

lectures on terrestrial magnetism at the Johns Hopkins University a month or so previously."

Because Prof. R. Gans had used the same word quite early, I wrote to him to ask his aid in locating its earliest occurrence. He replied to me from Argentina, saying:—"Auch mich interessirt es zu wissen wer das Wort 'Magneton' zum ersten Male gebraucht hat. Ich selbst habe wohl das Wort zuerst in der von Ihnen erwachten Arbeit in den *Göttinger Nachrichten*, 1910, verwendet. Die Arbeit von Bauer, den Sie zitieren, kenne ich nicht." The article referred to by Prof. Gans in *Göttinger Nachrichten*, 1910, p. 200, was presented at the session of May 28, 1910, by C. Runge. In the course of the discussion we find this: "Die Lage jedes Molekularmagnetens, oder wie wir kuerzer sagen wollen, jeden Magnetons. . ."

Since Prof. Pierre Weiss conferred on the word under investigation the quantitative meaning which it seems likely to retain, I turned to him also for assistance. He wrote me in reply:—"J'ai imaginé le nom de 'magnéton' à la suite de mes recherches expérimentales. L'analogie avec l'électron s'imposait. J'ai eu connaissance plus tard que M. Gans avait fait usage antérieurement du même terme dans un sens différent. Il me semble que, dans ce sens, l'expression de molécule magnétique convient tout aussi bien. Je n'avais pas connaissance jusqu'à présent de l'emploi fait de ce terme par M. L. A. Bauer et je vous remercie du renseignement."

In the *Comptes rendus* of the Paris Academy of Sciences, vol. cli., p. 189, session of January 23, 1911, occurs the first use of the word by the Zurich physicist in an article called "Sur la rationalité des rapports des moments magnétiques des atomes et un nouveau constituant universel de la matière." Near the close we come upon the following:—"Le nombre d'atomes dans l'atome-gramme est  $N=70 \times 10^{22}$  (Perrin). Le quotient  $m$ ;  $N=15.94 \times 10^{-22}$  est le moment de l'aimant élémentaire lui-même, correspondant à la partie aliquote des moments des atomes-grammes. Je l'appellerai magnéton. . . Le magnéton est donc un constituant universel de la matière."

It is surely interesting to note that three physicists in as many different countries independently introduced the word within a year. Priority appears to belong to Dr. Bauer.

As some uncertainty can be observed in the pronunciation of "magneton," I appealed to its sponsor, Dr. Bauer, for a decision. He replied: "I hesitate greatly desiring to appear competent to pass on the official pronunciation of the word 'magneton.' I prefer the accent on the second syllable, and giving the sound of *e* as in 'thee,' thus—magneeton. Still, I should not quarrel with anyone who wishes to put the accent on the first syllable and pronounce the *e* as in 'met.' Usage alone will decide." GEORGE F. STRADLING.

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#### An Optical Phenomenon.

A DESCRIPTION of the phenomenon mentioned by Capt. Cave in *NATURE* of October 18 will also be found in *NATURE*, vol. lxx., p. 107 (1904), and vol. lxxviii., pp. 255, 277, and 305 (1908). J. W. GILTAY.  
Delft, November 9.

#### THE NICKEL INDUSTRY.

THE complete report of the Royal Ontario Nickel Commission, of which a summary was published in March last, has recently been received in this country. It is a document of absorbing interest and exceptional importance. The commission was appointed on September 9, 1915, and asked to inquire into, and investigate and report

upon, the resources, industries, and capacities, both present and future, of the Province of Ontario in connection with nickel and its ores. Its reference also included an inquiry into the system of taxation by the province of its mines, minerals, and mineral industries. There were four commissioners, Messrs. Holloway, Miller, Young, and Gibson, representing metallurgy, geology, law, and administration respectively. They set to work at once and completed their labours in eighteen months—a remarkably short time considering what they did. Their report contains nearly 600 pages, and the appendix more than 200. It is a model of lucidity of exposition, and displays such a complete grasp of the subject in all its bearings and details, and such shrewdness of judgment in regard to its recommendations, that it will certainly rank as the most authoritative monograph on the nickel industry that has ever been published. The commissioners have rendered to Canada a service of remarkable value.

It appears that, so recently as 1900, as much as 65 per cent. of the world's market was supplied by nickel made from the New Caledonia ores, the balance being furnished by Canadian ores. New Caledonia, although discovered and named by Capt. Cook in 1774, was not claimed by any European country until 1854. In that year it is said that a French and a British frigate sailed simultaneously from Sydney (Australia) to take possession of it. The former was the first to find a way through the barrier reef and thus secured the island for France. The commissioners comment on the striking fact that "two countries so widely separated as are Ontario and New Caledonia, not only by distance, but in almost every other way, should alone be rivals, not merely in the production of nickel, but in that of cobalt as well."

For many years nickel from New Caledonia had an established world market. It was included in all British Government specifications where nickel was required. When the Mond Nickel Co., working on Sudbury ores, entered the field, it found an immensely strong prejudice both in Government departments and the trade against them, which was overcome only after elaborate and expensive trials and tests. Moreover, the New Caledonia nickel had for many years a tied market among the principal consumers in Europe, owing to the close business connections of the leading French producer—Le Nickel—with the great armament firms. This company has the financial backing of the Rothschilds and is the chief rival of the Canadian companies.

Since 1900 Ontario has forged ahead with its production. The world's output has increased sixfold since that time, and of this Ontario now furnishes about 80 per cent. The main factor in this change is the great difference in the size of the ore-bodies in the two countries. Whereas those of New Caledonia are reckoned in at most hundreds of thousands of tons, the Sudbury (Ontario) deposits are measured in millions. In spite of its apparently favourable position, how-

ever, the main questions which the commissioners had to answer were not easy. They were: (1) Are the nickel deposits of Ontario of such a character that this province can compete successfully as a nickel producer with any other country? (2) Can nickel be economically refined in Ontario? When they took up their work they were faced with the opinion of the companies interested that the answer to the latter question was in the negative. They also found that "for nearly fifteen years the whole of the great and highly profitable industry connected with the production of refined nickel from the vast deposits of nickel-copper ores in the Sudbury district has been divided between two powerful corporations. Both companies mine, smelt, and refine their own ore, and possess their own process of refining; both produce their refined metal product outside of Canada, and neither is a Canadian company. Other companies, British, American, and Canadian, some of them with excellent promise of success, have operated mines, erected plants, or have been otherwise engaged in the industry. *In no case has any of their undertakings been permanent or successful.*" They had also to reckon with the fact that there is no certainty that large profits can be made every year from the nickel industry. It is neither a necessity of life nor an article of universal consumption or use. Its uses may be classified under four headings: (1) as a component of alloys; (2) as a surface coating for other metals; (3) as a chemical or catalytic reagent; (4) as a pure metal. In the past the output has had to be curtailed at times.

In spite of these facts, the commissioners have had "no hesitation" in answering both the above questions in the affirmative. They say that the nickel deposits of Ontario are much more extensive and offer better facilities for the production of nickel at low cost than do those of any other country. Nickel-bearing ores occur in many parts of the world, but the great extent of the deposits in this province, their richness and uniformity of metal contents, and the success of the industry point strongly to the conclusion that Ontario nickel has little to fear from competition. They say also that any of the processes now in use for refining nickel could be successfully worked in Ontario, and conditions and facilities are at least as good in this province as in any other part of Canada. There is now an "assured prospect" of the erection in Ontario of two large plants for the refining of nickel—one by the International Nickel Co. of Canada at Port Colborne (Lake Erie), and the other by the British America Nickel Corporation, probably at Sudbury. The latter company, in which the British Government is a large shareholder, has been formed since the outbreak of the war. For special reasons the Mond Nickel Co. will continue to refine at Clydach, near Swansea. In its business the manufacture of copper sulphate is almost as important as that of nickel, and this is marketed chiefly at Mediterranean ports.

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### STUDIES IN INFANT AND CHILD MORTALITY.

IN view of the importance which must be ascribed at the present time to the saving of child life (see NATURE, October 26, p. 146), the Medical Research Committee has been well advised to institute an inquiry into the causes of death in infancy and childhood. The results of this inquiry have now been published in a series of essays,<sup>1</sup> which, it is pointed out in an introduction, have been written primarily with a view to the planning of future lines of research rather than for publication as finished reports.

An introductory historical note is contributed by Dr. Chalmers, in which he remarks that deliberate effort to conserve infant life can be said only to have begun with the recognition of the contrast which the movement in the death-rate of infants presents when compared with that of the general death-rate. Whereas the latter fell continuously and considerably during the fourth quarter of the last century, fluctuations of the infant-mortality rate remained fairly constant and without very marked indication of a corresponding decrease.

The first report, by Dr. Brend, deals with the relative importance of pre-natal and post-natal conditions as causes of infant mortality.<sup>2</sup> He concludes that under the term "infant mortality" we are classing together two radically different types of deaths, which are brought about by different causes and are governed by different influences. The first type consists of deaths due to developmental factors which vary but little in place, time, and class of the population, and appear to be caused by fundamental influences which we neither understand nor are able to control. The second type consists of deaths mainly due to respiratory diseases and enteritis caused by the influence of the post-natal environment—overcrowding, atmospheric pollution, etc.—and probably entirely preventable. These two types of death overlap somewhat in time, but the end of the first month after birth provides a fairly sharp line of division. Some three-quarters of the mortality during the first month represents a bedrock loss of life which we have hitherto failed to reduce and which is mainly due to developmental conditions, while mortality after the first month is part and parcel of the general mortality of childhood, due to the same causes and demanding for its reduction the same measures.

Dr. Brend suggests that it might be of advantage to divide "infant mortality" into "birth mortality," the deaths during the first month, and "mortality of early childhood," the deaths from the end of the first month to the end of the third year.

In the second report Dr. Findlay discusses the causes of infantile mortality. He brings out the importance of environment (housing, etc.) as a factor in causing the present high infantile mortality, and he urges the need for a more scientific

<sup>1</sup> "The Mortalities of Birth, Infancy, and Childhood." Medical Research Committee, Special Report Series, No. 10, October, 1917.

<sup>2</sup> In vital statistics the term "infant mortality" is used to denote the deaths of infants up to one year of age.