

## Avoid Boring People

*and other lessons from a life in science*

*J.D. Watson*

March 10–13, 2010

'Avoid Boring People'. What does it mean? The obvious association is that one should not associate with boring people, life is too short for such wasteful practices. But it could also mean not to bore people yourself. Obviously as one reads through the book one realizes that the pun is not unintended, but that both meanings are meant. Meanings that could be summarized by the exhortation 'to stay away from boring encounters'.

Is the book boring? Yes, there are long boring parts. And like almost every writer of an autobiography Watson falls into the trap of starting his account with a brief count down of his ancestors, those who made his eventual emergence possible. Of course the same curiosities that may lead to the impulse to write your life, also inform your own private fascination with those who preceded you. But the reader does not necessarily share the obsession of the writer, at least not in the beginning, maybe later, in the epilogue maybe, but in the beginning the readers want to know the author, not to look at dusty family portraits that (so far) have no meaning to them.

Yes, it is in many ways a boring and badly written book, far from a literary masterpiece, yet you keep turning the pages. What compels you? Gossip? Certainly there is a very large component of that. But of course also the voice of the author. It is the voice of an irreverent street-smart kid who made it big in science. What made him tick? What are the unique pleasures that success brings, especially in the sciences? What does it mean to pursue science? In what way does a scientists life differ from that of the regular mill, that of a banker, lawyer, real estate agent, or house-wife?

Watson has written about this before. At the end of the sixties he made a splash with 'The Double Helix' in which he depicted the exciting years of his youth when he made that momentous discovery together with Crick of the structure of the DNA. At the time it was published it was whetted for libel, and as a result staid Harvard University Press backed out. It made for strained relations with his former collaborator Crick, whose views later mellowed when he realized that the book rather than diminishing his status enhanced it. And Lawrence Bragg, who is depicted less than admirably, was gracious enough to rise to the occasion and provide a foreword. It was an irreverent book in which Watson himself is seen as, what we now would call a nerd, seemingly more interested in chicks, be they in the bush<sup>1</sup> or on the beach, than in the disinterested pursuit of science. I read it at the age of twenty-two, the first summer after my first year at Harvard. Did it inspire me? Did it make me become a scientist, maybe changing fields? In no way. I must admit that I was rather more put off than enamored. Deeply disturbed as I was by my mathematical career at the time, I was far too emotionally attached to it, to even considering alternatives. More

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<sup>1</sup> His first passion was for bird-watching, something he inherited from his father.

to the point though, did it give me pointers, offering me lessons? The point of asking the question is that this is what this autobiography is actually meant to do, be it tongue in cheek. At the end of each chapter, the author lists remembered lessons. This might be the most innovative aspect of the book, and also in a way the most rewarding and amusing. The author is street-smart, and the advice he gives is to the point and never platitudinous. Surely I would have benefited a lot had I read this when I was young, of course now it is far too late. The problems with the lessons of life are that they have to be lived through and they do not make any sense until it is too late.

Watson does not play himself down, on the contrary, yet in any account of success, the sources are usually obfuscated, it all seems in retrospect so easy, not to say inevitable. Surely anyone could have done it, if they had worked hard enough, had some appropriate luck, and cared sufficiently. He was not a child prodigy, yet he was taken through the educational quickly, and had already his Ph.D. at twenty-two. You do not have to be a genius to accomplish this, on the other hand this is nevertheless beyond the capabilities of most people, but maybe not for a far larger segment of the population than is generally thought. If you have the aptitude why not be given the opportunity? It means getting serious schooling starting in your early teens, to go through the general education of college at an accelerated pace while your powers of retention and reception are at their most astute. William James warns readers that all your interests in life are set at a fairly early age, and I certainly can confirm from my own experience. True, as noted, most people would not be able to survive such fast-paced instruction, their interests being more diffuse, but for those of the right stuff, coming out in your early twenties with life still ahead of you is a definite advantage. You do not have to be a genius, nor in possession of any extraordinary talents. You have just vigorously exercised your mental capacities in the healthy way an athlete has enjoyed his body at its developing prime.

Watson's scientific interest was kindled by his parents and encouraged at school. Biology attracted him, not mathematics. It shines through that he is painfully aware that he cannot compete in mathematics. Advanced calculus courses is just beyond him. He can perform, but not brilliantly so. He has a kind of minor hang-up, and makes a big point that at graduate school he took an advanced course in mathematics and did passably. Of course most of what he learned he will never have occasion to use, still it is part of a general education and at least gives him a feeling of his limitations as well as getting some familiarity as not to be overly intimidated.

Watson is of course a case of being at the right place at the right time, but to do so is of course not at all trivial. Physics had had its great era of the 20's and 30's when Quantum mechanics was developed, culminating with the Manhattan Project, the first case of Big Science. Afterwards there were a lot of physicists that were at a loss and ready to seek other challenges. Schrodinger's book 'What is Life' apparently had a momentous influence, suggesting that the secrets of life could be explored on the atomic level. This meant a revolution of biology by suggesting a bottom-up approach. Watson jumped on the bandwagon, despite the fact that he had no strong background in physics, and that his exposure to biology had been one of watching birds not doing chemistry. But he was, as noted, a street-smart scientist going for the kill where the action was. One surmises certain crucial components in the make-up. First and foremost, a genuine scientific curiosity, and

an ability to connect a large vision 'What is Life?' to some technical approaches 'molecular genetics'. The large visions serve as motivations, not unlike religious faith, but they are of course useless as feed for thought. Thought feeds on details, and unless you derive excitement from sustained intercourse with mundane technical work, you cannot pursue science. But of course without a larger vision, what you do would become meaningless. About this there is not so much said in the book, except at the beginning and at the very end when he voices critical views of the late President Summers initiatives of promoting a more applied science to foster the excellence of Harvard. Secondly, science is certainly competitive, and Watson has been intellectually competitive since childhood, but this does not mean that you should be hang-up on being the best. That is narcissistic and ultimately self-destructive. You need to be humble and recognize that other people can be as smart as you, in fact even smarter, and rather than being discouraged by it, you should relish it. Only by hanging out with those brighter than yourself do you extend yourself, and also more prosaically by latching on to your superiors, you are taken on a far more exciting ride than you would have been able to arrange on your own. Thirdly science is a social enterprise. Thus never do anything which does not interest others. This does not mean that you should head for a popularity contest, if too many pursue a project you can be sure that it is too mainstream, better to pursue something more exclusive, as long as there is strong competition with at least one worthy 'adversary'. Also, as noted previously, you are not an island unto yourself, alone you cannot accomplish much, your ability to sustainably generate ideas entirely on your own is limited. You need to get external output, that means always keeping in touch with people, inquiring what they are doing, who knows it may give you new ideas, suggest alternate projects. Competition does not mean cut-rate, it does not preclude cooperation, on the contrary, two hands wash each other.

This is science. How much of this does apply to say mathematics. Mathematics is not really science, although it is an inevitable prerequisite for science. In mathematics you need curiosity of course, but there are really not such overarching questions such as 'what is life?'. Mathematics although eminently applicable can very well stand on its own. Thus in mathematics there is more of a danger that you will get mired in obscurity and details. Some may not mind that, so there might be some truth to the claim that mathematicians attract disproportionately many autistic individuals. Furthermore in mathematics, being more self-contained, associating with people smarter than yourself may be much more of a mixed blessing. While sciences are more social, any kind of contribution counts, just as in society, in mathematics this is not necessarily true. The overwhelming intellect may render all other attempts superfluous, or at least it might feel so. Finally mathematics is not social in the same way as other sciences. Although there certainly are fashions in mathematics, the subject is less focused, people are not only allowed by actively encouraged to fan out. Thus while in more focused fields, a lecturer tends always to be challenged, that is not so in mathematics, where the speaker may very well be the only authority. Thus in mathematics you may find your niches not having to worry about other people breathing down your neck. This makes it a more civilized field in general. The mathematician is left alone, for better or for worse. To this is added that a mathematicians traditionally makes even few demands on society. A minimal salary to keep body and soul together, and provide

supplies of paper and pencil<sup>2</sup>.

Watson latched onto people, at Indiana he did not go for the old and well-established. but for Salvador Luria, a younger man, whom he did not have to share with too many fellow students. Then he attached himself to Delbrück the German physicists who had redirected himself. This was the vanguard of the new science of biology soon to take over. Then of course his post-doc in Cambridge hooking up with Crick now is history. Without Crick he would have been at sea, his expertise being so limited. Watson makes the point that when you seriously collaborate you should have only one collaborator. Three or more, and some people will invariably be marginalized. And while it is often credible to assume that two collaborators have done about equal shares, at least if they belong to the same rung on the career-ladder, this is harder to believe when there are more. Some invariably go for a more or less free ride.

Now the problem of determining the molecular structure of DNA was to a large extent a question of mathematics via crystallography. Not a pure math problem, because it was very complicated and involving many other aspects, such as a deep understanding of various chemical bonds, and in the end assumed inspired guesswork. So here we have a beautiful illustration of going for the crucial problem, even if you lack the technical tools to successfully attack it. This is in contradiction to mathematics, when the allure of a problem may to a large extent lie in the techniques necessary for its solution. Now following your nose doing things you are already equipped for, obviously does not restrict to mathematics, it is the common curse of most scientific activity. Maybe the very young are exempt from it, more driven by curiosity than competence. At least Watson seems to be suggesting that. Now what was so great about the DNA problem? Was it so difficult? It was difficult, too difficult for the cautious, but far from impossible. Pauling was very close to solving it, save for some blunders he initially made (and he was not given a second chance). Other people were also, at least in retrospect, very close to doing it. Had not Crick and Watson done it, it most likely would have been achieved by somebody else, within the next year or two. It certainly was in the air, and similar problems of other complicated molecules had been solved before. This highlights another difference between science and mathematics. Science is more competitive, because so many people can accomplish the same thing, while in mathematics this is not so clear. Some breakthroughs might only have been done by a single individual, and had that individual not come along, the breakthrough would not have occurred, and mathematics would have taken another course (and we would never have known).

Now why was it so important? Because DNA was the most important molecule, explicating its structure did open up an entirely new field of research. A field of research possible, because for one thing the necessary technology for its pursuit was in place (X-ray machines, centrifuges, radioactive markings, you name it) and more importantly chemistry was moving into the realm in which the actual spatial composition of large and complicated molecules actually direct the way they interact. Interaction being so complicated and subtle, that we are not quite talking about classical chemical reactions, but something not quite biological. Thus the discipline of biochemistry was being born.

Watson and Crick eventually got the call to Stockholm. Watson writes unabashedly

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<sup>2</sup> And nowadays computers are not much more expensive

about the pleasure he felt (only somewhat sullied by the fact that his week in Stockholm conflicted with an invitation to the White House). He takes great pleasure in rubbing shoulders with royalty, and when the Swedish princess Christina a year later attends Radcliffe, he takes an almost untoward interest in the trivial event, having her over at his place.

The casual reader of the 'Double Helix' may either be shocked or amused by the girl-hunting antics of a Watson. His interest in gorgeous females seemed not to have born any fruit for many years, until he at the age of almost forty marries a nineteen year old. Now there is a lot of prejudice against such large age differences in marriage, and like in the case of a lot of prejudice there usually are good grounds for them. It is very hard not to see in his infatuation with such a young girl the symptom of a rather immature individual. What did she see in him, over twice her age? The allure of fame and distinction, if not necessarily consciously appreciated. The marriage is still on forty years later, so outsiders should not be too censorious.

Watson spends twenty years at Harvard. From 1956 until 1976 when he is pressured to step down because of his side-commitment running the Cold Harbor Institute<sup>3</sup>. A mathematician can stick to himself and only take an intermittent interest in what is going on outside. A scientist cannot afford this luxury, his activities are not only more social but also require more resources and are thus more dependent on the outside world that has to be cultivated and courted. The task facing Watson was to transform the Biology department at Harvard. That meant making more and more space for the biology of the future at the expense of the old-fashioned and traditional<sup>4</sup>. It meant attracting the very best and marginalize the not quite the best. Watson applies the simile of sports. Potential matters more than actual achievement. Just as in sports you cannot rely on results of the past, what is interesting is the winner of tomorrow, not the one of yesterday. In his many asides to the reader, Watson urges people to go for the young advisers, those who are on the make, and stay away from the old and established, whose fields more likely than not are going nowhere. There is no welfare system in science, scientists have their due dates, when they no longer deliver, they should go out. Now, in practice this does not happen, people are kept on, in many cases without realizing that they are indeed past their primes and of no longer any significance. Now this vision of Watson never came to full fruition, yet moves do not have to be completed to reveal their directions. Then there is the question of resources, which play a marginal role in mathematics. A scientist needs a lab. A lab is expensive and you need to qualify to justify such resources going your way. Obviously a very fundamental reason for the more competitive and focused character of science. Salary is secondary, the ability or pursue is what matters. Not that scientists are indifferent to such worldly things as salaries. On the contrary, salaries bespeak status, and when your salary does not rise means that you are not being appreciated and it is time for you to move on (if that is an option at all). Watson becomes very upset when his salary

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<sup>3</sup> He resented this, and found it unfair. His greatest regret leaving Harvard had to do with the quality of its student body.

<sup>4</sup> Evolution and embryology might be important, but surely he reasoned, more fundamental things had to be explored before they could be profitably pursued. For other concerns, such as those of the ant specialist Wilson, he had only scorn.

does not benefit from the traditional rise<sup>5</sup>. Not that scientists want to be rich, but they do not want to forgo the pleasures of comfort.

So in what way does the life of a scientist differ from that of others? Watson does sprinkle his account with various technical references to RNA and messages and using a fair amount of Greek letters, but he makes no attempt to present a cogent picture, not to explain anything to the reader, those references are more in the nature of positional markers to remind him where in his thinking he was along. For a scientist the work at the lab is paramount. There is of course thinking and getting new ideas and envisioning new experiments, but experiments have to be done, and they involve a lot of nitty-gritty details and a lot of assisted support. They provide the heart of your activity, no theory is so brilliant that it can ignore factual counter-evidence. Lab work takes time. Long hours, including weekends. People just marking time and pretending to do science, normally do not engage themselves off hours, only if you are passionately in pursuit are you unable to detach yourself from your desk. And if you want to get ahead, this is what you need to do, put your work first, above family and friends. And of course here we see the demands of the race. It is not a race that necessarily go to the swift and brilliant, but pure stamina is essential. You need to be able, like the long-distance runner, to overcome the barrier of tediousness. Now this is very different from mathematics. A mathematician needs of course to be consistently thinking, but the mental demands are different. Hard mathematical thinking cannot go on productively for a very long time. G.H.Hardy famously only devoted a few hours each day to mathematics, at least according to himself. It might be true that also in mathematics some people simply have more stamina, being able to go those extra hours, and that may make the difference, still in mathematics there are less routine work, either you have a good idea that works, or you are stuck, there are no equivalents of washing test-tubes, when your mind can relax, being forced to do menial but necessary tasks. True, in programming, the mathematician may find a closer experience to scientific work. When you program you never get stuck, you are always on the verge of overcoming bugs, and thus you can go on for ever, because you are constantly receiving feedback.

Watson for some reason breaks off his narration in the late seventies. Then the reader has been treated to life at Harvard in the 60's and early 70's, something at least one reader appreciates, once again being reminded of old haunts. Why is that? Breaking off so early? Does the author not want to be boring? Does life in a sense stop after fifty? Certainly it does for a sports star. Anyway an epilogue brings matter up to 2006 or so. Summer is hounded away from office. Summers is not a favorite of Watson. As already noted, he opposed the overly 'translational' approach of the President, and his emphasis on commercial exploitation and his flashy visions with no substantial contents. Thus ambitions going against the very idea of a university as a venue for the disinterested and passionate pursuit of knowledge for its own sake. However, he regrets the issue that apparently proved to be the final straw, namely Summers remarks on the possibility of

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<sup>5</sup> In 1962 Watson salary was \$ 15'000, this should be compared to my salary of some \$ 13'000 as an assistant professor at Columbia in the late 70's. Even taking into account that inflation in the intervening years may have amounted to some 150%. the figure is not very impressive. It is true that in the past twenty years the egalitarian tendencies of the New Deal had entirely faded away, making for dramatically widening incomes.

genetic differences between males and females as to the pursuit of cutting edge science, especially mathematical. Summers vouched his ideas tentatively and guardedly, and yet they caused a widespread uproar. Only one Harvard professor - Steven Pinker, stood up to him (and as Watson remarked, had he continued at Harvard, he would have seen to it that the support had doubled). Not even Summer himself stood his ground, but instead abjectly back-pedaled. So strong is the tyranny of political correctness at American universities. No doubt far many more people sympathized with Summers right to propose his hypothesis than had the courage to take a public stand. Of course our times are not more cowardly than others, only just as cowardly. Even in the supposedly most enlightened of times as to free expressions of ideas, there are certain invisible lines you simply do not cross. Just as there are genetic differences between men and women that make the former physically stronger on the average (although women on the average live longer, a kind of manifestation of physical power most people would consider superior) one may hypothesize a similar mental inequity (ultimately as irrelevant as the physical?). Summer did not claim that this was the case, he only wondered whether this could be ruled out. As Watson remarks, when it comes to the actual world it does not confirm to our wishful thinking. Still he regrets Summers *faux pas*, and contributes it to a certain autistic streak in the President. Summer was after all a mathematical economist, and as is amply corroborated, at least in Watson's views, mathematicians tend to be if not downright autistic at least Asperger, and thus unable to read faces and moods and comply to the rules of social intercourse. Be it as it may with the factual truths of such opinions, and I have to admit that they carry the ring of truth, the way he gives voice to them, seems to reflect personal bitterness and resentment more than measured analysis. Finally, the author is committed to a bottom-up approach to life, and then you cannot close your eyes to a strong genetic component as to intelligence. If so committed there is no reason to assume that races having evolved parallel due to geographical barriers, should keep even steps as to intelligence. (That would almost be some kind of Cartesian duality.) Of course this does not mean that the expected conclusions about racial differences may be drawn, far from it. Later on Watson elaborated on those ideas expressed in the epilogue of his autobiography in an interview with a British journalist. People apparenmtly read interviews more than books, and it caused a furor. Watson had to step down from the Colds Harbor Institute, due to the controversy in which his person had become clouded. This seems to have taken him hard. He a traditional New Dealer and left wing, being accused of racism, the characteristic feature of reactionary politics. Speak about ironies. Watson has probably never thought through the nature of his political convictions.

March 13, 2010 **Ulf Persson:** *Prof.em, Chalmers U.of Tech., Göteborg Sweden* ulfp@chalmers.se