

SPRING BOOKS SUPPLEMENT

This above all...

G.S. Stent

THIS is the second of a series of books commissioned by the Alfred P. Sloan Foundation in which according to its President "a representative selection of accomplished and articulate scientists [are] to set down their own accounts of their lives in science", in order to further the public understanding of science. Who could be more fitting for such a commission than Sir Peter Medawar, supreme among contemporary scientists for his combination of scientific excellence, erudition and literary skill? But rather than simply composing another scientific autobiography, Medawar has "tried to write the kind of book I myself should have liked to have read when I began research before most of my readers were born": a young scientist's vade-mecum that offers succour and savvy to the innocent, as provided by an experienced, wise old owl. The scope of Medawar's advice is indicated by the titles of his 12 brief chapters: "How can I tell if I am cut out to be a scientific research worker?"; "What shall I do research on?"; "How can I equip myself to be a scientist or a better one?"; "Sexism and racism in science"; "Aspects of scientific life and manners"; "Of younger and older scientists"; "Presentations"; "Experiment and discovery"; "Prizes and rewards"; "The scientific process"; and "Scientific meliorism versus scientific messianism".

There is certainly a great need for a book from which young persons interested in a scientific career but lacking direct access to senior scientists can get some authentic ideas of what it's really like to be in the business. In fact, why hasn't it been done before? And Medawar, who as an adviser to the young sees himself as the Polonius, the Lord Chesterfield or the William Cobbett of science, goes some considerable way towards filling that need. Above all, Medawar emerges from these pages as a role model worth emulating for any aspiring youth: urbane, sensible, open-

Advice to a Young Scientist. By P.B. Medawar. Pp.109. (Harper and Row: New York and London, 1980.) \$8.95, £4.95.

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minded and liberal (but, of course, intolerant of nonsense), universally esteemed, and, most importantly, outstandingly successful, having reached the absolute pinnacle of his profession with perfect grace, never clawing his way to the top. Moreover, Medawar provides many *aperçus* of the scientific life, such as that "no working scientist ever thinks of himself as old, and so long as health, rules of retirement, and fortune allow him to continue with research, he enjoys the young scientist's privilege of feeling himself born anew every morning"; that "luck plays a real part in scientific research"; and that "the husband of a [woman] scientist must not expect to find *gigot de poulette cuit à la vapeur de Marjolaine* ready on the table when he gets

home from work probably less taxing than his wife's".

But I do not think the book completely achieves its aims. First, the down-to-earth questions posed in some of the chapter titles are not all given very helpful answers. Thus if the young reader really wants to know if he is cut out to be a scientific research worker, he is provided with little more on which to base his decision than the information that science (just like, say, professional skiing) is a very demanding and sometimes exhausting, albeit exciting and rather passionate, occupation, for which old-fashioned virtues such as diligence, a sense of purpose, and the power to concentrate and persevere are required. Moreover, he should be able to pass an intelligence test provided by Medawar, which consists of discovering what is wrong with the theory that El Greco painted unnaturally tall and thin human figures because of a defect in the painter's vision that made him see people that way. And if the young reader really wants to know what he should do research on, he is given little more guidance than the aphorism that he "who wants to make important discoveries must study important problems". By way of an example of an unimportant piece of research *not* worth doing, Medawar mentions the case of a young zoology graduate student who decided to find out why 36% of sea urchin eggs have a tiny black spot on them. It so happens that I myself am very interested in the role of topographic differentiation of the egg in embryonic development and became very excited on learning that there are black spots on a substantial minority of sea urchin eggs. In fact, I had already worked out the beginnings of a black spot theory of development before I came to the dénouement when Medawar reveals that there are no such black spots and that it was all made up by Lord Zuckerman. And if the young reader wants to know how to equip

Sir Peter Medawar when a graduate student at Oxford, 1936.

Ramsay and Muspratt, Oxford.

himself to be a scientist, he is informed only that he must read the literature (but not too much), that he better get some results (even if they are not original), that he should not waste time building equipment (if it can be store-bought), and, above all, that he ought to practise what Medawar in an earlier book called "The Art of the Soluble" (which is "making a problem soluble by finding out ways of getting at it — soft underbellies and the like").

A second shortcoming of the book likely to trouble intellectually alert young readers is a noticeable lack of logical consistency in some of the propositions put forward by Medawar. For instance, he cautions against "citing Marie Curie as evidence that women can do well in science; any such tendency to generalize from isolated instances will convince no one that they have a natural aptitude for science — it is not Madame Curie but tens of thousands of women gainfully and often happily engaged in scientific pursuits who should be called in evidence". Yet in the same chapter, Medawar merely cites the names of ten brilliant contemporary Hungarians (most of Jewish descent) to demolish the inference drawn from IQ tests administered at Ellis Island before the First World War "that 83 percent of the Jews and 80 percent of the Hungarians seeking entry were feeble-minded". Rather than generalizing from isolated instances, should Medawar not have called into evidence the tens of thousands of Hungarian and Jewish immigrants who did just about as well in the New World as their Anglo-Saxon fellow-citizens? Further, in one place Medawar indignantly rejects the notion that there are any national differences in the character of science — he mentions Japan in particular as one nation whose science has been falsely held to be somehow different from that of the West. In fact, he thinks that such "regional differences are intrinsically unlikely for methodological reasons" and asserts "that no experienced scientist seriously believes that they exist", thus sweeping away with a few strokes of the pen all of Joseph Needham's studies of Chinese science that show that culture *has* a profound influence on the way science is done. Yet a few pages later he makes fun of Fernand Braudel's dictum that history devours the present by calling it (with undoubted chauvinist irony) one of "those profound French epigrams, you know". In another place Medawar declares that "most of the very greatest scientists lived long before Alfred Nobel . . . founded the prize". But some pages later he declares that science has no limits and "will dry up only if scientists lose or fail to exercise the power or incentive to imagine what the truth might be". So, since the vast majority of scientists that ever lived have lived in this century and since their labours have presumably carried us far away from nineteenth century science into the limitless sea of scientific knowledge, the keen young reader will

Sir Peter Medawar.

wonder how it is possible that most of the "greatest" scientists happened to have been among that tiny band of old-timers. Is Medawar not giving himself over to what he castigates at the very end of his book as "Arcadian thinking [which] looks not forward nor far away but backward to a golden age that could yet return"?

In this connection it is instructive to examine Medawar's statement that "one can envisage an end of science no more readily than one can envisage an end of imaginative literature or the fine arts". Interpreted literally this statement would merely assert that it is just as easy to envisage an end of literature and the arts as it is to envisage an end to science. But in the context in which it appears in this book the intended meaning of the statement is undoubtedly the claim that it is very difficult to envisage an end to either of these activities. But this claim would be counterfactual since it is, in fact, easy to envisage an end of the sciences and the arts, as was done, for instance, by Hermann Hesse in his *Glass Bead Game*. And it is precisely from envisaging an end of imaginative literature and the fine arts in

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our time that the view that most of the very greatest artists lived before our time gains its logical justification.

But these niggling criticisms are not meant to imply that *Advice to a Young Scientist* cannot be read with great profit by young and old alike. On the contrary, the impression that I want to leave is that this book is bound to enlarge any reader's intellectual horizon and give him a good grasp of what it is like to devote one's life to what Medawar calls "exploratory activities of which the purpose is to come to a better understanding of the natural world". For such a life a critical mind is required, which Medawar challenges with the following "chestnut of immemorial origin":

Psychiatrist: Why do you flail your arms around like that?

Patient: To keep the wild elephants at bay.

Psychiatrist: But there aren't any wild elephants here.

Patient: That's right. Effective, isn't it?

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