THE AMERICAN PRESBYTERIAN, THURSDAY, FEBRUARY 20, 1868.

Zcientific.

HOW CHROMOS ARE MADE.

CHROMO-LITHOGRAPHY is the art of printing pictures from stone, in colors. The most difficult branch of it-which is now generally implied when chromosare spoken of-is the art of reproducing oil paintings. When a chromo is made by a competent hand, it presents an exact counterpart of the original painting, with the delicate gradations of tints and shades, and with much of the spirit and tone of a production of the brush and pallet.

To understand how chromos are made, the art of lithography must first be briefly explained. The stone used in lithographing is a specious of lime-stone found in Bavaria, and is wrought into thick slabs with finely polished surface. The drawing is made upon the slab with a sort of colored soap, which adheres to the stone, and enters into a chemical combination with it after the application of certain acids and gums. When the drawing is complete, the slab is put on the press, and carefully dampened with a sponge. The oil color (or ink) is then applied with a common printer's roller. Of course, the parts of the slab which contain no drawing, being wet, resist the ink; while the drawing itself, being oily; repels the water, but retains the color applied. It is thus that, without a raised surface or incision-as in common printing, wood-cuts, and stoel engravings-lithography produces printed drawings from a perfectly smooth stone.

In chromo, the first proof is a light ground-tint, covering nearly all the surface. It has only a faint, shadowy resemblance to the completed picture. It is in fact rather a shadow than an outline." The next proof, from the second stone, contains all the shades of another color. This process is repeated again and again; occasionally, rank and mind. But they were guarded as often as thirty times. We saw one proof, a group of cattle, -- that had passed through the press twelve times; and it still bore a read the alphabet; and, because they were ceived the decoration of the Hanoverian greater resemblance to a still bore a read the alphabet; and because they were ceived the decoration of the Hanoverian in a visit to Mr. Prang's establishment,greater resemblance to a spoiled colored rare and hard to get at, he had no incitephotograph than to the charming picture which it subsequently became. The number of impressions, however, does not necessarily indicate the number of colors in a painting, because the colors and tints are greatly multiplied by combinations created in the process of printing one over another. In twenty five impressions, it is sometimes necessary and possible to pro-duce a hundred distinct shades.

The last impression is made by an engraved stone, which produces that resemblance to canvas noticeable in all of Mr. Prang's finer specimens. English and German chromos, as a rule, do not attempt to give this delicate final touch, although it would seem to be essential in order to make a perfect imitation of a painting.

The paper used is white, heavy "plate before its surface is fit to receive an impression.

skill and judgment at every stage. A but to disseminate the choicest masterpieces single error is instantly detected by the of art itself. It is art republicanized and practised eye in the finished specimen. naturalized in America. Its attempts hithcomplicated, requires several months-some- | but it was not Homer and Plato that were times several years-of careful preparation. first honored by the printing-press. As the The mere drawing of the different and en- popular taste improves, the subjects will be tirely-detached parts on so many different worthier of an art which seeks to give back stones is of itself a work that requires an to mankind what has hitherto been confined amount of labor and a degree of skill, to the few."-Boston Daily Advertiser. which, to a person unfamiliar with the process, would appear incredible. Still more difficult, and needing still greater skill, is the process of coloring. This demands a knowledge which artists have hitherto al. David Brewster. No ancient or modern most exclusively monopolized, and, in ad- discoverer has done more to make the study dition to it, the practical familiarity of a of natural science attractive than Brewster. printer with mechanical details. "Drying" Turning his attention to a department of and "registering" are as important branches physical science that was before almost of the art of making chromos as drawing wholly unexplored, his observations and exand coloring. On proper registering, for periments led to results as beautiful as they example, the entire possibility of producing were unexpected. Sir David Brewster was a picture at every stage of its progress desuborn at Jedburgh, Scotland, on the 11th of pends. "Registering" is that part of a December, 1781, and was, therefore, at the pressman's work which consists in so arranging the paper in the press, that it shall | ted for the Church of Scotland, he studied receive the impression on exactly the same | theology at the University of Edinburgh, spot of every sheet. In book work, each became a licentiate of the Presbyterian page must be exactly opposite the page Church, and received the honorary degree printed on the other side of the shoet, in order that the impression, if on thin paper, may not "show through." In newspaper theology, and he refused a living which was work this is of less importance, and in offered him by the Duke of Roxbury. While chromo-lithography the difference of a hair's studying at Edinburgh, Mr. Brewster was breadth would spoil a picture; for it would under the instruction of three of the most hopelessly mix up the colors. After the chromo has passed through the press, it is embossed and varnished, and then put up for the market. These final processes are for the purpose of breaking the glossy During the year 1810 he was married to one. light, and of softening the hard outlines which the picture receives from the stone, translator, and also the author of the "Poewhich imparts to it the resemplance of a try of Ossian." Mrs. Brewster died in 1850, artisans of the most skilful class, —and is preparing to move into a larger building at Roxbury. He uses eighteen presses; and his sales are enormous. His catalogue now embraces a large number of Album Cards, Vice-President. In 1808, he took charge of about seventy sets of twelve in each set; a the Edinburgh, Encyclopedia, which he beautiful series of illuminated "Beauti-edited till its completion in 1830, and in tudes" and "Scriptural Mottoes;" an end- which he first published the results of his udes and "Scriptural motices; an end-less list of our great men, and of men not so great after all; of juveniles, notably, a profusely illustrated edition of "Old Mother Hubbard;" and of half chromos, and chroc mosiproper: Taits if Chrokens," is Duck lings," and "Quails" were the first chro-lings," and "Quails" were the first chro-lings, and "Quails" were the first chro-chrometer and a chrometer and the second and a chrometer and the second and the mos that met an instant and wide recogni-tion. Nineteen, thousand confies tof the "Chickens" alone were sold. Breacher's, to make experiments with variously con-"Early Autumn on Esopus Creek" is one structed lenses, which resulted in the inof the best chromos ever made on a small vention of a lens composed of zones of glass,

scale. The "Bullfinch" and the "Linnet" (after Cruikshank) are admirable. There are other chromos which are less successful, and one or two that are not successful at all; but they are nearly all excellent copies of the originals, with which the defects must be charged. The chromos of Beecher's paintings are

really wonderfully accurate.

Mr. Prang's masterpiece, however, is not yet published, although it is nearly ready for the market. It entirely surpasses all his previous efforts. It is Correggio's "MAG-DALENA." and can hardly fail, we think, to although at one time hundreds of thousands command a quick sale and hearty recogni- of them were sold in a month, the inventor tion

Like every modern discovery, chromo-lithography has its partisans and detractors, -those who claim for it perhaps impossible capabilities, and those who regard it as a mere handicraft, which no skill can ever elevate into the dignity of an art. We do not care to enter into those disputes. Whether graphy, enables us to sit by the fireside on an art or a handicraft, chromo-lithography a Winter's night and enjoy the finest scenery certainly re-produces charming little pic and most finished works of art, has become tures vastly superior to any colored plates almost indispensable in every home in that we have had before; and it is, at least, clearly entitled to be regarded as a means of educating the popular taste, and thereby raising the national ideal of art.

A correspondent, looking at chromos from this point of view, thus indicates (it may be somewhat enthusiastically) their possible influence on the culture of the people:-

"What the discovery of the art of printing did for the mental growth of the people, the art of chromo-lithography seems des- franc prize, given for two of the most imtined to accomplish for their æstretic portant scientific discoveries made in Europe culture. Before types were first made, schol- during the two preceding years. In 1819 ars and the wealthier classes had ample opportunities for study; for even when Bibles chained in churches, and copies of the Scriptures (then aptly so-styled) were coveries; and the Keith prize twice for his worth a herd of cattle, there were large discovery of two new fluids in minerals and libraries accessible to the aristocracy of against the masses by the double doors of privilege and ignorance. A book possessed ment to master their mysteries. Made cheap and common, the meanest peasant, in the course of a few generations, found solace for his griefs in the pages of the greatest authors of his times and of all time. Mental culture became possible for whole na versity of Edinburgh. Dr. Brewster edited tions; and democracy, with its illimitable and wrote a number of scientific works, be blessings, gradually grew up under the little shadow of the first 'printer's proof."

"Until within a quite recent period, art has been feudal in its associations. Galleries of the priceless paintings, indeed, there have on Optics," "Letters on Natural Magic." always been in certain favored, cities and " The Martyrs of Science," "Memoirs of countries; but to the people, as a whole, the Life and Writings of Sir Isaac Newthey have been equally inaccessible and un- ton," and " More Worlds than "One." It appreciated, because no previous training had taught the community how to prize them. It was like Harvest College without for the Advancement of Science owes its the district school, -a planet without satelpaper," of the best quality, which has to lites, and too far removed from the world hass through a heavy press, sheet by sheet, of the people for its light to shine in the cottage and in the homes of the masses.

"Now, chromo-lithography, although still The process thus briefly explained we in its infancy, promises to diffuse not a love of art merely among the people at large, skill and information of a love of art merely among the people at large, The production of a chromo, if it is at all erto have been comparatively unambitious; tion of an officer of the Legion of Honor .-

each of which was built up of several circular segments, and its application to an instrument composed of lenses and mirrors, by which all the heat of the sun might be concentrated into one burning focus, or the light converted into a straight beam. This invention is now in use in many of the

light-houses recently constructed in various parts of the world. In 1816 Dr. Brewster invented the kaleidoscope, an instrument of no particular value to science, but which became a very popular toy. The patent right for this was, however, evaded, and,

never received anything for it except the fame. His researches touching the mean heat of the earth and the determination of the isothermal lines were also important additions to this department of knowledge. Another instrument of his invention, and which, in connection with the art of photo-Christendom. Dr. Brewster exhibited at the Crystal Palace the first stereoscope, constructed under his direction by the ingen-

ious Frenchman, M. Duboscq. Almost every scientific society in Europe conferred its honors on him. In addition to the degrees already mentioned, Sir David Brewster received, in 1815, the Copley medal of the Royal Society for his discovery of the law of polarization of light. In 1816, the Institute of France awarded half of the 3,000 he received from the Royal Society the Rumford gold and silver medals, the Royal gold and silver medals for his optical dishis analysis of solar light. In 1825, the Institute of France elected him a corresponding member, as did also the Royal Academies of Russia, Prussia, Austria, Sweden, Guelphic Order, and in 1832 was made a knight by William IV. In 1838 he was nominated by the crown to be Principal of the United Colleges of St. Salvador, St. Leonard and St. Andrew's, and 1839 was unanimously elected Principal of the Unisides contributing largely to all leading Eng-

lish and Scotch periodicals. His best known works are "Treatise on the Kaleidoscope," a "Treatise on the Steroscope," a "Treatise was principally owing to Sir David Brews-ter's exertions that the British Association existence, he having proposed the scientific meeting at York in which it originated. In January, 1849, he became one of the eight foreign associate members of the Imperial

Institute of France, filling the vacancy caused by the death of the celebrated chemist, M. Berzelius. He also received the Prussian Order of Merit founded by Frederick the Great, and in 1855 the Emperor of the French conferred upon him the decora-

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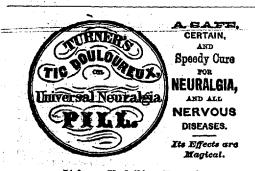
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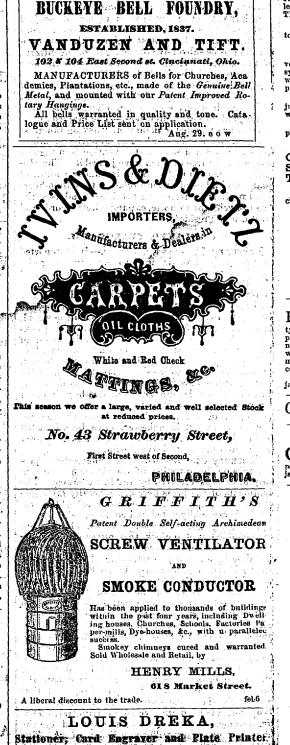
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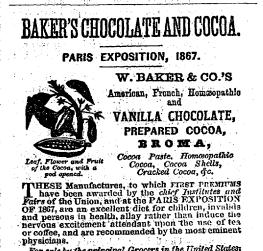
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