

copy the duplicates which had been deposited with the secretary of the Academy and to publish the same in the *Revue scientifique et Industrielle*. This was done, the article appearing four or five months later in Vol. 6, pp. 76-99. Laurent also reported his work upon nitrophthalic acid at the meeting of the Academy, June 21, 1841.<sup>1</sup> Before the publication of Laurent's delayed article in the *Revue scientifique et Industrielle*, a paper appeared in Liebig's *Annalen* (38, 1-13) by Marignac of Geneva, likewise dealing with the action of nitric acid upon naphthalene and announcing the discovery of "nitronaphthalic acid" (identical with Laurent's "nitrophthalic acid") and the preparation of some of its salts. Later in the same year (1841), Laurent<sup>2</sup> called attention to the fact that his work had anticipated Marignac's by at least a year.<sup>3</sup> and so far as we are aware, this claim was never disputed by Marignac. It seems, therefore, that the major portion of the credit for the discovery of nitrophthalic acid belongs to Laurent, not alone because he was actually the first to obtain the acid, but also because Marignac (as he himself acknowledges—*Loc. cit.*) was only following in a line of investigation already largely worked out by Laurent. M. T. BOGERT AND L. BOROSCHIEK.

ORGANIC LABORATORY, COLUMBIA UNIVERSITY,  
May 14, 1903.

*A Cheap and Efficient Water-blast.*—The work performed in the chemical laboratory of Cornell College emphasized the necessity of a water-blast, and some of the well-known kinds were purchased. The laboratory is situated on the third floor of the building where the water pressure was found to be scarcely 30 pounds to the square inch. This was not sufficient to maintain the blasts satisfactorily. It was therefore necessary to set about to devise a blast which would be suitable where the water pressure is low and which would give good results with a small jet of water. The apparatus here described has been in use for about four months and seems fully to meet the conditions.

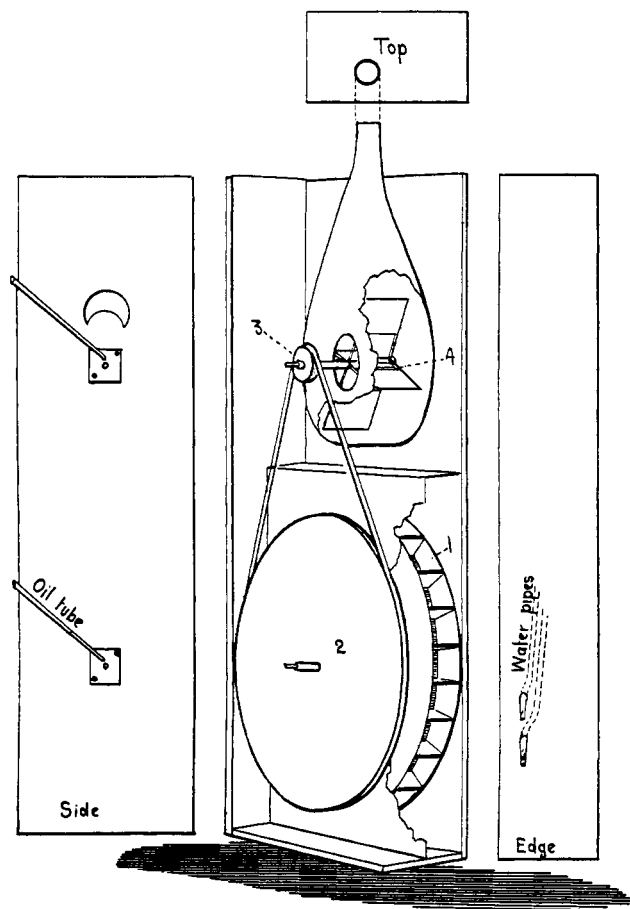
Experiments with various devices were made, but the one that has given the most satisfactory results consists of a small water-wheel (1), a large pulley-wheel (2) connected by belt with a small one (3) for driving a fan wheel (4), all of which are enclosed in a rectangular wooden box 7x12x24 inches.

<sup>1</sup> *Compt. rend.*, 12, 1193.

<sup>2</sup> *Rev. scientif. Indus.*, 9, 31.

<sup>3</sup> *Ibid.*, 5, 363-364.

The water-wheel is 9.5 inches in diameter, and 1.5 inches thick and is made of galvanized iron. Its construction is something on the plan of an undershot wheel. There are twelve paddles on the rim, projecting an inch, against which the water strikes to produce the motion. Each paddle is placed in line with a radius



of the wheel. The larger pulley-wheel has a diameter of 10 inches, is of a good quality of white pine and was soaked for three hours in melted paraffin to prevent warping. It has a groove  $\frac{3}{8}$  of an inch for the belt. These wheels are mounted on a  $\frac{3}{8}$  inch shaft, turned down at each extremity to  $\frac{1}{8}$  inch bearing. The smaller pulley-wheel is of wood  $\frac{3}{4}$  of an inch in diameter, with flanges

$\frac{1}{4}$  of an inch deep. The fan-wheel consists of four wooden paddles and is 6 inches in diameter. This wheel and the smaller pulley are mounted on a  $\frac{3}{8}$  inch shaft which is likewise turned down to  $\frac{1}{8}$  inch journals. The boxings in which the journals run are simply pieces of iron  $\frac{1}{8}$  of an inch in thickness, with holes drilled to fit the journals, and the iron pieces are fastened to the inside of the case. The water-wheel is separated from the rest of the apparatus by an air-tight tin partition to confine the water, which is conveyed to this wheel by two tubes consisting of mouth-blowpipes cut off at the small extremity to attain an inside diameter of  $\frac{3}{32}$  of an inch. These are placed through the edge of the case in such a way that the water from one strikes the paddles just a little below the axis at an angle of  $45^\circ$  to the horizontal plane of this axis, and from the other lower down and nearly parallel to this plane. The best effect is attained when the stream strikes the center of the paddle, when the paddle is exactly at a right angle with the stream. Ordinarily it has been found necessary to employ only one stream of water. Ample provision must be made for the escape of the waste water.

The fan is enclosed in a galvanized iron compartment, and is somewhat like the fan used by the blacksmith. It should have an outlet air tube with an inside diameter of  $\frac{1}{2}$  inch. By attaching a Y-tube to this, two blasts can be used as easily as one. A thick-walled rubber tube, about  $\frac{1}{4}$  of an inch in diameter has been found to be the most efficient belt. The bearings must obviously be kept well lubricated to secure easy action.

CHEMICAL LABORATORY, CORNELL  
COLLEGE, May 8, 1903.

FRANK L. HANN.

*Rapid Determination of Phosphorus in Steel.*—If the yellow precipitate, obtained from 1 gram of drillings, as usual, by shaking in an Erlenmeyer flask, be transferred together with the liquid to a 7-inch test-tube and, after standing one-half hour (a highly essential precaution), be whirled in a centrifugal machine, the supernatant liquid may be poured away and the last drops drained off without any danger of any of the precipitate being carried with it. This is a fact of considerable practical importance as it enables us to dispense with the filtration and prolonged washing which are the most tedious and laborious part of the Handy method. The liquid still adhering to the precipitate and walls of the test-tube after the first decantation and draining, amounts to an error of