

way, so that the financial position can be readily understood. A pupil who has been taught arithmetic in a reasonable way can adapt his knowledge to the forms of bookkeeping in a few weeks when placed in an office. For people who have not had the advantage of a rational education, it is necessary to draw up hard and fast rules, which must be obeyed in order to keep accounts intelligibly. The volume under notice does this, by showing as simply as possible how a trader unfamiliar with bookkeeping may construct, keep and balance a set of account books suited to his own business. A set of "Automatic Balancing Charts" is published separately as a supplement to the book, and they are drawn up in such a way that it is almost impossible for a person of average intelligence to make an incorrect entry upon them. Both the book and the charts should prove of service to business men unfamiliar with the intricacies of bookkeeping.

Reports from the Laboratory of the Royal College of Physicians, Edinburgh. Edited by Sir Batty Tuke, M.D., and D. Noel Paton, M.D. Vol. vii. (Edinburgh: Oliver and Boyd, 1900.)

THIS volume consists of a series of original papers which, since the end of 1897, have emanated from the laboratory of the Royal College of Physicians of Edinburgh. Practically all these papers have been published previously in the medical or scientific journals, and in this form have no doubt been read by those interested in their subject-matter. This is, however, perhaps only partially true of two reports which were presented respectively to the Fishery Board for Scotland and to the Prison Commission for Scotland. The first report consists of sixteen monographs on the life-history and the physiology, under varying conditions, of the salmon; and concludes with a monograph, by Dr. Dunlop, upon the food value of the salmon at different seasons, and obtained from different sources.

Dr. Dunlop is also the author of a report to the Prison Commission for Scotland upon prison dietaries. The report seems to be an exhaustive one, and contains many suggestions with regard to the adaptation of the diets in prisons to the varying conditions and labour employments of the prisoners.

Mother, Baby and Nursery. By Gènevieve Tucker, M.D. Pp. xvi + 193. (London: T. Fisher Unwin, 1900.) Price 1s.

THIS is one of the many manuals written for the guidance of young mothers. The writer is an American doctor, but suitable to every mother are the clear and practical directions on the management of herself and her infant. The earlier chapters are concerned with heredity and the conditions favourable for the unborn child. The practical advice is valuable, but it is misleading that the author's opinions on questions of heredity are stated as generally acknowledged facts. The chapters on the care of the infant are suggestive and helpful, and the importance of early training in good habits beginning during the first month of life is insisted upon duly and wisely; but the following advice is extraordinary and *not* to be recommended: "Take a good-sized raisin, cut open, taking out the seeds, put it on the umbilicus." A chapter containing a classification of the diatheses of infants (scrofulous, tuberculous types, &c.) seems out of place in a manual of this description. At the end of the book there is a short and emphatic summary of what is and what is not to be done in the nursery; but among the "nursery don'ts" we notice the omission of a warning against a practice too common, at any rate, in this country, namely, the use of so-called baby-soothers.

Interest is added to the book by the introduction of photographs of young children, but we dislike to see advertisements embodied in the text.

NO. 1035, VOL. 63]

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.]

Vortex Rings.

IN the course of some experiments preparatory to a lecture on vortex rings, I have introduced certain modifications which may be of interest to teachers and students of science.

The classic vortex-box is too well known to require much description. Our apparatus, which is rather larger than those in common use, is a pine box measuring about a metre each way, with a circular hole 25 cms. in diameter in one end. Two pieces of heavy rubber tubing are stretched diagonally across the opposite or open end, which is then covered with black enamel cloth tacked on rather loosely. The object of the rubber chords is to give the recoil necessary after the expulsion of a ring to prepare the box for a second discharge. Such a box will project air vortices of great power, the slap of the ring against the brick wall of the lecture hall being distinctly audible, resembling the sound of a flip with a towel. An audience can be given a vivid idea of the quasi-rigidity of a fluid in rotation by projecting these invisible rings in rapid succession into the auditorium, the impact of the ring on the face reminding one of a blow with a compact tuft of cotton.

For rendering the rings visible I have found that by far the best results can be obtained by conducting ammonia and hydrochloric acid gases into the box through rubber tubes leading to two flasks in which NH_4OH and HCl are boiling. Photographs of large rings made in this way are reproduced in Fig. 1, the side view being particularly interesting, showing the comet-like tail formed by the stripping off of the outer portions of the

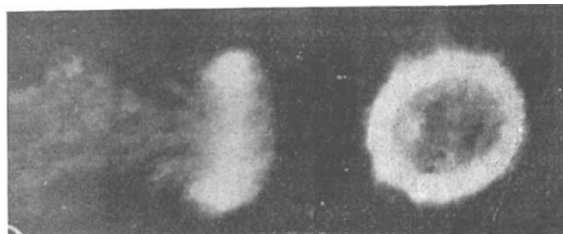


FIG. 1.

ring by atmospheric friction as it moves forward. It is needless to say that the experiment with the visible rings should be left until the end of the lecture. The power of the air-rings can be shown by directing them against a flat pasteboard box, stood on end at some distance from the vortex apparatus, the box being at once overturned or even driven off on to the floor. A large cluster of burning gas jets can be extinguished by the impact of a ring, a modification of which experiment can be shown on a small scale by shooting a capped shell in a shot-gun at a candle several paces off. If one's aim is good the candle will be extinguished by the invisible vortex.

For showing the elasticity of the rings by bouncing one off the other, I find that the best plan is to drive two in rapid succession from the box, the second being projected with a slightly greater velocity than the first, all experiments that I have made with twin boxes having yielded unsatisfactory results.

Though the large vortices obtained with an apparatus of this description are most suitable for lecture purposes, I find that much more beautiful and symmetrical rings can be made with tobacco smoke blown from a paper or glass tube about 2.5 cms. in diameter. It is necessary to practice a little to learn just the nature and strength of the most suitable puff. Rings blown in this way in still air near a lamp or in full sunlight, when viewed laterally, show the spiral stream lines in a most beautiful manner. I have succeeded in photographing one of these rings in the following way. An instantaneous drop shutter was fitted to the door of a dark room, and an arc-lamp focussed on its aperture by means of a large concave mirror. The shutter was a simple affair, merely an aluminium slide operated with an elastic band, giving an exposure of $1/300$ of a second. A photo-