hydrogen peroxide solution. Thus yellow and orange are produced from cerium, straw-yellow from lanthanum (impure) and "didymium" salts, and some doubtful brown colorations also. Kosmann also describes in this essay some special methods for the modification of the colors obtained by means of salts of the heavy metals, tannic acid, etc. According to the experiments of Brylinske, and of Wagner and Müller, the yellow shade produced by oxidized cerium compounds is of poor appearance, and deficient in fastness from soaping.

Barnes, in extending his work on the use of titanium oxide as a mordant for wool, noted that zirconium oxide with alizarin produced a color very much like one produced by chromium. According to him, cerium does not appear capable of yielding a mordant for wool. When wool is boiled in a solution of a cerium salt it does not take on any color in the dye-bath. He produced colors on cotton with a cerium mordant, but they were quite worthless, being readily destroyed by weak acids.

Mordants.—Otto Witt gave the first detailed directions for the use of the rare earths as mordants. His researches were confined to the use of cerium sodium nitrate. The color was developed by steam. The cerium mordants were also investigated by Matschak and Scheurer; Brylinske, also, studied yttrium salts. Gandourine considered the sulphates of "yttrium, lanthanum, erbium, cerium and didymium."

Kruis, Böttger and Bühring have maintained that cerium disulphate is an excellent developer of aniline black. Witt, on the contrary, states that the double nitrate of cerium has no effect on the production of aniline blacks. He attributed the effect to impurities, possibly vanadium. According to him, the colors produced on the material, mordanted and passed through boiling soda solution, are tolerably fast to soap. The shades given were intermediate between those given by chromium and iron mordants.

The speaker, with assistants, used the sulphates, acetates, and hydroxides of lanthanum, neodymium, and praseodymium. Although there was a mordanting, the colors "produced were not of a bright shade, and not always very fast to washing. The rare earths can have little practical application as mordants for the following reasons: (1) because they do not possess the mordanting action to a degree which would allow competition with known mordants; (2) because the supply is somewhat limited, and would