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.