1070-01-325 **Bruce S. Burdick*** (bburdick@rwu.edu). *Various Observations on Euler's E72.* Preliminary report.

Euler's *Variae observationes circa series infinitas* (E72) considers a variety of infinite sums and products. His first theorem,

$$\frac{1}{3}+\frac{1}{7}+\frac{1}{8}+\frac{1}{15}+\frac{1}{24}+\frac{1}{26}+\frac{1}{31}+\frac{1}{35}+\cdots=1,$$

where the denominators are the whole numbers that are one less than a non-trivial power, he attributes to Golbach, both for its statement and its proof. He then proceeds to prove other theorems in more or less the same manner.

The method of choice for Euler (and presumably Goldbach) involves subtracting infinite quantities from infinite quantities in a way that would no longer be acceptable as a mathematical demonstration. In a recent paper, Edward Sandifer and the speaker gave a modern proof of Euler's Theorem 1. This talk is a follow-up to that paper, and will show that other theorems from E72 can be supplied with proofs that meet the present-day standards of rigor. (Received February 15, 2011)