

**Acceptance speech
by the new
doctor honoris causa
Sydney Brenner**

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**Universitat
Pompeu Fabra
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It is a very great honour for me to be here. All I can say on the basis of the ceremony is there should be many more heads of universities who are women, because embraces are usually more spiritual, but I think in the present scene it was very practical and very much enjoyed. I thank you and, of course, if there are women professors who wish to enjoy an embrace, we can make time after.

I should say I was asked to write a speech, but I never write a speech because it commits you in advance. Of course, now that I have heard all the formal speeches, I realize my speech, if I had written it, would be extremely boring; just all the usual things that people say at these ceremonies.

Usually, when I get an honorary degree it is at a normal graduation ceremony. Sitting in the audience are many young people getting their degrees in medicine or biology or even humanities. On such occasions, I have to sit through the entire process of shaking hands and so on, and then I am allowed to speak. Of course, what I say then is very different from what I am saying now, because all those people have worked three years, four years, maybe many more years, night and day, doing written examinations, to receive a diploma, but I get one and I did not do anything! I just got it for free, and usually very high up in the ranks of degrees.

Of course, that is a little bit of an exaggeration, because to get into that position you have to work quite hard all of your life. I have always been interested in the science of solving problems, because that is what science is. It is the best way we know of giving answers to problems.

I remember once I spoke to a politician in England. As you know, many politicians are only interested in one objective, which is to be re-elected. That means they have short-term objectives covering maybe two, maybe three years. But scientists are interested in much more long-term things. This junior minister was criticizing me because I was living, as he said, in an ivory tower, not doing anything for the good of society or the economy, which is very important these days. So I said to him, "Have you ever solved a problem in your life?" He said, "What do you mean?" I said, "I mean there's been an unresolved problem and you've found the solution." He said, "Come to think of it, I haven't done that." I said, "That's what we do here, we solve problems."

I think the history of humanity can be summed up in very few words. We have learned a number of things. What we have learned is that magic does not work, religion is very unreliable, but science works. That is the important thing. It is only a few hundred years since we discovered it. What science does and can do is challenge the doctrines that go round. Research to accomplish an awful lot of things is our way of showing that we can give the answers to new problems.

I could say much but it has been said before. However, I must tell you the story of how I came to see that there is a difference between junk and garbage. One day a machine was delivered to our lab from California in a beautiful box. The box was open, so I took the box home. I said to my wife, "You know, I'm going to build a bookcase with this box." The box stayed in the house for many years, up in our attic. One day my wife said she needed to clear the attic so she threw the box out. I said, "Where's my box?" She said, "You'll never build a bookcase, I know you. I threw it out because now you can go and buy yourself a bookcase." So, my wife was a terrific agent of natural selection. She instantly converted

junk into garbage and threw it out. Of course, there is one difference between natural junk and garbage. I had a plan to build a bookcase, but biological systems cannot plan for the future. The bacteria sitting in the primitive ocean cannot say, "I'd better not touch this gene because I may need it in three billion years to make a muscle." So, junk is kept because there is no reason to throw it out. Most junk does not damage you, so there is no Darwinian move to make it important.

The other thing you learn, if I may say so, which I think many people do not appreciate, is that there is a difference between three disciplines. Only mathematics is the art of the perfect, only mathematics. Physics is the art of the optimal, but biology is the art of the satisfactory. If it works, keep it. To try and improve it is costly in terms of sequences and value. You have to invent new sequences and that is very expensive in evolution, so the best thing is to cut corners. Just keep it.

The other thing I know about evolution is that many things seem impossible to do in evolution. In fact, our whole initial programme of systems biology, where everything was calculable, is wrong. Why? Because biology treats evolution like income tax. As you know, if you evade paying income tax you go to jail. It is a criminal offence. But you can legally avoid paying income tax. That is the way out. Biology finds tricks to avoid all these catastrophes of too many equations. It just finds a different way to do it, usually very cheaply. So, for all of you who are studying evolution, and I know Barcelona is a great centre for that, just try to remember that *E. coli* is extremely stupid, it cannot do complicated things. All it knows is how to avoid income tax, the perils of evolution.

I will say one last thing. One of our speakers said he regrets that I have not written more or worked on evolution. I have been working on evolution for the last fifteen years. It is only very recently that I have seen a way out of the main problems of this. Of course, he will still have to wait, because I am a very reluctant writer. I do not have Francis Crick any more to lock me in a room and say, "You aren't coming out until you've written that paper." But I will be writing soon and I hope you will not have to wait for another Sydney Brenner, he exists already, but you may have to wait for another writer in the name of Sydney Brenner.

All I can say finally is why it is important to lodge all these things in universities, because now that we know, apparently, so much about humans, we recognize how little we know. As I mentioned before, humans are the most important animals on this planet. We are the only animal that can think about the future. We can remember the future, if you like. All animals remember the past, but we can actually envisage what the future will be. That is the basis of science, after all.

We live in a society now where everything is driven by economic value, most of it in the form of money, but there are many more things that we have to ensure. We have to ensure that humans are seen as much more than just genomes walking around in bodies. I once gave a lecture and someone in the audience stood up and said, "Why can't I copy myself, clone myself and keep the copies for spare parts?" My reply was, "Be careful, one of the copies might keep you for spare parts." He did not recognize that those copies were persons with minds and capacity for error. We should not forget that.

We should not forget that we still have to do new things in the future, and short-termism is something that universities can counteract, because you are in charge not of today's economy, but of the economy twenty years from now. Why? Because the people you will

educate and influence will be the people who will create the economy of the future, and we must preserve that at all costs. That is the function of universities. You should not just become a kind of research institute, but should encourage the broad education of your young people, as well as offering them challenges that will measure them or allow them to measure themselves. So, I wish you all a great future and I thank you for the honorary degree, for the nice medal and for the embrace. Thank you.

