

Mechanical Properties of Soils.

The property of absorbing and retaining moisture is important. Clay loams and peaty soils absorb the largest quantity of moisture and retain it best, especially those peaty soils which have a large excess of organic matter in them. Pure clay soils are generally too compact, while sandy soils are too loose either to absorb or retain moisture. On level clay soil the water will stand and become stagnant. This is the case, also, with sandy or peaty soils with a clay subsoil. Under these circumstances draining is necessary.

The air should be allowed to circulate freely through the soil. It carries the elements of plant food contained in it to the roots. Carbonic acid gas and ammonia are both furnished in this way to a considerable extent. It promotes the decay of vegetable matter present, and thus again provides food for plants. The proper chemical changes in the mineral elements of the soil are promoted by the carbonic acid and the oxygen of the air. How necessary, then, that the soil should be well plowed and well pulverized.—*Florida Farmer.*

THE GOLDEN DOOR OF THE TRANSPORTATION BUILDING OF THE WORLD'S FAIR.

The accompanying engraving of the beautiful golden door of the Transportation Building of the World's

ine, makes a firm, fairly flexible mass. By increasing the quantity of glycerine to two or three parts, a less firm but more flexible and elastic mass is obtained. In the author's experience, the most useful proportions are one of glue or gelatine and two of glycerine.

In making the mass the glue or gelatine is soaked in water until it has become soft, then all the surplus water is drained off and the soft mass added to the glycerine, which has been heated on a water bath. When the glue or gelatine has become melted, the thick, tenacious mixture is strained through cheese cloth, and again heated on the water bath for at least an hour to drive off the water. If this is not done, the evaporation of the water, after the model is cast, causes considerable shrinkage.

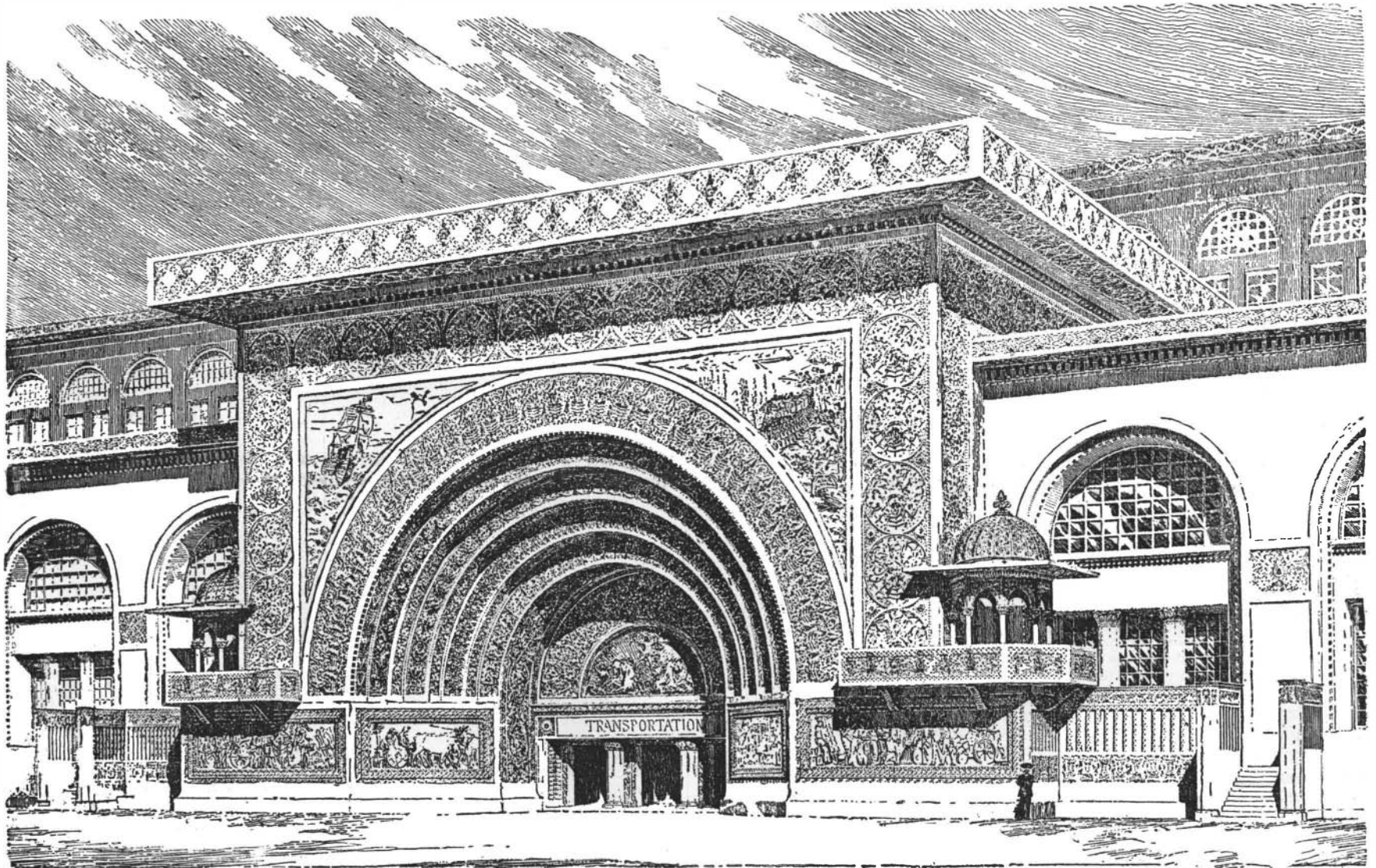
Any desired color can be given the mass by adding to it, while melted, a concentrated solution in water of an aniline dye. Care must be taken not to add an excess, or it will cause staining of the hands upon handling the model.

Making the Model.—He had found paraffine the most useful material for making the model from which the plaster mould is made. Other materials, such as wood or clay, may be used, but paraffine is preferable, on account of the ease with which it can be melted out of the mould without damaging it. The paraffine is

each coat being allowed to dry thoroughly before applying the next.

Casting the Model.—Both halves of the mould are placed in a perfectly level position and the surfaces and depressions well oiled. Each half is now filled with the melted mass until it projects slightly above the surface of the mould, using the mass at as low a temperature as possible, in order to avoid contraction of the model on cooling. When perfectly cold, the two halves are joined in the following manner: Remove one half of the model from its mould, then paint the exposed surface of the second half, still in its mould, with some of the modeling mass at a fairly high temperature, next place the other half on it, and adjust its edges to the half contained in the mould. After two or three hours remove the complete model from the mould, cut away all rough spots at the line of junction, and finally finish by painting with a brush wet with boiling water.

All finished models should be preserved in their moulds, to avoid distortion. The mass is likely to prove useful in making casts of irregular surfaces and cavities, as, on account of its flexibility, it can be easily removed without damaging the object, when a plaster cast would either break the object or be broken itself. To illustrate this adaptation of the process, Dr. Free-



GOLDEN DOOR—TRANSPORTATION BUILDING OF THE WORLD'S FAIR.

Columbian Exposition affords, even in the absence of the beautiful coloring which will characterize it in its completed state, a very good idea of what promises to be one of the most notable architectural features of that wonderful architectural display. The dimensions of this door, as well as those of the building itself, have been so frequently published that it is useless to again reproduce them, but the accompanying sketch will give an excellent idea of the design and appearance of the work when completed.—*The Railway Review.*

A New Material for Pathological Models.

At a recent meeting of the New York Pathological Society Dr. George C. Freeborn presented specimens illustrating their use. For purposes of instruction models are often very useful, but as usually made they only present three dimensions, length, breadth, and thickness. In many cases it is desirable to illustrate some of the physical properties of the object, *e. g.*, flexibility and elasticity, these properties being especially useful in models of some of the histological elements. With the mass to be described these two important properties have been gained.

The mass used in making these models is a mixture of glue and glycerine, or of gelatine and glycerine, the former being more economical and giving an opaque model, and the later yielding a transparent model. The proportion of the ingredients varies according as a more or less flexible mass is wanted. A mixture of equal parts of glue or gelatine, by weight, and glycer-

cast in a block or slab, in a wooden frame placed on a smooth, level surface. When cold, the wooden frame is removed and the block is ready for shaping into the model. In casting slabs, the melted paraffine is run into tin trays of the desired size and depth.

The outline of the model to be made is drawn on thick brown paper, and cut out with a sharp knife or scissors, and is then placed on the slab of paraffine as soon as it has become solid, but while still plastic. With a thin and narrow knife blade, the edges of the paper pattern are followed around, carrying the point of the knife down to the bottom of the tray. This cuts away all the surplus paraffine, which can then be pulled out of the tray. The outline model is now allowed to become perfectly hard before it is removed from the tray. The model is next brought roughly into shape by shaving with a sharp knife, still further smoothed by gentle scraping with glass, and finally finished by rubbing with bits of cloth moistened with turpentine. The model is always made in two parts, and a mould made of each.

Making the Mould.—The model is placed on a well oiled, smooth surface, the plane side of the model down, and a frame built around it with strips of wood. Plaster of Paris mixed into a cream with water is then poured into this frame until the highest point of the model is covered to the depth of at least an inch. After this has set, the frame is removed, and the mould stood up in a tray. The model is melted out by allowing the flame of a Bunsen burner to play against it, after which it is given three coats of shellac varnish,

born exhibited a cast of the base of the human skull. He also presented models of a red blood cell, from the human subject, and also from the frog, a crenated blood cell, and several nerve cells.—*N. Y. Medical Record.*

The Ideal Family Physician.

The Hon. Thomas F. Bayard recently addressed the class at one of the medical colleges in Baltimore, having for his theme, "The Lawyer and the Doctor." It has been his fortune, he says, to be thrown in contact with not a few medical men who have been "as the salt of the earth" in their respective communities. A man who is already eminent by reason of his natural endowments may be said to double his talent by becoming a physician. "It has been my personal fortune," says Mr. Bayard, "to know such a man. It has been my privilege and delight to accompany him in visits where his only medicines were the personal presence and conversation of the man himself. He had shared and had lessened their anxieties; counseled the wayward; cheered the weak-hearted; had rejoiced with them that rejoiced, and wept with the weeping. And I have seen such a man so surrounded by an atmosphere of love and trust, holding, as it were, the heart-strings of a family in [his hands, their guide, philosopher, and friend; and then I realized what a moral force in society the profession, properly comprehended and properly followed, was capable of exerting, and how relatively small a part of its usefulness was the administration of medicine."—*N. Y. Medical Journal.*