

spark is formed across the gap and the charge is thus conducted to earth. As now the electromotive force required to maintain an arc is much less than that required to start it across a gap, the arc is maintained by the ordinary voltage of the system, and has to be put out by some other means. Upon the methods adopted to do this Dr. Benischke bases his classification of the various arrestors as follows:—(1) An arc is not allowed to form by reason of the dividing up and cooling of the spark; (2) arc broken mechanically; (3) arc broken by a magnetic blow out; (4) arc broken by its own magnetic and thermal action; and (5) arrangements containing a large resistance in the earth connection.

This classification is all very well, but in our opinion does not give one a proper standpoint from which to judge of the value of the protection afforded.

Recent investigations have shown that the formation of an arc in the circuit of an underground cable is, in certain circumstances, attended with very grave danger. An arc in such a circuit, between horns, as, e.g., in the Siemens or the Allgemeine Elektrizitäts Gesellschaft's arrestors, whether it is blown out by a magnet or by its own action on itself or other means, is very liable to produce those very rises in potential which it is the object of the arrestors to obviate. This very important consideration is not mentioned by the author. That, however, it is true is borne out by the fact that, in many English alternating-current high-tension stations, originally fitted up with spark-gap arrestors, their use has been attended with such bad results that they have been given up. Even if such so-called arrestors are scientifically good, it is very questionable if they can be made of practical service for high-tension systems by reason of their inherent want of sensitiveness. In support of this contention it may be mentioned that on p. 32 the author gives as an example of great sensitiveness the adjustment of the gap so that it will go across at double the working voltage. We are very certain, however, that there are very few high-tension underground cable systems which have such a large factor of safety. In, for example, a 5000- or 6000-volt system which has been running for some time, a rise of but 2000 or 3000 volts above the working pressure is generally sufficient to break the insulation down somewhere. In purely overhead lines the case is somewhat different, as it is very much easier here to make the insulation with a much larger safety factor.

In our opinion the proper arrestor for high-potential lines has yet to be designed. It must be so adaptable to the circuit on which it is placed that by its action no danger of rises of potential due to it can occur. By proper adjustment of its dimensions to the electrical constants of the circuit this can, perhaps, be arranged.

The arrestors classified by the author under No. 5 are, in our opinion, the most hopeful. In places like South Africa, where static charges are of constant occurrence, this form is the only one that has given any good result, on, of course, low-tension circuits. Their development for high tension is, however, a thing of the future, and has to cope with many difficulties, some of which are indicated in the book by the author.

Dr. Benischke's book is to be welcomed as a valuable contribution to a subject to which as yet so little attention has been paid.

C. C. G.

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#### OUR BOOK SHELF.

*Catalogue of Scientific Papers (1800-1883), Supplementary Volume.* Compiled by the Royal Society of London. Vol. xii. Pp. xxxii + 807. (London: C. J. Clay and Sons, 1902.)

THE readers of NATURE must be so familiar with the "Royal Society Catalogue" that it is needless to give any description of it; suffice it to say that when the work for the decade 1874-1883, printed in vols. ix. to xi., was in progress, it was found that a considerable number of periodicals had been omitted, many of which contained valuable papers. As stated in the preface to vol. ix., the President and Council contemplated the publication of a supplementary volume which should contain the most important papers that appeared between 1800 and 1883 in periodicals not hitherto catalogued.

A preliminary list of the omitted serials was made, and after a careful sifting it was found that 355 remained to be dealt with, the titles and abbreviations of which occupy twenty-six pages of the volume. These were catalogued in the same way as the previous portion of the work, but when the matter was prepared for the press it was evident that the amount to be printed was much greater than had been anticipated; the committee therefore decided that references to abstracts of papers that had appeared in previous volumes should be excluded, that all references to abstracts should be excluded except in the cases of papers in some other language than English, French, German, Italian or Latin, abstracts of which had been published in one of these languages, and in such a case reference was to be made to only one abstract. The effect of this curtailment was to reduce the work to about 800 pages.

The papers of each author are numbered as in the previous volumes; it must be noticed, however, that these numbers no longer represent the chronological order of publication.

Great care has been taken to ensure accuracy in the references, and many corrections of errors discovered in previous volumes have been made. Much credit is due to Miss Chambers and Miss Bremner and the ladies working under them, and also to the late Mr. George Griffith, who acted as editor.

*The Early Life of the Young Cuckoo.* By W. P. Westell. Pp. 26; illustrated. (London: Burleigh, 1902.) Price 1s. net.

IN this little volume the author gives an account of the observations made by Mr. J. Craig, of Ayrshire, during the summer of 1899, as to the manner in which young cuckoos eject the other occupants of the nest in which they happen to have been hatched. Two of the photographs illustrating the work have appeared previously in the *Amateur Photographer* of November 28, 1901, in connection with a lecture by Mr. J. P. Millar; and it would perhaps have been better if the author had definitely informed his readers of this fact instead of merely stating that Mr. Craig's "photographs and observations have by this time been heard of throughout the ornithological world."

Since Mr. Craig's observations have not been previously referred to in NATURE, they may be briefly noticed on the present occasion. At the commencement of June, 1899, Mr. Craig found a titlark's or meadow-pipit's nest containing five eggs, two of which were those of cuckoos. One of the titlark's eggs was broken in order to ascertain how long it had been brooded. In due course two young cuckoos were hatched out, one of the titlark's eggs being by this time broken and the other missing. One cuckoo soon succeeded in ejecting its fellow by carrying it on its back to the edge of the nest and tilting it over in the manner shown in the illustrations. The same process