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An Italian philosopher of science, Mauro Dorato, once wrote a book entitled What does soul have to do with atoms?, because he is a philosopher of physics, and he wanted to show what does philosophy have to do with physics. Suppose that someone asks you «what does philosophy have to do with biology». What would you answer?

Well, I think my answer would be the following. I don't think that the relationship between philosophy and biology is something special. I think it's more a question of the relationship that philosophy has with lots of areas like physics, anthropology, biology, but also I think with politics, and art, and other issues like that. I, as a philosopher – and I *am* a philosopher – don't think that I'm doing biology (any more than if I did philosophy of politics would I be a politician). Rather, what I'm doing is coming to an area like biology – or like politics – with some overall knowledge about the way that we think, the way that we reason, whether there are differences, different kinds of thinking – say – between politics and what we say religion, or something like that. So, I like to think that philosophy can help to clarify issues, often issues which are troubling within a particular

discipline, and bring some light on these matters. Now, in a way, that sounds very arrogant, but it's not really.

Sometimes there can be a defensive attitude against the philosopher.

Well, I think that's true. To a certain extent philosophers should have a certain humility. The great English philosopher John Locke once said «I am an underlabourer, trying to clear out some problems that people have. I'm not Isaac Newton or Robert Boyle, or one of the other great scientists. I am an underlabourer, I'm trying to clear the ground so the plants can grow». And I think to a certain extent that that *is* the place of philosophy. Yes, I am not a biologist, I am not a politician, and I *don't want* to be, but *I do want* to clarify and understand. So, one of the nice things about being a philosopher is that I don't have to stay just with one area of biology: today I can look at evolution, tomorrow I can look at physiology; today I can look at sociobiology, tomorrow I can look at evo-devo, but also, of course, as a philosopher if I want to turn and look to something like stem cell research, I can do so. Well, as if you were practicing evolutionary biology it would be difficult to move on, unless you collaborate with somebody for some specific reason. So, I would say that for me what's important is to try to get a sense of the overall picture of what makes life tick, an overall sense of the meaning of reality, and I do this by looking at areas like evolutionary theory.

Indeed, while I was preparing this interview I tried to understand if you were a specialist in something, but you always changed your focus of interest through your career.

Right, I've written a great deal, and of course you probably know because I had several of my books translated into Italian. Although I work on evolutionary biology I would like to keep moving on to different areas, because I think it *is* such a broad area. At one time I work on human beings,

another time I work on – you know – sociobiology, a third time I work on “God and biology”, and I like to cover all of these issues.

Do philosophy of biology have some distinguished feature?

I think a philosopher as being a little bit like a physician. A *general* philosopher is like a *general* physician. Somebody comes in and say «oh, I’ve got a headache», or «my stomach aches». Now, you can start to analyze what’s going on: you bring some past experience with other people who had headache or stomach-ache; you also consider the fact that you’re dealing – let’s say – with a middle-age woman, or with a teenage boy (this would enter into your analysis because, you see, with the teenage boy the stomach ache is not likely to be the menopause, whereas with the middle-age woman it might be). I think that philosophy behaves in very much the same sort of way.

Now, the thing is, of course: if you’ve got problems, then at a certain point you might say «well, now the time has come to send you to a specialist», let us say to a gynaecologist, or to a paediatrician who beholds in teenage growth, or something like that. And I think that that would be where *the philosopher of biology* would come in, as opposed to the general philosopher. Because he has had to take some time to look at the theories of biology at some detail, and to try to understand them, and to get an appreciation of them – for example, the work that goes on between theory and evidence, and issues like that. And philosophers say «well, perhaps we can help clarifying issues where there are disagreements, trying to disentangle ideas, give some understanding». Helping to categorize different things can be *very* helpful.

Here is a case in point where a general philosophical knowledge might be very helpful: often for instance people, particularly young people, argue about the existence of god. What you find after a while is that they’re not talking about the same notion of god. One person is talking about an old man, in a white sheet, up in heaven, and another person is talking about more a conceptual idea, the

ground of all being. We say in English that they argue “in a logaheads”: they are arguing about different things. Now, I think you, as a philosopher, become sensitive to the fact that sometimes – though not always – disagreements are less about actual facts, and more because people are not really clear in their minds what they want to defend, or what they think the other person is trying to defend.

A perfect case in point in evolutionary biology would be the debate about group selection. On the one hand you’ve got somebody saying «oh, well, I believe in group selection», and another person says «oh, well, I *don’t* believe in group selection». But to a certain extent the disagreement is not about group selection (or about the nature of natural selection) but on *how you are going to use the term* “group selection”. If you insist on including kin selection in the group selection, then perhaps you’re going to say «there’s a case to be made today for group selection». On the other hand, if you say «no, kin selection is *not* part of group selection», then you’re going to say «well, the case *cannot* be made for group selection». So, here will be a case where to a certain (perhaps, to a great) extent, it’s not that people disagree about the biology, but they disagree about the terminology.

I am really interested in what you think about the proposal of a “new evolutionary synthesis” brought forth by some biologists, who also claim help from philosophers on this.

No, I personally think a great theory never stands still. A great theory is always changing. Certainly we’ve seen huge changes since Darwin published the *Origin of species*, 150 years ago, to where we are today. But at the same time I see it as being *exactly the same* theory. And my prediction is that when you interview me in 2109 (in a hundred years time) *nothing* that we do today will be the same, and still will be Darwin’s theory. The analogy I like – if you forgive me in the land of Maserati and Ferrari – is the Volkswagen Beetle. It was invented by Dr. Porsche in Germany, in 1937-1938. Today my daughter Emily in Florida drives a Volkswagen Beetle. *Not one part* of

Emily's car is identical to the car in Berlin in 1938. And yet it is *so obviously the same* car. So I expect that what's going to happen next will be a Beetle that has an electric motor, or that is more fuel-conserving... whatever it is of course, but I suspect – let us say – in 50 years we will still have the Volkswagen Beetle, but it will be a completely different car. And that is the analogy I like for evolutionary theory. I don't think we need a new theory, but the point is: today's theory will change completely.

You see a sort of continuity in this change.

I do, indeed. I think that this is what happens to great theories. Is that one gets *change by continuity*. There were two great philosophers before Socrates. One was Heraclitos, and he said «you cannot step into the same river twice: everything changes». The other was Parmenides, who said: «nothing moves». And I believe they were both right. In Darwin's theory nothing moves, everything changes.

The last question...

... Yes, I think that Italian women are very beautiful!

(laugh)

Ok, you're right, I'm too much serious... but what about Intelligent Design?

Ah, well, Intelligent Design theory. I've done quite a bit of work on it, and I got very interested in it, because I know several of the people who are the leaders of that movement – at a personal level I am very friendly with some of them. I don't think Intelligent Design theory is science. I think ID

theory makes appeal to miracles and I don't believe that contemporary science allows appeal to miracles. I think that it is a form of American Evangelical religion, dressed up to look like science in order to get around American constitution's separation of church and state, in order to be acceptable on American constitutional grounds in American classrooms.

Yes, but the problem is that also in Europe now we have some movements like that.

Yeah, you do, particularly in countries like Holland, which has a very extreme conservative protestant group. And, of course, within the Catholic church also you have people like cardinal Schönborn who are sympathetic. I think perhaps even the Pope. I think a lot of this – particularly in the Catholic world – is that they dislike the strident atheism of some prominent evolutionists, like Richard Dawkins and Dan Dennett and others. And so, to a certain extent, they associate Darwinism – and science – with atheism. And so, to that extent, they tend to be rather trying to push it on one side, of course. I mean, it also goes over to medical areas like stem cells research and things like that. So I think that there is more what I would call *a political hostility* in the catholic church to evolution at a certain level, than anything based on theological grounds. Because in fact I would argue – I *have* argued – that there is *absolutely no reason whatsoever* why a practicing Christian should not be an evolutionist. If God wants to design the world on an evolutionary basis rather than by miracles, that's God's business, not ours. I mean – as people used to say in the Nineteenth century – we could all each of us be individually created out of an egg, but in fact we come about through sexual intercourse, with a penis going into a vagina, and the Victorians used to say «well, that sounds pretty disgusting», but that's what God wanted, and so we've got to put up with that. And my feeling is that if you can accept sexual intercourse, then evolution is easy.