

tion, for he succeeds infinitely better with that than with chemistry.

I shall refrain from making any remarks on this part of his communication, and will confine myself to the scientific portions; and when I have proved Mr De Rottermund's utter and palpable ignorance, I will leave it to your unprejudiced readers to determine how much truth there may be in the allegations advanced against me.

(2) Mr DeRottermund's first attack on me is for not giving Bousingault's analysis of the water of Papayon in full. This was not done for two very good reasons, 1st, Because it was entirely unnecessary to mention more than had direct reference to the subject on hand; and secondly, Because I do not possess a full account of the analysis, having taken the numbers from Hoffmann's *Physikalische Geographie*. In paragraph 13, Mr DeRottermund says, (alluding to me,) "after having so flippantly remarked on the labours of another chemist, possessing more celebrity in the world, etc., etc." If by this Mr DeRottermund alludes to himself, I have nothing to say; but if he refers to Bousingault, he is guilty of a misstatement, to use the mildest word. It requires the acumen of a Mr DeRottermund to discover how quoting from the works of a great philosopher can be accounted "remarking flippantly on his labours."

(3) Mr DeRottermund then branches off at a tangent and attacks my use of carbonate of ammonia in testing for magnesia, "a mistake (as he calls it) unpardonable, even in a student of medicine," and he then gives me a lecture upon various points of analytical chemistry, which I will now proceed to elucidate. As, however, Mr DeRottermund requires to have conviction *forced* upon him, I have taken the trouble of referring him to certain portions in the works of Berzelius and H. Rose, hoping that the statements of the greatest chemist, and the most accurate analyst in the world, will have sufficient weight to convince even Mr DeRottermund.

(4) "Phosphate of soda (says Mr De R.) forms, with a neutral solution of magnesia, a double insoluble salt of phosphate of soda and of magnesia." This salt, I must allow, is entirely unknown to me. At page 304, vol. 4, of Berzelius' *Lehrbuch der Chemie*, you will find, "Phosphate of magnesia, $2\text{MgO} + \text{P}_2\text{O}_5$, is produced when hot solutions of phosphate of soda and sulphate of magnesia are mixed together, the salt crystallizes on cooling;" and words to a similar effect, in Rose's *Handbuch der Analytischen Chemie*, vol. 1, p. 41.

The fact mentioned by Mr DeR. is, therefore, not formed under such circumstances, and phosphate of magnesia (which is produced) is tolerably soluble in water.

"In acid solutions, ammonia is added to neutralize the acid, and facilitate the formation of the double phosphate." Now, if ammonia be added, another entirely different salt is produced, viz., the ammoniacal magnesian phosphate. Vide Rose, p. 42, and Berzelius, vol. 4, p. 305.

That either ammonia or its carbonate may be used in precipitating this latter salt, is mentioned by Rose and Berzelius in the same pages. "If in acid solutions, (says Mr DeR.) carbonate of ammonia be used, another salt of ammonia will be formed, and the carbonic acid being set free, will produce insoluble carbonates of lime, magnesia, and alumina." In the first place, every beginner is aware that such a thing as carbonate of alumina does not exist, (Berzelius, vol. 4, p. 333;) secondly, under such circumstances, carbonate of magnesia would *not* have been precipitated,—one of the fundamental rules in testing for magnesia, and of which Mr DeRottermund may convince himself by a simple experiment, (easy to one who possesses his vaunted *practical dexterity*). Let him make a solution of any salt of magnesia, add a few drops of acid to it, and then an excess of carbonate of ammonia—he will find no precipitate, owing to the formation of a soluble double salt; and, thirdly, had Mr DeRottermund taken the trouble of reading the experiment, he would have found that all the lime had been previously removed by oxalate of ammonia.

From this portion of the paragraph, we may deduce five conclusions with regard to Mr DeRottermund's knowledge, which I will presently enumerate.

(5) Mr DeR. also says, "He should have known that carbonate of ammonia yields white precipitates, with salts of baryta, strontia, manganese, alum, zinc, antimony, lead, tin, etc.; that as phosphate of soda gives white precipitates, with salts of manganese, *lithia*, baryta, alumina, iron, zinc, antimony, tin, lead, etc., and as he had previously added carbonate of ammonia, he might just as well have had a carbonate of lithia, alumina, etc., etc., (all the above bases,) as of magnesia.

It is scarcely necessary to remind your readers of certain facts unknown to Mr DeRottermund, viz., that salts of baryta and strontia are decomposed by sulphates, that lithia is not precipitated by phosphate of soda alone, that the oxides of iron, aluminum, tin, lead, and antimony, are precipitated by ammonia; and salts of zinc and manganese, by oxalate of ammonia." But we may de-

* I adopted the usual plan in my analysis, first precipitating with ammonia, then with oxalate of ammonia, and afterwards with phosphate of soda and carbonate of ammonia, as is recommended in all good works on analysis; and yet Mr DeRottermund argues, as if all the above mentioned substances might have been still present.