



XXII. Reply to Mr. Phillips's observations on the use of chemical symbols

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To cite this article: Thomas Graham Esq. M.A. F.R.S.E. (1834) XXII. Reply to Mr. Phillips's observations on the use of chemical symbols , Philosophical Magazine Series 3, 4:20, 106-107, DOI: [10.1080/14786443408648272](https://doi.org/10.1080/14786443408648272)

To link to this article: <http://dx.doi.org/10.1080/14786443408648272>



Published online: 01 Jun 2009.



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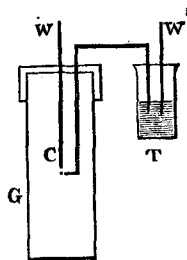


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to it and passing through the cap in the top of the glass tube, the lower end of the wire being flattened and bent at right angles as in the annexed figure, in which G is the glass tube, W one of the wires resting on C, which is connected with the brass tube T. The other end of the coil, W', dips into the tube T, filled with mercury. The ends of the wires and the flat piece at C should be well amalgamated and covered with a clean surface of mercury. If the end of the lever be struck rapidly with the palm of the right hand, the left pressing on the short end at D, the sparks at C may be made to follow each other in rapid succession.



If a mixture of two volumes of hydrogen and one of oxygen be introduced into the tube by means of a bent or flexible tube, and the spark made to appear at C, the mixture will be exploded. If the lever be gently struck, the spark still may be made to strike off in the mixture without exploding it, whereas with a smart blow the experiment never fails.

XXII. *Reply to Mr. Phillips's Observations on the Use of Chemical Symbols.* By THOMAS GRAHAM, Esq., M.A., F.R.S.E., Lecturer on Chemistry in the Andersonian Institution, Glasgow.

To Richard Phillips, Esq., &c.

Dear Sir,

IN reference to your objections to the notation employed in my paper on phosphoric acid, allow me to make the following observations.

The system of notation which I follow is that last proposed by Berzelius; and convenient as that system is, and as it is generally adopted on the Continent, I think the introduction of any other at present calculated rather to retard than to advance the progress of chemistry. You are therefore entitled to ask why, in the paper referred to, one atom of water is represented by \dot{H} , while in the tables of Berzelius it is represented by \underline{H} . My answer is, that in common with Gay-Lussac, and all the chemists of this country who have lately published, I consider water as composed of one atom of oxygen and one atom of hydrogen, a constitution expressed by \dot{H} in the symbolic language of Berzelius, Berzelius himself uses the expression \underline{H} ,

because, from theoretical considerations, which everybody knows, he halves the combining proportion of hydrogen, and therefore makes water to consist of one atom of oxygen united with two atoms of hydrogen.

The same observations apply to the expression used by me for phosphoric acid, namely, $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{P}}}$. I view the phosphorus in this acid as one atom, just as I view the nitrogen united with five atoms of oxygen in the case of nitric acid, or with three atoms of hydrogen in the case of ammonia, as one atom: Berzelius views it as two, and therefore expresses phosphoric acid by $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{P}}}$. In the original paper, I thought I had rendered this evident, by always stating first in words what was afterwards expressed by a formula, and particularly by adopting the admirable plan of Berzelius of stating the relation between the oxygen in the acid and that in the base or water; but in this your remarks prove that I have been unsuccessful.

In the tabular exhibition of the formulæ of various authors to express crystallized phosphate of soda which you give, you set down to me $\text{N}^3 \text{H}^{24} \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{P}}}$, which is not exactly the expression I would have used. The formula which I would give is $\overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{P}}} + \overset{\cdot\cdot}{\underset{\cdot\cdot}{\text{H}}}^{24}$, *i. e.* the crystallized salt consists of two atoms of soda and one atom of basic water united to the atom of phosphoric acid, together with twenty-four atoms of water of crystallization. In his formulæ for the salts, Berzelius arranges the symbols so that the most positive ingredient stands first. Now, from reasons which are explained in my paper, I presume that, besides the soda, one atom of water is positive to the acid, and not twenty-four, as you make me say.

I remain, dear Sir, yours, &c.

Glasgow, Dec. 16, 1833.

THOMAS GRAHAM.

XXIII. *On the Former Extent of the Persian Gulf, and on the comparatively recent Union of the Tigris and Euphrates.*
By CHARLES T. BEKE, Esq.*

WHATEVER may be the opinion of profane historians, founded on tradition, we have no warrant from the Scriptures themselves for the conclusion, that the City and Tower of Babel†, the Babel of Nimrod‡, and the Babel or Babylon of Nebuchadnezzar§, were identical. I do not, of course, intend to infer that their sites were different simply from the

* Communicated by the Author; being an extract from a Work on the Geography of Sacred History, now in the press.

† Gen. xi. 4. 9.

‡ Gen. x. 10.

§ Dan. iv. 30.