conjugates of α is in $\mathfrak{P}_i$, $i=1, \cdots, m$; hence neither is any power of their product. Some such power, however, is in $\mathfrak{R}$, hence in $\mathfrak{P}\cap\mathfrak{R}\subset\mathfrak{P}_1$. This is a contradiction and completes the proof.

HARVARD UNIVERSITY AND
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

NOTE ON AN ASYMMETRIC DIOPHANTINE APPROXIMATION

C. D. OLDS

1. Introduction. In a recent paper B. Segre [1][1] introduced a new type of Diophantine approximation which he called *asymmetric*, since the intervals of approximation are divided into two partial intervals which are in an arbitrarily given ratio. His main result is the following theorem [1, p. 357]:

THEOREM 1. *Every irrational θ has an infinity of rational approximations x/y such that*

$$(1)\qquad \frac{-1}{y^2(1+4\tau)^{1/2}} < \frac{x}{y} - \theta < \frac{\tau}{y^2(1+4\tau)^{1/2}} \qquad (y>0),$$

where τ is any given non-negative real number.

This theorem is classic for $\tau=0$, cf. [2, p. 139], and for $\tau=1$ it reduces to the fundamental result due to Hurwitz [2, p. 163]. No other particular cases of the theorem seem to be known.

Segre's proof of (1) is geometrical. The purpose of this note is to show that when $\tau\geqq 1$ it is possible to give a very simple arithmetical proof. The method is a generalization of that used by Khintchine [3] for the special case when $\tau=1$.

2. Proof of Theorem 1. We suppose that θ is irrational and that $0<\theta<1$. For an arbitrary positive integer n form the Farey series[2] of order n, that is, the ascending series of irreducible fractions between 0 and 1 whose denominators do not exceed n. Let a/b and a'/b' be the two successive terms of this series which satisfy the inequalities $a/b<\theta<a'/b'$. We distinguish two cases.

Received by the editors October 4, 1945.

[1] Numbers in brackets refer to the references.

[2] See Hardy and Wright [2, p. 23].