self-extinguishing power of electric arcs produced between certain metals which are good conductors, such as aluminium and copper. If a pile of plates of these metals with very small air-gaps is built up, and a high electromotive force applied to it, discharges will take place, or small arcs which, when the discharger is shunted by a condenser, can generate high-frequency oscillations. By the aid of these appliances, their inventors and other workers have conducted wireless telephony up to a distance of 1000 kilometres, or, say, five hundred or six hundred miles.

Thus, Dr. J. Vanni, working at Rome, and using a Moretti arc generator, his own liquid microphone, and a form of Fleming oscillation valve as a receiver, has transmitted and received articulate speech between Rome and the Island of Ponza (120 km.), to Maddalena (260 km.), to Palermo (420 km.), to Vittoria (600 km.), and finally between Rome and Tripoli, a distance of 1000 km.

The speech is said to have been clear and singularly free from evidence of distortion of wave form. In addition to this, successful experiments in wireless telephony are said to have been conducted between Berlin and Vienna, a distance of 375 miles, by the Telefunken Company. The stations were the German high-power station at Nauen, to the west of Potsdam, and a receiving station on the roof of the Technological and Industrial Museum at Vienna. The experiments were so promising that it is expected much greater distances can be covered. A very inviting field of work seems to be opening out in connection with the alternator method of generation. With a suitably designed Goldschmidt high-frequency alternation it is said that a small variation in the exciting current will produce very large variations in the amplitude of the radiated waves. Hence the microphone can be placed in the excitation circuit, and need only have a current-passing capacity of a few amperes to be able to modulate a radiation representing a very large horse-power. To transmit articulate speech across the Atlantic will necessitate the power of varying the amplitude of continuous wave radiation representing at least 50 or 100 horse-power. This must be done by means of some microphone which passes not more than, say, 10 amperes. These conditions are not impossible of attainment. Hence Transatlantic wireless telephony may be said to be within the range of practical politics, whilst no improvements yet made in submarine telephonic cables hold out hope of being able within any reasonable time to speak through an Atlantic cable.

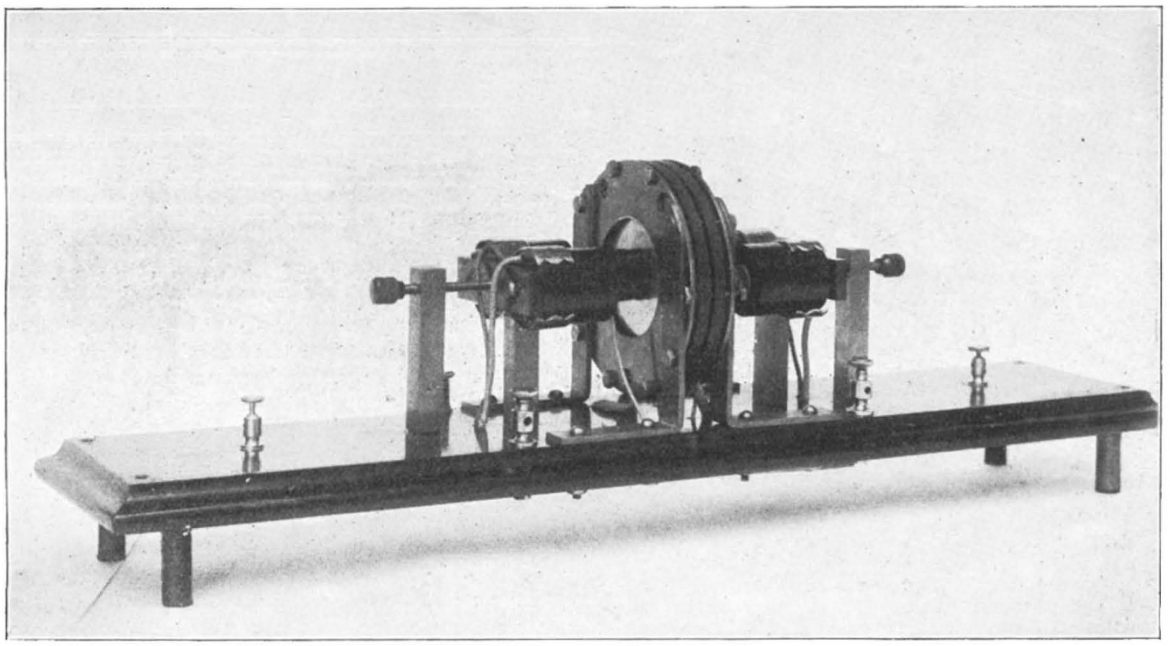


FIG. 3.—Dubilier water-cooled large current microphone.

The subject of wireless telephony is, therefore, one which holds out much promise for future achievement, and it is not surprising that it is attracting the attention of some of the leading workers in radiotelegraphy. J. A. FLEMING.

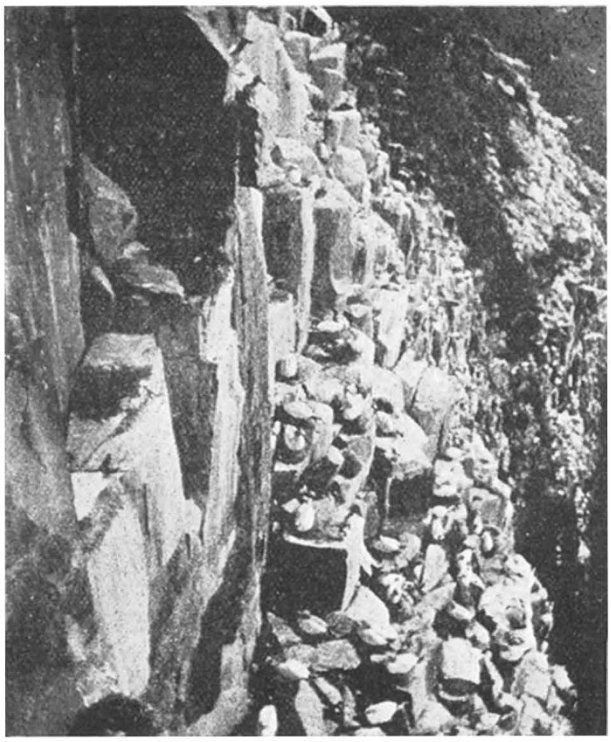
A BIRD WITH A HISTORY.[1]

A WELL-KNOWN ornithologist here gives us the fruits of many years of careful study devoted to a single species. His study has been diverse: at times it has lain among etymological dictionaries and curious old works on natural history, at times among the publications of

[1] "The Gannet: A Bird with a History." By J. H. Gurney. Pp. li+567+plates. (London: Witherby and Co., 1913.) Price 27*s.* 6*d.* net.

modern scientific societies and technical anatomical descriptions, and again in the open air on those rocky islets where the birds congregate in their thousands during the months of the long nesting season.

It is not every bird that deserves to be made the subject of a handsome and expensive monograph, but the gannet, as our author shows, makes more than ordinary claims on the interest and attention of the naturalist. And it is only just that a British naturalist should be the historian in this case, for of the fifteen breeding localities of the gannet, no fewer than nine lie off the coasts of our islands. Moreover, of the estimated total gannet population of 101,000



Gannets on the Bass Rock. From "The Gannet: a Bird with a History."

birds (exclusive of nestlings), 75,000 are allotted to these nine haunts. The British colonies are Lundy Island (recently abandoned); Grasholm, off Pembrokeshire; the Little Skellig and the Bull Rock, off the south-west of Ireland; Ailsa Craig, in the Firth of Clyde; St. Kilda (three colonies); Sulisgeir, to the north of the Lewis; the Stack of Sule Skerry, to the west of Orkney; and the Bass Rock. In the Færöes there is a colony on Myggenæs, while off Iceland there are colonies in the Vestmann Islands and the Eldey group, and a very small one on Grimsey, which is on the north coast, and lies within the Arctic Circle. Across the Atlantic there are colonies on Bonaventure and the Bird Rocks, in the estuary of the St. Lawrence; while there, as here, former sites, long since abandoned, are also known.

Mr. Gurney points out that these colonies, without exception, are on rocky islands, and that no mainland site, past or present, is anywhere known. Furthermore, the great majority of those on this side of the Atlantic lie off westerly coasts; the Bass Rock is, indeed, the only British exception. Apart from these points, there is an interest even in the purely statistical side of the careful census, which Mr. Gurney has been able to make. There are few species the numbers of which can be estimated even approximately, and the figures given in this volume should form an interesting basis for comparison in the future.

The book opens with a discussion of the various vernacular and scientific names which the species has received: both "gannet" and "solan" are dealt with at length. Then come many interesting pages quoting historical references to the gannet, illustrated by quaint figures taken from the works of the early naturalists. The species is justly called "A Bird with a History."

Mr. Gurney devotes a chapter to each of the important colonies, and shows personal familiarity with them in many cases, and an exhaustive knowledge of their literature in all. History is then left for a discussion of the general habits of the gannet, its nidification and incubation, the growth of its nestling, its food and its manner of fishing, its powers of diving and its seasonal movements, and many another question. Nor is its relation to man neglected — its effect on fisheries and its use as food. Finally, the plumage, osteology, and general anatomy are discussed, and appendices are added dealing with its allies, its parasites, its fossil remains, and the like.

We may note the omission from the bibliography of Mr. Kirkman's recent important contribution ("The British Bird Book") to the study of the gannet's habits, but Mr. Gurney has missed little that throws light on the interesting bird which he has made the object of enthusiastic and fruitful study. Many useful maps and beautiful photographs are scattered throughout the work.

A. L. T.

DR. G. J. BURCH, F.R.S.

FEW men of science have had such a varied career as Dr. George James Burch, whose death we announced with regret last week. Born in 1852, he went in 1873 to Cheshunt College to study for the Nonconformist ministry, and in due course became a minister first at Leeds, and later at Oxford. But at Oxford his duties became to some extent uncongenial to him, and this fact, coupled with a very bad breakdown in health, induced him to give up his pastorate, and take up the study of science for which he always had a natural inclination. He was hampered by pecuniary difficulties which would have deterred most men from such a course, and only by the most heroic struggles could he and his newly-