

SOME POSSIBLE DISCOVERIES

The present time is harvest home for the prophets. The happy speculator in future sits on the piled-up wain, singing "I told you so," with the submarine and the flying machine and the Marconigram and the North Pole successfully achieved. In the tumult of realisations it perhaps escapes attention that the prophetic output of new hopes is by no means keeping pace with the crop of consummations. The present trend of scientific development is not nearly so obvious as it was a score of years ago; its promises lack the elementary breadth of that simpler time. Once you have flown, you have flown. Once you have steamed about under water, you have steamed about under water. There seem no more big things of that kind available--so that I almost regret the precipitance of Commander Peary and Captain Amundsen. No one expects to go beyond that atmosphere for some centuries at least; all the elements are now invaded. Conceivably man may presently contrive some sort of earthworm apparatus, so that he could go through the rocks prospecting very much as an earthworm goes through the soil, excavating in front and dumping behind, but, to put it moderately, there are considerable difficulties. And I doubt the imaginative effect. On the whole, I think material science has got samples now of all its crops at this level, and that what lies before it in the coming years is chiefly to work them out in detail and realise them on the larger scale. No doubt science will still yield all sorts of big surprising effects, but nothing, I think, to equal the dramatic novelty, the demonstration of man having got to something altogether new

and strange, of Montgolfier, or the Wright Brothers, of Columbus, or the Polar conquest. There remains, of course, the tapping of atomic energy, but I give two hundred years yet before that....

So far, then, as mechanical science goes I am inclined to think the coming period will be, from the point of view of the common man, almost without sensational interest. There will be an immense amount of enrichment and filling-in, but of the sort that does not get prominently into the daily papers. At every point there will be economies and simplifications of method, discoveries of new artificial substances with new capabilities, and of new methods of utilising power. There will be a progressive change in the apparatus and quality of human life--the sort of alteration of the percentages that causes no intellectual shock. Electric heating, for example, will become practicable in our houses, and then cheaper, and at last so cheap and good that nobody will burn coal any more. Little electric contrivances will dispense with menial service in more and more directions. The builder will introduce new, more convenient, healthier and prettier substances, and the young architect will become increasingly the intelligent student of novelty. The steam engine, the coal yard, and the tail chimney, and indeed all chimneys, will vanish quietly from our urban landscape. The speeding up and cheapening of travel, and the increase in its swiftness and comfort will go on steadily--widening experience. A more systematic and understanding social science will be estimating the probable growth and movement of population, and planning town and country on lines that would seem to-day almost inconceivably wise and generous. All this means

a quiet broadening and aeration and beautifying of life. Utopian requirements, so far as the material side of things goes, will be executed and delivered with at last the utmost promptness....

It is in quite other directions that the scientific achievements to astonish our children will probably be achieved. Progress never appears to be uniform in human affairs. There are intricate correlations between department and department. One field must mark time until another can come up to it with results sufficiently arranged and conclusions sufficiently simplified for application. Medicine waits on organic chemistry, geology on mineralogy, and both on the chemistry of high pressures and temperature. And subtle variations in method and the prevailing mental temperament of the type of writer engaged, produce remarkable differences in the quality and quantity of the stated result. Moreover, there are in the history of every scientific province periods of seed-time, when there is great activity without immediate apparent fruition, and periods, as, for example, the last two decades of electrical application, of prolific realisation. It is highly probable that the physiologist and the organic chemist are working towards co-operations that may make the physician's sphere the new scientific wonderland.

At present dietary and regimen are the happy hunting ground of the quack and that sort of volunteer specialist, half-expert, half-impostor, who flourishes in the absence of worked out and definite knowledge. The general mass of the medical profession, equipped with a little

experience and a muddled training, and preposterously impeded by the private adventure conditions under which it lives, goes about pretending to the possession of precise knowledge which simply does not exist in the world. Medical research is under-endowed and stupidly endowed, not for systematic scientific inquiry so much as for the unscientific seeking of remedies for specific evils--for cancer, consumption, and the like. Yet masked, misrepresented limited and hampered, the work of establishing a sound science of vital processes in health and disease is probably going on now, similar to the clarification of physics and chemistry that went on in the later part of the eighteenth and the early years of the nineteenth centuries. It is not unreasonable to suppose that medicine may presently arrive at far-reaching generalised convictions, and proceed to take over this great hinterland of human interests which legitimately belongs to it.

But medicine is not the only field to which we may reasonably look for a sudden development of wonders. Compared with the sciences of matter, psychology and social science have as yet given the world remarkably little cause for amazement. Not only is our medicine feeble and fragmentary, but our educational science is the poorest miscellany of aphorisms and dodges. Indeed, directly one goes beyond the range of measurement and weighing and classification, one finds a sort of unprogressive floundering going on, which throws the strongest doubts upon the practical applicability of the current logical and metaphysical conceptions in those fields. We have emerged only partially from the age of the schoolmen In these directions we have not emerged at all. It is

quite possible that in university lecture rooms and forbidding volumes of metaphysical discussion a new emancipation of the human intellect and will is even now going on. Presently men may be attacking the problems of the self-control of human life and of human destiny in new phrases and an altogether novel spirit.

Guesses at the undiscovered must necessarily be vague, but my anticipations fall into two groups, and first I am disposed to expect a great systematic increment in individual human power. We probably have no suspicion as yet of what may be done with the human body and mind by way of enhancing its effectiveness I remember talking to the late Sir Michael Foster upon the possibilities of modern surgery, and how he confessed that he did not dare for his reputation's sake tell ordinary people the things he believed would some day become matter-of-fact operations. In that respect I think he spoke for very many of his colleagues. It is already possible to remove almost any portion of the human body, including, if needful, large sections of the brain; it is possible to graft living flesh on living flesh, make new connections, mould, displace, and rearrange. It is also not impossible to provoke local hypertrophy, and not only by knife and physical treatment but by the subtler methods of hypnotism, profound changes can be wrought in the essential structure of a human being. If only our knowledge of function and value were at all adequate, we could correct and develop ourselves in the most extraordinary way. Our knowledge is not adequate, but it may not always remain inadequate.

We have already had some very astonishing suggestions in this direction from Doctor Metchnikoff. He regards the human stomach and large intestine as not only vestigial and superfluous in the human economy, but as positively dangerous on account of the harbour they afford for those bacteria that accelerate the decay of age. He proposes that these viscera should be removed. To a layman like myself this is an altogether astounding and horrifying idea, but Doctor Metchnikoff is a man of the very greatest scientific reputation, and it does not give him any qualm of horror or absurdity to advance it. I am quite sure that if a gentleman called upon me "done up" in the way I am dimly suggesting, with most of the contents of his abdomen excavated, his lungs and heart probably enlarged and improved, parts of his brain removed to eliminate harmful tendencies and make room for the expansion of the remainder, his mind and sensibilities increased, and his liability to fatigue and the need of sleep abolished, I should conceal with the utmost difficulty my inexpressible disgust and terror. But, then, if M. Blériot, with his flying machine, ear-flaps and goggles, had soared down in the year 54 B.C., let us say, upon my woad-adorned ancestors--every family man in Britain was my ancestor in those days--at Dover, they would have had entirely similar emotions. And at present I am not discussing what is beautiful in humanity, but what is possible--and what, being possible, is likely to be attempted.

It does not follow that because men will some day have this enormous power over themselves, physically and mentally, that they will necessarily make themselves horrible--even by our present standards

quite a lot of us would be all the slenderer and more active and graceful for "Metchnikoffing"--nor does surgery exhaust the available methods. We are still in the barbaric age, so far as our use of food and drugs is concerned. We stuff all sorts of substances into our unfortunate interiors and blunder upon the most various consequences. Few people of three score and ten but have spent in the aggregate the best part of a year in a state of indigestion, stupid, angry or painful indigestion as the case may be. No one would be so careless and ignorant about the fuel he burnt in his motor-car as most of us are about the fuel we burn in our bodies. And there are all sort of stimulating and exhilarating things, digesting things, fatigue-suppressing things, exercise economising things, we dare not use because we are afraid of our ignorance of their precise working. There seems no reason to suppose that human life, properly understood and controlled, could not be a constant succession of delightful and for the most part active bodily and mental phases. It is sheer ignorance and bad management that keep the majority of people in that disagreeable system of states which we indicate by saying we are "a bit off colour" or a little "out of training." It may seem madly Utopian now to suggest that practically everyone in the community might be clean, beautiful, incessantly active, "fit," and long-lived, with the marks of all the surgery they have undergone quite healed and hidden, but not more madly Utopian than it would have seemed to King Alfred the Great if one had said that practically everyone in this country, down to the very swineherds, should be able to read and write.

Metchnikoff has speculated upon the possibility of delaying old age, and I do not see why his method should not be applied to the diurnal need of sleep. No vital process seems to be absolutely fated in itself; it is a thing conditioned and capable of modification. If Metchnikoff is right--and to a certain extent he must be right--the decay of age is due to changing organic processes that may be checked and delayed and modified by suitable food and regimen. He holds out hope of a new phase in the human cycle, after the phase of struggle and passion, a phase of serene intellectual activity, old age with all its experience and none of its infirmities. Still more are fatigue and the need for repose dependent upon chemical changes in the body. It would seem we are unable to maintain exertion, partly through the exhaustion of our tissues, but far more by the loading of our blood with fatigue products--a recuperative interlude must ensue. But there is no reason to suppose that the usual food of to-day is the most rapidly assimilable nurture possible, that a rapidly digestible or injectable substance is not conceivable that would vastly accelerate repair, nor that the elimination and neutralisation of fatigue products might not also be enormously hastened. There is no inherent impossibility in the idea not only of various glands being induced to function in a modified manner, but even in the insertion upon the circulation of interceptors and artificial glandular structures. No doubt that may strike even an adventurous surgeon as chimerical, but consider what people, even authoritative people, were saying of flying and electric traction twenty years ago. At present a man probably does not get more than three or four hours of maximum mental and physical efficiency in the day. Few men

can keep at their best in either physical or intellectual work for so long as that. The rest of the time goes in feeding, digesting, sleeping, sitting about, relaxation of various kinds. It is quite possible that science may set itself presently to extend systematically that proportion of efficient time. The area of maximum efficiency may invade the periods now demanded by digestion, sleep, exercise, so that at last nearly the whole of a man's twenty-four hours will be concentrated on his primary interests instead of dispersed among these secondary necessary matters.

Please understand I do not consider this concentration of activity and these vast "artificialisations" of the human body as attractive or desirable things. At the first proposal much of this tampering with the natural stuff of life will strike anyone, I think, as ugly and horrible, just as seeing a little child, green-white and still under an anaesthetic, gripped my heart much more dreadfully than the sight of the same child actively bawling with pain. But the business of this paper is to discuss things that may happen, and not to evolve dreams of loveliness. Perhaps things of this kind will be manageable without dreadfulness. Perhaps man will come to such wisdom that neither the knife nor the drugs nor any of the powers which science thrusts into his hand will slay the beauty of life for him. Suppose we assume that he is not such a fool as to let that happen, and that ultimately he will emerge triumphant with all these powers utilised and controlled.

It is not only that an amplifying science may give mankind happier

bodies and far more active and eventful lives, but that psychology and educational and social science, reinforcing literature and working through literature and art, may dare to establish serenities in his soul. For surely no one who has lived, no one who has watched sin and crime and punishment, but must have come to realise the enormous amount of misbehaviour that is mere ignorance and want of mental scope. For my own part I have never believed in the devil. And it may be a greater undertaking but no more impossible to make ways to goodwill and a good heart in men than it is to tunnel mountains and dyke back the sea. The way that led from the darkness of the cave to the electric light is the way that will lead to light in the souls of men, that is to say, the way of free and fearless thinking, free and fearless experiment, organised exchange of thoughts and results, and patience and persistence and a sort of intellectual civility.

And with the development of philosophical and scientific method that will go on with this great increase in man's control over himself, another issue that is now a mere pious aspiration above abysses of ignorance and difficulty, will come to be a manageable matter. It has been the perpetual wonder of philosophers from Plato onward that men have bred their dogs and horses and left any man or woman, however vile, free to bear offspring in the next generation of men. Still that goes on. Beautiful and wonderful people die childless and bury their treasure in the grave, and we rest content with a system of matrimony that seems designed to perpetuate mediocrity. A day will come when men will be in possession of knowledge and opportunity that will enable them to master

this position, and then certainly will it be assured that every generation shall be born better than was the one before it. And with that the history of humanity will enter upon a new phase, a phase which will be to our lives as daylight is to the dreaming of a child as yet unborn.