tory and discusses the applications of psychology to science and art. He indicates the line of demarcation between psychology and the human sciences as follows: The understanding of mental operations is valuable in the study of history, sociology, etc., but the interpretation of the subject-matter in each case belongs to the special science and not to psychology. In his closing chapters the author considers the applications of psychological data and methods to education, law, economics, medicine and culture. To this applied field he gives the name psychotechnics. These chapters offer a most interesting presentation of the recent progress in applied psychology, a line of development which seems likely to bring about a closer connection between psychology and the professions.

Whether or not the reader agrees with Professor Münsterberg's fundamental positions, he will find the present work most stimulating and suggestive.

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Design of Polyphase Generators and Motors. By HENRY M. HOBART. McGraw-Hill Book Company.

In "Design of Polyphase Generators and Motors," Mr. Hobart takes up the design of a simple three-phase generator and an induction motor from the standpoint of a designing engineer. This occupies the major portion of the book, but there are in addition two chapters devoted to a comparison of synchronous motors and induction motors and to the induction generator. Much useful information and many valuable tables compiled from empirical data obtained from existing machines are included.

The book follows the plan, outlined by the author in its preface, of taking up immediately without any preliminary discussion the design of a three-phase generator of definite rating, introducing the principles involved when required as the design progresses. In addition to the design of a three-phase generator, the design of a polyphase induction motor is also considered. The book should be valuable to the young designer who has a fair knowledge of the principles underlying operation and design of electrical machinery.

It is to be regretted that a portion of the book is not devoted to a simple analytical study of the effect on the operating characteristics of machines of modifying their dimensions and windings in order that the young designer might learn to analyze existing designs and to be able to judge the fitness of any particular design for a definite class of service.

Two appendices give a full bibliography of the papers dealing with polyphase generators and motors which have been printed in the *Proceedings* of the American Institute of Electrical Engineers and in the *Journal* of the British Institute of Electrical Engineers.

RALPH R. LAWRENCE

Synchronous Motors and Converters. By ANDRÉ BLONDEL. Translated from the French by C. O. MAILLOUX. McGraw Hill Book Co. 1913.

"Synchronous Motors and Converters" is a translation of the admirable little book by André Blondel entitled "Moteurs Synchrone à Currents Alternatifs." Several chapters have been added to the translation in order to increase the scope of the book and to bring it up to date. The translation is divided into three parts. Part I. is a translation of the original book with one chapter added by Professor C. A. Adams, of Harvard University. Part II. relates to Rotary Converters and is made of new material by Professor Blondel and a translation of papers presented by him at the Paris Congress in 1900. Professor Adams has also added a chapter to this section relating to the split-pole converter. Part III. contains reprints of papers presented by Professor Blondel at the St. Louis Electrical Congress in 1904, relating to his "two reaction" method of treating the armature reaction of alternators.

The first part of the book takes up the general principles of synchronous motors and a study of their operation under different conditions, and is particularly valuable in giving the development of well-known Blondel bi-

polar circle diagram. In translating Professor Blondel's "Moteurs Synchrone," Mr. Mailloux has rendered a valuable service to English-speaking electrical engineers.

Ralph R. Lawrence

Storage Batteries. By Harry W. Morse. New York, The Macmillan Company. 1912.

This little book of 263 pages on storage batteries is based upon lectures given by Professor Morse at Harvard University. It deals only with the theory and the characteristics of storage batteries. No attempt is made to discuss problems connected with storage-battery engineering. The first chapters are devoted to the laws underlying the action of storage cells and to the consideration of the fundamental reactions. A short discussion of the ionic theory and the energy relations involved in the action of a storage cell is included. Later chapters are given up to the operating characteristics, efficiency and capacity, and to the general principles underlying the methods of forming modern storage battery plates. The diseases and care of storage batteries are also discussed. In the last chapter a few pages are devoted to the iron-nickel-alkali cell. "Storage Batteries" is an excellent little book for any one who wishes a simple treatment of the theory, action and care of lead-lead-peroxide storage batteries.

Ralph R. Lawrence

SPECIAL ARTICLES

CORRELATION BETWEEN EGG-LAYING ACTIVITY AND YELLOW PIGMENT IN THE DOMESTIC FOWL[1]

In the Leghorns and the so-called American breeds, such as the Plymouth Rocks, yellow, in the form of yellow fat,[2] is present in varying amounts in the legs and beak. In these breeds, individual birds may undergo considerable change in the amount of the yellow pigment visible. The paling or yellowing of the legs has been attributed by poultrymen to various environmental factors. Of recent years, some individual poultrymen, however, have claimed that paling of the legs is due to heavy laying.[3] The requirements of the "Standard of Perfection," which controls judges in the show room, as well as the common practise of poultry breeders, are opposed to a belief in any connection between laying and leg color. Woods[4] under the title, "Has Leg Color Value Indicating Layers?" in the most recent discussion of the subject, concludes:

> Personally we believe that, as a practical guide in the selection of heavy layers, . . . the leg color of itself has no real value.

So far as the writers are aware, no published data are available which show in how far the leg color may be of any value in selecting the laying hen, and such suggestions as have been made in this connection have confined themselves almost entirely to a consideration of the legs alone. The results tabulated in the present paper show conclusively, it is believed, that a close connection does in fact exist between the yellow pigmentation in a hen and her previous egg-laying activity, and that, in Leghorns, the color of the ear-lobes is perhaps a better criterion of laying activity than either legs or beak and is more readily recorded.

The hens investigated were in the egg-laying contest at Storrs, Conn., and were handled essentially alike. The influence of environmental factors, therefore, can be largely neglected. The amount of yellow was measured by means of the Milton Bradley color top, which, when spinning, acts as a color mixer. The top readings were taken of the White Leghorns listed in Tables I. and II. at three different periods in October.

In Table I., the records at the three different readings have been used. A bird laying on the day of record, or on a later day within the month is considered to be laying and credited

[1] Paper presented before the American Society of Naturalists, Philadelphia, December 31, 1914.

[2] Barrows, H. R., "Histological Basis of Shank Colors in Domestic Fowl," Bull. 232, Maine Agric. Exper. Station, 1914.

[3] Rice, J. E., Circular 11, p. 42, N. Y. State Dept. of Agriculture, 1910; Barron, Tom, *Connecticut Farmer,* September 12, 1914; Circular 499, Maine Agric. Exper. Station. This is listed as an abstract of Bull. 232.

[4] Woods, P. T., *Amer. Poultry Jour.,* p. 35, January, 1915.