their minimum in winter. These co-efficients and the mean temperature at 6 a.m, will determine the temperature of the air at a given hour and altitude.

Jottings from the International Exhibition.

Had it not been for the watchfulness of the officials, the International Exhibition would have lately stood a good chance of being burnt down on very philosophical principles. In the Japanese Court, Messrs. Baring Brothers exhibit two extraordinary quartz spheres, four or five inches in diameter, ground and polished with mathematical nicety. These spheres stood side by side on a mahogany stand in the Japanese Court, attracting but little attention from the public, until one very sunny day a visitor suddenly rushed to the office of the department with the alarming intelligence that "the two glass globes had caught fire!" The officials, on going to the spot found the stand in a blaze, the sun having shone directly through the globes, which, of course, acted as burning-glasses, setting the woodwork on fire. There are now two holes in the mahogany stand large enough to insert the top of the finger. These holes are very interesting, as they are each double, showing perfectly the double refracting properties of the quartz. The spheres have been removed into the Chinese Court, that part of the building being quite in the shade.—*Chemical News.*

A Black Varnish for Zinc.

M. Bœttger describes a process for covering zinc with a chemical, adherent velvet-black varnish. Dissolve 2 parts by weight of nitrate of copper, and 3 parts of crystallized chloride in 64 parts of distilled water; add 8 parts of hydrochloric acid of 1.10 density; into this liquid plunge the zinc, previously scoured with fine sand; then wash the metal with water and dry it rapidly.

This coating constitutes a kind of metallic alloy. It is M. Bœttger's opinion, that characters in relief may be executed on a sheet of zinc by using this composition, and by employing dilute nitric acid (1 to 10), as the black coating resists the acid which attacks only the unpreserved metal.—*Scien. Amer.*

Ozone.

In a letter to Professor Faraday, Schönbein writes:—"After many fruitless attempts at isolating ozone from an ozonide, I have at last succeeded in performing that exploit; and have also found out simple tests for distinguishing with the greatest ease ozone from its antipode, 'antozone.' As to the production of ozone by purely chemical means, the whole secret consists in dissolving pure manganate of potash in pure oil of vitriol, and introcing into the green solution pure peroxide of barium, when ozone, mixed with common oxygen, will make its appearance, as you may easily perceive by your nose and other tests. By means of the ozone so prepared, I have rapidly oxidized silver at the temperature of 20°C., and by inhaling it produced a capital 'catarrh.'"

A New Telegraphic Instrument.

A new instrument, remarkable for rapid transmission of messages through long currents, has been exhibited at the Royal Society. It can transmit messages with the utmost ease and fidelity through 2,000 miles of continuous wire.

Best Grain at the World's Fair.

At a late meeting of the Bath and West of Eng. Ag. Society, Lord PORTMAN, one of the jury on Agricultural Products at the London International Exhibition, stated that the best oats were from Nova Scotia: the finest samples of wheat from Australia, weighing 68 lbs. 7 oz per bushel; The best flour also came from Australia. He attributed the excellence of Australian wheat to the climate of that country. The grain from the Zollverein States of Germany, with that also from Hungary, in the Austrian department, was represented as remarkably good.

Australian Gold Statistics.

A blue-book for 1861 published in Victoria states that the number of European alluvial miners in the colonies is 61,516; of Chinese, 24,536; quartz miners, 14,303 Europeans, and only 9 Chinese. The number of persons, miners and and those dependant on them, residing in the gold fields is 233,501; the value of machinery employed in alluvial and quartz mining, 1,411,012*l.* The prices of quartz crushing vary from 7s. to 1*l.* 10s. per ton, and prices of gold vary from 3*l.* to 3*l.* 19s. per ounce. The quantity of gold received by escort in 1861 was 1,832,887½ ozs., and the total quantity exported in same year was 1,967,420 ozs.

The Mount Cenis Tunnel.

Recent accounts of the gigantic tunnel through Mont Cénis state that the works are progressing favourably. It is ascertained that the tunnel will exceed eight English miles in length, and will pass under the ridge of the mountain at a depth of a full English mile below the surface. Shafts being out the question, the tunnel will be ventilated by compressed air, driven into it by machinery worked by water-power, which it is calculated, will drive about 51,000 cubic feet of compressed air into the tunnel daily. According to the present rate of working the tunnel will not be finished under six years; but we believe it is intended to increase the power of the boring machines, and to make them work more expeditiously.

Paris Permanent Universal Exhibition.

The project of the Paris Permanent Universal Exhibition has received the approbation of Napoleon III. and the ministers of Finance. Applications for space must be made on or before the 20th July next, to Messrs. J. Studdy, Leigh, & Co., of Leadenhall street, who are the appointed agents for Great Britain. The rental for goods or products of the first class, which will comprise all products and manufactures, whether open or in glass cases, will be 50 francs or £2 per annum per square metre; and for the second class, to which wall surface will be devoted, will be 25 francs or £1 per annum per square metre of wall space. Five square metres are equal to six square yards English.

Belgian Iron Paint.

The Belgium "minium," or iron paint, made at Anderghem, is a pure iron oxide mixed with about 1-4th its weight of silicious clay. It is said to contain no acid, and is now extensively used in this and other countries for painting ships' ironwork, gasholders, &c.—*Ironmonger.*