1154-76-2331 **Roseanna Gossmann*** (rgossmann@aopsacademy.org). *The elastohydrodynamics of a simplified model of human birth.*

With a view towards reducing the incidence of unnecessary surgical intervention during birth by reaching a better understanding of the mechanics of human birth, we investigate how amniotic fluid transfers forces from the birth canal onto the fetus during birth. Motivated by a simplified physical model which represents the fetus moving through the birth canal using a rigid cylinder (fetus) that moves through the center of a passive elastic tube (birth canal) immersed in highly viscous fluid (amniotic fluid), we utilize numerical methods to explore the forces on the fetus, and their relationship to the successful progression of birth and to strain in the birth canal. The time-evolving geometry of the elastic tube includes buckling behavior, which also occurs in other systems of flow through collapsible tubes, and is explored by varying properties of the rigid cylinder, elastic tube, and surrounding fluid. Peristaltic contraction of the elastic tube is also included in the model to provide additional insight into the force and velocity of the fetus and strain in the birth canal during human birth, when the birth canal is highly active. (Received September 17, 2019)