their belief the statement that it was the custom of merchants and manufacturers to invoice unions as linen was utterly false and misleading. They determined to initiate proceedings by a test case in order to have the technical question whether linen was a pure flax fabric clearly established by law. The result of this trial, so far as it had gone, was known to them. They wished it to be clearly understood by their members, by the linen trade, and by the public, that in opening up this question in the law courts they had no intention of impugning the honor of retailers collectively or individually, but they were determined to open the eyes of the consumers to the fact that under the clauses of the Merchandise Trade Marks Act nothing but a pure flax fabric could be sold as linen, and that the placing of cotton or union under the generic name of *linen was nothing else but a breach of a law* specially framed for the protection of the public.

A correspondent of the London Drapers' Record suggests the following names to designate unions so as to observe the Act: Lincot—for linen and cotton combined; Jucot—for jute and cotton combined; Hemcot—for hemp and cotton combined; Woocot—for wool and cotton combined; Silcot—for silk and cotton combined; Hemlin—for hemp and linen combined; Woosil—for wool and silk combined; Worscot—for worsted and cotton combined; Flancot—for flannelette; Lincot lining—for linenette.

THE ORIGIN OF COAL-TAR COLORS.

David Patterson, F.C.S., delivered a lecture on the origin of the coal-tar colors, before the Edinburgh University Chemical Society, last month, from which the following abstract is made:—

The study of the aniline or coal-tar colors forms that *special branch of organic chemistry known as the benzine* derivatives, or the aromatic compounds, and the rise and progress of the coal tar industry forms, perhaps, one of our most interesting examples of a fairy tale of science. Is this not so when we learn that from the black and nauseous substance, tar, whose touch, when smeared on the fences of our country roads, puts us in rather an indignant humor for the rest of the day, there can be evolved the gayest and brightest colors—all the colors of the rainbow, and hundreds more? Until the middle of this century dyers and calico printers were almost solely dependent on the animal and vegetable kingdoms for their various colors. These constitute the natural coloring matters, and the many colors now obtained by chemical means are generally styled the artificial coloring matters. As nearly all our artificial dyes are obtained from coal tar—a by-product of coal gas—the history of these colors is intimately connected with the history and manufacture of ordinary coal gas. There is no doubt that the introduction of coal gas for illuminating purposes has made the manufacture of these aniline colors possible. In the year 1814 the parish of St. Margaret's of Westminster, was first illuminated with coal gas, but it was not till over forty years later that the first aniline color, mauve, was discovered by Perkin.

During these forty years, however, many chemists were engaged in investigating the constituents of coal tar, and thus a great amount of knowledge was being accumulated and the foundations of organic chemistry were being laid, foundations on which rested the subsequent rapid development of the great coal-tar color industry. We must go as far back as 1825, when Michael Faraday discovered benzine, to find the first investigation bearing directly on the question of the aniline colors. Benzine he called bi carburetted hydrogen, and it was discovered in the light oils, but it was not until twenty years later that Mansfield and Hoffman showed that benzine was present in coal tar. We have here a few of the principal dates of discovery:—

1820—Naphthalene was discovered by Garden.
1825—Benzine was discovered by Faraday.
1832—Anthracine was discovered by Dumas.
1834—Phenol and nitro-benzine by Mitscherlich.
1845—Benzine recognized in coal tar by Mansfield.

It is an interesting fact that aniline itself was discovered independently by three investigators, Unverdorben, Runge and Fritsche, and each gave to it a different name. Unverdorben, in 1826, obtained his aniline, which he termed "crystalline," by the destructive distillation of indigo ($C_{16}H_{10}N_2O_2$), while Runge discovered his in coal tar oil, and named it "kyanol," from the violet blue coloration it gave with a solution of chloride of lime (from kyanos, Gr.—dark blue). Fritsche, in 1840, obtained his aniline from indigo by oxidizing and treating with caustic potash. He named it "aniline" from the indigo plant indigofera anil. The reaction which takes place is readily seen from the following equation:

$$\underset{\text{Indigo}}{C_{16}H_{10}N_2O_2} \text{ yields by oxidation} =$$
$$\underset{\text{Isatin.}}{C_8H_5NO_2} + 4\,\underset{\text{Caustic potash.}}{KOH} =$$
$$\underset{\text{Aniline.}}{C_6H_7N} + 2K_2CO_3 + H_2.$$

Hoffman showed that these three substances, "Crystalline," "Kyanol" and "Aniline" were identical, and he preferred the name given to it by Fritsche, hence it comes to be called aniline.

The quantity of aniline present in coal tar is so small that its isolation on the commercial scale would never be a success. The production of aniline on a sufficiently large scale for industrial purposes became possible when Zinin in 1842 showed that it could be obtained by the reduction of nitro-benzine $C_6H_5(NO_2)$—a substance discovered by Mitscherlich in 1834. It shows the wonderful patience and perseverance of those early investigators on aniline, that before the coal-tar industry was established all the aniline that could be obtained for experiment had to be made by the costly and laborious operation of Fritsche's, *i.e., by distilling indigo with caustic alkali. Zinin's method* of producing aniline is beautifully simple. Benzine, when treated with nitric acid, is converted into nitro-benzine $C_6H_5(NO_2)$. This, on reduction by means of iron filings and acetic acid or hydrochloric, produces aniline; the monad nitro group (NO_2) is replaced by the amido group (NH_3). This shows how, from benzine as the starting point, aniline may be produced, from which, with all