PLANT CONSERVATION

Flora Macaronesia

from a Correspondent

THE term Macaronesia is a collective name for the Atlantic Islands including Madeira, the Azores, the Canary Islands and the Cape Verde Islands which have long been recognized by plant geographers as together forming a floristic region characterized by many common elements associated with high endemism; possibly 700 species of flowering plants are endemic to the region.

Unfortunately many of these unique species are now gravely endangered—some are now represented by only a few individuals in a single locality; some may now be extinct. For scientific and historical reasons, their conservation and study have become urgent. Both aspects were discussed in detail at the first international congress "pro Flora Macaronesica" held at Las Palmas, Gran Canaria, in April. Some seventy-two botanists from the Canary Islands, Denmark, France, Germany, Great Britain, Italy, Jordan, Madeira, the Netherlands, Norway, Portugal, Spain, Sweden and the United States participated and provided convincing evidence of the increasing international interest in the Macaronesian flora.

The most important of the decisions made by the congress concerned the preparation of a *Flora Macaronesiaca*, which would provide a synoptic account of the plants of the region, and proposals for the conservation of areas of high scientific importance because the delegates sadly but realistically were well aware that complete conservation is now impossible against the growing demands of tourism, population growth and land speculation, particularly in the Canary Islands. Every island has its own peculiar specialities. A menace to the survival of many endemic species hitherto sheltered by their isolation is the harsh competition of many vigorous introduced alien plants, frequently introduced as ornamental or economic plants and now exterminating the native vegetation.

BIOMATERIALS

Prostheses and Tissue

from a Correspondent

AT the fifth annual biomaterials symposium organized by Clemson University, South Carolina, on April 14, the theme for discussion was prostheses and tissue: the interface problem.

Participants critically scrutinized some of the devices, including buried dental implants and knee and hip joint replacements made from stainless steel, cobalt-chromium alloys and titanium, which are in clinical use on a large scale at present. Numerous patients suffering pain and disability have obtained very considerable short term benefit from these implants, but there is disquiet about the long term results. This point of view was summarized by Dr C. Hirsch (Karolinska Institute, Stockholm) who, in reviewing clinical problems in total hip replacements, said, "Although it is probably an achievement to be able to implant joints, it is obvious that we are far from a clinical situation that can be tolerated".

One clinical problem is infection; another is loosening of the implant with time. The metallic or plastic components used to replace diseased joints are usually fitted to the skeleton with the aid of acrylic resin which is mixed in the operating theatre and allowed to polymerize *in situ*. Acrylic cement has made this type of surgery possible on a large scale, but it is widely recognized that the method is not ideal. Cold-curing acrylic is comparatively weak and brittle and some unchanged monomer, which is toxic, may be present at the end of the polymerization reaction. Patients on the operating table sometimes suffer a sudden drop in arterial pO_2 and cardiac arrest as was discussed by Dr P. I. Kenmore (George Washington University), who recommended that patients should be well oxygenated just prior to and for 15 minutes after the insertion of the acrylic bone cement. The polymerization reaction is exothermic and Dr E. P. Lautenschlager (Northwestern University, Chicago) has measured temperatures up to 70° C at the acrylic-bone interface. Thermal damage and necrosis of tissues, the poor flow and conforming qualities of acrylic dough and its inherent weakness may be why prostheses sometimes work loose.

A third problem has to do with the tissue reaction to minute particles of metallic alloy and their corrosion. Drs D. F. Williams (University of Liverpool) and G. D. Winter (Institute of Orthopaedics, Stanmore) both reported that there are three types of foreign-body particles commonly found in tissues around stainless steel joints and corroded implants: (1) particles of the steel alloy; (2) platy deposits, thought to be corrosion products, which cause a giant cell

Histone Phosphorylation and Chromosome Structure

A ROLE for histones in the control of genetic activity has been proposed for many years. But histones fell out of favour as control molecules when it was found that their number (and therefore versatility) was small and that their amino acid composition was almost identical in all tissues and, furthermore, in species as far removed as the pea and the cow. More recently, however, interest in histones has been revived with the discovery that these proteins can be enzymatically modified by phosphorylation and acetylation. In *Nature New Biology* next Wednesday (June 6), Louie and Dixon describe studies on the kinetics of phosphorylation and dephosphorylation of testis histones which suggest that such histone modification plays a part in determining chromosome structure.

The kinetics of phosphorylation and dephosphorylation of histone I in trout testis suggest that both "old" and "new" histone I undergo extensive phosphorylation and dephosphorylation throughout the cell cycle. Histones IIb_1 and IV are also extensively phosphorylated, but the kinetics differ from those of histone I. These kinetic differences indicate that specific phosphokinases and phosphotases exist in the cell for each principal histone fraction. Because the half-life of ^{32}P-labelled histone phosphate is 6–8 h, the maintenance of high levels of phosphorylated histones I and IV in trout testis cells over long periods suggests that enzymatic modification of these histones is a continuous balanced process.

Louie and Dixon have proposed previously that the phosphorylation of histones IIb_1 and IV is concerned with the correct binding of these histones to chromatin. They now suggest that the extent of phosphorylation of histone I molecules in a particular stretch of chromatin may determine the degree of supercoiling of the chromosomal fibrils. Fibrils in which histone I is completely phosphorylated would be in the extended form (30–40 Å diameter), intermediate degrees of phosphorylation would allow the extended form to collapse into 100 Å supercoils, and still lower levels of phosphorylation might give rise to coiled supercoils of 200–300 Å diameter. Louie and Dixon have calculated, from their data, the molar phosphate to histone I ratio in the 35 Å, 100 Å and 200–300 Å fibrils and have found that the figures agree well with experimentally determined levels of phosphorylation of histone I in euchromatin and heterochromatin.

The continuous phosphorylation and dephosphorylation of histones I and IV involved in the persistence of the histone in a phosphorylated state suggest that the maintenance of the euchromatic state is an active metabolic process. Regulation of the order of coiling of chromatin fibres by phosphokinases and phosphatases might constitute a coarse control of DNA replication and transcription.