into the sewers of the cities, which, like a bottomless pit, have for centuries swallowed up the guano elements of the English fields; and after a series of years the land will find itself precisely in the condition it was in before the importation of guano and bones commenced. A very little reflection will lead to the conviction that the relations of populations are governed by a great and comprehensive natural law, according to which the return, duration, increase or diminution of a natural phenomenon depends upon the return, duration, increase, or diminution of its conditions. This law governs the return of the harvest upon our fields, the maintenance and increase of the population, and it is easy to see that a violation of this natural law must exert upon all these relations a pernicious influence, which can be set aside in no other way than by the removal of its causes. If, then, it is known that certain existing relations work deleteriously upon the fields, it can be foreseen that their continuance must bring about the ruin of agriculture.

It has been maintained that the recovering of the manure elements out of the sewers in the large cities is impracticable. I am not ignorant of the difficulties which stand in its way—they are indeed very great; but if the engineers would come to an understanding with the men of science in relation to the two purposes—the removal of the contents of the sewers, and the recovery of their valuable elements for agriculture—I do not doubt that a good result would follow. Intelligence, in union with capital, represents a power in England which has rendered possible and practicable things of much greater apparent difficulty. I look forward with deep concern to the solution of the "sewerage question." For if this question is decided in Great Britain without regard to the wants of agriculture, we can scarcely hope for anything better upon the continent.

Countries may be fruitful, and become capable of sustaining a large population, when certain resisting influences, which in their unimpeded working make the cultivation of the soil impossible, are overcome by human intelligence; or when a land has all the conditions of productiveness except one, and then receives the one which it lacked. If Holland were without her dikes, which must be kept up at great expense, she would produce neither corn nor meat; the land would be uninhabitable. In a similar manner the inhabitant of the African oasis protects his grain fields by dikes against the storms of the desert, which cover his ground with a barren sand. I know that the prophets of future evil have at all times been derided by their own generation, but if history and natural law can furnish any ground whatever for a just conclusion, then there is none which stands upon a firmer basis than this: that, if the British people do not take the pains to secure the natural conditions of the permanent fertility of their land—if they allow these conditions, as hitherto, to be squandered, their fields will at no distant day cease to yield their returns of corn and meat.

CALIFORNIA WINE.—The Sonora *Aye* gives the following information relating to the wine manufacture in that place:—"At Moussaud's vineyard, near the foot of Bald Mountain, they are pressing nearly their entire crop, and have 1,500 gallons of white wine already made. They will make 4,000 gallons in all. Mr. Peltret has made 500 gallons of excellent wine, and has still a lot of grapes on hand, preserved for table use. Madame St. Cyr makes 500 or 600 gallons of wine; and about the same quantity will be made by Madame La Carce. Uncle John Moss has made 160 gallons of excellent red wine from 1,837 lbs. of grapes. Besides the wine thus manufactured from the grape, some brandy and a large quantity of vinegar will also be made. It will be seen, from the figures given, that very nearly 6,000 gallons of wine will be produced this season by a few small vineyards in the vicinity of this town. This will readily sell from $2 to $2.50 per gallon, which, at the lowest figure, will net $12,000 for the whole."

LIQUID GLUES.—Dissolve 33 parts of best (Buffalo) glue on the steam bath in a porcelain vessel, in 36 parts of water. Then add gradually, stirring constantly, 3 parts of aqua fortis, or enough to prevent the glue from hardening when cool. Or dissolve 1 part of powdered alum in 120 parts of water, add 120 parts of glue, 10 of acetic acid and 40 of alcohol, and digest.—*Druggists' Circular.*

TESTIMONIAL FROM AN INVENTOR.

GENTLEMEN:—I was at last compelled to employ you as agents to "fix up" my re-issue papers for a sugar evaporator; and I must say it is well done, and would have saved much difficulty if I had employed you to attend to my case in the first instance. I am not sure but that my present application for an improvement in ——— will have to be fixed up by your firm yet. Respectfully, D. M. COOK.

Mansfield, Ohio, Jan. 6, 1860.

[The above gentleman prepared his papers for a re-issue, and attempted to act as his own attorney. The consequence was, he got his case in such a "fix" that it was difficult, for a time, to determine where to begin to straighten them so as to get them in condition for the action of the Patent Office. But it was done, as seen by the inventor's statement above, and done to his apparent satisfaction.

While we recommend all inventors who are competent to prepare their own drawings and specifications and act as their own attorneys before the Patent Office, we counsel those who have had no experience in such business, and have an invention worth protecting by a patent, to employ some experienced attorney to act for them from the first—not to wait until they get their case in such a condition as to require more labor and expense to amend it than it would have cost in the first place to have had the business well attended to. The preventive of trouble is cheaper than the cost of cure in such cases, as the writer above can testify.—EDS.

DISCOVERIES AND INVENTIONS ABROAD.

Substitute for Chloroform.—A considerable sensation has just been produced in Paris by M. Velpeau, an eminent surgeon, who has recently communicated to the Academy of Sciences the extraordinary fact that, if a brilliant object (such as a red bead) is placed near to the face of a person and between the eyes, and the gaze be fixed steadily upon it for a few minutes, the person will soon fall into a cataleptic state and become as insensible as if under the influence of chloroform. M. Rocco is stated to be the discoverer of this, and in making several experiments, persons were made to undergo surgical operations quite unconscious of pain. A correspondent of the Boston *Traveler*, writing from Paris, seems to be enthusiastic on this discovery, and recommends its practice by the dentists of Boston in extracting teeth. We remember very well how this alleged new discovery was discussed in both the English and American papers about 20 years ago, as an explanation of the phenomena of animal magnetism and the cataleptic condition into which some persons may be easily thrown. It never can be used with certainty in surgery, in all cases, although it may be in some.

Red Dyes.—A patent has been taken out in England by R. A. Brooman (as a communication from abroad) for the preparation of red colors for textile fabrics from aniline. A mixture of aniline and anhydrous bichloride of tin are first heated up together to the boiling point and then boiled for fifteen minutes. At first the mixture is of a yellowish tint, but it finally becomes a beautiful red when held up to the light, although, in a very large quantity, it appears to be of a blackish crimson color. When hot, the liquor maintains its liquid condition; but on becoming cold, it assumes a jelly state. While still warm, the liquor is to be filtered to free the coloring matter from several impurities. By adding the tartrate of potash or the acetate of lead to the liquor while hot all the coloring matter is precipitated, and when it becomes cold it may thus be obtained solid, to be used like the extract of logwood in dyeing. The red solution of aniline thus obtained may be used with pyroligneous mordant, or the nitrate and acetate of lead in dyeing. To print calicoes with this preparation of aniline a very concentrated extract is required, which is mixed with dextrine or gum to make it into a printing paste. Acetic acid and alcohol will also precipitate the extract. The bichloride of mercury (corrosive sublimate), the protochloride of copper and the perchloride of iron can also be employed to mix with the anyline as substitutes for the bichloride of tin.

Aniline Blues, Lilacs and Drabs.—A patent has also been lately secured by Messrs. J. T. Beale and T. N. Kirkham, of England, for aniline in dyeing and printing. This invention consists in treating salts of aniline, or an acid solution of it, with hypochlorite of lime or common bleaching powder, to obtain fast colors. They take the nitrate of aniline, or the acetate, or a saturated solution of aniline in water, and add an equal quantity by measure of acetic acid. To this solution some hypochlorite or bleaching powder is also added, and a change in the color of the solution at once takes place. The shade of the liquor indicates the shade of color to be produced by it on textile fabrics. By varying the quantities of these substances different shades may be produced, from a blue to a lilac, purple, violet, slate and drab. It is well known to dyers that, by using the same substances in dyeing (only in different quantities—strong and weak), browns, drabs, &c., are colored; and so it is with using aniline of different degrees of strength, according to the shades desired. When preparing aniline for dyeing, the chlorite must be added very cautiously until the proper shade is attained, because it is the re-agent which "tones" the colors. The following is the method of practically using the aniline:—Dissolve as much aniline as can be taken up in a certain quantity of water—say one gallon, and to this add one gallon of strong acetic acid and a pint of the hypochlorite of lime. The whole is then carefully stirred and the color of the liquor becomes a violet of an intensity proportioned to the amount of chlorine used, the greater the quantity of the latter the lighter the shades produced. According to the quantity of hypochlorite used, the shades of aniline will vary from a violet to a drab. With aniline liquors thus prepared, silk may be dyed various shades without mordants; with mordants, both wool and cotton fabrics may be dyed with the aniline thus prepared; and strong extracts may be employed for printing. We had been informed that aniline—which is a preparation of indigo with dilute nitric acid, and formerly called indigotic acid—had gone out of use, but these two patents afford evidence of it becoming more extended in Europe. None of these colors, so far as we know, have yet been introduced into this country.

Increasing the Strength of Paper.—We described a method of producing vegetable parchment on page 237, Vol. XIV. (old series) of the SCIENTIFIC AMERICAN, by steeping unsized paper for a brief period in sulphuric acid, slightly diluted. We learn from our able cotemporary, *Newton's London Journal of Arts*, that another method of producing vegetable parchment has been discovered and patented by Mr. T. Taylor, London. Paper—either sized or not—is taken dry and soaked in a concentrated neutral solution of chloride of zinc moderately heated; after which it is washed, dried and is ready for use, having the strength and appearance of parchment. The neutral solution of the chloride of zinc is formed by adding the carbonate or oxyd of zinc to a solution of zinc dissolved in muriatic acid, then evaporating the solution until it has arrived at the consistency of sirup when cold. In this state it has a high specific gravity, and the paper to be treated is immersed in it for a few minutes, then taken out, and the adhering zinc removed by a scraper. The paper is now thoroughly washed in clean cold water and afterwards pressed and dried. This treatment draws or *fulls* the fibers of the paper together, rendering the sheets smaller in size but much stronger and closer in the texture. The process described is conducted with cold liquors, and the paper is only partly rendered into vegetable parchment; when it is desired to produce the fullest change possible in the paper, the liquor is kept heated about 120° Fah. while the paper is immersed in it. Sheets of paper, when saturated with such a solution, may be joined permanently together by uniting their edges and passing a heated iron over them. The chloride of tin may also be used as a substitute for the zinc. Paper treated in this manner becomes much thicker, and can be glazed with a most beautiful surface.

Refining Sugar.—In introducing raw sugar for the purpose of refining, it is liable to sink down and come in contact with the heated steam pipes in the melting pan, whereby some of it is carbonized and more molasses produced than otherwise would be. To avoid this a patent has been taken out by Mr. John Aspinall, of London, for melting the raw sugar before it comes in contact with the steam pipes of the open heating pan; and he does this by placing the sugar upon a perforated false bottom which just comes in contact with the surface of the water in the pan, and dissolves it gradually before it can be precipitated to the bottom. The idea embraced in this invention is to melt all the raw sugar in the liquor before it can come in contact with the pipes which heat the pan.