

ALLOY OF LEAD AND PLATINUM.

Most beginners in the laboratory have involuntarily made an alloy of platinum and lead by attempting to fuse lead in a platinum crucible, and finding to their dismay the bottom falling out.

Professor Bauer has subjected the alloy to a scientific investigation. He prepared an alloy by fusing three parts of lead and one part of platinum, which was so brittle that it could easily be pulverized in an agate mortar. This was moistened and exposed to the action of carbonic acid until a considerable portion of the lead was converted into the white carbonate, and there was no longer any action.

The residual alloy from this experiment was subjected to analysis, and yielded:

	Analysis.	Calculated.
Platinum.....	45.86	48.82
Lead.....	50.97	51.18
	99.83	100.00

This would give the formula P+Pb. The alloy of platinum and lead prepared in this way is a crystalline, brilliant, steel-gray powder, which is easily decomposed by mineral acids, but remains unchanged in dilute acetic acid. When heated it fuses easily to a brittle crystalline mass, resembling bismuth. Heated in a current of air the lead oxidizes, and can therefore be removed in a muffle.

The specific gravity of the alloy is 15.77 by calculation; it ought to be 16.15. This method of preparing the alloy of lead and platinum may have application with other metals, and Professor Bauer is now occupied with that branch of the subject. It has been hitherto supposed that an alloy of lead and platinum could not be kept any length of time without changing into white lead and platinum powder. The new researches show that a permanent alloy can be made in the way above indicated.

PLANTS of the cactus family are principally confined to the Western continent, and although most abundant in tropical regions, some forms extend far into the temperate zone, and some species even have an alpine character. Back, in his northern expedition, saw with astonishment the banks of the Rainy Lake, in latitude 40° 40', entirely covered with the prickly pear (*Opuntia vulgaris*). Humboldt found on the Andes several species of cactus on elevated plains from 9,000 to upwards of 10,000 feet above the level of the sea. Some have even been gathered at an elevation of 13,600 feet. In size and height the different kinds present remarkable contrast. In Mexico and Arizona many kinds assume an arborescent form. Other kinds have a globular form, some with a diameter of three feet, and attaining a weight of 2,000 pounds while a cactus in South America is so small and so loosely rooted in the sand that it gets between the toes of dogs.—*Entomologist.*

STUDY OF NATURAL HISTORY.—For many years it has been one of my constant regrets that no schoolmaster of mine had a knowledge of natural history, so far at least as to have taught me the grasses that grow by the wayside, and the little winged and wingless neighbors that are continually meeting me with a salutation which I cannot answer, as things are. Why didn't somebody teach me the constellations too, and make me at home in the starry heavens, which are always overhead, and which I don't half know to this day? I love to prophesy that there will come a time when, not in Edinburgh only, but in all Scottish and European towns and villages, the schoolmaster will be strictly required to possess these two capabilities (neither Greek nor Latin more strict), and that no ingenious little denizen of this universe be thenceforward debarred from his right of liberty in those two departments, and doomed to look on them as if across grated fences all his life!—*Carlyle, in the Edinburgh Courant.*

THE arborescent grasses constitute one of the most beautiful adornments of tropical vegetation. These grasses belong chiefly to the *Bambusa* (bamboo) and other related genera. In India the seeds of the bamboo are mixed with honey and eaten like rice. In South America an arborescent grass, the gigantic *Guadua*, attains a height from 50 to 60 feet. Another species, a powerful climbing grass, twines around the trunks of large trees, reaching to their tops. A species of cane (*Arundinaria*) grows in large tufts, reaching a height of 30 to 40 feet, of which the first joint rises without a knot to a height of 16 feet before it begins to bear leaves. These joints being hollow, are used as blowing tubes by the Indians, for the discharge of their arrows. Even in the Southern United States the stalks of *Arundinaria* furnish fishing rods of the best description.

A SAN FRANCISCO undertaker claims to have discovered a new method of preserving the dead human body. By his process he petrifies it. He exhibits a body that he petrified in July, 1868, and it shows no signs of decay. When struck, says the editor of the *Morning Call*, it gives out "a ringing, metallic sound." The color of the flesh is not changed. All this is very wonderful, if true, but it is of questionable utility so far as the human body is concerned.

BELGIAN RAILS.—In the first eight months of this year Belgian rails were exported to the extent of 93,889 tons, against 103,746 tons in the corresponding period of 1869. There was a considerable increase in the exports of Belgian rails to the Zollverein, France, and Spain, but a decrease occurred in the exports to Russia, the Low Countries, Turkey, Italy, and the United States.

SCIENTIFIC AMERICAN.

1871.

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Queries.

[We present herewith a series of inquiries embracing a variety of topics of greater or less general interest. The questions are simple, it is true, but we prefer to elicit practical answers from our readers, and hope to be able to make this column of inquiries and answers a popular and useful feature of the paper.]

- 1.—WHITE VARNISH FOR PAPER.—I wish a recipe for a white varnish for heavy paper that is white when applied, and will remain white after it is applied, and dry perfectly hard in a week after application.—J. D. B.
- 2.—CEMENT.—I wish a recipe for a cement to fasten chamols and other leather to iron and steel.—F. P. B.
- 3.—BLUEING PISTOL BARRELS.—I can form a blue on iron or steel by heat, but I am told the beautiful blue color on fine pistols is produced by acids and not by heat. Will some one inform me of the true method employed?
- 4.—PAINT FOR GALVANIZED IRON.—What is the best paint for priming galvanized iron so as to make a durable job?
- 5.—MAGNETIC PROBLEM.—Suppose two iron plates or disks of definite size to be placed one eighth of an inch apart, and then to be connected with battery poles, so as powerfully to attract each other. If now one of the plates be made to revolve at definite speed, will the attraction be diminished, and if so in what ratio to the size and speed of revolution of the plates?
- 6.—TO EXTRACT OIL FROM OLD BELTING.—How can I extract the oil from old belting, particularly sewing machine belts, so that they can be used again?—C. W. L.
- 7.—WHITENING DIALS OF STEAM GAGES.—How are the dials of steam gages and the scales of barometers whitened so as to present their peculiar frosted appearance?—M. C. H.
- 8.—TEMPERING JEWELERS' TOOLS.—How can I temper jewelers' tools, such as drills, small engravers, etc.? What color should they be when tempered? Also I wish the name of some instructive work on jewelry.
- 9.—CEMENT—GALVANIZING CAST IRON.—Will any of your million readers tell me how to make a cement that, when hard, looks like cast iron filed, and which will stand a moderate degree of heat? I would also like to ask of some one posted how to galvanize a deeply corrugated cast-iron surface which is not very large or cumbersome, the main point being to put it on very smoothly, and whether the piece to receive the coat is to be first heated?—M. H. K.
- 10.—SUBSTITUTE FOR PAPER.—What article can be obtained which can be written and printed upon and rolled up like paper, but stronger, and which can be had of indefinite length?—G. B.
- 11.—RENDERING BRICK FLOORS IMPERVIOUS TO MOISTURE.—The floor of the lower story of my house is laid in brick with a thick coat of Rosendale cement which is not impervious to moisture. What is the most economical way of preventing dampness from coming through and rotting the carpets?—J. M. K.
- 12.—PASTE.—What is the best recipe for paste to firmly attach strips of cotton cloth to stiff colored paper without leaving the parts pasted together much more rigid than the paper itself?—J. W.

13.—MILLSTONES FOR GRINDING CORN AND FEED.—Will some of your millwright readers inform me what sized burrs, kind, etc., shall I purchase for grinding corn and feed? I have a 10-horse power engine, and wish a mill that will suit such power. Are any of the patent mills or iron mills any improvement upon the old-fashioned French burrs?

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New Patent Law of 1870.

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