search of food or escape danger. Nor yet - it is a formidable list of bonuses whose significance becomes more and more apparent as one thinks about it - do they need a huge range of interlocking programs to allow them to enjoy good food and drink, nor a host of other sensory thrills which most biological beings experience, from basking in the sun to making love.'

The implication being of course, that in the absence of the need to generate exponentially more complex life support programs as intelligence increases, the exponential development rate of machine intelligence is liable to have a vastly shorter doubling time than the exponential development of biological model intelligence.

Towards the end of the book, Christopher Evans moves on to examine some of the social and psychological implications of the computer revolution.

Page 209

'Another dramatic effect of the Computer Revolution may be to put an end to war. War has been such a universal feature of Man's tempestuous history that it is hard to imagine him existing without it. But the reverse is really true - today it is hard to imagine him existing with it. War weapons have reached a state of such awful efficiency that a no-holds-barred conflict - a significant possibility at any moment - could eliminate Man and all his dependent species within a few days. There may be creatures, such as those limpets behind the rocks, who could manage to pull through, and if so it would be convincing testimony that animals equipped with a powerful biological computer supported by huge banks of software were not good bets in evolutionary terms. It is not the possession of software that is dangerous, but

> the possession of large amounts of it. The limpet has hardly any, and what it has is devoted to simple digestive and reproductive needs, and there is none left over to get it into trouble. Man has large amounts of it, much devoted to ensuring his survival in a world full of prey and predators. Unfortunately most of this software is instinctive and tends to be devoted to ruthless, selfish aggression. The remainder, which is non-instinctive (" learned") tends to run in a different direction. But the balance favours the instinctive, and the consequence is that Man acquires great technological mastery of his world, but, when under threat, reverts with terrifying ease to the programs inherited from his jungle and cave-man past.
>
> 'Instincts come with the system at birth, and cannot be erased. This suggests that in the long run we are doomed, since our capability for instant destruction grows while our inclination to unleash that power remains undiminished.'

The power and energy required to suppress these instinctive, social, aggressive, and destructive responses is potentially available within the computer revolution. Thus,

> Page 210
>
> 'But it may be that we are moving towards a position where we can not only redress the balance but also weight it heavily against the instincts. This will not be achieved by some miraculous modification of our own biological software, but rather by supplementing it with the intellectual power of computers and, when they come into being, of the Ultra-Intelligent Machines. As our social, political and economic problems grow, we shall turn to the computers for advice, prediction and strategic planning. Much of this will inevitably be devoted to militaristic matters.....'

He then proceeds to a brief review of computer-aided warfare and its horrors, followed by comments on the fact that computer-modelling of the likely outcome of war actually decreases the possibility of unleashing the potentially self-destructive forces which modern warfare represents.

The assumptions underlying this section are derived from classical Freudian and in part Jungian psychoanalysis. Human learning is confined to the post-natal field, the primal (intra-uterine and perinatal) experience which lies behind the formation of the 'instincts' is not perceived as learned experience. Its traces are therefore not open for re-learning, unlearning or modification and the so-called instincts generated are perceived as given, unalterable factors in human behaviour which require suppression and control in order to ensure survival. This fundamental fallacy then fuels Christopher Evans' future scenario of the use of computer-aided intelligence to control and suppress the effects of the aggressive, instinctive, responses so effectively reinforcing the primitive mechanisms of idealisation, (splitting) and denial, and in so doing actually vesting with greater energy the idealised bad (persecutory) primal object and environment. Whatever the intelligence and power of the cybernetic control systems utilised, man would be caught up in a vicious circle of dehumanising control, held in a knife-edge balance of power. The process of history has tended to indicate that such unstable positions of power balance require increasing investment of energy, money, manpower as well as increasing dragooning of the human populations involved to the point at which they reach a meta-stable or hyper-stressed condition in which they are exposed to sudden and total system collapse. At this point the defences against psychotic anxiety break down and the societal system is overwhelmed by the emergent anxieties, persecutory phantasies and retaliatory behaviour.

Our current critique of the work of Melanie Klein leads to the emergence of an integrational construct which operates by abreactive annealing of primal idealisation and denial, bleeds the

energy out of the primitive anxiety defence systems and allows a steady dismantling of those social reifications of anxiety defence at present utilised as defences against the emergence of psychotic behaviour at societal level. Such a program enables disarmament to proceed on the grounds of lowered persecutory anxiety. All current attempts to force disarmament rely on appeals to higher levels of anxiety on the boundaries of humanity as a reason for annealing the splits (and therefore disarming the armies) which exist at sub-racial level. I see current attempts at disarmament therefore as actually increasing societal paranoia and intensifying the need for more effective anxiety defence systems as controls over the emergence of social psychosis.

These two pathways for the future of mankind could not be more opposed. Integration and its concomitant reduction in instinctive aggression is antithetical to the program of repression and control promulgated as an answer to man's current social distress.

David Wasdell
38th March 1980