

researches difficult, and to give them the character of simple geological reconnaissances. In new countries, the first thing is to obtain a sketch approximating to the truth, and afterwards to proceed to detailed studies.

It was during this period, from 1842 to 1862, that the system of coloring geological maps underwent a complete change. Till then everything was done by hand, and seldom with care. Maps were colored rapidly, and tints varied not only from one copy to another, but also on the same map, some parts being a shade lighter or darker than others; besides, traces left by the brushes added to the imperfection of the work. Finally, the overlapping of one color on another at the limits of the different systems delineated on the map often took such alarming proportions that it was impossible to tell to what formation considerable belts of country were referred. It was only by the skill derived from practice that the defects of hand-coloring were much diminished. It may be said that the geological survey of the United Kingdom of Great Britain and Ireland attained the highest possibilities of the method by forming a special corps of colorists who did nothing else for years, and by being very strict in the acceptance of the colored sheets, every one that had an apparent defect being invariably rejected.

As early as 1841 attempts at colored printing had been tried by Major Le Blanc, chief of the office of topographical engineers at Paris. This was his method: He used a sheet of tin-foil similar to that employed in the manufacture of looking-glasses, on which he fixed a proof of the map or geological section which he wished to reproduce. They were then cut out simultaneously, which gave a tin pattern of the formation. Then the color was placed on it by means of brushes prepared for the "lucidonique" method of painting, and the maps were printed under a press. This method from the first secured promptness, exactness, and cheapness of coloring.

The first sheet colored by this system of "poncis découpés," with mechanical impressions, represents "*Coupes géologiques et topographiques des environs de Paris*," made for the use of the military engineers, in the location of the fortifications of Paris, created under Louis Philippe. Shortly afterward Messrs. Le Blanc and Raulin undertook to color by this system a geological map in one sheet, "grand aigle," which appeared in 1843 with the title "*Carte géognostique du Plateau tertiaire Parisien*," by Victor Raulin. Then Major Le Blanc undertook the impression in colors of the "*Carte géologique du globe terrestre*," by Boué, in one sheet. It is dated Paris, 1845, and bears this note: "Sous les auspices et la direction de la Société géologique de France par les soins et procédés de M. Le Blanc, vice-secrétaire." The execution took longer than was expected, and the map was not given to the public until the spring of 1846. The results obtained were quite defective, both as to the character of the colors, and exactness in outline, several colors either failing to meet or overlapping each other. However, these first