1041-60-36 **Paweł Hitczenko*** (`phitczenko@math.drexel.edu`), Department of Mathematics, Drexel University, Philadelphia, PA 19104, and **Jacek Wesołowski**, Wydział MiNI, Politechnika Warszawska, 00-661 Warszawa, Poland. *Tails of perpetuities.*

Perpetuity is a random variable R satisfying

$$R \stackrel{d}{=} Q + MR,$$

where (Q, M) are random variables independent of R. Alternatively, R is a limit in distribution of a sequence (R_n) satisfying

$$R_n = Q_n + M_n R_{n-1}, \; n \geq 1, \tag{1}$$

where (Q_n, M_n) are iid copies of (Q, M), (Q_n, M_n) is independent of R_{n-1}, and R_0 is arbitrary. Accordingly, R may be written as

$$R \stackrel{d}{=} \sum_{i=1}^{\infty} Q_i \prod_{j=1}^{i-1} M_j. \tag{2}$$

Conditions guaranteeing convergence in (1) and (2) have been given by Kesten. Equations like (1) are ubiquitous in applied mathematics; an example closely related to the theme of this session is the analysis of Hoare's `FIND` algorithm.

The main focus of research has been on the tail behavior of R:

$$P(|R| \geq x), \quad \text{as} \quad x \to \infty.$$

If $P(|M| > 1) > 0$ then as Kesten showed, R is always heavy–tailed. The case $0 \leq |M| \leq 1$ is much less understood. Goldie and Grübel showed that in that case the tails of R are no heavier than exponential and if $|M|$ behaves near 1 as a uniform random variable then they are Poissonian.

In this talk we will present further results about the tails of R and their connection to the behavior of $|M|$ near 1. (Received July 18, 2008)