

Houston Philosophical Society

635th Meeting

Cohen House

February 18, 2010

Under the leadership of President Evelyn Keyes, the Society gathered for a reception and dinner meeting. Following dinner, Vice President Herb Ward assisted in the introduction of both visitors and newly elected members of the Society.

President Keyes then introduced Professor John Polking to introduce the speaker of the evening, Professor Roland Glowinski whose topic was "Mathematics and Mathematicians: Facts, Legends & Myths, Applications."

Professor Glowinski is by birth a French mathematician. He received his B.S. from Ecole Polytechnique, Paris, his M.S. from Ecole Nationale Supérieure des Telecommunications, Paris, and his Ph. D. in Mathematics from P. & M. Curie, Paris. He has had a distinguished career in applied mathematics and is currently Cullen Professor of Mathematics at the University of Houston. He has published six books and numerous articles and is a member of both the French National Academy of Sciences and the French National Academy of Technology.

As a mathematician, Professor Polking reminded the audience of how hard a task it is for mathematicians to talk to non-mathematicians. Professor Glowinski then spoke as a lover of mathematics attempting to inculcate that same feeling in non-mathematicians. He prepared an extensive power point presentation which is available on the Houston Philosophical Society website.

Dr. Glowinski's stated purpose was to convince his hearers of what he describes as the diversity of mathematics. To do this he set out to define Mathematics and then to show its relationship to the other sciences, the applications of mathematics, a very interesting section on the sociology of mathematics with an emphasis on women in mathematics, and, finally, some great challenges in mathematics.

Using the Wikipedia definition of mathematics, in a tongue in cheek way, he traced the evolution of mathematics from counting, calculation, measurement, and the systematic study of the shapes and motions of physical objects. What he describes as practical mathematics has existed as far back as the development of written records. Mathematics early on branched into a division between applied mathematics (including statistics and game theory) and pure mathematics. He took some satisfaction in the fact that some concepts that first appeared in pure mathematics subsequently found practical application.

A basic question is whether mathematics is a science. The Physics Nobel Prize laureate in 1965 indicated that "Mathematics is just a language plus a tool box. If you do not find in the box the tool you need, you create (invent) one."

From a Platonic perspective that our world is a projection of reality, Dr. Glowinski indicates that "Another consequence, is that our imperfect world being a projection of the perfect mathematical one, it is not [therefore] surprising that mathematics works pretty well to explain what we call natural phenomena."

Dr. Glowinski indicates that without mathematics and mathematicians there would be no computers. Mathematics and computers cooperate instead of competing then they help provide the solution of a large variety of problems from the natural, engineering, medical, social, and economical sciences. They need each other.

In an area of particular interest to the non-mathematician portion of his audience, the speaker shared the reasons why there is no Nobel Prize in Mathematics. The leading Swedish mathematician around 1900 when the Nobel Prizes were created was G. Mittag-Leffler. Alfred Nobel strongly disliked the mathematician whom he thought to be vain, arrogant, and an operator (not in the mathematical sense). He was an excellent mathematician who could have won the Nobel Prize on his own. Accordingly, Nobel decided there would be no Nobel Prize in Mathematics.

The speaker then turned to the topic of women in mathematics indicating that the first famous woman mathematician was Hypatia of Alexandria (37-415). The first notable French woman mathematician was Gabrielle, Emile, Marquise du Chatelet (1706-1749, a physicist who translated Newton's *Principia Mathematica* from Latin to French with her own mathematical comments thereon. Voltaire, with whom she was romantically involved, said that she was "a great man whose only fault was being a woman."

The speaker then turned to what he described as great challenges in mathematics. These include the solution of the Fermat Last Theorem as well as the Poincare Conjecture but two major unsolved problems (the Riemann Hypothesis and the Goldbach Conjecture) still remain. From there he moved on to mathematical tragedies. The first took place in ancient Greece/Italy around 500 B.C. Pythagoras found a philosophical and religious school in Croton (in the south of modern Italy). Mathematics played a fundamental role in Pythagorean philosophy. A legend says that when one of the School members presented a proof to them that was counter to their thinking, members of the School threw him off a cliff into the sea, which seemed to indicate that some people took mathematics pretty seriously at that time. It also validated the concept of shooting the messenger.

Dr. Glowinski's conclusion resonated with his audience: "My conclusion is that math is cool!"

It is a strong possibility that some who did not share his enthusiasm and love for mathematics when the presentation began found a new appreciation for both mathematics and its practitioners.

Don R. Byrnes

Recording Secretary