1135-11-277 **Jared Duker Lichtman*** (jdl.18@dartmouth.edu), 5020 Cloister Drive, North Bethesda, MD 20852-3364. *Explicit estimates for the distribution of numbers free of large prime factors.*

A number is called *y-smooth* if all its prime factors are at most y. There is a large literature on the distribution of y-smooth numbers up to x. Asymptotic estimates for this distribution are quite useful in many applications, including the analysis of factorization and discrete logarithm algorithms. However, very little is known about this distribution that is numerically explicit. We generalize the saddle-point method of Hildebrand and Tenenbaum, giving explicit and fairly tight intervals in which the true count lies. For example, we determine that the count of integers at most 10^{500} free of prime factors exceeding 10^{35} lies within 0.65% of 1.505×10^{482}. This interval is so tight we can exclude the famous Dickman–de Bruijn asymptotic estimate as too small (1.472×10^{482}) and the Hildebrand–Tenenbaum main term as too large (1.513×10^{482}). One of the essential ideas in the proof is to relate the desired count of smooth numbers to a contour integral over a vertical line in the complex plane. The integrand includes an oscillatory sum over the primes, which requires an explicit form of the Prime Number Theorem. Joint work with Carl Pomerance. (Received August 17, 2017)