

disease', a condition due to the presence of chlorine, by soaking in sodium sesquicarbonate solution followed by copious washing will often remove all the chlorine without attacking the patina, whilst in aggravated cases, soaking in citric acid solution or the use of an electrolytic process may be necessary. Fourteenth century glass from Wells Cathedral was found to be coated with material derived from the combined action of an impalpable powder arising from the limestone floor and sulphuric acid provided by the combustion of gas. Other problems the successful solutions of which were described by Dr. Scott included the corrosion of a silver chalice, the unrolling of a manuscript on fragile leather, and the cleaning of marble busts.

Chemical and Photochemical Reactivity

ON Dec. 17, 1931, the Chemical Society devoted an ordinary scientific meeting to a discussion on the critical increment of homogeneous reactions. It was immediately apparent that the material then presented and the observations then offered should be put on permanent record in an accessible form, and this has since been done by the publication of a separate pamphlet (1s. 6d.) bearing the imprint of the Society and following the form of its *Journal*. The discussion was opened by Mr. C. N. Hinshelwood, whose subject was the energy of activation of chemical reactions. The magnitude and nature of activation energy, catalytic phenomena, and the contributions of quantum mechanics to the problem were among the matters considered. Mr. E. J. Bowen followed with a paper on photochemistry and chemical reactivity, referring to photosensitisation, the phenomenon of 'predissociation' discovered by Henri, and the direct reaction of excited and normal molecules. Prof. A. J. Allmand's contribution dealt with the variation of quantum efficiency with wave-length in photochemical reactions; five different types of effect are distinguished, and their incidence in affecting the quantum yield was examined. Prof. E. K. Rideal discussed transition reactions, while Dr. F. G. Soper gave an account of researches on the effect of solvents on reaction velocity. Dr. T. Iredale communicated a short contribution dealing with the heat of activation of hydrogen iodide. In the spontaneous discussion which followed, Dr. R. G. W. Norrish, Mr. C. R. Bailey, Prof. Allmand, Mr. H. W. Thompson, and Mr. Hinshelwood took part. Their observations, together with the full text of the principal contributions, are to be found in the publication already mentioned.

Preservation of the Fauna of the Empire

IN a short address at the general meeting of the Society for the Preservation of the Fauna of the Empire, the chairman, Sir Peter Chalmers Mitchell, made a strong appeal for the consolidation of the position in regard to animal reserves within the Empire. At present the continued existence of faunal reserves depends upon the goodwill of individual governments or individual parliaments. The discovery of mineral deposits, the demand for timber, and other possible eventualities, may lead to particular

reserves being thrown open to traffic or trade, with disastrous effects to the animal population, which cannot be herded into new areas at the will of man. What is needed for the permanent protection of those faunas, which are rapidly becoming relict faunas, is the raising of the status of their native territory in certain cases from temporary reserves to permanent national parks. The Society, which since its foundation has worked so strenuously on behalf of the Empire's threatened animals, has often appealed, with reasoned arguments founded upon the reports of its own observers, to the Colonial Office, but so far without success. The alteration would involve no extra expenditure; ultimately, indeed, the national parks by proper administration would bring in a certain amount of revenue; the surplus earned by the Game Department of Kenya, under strictly regulated conditions, was £15,022 in 1930. At present their creation would cost nothing, and would mean permanent security for the animals and plants in the reserved regions.

WE strongly commend the campaign which the Society has launched for the spread of news relating to wild life. A short time ago we read in a northern newspaper an account of life in the forests of British Guiana; and the article was to be followed in the course of a few days by a lecture. It is excellent propaganda, the educational value of which must be appreciated by everyone interested in Nature and its preservation. The Society has in all 867 members; it deserves and ought to have many more. May we suggest that somewhere, say on the blank cover of the *Journal*, from the December number of which we have quoted, a note should appear of the conditions of membership and of the amount of the annual subscription.

Frequency Range of Broadcast Receivers

IN opening a discussion on the selectivity of broadcast receivers at the Institution of Electrical Engineers on Feb. 24, Prof. C. L. Fortescue said that as the apparatus tested becomes more and more sensitive, components of higher and higher frequencies are found in it. The female voice is known to have components having frequencies so high as 10,000, and footfalls, hand-clapping, and the operation of typewriters are observed to have components of frequencies approaching 16,000. In broadcast transmitters provision is not usually made for such a wide range, and nearly every receiver has a much more limited range. A lower frequency limit of 50 and an upper limit of 5000 are usually considered to give good results. In the production of talking films, the audio-frequency output is, perhaps, subjected to the most careful scrutiny. In this case there is a noticeable tendency to try to get a full response up to a frequency of 10,000.

THE problem of getting uniformity of response over the whole audible range is more difficult. A highly trained observer detects, at particular frequencies, increases or diminutions in the loudness which the ordinary person does not notice. 'Musical' people are sometimes even the least critical of all in this