## *SCIENTIFIC AND SANITARY.*

Two Austrian engineers have invented a new explosive which is called ecrasite. Its power, as compared with dynamite, is as 100 to 70, and it may be carried from place to place with perfect safety.

The base of celluloid is common paper; by action of sulphuric and nitric acid it is changed to guncotton, then dried, ground and mixed with from 20 to 40 per cent. of camphor, after which it is ground fine, coloured with powder colours, cast in sheets, pressed very hard and at last baked between superheated rollers.—*Manchester Union.*

In a new process for the manufacture of phosphorus by electricity used by the Phosphorus Company, at Wednesfield, near Wolverhampton, England, says the London *Engineer*, the raw material and coke are all fed into a specially designed furnace, reduced to vapour by electric heat, and the vapour condensed into marketable phosphorus, the elaborate chemical material hitherto needed in dealing with the raw materials before putting them into the furnace thus being dispensed with. The estimated consumption of phosphorus throughout the world is only two thousand tons per year, used chiefly for match-making.

Under the guise of "a method of amalgamating glass with other metals than platinum," a sensationally worded Dalziel telegram attributes to Captain Walter, lecturer at the Military Academy of Vienna, "an invention which has been patented in every country in the world. It will effect a revolution in the manufacture of electric lamps, which will be immensely cheapened by it, as the use of platinum will be entirely discarded." Captain Walter states (according to Dalziel) that his invention will cheapen the manufacture of lamps by 100 per cent., while breakage will not hereafter amount to five per cent.—*Electrician.*

The tanning of elephant hides is comparatively a new industry, according to the Boston *Journal of Commerce*. The method employed is practically the same as in the tanning of cow hide, except that a stronger combination of the tannic ingredients is required, and greater length of time—about six months—is necessary to perform the work. When the hide is taken out of the vat it is an inch and a-half thick. Among the articles made of elephant leather are pocket-books, small satchels, cigar-cases, and similar articles, and they are said to be expensive luxuries. In finishing the hide no attempt is made to glaze or polish it, everything being done to preserve its natural colour and appearance. The leather is very enduring, several years' wear having but little effect upon it.



Railway Carriage Cooling Appliance.—An improved apparatus for providing railway carriages with a cool and pleasant breeze has just been brought out by Mr. George Payne, of the Locomotive Department, Indian Midland Railway. It is fitted under the body of a carriage, is self-revolving, is so arranged that it will catch the air from all directions, and it possesses, according to the *Indian Engineer*, other advantages, one of the most important being that it will keep working for fifteen minutes after the train has been stopped.

The fuel used on Italian railways has hitherto been imported; but trials have recently been made with lignite prepared by a process introduced by Signor Sapori, of Siena. More lignite was used than coal for the same amount of work—about a ton as compared to 15 cwt.—but lignite is plentiful, and has been used in Austria for some time. So far as the running of the train is concerned, the trials have been successful, and though they were made over a heavy line, the engine kept steam well.—*English Mechanic.*

In Sonoma County, California, may be seen a peculiar piece of engineering—namely, an actual railway-bed on tree tops. Between the Clipper Mills and Stuart Point, where the road crosses a deep ravine, the trees are sawn off on a level with the surrounding hills, and the timbers and ties laid on the stumps. In the centre of the ravine two huge redwood trees, side by side, form a substantial support. These giants have been lopped off 75 feet above the bed of the creek. This natural tree bridge is considered one of the wonders of the Golden State, and for safety and security is stated to far exceed a bridge built on the most scientific principles.—*Iron.*

The ventilation and disinfection of the holds of vessels is now proposed to be accomplished by an arrangement or system of tubes, which, in addition to its simplicity, easily overcomes the difficulties experienced in ordinary methods. According to this new plan, iron tubes, pierced with numerous holes, are extended from the deck of the vessel into the hold, these being arranged in such a manner as to establish and maintain an upward and downward draught, by this means causing a thorough ventilation of the hold and its contents, the adaptation of the apparatus for the purpose of fumigation being thus fully apparent.—*Philadelphia Record.*

A system has been devised by means of which a ship having a telephone installation on board can be placed in connection with the Central Exchange whenever it comes into port. A telephone is placed in the captain's office, and the wire connecting with it is attached to a flexible cord, fitted with a conductor at the side of the boat. The wire leading from the exchange is brought down to a corresponding position on the dock, and is also fitted with a conductor. When the ship comes into port all that is necessary is to make the connection, which is simply done, and anybne on board can at once communicate with any of the business houses of the town.—*Invention.*

Dr. John Grant writes to the *Lancet* as follows: "Having occasion to make a disinfectant fluid to apply to an offensive surface on a body awaiting *post mortem* examination, I chanced to select permanganate of potash. Thinking the solution might dry too quickly and inefficiently deodorize the part, it occurred to me to add glycerine on account of its hygroscopic powers. Putting a drachm of the crystals into a three-ounce bottle, I added two ounces of water and one of glycerine, and agitated the mixture. To my great surprise the cork and part of the contents were violently ejected, and the remaining portion developed great heat. Everyone is familiar with the danger of mixing glycerine and nitric acid. I have not, however, seen any mention of a combination of it and permanganate of potash. I observed the mixture became brown, losing its purple colour like a deoxidized solution of the salt; and as no effervescence took place, it is probable that the glycerine combined with the oxygen liberated by decomposition of the salt, and that, further, it possesses by some affinity of its own the power of producing rapid decomposition of the permanganate. Perhaps some chemist will kindly explain."

Argand, the inventor of the famous lamp which bears his name, had been experimenting for some time in trying to increase the light given out by his lamp, but all to no purpose. On a table before him one night lay an oil flask which had accidentally got the bottom broken of, leaving a long-necked, funnel-shaped tube. This Argand took up carelessly from the table and placed—almost without thought, as he afterward related—over the flame. A brilliant white light was the magical result. It is needless to add that the hint was not lost by the experimenter, who proceeded to put his discovery into practical use by "inventing" the common glass lamp chimney. Hundreds of discoveries which have been heralded to the world as the acme of human genius has been the result of merest accident—the auger, calico printing and vulcanization of rubber being among the number.—*St. Louis Republic.*

Tar "Rubber."—By-products in many chemical industries often have considerable commercial value without that fact having been discovered. The residue which remains after refining tar with sulphuric acid has heretofore been regarded as worthless (*Gummi Zeitung*). This mass is now worked up into a black substance resembling asphalte closely, but with elastic properties resembling poor rubber. When this is submitted to a continued and intense heat the volume decreases about 60 per cent., and the substance becomes hard like ebonite and very elastic. In its hard form the substance is known by various names, according to the use to which it is applied, while the soft form is known as "mineral rubber asphalte." It is a good non-conductor, and is therefore available for insulating. When dissolved in naphtha the "rubber asphalte" forms a very durable waterproof varnish.—*English Mechanic.*

Sea-Sickness.—There is a correspondent of the *Field* who has been trying for forty years to "exorcise the fiend sea-sickness," and has not succeeded yet. He extracts some comfort from the assurances of officers who have served aboard torpedo boats, that "even now he does not know what sea-sickness is," though those who have sailed in one of those delectable craft might tell him if human speech were only equal to the occasion. But this correspondent did not write to ask our condolence on the sufferings from this cause, but to tell us of a curious fact that he has discovered. It is that there are as many kinds of sea-sickness as there are varieties of vessels afloat. Hence you may get rid of one sort, and yet be ready to suffer misery from another. He has known men thoroughly case-hardened aboard small yachts who were utterly undone by the heavy half-roll, half-pitch of a big liner. Even a slight change in the ballast, or the addition of lead to a keel is enough. In short, nothing but perpetual going to sea in every variety of craft will effectually get rid of sea-sickness, unless one is disposed to try that finest of all remedies—stopping ashore.

New Weapons of War.—The invention of formidable weapons of war continues to receive so much encouragement in Europe that only the most fearful carnage can be predicted as the result of the various efforts to increase the efficiency of guns and explosives. Whether the theory is valid or not that war itself will be abolished from the excess of means of destruction, it is certain that the European Governments are not restrained by any theoretical fears, but are vying with each other in the securing of important secrets of advanced methods of war instruments. The Austro-Hungarian War Office is now sternly guarding the secret of a new explosive called "Ecracite," which has been invented by two Austrian engineers. Its power surpasses that of dynamite by ten to seven, and it is serviceable alike for cartridges and cannon. The future of military operations will have an aspect of terror not before known if this new explosive is put into practice. By experiment it is found that the "Ecracite" will cause one bombshell to practically demolish a line of 500 men. With such force in operation the present conditions of the Red Cross or any hospital service would be entirely inadequate, and the increase of Bands of Mercy would be demanded. Another new invention of war with similar purposes of wholesale destruction is a gun, the manufacture of which has been, until recently, a profound secret in England. This weapon is pneumatic in principle and is said to be superior to all guns fired by smokeless powder. The gun is described as "almost noiseless, absolutely smokeless and has no recoil, and even if fired by day, and to a much greater extent if fired by night by a moving field battery in a wood with a shell, the only possible means of judging where the shot came from would be by following the projectiles or watching the direction in which they struck the ground, and so following the line from which they came." The formidable character of this weapon is apparent.—*Boston Journal.*

It may not be commonly known that in the inferior races the head ceases to grow after twenty years of age. In the superior races the head of the intelligent and educated man increases in volume until thirty-five, forty and forty-five years. The skull has reached its maximum development when the bones composing it are welded together, so as to render the sutures invisible. Once the sutures are solidified, the further growth of the brain is impossible, which is said to explain the insurmountable difficulty experienced in trying to teach illiterate adults. The solidification varies according to the investigating activity of the brain. It takes place between twenty-two and twenty-five years in the taskworker, between twenty-eight and thirty-five in the middle-class manual professions, and after thirty-five in educated persons who practice intellectual professions.

Dr. Lannelongue, a well-known French surgeon, made before the Paris Academy of Sciences recently an official statement in regard to a process of anti-tuberculous inoculation upon which he has been experimenting for some time in his clinic at the Trousseau Hospital, and with which he has obtained some results sufficiently conclusive for public presentation. Dr. Lannelongue proceeds (the *Times* correspondent says) by injection of a special lymph, as does Dr. Koch; but his injections do not, like those of the latter, affect the general system. They are absolutely local in their action, discovering the seat of the tuberculous affection at the very spot where it is specially localized. Until recently Dr. Lannelongue had experimented only on exterior tuberculous manifestations, but he has since made experiments on internal complications. What is absolutely certain (the correspondent adds) is that Dr. Lannelongue's lymph arouses no disorder in any portion of the human organism, save in the specific part affected. It acts with strong curative force upon the tuberculous portions. It does not excite fever, and its application is definite and made without exaggerated pain.



Thoughts come and go, some never to return. What some of us would have given at the time for an Esterbrook pen to jot down a fleeting inspiration!