

a consideration of certain aspects of the formation of individual faunas, the conditions underlying the origin of expanding taxa, and the interaction of expanding and confined taxa.

Certain expressions have special meanings in these analyses and must be defined at the outset:

"Central" tropical Asia: arbitrarily defined as mainland tropical Asia west to and including India and north to and including the "Oriental" portion of southern China, plus Sumatra, Borneo, and Java.

New Guinea: refers to the mainland only.

Expanding taxa: species extending natively over more than a single archipelago, or higher taxa containing such species. Far-ranging species extending beyond certain arbitrary limits are referred to as Stage-I species (see below).

Stage-I species, Asia-based: ranging from tropical Asia, the presumed source area, east to as far as the Moluccas or Micronesia, or beyond.

Stage-I species, New Guinea-based: ranging from mainland New Guinea, the presumed source area, to as far as the Moluccas, Solomon Islands, Micronesia, or any combination of these. Species ranging to Queensland, Aru, Manus, Bismarck Archipelago, or Waigeo but not beyond are arbitrarily not classified as Stage-I.

Stage II and III species: Species of more restricted ranges interpreted as belonging to other phases of the speciation cycle (see Wilson, 1959a).

RELATION OF AREA TO FAUNAL NUMBER

It can be shown that as the area of islands increase, resident faunas of some animal groups logarithmically increase approximately as

$$F = bA^k,$$

where F is the number of resident species and A is the land mass in square miles. In the Ponerinae-Cerapachyinae of Melanesia and the Moluccas, k is approximately 0.7 (figure 1). It is a fact of uncertain significance that k shows considerable variation among different major animal groups and among different faunas. In the Carabidae and herpetofauna of the Greater Antilles and associated smaller islands it is approximately 0.3. In the breeding land and fresh-water birds it is approximately 0.4 in the islands of the Sunda Shelf (Indonesia) but close to 0.5 in the islands of the Sahul Shelf (New Guinea and environs).

The considerable scatter in the area-fauna measurements of the Ponerinae-Cerapachyinae is evidently due to two principal factors: (1) differences in ecology; for example, Kandavu and Vanua Levu are so extensively cultivated as to support smaller indigenous faunas; (2) simply incomplete collecting, which undoubtedly accounts in large part for the seeming paucity of the Halmahera, Bismarcks, and Rennell faunas.

If only those islands are considered which are along the main line of the Sunda-Melanesian arc, which still possess large tracts of native vegetation,