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ANNOUNCEMENTS

DISTINGUISHED AWARD OF THE HARDY-RAMANUJAN SOCIETY has been awarded to J.W. SANDER for the following work.

THEOREM (J.W. SANDER). *Let* $n \geq 20$ *and*

$$s = s(n) = \left[c(log\ n)^{\frac{1}{10}}(loglog\ n)^{-\frac{3}{10}}\right],$$

where $c(>0)$ *is a certain effective constant. For any prime* p *and integers* $m(>1)$ *and* $a(\geq 0)$ *let us agree to write* $p^a \parallel m$ *to mean that* p^a *divides* m *but* p^{a+1} *does not. Then whenever* $s \geq 1$ *there exists* s *primes* $p_1, p_2, \cdots, p_s$ *such that*

$$p_j^j \parallel \frac{(2n)!}{(n!)^2}, \quad (j = 1, 2, \cdots, s).$$

REFERENCE. J.W. SANDER, *Prime divisors of binomial coefficients : Reprise,* J.für die reine u. angew. Math., Band 437 (1993), 217-220 and his papers referred to there.

The award carryhing dollars 40 or pounds 20 will be given to him in due course. It is meant for the purchase of a volume of the collected works of mathematicians like S. RAMANUJAN, G.H. HARDY, J.E.

LITTLEWOOD, I.M. VINOGRADOV, H. DAVENPORT, P. TURAN and Yu. V. LINNIK. The amount of the award is not important. The award is an indication of the respect of the society to his work.

AN IMPROVEMENT. K. SOUNDARARAJAN has in his theorem (see p. 46, vol. 18 (1995) of the Hardy-Ramanujan Journal) improved the constant 20.26 to 24.59.

The following mathematicians have been elected as HONORARY FELLOWS OF THE HARDY-RAMANUJAN SOCIETY.

1) Professor H.L. MONTGOMERY (of the University of Michigan) who is famous for his contributions to Analytic Number Theory and in particular to Prime Number Theory. In collaboration with Professor R.C. VAUGHAN of the Imperial College, London, he has proved the following two surprising results. (a) The number of even numbers $\leq x$ which can not be expressed as a sum of two odd primes is $\leq x^{\theta}$ with a constant $\theta < 1$. The latest upper bound is $\ll x^{\theta}$ with $\theta = \frac{19}{20}$ is due to CHEN-jing-run and his collaborators. (See H.L. MONTGOMERY and R.C. VAUGHAN, *The exceptional set in Goldbach's problem*, Acta Arith. 27 (1975), 353-370. Also CHEN-jing-run and LIU-jianmin, *The exceptional set of Goldbach-Numbers*-III, Chinese Quart. J. of Maths. 4 (1989), 1-15, see the references at the end for the earlier works $\theta = \frac{99}{100}, \frac{24}{25}$ due to CHEN-jing-run and PAN-cheng-dong). (b) If ($k \geq 3$) is any integer, $r = \phi(k)$ and $a_1, \cdots, a_r$ are integers $\leq k$ and

coprime to k, then for any integer $j \geq 1$ we have

$$\sum_{i=1}^{r-1}(a_{i+1} - a_i)^j \ll_j \left(\frac{k}{\phi(k)}\right)^{j-1} k.$$

This solves an old famous problem of P. Erdös. (See H.L. MONTGOMERY and R.C. VAUGHAN, *On the distribution of reduced residues*, Ann. of Math., 123 (1986), 311-333).

2) Professor TREVOR D. WOOLEY (of the University of Michigan) who is famous for his contributions to Waring's problem. He has proved that if $k \geq 20$ in any integer, then

$$G(k) \leq k\left(log\ k + loglog\ k + 2 + log\ 2 + (1 + o(1))\ \frac{loglog\ k}{log\ k}\right)$$

where $G(k)$ is a positive integer depending only on k such that every positive integer (with a finite number of exceptions) can be expressed as a sum of $\leq G(k)$ kth powers of positive integers. The earlier long-standing record due to I.M. VINOGRADOV was $G(k) \leq 2k\ log\ k(1 + o(1))$. (See T.D. WOOLEY, *The application of a new mean value theorem to the fractional parts of polynomials*, Acta Arith., 65 (1993), 163-169).

3) Professor Robert TIJDEMAN (of Leiden University, The Netherlands) who is famous for his contributions (nearly as astounding as Roger APERY's contribution that $\zeta(3)$ is irrational) to an old conjecture of CATALAN which asserts that $x^m - y^n = 1 (x \geq 2, y \geq 2, m \geq 2, n \geq 2$ all integers) is possible only for $x = n = 3$ and $m = y = 2$. Professor R. TIJDEMAN has shown that x, y, m, n must all be less than an effective constant C (of

course we have to mention that his proof uses some very deep results of Professor Alan BAKER, FRS, of Trinity College, Cambridge, U.K.), see R. TIJDEMAN, *On the equation of Catalan*, Acta Arith., 29 (1976), 197-209.