

of students. The method of treatment of the thermodynamic principles is good, and will be readily comprehended by any reader who has but slight knowledge of higher mathematics.

The earlier chapters deal with heat, temperature, energy, the first law of thermodynamics, and the formation and expansion of steam. These lead to very useful chapters on the theory of reciprocating engines and on their thermal performances in practice. Sufficient is included on valve gears and indicator diagrams to enable the student to understand the ordinary gears and to detect any defects in practical working. A considerable section of the book is devoted to the steam turbine, and this portion is excellent, both as regards the treatment of the laws of expansion in nozzles, and also the explanations given of the action of the more common types of turbines. Some notes on propulsion, coal consumption, internal combustion engines, and refrigerators are also given.

As the book is rather a collection of expanded notes than a comprehensive text-book, the author has wisely omitted any elaborate descriptive drawings. Such drawings as appear give all the information required to enable the principles discussed in the text to be understood readily. Within its scope the book can be recommended as supplying a useful supplement to lecture courses dealing with the subject.

*Gardens in their Seasons: a Nature Book for Boys and Girls.* By C. von Wyss. Pp. 64. Illustrated. (London: A. and C. Black, 1912.) Price 1s. 6d.

*Wonders of Plant Life.* By S. Leonard Bastin. Pp. x+136. Illustrated. (London: Cassell and Co., Ltd., 1912.) Price 3s. 6d. net.

THE first of these books can be depended upon to arouse in children a love for both the plants and animals of the garden. It is for the most part well and simply written, and with the exception of the last one in the book, the illustrations are charming. One cannot altogether concur with the statement that the crocus lays eggs, nor is the author accurate in his remark that "none of us know" how food is constructed in green leaves. The statement on p. 64 that the thick skins of the holly leaves "keep in the warmth of the body, and frost cannot penetrate," is not only untrue, but very misleading even to children.

The second volume cannot fail to interest the young botanical student, but it is unfortunate that the author has not confined his attention entirely to the popular side of the subject. As soon as he enters the domain of scientific botany, especially physiological, he is obviously out of his depth, as can be verified by reference to many of his statements in the chapter on "The Feelings of Plants," and to his account of the reproduction of the fern on p. 66. Many of the illustrations are very good, and that of the *Yucca* in flower, facing p. 38, is excellent. As in so many books of this kind, "fertilisation" is used where pollination is meant.

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## 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 Ammonia Flame.

WITH reference to Mr. Egerton's interesting letter in NATURE of May 16, my colleague, Prof. Fowler, reminds me that he photographed the spectrum of the ammonia flame at the time that we were investigating the spectrum of the active nitrogen glow. Although the general colour of the flame is not unlike that of the nitrogen glow, he found nothing really in common between their spectra in the visual region. Re-examination of the negatives confirms this conclusion. I fear, therefore, that we cannot connect the ammonia flame with active nitrogen, interesting though such a connection would be.

Observations on the ammonia-flame spectrum are not new; an account of what has been done in this direction will be found in Kayser's "Handbuch der Spectroscopie," vol. v., p. 835.

I take this opportunity of referring to another flame phenomenon which is connected with the afterglow of electric discharge. E. Becquerel (*La Lumière*, vol. i., p. 196) remarks (and I have verified) that a colour may be observed at the tip of the oxy-hydrogen flame identical with the greenish-yellow of the afterglow in air. The latter, as I have shown (*Proc. Roy. Soc., A*, vol. lxxxvi., p. 57, 1911), is characteristic of nitrogen peroxide, and may be imitated by passing nitric oxide or peroxide into a Bunsen flame. The colour of the tip of the oxy-hydrogen flame is no doubt due to the presence of nitrogen peroxide, which is formed by oxidation of atmospheric nitrogen at the high temperature, and is stimulated to luminosity in just the same way as nitrogen peroxide artificially introduced.

There is nothing new in the oxidation of nitrogen attendant on the combustion of oxygen and hydrogen in its presence—indeed, the effect has been recognised as a source of error in gas analysis. At the time when Lord Rayleigh was working out the method of isolating argon by oxidation of atmospheric nitrogen, he was able, I remember, to detect the presence of nitrogen peroxide by its smell on entering an ordinary room lighted by incandescent gas lamps.

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Imperial College of Science and Technology,

May 22.

### The Free-living Marine Nematodes.

I HAVE recently paid a short visit of a few days to the Port Erin Marine Biological Station in order to gain some idea of the free-living marine nematodes and their distribution. The subject is one that has not received much attention in this country since the publication in 1866, in the Transactions of the Linnean Society, vol. xxv., of Bastian's monograph of the Anguillulidæ.

The nature of the food is one of the most obscure points in connection with this much neglected group, but I have been able to determine what it is in at least one of the marine species. Owing to pressure of work on the terrestrial nematodes, more extended investigation of the marine forms is at present impossible, and must be left until some future date. Therefore I have thought it better merely to report the matter now, and to publish my observations later on when they have been considerably amplified.