

Vulcanizing India Rubber.

Accidents have frequently occurred, especially in dental workshops, from the use of too high a temperature in melting and vulcanizing India rubber. Moreover, complicated apparatus is required for vulcanizing by dry heat. According to the *Moniteur Produits Chimiques*, this apparatus can be replaced by a bath of any liquid boiling at 140° or 150° C. (285° to 300° Fahr.), at which temperature the sulphur unites with the India rubber.

The cheapest salt for such a bath is chloride of calcium; but other solutions, such as acetate of soda and carbonate of potash, can be employed; also glycerine, oils, and paraffine. These liquids can be used in ordinary metallic vessels. Of course, the India rubber and sulphur solution must be in an air-tight vessel, as before.

WIRE TRAM ACROSS THE TEREMAKAU, N. Z.

The Teremakau River is situated in the Middle Island of New Zealand, in the district of Hokitiki. The stream has no great pretensions to size during the summer months, but in winter it rises to a considerable height, and not unfrequently floods the adjacent country. A wire tramway has been constructed for the purpose of crossing the river. The contrivance is ingenious, and saves both time and inconvenience. As will be seen by our sketch, the passengers are seated in the car, which is being conveyed over the river by an arrangement of wire ropes, which works with precision and facility. It is also perfectly safe, a fact that could not be urged as regards a ferry boat at certain periods of the year. Contrivances of this kind are numerous in South America.—*Town and Country.*

Physical Education of Girls.

We are pleased to find that increased attention is being paid to the question of the physical training of young and growing girls. The Swedish physical exercises have found general favor, while many games and athletic pursuits are now permitted which formerly were proscribed by prudish schoolmistresses and timid mammas. There can be no doubt that the present movement is in the right direction so long as it is kept within reasonable limits; for the extension of competitive athletic sports to our girl schools would be a great mistake. But, short of this, the daily employment of systematic exercise will prove of the greatest service in after life by developing the frame and obviating those ills which so frequently supervene in the passage from girlhood into womanhood. The disorders which occur at that period are generally to be referred to imperfect development and to defective nutrition. When the girl is naturally healthy, little is wanted but to encourage, or we might say insist on, ordinary systematic exercise being taken daily. This should consist of certain gymnastic exercises, which ought to be practiced each day as part of the school work, supplemented by such games as lawn tennis, rounders, golf, etc. Swimming is an exercise that every girl should indulge in, and it ought to be taught systematically at all our girl schools. Rowing, too, is an exercise which greatly strengthens the muscles of the trunk and abdomen, and is therefore serviceable, when employed with judgment, in giving grace and elegance to the figure. Schools at the seaside or near a river should avail themselves of the opportunity, and have rowing taught by some trustworthy boatman. Riding has always been an exercise in favor with the profession; the expense attending it, however, debars its pursuit in many cases. With delicate girls, or those rapidly growing, some of the above named exercises may prove unsuitable; in these cases it is best to rely at first entirely on gymnastics till the frame is strengthened. Until recently dress proved a great barrier in preventing the free exercise of the limbs and body, but the introduction of a more sensible costume for the playground will in future, it is to be hoped, remove the disadvantage. The costume in use consists of a short skirt of blue serge, draped with a crimson scarf, blue jersey, short trousers, and long stockings. Such a dress is quite suitable for girls under fifteen, and we fancy those who are educated on this system will not as they grow older readily submit to the bondage of high-heeled boots and tight lacing, though probably they would have to adopt a more lengthened skirt.—*Lancet.*

THE Clyde shipbuilding for 1883 represents a tonnage of 419,664 in 329 vessels. Twenty-five years ago the Clyde yards turned out only 35,709 tons in one year. For the past four years the business of shipbuilding there has steadily and largely increased. There are those who predict a falling off during 1884, on account of low freights and the many "ocean tramps" now in the business, but in answer to this it is claimed that the recently built ships are so economical of fuel, compared to carrying space provided, that they will continue to crowd out those of older build.

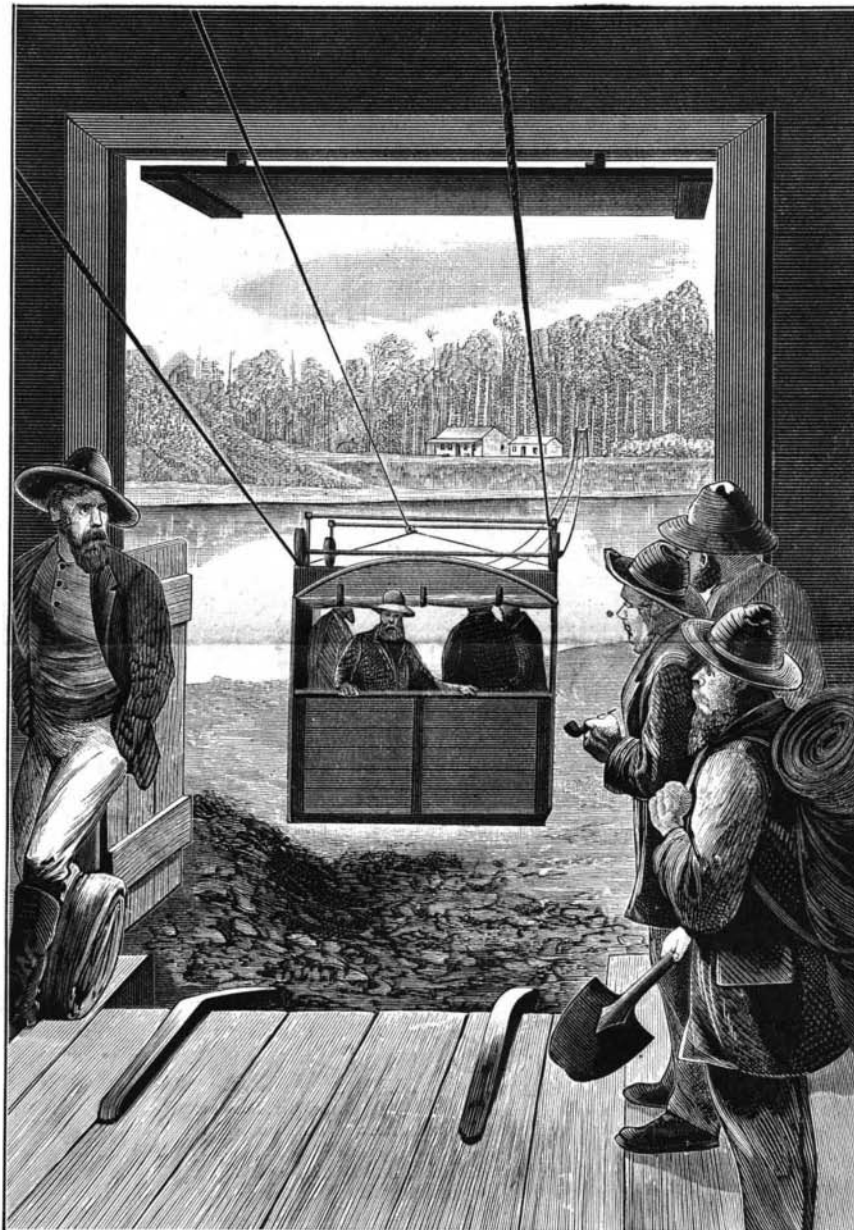
New Mode of Constructing Small Ships.

Sheet metal boats form the subject of a patent recently issued to a firm of boiler makers at Barrow-in-Furness, England. Sheet metal sides are bent under pressure to the required shape, having flanges on their lower edges for riveting to the keel bar, and the stern ends may be joined either with or without a stern plate. The bent plates forming the boat's sides may be readily packed in small space for transportation, and easily put together on reaching their destination, the design being to so construct boats lighter than of wood, or of numerous plates of metal riveted together.

Earthquake and Volcanic Eruption in Alaska.

On the morning of October 6 a settlement of fishermen on English Bay heard a heavy report, and looking in the direction from which the sound came saw immense volumes of smoke and flame burst forth from the summit of Mount Augustine. The sky became obscured, and a few hours later great quantities of pumice dust began to fall, some of it being fine and smooth and some gritty.

At 3½ P.M. on the same day an earthquake wave 30 feet high came rushing in over the hamlet, sweeping away all the boats and deluging the houses. The tide at the time was low, and this saved the settlement from utter destruction.

**WIRE TRAM ACROSS THE TEREMAKAU, N. Z.**

The wave was followed by two other waves about 18 feet high, which were succeeded at irregular intervals by others. The pumice ashes fell to a depth of 5 inches, making the day so dark that lamps had to be lit. At night the surrounding country was illuminated by flames from the crater. Ordinarily Mount Augustine is covered with snow, but this year it is completely bare.

Upon examination after the disturbances had subsided, it was found that the mountain had been split in two from base to summit, and that the northern slope had fallen to the level of the surrounding cliffs. Simultaneously with the eruption a new island made its appearance in the passage between Chernaboura Island and the mainland. It was 75 feet high and a mile and a half long. So violent was the volcanic action that two extinct volcanoes on the peninsula of Iliamna, 12,000 feet high, burst into activity and emitted immense volumes of smoke and dust. Flames were visible at night.

Tin in California.

An article in the *Mining Review*, by E. N. Robinson, C.E., states that the mine of Cajalco, in the Temiscal range, California, has assayed 13.1 per cent from the ore, of a purity of 0.98. This mine is believed by Cornish miners who have examined it to be a true and permanent vein, probably increasing in richness as it increases in depth.

Great Ships of War.

According to the official report submitted to the French Chamber of Deputies concerning the condition of the French fleet, the iron clad squadron of France may be divided into three groups. The first comprises three heavily armored ships, the Duperre, Devastation, and Redoubtable. These are protected by armor 23 inches in thickness, and are armed with 13.8-inch breech loading rifled guns. The second group consists of seven iron clad vessels with 8.5-inch armor and carrying guns similar to those of the preceding group. This class of ships will be superseded in a few years by vessels of the same magnitude as the three first mentioned. The third group is composed of seven vessels having an armor of but six inches, but these will, with the exception of one of them, remain but a short time longer in service.

There are at present launched and in course of completion, and almost ready for service, two heavily armored iron clads, the Admiral Baudin and the Foudroyant, while seven more of a similar type are being constructed. Besides these, says the *Army and Navy Journal*, there are available two armored coast guards, constituting formidable engines of war, and five more have been launched and are in rapid process of completion. In addition to these there are two new coast guard iron clads, of an inferior type, in process of armament for immediate service, and these will be supplemented in a few months by an additional vessel of the same class.

The report includes, as a reserve, six coast guard iron clads of the old type, which will remain available but for a few more years; also six floating batteries belonging to the same class. In addition to the foregoing the French fleet is provided with five fast cruisers of the commerce destroying type.

The writer says: "If we compare the effective force of our navy with that of other maritime powers, we find that England has 33 iron clads, of which 16 only have an armor varying from 17½ to 24 inches in thickness. Five iron clads of the first class are in course of construction. Besides these, England has 11 station iron clads,* 10 iron clad coast guard ships, 2 station iron clads of inferior size, 44 cruisers, and 180 torpedo boats of all grades.

"Italy has afloat, at the present date, four iron clads of the first magnitude. These gigantic war vessels are armed with 100 ton guns. Three iron clads of lesser proportions are in course of construction in the Italian dockyards, and will be launched next spring. These will take the place of the 8 iron clads of a past type at present belonging to the Italian navy, and which are destined soon to disappear.

"Germany, especially, has constituted her navy with a view to coast defense and running warfare (*guerra de course*). She possesses 4 large iron clad coast guards; 13 iron clad gun boats, adapted also for torpedo warfare; 24 fast armed cruisers (rams), capable of steaming 14 knots.

"The principal Russian war vessels are: 1 turreted iron clad; 1 central redoubt iron clad; 5 station iron clads; 3 iron clad coast guards, with heavy batteries; 7 turreted iron clad coast guards; and 10 turreted monitors. Russia has in process of construction 5 turreted monitors and one station iron clad."

The appropriation asked for by the French Admiralty amounts to 197,835,017 francs, or \$39,567,003.40. This amount has been approved of by the Commission, with but a slight reduction on points of minor importance and not exceeding 54,000 francs—\$10,800.

List of French war vessels in course of construction in the French naval dock yards, and to be available in the early part of 1884: One gun boat, La Comete; one iron clad, Vauban, at Cherbourg; one iron clad, Terrible; one cruiser, Iphigene, at Brest; one tender, Alcian, at Lorient; one iron clad, Tonnant; one tender, Ibis; one tender, Vigilant, at Rochefort; one iron clad, Caiman; one iron clad, Foudroyant; one cruiser, Arethusa, at Toulon. Total, 11 vessels.

A Dry Galvanic Battery.

Electro-piles without fluids were among the earliest forms invented, but they had but very little power, and although they last a long time have very little value. They are now beginning to attract attention again, and C. Schneler, of Dresden, has invented one consisting of a copper cylinder open at both ends, in which is placed another open cylinder of amalgamated zinc. For filling, he mixes up plaster of Paris with a saturated aqueous solution of chloride of zinc containing 7 per cent of common salt. A stiff paste is made in this way, and poured in the annular space between the two cylinders, where it soon hardens and sets. The electro-motive force is not stated.—*Poly. Notizbl.*, p. 381.

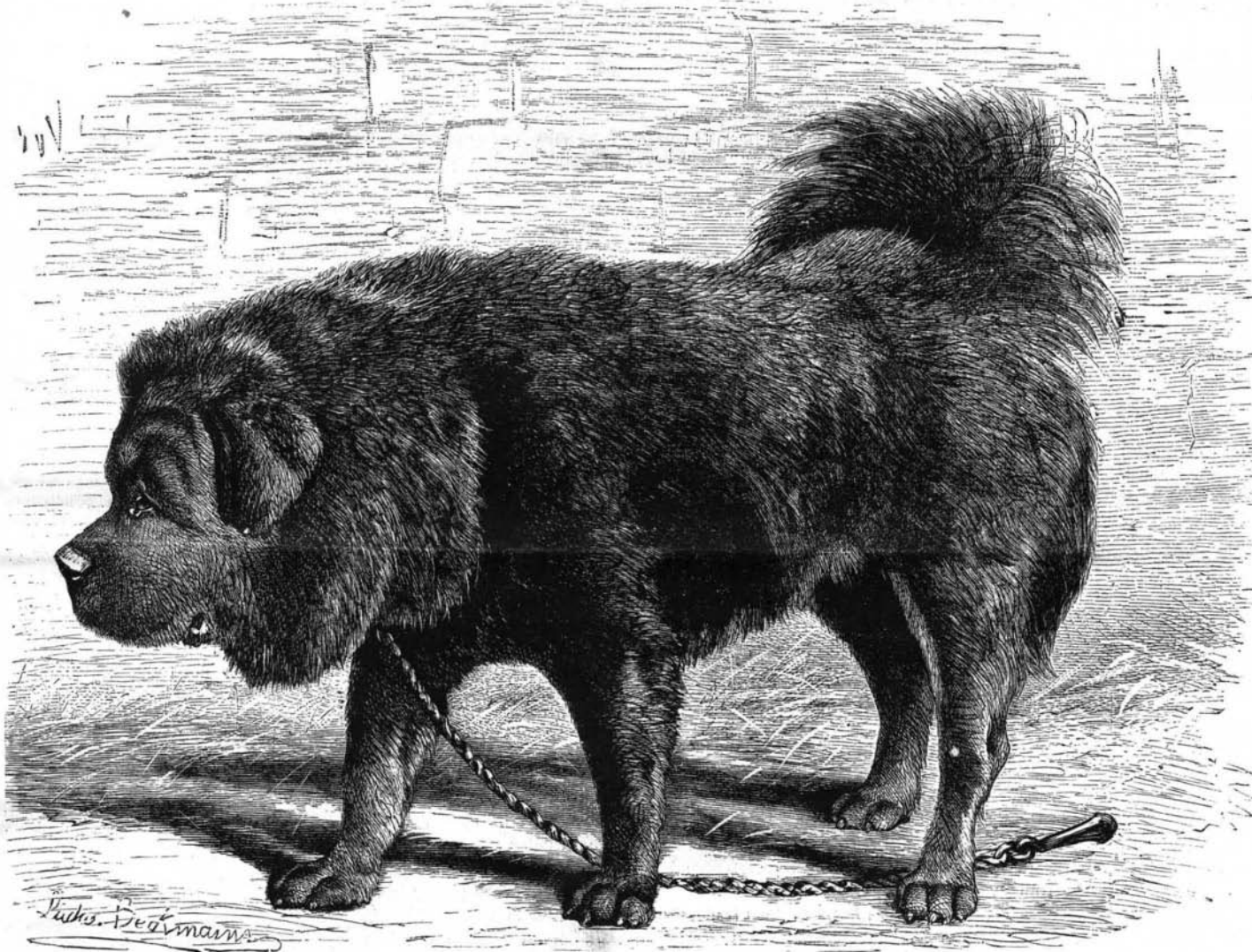
* Cuiraase de Station, a ship, in European navies, ranking second in the list of fighting ships.

The "Dugong," or Vegetarian Whale.

A writer in the *Gentleman's Magazine* gives some interesting particulars relative to this species of whale, now taken to a considerable extent in Queensland, and valuable alike for its oil and as food. Its size varies from eight to twenty feet in length, it lives upon submarine meadows of seaweed, it has no gills, but breathes air by means of lungs, its head is round and somewhat human like, and has hair something like that of a man's beard. It is said many stories of merman and mermaid may be traced to these creatures. Their oil is said to have all the medicinal merits of cod liver oil without its unpleasant flavor; at ordinary temperatures it deposits crystals, as olive oil does in frosty weather, but on warming slightly becomes liquid and clear. The flesh is much prized in Australia, being cut off in fitches and slabs, and it is stated that "from the same animal is taken meat resembling beef, veal, and bacon."

THE THIBET DOG.

The peculiar dogs of Thibet have frequently been described by travelers, and generally the size and strength of the same have been exaggerated. A very fine specimen of these animals was exhibited at the Vienna Dog Show, a picture of which is given herewith. The animal is about as high as a large pointer or setter, and has some resemblance to those Newfoundland dogs known as "Labrador dogs."

**THE THIBET DOG.**

His long, thick, and soft hair lies closely against his body and is not kinked; the color is a deep, brilliant, glossy black with yellow spots over the eyes and light colored spots on the paws. The wrinkled forehead, the small eyes, and hanging upper lip give the animal a threatening appearance, which corresponds with its ugly and vicious disposition.

These animals have generally been known as "Thibet hounds;" but this name is not correct, for although they resemble hounds somewhat in their appearance, they do not belong to this class of dogs.—*Illustrirte Zeitung*.

The Mole and His Little Ways.

The Rev. J. G. Wood lately delivered at Cooper Institute, in this city, a lecture on the mole. He said in part: "If a man were placed in a damp, dark, subterranean prison, he would not like it a bit, but would make the best of his way, as quickly as he could, to the air, the light, and the warmth of the upper world. Moles do not agree at all with human beings, but prefer coldness, moisture, and darkness. The mole is a burrower, and in the natural pursuit of his vocation—devouring the pupa of caterpillars, and also ground worms—he is compelled to throw up those little mounds of fresh earth which are called mole hills. Farmers strongly object to them on this ground, because mole hills look untidy. Then they have a lurking prejudice that they also do damage to the crops, which is nonsense, because the mole is strictly insectivorous and carnivorous, and utterly disdains cereals or roots. He is really a benefactor, because he supplies the farmer with a top dressing of unexhausted earth."

"All burrowers must be cylindrical and pointed at the foremost end, and that is the shape of the mole. He is inter-

mediate in size between a mouse and a rat, and his anatomy is highly interesting from the manner in which all the muscular power goes to the fore arm, which does the burrowing, and the spade-like hands with the long claws. Anatomists at one time were greatly puzzled by what appeared to be a sixth finger, which would have been a terrible anomaly. Fortunately it was discovered to be not a finger, but a radial sesamoid, of which the human anatomy contains numerous instances, as, for example, the knee cap. It was for the purpose of extending the forking power of the mole's hand. When an honest agriculturist comes to a bit of hard ground, he first loosens it with the fork and then shovels. The mole does precisely the same. When he opens his fingers as wide as he can, he does the forking business; when he closes them compactly, he shovels. I have seen at an agricultural fair a very smart digging machine, but upon examining it I found it to be only the mole's hands multiplied and set on wheels.

"The mole has eyes, but he does not use them very much. Shakespeare speaks repeatedly of the blind mole, but the sweet bard of Avon was incorrect. The mole is not blind, but his eyes are exceedingly small. If any person wants to find out this for himself he must first hold his mole, which is no joke, for they bite like fiends and scratch with their fore-paws like wild cats. Then by blowing away the fur, a small black speck appears, which is the eye. But the best

eruption had continued at a very great height in the atmosphere," and thus been more widely distributed over the earth than ever before. The Sandwich Island observer thus describes the appearance there at that early date:

"I would note three peculiarities of this phenomenon, distinguishing it from ordinary sunset reflections, and unlike anything I remember to have observed before. First: It appears to be a reflection from no cloud or stratum of vapor whatever. An undefinable haze might, perhaps, be fancied to be the medium reflecting sunlight. Second: The peculiar glow, as of a distant conflagration, totally unlike our common sunsets. Third: The very late hour to which the light was observable, long past the usual hour of total cessation of twilight. To these may be added a fourth peculiarity—that the center of brilliancy was more or less to the south of west."

Vaccination and Small-Pox.

Notwithstanding the almost universal consensus of public opinion among intelligent persons as to the importance of systematic and thorough, and, if necessary, compulsory vaccination, as a preventive of small-pox, we fear it is too true that the majority of people "take chances," or omit the precaution till they hear of the spread of the disease. Some of the Southern cities have been energetically agitating this subject, and the New Orleans Auxiliary Sanitary Association

way is to put the mole in water, when the eye immediately appears, showing that he has the power of projecting the eye beyond the fur. The same proverbial wisdom that made the mole blind gives it credit for a sense of hearing singularly delicate; yet the fact is that the ears are not specially acute. The delicacy of hearing is due to the singular manner in which the earth carries wave sounds, a circumstance well known to hunters and military men. The sense of smell is the pre-eminent quality in this creature, and upon which he depends chiefly to procure food. Moles are fiery to the last degree, and quarrelsome. Whenever two meet they fight, and the vanquished is devoured by the victor."

The "After Glow."

The red sunsets noticed over a large part of the earth for many weeks form the subject of a careful essay by Mr. George W. Stewart, of Tulare, Cal. It is believed the phenomena cannot be attributed to density of atmosphere, effect of heavy sandstorms, or any local conditions, which would have no effect at such great distances above the earth's surface, the light appearing far above the uppermost stratum of clouds. The writer recounts some former phenomena in connection with eruptions at Honolulu and at Java, and concludes that the recent noticeable sunsets have been caused by finely divided volcanic dust or gaseous vapor from the great eruption in Java, which broke out August 26 last. It is pointed out that the volcanic dust of lesser eruptions has frequently been carried thousands of miles, and that Mr. S. E. Bishop, of the Hawaiian Survey Department, as early as September 22 concluded that "some very light element among the vapors of the Java

publish, for the information of the public, a pamphlet thereon, written by Prof. Stanford E. Chaille, M.D., which gives arguments and statistics it is impossible to gainsay. Among other matters suggested, is the fact that on some few persons vaccination can never be made "to take," which is not singular, since some persons will not take small-pox; the estimates of the proportion of persons insusceptible to small-pox vary from 4 to 22 in every 100. Other persons are insusceptible to vaccination at one time, yet susceptible at another; which is also true of small-pox. On some persons vaccination will take several times, which is also true as to small-pox, for there have been persons who have had veritable small-pox not only twice, but even six times. On some persons, not the majority, the protection given by vaccination wears out in time. Actual experiment by vaccination is the sole means of determining whether any person belongs to either of these classes. The most serious imperfection connected with vaccination is its frequently careless and, therefore, imperfect performance. The good results necessarily vary with the efficiency of the operation. Any sensible person can estimate this efficiency by the appearance of the resulting scar or cicatrix. This, if perfect, is indelible, circular, depressed, dotted with minute pits, and not less than a quarter of an inch in diameter. Several such scars indicate greater security. English official instructions require four to five separate punctures.

THE TELEPHONE IN ITALY.—In proportion to its population Italy makes more use of the telephone than any other country in the world. There are now 4,786 subscribers to the General Italian Telephone Company, being an increase of 100 per cent in the last year.