see any justification in supplying him from a fund of small subscriptions given, presumably, by a tree-loving public.

In a brief note elsewhere "To Intending Planters", by H. E. Seaton, the sound advice is given, in deciding upon planting schemes, to remember that "pure woods of alien trees are not modern practice; but that mixed woods of trees which do well locally are likely to succeed and are fairly fool-proof". How often has this been forgotten, even by those professing forestry knowledge. "Tree Shelter for Cattle", by S. F. B. Lane, is a much-needed reminder to farmers of the dangers being introduced in many parts of Britain by the indiscriminate tree felling which is taking place. Not only cattle, but also crops will suffer from the resultant exposure. An interesting article by H. E. Seaton on "Sewage and Civilization" (reprinted from the Rotary Service, Nov. 1940) sums up research work carried out by, among others, Dr. McCarrison and Sir Albert Howard in connexion with obtaining the present food for man and beast by a future suitable treatment of soils.

The British Empire Naturalists' Association

THE twentieth issue of the quarterly bulletin of the British Empire Naturalists' Association contains its usual summary of current field records and also the interesting announcement of the revival in octavo form, as in the War of 1914–18, of its well-known journal *Country-Side*, which had to be suspended at the outbreak of war. This decision is made possible with the very considerable—perhaps unexpected—interest in field natural history that has been maintained in Great Britain despite the War, and often in the most heavily raided centres like London and Merseyside. The first issue of the new abbreviated form of this journal is expected in December.

Among botanical records in the autumn issue of the bulletin are creeping bellflower (*C. ranunculoides*) and willow-leaved spiræa (*S. salicifolia*) in the Cotswolds, thorn-apple (Datura) spreading over bomb craters in Kent and greater spearwort at Chippenham, Wiltshire. Entomological records show a very wide distribution of the clouded yellow butterfly during its immigration from the Continent this summer, records extending into Scotland. The pale clouded yellow is recorded from Cheshire, several white admirals from the Borough Green area of Kent and the Ruislip area of Middlesex, high brown fritillaries from the west Lancashire dunes, and the marbled white at Chippenham, Wiltshire. Ornithological reports include the black-necked grebe, white wagtail and shoveler nesting in Cheshire, and little gull, spotted redshank, greenshank, and sandwich tern on migration; grasshopper warbler nesting in Lancashire, and the little gull and red-necked phalarope on migration.

Future of Telecommunications

IN an address before the London Students' Section of the Institution of Electrical Engineers on October 15, Dr. W. G. Radley, of the Post Office Research Station at Dollis Hill, spoke on Telecommunications of the future. He pointed out that in 1914, although wire telephony had been in use for about forty years and had become an important factor in the social and business life of urban communities, the loss in speech power during transmission imposed definite limits to long-distance conversations. These limits disappeared as a result of the general introduction of thermionic valve amplifiers. Later on, the long-distance circuits which became possible were made cheaper by the development of systems of carrier-current telephony, culminating in a standard system providing twelve speech channels over one pair of wires. A novel form of co-axial cable followed. This was capable of transmitting television or providing several hundred speech channels over two conductors. In the meantime, the transmission of speech by radio had made world-wide telephony possible. Each of these developments was the result of a long period of experimental work.

From the position of research work in 1939, it is possible to hazard a guess at the nature of the telephone system during the post-war period. The disappearance of metallic conductors, and the development of long-distance speech transmission by means of what is virtually guided radio waves, is a future possibility. Research into the nature of speech sounds has made it possible recently to construct a machine which will speak under the control of an operator at a keyboard. An extension of this idea suggests the possibility of analysing speech in a local circuit, transmitting signals over the long-distance line corresponding to the results of the analysis and at the distant end automatically reconstructing the speech. The frequency band necessary for transmission of the signals over the long-distance line is very much narrower than that necessary for ordinary telephony, and this would enable more circuits to be obtained from long expensive submarine telephone cables. Improvements during the post-war period would probably lead eventually to the disappearance of telephone operators, except for special services. Improved fidelity of response of microphones and telephone receivers was foreshadowed, but no immediate change in principle.

The Royal Observatory, Cape of Good Hope

THE report for 1940 of H.M. Astronomer at the Cape of Good Hope illustrates how astronomical work in the belligerent countries is being affected even though they may be far removed from the present scene of hostilities. Half the observing staff at the Cape is now engaged on non-astronomical duties, this at a time when so many observatories in Europe have perforce suspended work. Nevertheless the depleted staff is doing its best to secure such observations as cannot be replaced by any made at a later date. Meridian observations of the moon have been started in view of the possible loss of European observations, and volunteers have come to the rescue in observing occultations. Photographic work has been somewhat precarious owing to delays in the delivery of plates, but few photographs have been lost, and the position has been eased by a modification of the programme of routine