

英语科普知识丛书

苏世军 编译

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未 来 人



Future Man

武汉测绘科技大学出版社

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1 Man, Evolution and the Future

In Darwin's day, the evidence that man was encroaching on the most fertile lands had already been embodied a century beforehand in economic theory. Adam Smith recognised that it was the most fertile lands which were first occupied. The encouragement given by highly fertile soil led to population growth but the housing needed was built on the same land. So progressively more peripheral land had to be used that was harder to win and probably less fertile. This process was embodied in Adam Smith's Law of Diminishing Returns.

If the economic implications of progressive change in soil fertility were clear to Adam Smith they were not a topic of conversation in Darwin's time and he voiced the general feelings of the time when he wrote: "Man has no power of altering the absolute conditions of life; he cannot change the climate of any country; he adds no new element to the soil ... It is an error to speak of man tampering with nature ..." In the same way, Darwin did not recognise that he was observing a last struggle for survival of species, many of which have become extinct since he wrote. Today man's "tampering with nature" is common conversation. It is never too late to learn, but the arrogance that grew out of the Victorian self-perception of the "fittest" has impeded the understanding of man's relationship

with the planet in the same way that religion held scientific and biological progress at a standstill. The economists lost contact with the simple message of Adam Smith. For our future success, economic theory must accept its biological and planetary responsibility. Gebbie would say that as far as their "planet" of Australia was concerned, the Aborigines understood; we don't.

There are no more continents to discover, existing resources are limited and being used at phenomenal rates. The problem is that *Homo sapiens* has yet to reach adulthood. In his relationship with his parent planet, *Homo sapiens* is still a child that has not learnt to look after his pocket money. The rich countries are no better or worse than the poor ones. They know about vitamin A blindness; we know about saturated fats and heart disease. We can forecast the logical conclusions.

We in the Western world can only just afford elaborate and expensive health services, and by this time we should surely have realised that nutrition must have an important place in anything that is truly a health service and not merely a machine for patching up patients who have become diseased. This means first of all that our doctors need to understand the issues and that the latest findings of nutritional science must play an important part in their education. The real facts are flabbergasting. In 1980, over the whole course of their training, British medical students were given just three hours of instruction in nutrition. In the USA the situation is not much

better. Yet every medical school has its full department of pharmacology to teach about the use of drugs. Fortunately, the situation is changing.

The problem is that common sense tells the public to recognise the significance of nutrition but they have few leaders. They must interpret for themselves the little information that comes from the few academic centres involved in research. The result is that everyone then has to become his own expert. Without proper science the end product is confusion; yet at the same time it is precisely that "people response" which has achieved the most.

What is important for individuals is still more important for societies. A French philosopher wrote that the riches of a nation lay not in its iron or mineral deposits, but in its intellectual wealth. In the way that the underprivileged are significantly more likely to experience foetal growth retardation and to give birth to handicapped children, so nutritional forces can manipulate whole populations, producing systematic change in a particular direction. Had the cretins of the Alps not been discovered and cured, the fossil record, stumbled across in some future epoch, would surely have described them as a different species!

We know that the average height in the UK increased by 0.4 inch per decade during the first part of the century having, according to data from the Hythe burial grounds, been fairly stable since the 13th century. IQ assessments of children have shown that those born to poor families fare worse than those

who are well off; the cycle of deprivation. The cross-cultural data also shows that Japanese children are scoring at a significantly higher level than their American counterparts. The Westinghouse Science Merit Awards in the USA have been won over the last five years mainly by children of Japanese or Far Eastern origin. At the other end of the scale, children are born never to achieve at school in far larger numbers from the lower socio-economic groups. Some 10 per cent of children in the UK require additional educational attention. We know that there are strong nutritional backgrounds to these situations. What if we could eliminate the bottom end of deprivation; would not the average intelligence increase?

If humans are growing taller (and perhaps more athletic) and if this is associated with different nutrition extending over but a few generations, could there be a similar improvement in human intelligence? Theoretically, there is no reason why not; if nutrition can change the shape and size of the individual's body at a speed far faster than selective processes could hope to operate, is there any reason why the brain may not also be affected? We have ample examples which tell us that brain size can diminish with an increase in body size. This question is too important to dodge.

We would not want to deliberately decrease brain capacity but this could happen if we are not careful. The extraordinary fact is that we could actually define the conditions which should at least eliminate low birth weight, foetal growth retardation and handicap of non-genetic origin. This in itself would

have to improve average intelligence. But could we lift the mean? Could we achieve higher intelligence in the way that we run faster and jump higher?

In practice, an approach based on conserving or improving physical and intellectual health demands a multidimensional approach. Nutrition is not just a set of individual drug-like vitamins; it is multifactorial. Food is several things but different foods provide different groups or clusters of nutrients. It is not just the single nutrient that matters; the relationship between them matters too. Different animal species have different requirements and in the mammals this truth is reflected in the composition of their milks which are rich in protein on the one hand for fast body growth or rich in essential fatty acids on the other, when the postnatal focus is on brain growth. In the human species the highest specialisation, which stands out head and shoulders above other species, is the brain and it is built in the womb of the mother. We must also remember that the other, interwoven specialisation, the vascular system, grows when the child is growing. We also need to remember the universal rule that any system is most vulnerable to external influences during its development and growth.

The challenge we face is clear; it is to stop the degenerative diseases and, instead, to continue the evolution and development of the human brain and intelligence.

In addition to considerations of nutrition and health, success requires giving education a far higher priority than it presently receives. To respond to this challenge requires

knowledge, particularly on the part of women, whose bodies and minds hold the responsibility for the next generation. Yet in our present day world, two-thirds of women are illiterate and only 1 per cent own property. One highly placed WHO worker commented that if he had a choice, he would give education to the girls in preference to the boys. In a future world, the education of women must assume a high priority.

On the biological side we must eliminate malnutrition and ensure that all female children, not just a favoured few, understand the importance of and have available a plentiful supply of education and good foods, especially those important to the nervous and vascular tissue. This will only have its full effect when children are born to mothers who have, from conception, been similarly nourished. To bring that about we need to build a world society willing to share its resources and control its populations to eliminate the miseries of poverty, hunger and malnutrition, and somehow we have to find more creative outlets for human energy than the wars and other forms of aggression that throughout history have called on man's greatest resources of strength and ingenuity. We need to devote that energy instead, to works of imagination, art, science and education, and we need above all to understand that the care of our environment is not an optional extra, a harmless pastime for the well fed middle classes, but the central task for our age. If we fail in that we fail in everything, for we are a part of that environment. Artificial intelligence may come to our aid and give us a breathing space, fending off

catastrophe long enough. But we must not give undue importance to artificial intelligence, for it is simply an extension of human intelligence and an aid for it.

It should now be obvious that biological considerations ought to direct agricultural policies world-wide, yet in reality the aim of 'agricultural development' is often pursued for different reasons. At the same time, the story is far from being all doom and misery. The advances in science and technology in this century alone leave one with no alternative view other than that man has the ability to do the right thing.

If society does respond to the WHO call of "Health for All", and if we do accept the challenge that the shape of human development is in our own hands, then the mind can only race through the most exciting images of the world in 50 years from now. The achievements since the turn of the century when Marconi flew a box kite above Signal Hill in Newfoundland and heard that first transatlantic radio message in the form of three faint dots are extraordinary. In this short space of time man has gone from box kite to satellite. The tragedy is that man's progress in ecology and land use has been in the opposite direction. It is up to our present generations to take the necessary actions and decide the direction of our own evolution and the shape of our future. The only downside of the equation is that for all the brilliant advances in science and technology, the same care to detail and excellence has not been devoted to our use of land and marine resources. Indeed, the pollution of the rivers, lakes, oceans, the deforestation,

desert formation and famine all speak of the opposite.

In learning to decide wisely we would be greatly helped by a new understanding of human evolution to extend that of Darwin and supplement it with insights that the Darwinian view cannot itself provide. It is not only that the theory we have described in this book can give us predictive power in scientific and practical terms; it also gives us a wholly different philosophical approach. Are we what we are because of a long process of selection involving the unceasing war of all against all in which the survivors demonstrate their "fitness" by wiping out their rivals? Or are we instead the product of a more generous world, whose children are called into existence by the wealth of new opportunities which at certain critical moments she presents to them? Were we shaped by a concatenation of random events, unpredictable and unpatterned, or are we rather the latest creation of a universe governed everywhere and always by the laws of its own development; laws which through science we, its creatures, can hope to understand and to use in shaping our own destiny?

That is the image of the world that we believe to be the true one. If we look at evolution we can see a long history but not a disorderly one. When the elements were first forged in the great star-furnaces and supernovae, what came out of that process were not random combinations of fundamental particles but just those few particular ones that the nature of matter dictates. When compounds of elements formed on the cooling earth they too were predetermined by the laws of matter,

and so in due course were the organic chemicals and the biochemicals that, when the conditions were right, shaped themselves into the first biotic matter and then into the first true living cells again in the shape and form that chemistry and nature allows. From those primal cells to the plants, the animals, the mammals and at last to man himself, the whole process has been one of ordered interactions between organisms and their environment.

Man is one of many creatures that long progression has thrown up, and not in all ways the most favoured or the best adapted. What can give him hope is that he alone can look back and see what made him, and look forward to gauge what that knowledge implies for his future. Among that knowledge is a fact so simple that it is strange it should be so often ignored; whatever else he may be, man is a particular structure of organic chemicals. To maintain that structure in good order the materials of which it is built—that is to say its foods—must be right. Above all they must be right during that critical time when the organism is being formed in the womb, to emerge in due course as one of a new generation of that species whose actions will determine the fate of every species on earth. Standing at the moment of intersection between the vast gulf of the past and the dangers and promises of the future there stands a figure whose importance overwhelms all others; the figure of a human mother and child.

Vocabulary

encroach [in'krəʊtʃ] *vi.* ~ on/upon, go beyond what is right or natural or desirable 超出正当范围;侵入,侵害

peripheral [pə'rɪfərəl] *adj.* of, on, forming 外围的;表面的

standstill [stændstil] *n.* stop; halt 停顿,停止

elaborate [i'læbəreɪt] *adj.* worked out with much care and in great detail; carefully prepared and finished; complicated 精心做成的;细心完成的;复杂的

flabbergast ['flæbəɡɑ:st] *vt.* overwhelm with amazement (俗)使惊愕

pharmacology [fɑ:mə'kɒlədʒi] *n.* science of pharmacy 药理学,药理学

underprivileged [ʌndə'prɪvəlɪdʒd] *adj.* not having had the educational and social advantages enjoyed by more fortunate people, social classes, nations, etc. 没有地位的;下层社会的;贫困的

译文

人类、进化与未来

达尔文时代人类侵占最肥沃土地,这一事实在此前一个世纪的经济学说中就已有过描述。亚当·斯密认识到首先被占用的是最肥沃的土地。富饶土地的鼓舞作用导致人口增长,所需的住房也建在同一土地上。因此靠近周边的土地也逐渐被开发,这类土地较难于改造,可能也不那么肥沃。这一过程可以从亚当·斯密报酬递减规则中得到解释。

如果亚当·斯密对土壤肥沃性逐渐改变的经济学意义一清

二楚,那么这种意义就不会是达尔文时代的一个话题,他表达出时代的普遍感受,他写道:“人类无力改变生活的基本状况;他无法改变任何国家的气候,他不能给土地增添新成分…说人类在破坏自然是错误的…”同样达尔文也没有认识到他正在观看为种类生存而进行的一场最后斗争,自从他写作以来,有许多生物种类已经绝迹。今天人类在破坏大自然是一个普遍的话题。学永不言晚,维利多亚时代适者的自我观念滋润出一种傲慢情绪,阻碍了对人类与地球关系的认识,如同宗教阻止科学和生物学进步一样。经济学家与亚当·斯密的简单信息失去了联系。为了我们未来的成功,经济学说必须承认对生物和星球的责任。吉比会认为就澳大利亚的“星球”而言,当地的土著人过去就懂得:我们不懂。

再没有可发现的大陆,现存资源有限而且利用得非常快。问题在于现代人还没有成年,从与其起源的星球来看,现代人还是一个孩子,尚未学会管好自己的零用钱。富国与穷国都差不多,它们懂得维生素 A 可以治疗失明症;我们知道饱和脂肪与心脏病的关系。我们可以预测出这种合乎逻辑的结论。

我们在西方世界只不过能用得起精心而昂贵的健康服务,现在我们应该清楚认识到营养在任何真正的健康服务中占有重要的位置,而不仅仅是匆忙处理患者的一台机器。这首先意味着我们的医生需要对这类问题加以认识,需要认清营养学的最新成果一定会在其教育中起重要作用。1980年英国医学生在其整个训练过程中仅上3个小时营养课。美国的情形也好不了多少。但是每所医学院都有名符其实的药理学系讲授有关药物的使用。所庆幸的是形势正在改变。

问题在于民众会从常识中认识到营养的意义,但是却很少能得到引导。他们必须得自己理解来自几个大学研究中心的少

量信息。结果人人都得给自己当老师。没有适当的科学知识，最终结果是一片混乱，与此同时，恰好是有反应的人获得的最多。

对个人重要的事物则对社会就更加重要。一位法国哲学家写道一个民族的富有不在于其铁矿或其他矿物储藏，而在于其知识财富。穷人更多的体验到胎儿发育迟缓，先天残疾，因此营养的力量可以左右整个人口。如果阿尔卑斯山脉的侏儒病者不被发现并得到治愈，在未来某个时代偶尔发现的化石记录就肯定会将他们当作一个不同的种类。

我们知道，本世纪初英国人平均身高每年增加0.4英寸，海祠墓地的数据表明，这一增长自13世纪以来相当稳定。对孩子的智商测验表明贫困家庭出身的孩子比富裕家庭出身的孩子要差不少：一种贫困循环。交叉文化数据还表明日本儿童的成绩要比美国儿童好得多。美国威斯汀豪斯科学成就奖过去5年主要被日本或远东血统的儿童夺得。在这个量标的另一端，生来就学业平庸的孩子绝大多数来自下层的社会经济群体。在英国大约有10%的儿童需要补习功课。我们知道这种形势有着强烈的营养背景。如果我们消除了最严重的贫困又会怎样呢？平均智力不会增长吗？

如果人长得更高（且也许更健壮），如果这仅与几代人的营养不同有关系，那么人类的智慧会有类似的改进吗？从理论上讲不存在不可能的道理：如果营养能改变人体的形状和大小，其速度远远超过选择过程期望的运作的速度，那么不就有理由认为大脑也会受到影响吗？我们有许多例子可以说明大脑体积能随着躯体体积增加而减少。这个问题举足轻重，不容回避。

我们不想有意减少大脑容积；但如果我们不注意，这种情况就会发生。一个突出的事实就在于我们的确能确定条件，这些条件至少可以用来消除出生体重、低胎儿发育迟缓、非遗传性残疾

等现象。这本来就一定会提高平均智力。但是我们能提高中等智力吗？我们能像提高跑步速度、跳高高度一样提高智力吗？

在实践中，以保持或促进身体和智力健康为基础的方法就必须得是一种多维方法。营养不仅仅是一组具体的像药一样的维生素，而且是多因素的。食品有几种成分，但不同食品提供不同的营养成分组或群。不仅仅单独一种营养品重要，不同营养品之间的关系也重要。不同动物种类有不同的需要，这个事实在哺乳动物中表现在其乳汁成分，一方面富含蛋白质以供身体快速发育的需要，或者另一方面富含基本脂肪酸，此时产后重点在于大脑发育。人体最高的特化作用显著区别于其他种类在于大脑，这种特化作用是在母亲子宫建立的。我们还必须记住其余交组在一起的特化作用——血管系统的特化作用是在儿童发育时期形成的。我们还需记住一个普遍规律：任何系统在其成长发育过程中都十分容易遭受外部影响。

我们所面临的挑战是显而易见的：消除退化性疾病，继续人脑和智慧的进化和开发。

除营养和健康因素外，成功还需要重视教育的程度应远远高于目前的水准。迎接这种挑战需要知识，特别需要妇女掌握知识，她们的身体和头脑担负着对下一代的责任。但在当今世界中三分之二的妇女没有文化，仅有百分之一的妇女拥有财产。一位世界卫生组织的高级官员说：假如他可以做出一种选择的话，他就会让女孩而不是男孩优先受教育。在一种未来世界，必须得高度重视对妇女的教育。

从生物学角度讲，我们必须消除营养不良症，必须得使所有的女孩而不仅是几个得宠的女孩懂得教育的重要性，确保她们有充分的受教育的机会，有营养丰富的食品，特别是对神经和血管组织重要的食品。这只有当孩子的生母从受孕之日起就得到