

near Craveggia in North Piedmont. Crystallographically it is very similar to rutile and tapiolite with axial ratio $a : c = 0.6456$. Some of the crystals are elongated along the pyramid edge and are probably twins similar to those of ilmenorutile. The mineral is black and opaque, and has a specific gravity of 5.59. It contains titanic acid, zirconia, oxide of iron, and niobic and tantalic acid. The result of analyses suggests the formula $3 \text{FeO} (\text{Ta Nb}_2) \text{O}_3, 4 \text{ZrO}_2, 9 \text{TiO}_2$, which may be written as a mixture of the three molecules $\text{Fe} (\text{Ta Nb}_2) \text{O}_3, \text{Fe ZrO}_2 \text{O}_5$, and $\text{Ti Ti}_2 \text{O}_6$ in the proportion of 1 : 2 : 3. Chemically it is very similar to ilmenorutile, but contains about 28 per cent. of ZrO_2 , replacing part of the TiO_2 .

CORRESPONDENCE.

PROFESSOR C. D. WALCOTT, LL.D., FOR. MEM. GEOL. SOC.

SIR,—At the annual meeting of the Board of Regents of the Smithsonian Institution, held on January 23rd, 1907, Charles Doolittle Walcott, LL.D., was duly elected Secretary of the Smithsonian Institution, to succeed the late Samuel Pierpont Langley.

MELVILLE W. FULLER,
Chancellor of the Smithsonian Institution.

SMITHSONIAN INSTITUTION, WASHINGTON.

MRS. AYRTON'S THEORY OF RIPPLE-MARK.

SIR,—I am grateful to Mrs. Ayrton for having replied to my note of despair in the Magazine for February last. Our sole object is the truth in a question of small account with physicists, but of great importance to geologists. Owing to the action of the Royal Society and of the British Association in having Mrs. Ayrton's new theory presented to the scientific public in a demonstration at a conversazione, in a lecture to a section, and in a very short abstract in the Proc. Roy. Soc., there is next to nothing on public record, as even Mrs. Ayrton's abstract of her British Association lecture was not published in the Report, so there is little to discuss.

In her letter Mrs. Ayrton writes: "I actually showed at the lecture a series of periodically oscillating waves moving in one direction over a fixed bottom, and expending themselves on a sandy shore, and proved that under such waves ripples formed exactly as they did *in the moving tank* with vertical sides."

Mrs. Ayrton's own description of this experiment is as follows:—
"I can imitate exactly the sand ripples *on the sea-shore* with water running in one direction only, if I slope the sand so that the water runs up it, as it does on the sea-shore, and if by means of a paddle I send a series of waves along the water in the direction in which it is running, if, in fact, I imitate the incoming tide." (Abstract, p. 3. Italics are mine throughout.)

It is most important to note that, as stated, the ripples thus made are like those made on the shore, but they are dissimilar from those

made in the tank. Mrs. Ayrton is explicit on this point. She says, and very truly, with reference to the tank, that “the sand has heaped itself up in the middle of the trough, having a contour *very unlike* sea-shore ripples.” (Abstract, p. 4.)

The paddle experiment made the nearest approach to sea-shore conditions, but it is practically impossible to make oscillating waves of uniform period by hand, and a paddle is a most unsuitable instrument for the attempt.

Had Mrs. Ayrton read a paper on so novel a subject in the usual way there would have been a most valuable discussion on it, as there were members present of both the British Association Committees that have investigated ripple-mark, viz., that on “Waves and Currents in Estuaries” and that on “Terrestrial Surface Waves and Wave-like Surfaces.”

In a letter to the Magazine in December, 1904, I pointed out that all that was needful was a conference between Mrs. Ayrton, Sir George Darwin, Prof. Osborne Reynolds, and Dr. Vaughan Cornish, and that a unanimous report might easily be arrived at. Since then, however, the Royal Society have authoritatively approved Mrs. Ayrton's views on the general subject of ripple-mark, and have thereby inferentially disapproved of the aforesaid eminent authorities.

I only wish Mrs. Ayrton could be prevailed upon to experiment with waves of regular period running on a beach. The original suggestion was made by the late Mr. William Froude, F.R.S. My own small experiments did little, but they showed how much could be done with suitable tanks and motors to reproduce marine phenomena.

A. R. HUNT.

April 10th, 1907.

UINTEGRINUS IN THE LONDON BASIN.

SIR,—It may interest your readers to know that I have at last found *UinTEGRINUS* in the London Basin, near Orpington. The specimens have been submitted to Mr. Sherborn, who writes: “I have no hesitation in identifying your specimens as *UinTEGRINUS*, because you send me well-preserved plates as well as large and small arm-ossicles. Heartly congratulations; you have worked hard enough for the discovery of this zone.” I am now engaged in working out the area of the exposure.

G. E. DIBLEY.

April 23rd, 1907.

OBITUARY.

JOHN FRANCIS WALKER, M.A., F.L.S., F.G.S., F.C.S.

WE deeply regret to record the death of our valued friend and fellow-worker in geology for so many years, John Francis Walker, who died rather suddenly at his residence, 45, Bootham, York, on 23rd May, aged 66. We hope to give a suitable notice of his work next month.
