

by officials of the national park on motor-cycles. The jagged peaks and absence of green vegetation make Timanfaya, one of the world's largest lava-fields, an unusual and exotic region. Not surprisingly it has, on a number of occasions, been used as a film setting. The national park buildings are blended into the landscape, making use of the local topography.

On the coast, to the west of Fire Mountain, lies El Golfo, a volcanic cone at sea-level with a whitewashed village beyond, and a beach of black sand. By law, all the houses on Lanzarote are white with green paintwork (the island's 'national' colours) and, outside Arrecife, none may be higher than two storeys. In consequence, the towns and villages present a neat, harmonious appearance that is probably unique.

The road to the bay of El Golfo is spectacular, with jagged splinters of black lava, dark caves, and apertures through which the ocean waves foam. Visitors following this dramatic route often stop at Los Hervidos (Boiling Springs) on the way. To the south of El Golfo, there are extensive rectangular brine pans in which sea-water evaporates in the hot sunshine.

Various Vegetables Grown

Cereals, chick-peas, onions, tomatoes, and other vegetables, are grown in terraces on the steep slopes of the volcanoes by remarkable dry-farming methods, mainly on the eastern side of the island. Despite negligible rainfall for most of the year, vines, too, are cultivated in hexagonal plots delineated by lumps of volcanic rock and containing crushed lava on which dew condenses. The water percolates through the particles of lava to irrigate the roots of the vines, grapes from which produce excellent wine. It is usually the case that the best of wines comes from the poorest soils. Those of Lanzarote are similar in character to many of the wines of Sicily and Madeira.

The capital, Arrecife, is the chief fishing port: fishing and fish-preservation are among the principal industries of Lanzarote. Zoologists will see few animals, although there is said to be an endemic species of lizard: even flies and other insects are conspicuous mainly by their absence. But no-one can fail to be interested in the plantations of prickly-pear cactus (*Opuntia* sp. or spp.) on which Cochineal Insects (*Dactylopius coccus*) are cultivated for their dye. Botanists, moreover, can enjoy the older lava fields lying towards the east, with their unusual flora of xeromorphic Euphorbias. Like the other Canary Islands, Lanzarote has a large number of endemic species. There are few goat-herds and little sign of overgrazing.

The Cuevas de los Verdes in the north of the island are a series of narrow tunnels connecting enormous caverns, one of which is used as a concert hall. Nearer the sea, Jameos del Agua, a series of grottos and lakes, has a restaurant, bars, a nightclub, and a swimming pool. Readers of this Journal will, no doubt, find it far less appealing, as it is one of the chief tourist attractions of the island. On the north coast, Mirador del Rio is a cliff-top vantage point commanding breath-taking views of the islands Graciosa, Montaña Clara, and Alegranza. Graciosa is the largest, lying more than 1 km away. It is inhabited by only a few hundred people, mostly fishermen.

'Living Earth': New Initiatives in Environmental Conservation

Living Earth is a non-profit organization which was established in 1987 with the aim of helping to protect the environment by working towards the sustainable and socially beneficial use of the world's resources. The work is long-term and strategic, because Living Earth does not believe that the problems which they are tackling are solvable by instant injections of cash, surges in public opinion, or swift changes in government policy.

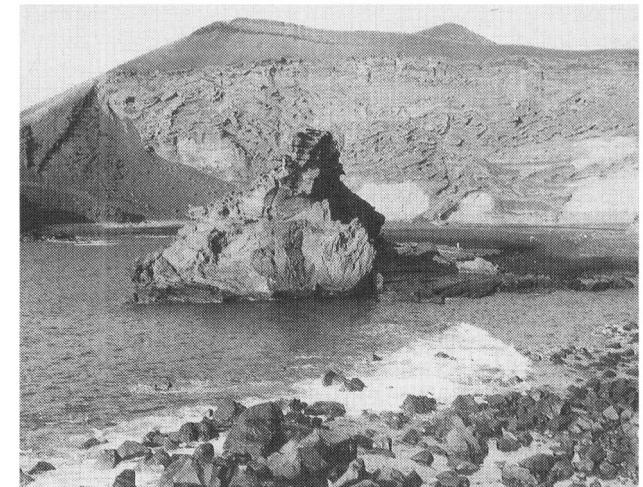


FIG. 1. The coast of Lanzarote is widely rocky and the hinterland often barren.

Conservation of Amenities

Despite its latitude, the climate of Lanzarote is never too hot. Rain seldom falls, and tourists are attracted in large numbers to the fine sand-beaches in the south, and by the cheapness of the excellent foods and wine. In the past few years, scores of villa complexes have been built at developing resorts such as Puerto del Carmén, which now extends into Playa de los Pocillos. The main part stretches for some two miles (3.2 km) along the coast—a continuous series of shops, bars, and restaurants, backed by holiday apartments. The conservationist need not feel too depressed, however. Just as holiday camps in Britain help to preserve the countryside by attracting the masses into relatively small areas, so do the beaches in the south attract tourists from overseas. Consequently, it is possible to rent a car and drive over spectacular unspoiled countryside, and even to find the occasional empty beach away from the south, from which to bathe—much of the coast being too rocky and wild, with Atlantic rollers that are too large to make bathing possible (Fig. 1).

In general, the island of Lanzarote is being conserved strictly and tastefully. It is still quieter than Tenerife and Gran Canaria, but is said to be the best island in the Canaries for windsurfing. The main threat to conservation lies in the ever-increasing number of tourists, however well they are regulated by the Spanish authorities. The lava, being soft, is as susceptible to tourist pressure as are the flora and fauna.

Warmest thanks are due to my friend Richard Bailey, Birkbeck College, University of London, for his helpful comments.

JOHN L. CLOUDSLEY-THOMPSON
Department of Biology (Medawar Building)
University College London
Gower Street
London WC1E 6BT
England, UK.

cation programme to enhance the development of the rain-forest parks, concentrating initially on the Korup National Park. In Kenya, a project is being developed in collaboration with the Royal Botanic Gardens at Kew in England and the Kenya Energy Non-governmental Organization (KENGO). This work involves, *inter alia*, having school-children in both Kenya and the UK looking into the ecology of traditional food-plants, which could develop into valuable research for the management of arid and semi-arid areas and meanwhile prove a useful contribution to environmental awareness on the part of the children involved.

Rain-forests Resource Pack

Living Earth is also bringing the facts and issues surrounding rain-forest conservation to British schoolchildren. More than 40 teachers, environmentalists, and designers, have been involved in the development of their award-winning Rain-forests Resource Pack. It is designed to be both educational and entertaining, and is remarkable for its flexibility; it has been used with four year-olds and Body Shop franchises, and even with a group of company directors!

Among its 40 items, the Pack contains a wealth of ideas, approaches, and practical case-studies, all supported by visual material of a standard that is normally reserved for coffee-table books. It is designed to be cross-curricular, because learning about tropical rain-forests draws on, and enhances, many resources that are already provided in schools. It has been used within art, English, maths, and economics, lessons as well as the more naturally applicable areas of geography and the sciences.

Another element of the Pack is a set of cards which can help to mobilize the older students to start up a local group, as it gives hints about how to acquire the techniques which are needed to achieve *results* (publicity, exhibitions, minutes, letter-writing, etc.). The particular example in the Living Earth Pack suggests that the wall sheets be used to build an exhibition about tropical rain-forests, in order to continue the educational work of the Pack. However, these guidelines could help a group of young people to motivate itself and achieve results on almost any allied issue.

Developments

The Pack is currently being marketed to schools throughout the UK, and a grant is being sought to adapt and



FIG. 1. Living Earth's Rain-forests Resource Pack, full of colourful and comprehensive materials to aid education about the world's tropical rain-forests.

translate it into other languages. This will open it up to distribution in some key developing countries, as well as more widely than hitherto in Europe. The Pack is the first of what is intended to be a series of environmental resources designed for use in schools.

Living Earth's Rain-forests Resource Pack is probably by far the most comprehensive educational aid available on this urgent and topical subject. More details about it, and about Living Earth's activities and membership, can be obtained from the undersigned:

CLAIRE BIRCH (Mrs)
Living Earth
10 Upper Grosvenor Street
London W1X 9PA
England, UK.

Acquisition of a Significant Wetland in Canada

A major achievement in the preservation of significant wetland was realized on 17 August 1988, with the purchase of 1,500 hectares of land in Alfred Bog. Preservation of this wetland has been a high-priority conservation objective for years, and this acquisition protects about one-third of the Bog.

Alfred Bog is a 5,000 hectares' domed peat-bog (4,000 hectares of open-to-closed Black Spruce [*Picea mariana*] forest with heath or sedge-heath openings surrounded by 1,000 hectares of peripheral wetland) located about half-way between Montreal and Ottawa. It is situated in a broad, shallow valley that was once a channel of the Ottawa River. Peat depths range from about one metre at the edge of the Bog to over seven metres in the interior. The Bog contains a relict boreal habitat that was once widespread in the St Lawrence lowlands. Of national significance, it is the largest, and has the richest floral and faunal diversity, of the few remaining bogs in the Ottawa Valley. Alfred Bog is home to many rare species: the Southern Twayblade Orchid (*Listera australis*), Fletcher's Dragonfly (*William-*

sona fletcheri), the Bog Elphin Butterfly (*Incisalia lanorianaensis*), and the Spotted Turtle (*Clemmys guttata*), being examples.

Encroachment by drainage, agriculture, and mining for peat-moss, has been continuous over the years until the bog is now only about half its original size. A serious threat came in 1982, when the local municipality changed the zoning for the 1,500 hectares mentioned above from 'conservation' to 'agriculture'. The Ottawa Field-Naturalists' Club became involved at this point, unsuccessfully appealing against the zoning change before a provincial court.

The Ottawa Field-Naturalists' Club then teamed up with the Nature Conservancy of Canada, convening a meeting in 1985 of 14 organizations who were concerned about preservation of the Bog. This meeting resulted in the creation of the Alfred Bog Committee, which was responsible for negotiations with the owners of the land, arranging the financing, and publicity. Significant contributions were received from the Ontario Ministry of Natural Resources and Wildlife Habitat Canada.