the quantity and origin of helium in gases of natural origin, and the helium content and age of meteorites. At Ahlen, in Westphalia, a source of natural gas has been found to provide about 40 m.^{3} per day containing 0·19 per cent helium, but this does not compare with the source at Calgary in Canada, 330,000 m.^{3} per day containing 0·33 per cent He, or with that at Petiola in Texas, 425,000 m.^{3} per day of 0·9 per cent. The ages of the various iron meteorites investigated are found to range from that of the Savic meteorite (8000 years perhaps) to the hoariness of the Nelson Co. meteorite, comparable to the age of the earth ($2{\cdot}6 \times 10^9$ years). It is thought that passage near the sun might account for the removal of helium from the Savik meteorite, making it appear more youthful than it is really likely to be.

Another interesting direction of Prof. Paneth's work was in the attempt to prepare helides after the manner in which he has so successfully made hydrides of various elements. No trace of the formation of helides of arsenic, antimony, lead, germanium, selenium, iodine, and chlorine was obtained. In the experiment with chlorine, the merest trace of the formation of a helide would have been detectable. It is considered that such helides as can be formed can only have a very fugitive existence, of the order of 10^{-8} second.

One might recall the words of Leonardo da Vinci in connexion with all this illuminating work: "Experience is never at fault; it is only our judgement that is in error in promising itself such results from experience as are not caused by our experiments". A. C. E.

Obituary.

GEORGE BIRTWISTLE.

GEORGE BIRTWISTLE was born at Burnley in 1877. Educated at Burnley Grammar School and Owens College, he won an open scholarship in mathematics at Pembroke College, Cambridge, in 1895. He was bracketted Senior Wrangler in 1899 and was placed in Class I., Division I., of the post-graduate part of the Mathematical Tripos in the following year. He was immediately elected to a fellowship and was responsible for the mathematical teaching in Pembroke until the time of his death. He had also served as assistant tutor and prætector of the college. He died very suddenly and unexpectedly on May 19.

It was as a teacher rather than as an investigator that Birtwistle was known, and as a teacher that he played a conspicuous part in Cambridge mathematics, especially during the last ten years. In certain respects his position was unique, for he was a link between the older theoretical physics and the new. Since the War, while continuing to lecture on classical mechanics, electrodynamics, and hydrodynamics, his interest in more recent developments, always strong, rapidly increased. He began to lecture on the older quantum theory, on thermodynamics (then just introduced into the schedule of elementary teaching), and finally on modern quantum mechanics. Each of these lecture courses ultimately grew into a book.

As a lecturer, Birtwistle was admirably clear and easy to follow. He set, in fact, a standard of exposition which made it very difficult for anyone to attract students to any duplicate course. His books are like his lectures—admirable expositions of those sections of the subject with which he deals, written in lecture-room style. He seldom attempts to go deeply into difficult points or to present the subject as a single logical whole. His aim is the lecturer's aim—to interest the student in the subject, especially in its more outstanding or exciting parts, and lead him on to other more systematic or abstruse expositions.

In all his lectures and in all three books, Birtwistle was successful in this aim, though naturally in varying degrees. Perhaps the least successful of his books was the last, on modern quantum mechanics. Here, owing to the novelty of the subject and the absence (when Birtwistle wrote) of other more systematic expositions (or indeed of any other exposition), the weakness of his deliberate method becomes more obvious. The book gives rather the impression of a collection of interesting isolated sketches. It stimulates the reader to ask for more, but to what other author is he to turn? With the coming of other books the weakness is already less felt and Birtwistle's book is gaining in value as a stimulating introduction. The staff of the Mathematical Faculty of Cambridge mourn the untimely loss of a valued friend and colleague.

DR. W. MARTIN.

DR. WILLIAM MARTIN, who died on May 24, was known to a very wide circle as an antiquary whose knowledge and insight enabled him to see almost everywhere in London vestiges of the life and activities of former times; but to many others he was known as an authoritative exponent of patent law, and he was an occasional contributor to our columns upon this subject.

Dr. Martin's antiquarian bent led him to treat patent law historically; but he was none the less alive to the conceptions which govern modern practice in this sphere. In his lectures and publications, notably his articles in the *Law Quarterly Review*, he worked out with great originality a systematic key to the immense body of decided cases with which he seemed to be familiar in every part. The law of treasure trove also attracted him; and in it he saw, contrary to the opinions of some antiquaries, means which could be utilised for the advantage of archæology as a check on the surreptitious disappearance into private collections of finds of general interest.

As an antiquary Dr. Martin was insistent on a strict separation of ascertained fact from the accretions of sentiment and fancy which too often obscure instead of illuminating the past. Nowhere was he more impatient of any looseness than in his