Genes and Genomes: Impact on Medicine and Society

Genes, Genomes, and Society
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Lee C. Bollinger, President, Columbia University, and Jonathan R. Cole, Ph.D., Columbia University
Welcoming Remarks and Introduction

Welcome by Lee C. Bollinger

President Lee C. Bollinger: I would just like to welcome everybody briefly to the second day of the symposium. I have heard comments after yesterday's session that makes me think that the impossible may have been reached here, which is that a symposium has actually been one of the most creative and important experiences intellectually for people who were fortunate enough to be here. I want to thank all of the people who have come as panelists and speakers from outside of Columbia to participate in this and to help us celebrate the 250th anniversary of Columbia.

The subject of genes is of course immensely important, and we all know that. We are, outside of science, woefully ignorant about what this really is and the implications, although through discussions, through media, we have inklings that this is perhaps one of the most important revolutions in human knowledge within several centuries, or right up there among the very top.

The other panel, the other symposium that we have going on yesterday and today, is on constitutions, constitutionalism, and for my mind, to my mind, these are again two of the most important areas of development in knowledge in human activity. The subject of constitutions of course in the United States has a sort of magisterial presence. It has really been not only a way of defining the government in a fundamental way, including civil liberties of course, but also a way of defining the basic values of American society. Today in this symposium we take up also a connection between the discoveries that have been made or that well be made, we hope will be made, and the implications those have for society.
The moderator is Jonathan Cole, whom I very pleased to introduce. Jonathan is enviably on a sabbatical in Paris and has given up a few days of that to come back and be with us here. No one understands the interconnections of knowledge, whether from constitutions to genes, or from science to humanism, technology to social sciences, better than Jonathan Cole, whose own work as a sociologist covers and thinks about the sociology of science. It is a great, great pleasure to have Jonathan back, and I give him to you. Thank you very much.

Introduction by Jonathan R. Cole

Jonathan R. Cole: Good morning, and thank you very much, Lee, for those kind words. It is good to be back at Morningside Heights, despite the pleasures, culinary and otherwise, of Paris. And it really is my pleasure to serve as the moderator of this morning’s session, "Genes, Genomes, and Society."

I should also like to take this opportunity to thank our guests at Columbia, particularly the extraordinary women and men of science who have participated in this exciting program. I want also to thank Gerry Fischbach, Tom Jessell, and Joanna Rubinstein for organizing the program and for the immense care that they've taken in putting together a balanced and extraordinarily interesting set of speakers.

Now over the past day we've heard some extraordinary examples of the way the biological revolutions involving genes and genomes are rapidly advancing, and are apt to change the way we think about medicine, disease, about creating and sustaining life. We have also been given a tantalizing introduction into the puzzles of science, and how scientists go about trying to solve them. We have seen the beauty of science and its unending quality, that is, the way in which the solving of puzzles create new puzzles to be addressed. If these scientists see further by standing on the shoulders of giants, they in turn are creating the shoulders on which others will sit and gain advantage in viewing the beautiful and ever-continuing landscape of scientific puzzles. Watching my old friend and colleague Michael Levine and others here yesterday, I thought of Newton’s reflections with perhaps slightly obsessive humility on doing science. He said, "I do not know what I appear to the world, but to myself I seem to have been only like a boy playing on the seashore, and diverting myself and now and then, finding a smoother pebble or a prettier shell than ordinary whilst the great ocean of truth lay all undiscovered before me."

Now on an entirely different but equally important level, there are, of course, profound social implications of these revolutionary scientific changes that were discussed yesterday. All of the science created and developed by these extraordinary men and women is embedded in larger cultures and societies. Fully understanding these revolutions requires that we place them in the proper societal context. The values, attitudes, beliefs, and allocation of scarce resources affect the progress of these revolutions and in turn affects how we use the
outcomes of this amazing work. It's therefore critically important that we consider the way societies have had an impact on this science, and the ways that science and technology can have an enormous impact on societies. And we should consider how these discoveries can affect the relationship between the richer and poorer societies of the world.

There are a set of important and relatively new questions that we must also attend to. A sharply reductionist view of science is yielding to a deeper understanding of the critically important interactions between biology and the larger social environment, if you will, to the critical interaction between the biological and the sociology and anthropology of social systems. This in itself opens up the possibilities of the emergence of critically important new areas of social-science study that are related to the knowledge being generated by the biological revolutions.

How do genomics and genes influence social orders and social systems? How do social systems influence biological outcomes? How do biological and social factors interact to affect the expression of genes or influence types of behavior? How do we reconsider old and problematic concepts, such as race? How should we, in the purely normative sense, use the fruits of our biological discoveries to improve the condition of the populations of developing nations in the world? Can biological discoveries, if put to proper use, attenuate the growing inequalities between the rich and poor nations of the world? How do we strike a proper balance between the needs of scientists to experiment and the needs of individuals to be protected from improper modes of experimentation? How do we deal with the ethical issues related to the science of cloning and the use of specific strategic materials, such as stem cells? Can we protect science from the dangerous intrusion of political ideology, which can destroy otherwise healthy scientific organizations? Can science police itself adequately? How do we close the gap between the rate of advance of science and the rate of advance in institutions that must use or misuse the fruits of the discoveries?

It is towards consideration of such questions that we turn to in this session "Genes, Genomes, and Society." We have four extraordinarily distinguished speakers with us this morning, and biographical sketches of each of our speakers can be found in your programs, so I will only highlight a number of their many achievements.

Now in the first of this morning's sessions before we break for some coffee, we shall hear from Professor Anne McLaren and Professor Andrew Colin Renfrew.