

explanation, to which we are led by palpable facts in this case, will be found to be generally applicable to all virulent diseases.

It must appear superfluous to point out the principal consequences of the facts which I have had the honor to present before this Academy. There are, however, two of these which may be mentioned. One is, that we may hope to obtain artificial cultivations of every virus, and the other is, the idea of obtaining vaccines of the virulent diseases which afflict humanity, and which are the greatest plague of agriculture, in the breeding of domestic animals.

It is a duty and a pleasure for me to add, that in these delicate and lengthened researches, I have been assisted with great zeal and intelligence by Messrs. Chamberland and Roux.

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### Abstracts from American and Foreign Journals.

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#### Bulletin de la Societe Chimique de Paris.

Abstractor, E. H. S. BAILEY, PH. B.

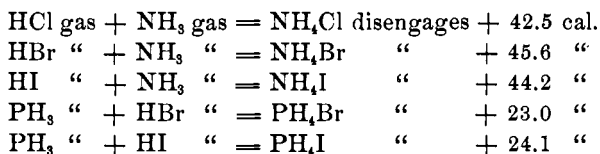
*Various Thermochemical Data*, BERTHELOT (32, 385).—From his recently published work, the author gives various data, the result of careful experiments, in regard to the heat of formation of cyanogen, of diamylene in the gaseous state, and the heat of fusion of glycerine, and its specific heat.

*On the Elimination of Bromine from Bromocitraconic Acid, and on a New Organic Acid*, E. BOURGOIN (32, 388).—By partially saturating a solution of bromocitraconic acid with caustic potash, and slowly evaporating the solution, crystals of bromide of potassium separate out, and the mother liquor consists of a new acid corresponding to the formula  $C_{10}H_4O_8$ . It appears to be related to pyrotartaric acid ( $C_{10}H_8O_8$ ), and also to citraconic acid ( $C_{10}H_6O_8$ ).

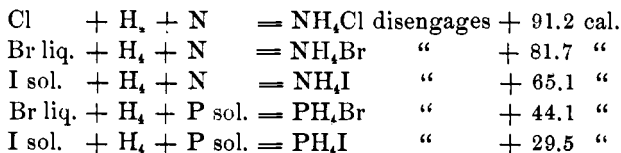
*Note upon the Solubility of Benzoic and Salicylic Acids*, E. BOURGOIN (32, 390).—A re-assertion of facts previously stated, and a description of the methods used (see Bull. Soc. Chim., 31, 53, and this JOURNAL, I, 272)

*On the Chlorhydrate of Phosphoretted Hydrogen*, J. OGIER (32, 483).—In the apparatus devised by M. Cailletet, at a temperature of  $14^{\circ}$ , hydrochloric acid combines with phosphoretted hydrogen, producing hydrochlorate of phosphoretted hydrogen. It appears in the shape of small, snowy flakes. At a little higher temperature it is a liquid.

*On the Heat of Formation of Bromohydrate and Iodohydrate of Phosphoretted Hydrogen*, J. OGIER (32, 484).—These determinations were made with special reference to a comparison with similar ammoniacal compounds. The results are:



Or, if we take the elements simply, the results are :



It will be noticed that the heat of combination of the ammoniacal salts is considerably higher than that of phosphorus compounds.

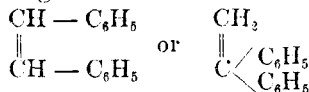
*On the Pyridine Bases*, AUG. RICHARD (32, 486).—Several homologous bodies having the general formula C<sub>n</sub>H<sub>2n-5</sub>N, have been discovered in animal oil from various sources. Some of these, as pyridine, picoline and collidine, have been formed synthetically, but it has not been fully determined whether these bodies are identical or isomeric. From a study of these bodies, and especially of collidine, the inference is drawn that they are isomeric.

*Partial Synthesis of Sugar of Milk, and Contributions to the Synthesis of Cane Sugar*, E. DEMOLE (32, 489).—Starting with the simple hypothesis, that in cane sugar and milk sugar the molecules of glucose are different and not identical, the author has made the attempt to unite levulose to dextroglucose, and galactose to lactoglucose. He has failed with the former, but succeeded with the latter. Two molecules of dextroglucose united, with loss of water, cannot form cane sugar. In the case of sugar of milk it is converted by dilute acid into two isomeric bodies, galactose and lactoglucose. By acting on this mixture with acetic anhydride, a body is produced having all the properties of octacetyl milk sugar, and agreeing very closely with the octacetate described by Schuetzenberger. If an alcoholic solution of this synthetically formed ether of milk sugar be treated with baryta, milk sugar is formed, which readily crystallizes from the solution after the removal of the excess of baryta. There is then a complete identity between the two octacetylic ethers and the sugars derived from them. The action of acetic anhydride upon the

glucoses seems to be that two molecules of glucose, either different or similar, in the presence of this dehydrating body, are changed to their anhydrides. Afterwards the action of acetic anhydride upon these anhydrides, changes them to an ether of diglucose, in the same way that oxide of ethylene absorbs acetic anhydride, producing an ether of diglycol.

*On Chlorophyl*, A. GAUTIER (32, 499).—This substance, as was shown several years ago, may be obtained in very perfect crystals. It presents many analogies to bilirubin, both in its reactions and in its elementary composition; the latter seeming to classify it as a higher isologue of that substance. The substance described by Hoppe-Seyler under the name of chlorophyllane, is probably simply chlorophyl. Pure chlorophyl does not contain iron. It seems to be related to hæmatin, the coloring matter of the blood.

*On the Constitution of Dibromethylene*, E. DEMOLE (32, 547).—The determination of the constitution of dibromethylene is of importance, as it will help to explain the phenomenon of oxidation which bodies undergo in contact with free oxygen at ordinary temperatures. In studying the action of benzine upon dibromethylene, in the presence of  $Al_2Cl_6$ , it is found that two atoms of bromine may be replaced by phenyl, giving

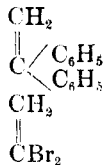


This hydrocarbon,  $C_{14}H_{12}$ , is either stilbene or diphenylethylene. On treating it with an acetic acid solution of chromic acid, and by saturating the excess of acid with carbonate of soda, drying and distilling, crystals of pure benzophenone are obtained. The above hydrocarbon

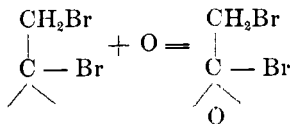
is therefore disymmetric stilbene, and has the formula

$$\begin{array}{c} CH_2 \\ || \\ C < \begin{array}{l} C_6H_5 \\ C_6H_5 \end{array} \end{array}$$

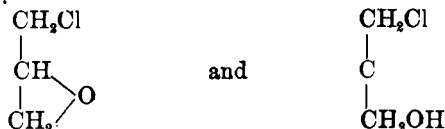
derived, of course, from dibromethylene, also disymmetric



Since it is demonstrated that in dibromethylene the two bromine atoms are attached to the same carbon, it seems best to discard M. Fittig's explanation, which assumes that dibromethylene has two free affinities, and can take up oxygen, as follows :



*On the Constitution of Epichlorhydrine.* HANRIOT (32, 550).—Two methods have been proposed to represent the constitution of this body, viz :



If, as the last method supposes, an alcoholic group exists, the body should be attacked by  $\text{PCl}_3$ , giving dichloride of isoallylene. If, however, it contains oxide of monochlorpropylene, it should not be affected by  $\text{PCl}_3$ .

Essentially, two bodies are obtained by this reaction. The first, boiling at  $130\text{--}140^\circ$ ; the second, at  $220^\circ$ . The first has the formula  $\text{C}_3\text{H}_5\text{OCl}, \text{PCl}_3$ ; the second, since it has no constant composition, is evidently dissociated. The combination of epichlorhydrine and  $\text{PCl}_3$  is decomposed by water into phosphorous acid and epichlorhydrine. In the reaction of  $\text{PCl}_3$  upon epichlorhydrine, no chloride of isoallylene was produced, hence confirming the formula as given by M. Reboul, viz., the first above mentioned.

*Action of Sodium upon Epichlorhydrine,* HANRIOT (32, 552).—The body  $\text{C}_6\text{H}_{10}\text{O}_2$  can be separated from  $\text{NaCl}$ , which is obtained by the action of sodium upon epichlorhydrine, by crystallizing out the  $\text{NaCl}$ , and distilling the oily liquid with ether.

*On Dimethylnaphtylamine and Naphtoquinone,* P. MONNET, F. REVERDIN and E. NOELTING (32, 552).—Dimethylnaphtylamine was subjected to oxidation for the purpose of obtaining a coloring matter. Different methods of oxidation were used, with no success. A naphtoquinone was prepared by the oxidation of naphtylamine with  $\text{K}_2\text{Cr}_2\text{O}_7$  and  $\text{H}_2\text{SO}_4$ .

*On the Fermentations that take place in the Process of Extraction of the Saccharine Liquid from Beet Roots by Diffusion,* A. MILLOT and MAQUENNE (32, 611).—It has been frequently noticed that in this process about 1 per cent. of the sugar is destroyed. In the case of the apparatus being partly empty, it has been noticed that sometimes an explosive mixture is formed. From the products obtained by distillation, the theory is advanced, that at the temperature at which this diffusion takes place, as long as oxygen is present, acetic fermentation goes on. As soon as the oxygen is exhausted, the fermentation ceases, and butyric fermentation proceeds, accompanied by the disengagement of carbonic anhydride and hydrogen. A little alcohol is also formed. The hydrogen is therefore produced

by butyric fermentation, and a small quantity may be also formed by the action of the acetic acid on the iron of the apparatus.

**Transformation of Styrolene Bromide into Methyl Benzoate,** C. FRIEDEL and M. BALSOHN (32, 613).—Some diversity of opinion has existed as to the constitution of monobromostyrolene made from styrolene bromide by the action of alcoholic potassa. From styrolene bromide, by the action of sulphuric acid, a small quantity of methyl benzoate was obtained. The decomposition succeeded better, however, if styrolene bromide was heated in sealed tubes at  $180^{\circ}$ , with a large excess of water. The oily part of the liquid, on being distilled at  $200^{\circ}$ , gave off a little more than one-half of the theoretical quantity of methyl benzoate. The reaction is expressed:  $C_6H_5.CBr.CH_2 + H_2O = C_6H_5 - CO.CH_3 + HBr$ . Styrolene bromide consists largely, therefore, of  $C_6H_5.CBr.CH_2$ .

**On the Oxidation of Ethyl Benzine,** C. FRIEDEL and BALSOHN (32, 615).—The author infers, that in oxidizing ethyl benzine it ought to be possible to obtain not an aldehyde, but an acetone, methyl benzole. This would take place if we suppose that of the two groups,  $CH_2$  and  $CH_3$ , which are attached, directly or indirectly, to the benzine nucleus, the first is most readily oxidized. Upon oxidizing ethyl benzine by an acetic acid solution of chromic acid, and subsequent distillation, methyl benzole was formed. From a consideration of the facts of the case, it is concluded that in the oxidation of aromatic hydrocarbons, at least in those in which there is a  $CH_2$  group attached to the benzine nucleus, an acetone is formed, which breaks up, as is readily seen. If, however, in the place of a  $CH_2$  group, there should be a  $CH$  group attached to the benzine, and saturated by two other atoms of carbon, the oxidation would not give acetone, but without doubt a tertiary alcohol, by the simple addition of oxygen, without the elimination of hydrogen.

**On the Synthesis of Ethyl Benzine by means of Ether and Benzine,** BALSOHN (37, 617).—By heating together for some time at  $180^{\circ}$ , 1 part of ether, 2 parts of chloride of zinc, and 4 parts of benzine, there is obtained ethyl benzine, together with some undecomposed ether, benzine, and probably a little bi- or tri-ethyl benzine.

**On the Direct Combination of Cyanogen with Hydrogen and the Metals,** BERTHELOT (33, 2).—By heating a mixture of cyanogen gas and hydrogen, in a sealed tube at  $500-550^{\circ}$  for several hours, the two gases can be made to combine, producing hydrocyanic acid,  $Cy + H = CyH$ . Only a small quantity is changed to paracyano-

gen. Cyanogen also combines directly with the metals Zn, Cd and Fe, at 300°, if heated for some time in sealed tubes. With Cu, Pb, Hg and Ag, the combination is difficult to produce, probably because so high a temperature would be required as would cause a dissociation of the cyanogen gas. Cyanogen seems properly to have a double character, and to belong to both the formine and the ethylic series.

*On Epichlorhydrine*, BERTHELOT (33, 6).—A review and explanation of articles published elsewhere.

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## Berichte der Deutschen Chemischen Gesellschaft.

ABSTRACTOR, H. ENDEMANN.

*On a Series of Aromatic Bases Isomeric with Mustard Oil and other Sulphocyanides*, A. W. HOFMANN (13, 8).—In the preparation of Sell and Zierold's isocyanphenyl chloride by a modified method, using, instead of chlorine, phosphorus pentachloride, the author has obtained the above-mentioned compound, together with another substance, which on analysis proved to be monochlorphenyl sulphocyanide. Chlorine, as also sulphur chloride, did not produce this substance, and with phosphorus pentachloride but 18 per cent. of the theoretical quantity could be obtained.

Monochlorphenyl sulphocyanide is solid at ordinary temperatures, but melts at 24°. Vapor density, found, 82.4; calculated, 84.75. It forms crystallized salts with hydrochloric, sulphuric and nitric acids, and double salts with gold and platinum chlorides, which, however, are at once decomposed by the addition of water. A mononitro compound is produced by the action of nitric acid on a solution of the substance in concentrated sulphuric acid.

The chlorine atom is easily replaced by hydroxyl, by simple boiling with alcohol, or by ethyl, by the action of sodium ethylate.

By other well-known reactions, an amido compound, and an anilide, may likewise be produced.

The monochlorphenyl sulphocyanide loses, by the substitution of chlorine for hydrogen, its properties as a mustard oil. It does not, for instance, form compounds analogous to urea, nor does it lose its sulphur by the action of oxidizing agents, or give any other reaction which would prove its character as a simple derivative of mustard oil. Moreover, it has entirely different properties from all other products of the same atomic composition, derived from either para-, meta- or ortho-chloraniline