Such, in brief, is the "burden" of this erudite but eminently readable book. It is a fine text-book of open-air history, an attempt to write history "writ large on the face of the country" (p. vii). The available documents are read and expounded *in situ*, so to speak. Archæology, traditions, and folklore "assign their true value to records which have hitherto been loosely read" (p. viii). Accounts of the Scandinavian invasions of western England are read, very properly, in the light of northern antiquities. The first Danish invaders allied themselves with the "bottled-up" "One and Alls," and we learn much about peaceful Danish settlements on the coasts of the Severn. Two archæological maps, many plans and diagrams of camps, and a copious index mark the thoroughness and finish which characterise the whole work. JOHN GRIFFITH.

The British Journal Photographic Almanac, 1914. Edited by G. E. Brown. Pp. 1496. (London: Henry Greenwood and Co.) Price 1*s*. net.

To photographers the approaching end of the year and the beginning of a new one is always heralded by the announcement of the publication of this almost indispensable year-book, which is so familiar to them and a natural fixture in their studios. The copious material contained between the two covers and the useful facts embodied in it has made it a book of reference difficult to part with. The issue for this year follows mainly the lines of its predecessors, but new features of course have been inserted. These, to state them briefly, comprise a glossary of photographic terms, which, no doubt, will be helpful to many a beginner in the subject of photography.

Lists are given of the German, French, and Italian equivalents for the chief appliances and operations, and these should be most serviceable to those who study foreign photographic journals and books, but have no technical dictionary at their elbow. The beginner is also favourably treated with an excellent series of reproductions of negatives incorrectly exposed and developed, which should show him more than words can express what he must avoid; the accompanying text will also prove of service. The epitome of progress, novelties in apparatus, formulæ for the principal photographic processes, miscellaneous information, tables, &c., are as full and complete as ever, and the great number of advertisements are a valuable feature of the volume.

Hazell's Annual for 1914. Edited by T. A. Ingram. Pp. cxiii + 592. (London: Hazell, Watson and Viney, Ltd., 1914.) Price 3*s*. 6*d*. net.

IN addition to its revision up to November 25 last, this twenty-ninth issue of "Hazell's Annual" contains a section entitled "Occurrences during Printing." It justifies its claim to give the most recent information on the topics of the day. A section running to some forty pages is headed "The March of Science," and provides a summary of progress made in the world of science during 1913. An index containing 10,000 references makes it easy for the reader to find his way about the volume.

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 Pressure of Radiation.

WITH reference to my letter on this subject in NATURE of December 18, the majority of my correspondents complain that, although I may have indicated the possibility of my own view, I have not shown why the simpler relation, that the pressure is always one-third of the energy density, is untenable. As I cannot reply to each individually, I shall be glad if you will allow me space to rectify this omission.

It is generally admitted that the total heat required for the emission (or evolved in the absorption) of unit volume of radiation is the sum of the intrinsic energy density, E/v, and the external work p. By Carnot's principle, this must be equal to $T(dp/dT)$. Whence, if $E/v=3p$, we obtain immediately the fourth power law for full radiation in the usual manner. It would appear, however, by similar reasoning, if E/v is equal to $3p$ for each separate frequency, that radiation of constant frequency should also increase with temperature according to the fourth power law, which is certainly not the case. Either Carnot's principle does not apply, or E/v is not equal to $3p$ for each separate frequency. I have chosen the latter alternative.

It has been shown by Lord Rayleigh, Lorentz, Larmor, Jeans, and others that the electromagnetic equations (from which $E/v=3p$ was first deduced) lead inexorably to Rayleigh's formula,

$$E_\lambda = 8\pi R\lambda^{-4}T/N,$$

without the exponential term, for the partition of energy in full radiation per unit range of wave-length λ. This result appears to be true in the limit for long waves and high temperatures, but is otherwise so hopelessly at variance with experiment as to suggest that something may have been overlooked in the application or interpretation of the equations.

Some of my correspondents point out that Nichols and Hull have already shown by experiment that the pressure of a beam of light is equal to the energy density irrespective of wave-length. According to my theory, the mechanical effect which they measured should be equal to the total energy density, $E/v+p$, as deduced from their energy measurements. Their result is in perfect agreement with my theory, but it is not quite such a simple matter (and may even prove to be impossible) to measure p separately from E/v, which is the experiment that I proposed to attack.

H. L. CALLENDAR.

Imperial College of Science, S.W.,
December 27, 1913.

Atomic Models and X-Ray Spectra.

MR. H. G. K. MOSELEY has published in the December issue of the *Philosophical Magazine* a very interesting paper describing his measurements of the wave-lengths of the characteristic X-ray lines of various metals. He has succeeded in calculating the wave-lengths of one-half of the lines he observed, assuming Bohr's atom and supposing the positive charge on the nucleus to correspond to the place of the element in the periodic table as suggested by van den Broek. He concludes that the agreement between calculated and observed wave-lengths strongly supports the views of Rutherford and of Bohr.

It appears to me that Moseley's research really only supports the views of Rutherford and of van den Broek. As I propose to show in detail in a paper to