

appear to fit all the cases equally well. To the reviewer, at least, a rather different "mental mechanism" would seem to fit the case histories better. In particular, the association between sex behavior and such other forms of misconduct as stealing and truancy is perhaps not so purely accidental and extraneous as the author assumes; for all of these forms of bad conduct typify for the child that life of "badness" which, perhaps because of its rebellion against authority and restraint, makes a certain appeal even to the "good" child. That is to say that the child does not resort to stealing as an outlet for dammed-up energy primarily directed towards sex behavior, but that, being incited to "badness" in several directions, and responding in some measure to the incitation, he follows the line that he is able to understand and follow with some success, leaving aside what he is not ripe for, though perhaps being mystified and obsessed by this latter.

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*Telephone Apparatus.* By GEORGE D. SHEPARDSON, Professor of Electrical Engineering, University of Minnesota. D. Appleton & Co. 1917. 337 pages, 115 illustrations.

Considering the marvelous rapidity of growth of telephony and the extent to which the telephone permeates the daily life of the modern business man, especially in America, where there is an average of one telephone to each ten persons, it is surprising how little is generally known concerning the history, construction or mode of operation of that wonderful device. This book presents an introduction to the development and theory of telephony for the educated classes of the public in general, and particularly for those engaged in telephonic operation or manufacture.

The book contains sixteen chapters, relating respectively to the following subjects: Introduction, Sound, Speech sounds, Telephone receivers, Telephone-receiver investigations, Telephone transmitters, Telephone-transmitter investigations, Signaling devices, Design of non-polarized signaling apparatus, Perma-

nent magnets and polarized apparatus, Design of polarized apparatus, Electromotive forces and currents, Principles of induction coils, Uses of induction coils in telephony, Condensers in telephony, Protective devices. The treatment is directly descriptive, abundantly illustrated by pictures and diagrams of the apparatus. The mathematical analysis is nearly all collected into the appendices at the end of the book, so that a non-mathematical reader can peruse all the chapters with very few interruptions.

The book deals mainly with telephonic apparatus, and the principles underlying its operation. Circuit arrangements are given relatively minor consideration, and radio-telephony is not included. A good set of indexes at the end of the volume greatly assists the reader.

A noteworthy feature of the book is the large number of collateral references indicated in footnotes throughout the text. The collection and collation of so much historical and technical material represents a large amount of labor. The insertion of this subordinate material makes the work of great value as a reference book to telephonists and students of telephony. Probably no other text-book on telephony in the English language contains such a wealth of electro-technical reference material. \* A. E. K.

## SPECIAL ARTICLES

### ANESTHESIA AND RESPIRATION<sup>1</sup>

THERE is much uncertainty as to the effect of anesthetics upon respiration. Some writers hold that anesthetics decrease respiration while others take the opposite view.<sup>2</sup> To clear up this confusion appears to be a necessary step toward a satisfactory theory of anesthesia.

<sup>1</sup> Preliminary communication.

<sup>2</sup> Cf. Höber, R., "Physik. Chem. der Zelle und der Gewebe," Ch. 8 und 9, 1914. Czapek, F., *Biochem. der Pflanzen*, Vol. I., S. 195 ff., 1913. Ewart, A. J., *Annals of Bot.*, 12: 415, 1898. Tashiro, S. and Adams, H. S., *Amer. Jour. of Physiol.*, 33 xxxviii, 1914. Appleman, C. O., *Amer. Jour. of Bot.*, Vol. 3, No. 5, May, 1916.