We have read some of the chapters with considerable interest and pleasure, notably those which deal with the phenols and with the carbohydrates, the subjects of which are carefully and fully dealt with. In some parts of the book, however, the explanations are not so clear as we could have wished, the reactions being given with little or no attempt at an explanation. Now the average student requires a considerable amount of explanation in order that he may understand the subject. As an example of want of clearness we think it would have been wise to give some explanation of the probable mechanism of the process involved in the preparation of benzaldehyde by the action of metallic nitrates on benzyl chloride, and some explanation of Reimer's reaction would not have been out of place.

The book is well printed, and the proofs have evidently been very carefully corrected. Taken as a whole, we consider Dr. Cohen's book a very useful compilation; from the preface we had expected to find a book written on new and original lines; in this, however, we were disappointed. F. M. P.

Nature Studies (Plant Life). By G. F. Scott Elliot. Pp. viii + 352. (London: Blackie and Son, Ltd., 1903.) Price 3*s.* 6*d.*

IT is not evident whether the author intends this book as a contribution to the subject of "nature-study," which is now attracting so much attention. Certainly the first and most essential feature of nature-study, namely, personal observation, is not emphasised, nor is the discursive style which the author adopts calculated to induce careful and accurate investigation. A large mass of information has been brought together, compiled from books on bionomics and original papers. The book begins with the flower and fruit, and the vegetative portions follow, an arrangement which has its advantages since morphology is sacrificed to bionomics. The relations between animals and plants are well brought out, but less prominently so the relations between plants *inter se*. The study of plant associations begins with the Cryptogams, and here, as indeed in most of the chapters, the matter is too fragmentary; only occasionally, as, for instance, in the chapters on seaweeds, or when describing the lichens, does Mr. Scott Elliot take the necessary space to do justice to himself and his subject. The concluding chapters dealing with the origin and development of the English flora introduce a subject which is well worth studying.

Das Objectiv im Dienste der Photographie. By Dr. E. Holm. Pp. xvi + 142. (Berlin: Gustav Schmidt, 1902.) Price 2 marks.

THOSE photographers, whether professional or amateur, who are able to read German will find this book full of useful information and valuable hints regarding the properties and use of the photographic objective. So numerous, so varied in construction, and so different in price are lenses of to-day that it is important that the photographer should know something of their nature and capabilities before investing in one or more of them. The present book is intended to give the reader a good all-round idea of not only the properties of lenses, their errors, corrections, the different kinds available, and hints on choosing them, but also how to use them when obtained. Although the text quite fulfils this object, the very excellent set of reproductions illustrating all the kinds of results which accrue from good or bad focusing, setting, choice of position, &c., adds greatly to its value, and demonstrates better than any words could do the points to be observed. The telephotographic lens is also included in these pages, and the book concludes with quite a full index.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Permanent Electric Vibrations.

IN his "Electric Waves" (see p. 361) Mr. Macdonald considers that electric waves may be propagated round a ring without being subject to any loss by radiation. The question whether this is possible is of great interest, as such waves might play an important part in atomic phenomena. It seems, however, that such waves cannot exist, except possibly in exceptional cases. For consider a spherical surface to be drawn enclosing the whole of the vibrating system. The electric force cannot vanish at all points of this surface, for the sphere may be as close to the conductors as we please. From the value of the force, and the condition that at infinity any motion that there may be must consist of outwardly progressing waves, we can find by spherical harmonic analysis the field at any point outside the sphere. The result is that in any case the field cannot at all distant points be of an order lower than that of $1/r$; there must be loss of energy by radiation. For a thin circular wire a fundamental mode of vibration is determined, to a first approximation at least, in *Proc. Camb. Phil. Soc.*, vol. ix. p. 326; and the case of a wave progressing round the wire can be deduced by compounding two such vibrations differing in phase. The determination of the resultant disturbance at a great distance involves Bessel's functions in general, but it can be proved without difficulty that for points on or near to the axis of the ring it consists of divergent waves. The consequent rate of loss of energy is of the order of unity, while the energy held is of the order of $\log(a/\epsilon)$, where ϵ is the radius of the wire and a that of the circle. The decrement is hence of the order of $1/\log(a/\epsilon)$, as found in the paper referred to.

On the other hand, it is hard to find a flaw in Mr. Macdonald's general reason for the absence of radiation in this case, and the possibility of non-radiating systems is suggested by the case of a uniformly and superficially charged dielectric sphere of unit specific inductive capacity. If it performs small simply periodic oscillations, each point of its surface may be treated as a Hertzian oscillator. On evaluating the external field, we find that the variable part of it is the same as if the charge were collected at the centre and multiplied by $(\sin \lambda a)/\lambda a$, where a is the radius of the sphere, and $2\pi/\lambda$ is the wave-length in free ether corresponding to the frequency of the oscillation. Hence, if this wave-length is a submultiple of the diameter of the sphere, there is no external oscillating field.

H. C. POCKLINGTON.

The Bearing of Recent Discoveries on the Physics of Taste and Smell.

ONE of the first experimental papers on the nature of the stimulus given to the organs of taste or smell by sapid or odorous substances is, I think, that by the Hon. R. Boyle ("Experiments and Observations about the Mechanical Production of Tasts (*sic*)," London, 1675), in which he puts forward a theory of irritation by particles which penetrate and irritate more or less according to their size and shape. After this a chemical theory of taste seemed to gain ground, and Graham laid down the principle that only soluble substances are sapid, and that further only crystalloid solutes are sapid (see Bain, "Senses and Intellect," 1864). Then in 1882 Sir W. Ramsay very tentatively put forward a dynamical theory from analogy with optics and sound (NATURE, xxvi. 187). He proposed that very light molecules vibrating at a high rate are inodorous, taking as the limit a molecular weight of about 30. On the other hand very heavy molecules would be odourless, because vibrating too slowly, whereas those vibrating at a rate between these limits would find the nerve-cells capable of response. Thus he accounted for the want of odour on the part of H, CH_4, O, N, H_2O, &c. Similar views were later ex-