BERMUDA'S NATURAL HISTORY IN A NUTSHELL

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In terms of latitude, distance from the nearest continent, and climate, Bermuda might be called the western Atlantic twin of Madeira. Situated at 32° N and 65° W, 1000 km off the USA, it is a hook-shaped chain of interconnected islands of 50 km² surface area. Unlike Madeira, though, Bermuda has a low, gently rolling profile, its highest elevation being no more than 80 m; and its land area is surrounded by over 500 km² of shallow reef platform. The Bermuda seamount originated 100 million years ago on the Mid-Atlantic Ridge, and was topped up in a separate eruptive event some 35 mya to form a towering island. During the last ice ages the Island's remains, eroded down again to near-sea level, acquired a thin cap of alternating layers of soil and wind-blown calcareous sand dunes which subsequently solidified into cave-riddled limestone.

The climate is subtropical, with mean sea and air temperatures ranging from 19° to 28° C. Relative humidity is usually above 70%. The annual rainfall of 60 inches (146 cm) is rather eveniv distributed throughout the year. The Island lacks surface streams and has only a few shallow freshwater lenses; much of the rainfall, therefore, is directly harnessed by white-washed roofs and channeled into individual underground cisterns.

Bermuda was colonised by the British in 1609 who later-on brought in slaves from Africa, and invited Portuguese, mostly from the Azores, for farming. Today's population numbers 60,000 - which translates into a high density of 3,000 per square mile, or 1200 per square kilometer. It has been estimated that 10% of Bermuda's land is covered with houses, roads and other artificial surfaces. Farming and fishing are of only local importance, the former because of the scarcity of arable land, the latter owing to overexpioitation. In the absence of tangible resources or a manufacturing industry, Bermuda's economy relies entirely on the beauty of its natural and human environment, which entices some 5000 international companies to do business here, and attracts more than half a million tourists each year.

It is clear that so much human presence left its mark on the physiognomy of the

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Island. Little remains of the once dense forest cover of endemic palmetto *(Sabal bermudana), Olivewood (Cassine laneanum)* and cedar *(Juniperus bermudiana)*. The latter became almost extinct in the 1940s due to accidentally introduced scale insects; subsequent reafforestation relied heavily on Australian casuarina trees. Of the 7 species that now make up the Island's herpetofauna, 6 are introduced *(Bufo marinus, Eleutherodactylus* spp., and *Anolis* spp.), whereas the endemic rock lizard or skink *(Eumeces longirostris)* has become scarce on all but the least accessible islets. The avifauna was drastically decimated by early settlers and their traveling companions - rats, cats, hogs and dogs - and augmented by introductions such as the European sparrow, starling and goldfinch, and the Caribbean Kiskadee flycatcher *(Pitangus sulphuratus)*. Only few native land birds, such as the White-Eyed Vireo *(Vireo griseus bermudianus)* and the Eastern Bluebird *(Sialia sialis)*, still hold their own. Among the nesting marine birds, the White-Tailed Tropicbird *(Phaethon lepturus catesbyi)* is still common whereas the endemic Bermuda Petrel or Cahow *(Pterodroma cahow)* has been brought back from near-extinction by the extraordinary efforts of Chief Conservation Officer David Wingate. Rediscovered in the 1940s on some outlying rocky islets, its breeding population was helped by the construction of artificial ground burrows, with bafflers to exclude competing Tropicbirds. From 15 pairs fledging 8 chicks in 1962 the Cahow population rose to 41 pairs fledging 19 chicks in 1991, with a temporary decline in breeding success in the 1960s due to DDT poisoning.

Bermuda's nearshore marine environment, albeit influenced by siltation, eutrophication and overfishing, is still relatively unscathed. As the world's northernmost coral atoll, Bermuda's extensive reefs sport 2 dozen species each of hard and soft corals (as opposed to about 60 in the Caribbean). The absence of elk- and staghorn corals *(Acropora* spp.) is visually compensated for by a lush growth of gorgonian corals. Nearly all of the 5000 marine plant and animal species recorded are of Caribbean origin, with only a smattering of endemics such as the hermit crab *(Calcinus verrilli)* and the bream (Diplodus bermudensis). Endemism is more prevalent in the recently explored, extensive marine cave system: over 250 spp. of macro-invertebrates identified to date include 42 new species, 14 new genera, one new family, and two new orders (Copepoda: Platycopioida and Peracarida: Mictacea). Many of these have close affinities with other oceanic island cave species as far away as Ascension and Galapagos, and/or the deep sea.

With nearly 2500 books and papers written about one or the other aspect of its natural history, Bermuda may well be one of the best-studied rocks in the universe. Most natural history research is carried out by visiting or resident scientists at the Bermuda Biological Station, a US non-profit organisation, and staff of the Bermuda government's Department of Agriculture, Fisheries and Parks, of which the Natural History Museum is a part. Whereas the Biological Station is now increasingly concerned with the global oceanic

and atmospheric environment, most governmentsponsored projects concentrate on pollution control, conservation, and habitat restoration. These include the rescue of the Cahow as much as thd successful reintroduction of the Yellow-Crowned Night Heron (Nyctanassa violacea) and the West-Indian Top-Shell (Cittarium pica). Green Turtles (Chelonia mydas), whose catastrophic depletion by the first settlers prompted, in 1620, the first conservation legislation in the New World, do not breed here any more, but restocking efforts may have contributed to a sizable population of juveniles. The biology of the skink is being studied in view of re-extending its local habitat, and resistant strains of Bermuda cedar and other endemic plants are used in reafforestation.

It seems that the people of Bermuda have finally come to appreciate that the Island's economic fortunes are vitally linked to an attractive and healthy natural environment. In spite of Bermuda's dismal early history of environmental destruction, its high population density, and continuing pressure for development there is hope, therefore, that what is left of the Island's natural heritage may prevail.

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