Having fixed \( y \), we can find from (2) integers \( n_1, \ldots, n_5 \) (not all zero) such that
\[ y < c_1 n_1^2 + \ldots + c_5 n_5^2 \leq y + \epsilon. \tag{4} \]

From (3) and (4),
\[ \left| \sum_{s=1}^{r} c_s n_s^2 \right| \leq \epsilon, \]
where the \( n \)'s are not all zero; this proves the theorem.

**A THEOREM IN ARITHMETIC**

S. CHOWLA*.

**Hypothesis.** Let \( \theta_1, \ldots, \theta_5 \) be positive numbers and such that at least one of the ratios \( \theta_s/\theta_1 \) \((s = 2, 3, 4, 5)\) is irrational. Let \( [y] \) denote the greatest integer contained in \( y \).

**Theorem.** Every \( n \geq n_0(\theta_1, \ldots, \theta_5) \) satisfies
\[ n = [\theta_1 n_1^2] + \ldots + [\theta_5 n_5^2] + c, \]
where \( c \) may be 0, 1, 2, 3, or 4, and the \( n \)'s are integers.

**Remarks.** Two points about this theorem are:

(i) It is not a consequence of Schnirelmann’s recent generalization† of Waring’s problem.

(ii) It is not capable, as proved here, of generalization to higher powers.

**Proof.** It follows from (1) of the preceding paper that the number of solutions of
\[ x < \theta_1 n_1^2 + \ldots + \theta_5 n_5^2 \leq x + \frac{1}{2} \]
is asymptotically \( Bx^3 \) for all \( x \geq x_0(\theta_1, \ldots, \theta_5) \), where \( B > 0 \). Hence
\[ [\theta_1 n_1^2] + \ldots + [\theta_5 n_5^2] \]
is equal to one of \( x, x - 1, x - 2, x - 3, x - 4 \), where \( x \) is a sufficiently large integer. This proves the theorem.

* Received 27 January, 1934; read 15 March, 1934.