

upon the reader, while the other parts are without interest to those to whom the argument might appeal. It is difficult to imagine what class of readers the author intended to serve. Like most books written from the Continental point of view—*i. e.*, starting out with established conditions of forestry practice—much is unpalatable and of little import to the American reader. The title, division and treatment of the subject also are novel with the author, and not always fortunate. The term 'exploitation' does not, as in English, mean the mere rough utilization, but the very opposite, a regulated management. Under *exploitation technique* he discusses not only the methods of regulating the management of a forest for continuous revenue, but also silvi-cultural operations—*i. e.*, the methods of securing the wood-crop—while under *exploitation commerciale* the methods of harvesting the crop are discussed, and the commercial considerations that enter into it either with or without reference to the future conditions of the property. From this little is to be learned for our practice. Yet it is interesting to note that evidently good forestry practice is not as general among private forest-owners in France as is usually supposed, for the author declares silvi-culture 'a new art,' primitive in its development, deficient in scientific basis and 'official'—*i. e.*, practiced mainly by the government officials in government forests. We agree with the author that forestry as a business commends itself mainly to rich people, to eternal persons like the state, and not to people who have the natural desire to increase their property by their labor. Forestry is, as the Germans term it, *kapital-intensiv*, and *arbeits-extensiv*—business, *i. e.*, relying to a large extent on capital, with small chance of increasing the earnings by intensive application of labor. Especially for timber purposes it requires large areas in one hand, a persistent system of management and a 'wholesale' organization. Small space and little light are given on the difficult and complex question of rotation (*principe de l'exploitabilité ou egoque de la récolte*)—*i. e.*, the length of time to which it is desirable to allow the crop to grow—when to cut the crop. This problem is *sui generis* in forestry, unknown to other industries, and as

the author very wisely points out, requires a different solution according to whether the state, with its long existence and providential functions, or a private owner is concerned. Since to a certain point 'the value of a tree grows at least as the cube of the diameter,' from the standpoint of the financier the harvest time would have arrived when this value is at a maximum, if other calculations, namely, interest on investment, cost of production, etc., to be charged with compound interest, did not vitiate this simple device. The author concludes that 'every harvest of old timber is economically or financially a bad operation' which contemplation leads to short rotations, hence the production of heavy timber is not for private enterprise, which thesis the author supports by examples. Most space is given to the consideration of the 'felling budget' (*offre raisonné*) in a sustained-yield management which the author calls with a new term '*possibilité en fertilité*'—*i. e.*, a management which only reaps the amount annually accumulating (*revenue*) if the soil is properly stocked with a wood capital (*valeur génératrice*).

We learn here to distinguish financially between two distinct values, which may attach to one and the same forest property, namely, the realizable (sale) value (*valeur de réalisation*) based upon what can be realized at once by a crude exploitation of the standing timber, and the investment value (*valeur de placement*) based upon what can be continuously realized from the property by a forest management, a distinction which will only gradually vanish, the author expects, when the old natural woods have vanished or the State has hold of them. The same expectations are in place in the United States, notwithstanding the sanguine assertions of enthusiasts.

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Technic of Mechanical Drafting. BY C. W. REINHARDT. (Pub. by Engineering News Co.)

Mechanical draftsmen and teachers of graphics may well add to their working libraries this volume, in which the chief draftsman of the *Engineering News* gives to the profession the 'wrinkles,' 'short cuts' and methods in

general which have approved themselves to him during his long experience. As the author frankly admits, this is not a complete work for beginners, as all theory of construction is omitted; but as an adjunct to existing textbooks it must prove of great service, being especially rich in examples of conventional representation and of line shading. Incidentally it shows also the remarkable adaptability of the author's system of lettering to reduction by photo-processes.

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BOOKS RECEIVED.

Elements of Mineralogy, Crystallography and Blowpipe Analysis. ALFRED J. MOSES and C. L. PARSONS. New York, D. Van Nostrand Company. 1900. Pp. vii + 409.

Elements of Physics for Use in High Schools. HENRY CREW. New York, The Macmillan Company. 1900. Second Edition Revised. Pp. xvi + 353. \$1.10.

Ethnology. MICHAEL HABERLANDT. Translated by J. H. LOEW, London, Dent. Pp. viii + 169.

SCIENTIFIC JOURNALS AND ARTICLES.

THE *American Journal of Physiology* for October contains a very interesting and suggestive article by D. J. Lingle on 'The Action of certain Ions on Ventricular Muscle.' Particular attention is paid to the rhythmic activity of heart tissue as an ion effect. Strips from the ventricle of the turtle's heart were placed in solutions of non-conductors, in solutions of sodium, of calcium, and of potassium, and in solutions of these salts combined. Lingle found that the non-conductors he used (cane sugar, dextrose, glycerine) did not occasion rhythmic beats in the heart strips. In the solution of sodium salts, however, the strips always beat rhythmically. If a strip is kept in the solution the beats reach a maximum and then gradually decline to a complete standstill. The stopping is apparently due to poisonous action of the sodium salt alone, for the rhythm is prolonged by diluting the solution in which the strip remains or by exposing the strip for a shorter interval to the action of the strong solution. When transferred to solutions of sodium salts, strips which have been quiescent

in non-conductors begin to beat as suddenly as if started by an electric shock. The application of calcium salts and the treatment of the tissue so that an excess of calcium salts remains in the tissue both fail to start rhythmic beats. Potassium salts are likewise ineffective. Moreover calcium and potassium in combination do not start beats, while sodium chloride always succeeds. These results have a remarkable similarity to the results obtained by Loeb on rhythmic contractions in striped muscle and the tissue of the swimming bell. According to Lingle, sodium and not calcium is the stimulus for rhythmic contraction in the heart; calcium and possibly potassium salts improve the rhythm by neutralizing the injurious action of pure sodium salt solutions. W. T. Porter and H. G. Beyer in a paper on 'The Relation of the Depressor Nerve to the Vasomotor Center' raise the question, Does the bulbar vasomotor center act as a physiological unit to lower or raise the general blood-pressure, or has it parts regulating the regional distribution of blood? This question they have endeavored to answer by investigating the depressor nerve, an afferent nerve regarded by Cyon and Ludwig as stimulating the bulbar vasomotor center to cause especial dilatation of abdominal blood vessels. First the depressor nerve was stimulated when the splanchnic nerves were prepared for experimentation but still intact. This caused a fall in blood-pressure usually from 35 to 40 per cent. Next the abdominal vessels were removed from vasomotor influence by cutting the splanchnic nerves. The blood-pressure which falls on cutting these nerves was restored to the normal level either by stimulating the peripheral ends of the cut nerves, or by intravenous injection of normal salt solution. Now, with the abdominal vessels free from vasomotor influence and the blood-pressure normal, the depressor nerves were again stimulated. The blood-pressure fell usually as much as it had previously fallen when the abdominal vessels were still connected with the bulb. From their results the investigators conclude that the depressor nerve has no special connection with cells controlling vasomotor fibers of the splanchnic nerves, and they express the opin-