its many derivatives, we get the innumerable colors now at the command of every dyer. For forty years coal tar was considered a useless by-product, but now its value is such that indeed we must wonder how we could do without it. In the autumn of 1856 William Perkin was experimenting on aniline. He was engaged on a research for the production of artificial quinine. Many have been the stories written describing his discovery of the first aniline color, but they are all more or less fanciful. They describe him, tired and disappointed with a day of failures in his laboratory, mixing all the liquids with which he had been working into a tall glass vessel, when lo, to his delight, a lovely and brilliant color was produced. But, unfortunately, like many other pretty stories, it is quite untrue. The real facts of the discovery were not romantic or encouraging. He obtained, by the oxidation of aniline sulphate with bichromate of potash, a dirty, unpromising looking precipitate, which, after investigating and purifying, he found could dye cloth a violet or mauve color. This was the discovery of the first aniline color, and it ever went by the name of "Perkin's Mauve." Two years later, 1858, Hoffmann discovered the splendid color magenta, or fuchsine, and during the following ten years violet, blue, green, red, and yellow coloring matters came in quick succession, and at the present day the number and variety of the aniline colors is simply bewildering. Few people, except those engaged in the chemical trade, have any idea of the immensity of the coal-tar industry. Its influence is world-wide; all other chemical industries are benefited by it, and hundreds and thousands of people are busily employed in its development.

THE PREPARATION OF RHEA FIBER FOR TEXTILE PURPOSES.*

BY PERRY F. NURSEY.

(Continued from last issue.)

In another letter to the author, Sir Joseph wrote: "The real question is now spinning machinery suitable for these long fibers. Cotton machinery is of no use; flax little better; silk and wool expensive, and the waste too great. Some practical machinist must take the matter up and prepare specially for the ramie fiber." Considering the amount of time, ingenuity, and money expended upon the Fremy-Urbain process, it is perhaps a matter for regret that the author is unable to record its commercial success. It will doubtless have been observed that there were somewhat complex elements in the treatment, and that its success moreover depended to some extent upon the skill of the examiner in deciding, at an early stage, what chemicals should be used. But whatever points of detail may have been responsible for failure, the fact remains that the works at Louviers were run but for a short time on the Fremy-Urbain process.

Besides the steaming box for the stems devised by M. Favier, that gentleman also brought out a combined mechanical and chemical system for the complete treatment of rhea fiber. Of this system the author has no personal knowledge. He came across a description of it a few years since, but cannot now find it. He is therefore unable to give any particulars further than that the preparing machine had no fewer than fifty-two pairs of rollers. It worked very well on dry stems, but its output was limited. It was in fact complicated, ponderous, and expensive.

Intimately associated with Brogden & Co., in connection with the Fremy-Urbain process, was Edward Casper, who, after having carefully followed the development of that process, came to the conclusion that the employment of decorticating machinery and caustic soda was not only unnecessary but prejudicial to the fiber. He held that the beating caused fractures in the fiber and caustic soda reduced its strength. He therefore devised a system in which decortication was effected by hand, and from which the use of caustic soda was excluded although other chemicals were employed. In Casper's process the stems are made into bundles of 100, as soon as cut, and are placed in a tank on the field where they are grown, and boiled for half an hour. The bark is then stripped from the stem, coming off in ribbon form and leaving no fiber adhering to the stem. As soon as they are stripped the ribbons are laid across girds and placed in a boiler containing a chemically charged liquid, in which, however, it is stated there is no caustic soda. Steam is admitted to the boilers and the ribbons are boiled under pressure for two hours, at the end of which time the grids, with their charges, are withdrawn and conveyed to a washing apparatus in which the effect of a continuous heavy rainfall and a constant dipping into a running stream are produced, pure water alone being employed. This completes the treatment, the grids being removed to the open air, where the filasse is exposed to the action of sun, wind, and rain, which is said to perfect its color and quality. When dry the filasse is conveyed to the packing shed and packed ready for the market. Although Mr. Casper expended time and money upon this invention it never reached the commercial stage. He was, undoubtedly, correct in principle in preparing the filasse from the rhea on the plantation, and thus justifying the motto "from planter to spinner," which was adopted by the syndicate formed to develop his invention. At the same time the author cannot help thinking that difficulties would arise in many localities with respect to water and fuel for boiling and steam-raising.

Turning to that part of the question under consideration which relates to the mechanical treatment of rhea fiber, the author will next describe a fiber-extracting machine which was invented by H. C. Smith in 1882, and was manufactured by Death & Ellwood, of Leicester. In the autumn of 1883 the author inspected the working of this machine, which answered its purpose very well, and gave a very clean separation without apparently damaging the fiber. This machine consisted of an iron framing about 3 feet high, 2 feet wide, and 3 feet deep from front to back, carrying a revolving drum about 18 inches in diameter and 12 inches wide. The drum was fitted with a series of beaters which passed near to the edge of a feed-

*From a paper read before the Society of Engineers.