

seventeen have both liquid and solid waste, and in the greater number of these the liquid waste preponderates.

But those industries selected by the author for special treatment are undoubtedly among the greatest sinners as regards possible river pollution. Their waste is, as a rule, particularly difficult to deal with, and a study of the means adopted in the several instances presents many features of interest to the sanitary and municipal engineer.

The work has been judiciously put together, and the examples of plant selected for special description are in all cases typical examples of their class. It is admirably printed and illustrated, and the diagrams and drawings are such as will commend themselves to the practical man. The work is specially addressed to borough engineers and surveyors, and we trust that it will be as widely read and studied by them as it deserves to be.

OUR BOOK SHELF.

Die Weltherrin und ihr Schatten. Ein Vortrag über Energie und Entropie. Von Dr. Felix Auerbach, Prof. a. d. Universität Jena. Pp. 56. (Jena: Gustav Fischer, 1902.) Price Mk. 1.20.

DR. AUERBACH no doubt undertook a very difficult task when he endeavoured to popularise the exact significance underlying the expressions "energy" and "entropy," and the relations subsisting between them, and it is not easy to say how far he has succeeded in making himself intelligible to an unscientific audience. Doubtless, of energy everyone believes himself to be more or less well informed, but of entropy, though perhaps not really more difficult of apprehension, yet from its less familiar use very great perplexity and uncertainty seem to exist. We can only hope that the author dissipated some of the clouds which hover around this intricate subject. The somewhat fanciful title of "The Mistress of the World and her Shadow" which is attached to the address leads one to expect a more picturesque and imaginative treatment than the subject receives. One looks naturally for a new set of metaphors and illustrations by which a rather dry subject may be illuminated and its treatment rendered more entertaining, but one does not find much that is new or very appropriate, though of course the matter is sound, and doubtless as a popular address the lecture was very effective.

We are glad to see that it has since been published in *Himmel und Erde*, where it is likely to meet with many and appreciative readers, and thus reach a wider audience than is possible in a lecture theatre. The authoritative version is accompanied by a short list of works connected with the general subject, and also some pages of explanatory notes from the professor addressed to those who are supposed to have some slight previous knowledge of the subject. Notes, attached in this way are usually a tacit admission on the part of the author that he has failed to accomplish the task that he has undertaken. We see no reason to view these notes in a different light.

Chemisch-Analytisches Praktikum. Von Dr. Karl Anton Henniger. Pp. viii + 127. (Brunswick: F. Vieweg und Sohn, 1902.) Price Mk. 1.50.

THE chief interest of this book lies in the fact that the author is head-master of the Charlottenburg Real Gymnasium, and that the course which he describes is the one adopted in that institution. We have thus an opportunity of seeing what kind of practical chemistry is cultivated in one of the first-class German schools. According to the author, the goal to be reached by the

great majority of his pupils is a knowledge of the chief reactions of the non-metals and metals, as well as sureness and clearness concerning the procedure of analysis and the use of the distinguishing reagents. This is to be effected by exercising in simple analysis.

If this be the case, it may be said that the book is well calculated to fulfil its purpose, for it is substantially a treatise on qualitative analysis prefaced by some useful exercises on different types of chemical action. Descriptions and equations are given for all the tests that are to be performed, and the pupil is, in fact, put through a regular analytical drill. The amount of detail is surprising considering that we are concerned with school-work, and it is difficult to see what would be left for the university to teach in the way of qualitative analysis if the students came with a mastery of this book.

It is remarkable that the course of chemistry here prescribed for school purposes is of the kind that, with pretty general approval, has been steadily disappearing from English schools during the past fifteen years. In this corner of education Germany can hardly be said to show the way.

A. S.

La Protezione degli Animali. By N. Licò. Pp. viii + 64. (Milan: U. Hoepli, 1902.)

THE appearance of this "booklet" may be taken as an indication that the proper treatment by man of the inferior animals and the avoidance of unnecessary and wilful cruelty are attracting attention in countries other than our own. Indeed, Turin, like Paris, possesses its own Society for the Protection of Animals, and the crusade against bearing-reins and other forms of minor torture is carried on as vigorously (and, shall we say, as vainly) as in London.

The author commences with a chapter on the duty of humanity to animals in general, and then proceeds to discuss the various groups of animals brought more especially into contact with man, and the cases where amendment in their treatment is most urgently required. In general, the arguments appear to be put temperately and moderately, even in regard to that thorny subject vivisection. Such sports as dog-racing (under the conditions in which it is conducted in some continental countries), cock-fighting and bull-fights the author unhesitatingly condemns. He is likewise averse to all mutilations of animals, whether to "improve" their appearance or for other reasons. But minor matters, such as the treatment of horses by cavalry soldiers and coachmen, and the nature and fitting of their accoutrements and harness, claim a share of attention. Whether the author will succeed in convincing the world that a vegetarian is preferable to an animal diet may be more than doubtful, but if the book leads to a diminution in any degree of certain forms of cruelty to animals from which this country at any rate is free, its publication will not have been in vain.

R. L.

Coal Cutting by Machinery in the United Kingdom. By Sydney F. Walker. Pp. 144. (London: The Colliery Guardian Co., Ltd., 1902.)

THE complaint has frequently been made against mine owners in this country that they are not availing themselves of coal-cutting machinery to anything like the same extent as mine owners in the United States. The complaint is justifiable, inasmuch as any methods by which labour and capital can economise are now absolutely necessary. In his excellent monograph on coal-cutting by machinery, Mr. Walker shows that the question is by no means new to this country. The history of the coal cutter in Great Britain is an ancient one. Indeed, the earliest proposal to substitute the labour of a machine for that of a collier appears to have been made by Michael Menzies, of Newcastle-on-Tyne,