British Isles, and 538 from the British Isles outside a radius of thirty miles from the College. The accumulated excess of expenditure over income has been reduced from £19,152 to £1,458. The usual valuable list of published papers, arranged departmentally, is appended to the report.

Use of Aircraft in Agriculture

In 1952 the Food and Agriculture Committee of the Organization for European Economic Co-operation sponsored a mission to the United States to study the use of aircraft in agriculture, with the view of promoting its development in Western Europe. From its report (Technical Assistance Mission No. 107; O.E.E.C., 2 rue André-Pascal, Paris 16e) it is evident that great advances in this technique have been made since the Second World War, largely owing to the discovery of new synthetic insecticides and weed-killers suitable for low-volume application, and the availability of adaptable war-surplus aeroplanes. In the United States some seven thousand aircraft, compared with sixty-five in Western Europe, are now in use, chiefly for pest and disease control, seeding and fertilizing. While it is recognized that conditions in Europe, where intensive agriculture prevails, are not entirely comparable with those in the United States, the Committee nevertheless considers that there is great scope for expansion in the use of agricultural aviation both in Western Europe, North Africa and other overseas territories. To put the matter on a sound international basis, it recommends the establishment of a European Agricultural Aviation Centre (possibly under the ægis of the Organization for European Economic Co-operation and the European Plant Protection Organization) and the formation of an association of agricultural air companies to facilitate the exchange of technical information, safeguard standards and promote research. In addition to describing the current uses of aircraft in agriculture in the United States, the report includes sections on the economic, technical and operational aspects of the subject.

Fusarium Studies

In a study of the antagonism of soil micro-organisms, including a considerable number of bacteria and actinomycetes, to *Fusarium oxysporum* f. *lini*, a pathogen causing wilt of cultivated flax, R-O. Lachance and C. Perrault (*Canad. J. Bot.*, 31, 5, 515; 1953) found that nineteen bacteria and eleven actinomycetes showed some antagonism; of eleven organisms which yielded large inhibition zones on agar plates, six had a fungicidal and five a fungistatic action on the *Fusarium* conidia. Among the nineteen antagonistic bacteria under trial, six induced a swelling of the germ tubes or the production of an appressorium-like structure on agar. Greenhouse experiments have indicated that fifteen bacteria and eleven actinomycetes offered a certain protection to seedlings, some of which reached 6, 12, and sometimes 24 in. in height before showing any signs of wilting. The organisms evidently delayed the onset of wilt symptoms, but failed to protect the plants through their entire growth. R. H. Storer (*ibid.*, p. 693) has reported on the effect of soil moisture on *Fusarium* species. Six species and forms of the genus *Fusarium* show optimum growth and survival in soil at 15 per cent saturation. Optimum soil moisture content for actinomycete growth and survival is similar to that for the *Fusarium* species, whereas that for bacteria is at 75 per cent soil saturation. The present studies indicate that *Fusarium* spp. are strongly aerobic and that *Fusarium* populations can be greatly reduced by maintaining the soil in a saturated condition in the absence of hosts.

Salt-uptake by Root Tissue Cytoplasm

The relation between the uptake of salt by root tissue, that is, by the cytoplasm, and the external concentration of the salt, has been investigated in some of its biophysical aspects by A. B. Hope (*Austral. J. Biol. Sci.*, 6, 396; 1953). The proportion of a given length of bean-root tissue which appears to reach the external concentration when placed in potassium chloride solutions (the apparent free space) increases as the external concentration is increased. The experimentally determined values of the apparent free space at various concentrations of the medium fit the curves representing the quantitative relations between apparent free space and the external concentration deduced by assuming a Donnan equilibrium between the root cell cytoplasm and the medium at each concentration. Thus the experiments indicate the presence of non-mobile ions (probably anions) in the cytoplasmic phase. The concentration of these ions has been calculated to be of the order of 0·01 mol./l. for both bean and maize root cytoplasm. Mature cells seem to have a higher concentration than those less mature. The relation between uptake of potassium chloride by bean-root sections and the time of immersion has been found to follow Fick's law of diffusion. The apparent coefficient of diffusion for potassium chloride in the tissue has been calculated. A typical figure is $0{\cdot}07 \times 10^{-5}$ cm.^{2} sec.$^{-1}$, about one-twentieth of the value for an aqueous solution for the same concentration. The results of these experiments are discussed in relation to the few existing evaluations by other investigators of the non-mobile ion content of cell cytoplasm.

Bibliography of Natural History

The Society for the Bibliography of Natural History (c/o The British Museum (Natural History), London, S.W.7) is a scientific society instituted for the study of the bibliography of all branches of zoology, botany and geology. The Society publishes a *Journal* containing collected lists of bibliographical papers already published on various branches of natural history; original contributions in regard to the dates of publication of zoological, geological and botanical works; particulars relating to the disposal of the libraries and collections of deceased naturalists; and papers on bibliographical subjects. It is proposed also to publish from time to time in the *Journal* facsimile reproductions of rare or unique works or parts of works on natural history.

Effect of Movement of Surface Masses on the Rotation of the Earth

In a paper on "The Effect of the Movement of Surface Masses on the Rotation of the Earth" (*Mon. Not. Roy. Astro. Soc., Geophys. Supp.*, 6, 8; 1953), Andrew Young refers to the third edition of Sir Harold Jeffreys's "The Earth" (pp. 215–16), where doubt is expressed concerning the validity of the equations of motion governing the variation of latitude. This doubt arises from the view that an observer on the solid surface of the earth cannot observe the changing motion of the whole earth, because the axes fixed in the solid earth do not necessarily continue to coincide with the axes of reference