under "general," and included in parentheses.

When your picture is painted, back ground and all, let it dry; then cover it on the back with a smooth sheet of tin foil, between your glass and back board, and this will render all your transparent colors brilliant. You can make any color you wish transparent, by mixing a great quantity of Demar varnish with it, as you lay it on.]

III.—Instructions for Italian Painting.

This is a mode of glass painting and performed by following those directions, "special" and "general," included in brackets in Nos. 1 and 2.

IV.—Instructions for Crystaline, or Oriental Painting.

First draw or get your pattern on paper, such as flowers and vases of fruit, &c., then with wafers or otherwise fasten the same to the glass so as to prevent it moving—the pattern of course on the under side; then with a fine pencil brush, or with a common writing pen, trace all the out-lines of your picture, such as leaves and veins of the same, stems and flowers, &c., as near as possible on the glass, over your pattern, the same as you would trace a pattern for embroidery; this done, fill or paint the back ground of your picture, and spaces not occupied by leaves, flowers, stems, ornaments, &c., with the same when you want a back ground; using for that purpose, asphaltum varnish with lamp black, mixed—add a little turpentine if too thick,—but if any other color is desired, paint it with oil-colored paints. When your ground work is dry, then paint your flowers, leaves, stems, ornaments, &c., their respective colors, using artist's colors and brushes.

For coloring, use "special" directions included in brackets in No. 2.

Lay your colors on thin, and mix them with Demar varnish. As you lay them on shade with extra coats, after the first becomes dry; and after all is well dried, crinkle copper or tin foil, and cover the back of your picture with the same as you frame it. This will give it the spangle.—[School Visitor.

THE SPECTRUM.

(*From the Scientific American.*)

In the year 1701, Sir Isaac Newton published his work on optics, and in it made known to the world his great discovery of the analysis of light. He had found that if a beam of light was passed through a triangular prism, it was refracted or bent from its course, and separated into seven beautiful colors, which falling upon a wall or screen produced an elongated oval image that is called the spectrum. For the last 160 years the spectrum has been the subject of an immense amount of study and observation among all civilized nations, but it never before occupied the prominent position in the world of science which it holds in this year 1861.

It has been discovered that the prism, besides separating the sunbeam into seven colors, also divides it into three elements, viz., light, heat, and the chemical or actinic rays; the last being those that produce the picture in the daguerreotype and photograph, as well as all the other chemical effects of what is called light. The luminous rays are refracted more than the heat or thermic rays and less than the actinic, though both the heat and actinic rays mingle with the luminous at their respective ends of the spectrum. Hence, violet and blue light acts very energetically on the photograph sheet, while the yellow light does not act at all. Every photographer has a room with the windows glazed with yellow glass, or shaded with yellow curtains, in which to work on his sensitive paper.

In 1801, just a hundred years after the publication of Newton's work, Walloston discovered that if the ray of light, before entering the prism is passed through a narrow slit, the spectrum is crossed by several dark lines. These were subsequently examined by Fraunhofer, who named seven of the principal ones from seven letters of the alphabet, B C D E F G H. A more careful examination of the spectrum, by means of magnifying lenses, has revealed the existence of several thousands of these dark lines, and an investigation of these has given us the new method of spectral analysis, the results of which are among the most wonderful of all the marvels of science. This method, not only enables us to detect the presence of elements in quantities of inconceivable minuteness, but it has led to the sublime discovery that some of the substances with which we are familiar on this earth also enter into the constitution of the sun and stars.

When any metal or other element is burned in a colorless flame, like that of an alcohol lamp, it gives a peculiar color to the flame, and if the light is passed through the triangular prism, each element produces its own peculiar spectrum, and the spectra of several of the elements are crossed by bright lines in the same position as some of the dark lines of the solar spectrum.

The next great step in this most wonderful investigation, was the discovery that if the flame of an artificial light is interposed in the path of the sun's ray, then passed through the prism, the bright line of the spectrum from the artificial disappears, and its place is occupied by the corresponding dark line of the solar spectrum, which is deepened by the passage of the light through the colored flame. The flame of every substance seems to have the power of absorbing, or rather of dispersing, the rays which produce its own bright line or lines, so that light passing through a flame has a dark line across its spectrum in the same place as the bright line of the spectrum from the flame.

This fact last stated, led to the discovery of the composition of the sun. It is inferred that the light comes from the solid body of the sun, and passes through an atmosphere of flame, or of highly heated vapors of various substances, each of which absorbs the light that would produce the bright line in its own spectrum.—Hence the solar spectrum is crossed by dark lines corresponding to the bright lines in the spectra of various substances. As there is a dark line in the solar spectrum in the same position as the bright line in the spectrum of burning potassium, it is inferred that there is heated vapor of potassium in the sun's atmosphere; and as there is no dark line in the solar spectrum corresponding with the bright line in the spectrum of lithium, it is inferred that there is no vapor of lithium in the atmosphere of the sun.

Each star appears to have its characteristic spectrum, revealing to man the knowledge of its composition. Chemistry, following in the sublime path of astronomy, is extending the field of its investigations over the visible universe. Every ray of light that comes from the distant worlds above, beneath and around us, through its swift flight continue, through years or through centuries, bears in its constitution the ineffaceable record of its origin, and conveys to human intelligence, across inconceivable distances, a knowledge of the substance from which it issued forth.

☞ All kinds of soft porous stone become hard by whitewashing them with fresh slacked lime. The lime absorbs carbonic acid from the atmosphere, and is converted into carbonate of lime. A portion of this remains in the pores of the stone, and ultimately becomes marble.

☞ Marriages are often called "matches;" yet, of those who are married, how few are matched! Temper, taste, and disposition should be well studied before marriage. Husbands and wives are like locks and keys, that rather break than open if the wards be not answerable.