biology syllabus, and the other on the elementary science suggested by the School Certificate Investigators' Report as a compulsory subject at the School Certificate stage. This latter discussion will form the subject of a further report.

Visits were paid by various members to seventeen factories and Government scientific institutions in and around London. These included, among others, the Courtauld Institute of Biochemistry, the Paint Research Station, Government Laboratories, the Royal Observatory, the Royal Aircraft Establishment, and the Royal College of Surgeons. These, together with the exhibition of scientific textbooks and apparatus, made a very full programme. Twenty-three publishers and thirty-nine manufacturers and thirty-five members exhibited.

The next annual meeting will be at Oxford under the presidency of Dr. N. V. Sidgwick.　　F. W. T.

Annual Meeting of the Mathematical Association

THE annual meeting of the Mathematical Association was held at the Institute of Education, London, W.C.1, on January 4–5, under the presidency of Prof. G. N. Watson. Discussions on the place of mathematics in the new central schools, on the interesting and novel suggestion that in the teaching of elementary geometry, solid geometry should precede plane geometry, and on the place of differentials in the teaching of the calculus, showed that the Association has not forgotten its primary purpose, the improvement—if necessary, the reform—of the teaching of elementary mathematics.

Under the title "Scraps from some Mathematical Note-Books", Prof. Watson delivered a lucid and stimulating presidential address. It was based on the diary in which C. F. Gauss (1777–1855), one of the greatest mathematicians of all time, recorded many of his discoveries ; Gauss started keeping this diary at the age of nineteen, and it is remarkable that the majority of the hundred and fifty entries were made before 1801.

The first entry is the discovery of the possibility of a ruler and compass construction of the regular polygon of seventeen sides, a particular case of a more general problem to which Gauss himself gave a complete answer at a slightly later date. There are several entries referring to the quadratic reciprocity theorem ; another, prefaced by a triumphant "Eureka", is equivalent to the result that every integer of the form $8m + 3$ is expressible as the sum of three odd squares. Other entries mentioned by Prof. Watson deal with continued fractions, the zeros of a Bessel function, and a function which is connected with the famous zeta function of Riemann. In connexion with this last entry, Prof. Watson pointed out that in a copy of Schulze's logarithm tables inscribed "Gauss, 1791", Gauss has made a note which can readily be interpreted as a statement that the number of primes less than a large number x is approximately equal to $x/\log_e x$; this is the "prime number theorem", of which the first proofs were given by Hadamard and de la Vallée Poussin in 1896.

In addition to describing these striking results, Prof. Watson gave a brief account of the developments to which these results have led, concluding with a description of some remarkable numerical work connected with the prime number theorem which was carried out in 1933. His general aim was not only to honour Gauss but also to stress the importance to mathematicians of the dictum of N. H. Abel (1802–29) who, when asked how he had been able to accomplish so much in so short a time, replied : "By studying the masters, not the pupils".

Prof. E. H. Neville, professor of mathematics in the University of Reading, has been elected president of the Association for the forthcoming year.

Research at the Cawthron Institute

THE Cawthron Institute at Nelson, New Zealand, was founded and endowed through the munificence of Mr. Thomas Cawthron, who was born in 1833, and after his death his trustees decided that a research institute for the investigation of agricultural problems should be established as the best means of carrying out his expressed desire. The Cawthron centenary lecture, "The Achievements of the Cawthron Institute", delivered on October 9 by Prof. T. H. Easterfield on his retirement from the directorship of the Institute, formed a fitting epilogue to the first Cawthron lecture, "The Aims and Ideals of the Cawthron Institute", given by him in 1917.

Beginning with the early work of the Institute, Prof. Easterfield said that one of the first problems to be attacked was the improvement of the fruit industry. A soil survey of the Nelson province was initiated, and the distribution and special characteristics of the soils studied with particular reference to fruit growing. The information thus gained led to recommendations with regard to soil treatment and cover cropping without which many orchardists would have been obliged to abandon their crops. Biological problems such as bitter-pit, black spot, woolly aphis and codlin moth were investigated concurrently. An insect, *Aphelinus mali*, was imported in 1920 for the control of woolly aphis and induced to breed in New Zealand. Its remarkable success is evidenced by the fact that it is no longer necessary to spray trees which formerly had suffered heavily. Such parasitic control is being extended with promising results to other insect and plant pests including the blowfly, which attacks lambs, and the piri-piri, a burr-producing plant which seriously reduces the commercial value of wool fleece. Much useful work has been done in controlling fungus diseases of fruit and flowers. In the work on black-spot, the main fungal disease of pip fruit, it has been found that infection can be controlled by spraying at a period, varying with the season, when ascospores are just about to be ejected by the fallen leaves of the previous year.

Prof. Easterfield gave further instances of researches which have resulted in outstanding increases in the production of fruit and other important crops, notably the control of brown rot in peaches, the improved fertilising of raspberries, the selection of soils for tobacco and lucerne, the steam sterilisation