is about 30 inches. It is supported by a clamp, *U*, attached to an iron stand. Also attached to this stand is a ring, *V*, which supports the flask over the drier at an adjustible height.

The temperature of the current of air at a distance of an inch from the tip is about 100°.

In the operation of the dryer, the precautions must be taken that in starting, the current of air should be turned on before the current of electricity; and in stopping, the electricity should be turned off before the air.

The advantages of this form of drying apparatus are—

1. The heat is supplied just before the air enters the flask, so that there is no time given for the air to cool off before it reaches the moisture.

2. The air is both hot and dry, and is blown in all directions forcibly against the walls of the vessel which is to be dried, so that the operation is rapid. Furthermore, the temperature is not high enough to produce hysteresis of standard apparatus.

3. There is no necessity for the use of alcohol and ether, and the air which reaches the flask is free from dust, oil, etc., so that the flask is clean when it is dry.

This apparatus has been in practical use several months in the physical chemistry laboratories of the College of the City of New York, for drying bottles, flasks, test tubes, cylinders, beakers, etc., and has been found rapid, effective and convenient. This apparatus, apart from the external resistance, may be ordered from Eimer & Amend, at a cost of about $6.00.

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ANALYSIS OF SOME BOLIVIAN BRONZES.[1]

By Morris Loeb and S. R. Morey.

Received February 26, 1910.

Through the kindness of the authorities of the American Museum of Natural History, we were enabled to analyze portions of certain implements collected in the region around Lake Titicaca. It will be seen that these metals differ remarkably in composition, and indicate the possession of considerable metallurgical skill by the inhabitants of that region. The absence of the slightest traces of silver may be taken as a proof that the tin was derived from cassiterite, rather than native tin. The composition of Specimen IV suggests its preparation from domeykite, or some other copper arsenide, fairly free from sulphur. Owing to the small mass of samples, which were drilled or cut from the specimens, the density determinations, made with water in a pycnometer, are only approximate. In Specimen VI the porosity of the material undoubtedly occasioned a low result. Tin and copper were separated by potassium

[1] Paper read at the December meeting of the New York Section.

polysulphide, the former determined as stannic oxide and the latter electrolytically. Arsenic was separated from copper by Crookes' method, and sulphur was weighed as barium sulphate after oxidation with nitric acid in a sealed tube.

I. Museum No. 1842. Small chisel or pinch-bar, 18 x $1^1/_8$ x $^1/_2$ inches. Very tough. Density, 8.68.

II. Museum No. B-1840. Implement 5–6 inches long, very hard and tough; pale color. Density, 8.94.

III. Museum No. 1959. Thick wide chisel $4^1/_2$ inches long, tough but less hard. Density, 8.92.

IV. Museum No. 1-859. Socketed spear-head, 12 inches long. Density, 8.89.

V. Museum No. 2413. F agment of pointed bar 6 inches long. Density, 8.61.

VI. Museum No. 1949. Small cast chisel; contained characteristic air-holes or "pipes." Apparently contained considerable *oxide*. Density, 8.18(?).

ANALYSIS.

	I.[1]	II.	III.[1]	IV.	V.[2]	VI.
Cu	91.81	90.51	95.59	97.43	94.96	91.43
Sn	7.56	8.92	4.48	.....	4.98	7.05
Pb	.....	.....	.....	trace(?)	......	.....
Fe	trace	trace	trace	trace	......	trace
S	.....	trace	.....	little	0.53	.....
As	.....	.....	.....	2.14	......	.....
	99.37	99.43	100.07	99.57	100.47	98.48

To this report may be added the record of an analysis, made in 1901, by Dr. A. E. Hill with one of us, of a figurine found in Honduras. Color, pale yellow; density, 8.94–6. Cu 93.19, Sn 1.64, Pb 1.60, Fe 0.40 per cent.; Au, Sb and Zn absent.

NEW YORK, February, 1910.

[CONTRIBUTIONS FROM THE LABORATORY OF PHYSICAL CHEMISTRY, UNIVERSITY OF ILLINOIS.]

THE FUNDAMENTAL LAW FOR A GENERAL THEORY OF SOLUTIONS.[1]

BY EDWARD W. WASHBURN.

Received March 3, 1910.

Nomenclature.

C	Volume concentration.
(1) C_P, (2) c_p	Molecular heat capacity of (1) a liquid, (2) a gas.

[1] Average of two complete analyses.

[2] Average of three concordant analyses.

[1] Presented at the Second Decennial Celebration of Clark University, Worcester, Mass., September 16, 1909.