The ups and downs of evolution: the role of small numbers

If, as a result of geographical or climatic accidents, a small group of individuals becomes completely isolated from its native population, its genetic diversity will *ipso facto* be reduced. By simple random sampling, its average composition may be very different from that of the mother population. This will of course could be a handicap for the adaptation of this small isolated group and it will most likely disappear. But in the event of a favourable environment, this small group could be able to prosper and even, in the long term, to increase to a significant number. Due to its particular genetic composition, combined with new variations and natural selection, differences with the original population will increase and may become such that any crossing will have become impossible, due to differences in behaviour (e. g. marital parade) or other factors. A "reproductive barrier" will be put in place, creating a new species, a phenomenon that further increases the share of chance in Neodarwinian theory. This process must have occurred 'in cascade' with the "Darwin finches" on the Galapagos archipelago. 2 to 3 million years ago, a few individuals accidentally arrived from the American continent (in a single wave it seems). They found a favourable environment there, including abundant food and few predators, so they were able to survive, multiply and diversify and gradually colonize all the islands of the archipelago. These successive geographical isolations, leading to serial reproductive barriers, have led to the creation of 13 different species, spread over some 15 islands, which is a good example of what is known as "adaptive radiation" (see Figure).