from Dakota, Colorado and California—and some of these compare very favorably with the best products of the celebrated Carolina mines. We are glad to note this, for mica is peculiarly well suited for hundreds of useful applications in the arts for which it is not now available on account of its cost.

Mica is a very common mineral in some localities, but the merchantable article is by no means common, and a large body of "mica rock," capable of affording large, clear, and colorless sheets of the mineral, free from flaws and of uniform structure, is worth developing almost anywhere.

Muscovite or oblique mica—the clear variety—is essentially a silicate of aluminum and potassium. When the crystallization is uniform it can be easily separated with a knife blade into very regular flexible and elastic sheets of almost any required thickness. It is not affected by water or strong acids (with the exception of hydrofluoric acid), and may be heated quickly to redness without danger of melting or cracking it. In thin plates or sheets it resembles glass, but it is not brittle, and this, in connection with the other peculiar properties alluded to, makes it available and serviceable as a substitute for glass under conditions which preclude the use of the latter. Mica is never quite colorless, although in good sample the color is barely perceptible in the thin sheets. That having a faint wine or brandy tint commands the best prices.

In the New York market the mineral is usually sold by the pound, in sheets cut to sizes varying from two inches to fifteen inches square, the price varying with the size and number of sheets to the pound, color and quality. When the sheets are properly split, trimmed and cut to size the prices for good clear mica vary from twenty cents to eight dollars per pound.

Of the numberless uses to which this mineral glass has been put it is chiefly in demand for the glazing of stone and furnace or heated doors, and as a substitute for glass in some kinds of lanterns, as it is much lighter and tougher than glass, and is not easily ruptured by jar or concussion. The latter consideration has caused its substitution for glass lights on gunboats and naval vessels.

Mica is peculiarly well suited to the construction of light roofs and walls for galleries, conservatories, greenhouses, or hot-beds, etc., as it can be easily shaped and bent, and secured with tacks after the manner of shingles; is not easily fractured and requires very light supports. We have seen structures of this kind, and they would seem to leave little to desire in this line, except, perhaps, larger sheets of the mineral and a reduction in its cost. The sheets may be tinted or colored by dipping them momentarily in a very dilute alcoholic solution of pale shellac suitably colored with any of the soluble coal tar or aniline dyes, and exposing them for a few minutes to warm air to dry. Very pretty color effect can thus be produced. A simple way of producing a frosted or ground appearance on the sheets of mica is to coat them with a thin milky varnish prepared by mixing together solutions of one ounce of pale shellac in three pints of wine spirit and one ounce of pale resin in a pint of good benzine. A rather thin sirupy solution of water glass, with which has been mixed a trace of zinc sulphate dissolved in water, can be used in a similar manner to effect this object.

A colorless cement for joining sheets of mica is prepared as follows: Clear gelatine is softened by soaking it in a little cold water, and the excess of water is pressed out by gently squeezing it in a cloth. It is then heated over a water bath until it begins to melt, and just enough hot proof spirit (not an excess) stirred in to make it fluid. To each pint of this solution is gradually added, while stirring, one-quarter ounce of gum ammoniac and one and one-third ounces gum mastic previously dissolved in four ounces of rectified spirit. It must be warmed to liquify it for use and kept in stoppered bottles when not required. This cement, when properly prepared, resists cold water.

Flexible mirrors are made from sheet mica, the silver being deposited from a solution of the nitrate by one of the processes in the *Scientific American Supplement* No. 104. Small mirrors of this description are used in some kinds of inlaid work and for various decorative purposes. As their flexibility admits of their application to irregular surfaces they can be used where glass mirrors cannot. With the aid of a little gold leaf, bronze powders, size, and various colored thin transparent varnishes or collodion mica has been worked into hundreds of beautiful articles for decorative purposes, toys, etc.

When mica is heated to redness for some time in a muffle and then allowed to cool rather quickly the laminæ become distorted and the sheets present a silvery white appearance by reflected light the mineral losing much of its flexibility. The dust of this whitened mica is used to some extent by the French as a silver bronze powder. Mixed with a weak solution of gum arabic it makes a good silver ink. The powder is sometimes variously tinted by washes of very dilute colored solutions of gum or varnishes. To prepare the glistening powder the sheets of whitened mica are simply crushed (not ground), boiled in hydrochloric acid, rinsed, dried, and assorted to size of laminæ. The finer filaments have a pearly luster and are made to adhere to semi-softened gelatine and wax to imitate pearl. The silvery powder is used on metals, glass, wood, paper, plaster, tapestry and furniture, it has also been used in calico printing in place of the heavy bronze and glass dust of Lyons fabrics, and for the decoration of china and glassware.

Mica is used by electricians for certain insulating purposes and also to some extent by makers of philosophical and optical instruments. Good mica because of its lightness, is often employed as a substitute for glass in spectacles designed to simply shade the eyes or to protect them from dust, cinders, or flying particles of metal or stone for travellers, millwrights, grinders, polishers, and others whose work necessitates such protection. Vessels of mica are often used in the chemical lecture room, and are particularly serviceable in the experimental illustration of the properties of certain gases—the burning of metals in oxygen, etc.

The powdered or crushed mineral has recently been used, in connection with nitroglycerine, in the preparation of a kind of dynamite called mica blasting powder. It has also been employed as a filling for fireproof safes, as a non-conducting covering for boilers and steam pipes, and, in connection with water glass, as a fireproof varnish or paint. The larger sheets, applied after the manner of shingles, make very good fireproof roofing material.

Formerly most of the merchantable mica used in this country was imported, but for the past few years—since 1867—our supply of the mineral has been derived chiefly from mines located in Mitchell, Heywood, Yancey, McDowell, and Macon counties, North Carolina. The product of these mines is at present hardly equal to the demand, which is increasing very rapidly.

The discovery—or rather rediscovery (for some of them show signs of having been worked centuries ago)—of these valuable beds of mica in the Carolina gold fields was, like the Western "finds" above referred to, one of the results of a search after the precious metals.—*Scientific American.*

ARCHEOLOGICAL DISCOVERIES.

The latest excavations made by order of the Athens Archæological Society at Tanagra, the well-known place in Boeotia, whence comes the charming terra-cotta figures, have yielded important results. On the northern side of the town, in front of the principal gate, fifteen tombs were discovered which were completely untouched. They contained some sixty clay figures, most of them perfect, and measuring between ten and thirty-five centimetres in height. They represent satyrs and women standing and sitting, and one is a group of two figures. Besides these many vessels were found, amongst which some twenty lekythoi (paint and oil phials) with antique painted ornaments. Unfortunately most of these were broken. One vase which was found in a stone case shows an artistic inscription which designates it as a work of Teisias. We may also mention that fourteen scraping irons were found, and also that in two of the tombs some fifty small terra-cotta ornaments were discovered, most of which were brightly colored, and some covered with thin gold. The excavations became even more important after April 1. The published report mentions twenty vessels, some broken, ten of which are ornamented with paintings. Two of these are said to be particularly fine. Of the numerous clay figures only eight could be got out in a tolerably perfect condition. Of these two are reported to be the most perfect figures ever found at Tanagra. One represents a winged youth who is about to raise himself into the air; before him is a maiden on her knees, her dress forming an arc above her; the youth holds her by the arms as if he wished to take her along with him in his flight. The other masterpiece is an Aphrodite rising from the sea, diving up out of a shell as it were.

ONE of Mr. Berthon's folding boats has been supplied to the *Inflexible*. It is 31ft. long, 8 ft. 3in. wide, and 3ft. 10in. deep, and is capable of carrying 60 men. This boat was recently put to a severe test in going out to Spithead with a crew of 16, accompanied by Mr. Berthon. Taken in tow by a steam launch that was swept fore and aft by every sea, the boat did not ship a pint of water, although the sea was heavy and broken.