Conversations with Einstein

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Moszkowski was a Polish born noted journalist and critic located in Berlin with an interest in philosophy and general culture, who was close to seventy when he encountered Einstein, still a comparatively young man, just turned forty, still already marked not only by fame that comes with recognition, but also by a celebrity status endowed by the modern media. Moszkowski must have had some clout indeed to be admitted to the personal sphere of Einstein, whose time and attention was cravenly demanded by a growing public. In fact the author was able to meet with him during a year and a half, of which the present book is a condensed and edited version. A model must have been Eckermann's conversations with Goethe, and like Eckermann he is not shy of putting himself forward allowing his own thoughts and formulations usurp a lot of place. However, the rift between Moszkowski and Einstein is probably much greater than was the rift between Goethe and his junior partner. Eckermann can at least expound with some authority on the various topics which present themselves over the years, and occasionally hold forth on matters that captivate Goethe as well as the reader. Moszkowski has no scientific training and his comments pertaining to relativity theory must have bored and pained Einstein, who also shows little patience when it comes to the authors philosophical flights. Nevertheless the book contains a lot of interest and revelations on a variety of topics, and ends with a condensed mini-biography based on what the author has been able to extract from his many sessions.

The most famous equation of them all is $e = mc^2$ and given the size of the conversion factor between mass and energy, would one be able to annihilate a kilo of coal, not just extract the chemical energy bound in it, one would be able to get a huge amount of energy indeed, giving rise to all kind of speculations of future riches. Einstein is very skeptical. First he sees no way how this conversion can be effected in practice. It might not be even feasible, at least not in the foreseeable future; and more seriously he does not see how such an abundance of energy would contribute to the happiness of mankind. With such power at your disposal there would be no natural limits to the action of men, in particular it could be used for destructive purposes. In general Einstein does not see how technology in general is conducive to human happiness. As to practical applications, such as the one just mentioned, to his discoveries, he is indifferent. Not hostile, just indifferent. This is certainly not what inspires and motivates him, what he follows is pure scientific curiosity, which he finds similar to a religious feeling. It is a common misunderstanding that pure research is aimless and hence frivolous, concerned with small puzzles with no serious ramifications, although he may occasionally not be indifferent to such diversions. Pure research too has overreaching aims, and it is the purpose of a serious scientist to identify and pursue those. And it those aims which he has followed. Of course when the author asks him about the puzzle how often the dials on a clock can be interchanged and still be in a legal position, he gets delighted by the problem and very

quickly comes up with a solution[1]. Other distractions, such as chess, does not interest him at all, much to the surprise of the interlocutor, who believes that all mathematically inclined are attracted. When it comes to school, Einstein's personal experience is not a happy one, and he found many subjects boring and pointless. The study of languages he considers overrated. The author points out that with each new language you acquire a new personality. This argument does not impress Einstein, after all people who know a lot of languages are not especially intellectually productive. In particular he thinks that the Classics should be, if not abolished, at least a matter of choice. The author is a bit taken aback, he himself recalls fondly how excited he was of old antique tales, belonging to the happiest of his school memories. As to world history, it should be severely curtailed and no dates to be drilled into memory. And drills are something that is anathema to him. By restricting the curriculum one can get away with a four hour school day to be complemented with two hours of home-work. Is this not too little, the author asks, but is reminded that the hours at school are taxing for the students. One thing he really dislikes about the school system is the tradition of examinations. While in science, and life in general, the goal is to get the maximum result out of a minimum of effort. Examinations are the other way around, with a maximum of effort achieve a minimum of results. The work of cramming for an exam is hard, what it results in is almost nothing. Almost all knowledge forced into you is bound to evaporate after the ordeal is over. When it comes to teaching it is the duty of the teacher to make the subject interesting. This is of course something in accordance with modern pedagogy, and one can well imagine how their proponents would seize the authority of Einstein for their case. When it comes to women and education, his views are less congruent with our present 'Zeitgeist' at least in his comparative youth, he waves aside the name of Marie Curie when it is brought forward by the author as signifying little, and scandalizes him when suggesting that God may have created a sex without brain. Such sentiments would clearly cause nothing but embarrassment and provide gist to militant feminists. And should we not also take his other pronouncements on education with a grain of salt? No one can of course deny that it is of great value if the teacher can make the subject interesting and stimulate the imagination, but closer scrutiny reveals the suggestion as devoid of much real content. For one thing, the author remarks, that no other subject can make the uninitiated student more confused and at a loss than mathematics. You may be weak in history, hard up memorizing dates, yet you still have a good inkling of what it is all about. In mathematics some people take to it directly finding it easy and natural, while others are left clueless. In a sense all those students have been exposed to the same teacher. Why does his teaching work so well for a few and not for others? Is it really possible to make mathematics so fun and available that even the weakest students take to it? Einstein's suggestion that if students were led out into the open with a stick they would soon figure out by themselves how to measure heights of structures which could not be scaled. This appears to me naive. Although Einstein himself learned mathematics

[1] The possible positions of the dials make up a torus $S^1 \times S^1$ the legal positions form a curve of type (12,1). Inverting the dials give a curve of type (1,12) and the two intersect in $12^2 + 1^2 = 145$ points, thus giving 145 positions. Einstein is reported to have given 143, which might be a slip of the author. To show that they are equidistant in time requires an additional argument. The solutions come into pairs, with the sole exception of the obvious case - noon.

by himself, being directed to some books, whose contents he took immediately too, one does not expect this to work in general, then schools would be superfluous (as they may be in their standard form for gifted students). Euclid served as a good basis and as a child he was able to prove the Pythagorean theorem by himself, coming up with the idea of dropping a perpendicular and using similar triangles, a feat that few children would be able to repeat. And as to popular presentations of relativity theory, the author suggests that one should not be so technical, that one should be content by a certain vagueness, and by freely using suggestive analogues would jog the minds of the innocent readers, enlarging them without necessarily filling them. Einstein does not see the point. When the case of the contracting rod is brought up, and the special mental blocks that might be associated to that, Einstein is puzzled. But I prove that the rod contracts he protests, and he listens to the suggestions brought forward by his conversation partner and dismissing them as artificial and far-fetched, and as a reader I am inclined to agree with him.

When it comes to the process of discovery Einstein has not very much to add. After all, when in the process you are too engaged in it to step aside and observe it at the same time, because if you do so, the process you want to study disappears. Einstein emphasizes the gradualness of the process, an important discovery entails the significant linking of many sub-discoveries. He quotes with particular relish the saying of Gauss, that he has the results, but that he does not know how to get to it. Thus Einstein agrees that intuition plays a paramount role, a romantic notion sure to gratify many readers. When it comes to rank scientists of the past, he holds forth Newton and Galileo on one hand and Faraday and Maxwell on the other, but thinks little of say da Vinci as a scientist, and holds the claims made for his priorities unfounded. One can always in retrospect discern traces of anticipation of previous thinkers, the important think is to fully understand and forcefully formulate as to make an impact beyond the tentative. It is necessary to have preliminary vague ideas, but they need to be developed into real thought in order to matter.

When it comes to speculations about a Lumen, which can travel faster than light and hence experience time running backwards, Einstein has only scorn. Such phantasies have no value, give no instruction, and are just impossible and stupid. The same thing about parallel worlds with which we have no contact. Science has no truck with such things. This somewhat to the dismay of the author to whom such speculations are dear. Nor does Einstein show any curiosity about so called occult phenomena, and when he is pressed on the issue that scientists should look into them, he just shrugs his shoulder and thinks it is not only right but a positive duty for scientists to ignore the matter. When it comes to charlatans and duplicities there are too many confusing factors for the man of intellect to busy himself with it. Those who nevertheless consent to do so, put their reputations in jeopardy. The author is disappointed, he has personal stories to relate, which he does, with Einstein dutifully listening to, but of course he fails to understand Einstein's singular indifference.

The kindness of Einstein impresses the author, and he believes that the moral fibre of his being is probably the reason why he has attained such an iconic status as the scientist of the age. Einstein self finds the celebrity status imposed on him peculiar and looks at it with some amusement, yet ultimately finds it irksome and an impediment to his work, his attention being claimed by so many fools (out of which, the author probably realizes,

one at least is suffered gladly). On the other hand he also recognizes that Einstein does not really need people, that although friendly and humorous in society, especially among friends, he is utterly self-sufficient. He may love mankind in the abstract, but not as individuals.

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