each, which occupies the greater part of the book, follows the ordinary, old-fashioned lines, even to the use of the Millerian indices, and the author has wisely refrained from complicating the discussion by devising a brand new set of names for the several classes. The sections on the Goldschmidt method are, on the other hand, scattered throughout the book; it would have been wiser to collect them together and to have expanded them. The argument is incomplete. For instance, the fundamental property of the gnomonic projection, viz., that all zones are represented by straight lines, is very indefinitely stated, and not proved at all. Examples of working out crystals belonging to the six systems should have been included in the several chapters, instead of reprinting more or less fully at the end of the book a few original papers, in which the actual working is subservient to the interest of the particular research. For a full understanding of the Goldschmidt method the student must still refer to the original source.

We are informed that the Hill Publishing Co., Ltd., are the London publishers, but their name is not given on the title-page.

First Book of Physiology and Hygiene. By Gertrude D. Cathcart. Pp. vi+158. (London: Macmillan and Co., Ltd., 1914.) Price 1s. 6d.

IT is apparently the notion in certain educational circles that hygiene can be taught without a preliminary knowledge of the science physiology on which it is founded. If such an idea still lingers anywhere it will be immediately dispelled by a perusal of this attractive little book. The author shows quite clearly that the laws of health are direct deductions from physiological principles. These are explained in clear, simple language, so free as possible from technical terms, and we can highly recommend the book as suitable for readers commencing the study of the subject, or for those who do not wish to take it up from the professional and medical point of view. Where so much is excellent, it seems ungracious to point out a serious mistake, the only one so far as can be ascertained; this is the erroneous statement that the red blood corpuscles are the carriers of carbon dioxide.

W. D. H.

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 Density of Lead from Ceylon Thorite.

LAST May, in conjunction with Mr. H. Hyman, I published the result of an examination of the relative atomic weight of a small specimen of lead, less than one gram, separated from a kilogram of Ceylon thorite, which showed a value rather more than a unit in excess of that found for a specimen of ordinary lead. I have since been engaged in extracting the lead from 33 kilograms of Ceylon thorite, which was first carefully sorted by hand, piece by piece, into various grades. From the finest grade, consisting of 20 kilograms, about 80 grams of lead were obtained, in agreement with the percentage obtained by analysis.

This specimen, and a similar weight of ordinary assay lead, have been carefully purified by identical processes, and finally obtained as metal, by fusing the oxide with cyanide, and repeating the fusion with the metal. The very porous castings so obtained were melted in a mercury pump vacuum in glass tubes with drawn-out jets, and cast into cylindrical graphite moulds in the vacuum, hydrogen to atmospheric pressure being then admitted, and the lead allowed to freeze from the bottom.

It was thought that a determination of the specific gravity would yield results of interest. It is to be expected that the atomic volumes of isotopic elements should be identical, so that, on this view, the densities should be in proportion to the atomic weights. The density of lead distilled in a vacuum was found, by Kahlbaum, Roth, and Siedler, to be 11·3415 ($D^{20°}_{4°}$), and after pressing to 10,000 atmospheres, 11·3470. For the ordinary lead, prepared as above detailed, $D^{20°}_{4°}$ was found to be 11·3465, as the mean of three determinations agreeing within 8 units in the last place, in good accord with that found for distilled lead. On the other hand, the value found for the specimen of thorite lead was 11·376, which is 0·26 per cent. greater, and higher than has been found previously in any trustworthy determination. The atomic weight calculated from the density, taking 207·10 as the figure for ordinary lead, is 207·64. It remains to be seen whether the constants of the lead will be altered by further purification, but one would expect that the effect of any possible impurity would be to decrease, rather than increase the density.

During the purification of the lead, bismuth was specially looked for, but, if any at all was present, its quantity was certainly less than one part in ten millions of the mineral. This seems to dispose of the speculation that bismuth is one of the end products of the thorium disintegration. On the other hand, I was surprised to find a perceptible quantity of iodine in the mineral, and separated between one and two grams, which Mr. J. A. Cranston is now examining. So far as the tests have yet gone, there seems to be a distinct trace, also, of thallium present.

FREDERICK SODDY.
Chemical Department, Aberdeen University,
January 30.

The Cause of Streaks upon Lath and Plaster Walls.

IN reply to Mr. Thomas D. Cope's letter in NATURE of January 21, it may be stated that he is correct in supposing that the best explanation of the streaks on the plaster he refers to is that they are due to the hot-air molecules driving the dust particles into contact with the plaster, and the colder the plaster the weaker is the power of the cold-air molecules next it to resist the deposition. This tendency of hot air to deposit its dust on cold surfaces can be seen in a very marked way in any house heated with hot water or steam. Wherever a hot pipe comes through a wall there will always be found a dirty vertical streak on the wall just above the hot pipe, caused by the stream of hot air rising from the pipe depositing its dust on the cold surface.

This action of hot air on cold surfaces accounts for the difference in cleanness of surfaces in rooms heated by open fires, and those warmed by hot air or by the so-called radiators, which do most of their heating by warming the air by contact. In a fire-heated room the furniture is principally heated by radiation, and, being warmer than the air, it repels the