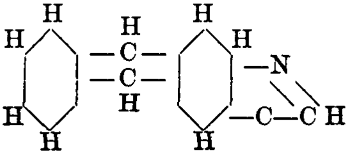
cose is also ascertained. The most striking results of these experiments is the indication that transformation of glucose into bodies of lower reducing power is possible under the influence of a ferment existing in the stomach and intestines. Boiling of the animal substance with water previous to the experiment was found to annul the action of this ferment. The latter body seems to exist rather within the walls of the vessels examined than upon the mucous surface. So far as the experiments have gone, the author regards them as indicating that this ferment is more abundant in the stomach and intestines of the rabbit than of those of the dog, cat, horse, sheep or pig. (*Chem. News*, *XLIX.*, 140.) A. A. B.

# ORGANIC CHEMISTRY.

## **Synthesis of Anthrachinoline.** C. GRAEBE.

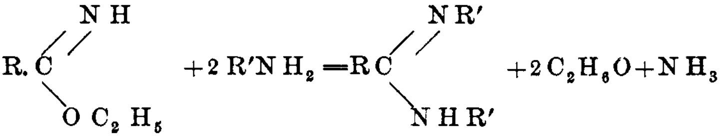
After Skraup had shown that β-naphthylamine on being treated with glycerine, sulphuric acid and nitrobenzole, was converted into β-naphtochinoline, it seemed probable that anthramine, under the same conditions, would yield anthrachinoline. This investigation was undertaken with the view of determining whether, in this case, the same product would be obtained as that derived from alizarine blue by heating it with zinc dust. Previous examination led the author to believe that the anthrachinoline derived from alizarine blue has the following composition :



Now, as the amido-group in anthramine was supposed to hold the same position as the nitrogen atom in alizarine blue, it was therefore probable that anthramine would yield the same anthrachinoline. This was fully verified by experiment. An anthramine melting at 170° C is. obtained. It forms yellow colored salts which, in solution, possess a very strong green fluorescence. (*Ber. d. chem. Ges. 1884, 170.*) J. H. S., JR.

## **Upon the Action of Phenylhydrazine upon the Imido-ethers.** (Azidines.) A. PINNER.

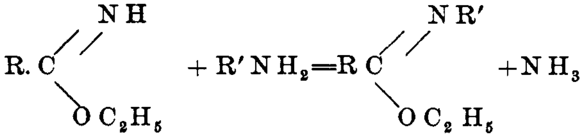
It is known that all primary amines react with the chlorides of imido-ethers in such a manner that symmetrical, di-substituted amidines result therefrom, viz :



$$R.C\begin{matrix}\diagup\!\!\diagup NH\\ \diagdown OC_2H_5\end{matrix} + 2R'NH_2 = RC\begin{matrix}\diagup\!\!\diagup NR'\\ \diagdown NHR'\end{matrix} + 2C_2H_6O + NH_3$$

This reaction takes place (as the author has shown) more or less rapidly in two consecutive phases, viz :

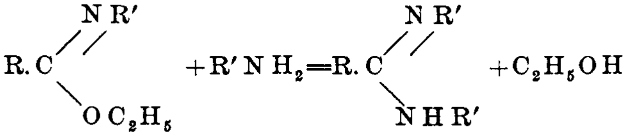
(I)



$$R.C\begin{matrix}\diagup\!\!\diagup NH\\ \diagdown OC_2H_5\end{matrix} + R'NH_2 = RC\begin{matrix}\diagup\!\!\diagup NR'\\ \diagdown OC_2H_5\end{matrix} + NH_3$$

At first the imido-group is exchanged for the remainder of the amine group, and then only is the oxyethyl group replaced by a second, univalent amido-radicals, viz :

(II)



$$R.C\begin{matrix}\diagup\!\!\diagup NR'\\ \diagdown OC_2H_5\end{matrix} + R'NH_2 = R.C\begin{matrix}\diagup\!\!\diagup NR'\\ \diagdown NHR'\end{matrix} + C_2H_5OH$$

It was therefore to be expected that, with the aid of the hydrazines, analogous reactions would take place. For this reason phenylhydrazine was treated in alcoholic solution with the chloride of benzimido-ether.

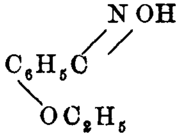
The author calls the first class of these compounds "azido-ethers," and the second class "azidines."

In reality the above reactions take place when a solution in absolute alcohol of about 2 mols. phenylhydrazine are added to an alcoholic solution of the imido-ether chloride. (*Ber. d. Chem. Ges. 1884, 182.*)

J. H. S., JR.

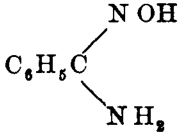
## Upon the Action of Hydroxylamine upon the Imido-ethers and the Amidines. (Acidoximes.) A. Pinner.

It was found that hydroxylamine united readily with benzimido-ther and benzamidine to form benzoximido-ether



$C_6H_5C\begin{matrix}\diagup\!\!\diagup NOH\\ \diagdown OC_2H_5\end{matrix}$

and benzoxamidine, viz:



$C_6H_5C\begin{matrix}\diagup NOH\\ \diagdown NH_2\end{matrix}$

(*Ber. d. ch. Ges. 1884, 184.*)
J. H. S., Jr.

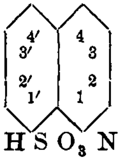
## On Paradibromchinoline. Sigmund Metzger.

The original material in this investigation was benzene, which, at a boiling temperature, was treated with 8 pts. of bromine. Paradibrombenzole (M. P. 89° C.) was thus obtained. This was converted into the nitro-compound by treating it with hot nitric acid. The mononitroparadibrombenzole was converted into paradibromaniline by reduction. 5 grms. paradibromaniline, 12 grms. nitrobenzole, 60 grms. glycerine and 50 grms. conc. $H_2SO_4$ were heated together for 5 hours. The melt was diluted with water and treated with steam, which carried over a compound which proved to be paradibromchinoline (M. P. 127°–129° C.). (*Ber. d ch. Ges. 1884, 186.*)
J. H. S., Jr.

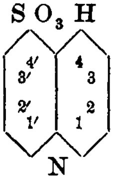
## On Parachinoline Sulpho-Acid. Joseph Happ.

The only sulphur acids of chinoline now known are the ortho- and meta-sulpho-acids which have the following structure:

Ortho sulpho-acid.
1:1′

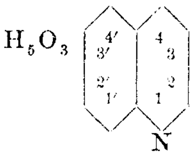


Meta sulpho-acid.
1:4



A para sulpho-acid should therefore be produced, if sulphanilic acid were treated with glycerine, nitrobenzole and sulphuric acid.

The para sulpho-acid obtained by the author has the following structure:



It consists of highly refracting, shining crystals, which are quite stable. It dissolves with difficulty in cold, but more easily in hot water. The aqueous solution reddens litmus paper. It unites easily with bases to forms salts. (*Ber. d. chem. Ges. 1884, 191.*)

J. H. S., Jr.

### **On Derivatives of β-Dinaphtylamine.** Ch. Ris and A. Weber. (Dinitro-β-Dinaphtylamine.)

This was obtained by treating the base, dissolved in glacial acetic acid, with fuming nitric acid. This body crystallizes from cumene in yellow red needles, which melt at 224–225° C.

### **Tetranitro-β-dinaphthylamine.**

This compound is formed at the same time as the previous one and almost exclusively, if nitration is performed without cooling the mixture. Crystallizes from nitrobenzole in little yellow crystals. M. P. 285–286° C. (*Ber. d. chem. Ges 1884, 197.*)

J. H. S., Jr.

### **On Chrysaniline.** O. Fisher and G. Töerner.

The authors found that chrysaniline is a diamidophenylacridine, as they were enabled to obtain not only phenylacridine from chrysaniline, but also to produce the latter in a new way, synthetically. The material used in these experiments was Oehler's phosphine, which, after being purified, crystallizes in long, golden yellow needles.

### **Chrysophenole.**

This was obtained from chrysaniline by heating it, under pressure, with 3–4 pts. strong H Cl. The following reactions then take place:

$$C_{19}\,H_{15}\,H\,Cl+H_2\,O=C_{19}\,H_{15}\,N_2\,O+N\,H_4\,Cl,$$

$$\text{or } C_{20}\,H_{17}\,N_3\,H\,Cl+H_2\,O=C_{20}\,H_{17}\,N_2\,O+N\,H_4\,Cl.$$

## Phenylacridine.

The formation of this compound from chrysaniline is a proof that the latter has the formula $C_{19} H_{15} N_3$. 10 grms. chrysaniline were dissolved in 50 grms. conc. $H_2 S O_4$, the mixture cooled, and then treated with a stream of nitrous acid until an excess of the latter predominates. The diazo-compound thus formed was poured into 600 grms. of boiling absolute alcohol, and, after the evolution of nitrogen has ceased, an intensely yellow green, fluorescing solution was obtained. The alcohol was distilled off, and the acid solution, after being diluted was treated with an alkali which threw down a precipitate consisting of reddish flakes. These were then treated with a current of steam. A substance was thus obtained melting at 181°, which turned out to be phenylacridine. It will therefore be seen that chrysaniline is a diamidophenylacridine.

### *Synthesis.*

E. Renouf, a short time since, found, on treating orthonitrobenzaldehyde with aniline, that a compound was obtained which he called orthodiparatriamidotriphenylmethane, and that this body, on oxidation with arsenic acid, yielded a brown coloring matter. The authors found, on treating this triamidotriphenylmethane with arsenic acid at 180–200° C, that chrysaniline is formed. (*Ber. d. ch. Ges. 1884, 203.*) J. H. S., Jr.

## Chlorophyll Probably a compound of Iron with one of the Glucosides. A. B. Griffiths.

From recent researches of E. Schunck upon chlorophyll (Proc. Roy. Soc. **36**. 183) and from those of the author upon the value of iron, as ferrous sulphate, to plants, (This Journal, vol. VII. 77) the attempt is made to justify the conclusion suggested in the above title. (*Chem. News, XLIX.* 237.) A. A. B.

## The Chlorination of Pyrogallol. C. S. Webster.

The first stage in chlorination of pyrogallol (in solution in glacial acetic acid) is found to be trichlorpyrogallol, $C_6 OCl_3 (O H_3)$ which crystallizes in needles with $3H_2 O$. (*Chem. News, XLIX.* 140.) A. A. B.