THE APRIL MEETING IN BERKELEY

The five hundred thirty-fifth meeting of the American Mathematical Society was held on April 20, 1957, at the University of California in Berkeley. Registrants numbered 144, including 124 members of the Society.

By invitation of the Committee to Select Hour Speakers for Far Western Sectional Meetings, Professor A. L. Whiteman of the University of Southern California delivered the main address, on *Recent developments in the theory of cyclotomy*. He was introduced by Professor D. H. Lehmer.

Presiding over the sessions for contributed papers were Professors C. B. Allendoerfer, Leon Henkin, A. F. Moursund, and Bertram Yood. The abstracts of these papers are appended. Those having the abstract number followed by the letter "*t*" were read by title, the others in person. For papers having more than one author and presented in person, the letter (p) follows the name of the author who presented it. Dr. Cordes and Dr. Helmberg were introduced by Professor Klee.

ALGEBRA AND THEORY OF NUMBERS

548*t*. S. Chowla and E. G. Straus: *On the lower bound in the Cauchy-Davenport theorem.*

Let A, B be sets of residues (mod p) where p is prime. Let $A+B=\{a+b \mid a\in A, b\in B\}$ and let $n(S)$ denote the number of elements in S. The Cauchy-Davenport theorem states $n(A+B)\geqq \min\{p, n(A)+n(B)-1\}$. In the present note it is shown that if $n(A+B)<p-1$ then the lower bound $n(A)+n(B)-1$ is attained only if $n(A)=1$ or $n(B)=1$ or if A, B are in arithmetic progression with the same difference between consecutive terms. This theorem is applied to several number theoretic problems. For example, it is proved that if $(p-1, k)<(p-1)/2$ then every residue (mod p) can be expressed as the sum of no more than $[k/2]+1$ kth powers. (Received April 12, 1957.)

549. W. J. Coles: *On a theorem of van der Corput on uniform distribution.*

Van der Corput has shown (Acta Math. vol. 56 (1931) pp. 373–456) that the two-dimensional sequence $\{P_n\}$, $P_n=(\alpha_n, \beta_n)$, is uniformly distributed mod 1 if and only if for all integer pairs (u, v) other than (0, 0) the one-dimensional sequence $(u\alpha_n+v\beta_n)$ is uniformly distributed mod 1. Let $F^{(n)}(x_0, x_1; y_0, y_1)$ be N^{-1} times the number of points of the type $(\alpha_n+a_n, \beta_n+b_n)$ $(n=1, \cdots, N)$, a_n, b_n integral, contained in the rectangle $x_0\leqq x\leqq x_1$; $y_0\leqq y\leqq y_1$. Let $D^{(N)}$ be the l.u.b. of $F^{(N)}$ over $0\leqq x_0<x_1\leqq 1$, $0\leqq y_0<y_1\leqq 1$. $D^{(N)}$ is the *discrepancy* of the set $P_1, \cdots, P_N$. Similarly one defines the discrepancy of one-dimensional sets. Let $D_{uv}^{(N)}$ be the discrepancy of the set of points $(u\alpha_n+v\beta_n)$ $(u=1, \cdots, N)$. *Theorem*: There is an absolute constant $\mathfrak{C}$ such that $D^{(N)}\leqq \epsilon+\mathfrak{C}(D_{10}^{(N)}+D_{01}^{(N)}+\sum_{(u,v)=1,u>0} f_{uv}(\epsilon)D_{uv}^{(N)})$ for any $\epsilon>0$, where $f_{uv}(\epsilon)$