matics, and Dr. J. H. Orton, chief naturalist at the Plymouth Marine Biological Laboratory, has been appointed Derby professor of zoology. Dr. D. B. Blacklock, professor of tropical diseases of Africa in the university, has been made Walter Myers professor of parasitology.

# DISCUSSION

## BIOLOGICAL CONTROL OF THE PRICKLY PEAR IN MADAGASCAR

THE recent accounts in SCIENCE of prickly pear control in Australia have dealt with the problem only from the standpoint that the complete eradication of this pest is an unmixed blessing. However true this view-point may be for most places in the world, in the south of Madagascar the destruction of the *raketa* by a cochineal insect (*Coccus cacti*) is being looked upon both by the natives and the Europeans as a calamity.

What are the conditions in the south of Madagascar that make it unlike the rest of the world, differing from the territory a few miles to the north where the disappearance of the prickly pear has been witnessed with acclaim? M. Decary, for many years a French official in southern Madagascar, and a botanist of note, has called attention[1] to the dependence of the Antandroy natives upon the *raketa,* quoting a local proverb to the effect that "The *raketa* and the Antandroy are inseparable," and going so far as to say that without the prickly pear there could have developed no Antandroy tribe!

Certainly this plant has its undesirable features, but to these people it is not only endurable, but essential; it furnishes food and drink for man and beast in this desert region, and these at the time of year when they are most necessary. Among other things it also provides impenetrable barricades around the cultivated fields, the livestock corrals and the villages.

Some years ago, before the appearance of the cochineal insect, a partially successful attempt was made to introduce *Opuntia inermis* into this region to replace the thorny types (*O. dilleni* and *O. ficus-indica*) which, during the last two centuries, have become the commonest plants in this region. Although *O. inermis* is immune to the attacks of the insect, one of the cultural requirements for its establishment has been a barrier of the thorny type sufficient to keep out the livestock; hence the destruction of the immune species is indirectly being brought about by the destruction of the species actually susceptible to the insect.

I can not offer any direct testimony as to the exact nomenclature of the causal insects; however, I can vouch for the thoroughness of the destruction now being wrought. Our party marched for days through country where, a few months before, the commonest plant had been the fifteen-foot-high prickly pear, now all completely destroyed; very rarely we would see a weak shoot, six inches high, which had come up from the root and which was also rapidly being destroyed. If such complete eradication could be effected in Australia and other places where the presence of Opuntia is not desired, in a few months the prickly pear would cease to be a problem.

CHARLES F. SWINGLE
BUREAU OF PLANT INDUSTRY,
U. S. DEPARTMENT OF AGRICULTURE

[1] Bull. Economic Madagascar, 1927 (1); Rev. Bot. App. No. 50, 1925, and No. 77, 1928.

## HORSES, DOGS AND CATS

IN a recent number of SCIENCE (May 10, p. 494), Professor W. D. Matthew objects to my using the horses as an example of "linear evolution involving a time element." But he admits, apparently in connection with horses, that:

> We can and do have, in many cases, a succession of collateral ancestors so nearly related to the direct genetic line as to afford, when critically studied with due recognition of their status, a clear record of the physical evolution of the race, sometimes in more general, sometimes in more detailed terms, according to the nearness of their approximation to the direct ancestral line.

This "direct ancestral line" from *Eohippus* to *Equus* was precisely the line to which I referred. He therefore himself predicates its existence, and admits that it involves a time element. He says that in the case of the phylogeny of the horses the "analogy to the growth of a tree is a sound and a real one." No one doubts this. But does not the trunk of the tree run from *Eohippus* at the base to *Equus* at the summit?

He regards my statement that "the gap between cats and dogs is broad, and it remains broad throughout the fossil record" as misleading. However, he says

> No one, so far as I know, ever suggested that cats became dogs or dogs cats . . . but it *has* been believed that these two diverse families of Carnivora are descended from the primitive Carnivora (Miacidae) of the Eocene epoch.

I said that both cats and dogs are carnivorous mammals, expecting that zoologists would understand