Sometimes the dentist had to take plaster casts of the defective tooth and adjacent parts, and by their aid manufacture temporary bulworks of gum mastic, to fit the mouth, with a view to shut off the water from the designated tooth. This preliminary operation involved much more time and trouble than the filling of the tooth.

Then there were the tongue clamp, the gum clamp, the gag, the iron presser, and other special tormenting devices, which were brought into operation for the one purpose mentioned; to say nothing of sponges, blotting paper, and cloth napkins, with which it was deemed necessary to stuff and torture the patient's mouth. All of these relics of what may be termed the dark age of dentistry have been superseded by Dr. Barnum's rubber dam. The author occupies a high place in the estimation of the profession, by whom he is justly regarded as a benefactor; while every dental patient, who remembers the old instruments, gives honor to the inventor, and rejoices with elastic profanity.

THE LATE DR. NELATON.

To Nélaton, the greatest of modern French surgeons, recently deceased, it is said that the medical profession owes the perfection and simplification of an immense number of the most difficult chirurgical operations. Although he wrote but little, he manifested a wonderful genius for devising tools and apparatus, and for imparting clinical instruction to others. "Give him a piece of wood, some iron wire, and some chisels," says a biographer, "and he will invent and construct an instrument to suit any requirements."

He detested display, and particularly avoided spreading out cases of implements during the course of an operation. "Surgery *à grand orchestre*," he called such exhibitions; and it seemed as if he managed to do far more with his fingers than many other surgeons with the most elaborate of tools.

His coolness equaled his dexterity, and some of his sayings will doubtless pass into proverbs. "When you have made a correct diagnosis and know what you are about, you risk nothing," was a favorite remark. "If you have the bad luck, while operating, to cut a man's carotid artery, remember that it takes two minutes' time to cause syncope, and four minutes will elapse before he bleeds to death. Now four minutes is just four times as long as is necessary to place a ligature on the vessel, provided you do not hurry": and "You are working too quickly, my friend; remember that we have no time to lose," were other now famous observations made during the course of difficult operations.

Nélaton attained very general celebrity from the fact of his treating the Prince Imperial and the wounds of Garibaldi. He died of a lingering malady of the heart, continuing his teachings and practice to the last.

SCIENTIFIC AND PRACTICAL INFORMATION.

A NEW GALVANIC BATTERY.

Abbe Fiehol, says *Les Mondes*, has recently constructed a new battery, using a Spanish mineral which is probably a kind of pyrites. Within a glass jar is placed a zinc cup, 7 inches long, 3 inches deep, and 2 inches broad, into which the mineral is packed. Above is a piece of copper, and the interstices are filled with pulverized coke, mixed with ten per cent of chloride of sodium (common salt) and moistened with water. Four elements, united with isolated copper wires, copper to copper and zinc to zinc, it is stated, gave a current of surprising energy, fully equal to that of five Bunsen couples. The battery is constant, and it has been found that, after eighteen months continuous use, it operates as well as when first employed. The only condition seems to be that it should be kept thoroughly moistened.

A NEW TEXTILE PLANT.

The jury at the recent Exposition, at Lyons, France, awarded a medal for the utilization of the fiber of a marsh plant, commonly known as the *massette*. It is of the typha family, and three varieties, namely, *typha latifolia, angustifolia* and *minima*, yield the fiber. The plant grows in a wild state in great profusion in streams of water, ponds, etc., and reaches a hight of some ten feet. Heretofore it has been employed for seating of chair bottoms and thatching of cottages, and occasionally in place of straw as bedding for animals.

The mode of extracting the fiber from the leaves after the latter are cut and dried consists simply in boiling them for several hours in an alkaline solution and afterwards dressing them in a mill or under rollers. Washing terminates the process. A yellowish paper is made, worth about $16 per 220 pounds. The fiber, it is believed, may be used for fabrics and for cordage, and is considered equal to hemp, flax or jute.

AMERICA NO LONGER A CUSTOMER FOR BRITISH STEEL.

The excitement produced in Sheffield by the rise in coal has been intensified by a rumor that one of the largest firms engaged in the manufacture of steel—mainly for American customers—is about to transfer its business to the United States. For a long time past these makers have been producing steel from Bilbao ores, but have at last found themselves (overweighted by the cost of freight and the high prices of fuel and labor) unable to compete with American makers, who import the ore direct, and manufacture upon the spot. If confirmed, says *Iron*, this report will only tend to prove more clearly than before that, although we need not—for awhile—dread the American as a rival, he is gone for ever as a customer.

THE MANUFACTURE OF MAGNESIA.

The Washington factory, near Newcastle, England, manufactures the greater part of the magnesia used in the world. The principle of the process employed consists in treating dolomite with gaseous carbonic acid, under a pressure of 5 or 6 atmospheres. The dolomite is first dried, then finely pulverized, and afterwards placed with cold water in a cylinder which constantly revolves on its horizontal axis. The carbonic acid gas formed by the action of hydrochloric acid upon carbonate of lime is, by a powerful pump, driven into the vessel at the pressure above noted. The solution of bicarbonate of magnesia thus produced is carried into a vertical cylinder and submitted to steam (the consequent elevation of temperature regenerating the neutral carbonate,) and then led into canals beside the last mentioned receptacle. Lastly, the substance is gathered into masses, from which are cut the parallelopipeds which, after desiccation, are supplied to commerce. Caustic magnesia is obtained by heating the carbonate in red hot muffle furnaces.

ANALYSIS OF TEA.

Zöllers analysis is as follows:

Potash	39·22
Soda	0·65
Magnesia	6·47
Lime	4·24
Oxide of iron	4·38
Protoxide of manganese	1·03
Phosphoric acid	14·55
Sulphuric acid	trace
Chlorine	0·81
Silica	4·35
Carbonic acid	24·30
	100·00

THE BRITISH ASSOCIATION.

We continue, from our last, abstracts from papers read at the late meeting at Bradford:

HEAT-CONDUCTING POWER OF ROCKS.

Professor Herschel and Mr. Lebour have been experimenting in this subject. Twenty-eight specimens of rocks were reduced to uniform circles of 5 inches diameter and ½ inch thickness, carefully gaged. Out of six specimens that had been tried, slate plates, cut parallel to the plane of cleavage, transmitted the heat faster than any of the others. Where the flow of heat had become uniform, the water was raised 1° Fah. in thirty-two seconds. With marble, sandstone, granite, and serpentine, about thirty-nine seconds were required to raise it by the same amount. The greatest resistance to the passage of heat was offered by two specimens of shale, gray and black, from the coal measures in the neighborhood of Newcastle, which occupied forty-eight or fifty seconds in raising the water one degree, or half as long again as the time taken by the plate of slate.

PHOTOGRAPHS OF INVISIBLE SUBSTANCES.

Dr. J. H. Gladstone, F. R. S., called attention to some photographs of fluorescent substances. Fluorescent substances, such as bisulphate of quinine or uranium glass, have the power of altering the refrangibility of the violet or chemical rays of light; hence, although paper painted over with bisulphate of quinine will look nearly white, it will appear in a photograph as if it were nearly black. Dr. Gladstone exhibited some photographs of ornamental design traced on white paper with bisulphate of quinine; although the designs were nearly invisible to the eye, in the photographs they were boldly visible. A colorless solution of bisulphate of quinine was placed in one glass, and some ink in another glass; when both glasses were photographed, they came out equally black. Dr. Gladstone said that once, at the seaside, he painted a pattern with bisulphate of quinine upon paper, and took the paper to a photographer to be photographed; he objected, because there was nothing on the paper, but on trying the experiment he found out his error. It was stated that some kinds of varnish possess a similar power of affecting the refrangibility of light.

SHOOTING STARS.

It appears, from the report of the Luminous Meteor Committee of the British Association, that shooting stars and large fire balls have appeared during the past year in more than usual varieties. Large meteors have presented themselves in considerable numbers, and ordinary shooting stars in a more striking manner, as regards the explanation of their origin, than has often been the case in former years. Of all these kinds of shooting stars, both large meteors and meteoric showers, much accurate information has reached the committee. Two of the largest fire balls seen in Great Britain were aërolitic, or burst with the sound of a violent explosion on November 3 and February 3 last. Aërolitic meteors and aërolites have also been noticed in the scientific journals of other countries, which have given rise to experiments on the composition of aërolitic substances, both chemical and microscopical, the conclusions of which continue to extend the range of our speculations regarding the origin of these bodies. Thus the existence of carbon and hydrogen, in the atmosphere from which the largest iron meteorite yet found (a few years since upon the shores of Greenland) was expelled, confirms the discoveries of Grahame and Professor Mallet, in America, of the existence of the same gases in other meteoric irons. Dr. Wöhler has thus detected the oxides of carbon as gases in the vast meteoric iron of Ovifak, found in Greenland and brought to Stockholm during the last few years by Professor Nordenskiöld; and the same gas was found by Professor Laurence Smith in the siderite which fell recently in the United States. A connection between comets and meteorites appears to be indicated by these discoveries, in the spectra of some of which gases containing carbon appear to have been certainly recognized by Dr. Huggins.

The past year was distinguished by the occurrence of a most remarkable star shower on the night of November 27 last, to the expected appearance of which astronomers were looking forward with especial attention, from the unexplained absence of the double comet of Biela (to which it belongs), from its accustomed returns in the last three of its periodical revolutions.

The cloudy state of the sky unfortunately deprived observers in the South of England from witnessing the sight; but in Scotland, and north of the Midland counties of England, many uninterrupted views of it were obtained. On the European continent and in the United States of America, as well as in the East Indies, at the Mauritius, and in Brazil, observers were equally fortunate in recording its appearance, and few great star showers have hitherto been more satisfactorily observed, or indeed more abundantly described. In an astronomical point of view, the agreement of the time and other circumstances of its appearance with the supposed path of the lost comet is so exact as to prove that the calculations made by astronomers of that comet's orbit cannot be affected by any errors of a large sensible amount, and a proof almost certain is thus obtained, that the disappearance of the comet is owing to no unexplained disturbances of its path; but that like some former comets of variable brightness, it has not improbably faded for a time out of view, and that at a future time a reasonable expectation may be entertained of re-discovering it pursuing its original path in repeated visits to the earth's neighborhood, and to the field of telescopic observation.

IMPROVED PROCESS FOR PURIFYING COAL GAS.

Mr. Vernon Harcourt said that the usual method of freeing coal gas from sulphuretted hydrogen was by passing it through lime. But oxide of iron was also employed in place of the lime, the advantage possessed by the oxide being that while the lime, after it had served its purpose, was useless and difficult to get rid of, the oxide of iron could be used repeatedly for the same purpose. The chemical changes involved were that, when the gas had passed through the oxide the latter was changed into sulphide of iron; when the sulphide was exposed to the air, the sulphur separated and the oxide was re-formed, thus enabling the oxide to be again used. This was called a continuous process, because the oxide could be continuously used. But the process was not quite continuous, for, after the oxide had been used some thirty times, it became so clogged with sulphur as to be useless. The new process was applicable wherever oxide of iron could be used in the purifying process. The difference from the old process was that the oxide during revivification was moistened with a solution of ferric sulphate (persulphate of iron), and a portion of the oxide was removed from time to time, and treated as follows: It was first extracted with water by the use of a well known arrangement. The soluble salts were sulphate of ammonia—formed in the purification by the reaction of ammonia upon ferric sulphate—and, in smaller quantities, sulpho-cyanide, hypo-sulphite, and probably sulphate of ammonia. This extract was mixed with a small excess of sulphuric acid; and yielded, when concentrated by evaporation, crystals of ammonium sulphate. The remainder of the substance was then boiled with dilute sulphuric acid, which dissolved the oxide and left a residue of sulphur. The actual process of extraction by acid consisted in treating the substance successively with (1) a solution of ferric sulphate containing some free sulphuric acid; (2) with a more dilute solution of ferric sulphate to which sulphuric acid had been added; (3 and 4) with more dilute solutions of ferric sulphate—all these liquids being the product of a former extraction—and (5) with water. The liquid resulting from the first of the treatments enumerated above was a strong solution of ferric sulphate, which was used as already mentioned, by being mixed with the charge of oxide before it was replaced in the purifier. The residue of the final washing consisted almost entirely of sulphur, and required only to be dried. It would be evident that all the oxide which had been freed from sulphate of ammonia and sulphur by this treatment passed into the condition of ferric sulphate, and in this condition it was replaced in the purifier. There it again became oxide by the action upon it of the ammonia in the gas, which it completely removed, fixing it as sulphate. This system had been brought into use as a manufacturing process, and had been found to be, as far as could be judged, a complete success.

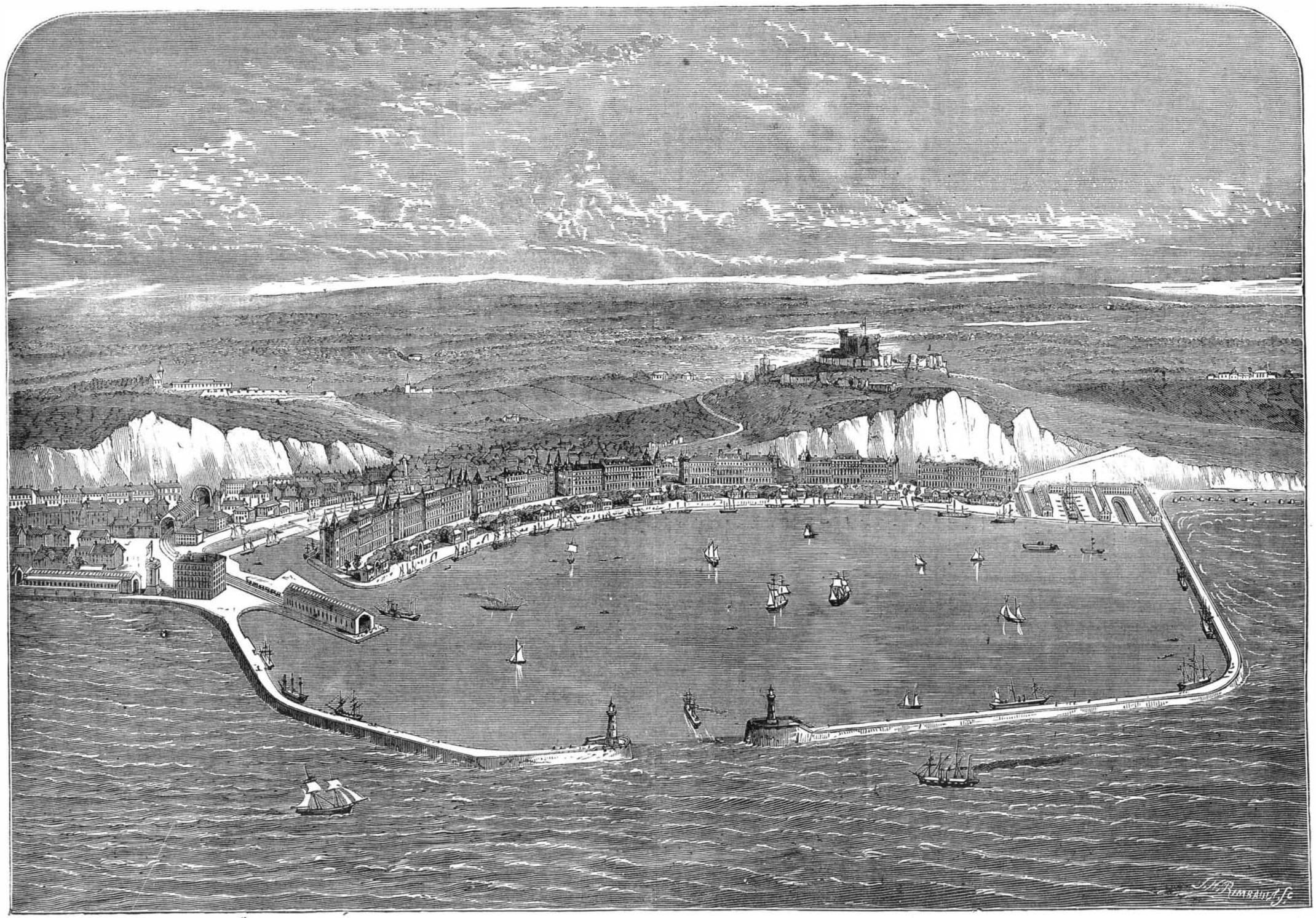
NEXT YEAR'S MEETING.

The next meeting of the British Association is to take place at Belfast, Ireland, on August 9, 1874. Professor Tyndall has been elected to preside.

A Gigantic Cotton Press.

We devote our initial page this week to the illustration and description of a new machine for the compressing of cotton, hay, or similar material. The apparatus is a gigantic affair, occupying two stories of a moderate sized building, and is a model of admirable workmanship. The parts, though weighing tuns, move with the ease and regularity of a well balanced engine, and the tremendous pressure which they develope produces results which it is difficult to imagine could be otherwise so well and readily effected.

The application of the invention to the re-pressing of cotton bales, previous to their shipment abroad, will tend to increase materially our present facilities for exportation, as a vessel is thus enabled to carry fully three times more of the staple than heretofore. There are many advantages gained, notable immunity from danger of fire or injury by moisture, increased facility in handling, besides others which will be easily apprehended on perusal of the description of the device. Apart from its capabilities, the machine is intrinsically well worthy of the examination of engineers and mechanics.



THE TOWN AND HARBOR OF DOVER, ENGLAND, WITH THE PROPOSED NEW WORKS.