OUR BOOK SHELF

Theorie der algebraischen Gleichungen. Von Dr. Jul. Petersen. xii. and 335 pp. (Kopenhagen, 1878.)

THE author tells us that this work owes its origin to the lectures he has given on the theory of equations at the Copenhagen Polytechnic School. In the preparation of it he has made use of J. A. Serrêt's "Cours d' Algèbre Supérieure," Todhunter's "Theory of Equations," and Jordan's "Traité des Substitutions." The first section treats of equations in general; Cap. I. general properties of algebraic equations ; Cap. II. relations between the coefficients and roots; Cap. III. on elimination, describing the methods of Labatie, of Euler, of Sylvester, of Bezout, and of Poisson ; Cap. IV. the transformation of equations. The second section is devoted to the algebraic solution of equations, viz., of the cubic (the methods of Hudde, Lagrange, Tschirnhausen, and Euler); of the biquadratic (the methods of Lagrange, Descartes, and others); the binomial equation, the Quintic, the breaking-up of a rational polynomial into rational factors, Abelian equations (a long chapter, including the division of a circumference into seventeen equal parts, and the reduction of the equation $x^{13} = 1$).

The third section is on the Numerical Solution of Equations: Cap. I., on the Separation of Roots (Descartes', Budan's, Rolle's, Sturm's, and Newton's theorems); Cap. II., the Calculation of the Roots in Numerical Equations (interpolation, of Newton's Method of approximation, also Lagrange's and Horner's methods). The fourth part, which treats of Substitution in four chapters : Cap. I. Substitution in General ; Cap. II. (a long chapter, including the theorems of Lagrange and Cauchy, alternate, transitive, and intransitive groups, linear substitutions, &c.); Cap. III. Galois' Theory (this has not found its way into English text-books ; Prof. H. J. S. Smith classes Galois, for early precocity, with Pascal and Gauss); Cap. IV. Applications of Galois' Theory (Abelian equations, the Galois and the Hessian equations).

This bare enumeration of the principal articles will show that this carefully-written treatise takes up some ground which has not yet been opened out or even alluded to in our common text-books on equations.

The Botany of Three Historical Records, Pharaoh's Dream, The Sower, and the King's Measure. By A. Stephen Wilson. (Edinburgh : David Douglas, 1878.)

THIS is a curious little book, the author's aim being to throw what light he can, either by comparison or suggestion, upon the probability of the plants referred to in these Scripture records being this or that species of cereal. Mr. Wilson seems to have given a good deal of consideration to each of the above questions, which, as he says in his preface, have only one bond of connection between them, namely, "a common basis in the botany of the cereal grasses." Notwithstanding the pains the author has evidently given to each of the subjects, we cannot but think that it will prove of but little value, the points advanced being by no means conclusive, and even the subjects in themselves being of small importance. It may be of some value to know whether the cereals "stand in the same alimentary relationship to mankind as they did when Joseph laid up the surplus of the plenteous years in the granaries of Egypt," because such a knowledge, if it could be proved, would show the progress made in developing the productive resources of these grasses, but whether the plant in Pharaoh's dream was *Triticum compositum*, or any other species of *Triticum*, is perhaps of little moment to mankind at the present time. As an illustraiton of what is to our mind mere speculation, we quote the following from p. 6 :—" The wheats of 'Minnith,' in the

Belka (Ezek. xxvii.) grown by the farmers of Judah and Israel, seem to have been in demand in the corn-market of Tyre. Probably Minnith was a remarkably good locality for wheat, so that when the husbandman in other districts got seed from this place they called it Minnith wheat."

The author's summing-up of this his first "Historical Record," namely, that "seven ears of corn came up upon one stalk," is that it "may be wrong, and probably is wrong, whereas the reading here proposed, that seven ears of corn came up upon one *stock*, while probably expressing the full meaning, can only err by defect, and must necessarily be right, as embracing an essential morphological fact common to all varieties of corn."

The Commercial Products of the Sea; or, Marine Contributions to Food, Industry, and Art. By P. L. Simmonds. With thirty-two illustrations. (London : Griffith and Farran, 1879.)

THIS is the first example this year we have had of a work antedated, in this case by more than two months. We cannot possibly see what is gained by this ; is it meant to make readers of future years believe that a work was published a year later than it really was ? If this is so, is it quite honest and respectable—to put it in the mildest possible form ? When one gets over Mr. Simmond's extraordinary and often misleading style (for which we commit him to the tender mercies of the literary Dr. Birch), it is found that his work contains a great mass of useful and curious information, showing great diligence in the collection of facts, if not much skill in putting them together. Mr. Simmonds' work is divided into three parts, dealing with food-products obtained from the sea, marine contributions to industry, and marine contributions to art. Detailed accounts and statistics are given of the various fisheries of the world, under the first head ; under the second head the sponge fisheries are dealt with, oils, isinglass, shells, seaweed, marine salt, and other products ; and under part iii. tortoise-shell, mother-of-pearl, coral, and amber. It will thus be seen that the work has a wide range ; it shows how much has been done, and how much yet remains to be done by science, to make the most of the products with which the waters swarm. Altogether the work contains much useful and intcresting information in a handy form.

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. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

A Question raised by the observed Absence of an Atmosphere in the Moon

IT is known that there is physical evidence of an absence of atmosphere in the moon. It would appear reasonable to conclude that the moon at one time had an atmosphere ; for, according to the generally-accepted principles of Laplace, which make the sun and members of the solar system to have a common nebulous origin, it would seem very extraordinary if the particular offshoot of the common nebula which formed the moon had no gaseous constituent in it. If we admit, therefore, as probable that the moon at one time had an atmosphere, the question naturally suggests itself as to what has become of it. Various surmises have been hazarded in reply to this. I would venture to submit the following as a possible explanation, which, as far as it goes, is based on accepted principles :—It is known to be a demonstrated fact in connection with the established kinetic theory of gases that the velocities of the molecules of a gas vary among themselves from zero to an *indefinitely* great