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John Pell's mathematical papers and the Royal Society's *English Atlas*, 1678–82. (English. English summary)

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At the end of the 1670s the Royal Society of London endorsed a project to produce a grand atlas of the world, containing 200 maps covering both hemispheres of the globe. This project involved several people, of whom the three most important were: Moses Pitt, a London printer who originated the proposal; Robert Hooke, a fellow of the Royal Society who formulated general methodological guidelines for the atlas; and John Pell, another fellow of the Royal Society who was charged with the technical work of actually producing accurate maps.

The project to create an atlas resulted only in four volumes of a projected twelve volumes, and is regarded as a failure. The printer Pitt lacked cartographical expertise, there was a shortage of skilled draftsmen, and the project was under-capitalized. Pitt himself ended up in debtor's prison, where he spent the last seven years of his life. The *English atlas* was one of several ambitious scientific projects of the period that failed to come to fruition.

Working from unpublished papers of Pell, the author examines Pell's hitherto neglected mathematical efforts to create maps that followed the methodological desiderata set forth by Hooke and also satisfied the practical and material conditions imposed by the printing process. Hooke had stipulated that the same projection should be used for all of the maps and that a common scale should hold throughout. The maps were based on Mercator's projection, which had been described in mathematical detail by Edward Wright in his book *Certain errors in navigation* (1599, 1610). The Mercator projection projects the sphere of the Earth on an enclosed cylinder, producing the familiar world map which becomes progressively distorted as one approaches the poles. Given a chart with north at the top in which latitude increases from bottom to top, an inch of horizontal length on the chart will represent a larger distance at the bottom of the chart than at the top. Hence for a map of some region of the Earth it is necessary to find a method that allows one to determine for each latitude the corresponding scale factor. An English touch that Pell brought to his calculations was to use Henry Brigg's logarithms to facilitate the work.

The author provides an overview of Pell's draft work, foregoing a detailed analysis of the calculations and geometrical principles employed by him. No concrete examples are presented to illustrate his work. It is clear that Pell struggled to reconcile Hooke's theoretical precepts with the reality of having to produce maps on sheets of paper of common dimensions. The author's larger goal is to understand the map project as part of early modern English mathematical science. The author concludes (p. 29): "Pell's papers show, in action, the Royal Society's determination to use mathematics to control variables, to regulate data-sets, and to synthesize the greatest possible quantity of data with the highest feasible level of accuracy." *Craig G. Fraser*