

of Trade, which was very favourably received. The popularity of the present manual and its immediate precursors has been greatly increased by its adoption by the Board of Trade as a text-book in connection with the examination of masters and mates in the mercantile marine service. It has been prepared under the superintendence of Commander Hepworth, marine superintendent of the Meteorological Office, formerly a keen observer of meteorological phenomena in various oceans. Several new charts have been constructed from the materials in the possession of the meteorological committee, and show, *inter alia*, the mean isobars for the middle months of each quarter, and the pressure and prevailing winds for January and July over the globe, with an interesting discussion of the leading features exhibited.

Cows, Cow-houses, and Milk. By G. Mayall. Pp. xi+102. (London: Baillière, Tindall and Cox, 1909.) Price 2s. 6d. net.

THE above title covers a lot of ground for a small book of about a hundred pages. Naturally, we expect to find the information much condensed; thus, in the chapter on breeds, little more than a page is given to the premier race, Shorthorns. Again, in feeding cattle and in the variations of milk, we are told, in the one case, a fair ratio is 1 to 6 or 7, and, in another place, $\frac{1}{2}$ lb. to $\frac{3}{4}$ lb. of good oats is said "to improve fat yield and milk taste." We should have preferred to have seen the starch equivalent and protein in the ration explained in a different way. Breeders, like other people, cannot be expected to agree on all points, and we should wish to have our heifers served long before "at the end of their second year."

The illustrations are very good, and misprints in the reading matter appear to be very few. One may be pointed out on p. 56, concerning the average per cent. of fat in cream, which may be anything from 25 per cent. upwards; also, on p. 63, 40° C. should read 40° F. Of the hygiene and veterinary sections we have nothing but unstinted praise. Everyone interested in this important subject should read "Checking the Spread of Disease." The book can be commended to the improving landowner, the land agent, the dairy farmer, and the short-course student, who requires much information in a limited time.

The Oxford Geographies. (Oxford: Clarendon Press, 1909.) *The Elementary Geography.* By F. D. Herbertson. Vol. II., *In and About our Islands.* Pp. 112. Price 1s. Vol. IV., *Asia.* Pp. 128. Price 1s. 6d. Vol. VII., *The British Isles.* Pp. vi+192. Price 1s. 9d.

Cambridge County Geographies. Gloucestershire. By Herbert A. Evans. Pp. x+155. *Westmorland.* By Dr. J. E. Marr, F.R.S. Pp. ix+151. (Cambridge: University Press, 1909.) Price 1s. 6d. each.

THE characteristics of the series of elementary books of geography to which the new volumes under notice belong have been described already in these columns (vol. lxxxii., p. 125). In the three new parts of Mrs. Herbertson's "Elementary Geography," it is satisfactory to find the same simplicity of language, correctness of information, and abundance of well-chosen illustrations which served to make the earlier volumes admirably adapted to the requirements of junior classes.

Both Mr. Evans and Dr. Marr have entered into the spirit of the scheme of the Cambridge County Geographies, and their accounts of Gloucestershire and Westmorland respectively maintain the high standard of the series. Geography is given the same wide interpretation, and the books include a description of the architecture, natural history, and geology of the counties dealt with.

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LETTERS TO THE EDITOR.

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The Atomic Weight of the Radium Emanation.

IN a paper by Mr. A. J. Berry and myself read before the Royal Society on December 9, on the thermal conductivities of gases at very low pressures, we showed that for the heavier monatomic gases, neon and argon, the experimental conductivity agreed (as well as could be expected from the present state of the measurements) with that calculated from the kinetic theory from the number of impacts of the molecules per sq. cm. per second and the molecular heat of the gas, assuming perfect interchange of energy on impact.

This suggests a possible means of obtaining experimental evidence on the much-debated question of the atomic weight of the radium emanation. If a moderate fraction of a gram of radium were available the infinitesimal quantity of the emanation would not be an insuperable difficulty, for at the sufficient pressure of 0.04 mm. the emanation from this quantity would occupy the sufficient volume of 2.2 c.c. The pressure of the emanation could be deduced from existing data by means of γ -ray measurements; but also, with hardly any elaboration of the apparatus, an accurate determination of the volume of the emanation could be obtained. For it may be remarked, without in any way reflecting upon the numerous and careful experiments that have been done on this volume since its first determination six years ago by Sir William Ramsay and myself, the purification of the emanation by ordinary methods appears at the best to be imperfect; whereas to an operator experienced in the use of the calcium method, worked out in this laboratory, no difficulty is to be anticipated.

On the view discussed in our paper, the thermal conductivities of the heavier monatomic gases should be inversely proportional to the square root of their atomic weights, so that the atomic weight of the radium emanation could be compared with those of the heavier argon gases by a novel method.

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Alkali-syenites in Ayrshire.

IT is now well known that a group of basic alkalic rocks of approximately late Carboniferous or early Permian age occurs in central Scotland. Dr. Teall first remarked the teschenitic affinities of some of these rocks in his "British Petrography" (1888). During the recent work of the Geological Survey in central Scotland, many occurrences of teschenite, essexite, and theralite have been recognised by Mr. Bailey and Dr. Flett. In several localities the teschenites pass into picrites of the Inchcolm type. Although the general facies of this group is quite basic, and locally ultra-basic, the presence of acid veins in some of the teschenite intrusions has encouraged the hope that a more acidic phase might be discovered in some of the lesser known intrusive masses of central Scotland, hitherto indiscriminately lumped together as "dolerites."

This hope has been realised by the discovery of a large mass of alkali-syenite at Howford Bridge, near Mauchline. This mass, which is intrusive into the Permian lavas of the central Ayrshire basin, is finely dissected by the river Ayr. It is composed mainly of a peculiar medium-grained rock, consisting of thoroughly idiomorphic feldspars, principally anorthoclase, with subordinate albite and orthoclase, a little nepheline, numerous small crystals of ægirine, brown and bluish-green soda-amphiboles (barkevicite and arvedsonite) in mutual intergrowth, and ilmenite altering to leucocene. The well-shaped crystals of feldspars are loosely crowded together, and the angular spaces between them filled with abundant fresh analcite, which encloses the ægirine and soda-amphibole, as though these had been pushed aside by the crystallisation of the feldspars in a thoroughly liquid magma. This rock passes downward