

SPEECH OF

PROF. MOSTAFA A. EL-SAYED

at the ceremony of awarding him the Prize

9.8.1410 H - - March 6, 1990

Your Royal Highness, Prince Abd Allah Ibn Abd Al-Aziz,
The Crown Prince,
Your Highnesses, the Princes
Your Eminencies and Excellencies
Distinguished guests
Ladies and gentlemen

I am very proud and privileged to be among those fortunate scientists that have been selected to be awarded the King Faisal International Prize in Chemistry this year. This prize is one of only four prestigious scientific international prizes given annually to the fortunate few. For this I am most thankful to the King Faisal foundation, to the institutions in the Kingdom and elsewhere who had nominated me and to the Selection Committee for selecting me. I also would like to thank with great pleasure the many people who have helped me all along and thus enabled me to be at this honorable gathering tonight: my brother and father Mohammed Amr El-Sayed who had raised me with love and wisdom, my wife and children whose patience and encouragement enabled me to concentrate on my work, my teachers at Ein Shams and Florida State Universities who taught me science, and my research students whose work is being recognized tonight.

My group and I have been trying to understand how energy, in particular light energy, that is absorbed by matter can be converted into other kinds of energy or change matter into other kinds of matter. Together with many scientists the world over, we have learnt a great deal about this in particular during the past two decades after the advent of lasers.

Over a decade ago, our research efforts began to focus on how solar light energy is converted by some living cells into the “fuel of life”, a molecule called ATP, by a process called photosynthesis. In this process resides one of the important secrets of life on the planet earth. The energy extracted from ATP is used by plants to grow. As you all know, plants are vital to the life of many living beings on earth, including animals. Animals are also important to the life of humans. Also, plants when buried underground for long period of time are transformed into petroleum. Thus photosynthesis is one of the many gifts that God gave us here on earth.

There are two types of photosynthetic cells in nature, the one present in plants and the other is in a special bacteria called bacteriorhodopsin. We have done our research on the latter. We developed new laser techniques which enabled us to follow the changes in the different molecules within the cell as a function of time after the absorption of light. Two lasers were used, one as the light source and the other as a probe of the molecular changes. It turns out that solar energy is first converted into different types of electric energy on different time scales before it is converted into the chemical energy stored in ATP. A great deal of understanding has already been accomplished, but, thank God, there is a great deal more to learn to keep us busy for a long time.

Again, I would like to express my thanks to the King Faisal Foundation for recognizing and honoring our scientific contribution. God bless you.