provided a large boost to the research and conservation programs of the Station by donating six computers with printers and battery backup units to the Smithsonian Institution for use in the Galápagos. This equipment brought the Station firmly into the computer age strengthening science and student training programs. The equipment is particularly applicable to the development of the biostatistics course to be taught periodically at the Station and in the establishment of a better data base for environmental monitoring.

The Charles Darwin Research Station and Galápagos National Park Service are grateful to Messrs. Daugherty, Jacobson, and Hubbard for their generous support of conservation in the Galápagos. Their donations provided basic tools and resources needed for essential work. **Daniel Evans, Charles Darwin Research Station, Isla Santa Cruz, Galápagos, Ecuador.**

Station Research Vessel.—On 3 October 1990, the Charles Darwin Foundation acquired a new research vessel for the CDRS. The ship is a 42-ft fiberglass fishing vessel with a 20-ton capacity. It was built in Norway in 1978 and imported to Ecuador in 1979. The current sleeping capacity is for only four people; however, the cabin will be expanded to allow the ship to sleep at least eight. It is expected that the ship will operate at a speed of 9-10 knots, with a cruising range of over 1,000 miles. Due to its speed, size, cost, ample deck space, and range, this ship is ideally suited to fulfill the needs of the Station. It was decided to retain the name *Beagle*, without using a number.

The ship was found in Manta by Godfrey Merlen, who will be in charge of directing the necessary refitting prior to bringing the vessel to the Galápagos. Godfrey's assistance and knowledge have been invaluable in obtaining a suitable ship. **Daniel Evans.**

ERYTHRINA VELUTINA AND THE COLONIZATION OF REMOTE ISLANDS

By: Peter Grant, K. Thalia Grant, and B. Rosemary Grant

Erythrina velutina is a familiar tree at middle elevations on the south side of Isla Santa Cruz. Unlike most Galápagos trees it flowers when leafless in the dry season. The flowers are large, showy, red, and tubular, and are apparently adapted for pollination by long-tongued animals like hummingbirds (Faegri and van der Pijl 1971); yet hummingbirds have never been on the Galápagos as far as anyone knows.

It came as a surprise to us in April 1978 to find half a dozen large trees of this species on Isla Wolf. The Island is not very high: the maximum elevation is 253 m (Wiggins and Porter 1971). It is also remote. How did they get there? In November 1978 we had a further surprise in discovering one single tree on the west side of Isla Genovesa, probably no more than 20 m above sea level but an estimated 400 m inland. How did it arrive there?

Judging by the amount of colorful plastic to be found on uninhabited Genovesa and by the habit of Red-footed Boobies and frigate birds of carrying pieces of vegetation while flying around the coast, we might surmise that the bright red seeds (beans) of *Erythrina* have been picked up from the sea or the shores on which they have been washed and dropped on the Island. Or a landbird, such as a dove or a mockingbird, might have picked up a seed from the beach and taken it inland before discarding it. Either way the seeds would have to float in seawater for several days to reach remote islands like Genovesa, Wolf, as well as Darwin (Wiggins and Porter 1971).

To test this idea we placed 30 seeds in a jar of seawater on Genovesa, stirred the water whenever we were back in camp, and recorded how many floated and how many sank. Four immediately sank, and in the next 72 hours five more did. Thus, after 3 days, 21 of the original 30 seeds were still afloat. Three days travel at sea under natural conditions would have carried them an unknown distance from their island of origin. If they travelled in the range of 1-5 m per minute they would be displaced somewhere between 4.5 and 22.0 km in that time.

The experiment was carried out in November 1978.

Erythrina velutina blossom on Isla Genovesa. *La flor de* Erythrina velutina *de Isla Genovesa.*

In June 1983, near the end of the extraordinary El Niño event that lasted for 8 months, we found almost 100 *Erythrina* seeds on the beaches of Genovesa, as well as even more seeds of manzanillo (*Hippomane mancinella*), a species which does not grow on the Island. If the *Erythrina* seeds had been released from the single known tree on Genovesa, how had they got down to the sea? It seems more likely they floated in from another island, as the *Hippomane* seeds did. Had they been washed down to the sea in the torrents and temporary rivers that flowed frequently that year, on Santa Cruz for example, or Santiago, and then out to Genovesa? It is even possible they were carried all the way from the South American continent.

With the possibility of even longer than intra-archipelago transport in mind, we repeated our earlier flotation experiment, but this time extended its duration. Fourteen of the 20 seeds initially floated, and 11 were still afloat 3 days later, a result similar to the previous one. After an additional 4 days, 10 seeds were still afloat. Given the artificiality of the experiment (mainly still water, temperatures reaching the low 30°C), the results surely testify to a high potential for long-distant transport by sea. However, we stopped the experiment too soon to provide clear-cut proof. At the estimated maximum sustained rate of 5 m per minute a seed would be in the water for 14 days in travelling the 100 km from Santiago, the closest source Island, to Genovesa. The passage from Santiago to Wolf by sea would take more than a month, and from the continent to Galápagos it would take almost half a year.

Similar experiments (Grant et al. 1975) have demonstrated the same floating ability for 8 out of 22 common arid zone species of plants. Whether *Erythrina* and other seeds can germinate after a long spell in the sea is another matter. Experiments are needed to answer this question. We must presume the seeds can germinate, in order to account for the presence of *Erythrina* trees on Genovesa, Wolf, and Darwin.

Once a single tree has become established, is it doomed to leave no descendants? We thought it would be doomed because from 1978 to 1982 we found seeds beneath the single tree on Genovesa, but never a sapling. It would have been legitimate to conclude after 5 years of observation that *Erythrina velutina* was self-compatible (in being able to produce seeds) but that progeny were inviable. And our conclusion would have been wrong! In July 1983 there were nine small saplings growing beneath the tree ranging from 15 to 30 cm in height. Evidently the more than 2,400 mm of rain which fell that year (Grant and Grant 1989) were sufficient to germinate at least a few of the seeds. Seven were present the following (dry) year and five were present in the drought of 1985. We have visited the site every year since 1987, each time finding two were alive. Both survived to 1991 and were healthy and in bud in February. One, 20 cm tall, stands under the canopy of the parent, 1.5 m from its trunk. The other, 35 cm tall, stands just beyond the canopy 4 m from the trunk.

The parent tree on Genovesa is old. Thirty-five rings were counted in a dead branch less than 2.5 cm in diameter; thus, if one ring is laid down each year the branch was at least 35 years old when it died. Given the much greater diameter of the tree trunk (48 cm at 0.5 m height), we can extrapolate to a total age of 700 years or more. This seems extraordinarily old and needs to be verified. Tree-ring studies (e.g., Grant 1981) would help to determine if the reasoning is plausible. At the moment the tree stands 6 m tall, produces leaves and seeds each year, and looks basically healthy. If it dies before its offspring do, then it may be replaced by two, and very gradually a population may build up.

We suppose this happened on the even more remote and apparently inaccessible Islands of Wolf and Darwin. A single seed reaching one of these Islands by sea, being transported to the flat region on top, and germinating, seems improbable enough. Two seeds establishing themselves is even less likely. Nevertheless a single colonization assisted by a bird, followed by multiplication, would explain the puzzle of *Erythrina* trees on these remote Islands in the Archipelago.

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THE PASSING OF TWO BELOVED REPTILES: ONAN AND CHIQUITA

By: Linda J. Cayot

AN OBITUARY FOR A TORTOISE

The most individualistic, ornery, beloved tortoise in Galápagos died early last year. Onan, an ancient male tortoise, lived alone for most of this century in the central crater of Isla Pinzón. As a result of the overexploitation of tortoises in the 1800s and early 1900s, the tortoise population on Pinzón fell to dangerously low levels. The tortoise surveys in the 1960s showed less than 200 tortoises were left on Pinzón, and all but Onan lived on the outer western and southern slopes. In the central crater, Onan reigned alone.

Onan spent so many years alone that he began exhibiting amorous intentions with tortoise-shaped rocks. During a visit to Pinzón in 1970 by Craig