Zbl 459.10002
Erdős, Paul
Problems and results in number theory. (In English)
Recent progress in analytic number theory, Symp. Durham 1979, Vol. 1, 1- 13 (1981).

[For the entire collection see Zbl 451.00001.]
In the author's words, "somewhat unconventional problems on sieves, primes and congruences" are discussed. Of the wealth of the problems, let us take a few examples. The integer n is said to be a barriere for an arithmetic function f if $m + f(m) \leq n$ for all $m < n$. Question: are there infinitely many barriers for $\varepsilon\upsilon(n)$, for some $\varepsilon > 0$? Here $\upsilon(n)$ denotes the number of distinct prime factors of n. A related problem: is it true that $\lim_{n\to\infty} \max_{m<n}(m + d(m)) - n = \infty$? There are also many problems concerning consecutive primes. Let $d_n = p_{n+1} - p_n$. To prove that for any $c > 0$ there are infinitely many k such that

$$d_k > c \log k \log\log k \log\log\log\log k/(\log\log\log k)^2$$

(10000 dollars offered for a proof).

M.Jutila

Classification:
11-02 Research monographs (number theory)
11Axx Elementary number theory
11Mxx Analytic theory of zeta and L-functions
00A07 Problem books

Keywords:
problems in number theory; sieves; primes; congruences; barrier for arithmetic function; consecutive primes