

NEW USE FOR PAPER.—A great diversity presents itself in the various useful purposes to which paper, or *papier mâché*, has been applied of late years. Besides ornamental articles, clothing, bedding, stamps, boxes, barrels, picture frames, furniture, stovepipes, chimney-pots, bricks, partition walls, carriage and car wheels and boats, it would seem as if the inventive ingenuity of manufacturers has succeeded in adapting this single substance to some new use every day. The last remarkable application of *papier mâché* is the manufacture of a revolving dome for the astronomical observatory of Prof. Greene, of the Polytechnic Institute at Troy. This dome has an internal diameter of 29 feet, and if constructed in the usual manner, would weigh five or six tons and require powerful and complicated machinery to manipulate it, besides also requiring foundations of considerable depth for its support; whereas the total weight of the paper dome will not exceed a ton and three-quarters, and, mounted on pivots working in iron grooves, is capable of being revolved in any direction required without the assistance of any machine or apparatus of any kind. The paper is put upon a light framing of wood, and is, by means of a special preparation, rendered fully as hard and even more rigid than wood.

COMMUNICATIONS WITH LIGHTHOUSES.—A new description of rocket, called the "buoyant rocket," has been produced by the Royal Laboratory Department, at the request of the Board of Trade. A rocket was required as a means of communication between the shore and lighthouses a few hundred yards from the main land during bad weather, and in circumstances under which the ordinary life-saving rock apparatus by which a line is conveyed to a wrecked vessel would be unavailable. The laboratory have answered the demand by adopting the old-fashioned Congreve rocket to meet the required end. A small iron tube containing the composition is enclosed in a casing of cork, and fitted to a stick in primitive fashion, with a line made fast to the extremity, and the simple arrangement has admirably succeeded. Three of the rockets have been tried at Shoeburyness, being fired from a trough at the surface of the sea, and plowing a direct course through the water with a strong line attached, by means of which an assistant or a boatload of provisions could be conveyed to the lighthouse keeper.

WIND GAUGE.—A simple apparatus for continuously recording the direction of the wind, constructed by M. Redier, is now in use at the observatory at Lyons. A weathercock of suitable form is supported by a sort of tripod of grooved wheels running upon a circular rail of steel (the wheels having individually a horizontal axis, but collectively a vertical). From the weathercock passes down a vertical rod to connect with a cylinder (placed with axis vertical), which is supported below by a steel pivot resting on a plate of agate, and is guided at the upper part by horizontal pulleys. Thus each movement of the weathercock is transmitted to the cylinder. The latter has wound round it a sheet of paper, graduated vertically and horizontally (the vertical divisions representing the hours, the horizontal the directions), and a pencil applied to the paper is moved in vertical directions by clock-work. It will thus be seen that the tracing obtained on the paper indicates the successive positions taken by the weathercock, and, accordingly, the direction of the wind for any given time.

NEW ANTISEPTIC SALT.—During some experiments in separating sugar from molasses, a double salt of borate of potassium and sodium was found, that proved to have valuable antiseptic properties. This salt is now manufactured on a commercial scale, and costs about 10 cents a kilogramme or five cents a pound. It is obtained by dissolving in water equal quantities of chloride of potassium, nitrate of sodium and boric acid, filtering and evaporating to dryness. The salt is said to be quite deliquescent, and must be kept in tight bottles. It is quick in action, retains its qualities for a long time and has no injurious effect upon the taste, smell or healthfulness of the substances to which it is applied. It has already found a use in making sausages, in preserving meats, in tanning and in butter-making. A small quantity of the salt added to milk will preserve it in good condition for a week. It is also used in preserving beers and wines, and is being made the subject of experiments in several other directions.

CHINESE PORCELAIN.—The Chinese subject the greater part of their porcelain to but one firing, first drying the pieces sufficiently in the air to prepare them for glazing. This plan they are able to pursue, because the nature of the material is such that it resists the entrance of water. Their glaze is much superior to any in use in the European potteries, but it requires the most intense degree of heat for its fusion, and considerable art is con-

sequently required for the management of the fire, as well as in the construction of their ovens. These are built in the most substantial manner, so that when the fire is at its greatest height the hand may be applied to the outside without any fear of burning.

SELENIUM CAMERA.—The *Scientific American* refers to some very ingenious and curious applications of selenium, in which its peculiar property of changing its electrical conductivity when exposed to light varying in intensity, is utilized. The several devices are the invention of Mr. George R. Carey, of Boston, Mass. Perhaps the most curious of these instruments is the selenium camera obscura, which is capable of transmitting, telegraphically, an image of any object and making a permanent impression of it at a distant point. In this case a person may sit before the camera in New York while his photograph is made in Boston.

A NEW process for the production of a superior artificial stone is described to consist of the employment of a thorough mixture of six parts of fine sand and one of slacked lime, which is exposed for about three days to a high temperature under a pressure of some three atmospheres. The result is affirmed to be the partial decomposition of the silicious particles with the formation of silicate of lime, which acts as a cement, so that the mass, when cooled down to the ordinary temperature, hardens. This hardening process is said to continue for some weeks after exposure to the air, and the final product is declared to be as hard and solid as good sandstone.—*Mining Journal*.

WORKING STEAM AT HIGH PRESSURE.—It is well known that great efficiency in steam engines is obtained by an increase of pressure and the use of expansion. To accomplish this, the point lies not so much with the engine as with the boiler, engineers finding no difficulty in working an engine with steam at 150 to 200 pounds per square inch; therefore Mr. Walt, an eminent Liverpool engineer, thinks there is no limit to the practical working pressure. Some engineers will be inclined to differ with this opinion, as the management of steam used expansively in simple reciprocating engines at ranges of pressure much exceeding those named, is considered by many risky practice.

THE DEEP MINES OF THE WORLD.—In reply to the letter of Mr. H. Musgrove and others, Lake City, Colorado, inquiring as to the depth of the deepest mine now being worked in the world, we may say, this distinction probably belongs to the Adilbert mine, Austria, in which the workings are probably carried on through a perpendicular shaft 1,000 meters—3,280 feet deep. This is a lead-silver mine, and has been worked many years. The next deepest mine on the continent of Europe is the Viviers coal mine in Belgium, 2,847 feet deep.

STEEL-FACED IRON PLATES.—A section mold is divided into two sections by means of a transverse plate of thin sheet iron. The two metals are then poured into the respective compartments. The sheet iron partition prevents the mixture of the metals and facilitates the welding by itself being brought into a state of fusion. It is said that the product is well adapted for safes, and that it resists drills.

SOFT STEEL BEING USED FOR TIN PLATES.—A correspondent of the *London Mining Journal*, who appears to be well informed, states that very large quantities of tin plates made from steel are branded charcoal and best charcoal, and so exported; and these plates, he affirms, are exceptionally well received, especially for stamping purposes, in the United States.

NEW DYE.—Sulphoamidoazobenzolic and sulphoamidoazotoluic acids have been made permanent canary and orange yellow dyes by the conjugation of the sulpho-acids with amidoazobenzol and amidoazotoluol, the excess of acid neutralized by dissolution in alkali and concentrated. The colors are dyed in a slightly acid bath.

SIXTY-THREE years of age is said to be the grand climacteric or turn of life, a critical period for masculine humanity, more men dying at that age, or near it, than at any other, leaving accidents and violent deaths aside. A like critical period for feminine humanity is 47 years.

TO CUT A HOLE IN GLASS.—To cut a round hole in a pane of glass of any required size so as to save the pane, use a copper tube of the size of the required hole; revolve it in contact with the glass, and supply it with emery and water.

THE HOTEL DE VILLE.—The Hotel de Ville in Paris, the old seat of the Municipal Government, which was destroyed in 1871, is far advanced in rebuilding, and will be completed in 1881, at a total cost of about \$4,400,000.