Prof. Ford, shows the fresh material available for research, and the progress that has been made through new observations on established species in the last six years. A special list is given of literature on X-rays and crystal structure.

Numerous studies on the thermal behaviour of quartz and on its relations to cristobalite and tridymite come within the period covered by this appendix, and the attention of geologists may well be directed to the references given on p. 66. A cross-reference to these would have been useful under the heads of the other forms of crystalline silica. Among the new species we may note barbierite, which indicates that a monoclinic structure may be formed under certain conditions by the well known felspathic molecule, $NaAlSi_3O_8$. Bazzite, a blue scandium silicate from Baveno, and several vanadium minerals seem attractive novelties. Sefstromite, among the latter, passes away as a mixture. Metallic tantalum, first described in 1909, forms an important record, and specimens have already found their way from the Urals into most collections. It is late to quarrel with the makers of new names, but didymolite, with no didymium, platynolite, suggesting platinum when pronounced, and Prof. Ford's own pyroxmangite for "manganopyroxene," strike us as unfortunate. The author of this appendix, however, will at once be gratefully absolved.

G. A. J. C.

The Structure of the Fowl. By Dr. O. C. Bradley. Pp. xi+153. (London: A. and C. Black, Ltd., 1915.) Price 3*s.* 6*d.* net.

THE author of this little volume has successfully accomplished a somewhat difficult task in his effort to produce a concise and not too elaborate account of the structure of the fowl. The first chapter deals with the zoological position of birds, and includes a very interesting account of the probable ancestry of the domestic fowl. This is followed by chapters on the skeleton and muscular system, both of which are of necessity dealt with in a very elementary fashion. More detail is entered into when the author deals in successive chapters with the digestive system, the respiratory organs, the urinary organs, the reproductive organs, and the circulatory system. The descriptions of the macroscopic characters of these apparatuses are so clear and lucid that they can be well and easily followed by readers who have received little or no previous anatomical training, while the microscopic structure is dealt with in such a masterly way as to render the book of the greatest assistance to the student of comparative histology and pathology. The illustrations in these sections are excellent, and have very considerably simplified the author's task. The nervous system, the eye and its appendages, and the ear are briefly considered, and a chapter is also devoted to the skin and its appendages.

Probably the best chapter is that on the development of the chick, which is dealt with in rather more detail, the various stages being well illustrated.

While this little book would appear to contain little or nothing that is new, it is the only work with which we are acquainted that contains such an excellent general description of the structure of the fowl. The illustrations must be regarded as a special feature. There are seventy-three of them, and many are full-page plates.

There is a very complete index. G. H. W.

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.*]

The Structure of the Line of Wave-Length 4686 A.U.

PREVIOUS experiments by one of us (NATURE, vol. xcii., p. 5; *Phil. Mag.*, vol. xxix., pp. 284–297, 1915) have shown that the 4686 line could be obtained by passing a condenser discharge through pure helium, and it was concluded that the results supported a theory put forward by Dr. Bohr (*Phil Mag.*, vol. xxvi., p. 1, 1913). This theory, which was deduced by applying the quantum hypothesis to Sir Ernest Rutherford's atom-model, ascribed the line to helium. On the other hand, Rydberg, assuming the Pickering lines to constitute the sharp series of hydrogen from analogy with the spectra of the alkali metals, obtained by calculation the value 4687·88 for the wave-length of the first line of the principal series of hydrogen.

The present experiments on the structure of the line were commenced with the purpose of testing still further its chemical origin, and of obtaining results which would throw further light on the mechanism of emission of spectrum lines. The importance of accurate knowledge of the structure of hydrogen and helium lines from the latter point of view has already been shown by Bohr (*Phil. Mag.*, vol. xxix., p. 332, 1915). It is well known that the hydrogen lines of the Balmer series are not single lines, but close doublets, and it is therefore to be expected from both Rydberg's and Bohr's theories, that the 4686 line should also have a complex structure. According to Rydberg's theory, the line should be a doublet having the same frequency difference as the members of the Balmer series. The recent measurements of Buisson and Fabry gave 0·132 A U. as the separation of the two components of $H\alpha$, and it follows by calculation that the two components of the 4686 line should be separated by 0·0674 A.U. From Bohr's theory, the details of the structure of the line could not be anticipated, but from the supposed analogy between the mechanism of emission of the 4686 line and the lines of the Balmer series, it was hoped that a knowledge of the structure of the line would serve as a guide in testing different hypotheses for explaining the doubling of the hydrogen lines.

The origin of the "4686" line has recently been studied by Merton (NATURE, vol. xcv., p. 64; Proc. Roy. Soc., vol. xci., p. 382, 1915), who used a method based on Lord Rayleigh's theory of the width of spectrum lines. He concluded that either the breadth of the line is controlled by circumstances at present unknown, or that the line originates from systems of sub-atomic mass. Later experiments by the same author (Proc. Roy. Soc., vol. xci., p. 421, 1915, February, 1916) show that the widths of some spectrum lines are not wholly due to the motion of the molecules.

In our first set of experiments the line was excited by passing a condenser discharge through a helium