1056-R1-255 **Melvin G. Royer*** (melvin.royer@indwes.edu), Department of Mathematics, Indiana Wesleyan University, 4201 S Washington St, Marion, IN 46953. *Gabriel's Other Equipment.* Preliminary report.

This Calculus II laboratory introduces Gabriel's Horn (infinite surface area but finite volume), then investigates other solids of revolution with similar curious behavior. The overall goal is to have students discover the following facts:

1) A solid with finite surface area must have finite volume but not vice-versa

2) The finitude of the planar area of the generating region and the finitude of the volume of the solid are independent

3) A planar region with finite perimeter must generate a solid with surface of finite area but not vice-versa

Most examples are compiled from journals, though a few seem to be new. One category of solids uses improper integrals while the other involves infinite series. Since many results cannot be expressed with elementary functions and since numerical evaluation is unreliable, students are guided through extensive use of integral and series comparison tests. Other benefits to student learning include exposure to some bounded fractal-like surfaces and to some classical summation results.

The primary uses of the computer algebra system are (1) visualizing the solids, (2) automating the routine calculus involved in setting up the surface and arc length integrands, and (3) evaluating a few of the integrals and summations. (Received August 20, 2009)