criticism, as this made it difficult for the potter to obtain just the kind or grade of clay he needed, the different qualities frequently being mixed, so that there was no uniform standard. To remedy this it was said that clay miners must work their beds on a broader scale, so as to obtain a more even grade, as, even in the best strata, there were variations every few feet, and, by working in a small way, it was impossible to prevent the mixing of the different qualities.

The interesting archæological discoveries of Dr. Schliemann and General Di Cesnola have, of late years, drawn more particular attention to ancient accomplishments in the ceramic art, but, while so much interest is being developed in the purely artistic side of the question, we hope the practical department—that which tends to develop and enlarge an important home industry—will not be lost sight of.

ANOTHER RAIN CONTROLLER.

Several schemes for the artificial production of rain have been noticed in recent issues of the SCIENTIFIC AMERICAN. Mr. Geo. H. Bell, of this city, goes further, and sends us the plan of a rain tower, by which he would not merely produce rain when it is needed, but prevent rain when nature is disposed to grant that blessing too liberally.

Mr. Bell's rain tower is a charming little structure of stone, one hundred feet in diameter at the base, and tapering to sixty feet diameter at a height of one thousand feet. Above this rises a tubular tower of wood or iron, say five hundred feet. It would not often be necessary to go above one thousand five hundred feet, Mr. Bell thinks, though that altitude might be exceeded if necessary. Of course there would be no risk of such a tower being blown down or crushing its foundation by its own weight.

The interior hollow of the tower would have a diameter of twenty feet; and through it a vast volume of saturated air could be blown into the upper atmosphere by means of proper machinery at the base of the tower. In case that might not suffice to secure the desired precipitation of rain, an additional up-rush of air around the tower is obtained by means of numerous tubes leading upward and outward from the interior of the tower at an angle, say, of 45°. Similar tubes descending from the inside to the outside of the tower serve as inlets, the air let in through them being sucked in by the ascending current within the tower; then, after it has received "the upward impetus of the inside force," it will be ejected upward through the ascending tubes. "Thus," in the words of the inventor, "through every stratum of air pierced by this mammoth rotunda, the air surrounding the outside walls will be agitated by an upward influence," making the exterior ascension indefinitely exceed the interior.

The inventor adds: "While these tubes, discreetly located at meteorological centers, would doubtless become reliable agencies for the formation of clouds, it should be their faculty also to prevent rain; for by reversing the motion of the fan or blower, a descensional flow of air would begin, which might annihilate the clouds overhanging, by bringing them to earth in aeriform and holding them here [securely bottled of course!] until they be wanted in precipitation on some locality, then instituting the ascensional flow and send them up to be condensed."

Mr. Bell suggests that a single timely rain would pay the cost of building a tower of this sort, "and a nation furnished with a reasonable number might prove them her wealth and grandeur."

REMARKABLE EXPLOSIONS OF GAS.

An explosion of gas of a magnitude unprecedented in the history of gas illumination, occurred in London, July 5. The district in which the disaster happened had been supplied with gas through a system of small (three and four inch) mains, which had become inadequate. Accordingly preparation had been made to increase the supply by laying down a new thirty-six inch trunk main. This work had nearly been completed, only a single length of pipe having to be put down before the gas could be turned in. The point of junction was in an open trench, where the end of the main had been plugged and fitted with a half inch stand pipe.

Just before the explosion workmen had been engaged in cutting out the plug from the end of the pipe. The foreman was standing on the main near the stand pipe, from which he had removed the pressure gauge with which he had tested the main, and ascertained that there was no pressure in it. He then smelt the stand pipe to ascertain whether any gas was issuing therefrom, and finding none came out, he applied a light, and almost immediately a dull rumbling sound was heard, followed by an explosion, which blew one of the workmen a considerable distance into the open pipe on the opposite side of the trench, killing him instantly, and so injuring the other man that he died shortly after his removal to the hospital. The foreman escaped unhurt. There was a quantity of dust and smoke, but no flame was seen.

Almost simultaneously another explosion occurred some yards away, and was followed by five or six more explosions at varying distances along the line of the main. The streets were much torn up, many buildings were wrecked or more or less seriously injured, and several persons were hurt. At the second point of explosion something like a dozen lengths of main were upheaved; at others, from three to six lengths were blown out; while in two places the explosion was limited to one length. At each point of explosion the paving stones were hurled into the air, causing great destruction of surrounding property, and peril and injury to passers-by.

At the coroner's inquest, the foreman of the pipe layers testified that the point of first explosion was nearly two miles from the "live" main containing gas. The new main —technically "dead" main—was shut off from the live main by means of a valve and cap, the cap being bolted on so that there was no flow of gas from the live main to the dead one. Everything was ready, however, to turn the gas into the new main when the lacking length at the west end had been laid. How the gas got into the main which was broken up is a mystery. In his testimony, the chief inspector of the gas company said:

"I was certainly not aware of there being gas in the main; but it did not occur to me to test it. I did not think gas had come there. The valve in Howland street was put in under my superintendence, and I know that it was sound and proper. I have no doubt that the explosion was caused through there being gas in the main to the westward. About five per cent of gas combined with atmospheric air would be sufficient to create an explosive mixture, but ten per cent would be more dangerous. The main had not been tested with a view to seeing whether gas was present. It is my belief that gas had got mixed with the air in the main, but I cannot account for it. The theory I have formed is that gas must have escaped from a fracture in one of the smaller pipes, and found its way into the main."

Another theory was that the passage of some heavy vehicle over the valve in Howland street might have loosened it enough to let a sufficient quantity of gas into the "dead" main to make the mixture of gas and air explosive. The explosion not only tore up the streets in places, but broke in the sewers, and so damaged the gas and water connections of the houses as to leave the district for some hours without water or light.

Though this accident was pronounced unprecedented by gas engineers, it was quickly followed by a similar but fortunately less disastrous one of the same sort. A number of workmen were engaged in enlarging a gas main at Bilston, near Wolverhampton, England, when, through an incautious use of a light, an explosion occurred, and a portion of the roadway and pavement was upheaved. The explosion traveled underground, and burst at some distance from its origin. The amount of damage done, however, was not great, and no lives were lost. A second explosion occurred some hours after the first.

THE TEXAS HYDRAULIC MINERAL BELT.

A correspondent, writing from Round Rock, Texas, announces the recent discovery of a valuable and very extensive deposit of hydraulic earth, which crops out along a belt many miles in length. At Del Valle, on the Colorado River, eight or ten miles from Austin, it shows a stratum from sixty to eighty feet thick, above the river. At Round Rock, twenty miles northeast of Austin, it lies two feet below the surface, and is of unknown depth. At this point it is easily converted into quicklime by burning. Mixed with from two to four parts of sand it produces a hydraulic building mortar or artificial stone, said to be equal to that made with the best English Portland cement. By similar treatment with three parts fine sand through one-eighth mesh sieve, and three parts coarse gravel through one-fourth sieve, it produces a concrete which, when moulded and pressed, gives a hydraulic stone brick of superior quality, suitable for all common building uses. The presence of such an inexhaustible supply of material for making cheap and strong artificial stone cannot fail to be of great benefit to Texas.

ARSENIC IN WALL PAPERS.

A law suit concerning the use of arsenic in colors was lately tried in the High Court of Justice, London. Steinhoff, a color maker, sued Woollams & Co. for a small bill for colors furnished. Woollams refused to settle because the colors were found to contain arsenic; they not only refused to pay, but claimed damages against Steinhoff to the amount of nearly two thousand dollars. It was proven on the trial that Steinhoff, when he sold the colors, which were the "imitation azure blue," guaranteed that they contained no arsenic. Woollams showed that his reputation in business was to a great extent founded on the fact that his wall papers were made without arsenic. Believing that the colors of Steinhoff contained no arsenic, he made up a lot of wall papers therewith. Subsequently it was found that the colors contained arsenic to the large extent of fifty per cent. The jury allowed the claim for damages. So the plaintiff, instead of obtaining a judgment in his favor, had a heavy judgment rendered against him, and had to pay the costs on both sides in addition.

THE MAGNET IN MEDICINE.

Some recent researches undertaken under the direction of Prof. Charcot, in his laboratory at the Salpêtrière, have attracted attention anew to a therapeutical agent which has been known for a long time, but which at the present time has fallen into disuse. We refer to the application of the magnet in the treatment of certain diseases. It is claimed by the believers in the efficacy of this mode of treatment that magnetization has fallen into discredit on account of the absence of precise rules for the application of the remedy, and also because of the air of mystery which seems to be connected with it. To Prof. Maggiorani, it is said, is due the credit of calling attention again, in 1869, to the value of magnetic medication, and of endeavoring to establish it on a rational and strictly scientific basis. The first experiments were made at the Salpêtrière in order to verify the facts collected together by M. Burq under the generic title of metallotherapy. After the results obtained by metallic applications, it was natural to endeavor to throw some light on these phenomena by varying the conditions of experimentation. It was found that patients (especially those afflicted with nervous diseases) were not only acted upon by plates of different kinds of metals, but that like results were obtained by the majority of physical agents, such as weak currents, static electricity, sonorous vibrations, differences of temperature, magnetized bars, etc. It was soon found that magnetized bars were remarkable for the consistency of their action and the facility with which they could be employed. It is not claimed that magnets are endowed with specific properties, but that they form part of a group of physical agents which, in varying degrees, possess the same power as the above-named of affecting the nervous system and giving rise to biological phenomena. The Salpêtrière researches have provoked a lively discussion. The facts announced have been confirmed in Germany, Italy, England, etc., but have been boldly attacked likewise in the last-named country.

A medical writer in *La Nature*, who has been a witness of Prof. Charcot's experiments, says that the action of the magnet is in some respects so surprising that it might *a priori* excite mistrust. The application is not direct. The magnet is not placed in contact with the skin of the subject experimented on, but its action takes place at a distance. To influence the organism and to produce the same effects as with metals it only suffices to place the poles of the magnetized bar at one or two centimeters' distance from that portion of the body upon which it is desired to act. It is thus that all the experiments have been made at the Salpêtrière. It is not necessary that the magnet should be a large one, but merely that the magnetic force should be appreciable. It is alleged by the writer in question that this mode of treating disease should be ranked of equal value with other methods now in use, such as that of electricity, etc.

The Growth of our Export Trade.

During the year just closed both the value of the imports of merchandise into and the value of the exports of merchandise from the United States were larger than during any preceding year in the history of the country. According to the annual report of the Chief of the Bureau of Statistics, just issued, the value of the exports of merchandise during the year ended June 30, 1880, exceeded the value of the exports of merchandise during the preceding year about $125,000,000, or 18 per cent, and the value of the imports of merchandise during the year ended June 30, 1880, exceeded the value of such imports during the preceding year about $222,000,000, or 50 per cent. The increase of the value of imports of merchandise exceeded the increase in the value the exports nearly $97,000,000.

The value of the imports and exports of merchandise during the fiscal year just closed exceeded the value of such imports and exports during the preceding year about $347,000,000—an increase of 30 per cent. The rapid growth of the foreign commerce of the country is strikingly exhibited by the fact that the value of the imports and exports of merchandise during the fiscal year just closed amounted to $1,503,679,489, being about 81 per cent greater than the value of the imports and exports of 1870, and nearly 119 per cent greater than the value of the imports and exports for 1860.

The exports of coin and bullion during the year ended June 30, 1880, were about $7,800,000 less than during the preceding fiscal year, and the imports of coin and bullion during the year ended June 30, 1880, exceeded the imports during the preceding fiscal year about $72,700,000. During the year just closed, for the first time since 1861, the imports of coin and bullion exceeded the exports of the same.

Wanted—An Easy Place.

Rev. Henry Ward Beecher some time since received a letter from a young man, who recommended himself very highly as being honest, and closed with the request, "Get me an easy situation, that honesty may be rewarded." To which Mr. Beecher replied: "Don't be an editor, if you would be 'easy.' Do not try the law. Avoid school keeping. Keep out of the pulpit. Let alone all ships, stores, shops, and merchandise. Abhor politics. Keep away from lawyers. Don't practice medicine. Be not a farmer nor a mechanic; neither a soldier nor a sailor. Don't study. Don't think. Don't work. None of them are easy. O my honest friend, you are in a very hard world! I know of but one real 'easy' place in it. That is the grave."

Injurious Effects of the Buttonball.

Les Mondes states that a French medical journal has recently called attention to the injurious effects that are apt to follow a residence near the common shade tree, the buttonball or plane tree. The fact has long been known, even from the time of Pliny, that a stay near these trees is often followed by an irritation of the air passages, followed by a disagreeable and sometimes persistent cough. This is due to the fact (familiar to botanists, though perhaps not to the general public) that the young shoots, leaves, and stipules are covered with a fine thick down composed of minute branched rigid hairs, which falls off as these parts become older, and often floats in the air in large quantities. It is the inhalation of this that causes the throat difficulties. It often causes serious annoyance to employes in nurseries where the tree is raised, and who fail to take precaution against it.