

It appears, however, that if the solution of digitaline is boiled with acid prior to the mixing with copper and potash, a great reduction of the copper will take place on raising their temperature to 200° Fahr.

Taking all these facts into consideration, I am inclined to believe that the bitter of the karaka nut is a glucoside, and that digitaline falls into the same class, though I have not known this character imputed to it before.

An appropriate name for this bitter principle of the karaka will be, I think, *karakine*, and this name, therefore, I propose to give it.

Having failed, after a careful examination of the nut for vegetable alkaloids, to find any principle having the characters of these bodies, I conclude that the bitter substance here treated of (*karakine*) is the poisonous part of it; but not having sufficient of this principle separated to allow of a proper trial of its effects upon the animal system, I am unable to confirm or disprove the correctness of these surmises, but I hope at an early date to be able to supplement this paper by a statement of results of experiments undertaken to settle the question.

As being connected with this subject I may state, in conclusion, that the inner bark of the tree is also bitter, probably from the presence of *karakine*. The outer bark is not bitter, but astringent from the presence of tannin, while the sap, the wood, and the leaf (which is, I hear, wholesome to cattle) taste sweet (sugar), with not the least bitterness. These observations were taken in July.

ART. LIV.—*On a New and Rapid Process for the Generation of Sulphuretted Hydrogen Gas for use as a Re-agent in Laboratory Operations.*

By W. SKEY, Analyst to the Geological Survey of New Zealand.

[*Read before the Wellington Philosophical Society, 26th August, 1871.*]

SULPHURETTED hydrogen gas is in such constant use in all laboratories, that I offer no excuse for submitting a new process for its generation, particularly as there appears to be a positive want for a better one than that at present in ordinary use. Indeed, owing to this want several processes have lately been published for its preparation especially having for their object a combination of evenness and constancy of delivery, but I have not learnt that the advantages promised by their several authors have been realised in actual practice. In consequence it occurred to me to try whether the reaction of metallic sulphides with zinc in acidified water, described in the third volume of our *Transactions*,* could not be turned to account for the production of this gas.

* See *Trans. N. Z. Inst.*, Vol. III., p. 222.

It will be remembered, perhaps, that in that paper I stated that an evolution of sulphuretted hydrogen occurred under the above circumstances, the gas being thrown off from the surface of the sulphide used, while the zinc was *oxidized* and the sulphur of the sulphide *hydrized*, a true voltaic pair forming, as further demonstrated in an ensuing article.*

This reaction, therefore, I applied in the following modified manner, and found it to answer so well that I am induced to make the process public for the benefit of practical chemists:—

Fragments of galena and granulated zinc, in proportions of about 1 to 1, are well mixed and put into a small apparatus of the kind generally in use for the preparation of this gas, and hydrochloric acid diluted with water (1 to 20 or so) poured upon them. Sulphuretted hydrogen is instantly given off, and its evolution is found to proceed energetically, regularly, and continuously for a great length of time—a length proportionate to that of the quantity of material used and its proper adjustment as to parts. A little hydrogen accompanies the gas named, and traces of hydrochloric acid. The acid is, however, easily removed, by allowing it to pass through a little carbonate of lime before use, while the presence of hydrogen can have no bad effect for all ordinary purposes.

After a sufficiency of the gas has been used it is best, in ordinary cases, simply to wash the galena and zinc with water, when the apparatus is ready for further use at a moment's notice; but when quantities are required in rapid succession a form of apparatus may be used which allows the separation of the acid liquid from the undecomposed substances, within itself, when the delivery tube is closed. But a still more excellent method may be had recourse to in such cases, and this is to make the necessary electric contact of the zinc with the sulphide dependent upon the juxtaposition of moveable wires carried outside the apparatus. For this it is only necessary to use them in mass instead of in fragments, connecting them electrically by means of wires, which are passed through the cork of the apparatus, and which are only allowed contact with each other by means of proper connecting screws.

If care is taken to keep the zinc and sulphide from direct contact, the evolution of gas instantly ceases on disconnecting the wires, and commences on making the connection.

For this last method it is necessary to amalgamate the zinc. I should state that any sulphide which is an electrical conductor may be substituted for galena, such as sulphide of iron or copper, but for cheapness and general convenience I recommend galena.

Having used this method during the last six months a great number of times, I have no hesitation in recommending it as a most simple, expeditious,

* See *Trans. N. Z. Inst.*, Vol. III., p. 232.

and economical one, easy of control, and capable of delivering the gas equally, continuously, and vigorously; and I am authorized to state that Dr. Hector's experience of it in the Colonial Laboratory testifies to the correctness of these assertions.

ART. LV.—*Notes in Support of the Alleged Alkalinity of Carbonate of Lime.*
By W. SKEY, Analyst to the Geological Survey of New Zealand.

[Read before the Wellington Philosophical Society, 30th September, 1871.]

IN a paper which appeared in the second volume of the *Transactions* of this Society,* I asserted the alkalinity of carbonate of lime, but the correctness of this assertion having been disputed by Mr. Charles R. C. Tichborne, F.C.S., of the Laboratory, Apothecaries Hall, Ireland, in a communication to the Editor of the "London Chemical News,"† I have re-investigated this subject and extended my researches upon it, by which I have arrived at results corroborative of the correctness of my statement, and which show besides that a large number of salts hitherto maintained to be neutral, or about which nothing has been affirmed, are in reality alkaline.

The latter results I will communicate in a separate form at an early date,‡ limiting myself in this paper to an attempt to clear the ground already broken, as far as I can, from the objections above referred to.

Mr. Tichborne very courteously, and with a considerable amount of plausibility, intimates that as the reddened litmus has the acid used to colour it only weakly combined with the tinctural matter of the paper, the carbonate of lime acts merely by absorbing this acid, and thus the litmus is brought back to its normal colour, blue with a shade of violet; and that therefore this is not a reliable test in such a case.

In answer to this I would ask, does not this capacity of the lime salt to abstract the acid, whether acetic or carbonic (for I guarded against encumbering the process with a double decomposition by using the latter acid), argue most forcibly and sufficiently for its alkalinity?

If it does not demonstrate alkalinity in such a case, then reddened litmus in opposition to all received opinion is not a proper test, nor indeed one at all, for ascertaining this character for any substance.

I would ask what other condition or property is required for a substance besides that enabling it to act as an alkali upon litmus, wanting which it is neutral?

* See *Trans. N. Z. Inst.*, Vol. II., p. 150.

† See "Chemical News," No. 565, September 23rd, 1870.

‡ See Art. LVI.