EXTERNAL VERSUS INTERNAL EVOLUTION

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During his history on earth, man has passed through three main periods which have changed the way he lives and expanded his ability in dealing with his environment :

First - when he used hand tools

Second - when he used machines

Third - when he used artificial intelligence.

The first period started when man used hand tools for hunting and farming, which transferred him to a higher level of existence. He used them to defend himself against the wild animals and his enemies. In addition, his ability to survive was increased by the adoption of new hunting and farming methods, by which he was able to secure food in an easier and secure way all the year round.

The second period started with the industrial revolution, when man used machines to perform physical tasks, and carry out ideas not possible before -with or without his hand tools - due to his limited physical abilities. Thus, his physical abilities by which he could exercise more control over his environment were expanded. This period also expanded his senses and mobility, leading to an expansion of his understanding and the range of experiences to which the individual could be exposed in a life time.

The third period started with his use of artificial intelligence and computers. This expanded and will continue to expand his mental abilities, in the way the machine

expanded his physical power, in performing calculations, complicated mental tasks and information storage which was either not possible previously or took a long time to perform or recall.

But with all these benefits, there are two sides to the coin. If man is able to understand the harmful effects of these aids, he might be able to control such effects after enjoying the benefits of the useful aspects.

After millions of years, life on this planet reached its present form in response to the stress of function. Human beings have fingers, eyes, ears, liver, heart, etc. each to perform a specific function or functions. In addition, man has acquired via the ladder of evolution three basic characteristics responsible for his present position :

1. His ability to think;
2. His ability to act;
3. His ability to feel and believe.

The first and second use his ability to create and act, and the third is the driving force behind this creation and action.

Evolution took a sharp turn when man started using tools and machines, besides helping him with his life and in dealing with his environment. It also accelerated evo-

lution and progress. In the past, environmental problems were solved by functional and anatomical changes in the human body, in my opinion, via environmental pressures, the pressures of need, and evolution; these changes occurring over a long period of time. However, today solutions to different environmental problems and pressures do not need to wait for bodily changes, but instead occur through external elements, i.e. through machines and artificial intelligence. The length of time required for physical and mental "permanent" changes arising in response to functional alterations in the environment is essential. These changes then pass through to the genes and become hereditary. I would suggest the following criteria which might be needed if the environment should change to induce permanent bodily changes :

1. Repetition and persistence of the change over thousands of years, perhaps tens or few hundreds of thousands. It might not be practical for the genes to respond to any "momentary" or "transient" change in the surroundings which is neither beneficial nor practical.
2. Response to change in the surroundings might occur more quickly when this change means a difference of life and death and not just disease or ill health; i.e. immense pressure might act in a shorter time.

3. This bodily response usually occurs for the benefit of survival and towards the solution of the immediate and persistent environmental problem.

A common, easily quoted example is shown by what happens when a white-skinned individual moves to a hot climatic area with a higher amount of sunshine and ultraviolet light present in the atmosphere. His body will respond to the increase in the ultraviolet rays in the surround by increasing the melanin content in the skin melanocytes as a protective mechanism. The parts of the body covered by clothes, however, may not need to change colour to a large extent because of the protective effect of the clothing which cancels the need for an increase in the melanin in those parts of the skin. Now if the individual stays in the heat of that country for one month only and then returns to his original area of less ultraviolet light, the acquired bodily change will disappear in a week or so, simply because there is no longer a need for it; but if he had spent one year in the hot climate after which he returned to his country of less sunshine, the acquired change of colour would need about a month or so to disappear. However, if he lived in the sunny climate for thousands of years, his skin must acquire a dark tan, depending on the amount of ultraviolet light in the atmosphere. The characteristic eventually becomes part of his hereditary

and genetic make-up, because it occurred in response to a permanent and persistent component or change in the environment. The amount of tan on different parts of his skin will not only depend on the amount of ultraviolet change in the environment, but also on whether any shield is used to prevent skin contact with the ultraviolet rays.

In the above example we have seen the effect of environmental characteristics and the solution produced by the body, and the effect of shields, or anything which prevented the skin-ultraviolet contact, on that solution. Examples similar to this are many. Machines and artificial intelligence will have similar effects in preventing man from mental and physical adaptation to the solution of life's problems and environmental challenges and in many ways it may even degrade this adaptation.

Human mental capacity expanded in the past few thousands of years of tools, and more so of machine usage, because these, as mentioned previously, expanded his ability to act and apply his ideas in practice. It also expanded his sphere of mobility, senses - especially sight via telescopes, microscopes, etc. - and the amount of experience and the situations through which an individual may pass. These, in turn, reflected themselves, to some extent on the human mind and understanding. This expansion in man's mental capacity was not built on actual expansion of his

physical capabilities or senses because the use of machines removed the need for strenuous and excessive muscular effort and cancelled the need for evolution along those lines in response to the need. Also, with the beginning of the use of computers, this usage will have an inverse effect on mental evolution. This expansion of the use of computers will not only be in an upward direction to solve complicated mental tasks, but also will eventually be in a downwards direction, where it will gradually replace many basic brain functions. The use of artificial intelligence will in effect cancel out the need for strenuous mental effort in trying to solve complicated problems. This, in turn, will cancel out the need for internal evolution on those lines, because complicated mental tasks, which normally provoke a challenge will be available by pressing a button. By the coming changes the man will not need to go to the market to shop, to the library for information, walk upstairs, memorise basic data, apart from complicated ones, not rack his brain all night long in search of the solution of a problem; all this will be available at the pressing of a button: and this, in the long run, will produce a lazy human being, depending on machines and computers to the degree that he will be incapable of significant physical or mental tasks without them.

But alas! Life is not static. It is always on the move. In the human body there are many vistigial tissues

which atrophied when they ceased to have a useful function. Present human evolution is external and will be more so in the future. This will retire many of the present human functions in the physical and mental fields. What will happen to the unused or underused tissues and nervous pathways ? They must weaken and degenerate in the long term over tens or hundreds of thousands of years, resulting in a total transfer of those particular functions or human abilities to external sources which might in turn use men as servants for their reproduction and maintenance, and man will be unable to survive without them. The future man may not be called a scientist, but rather a technician. Is it not evident even now that man needs computers to design another computer?, and we are still at the beginning.

But it may be said that the human mind will not weaken. It must use the available advanced knowledge to further its capacity and understanding. But will this be the real event ? We can compare what will take place to what actually happened to the physical capabilities of man. This can be appreciated by contrasting the physical capabilities of the machine age man with that of the tool man after only a few hundreds or thousands of years. Most likely the same deterioration in mental capabilities will occur with the use of computers and artificial intelligence unless it plays, in relation to the brain, the role of hand tools rather than

the machines. The mental games and exercises will not do to the mind more than sports do to the muscular system, with few real practitioners.

The solution of the environmental challenges normally occurs through physical and mental adaptations in the long run, if machines did not intervene in preventing this solution and cancelling the need for this adaptation. But tools, machines and computers used wisely can aid this adaptation rather than cancel it. It is absurd to call for the cancellation of the use of computers in performing complicated mental tasks, this would be the same as calling for going on foot, instead of using a motor car or an aeroplane especially for long distance travel. But life is a middle solution, and extremes are as harmful as absence. How and to what extent the machine should be allowed to replace human effort is a decision for humanity generally. No nation or country can afford to take a unilateral decision, or it may lag behind in the evolution that is being accelerated by machines and be controlled by other countries.

Man is passing through a critical stage of his evolution and life on this earth will be influenced greatly by the coming changes. The Creator did not need to use machines to create man, and the question is, 'is change needed for the sake of change and fast accelerated change at any price, or a balanced restricted change with studied and

secure present and future remote effects, even if this change should take a longer time. The time is due for man to stop and think deeply, and look at the real effects of the coming changes on him and his abilities and evolution and take decisions accordingly.

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Dear Dr Assaf

Thank you for offering us your manuscript "External versus internal evolution", which however I am afraid we are unable to publish.

Regretfully, therefore, we are returning the manuscript so that you can resubmit it to a journal specializing in discursive and speculative articles.

Yours sincerely

MIRANDA ROBERTSON
Acting Life Sciences Editor

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16th July 1984

Dear Dr Assaf,

Thank you for suggesting your paper 'External vs. Internal Evolution' for Ratio. It has been read with interest but you will appreciate that a small, twice-yearly journal has to refuse much which a stout quarterly might be glad of. In this spirit, I am unable to accept your piece, I'm afraid, but am happy to have had the chance.

Yours Sincerely

Martin Hollis.