

Speech of Professor
Sir Michael Atiya
Winner of King Faisal International Prize
For Science 1987/1407H.
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It is a great honour for me to receive a King Faisal Prize and I am very pleased to have been invited to Riyadh for this occasion. As you know the field of science selected this year was Mathematics, a choice which is particularly appropriate in view of the important contributions made in that field by the great Arab mathematicians of the past. While the Greeks created Geometry, as we know it, the Arabs, notably AL-Khwarizirni, created Algebra. They also translated and developed Greek mathematics which was then transmitted to the West and provided the foundation of modern science.

At the present time Mathematics, one of the oldest branches of human knowledge, continues to develop in many directions. In addition to its traditional role in the natural sciences it is now increasingly involved in economics and the social sciences, while its off-shoot computer science is rapidly spreading into all areas of modern life. It is perhaps an interesting reflection that Al-Khwarizimi in his famous book Al-Jabr wa Al-Muqabala stressed that his algebra was being developed for practical, essentially commercial purposes, so he would not have been surprised at the present role of computers in our world.

My own involvement in mathematics in recent years has been in the area between Geometry and Theoretical Physics. At the present time there is much excitement amongst physicists trying to understand the ultimate nature of matter and of the forces that govern the Universe. New and very sophisticated ideas from mathematics are being used in an attempt to unravel these secrets of Nature. Einstein's dream of a unified field theory may be on

the verge of being realized, and mathematicians are actively involved in this great enterprise.

Modern science is very much an international collaborative effort. This is obvious in those experimental sciences which depend on large and expensive laboratories and equipment, such as high energy physics or astronomy. It is also true in more abstract disciplines such as mathematics and theoretical physics. The speed of modern communications means that new ideas and results are almost instantly available to all workers in the field. My own contributions in mathematics have been very much part of this cooperative process, and I have been fortunate to have had as friends and colleagues some excellent mathematicians from a variety of countries. I would in particular like to take this opportunity of acknowledging the help I have had over the years from my major collaborators, Fritz Hirzebruch from Bonn, Raoul Bott from Harvard and Isadore Singer from M.I.T. In addition I have been fortunate enough to have had some very talented students, from whom I have learnt much. Notable amongst these are Graeme Segal, Nigel Hitchin and Simon Donaldson, all colleagues of mine now at Oxford.

On a personal level it is an especial pleasure for me to be here in Riyadh today. I spent most of my childhood, until the age of sixteen, in the Arab speaking world: in Khartoum, Cairo, Alexandria, Beirut and the mountains of Lebanon, from which my father came. Although, forty years later, my command of the language is now limited, I retain a close identification with this part of the world and I am glad to be back.

A few years ago I came to Riyadh to attend the First International Conference of Mathematics in the Gulf States. On that occasion I made the acquaintance of many of the mathematicians in your universities and I am happy to have the opportunity of seeing them again. I also met many Arab mathematicians from other countries who came for the conference and it was gratifying to see from their number that Arab involvement in mathematics is now substantial, and that the skills of the past have been handed down to our own times. That conference also showed the importance now attached to mathematics, as a basic science, in this country.

Finally I would like, on behalf also of my wife and son, to thank all those at the King Faisal Foundation who were responsible for arranging our visit and for taking such good care of us. My only regret is that our stay here has to be such a short one.