The Printer's Miscellany.

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[Selected from our Scrap Book.]

THE THEORY OF COLOR-PRINTING.

PRACTICAL HINTS BY AN OLD HAND.

There is melody in a thousand hues as well as in a skilled combination of sweet sounds; and there are painful discords in both harsh, grating, and intensely disagreeable. Mr. Yellowtint complains that John Green's red ink is always brighter and more brilliant than his own. He discovers a new ink maker, pays a higher price, and finds at last, to his chagrin, that he cannot ascend higher than a brick-dust scale of prices, notwithstanding all his pains and all his expenditure. Why? The whole secret of the harmony of Nature's hues is comprised in the answer. It is answered in the rainbow. It is answered in the ethereal blue of the heavens; it is answered in the thousand-tinted flowers which have studded the world since that "third day," when they sprang up to glorify the earth. It is answered everywhere by the uniform subordination of parts, the relief of harsh hues, and by the grey tone and broken foliage with which Nature modifies the harsh lines which too frequently defaces her fair face when man shows his handiwork thereon. A knowledge of the laws which regulate the harmony of color is necessary to ensure success the want of this knowledge was the cause of the failure of our ideal printer, and of scores of practical, earnest, skilful men, on whose behalf we will lift up the veil and reveal the few simple rules which have to be borne in mind by letter-press printers when using or combining colors, either of paper or of ink.

Scientifically speaking, there are only three colors red, blue, and yellow. A solar ray, divided by a prism, shows seven distinct rays, but the four additional rays indigo, green, orange, and violet are in reality produced by the admixture of others. Thus: yellow and blue produces green: yellow and red, orange; red and blue, violet, or more intensely indigo rays. These seven colors, to which, for printing purposes, we may add white paper and black ink (the two extremes of contrast), form the printer's palette, as an artist would call it, with which he must produce his effects. If red was emphatically red, and blue really blue of one ascertained and unmistakable hue, the laws which govern their contrasts would be soon wed; but in practice, the red rays are almost as various as the colors themselves. They are modified by the surrounding colors, for red not only reflects red rays, but every other sort of colored rays, only those which distinguish it from yellow or blue predominate; and the same remark applies to the whole of the seven colors. This explains the diverse hues known as tints and tones of red, blue, green, etc., the word tint representing the fine or mixed hue of the color, and the tone its intensity. Thus a scarlet tint inclines to orange, and a crimson tint to violet; but pink is a light and diffused tone of red, which is seen in its most intense tone in dark brilliant crimson. If we could procure these colors perfectly dead and pure, the result would be as demonstrable as the simplest mathematical problem. We know that these colors give off and impart a portion of their rays to surrounding objects: these rays are not of the same hue as the color, but are of the hue of their complementary color, or, in other words, of the color most necessary to complete its brilliancy and effect. Thus:

1. Green is complementary to Red, and the reverse.
2. Blue ditto Orange, ditto.
3. Violet ditto Greenish-yellow, ditto.
4. Indigo ditto Orange-yellow, ditto.

This is easily demonstrated. If a red wafer is placed in the centre of a piece of white paper, and the eye is fixed intensely on it for a few seconds and the wafer is removed, we see not the red wafer, but its spectra, colored green. The retina of the eye retains the form and the green rays of its complementary color. The effect of these complementary colors, when placed side by side, is to purify and render more brilliant each color. We were much struck, during the Exhibition of 1851, with some specimens of color-printing exhibited in the French department. The label was circular, and contained blue letters, but such a blue, it was intense and brilliant in extreme. Round the circle was a prettily-designed wreath, of a brilliant orange tone. We knew of no color, save the fabulously expensive ultramarine, that could produce so glorious a color; and we gave Mr. Frenchman the credit of using so expensive a pigment in order to produce so beautiful an effect. It happened, a few weeks afterwards, that we were engaged in designing some new tickets for a watchmaker's window. The tickets were all to be uniform in shape and design, but of diverse colors,