TIN is one of the most necessary metals, and at the same time one of those whose production is most limited; it enters into the preparation of bronze, hence it was contemporary with the age of bronze. Ten parts tin and ninety of copper, compose bronze. The trade in tin ought to date from the highest antiquity; yet in neither Assyria nor Egypt, the presumed cradles of civilization, where bronze instruments were generally employed, does tin exist in a mineral state. The Egyptians had copper mines between the Nile and the Red Sea; bronze was their favorite metal; it formed the woodman's axe, the laborer's pick, and the implements of the artizan. From whence did the Egyptians import tin, as the name of such a metal is never mentioned in the several lists of tributes engraved on the palace of Thebes? The nearest mines were in the Caucusas and Central Asia, and it is presumed to have entered Egypt under the name of lapis, so called after the traders who trafficked largely in general merchandise under that appelation—the contraction of lapis lazuli. As bronze existed, so must tin have been known long before the discovery of the mines of Cornwall, to which Herodotus alludes in terms characteristic of their richness. When the Phœnicians established themselves on the coast of Syria, they became the chief furnishers of tin to the Egyptians; they first settled in Spain and worked the tin mines of that country—for the mines of Spain and Portugal were formerly very rich, though in 1870 they produced but 27 tons; then they coasted round Spain and France, passing from America to Cornwall. But the tin mines of the latter country were known to the Celts before the epoch of the Phœnicians, and the knowledge of that metal, how to work it and where to find it, was derived from the original Celts in their migration from Central Asia. Further, the Celtic terms for tin are analagous with those found in Sanskrit. There is only one of the combinations of tin that interests the metallurgist, the binoxide, sometimes called stannic acid, and which contains 21 p.c. of oxygen and 78 of tin. Wherever kaolin exists, binoxide of tin may be expected to be found. Apart from Cornwall, where the supply of tin is limited, the chief production of that metal comes from the Peninsula of Malacca and the neighboring islands. At Banca the ore is found at a depth of 8 or 10 yards, and 30,000 Chinese constantly work in the mines; were the inhabitants of these regions more active, the mines of tin are so rich that the production would surpass the demand. In America tin has not yet been worked on a large scale, and Australia does not deliver notable quantities to industry. The best bronze contains ten per cent. of tin; the proportions can, however, change, yet in the age of bronze the ratio was uniform. The ancients knew how to produce the brassy character, but their aim was to soften the metal, the better to manipulate it; they were ignorant how to harden it. When heated copper is plunged into water, the result is exactly the opposite to what takes place in the case of steel, it becomes more flexible and softer, taking any form desired, but in proportion as the metal is hammered, it cakes and its hardness augments.

THE distinguished chemist, M. Müntz, has devoted four years to demonstrate the existence of alcohol everywhere in nature, and as common place as stones on the highways. There is alcohol in the air, in the cultivated soil, between paving stones, in the sewers, in rivers, in the sea, in the kennels—only pure spring water is free from the spirit. Having been made aware of these facts, reflection shows that nothing is more natural. Fermentation is universal, and the products of fermentation are carbonic acid and alcohol; decomposing organic matter is everywhere, and the diffusion of alcohol is a necessary corollary. The process employed by M. Müntz to detect the presence of alcohol, is so delicate, that the existence of one-millionth part can be revealed. And that process is as simple as it is certain. In presence of iodine and carbonate of soda, alcohol assumes the idoform state, that is, in tiny, yellow, shaped crystals of six rays, in appearance like crystalline snow that has fallen during a calm. The quantity of alcohol of course varies; cold rain and snow are richer in that spirit than luke-warm rain, while in sewage water the quantity is still higher. Appreciable quantities can be extracted from vegetable soil. Perhaps it would not be too much to say that it is in the decomposition of organic matters in the soil that is to be found the generating source of alcohol in the air and rain water. A cubic yard of water —220 gallons—contains, however, only the thirtieth part of an ounce; the dose is too homœpathic to affect either the interests of health or industry.

PHOTOGRAPHIC PHOTOMETRY.

A promising application of photography to precise measurement of phenomena of light has been recently tried by M. Janssen. The method is advantageous in that photography reveals the action of the extremely weak luminous and the ultraviolet rays; but the chief advantage lies in the permanence of the results as against the fugitive nature of ordinary photometric comparisons, which, too, require the simultaneous presence of the two light sources. The various amounts of metallic deposit on the photographic plate cannot well be weighed, so M. Janssen measures by the degree of opacity produced. His photometer consists of a frame with sensitised plate, before which is passed at a known rate of uniform motion a shutter having a slit. If this slit were rectangular, a uniform shade would be produced on the plate; but by making it triangular he obtains a variation of shade, decreasing from the side corresponding to the base of the triangle to that corresponding to the apex. It is further proved that the photographic deposit does not increase as rapidly as the luminous intensity. Now, to compare the sensibility of two plates differently prepared, they have merely to be exposed successively in the frame under like conditions, and the points where they show the same opacity being compared to the points of the triangular slit corresponding to them, the ratio of the apertures at those points expresses the ratio of sensibility. Thus the new gelatino-bromide of silver plates are proved to be twenty times as sensitive as the collection plates prepared by the wet process. Again, to compare two luminous sources, they are made to act successively on two similar plates in the photometer, and the points of equal shade in the plates indicate, as before, the relation sought. M. Janssen has compared the light of the sun and some stars on these principles, preparing from the former "solar scales" (with uniform degradation of shade), under exactly-determined conditions to sensitive layer, time of solar action, height of the sun, &c. Circular images of stars are obtained by placing a photographic plate a little out of focus in the telescope, and a series of these, got with different times of exposure, are compared with scales obtained from sunlight. M. Janssen will shortly make known some of the results.

THE TELEPHONE IN CHINA.—The Chinese language is so peculiar that there is great difficulty in devising any practicable system for conveying telegraphic messages. The telephone, therefore, is received with peculiar favor by the Chinese Government, which has at length decided to establish a complete system of telephones throughout the country, commencing north of the Yang Tse Kiang. The work will be conducted under the charge of J. A. Betts, the American telegraphist, under whose superintendence the telegraphic line was built from Tientsin to Taku.—*L'Ingèn. Universal.*