autistic thinking to making it worth while to live."

Pages 71 to 113 are devoted to Symbolic Association, in a chapter showing a remarkably wide range of resources of reading, and leading from the symbolisms of language and of normal waking life to those of dreams.

The discussion of emotion is given the title "The continuity of emotion," and deals with "affective displacement" (a somewhat questionable term for affective diffusion and disproportions) and affective compensation. The more specific types of "affective displacement" are exemplified by a number of "unaccountable" dislikes and in the use of contrast and exaggeration in humor. "Loaded" experiences and transference are reduced to the principle that emotions are to be viewed as reactions, which are switched in and out according to the principle of associated reflex and conditioned and associated responses. The switching off of the affect is spoken of as a de-emotionalizing and siphoning process. The rôle of various complexes and affective symbolism is illustrated by many examples. The phrase "Objekt vergeht, Affect besteht" expresses the meaning of the title of the chapter.

The discussion of "Types of Dissociation" is more clearly systematic than most of the rest of the book and is a valuable survey for the student, although perhaps somewhat heavily loaded with varieties and subvarieties for those readers who have but little concrete experience, and who might have a desire for principles rather than for details. Chapter VI. (pp. 204–226) takes up the dynamic importance of factors which determine repressions and its various degrees. Chapter VII. takes us into the field of available experimental approaches, with a discussion of various types of intelligence tests, the association method, and those involving what is called measurements by relative position (the "better or worse"), free association, the schedule of personality study; and a final chapter dealing with "Balancing Factors" gives a valuation of various trends for life and the quest of happiness and application to education.

It is, I suppose, both a merit and a drawback of the book that it resists a brief summarizing survey. Clearness of principles and the ease of reading might readily gain by moderation in the amount of illustration and in the use of metaphors, or, since most of these are really well chosen, by paragraphs of orientation. The few paragraphs of this character certainly do much to make one more receptive.

Wells puts forth as his aim not to tell us things, but to enable us to see for ourselves what we would otherwise miss. He does, in fact, tell us so many things that one feels very much the importance of what he himself calls "strategic regrouping," of the author's treasure of reading and of observation. Every reader of the replete volume must be willing to do his share; those who do so will certainly find a rich material and ample work. How readily the book would lead one not already experienced in the field will have to be tried out. The reviewer can not help feeling that medical responsibilities with the cases and the material might have added a kind of practical simplicity and directness where the reader might be apt to lose himself in the detail. Wells does, however, make it clear that the normal and the abnormal are made of much the same material, and his book, with its softened rendering of Freudian conceptions, will be a stimulus and a help along sane and useful lines.

Adolf Meyer

The Combination of Observations. By David Brunt, M.A. (Cantab.), B.Sc. (Wales), Lecturer in Mathematics at the Monmouthshire Training College, Cærleon, Mon. Cambridge University Press. 1917. Pp. x + 219.

This book gives an elementary treatment of the methods of adjusting observations. The normal or Gaussian law of error is derived from Hagan's hypotheses regarding the nature of errors, and the presentation in this connection is very attractive. The book gives a brief and simple treatment of certain important parts of the theory of statistics. This includes Pearson's generalized frequency curves first published in the *Philosophical Transactions* of

the Royal Society, 186 A, p. 343. These curves include six types besides the normal curve, but the book makes no reference to the five additional types of curves recently published by Pearson.[1] The book presents a treatment of the correlation of two systems of variates. The treatment is, in general, clear, and should serve a useful purpose in making better known to persons who are applying these methods to data the nature of some of the limitations that underlie the interpretations of correlation coefficients. However, the reviewer has one criticism to offer. On p. 155, using r for the correlation coefficient, we are told that "it seems doubtful whether any serious meaning can be attached to values of r which are less than .5." It seems to the reviewer that this statement should be modified. To be sure, the statement would hold if the correlation coefficient r were calculated from such a small number of observations that the probable error of r is not particularly small compared to r. But when the conditions under which the formula for probable error of r is derived are well satisfied, r may be much smaller than 0.5 and have decided significance if derived from large enough number of observations to make its probable error small in comparison to the value of r.

A useful chapter is devoted to harmonic analysis from the standpoint of least squares, including an interesting section on a practical method of investigating periodicities. The last chapter deals with the periodogram, including a treatment of hidden periodicities.

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SPECIAL ARTICLES

THE PRODUCTION OF GASEOUS IONS AND THEIR RECOMBINATION

GASEOUS ionization has played a large part in recent advances in both physics and chemistry. In the ordinary college- and high-school courses given in these subjects little, if any, attempt is made, however, to demonstrate methods of producing gaseous ions or of measuring their recombination or diffusion constants. Practically no laboratory work along these lines by elementary students is attempted. This may be explained in part by the fact that most investigators in this field of research have made use of the electrometer, an instrument well adapted for demonstration purposes but inappropriate for use by the inexperienced student. An electroscope of very simple design has, however, proved entirely satisfactory in place of the more cumbersome and possibly less sensitive electrometer.

Some elementary experiments are suggested in the first part of this paper using apparatus involving little or no expense and which may be assembled by any high-school student. This is followed by a description of some results obtained in verification of the law governing the recombination of the ions of a gas.

PART I

The type of electroscope used is shown in Fig. 1.

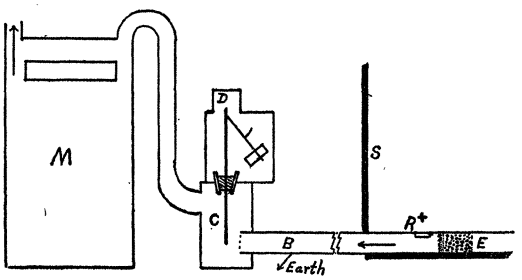

FIG. 1.

A brass rod passes through a sulphur plug into the hollow cylindrical chamber (C) 12 cm. high and of 4 cm. radius. On this rod is mounted a flat brass strip which supports the gold leaf. The top of this mounting projects through a large opening in the square metal box surrounding the gold leaf to permit the electroscope to be charged by removing the metal cap (D). (B) is a brass tube approximately 2 meters long the radius of which will depend upon the laboratory facilities for providing a suitable current of gas. If air ionization is to be studied and compressed air is not available, a suction pump attached to a water faucet will provide a convenient velocity for carrying ionized air through (B) if its radius is of approximately 3 cm. diameter.

[1] *Phil. Trans.*, 216 A, p. 429.