direction of the lamination and the specific gravity was 5.0405 (temp. of water 16°C).

The analysis gave:

ZnO	93.34
PbO	2.37
Fe (metallic)	1.99
$CaCO_3$	1.01
C	.20
SiO_2	1.11
	100.02

ABSTRACTS.

Abstracts from the Journal of the Chemical Society (London), by Arthur H. Elliott, Ph. B., F. C. S.

On Rotary Polarization of Chemical Substances under Magnetic Influence. By W. H. Perkin, F. R. S. (Vol. XL., p. 330).

Author used tubes 10 c. m. long, closed with glass plates ; which tubes had their ends inserted a short distance into perforations in the armature of an electro-magnet, as proposed by De la Rive. Water and carbon disulphide were used as standards of comparison. The results obtained bear little or no relationship to the chemical composition of the substance examined. But by referring the observations to lengths of tubes related to each other in proportion to their molecular weights, and making the necessary corrections for density, it is found that the molecular magnetic rotary power of bodies follows more or less regularly with the chemical composition.

A Spectroscopic Study of Chlorophyll. By W. J. Russell, Ph. D., F. R. S., and W. Lapraik, F. C. S. (Vol. XL., p. 334).

By making an alcohol-ether solution of leaves, the authors obtained a chlorophyll solution and studied the four least refrangible absorption bands. Authors tried the action of hydrochloric acid gas upon the spectra and observed some remarkable movements in the position of the bands. They also state that other acids produce like changes. Carbonic acid produces no change. Application of heat produces like changes. The action of mercuric chloride, ferric chloride is also noticed. Also the alum and basic lead precipitates. By adding alkalies to the chlorophyll solution, there is a fading out of all except the least refrangible band, and the spread of this band towards the blue. Further addition of alkali divides this band into two, and still more alkali entirely eliminates all but one band.

On the Precipitation of the Alums by Sodic Carbonate.

By Edmund J. Wills, D. Sc., F. R. S., and K. L. Barr, (Vol. XL., p. 343).

By a series of experiments the authors find that the precipitation of an alum by sodic carbonate takes place in three stages. First, much carbonate is added without any precipitation taking place; secondly, there is a precipitation according to a continuous law until about half the alum is thrown down; and thirdly, the precipitation proceeds according to the previous law, but with altered constants.

On the Determination of Nitric Acid as Nitric Oxide by Means of its Reaction with Ferrous Salts. (Part II.)

By Robert Warrington. (Vol. XL., p. 345).

This paper gives the details of a modification of Schloesing's method with ferrous chloride and hydrochloric acid, making the determinations in an atmosphere of carbon dioxide, measuring the nitric oxide by treatment with excess of oxygen in a gas analysis. It is especially applicable to the determination of nitrates in soils.

On the Determination of Nitric Acid in Soils.

By Robert Warrington. (Vol. XL., p. 351).

Author gives details of the manner of taking soil samples, the treatment of the samples, variations in the quantity of nitrates present in the soil resulting from different modes of drying, preparation of the watery extract, and analysis of the soil extract. Author also gives a set of tables showing the relative value of the Crum-Frankland and Schloesing methods for the determination of nitrates, giving the preference to the latter. The indigo method for the determination of nitric acid is shown to be valueless.

Metallic Compounds containing Bivalent Hydcocarbon Radicals. (Part III).

By J. Sakurai, F. C. S., University of Tokio, Japan. (Vol XL., p. 360).

By mixing monomercuric methylene iodide with mercuric chloride, molecule for molecule, and cohabiting with alcohol, a white crystalline body was obtained, soluble in ether, chloroform, and alcohol, but insoluble in water. It melts at 129°C. Heated with a solution of iodine in potassic iodide, it yields an oily liquid. Its formula is given as CH_2 HgICl or monomercuric-methylene chloride. The constitution of this body is discussed and the formula Cl (CH_2) HgI is believed to be the correct one. Incidentally, during this investigation methylene chloroidide was obtained, and its boiling point is given as 109°C.

Some Observations on the Luminous Incomplete Combustion of Ether and other Organic Bodies. By W. H. Perkin, F.R.S. (Vol. XL., p. 363.)

The author noticed during the evaporation of ether that a pale blue flame, visible in the dark, was floating about upon the hot sand-bath near without igniting the ether which was evaporating. The temperature at which this phenomena occurs is about 260°C., from that to a dull red heat. A number of methods of exhibiting this phenomena at lectures are mentioned; one with a hot copper or iron ball, and another with a glass tube, which. appear easy of execution. The temperature of this flame is low and will not ignite carbon disulphide. Another point about this combustion is that the quantity of carbon dioxide produced is very small. It was found that for 1.313 grm. of oxygen consumed only 0.133 grm. of carbon dioxide was found. Among other bodies that produce this effect are mentioned acetic aldehyde, the alcohols up to amylic pentane, hexane, heptane, and the hydrides up to paraffin. Benzol and homologues, phenol and cresol, give no result. The fatty acids give luminous effects; stearic acid at about 250°C. and when 290°C. is reached blue flames appear: oleic acid acts like stearic. Benzoic, cinnamic and phthalic acids give no results. Olive and linseed oils, and white wax act like oleic acid. Spermaceti shows the effect very well and is recommended for a lecture experiment. When solid paraffin was used and heated in a retort through which air was drawn 0.3816 grm. of oxygen was consumed and only 0.025 grm. of carbon dioxide obtained. Author thinks that the luminous appearance is similar to the phosphorescence obtained during the imperfect combustion of phosphorous. The light was too feeble for detailed spectroscopic analysis; but no bands were seen.

On Some New Compounds of Hæmatein and Brazilein.

By J. J. Hummel and A. G. Perkin. From the Dye-house of the Yorkshire College. (Vol. XL., p. 367.)

Authors describe a simple method of preparing crystalline hæmatein in tolerable quantity. They use the ammonio-compound of hæmatein, and by treatment with strong acetic acid obtain crystals. These crystals are microscopic rhombic plates, soluble in water, alcohol, ether and acetic acid; and alkalies dissolve them readily. Analysis gave figures agreeing with the formula $C_{16}H_{12}O_6$ and the crystals are anhydrous.

By treating hæmatein with cold concentrated sulphuric acid and then adding acetic acid an orange colored crystalline powder is obtained, consisting of microscopic prisms; and analysis gives the formula $C_{16}H_{11}O_5HSO_4$ or *acid isohæmatein sulphate*. It is insoluble in alcohol, ether, and benzol; but is soluble to a small extent in acetic acid. Ammonia and soda solutions dissolve it.

When hæmatin is heated in sealed tubes with hydrochloric acid, and purified by crystallization from water microscopic orange-red needles are obtained, which analysis shows to have the formula $C_6H_{11}O_5Cl$. *Isohæmatein chlorhydrin.* It dissolves easily in water; it is less soluble in alcohol; and gives a reddish violet solution with alcoholic potash. Concentrated sulphuric acid converts it into isohæmatein sulphate.

Treatment of hæmatein with hydrobromic acid in the same manner as with hydrochloric acid gives *isohæmatein monobromhydrin* as microscopic needles, having the formula $C_{16}H_{11}O_5Br$ and resembling the chlorine compounds.

By treating isohæmatein chlorhydrin or bromhydrin with argentic hydrate, *isohæmatein* is obtained, having the formula $C_{16}H_{12}O_6$ and isomeric with hæmatein

Crystalline Brazilein is obtained from Brazil Wood extract in the same manner that hæmatein is obtained from Logwood extract. It forms thin microscopic reddish-brown rhombic plates, very slightly soluble in cold water, more so in hot. Alkalies dissolve it. Analysis gives the formula $C_{16}H_{12}O_5H_2O$. Treated with concentrated sulphuric acid yellow rhombic needles of *acid isobrazilein sulphate* are obtained, having the formula $C_{16}H_{11}O_4HSO_4+H_2O$. It is slightly soluble in boiling glacial acetic acid, very soluble in alkalies.

By heating brazilein in sealed tubes with hydrochloric acid *isobrazilein chlorhydrin* as microscopic prisms is obtained, having the formula $C_{16}H_{11}O_4Cl$. It is soluble in water and alkalies. By similar treatment with hydrobromic acid the corresponding bromine compound $C_{16}H_{11}O_4Br$. is obtained.

The tinctorial power of the new compounds is much greater than the original hæmatein and brazilein, and much faster.

On the Crystallization from Saturated Solutions of Certain Compound Salts. By JOHN M. THOMSON AND W. POPPLEWELL BLOXAM. (Vol. XL p. 379).

The Paper is a continuation of the experiments published in the *Journal* May 1879, on "The Action of Isomorphous Salts in producing the Crystallization of Supersaturated Saline Solutions." In the present communication the Authors take up the case of supersaturated solutions of double salts, acting upon them with nuclei consisting of one or the other of the component salts. Of the salts experimented with are the halogen salts of mercury with potassium and ammonium, potassic alum, Lefort's salt (the double zinc-copper sulphate), microcosmic salt, double tartrates and citrates of potassium, sodium and magnesium.

Abstracts from Berichte der Deutschen Chemischen Gesellschaft. By Percy Neymann, Ph.B.

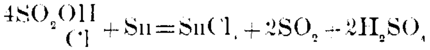
On the Behavior of Chlorosulphurous Acid with Several Metalloids and with Tin. K. HEUMANN and P. KŒCHLIN. (Vol. XV. p. 416).

Chlorosulphurous acid $SO_2OH.Cl$. can be regarded as an acid and also as an acid chloride. The authors experimented with chlorosulphurous acid and sulphur, phosphorous, arsenic, antimony, tin, and carbon separately.

Chlorosulphurous acid and sulphur react upon heating and a yellowish oil, found by analysis to be sulphurous chloride S_2Cl_2, was distilled. Sulphurous acid gas and hydrochloric acid escaped during the reaction.

Chlorosulphurous acid and yellow phosphorus reacted best upon each other at a temperature of 25°—30° and currents of sulphurous and hydrochloric acid gases escaped. The liquid became more heated by the reaction and the experiment terminated in an explosion of the apparatus. Red phosphorous is only attacked after stronger heating and a few drops of a distillate are obtained which seem to be phosphoroxychlorid, but this is probably the product of a second reaction.

Arsenic and antimony form their trichlorides. The reaction is characterized by leaving in both cases a non-volatile compound in the retort. The chlorosulphurous acid is most probably split up into chloride, sulphur dioxide and sulphuric acid : $2Cl.SO_3H = 2Cl + SO_2 + H_2SO_4$. The reaction with tin is much more complete the tetrachloride being formed according to the formula



$$4SO_2\begin{matrix}OH\\Cl\end{matrix} + Sn = SnCl_4 + 2SO_2 + 2H_2SO_4$$

Freshly ignited wood charcoal when strongly heated with chlorosulphurous acid generates gases which cannot be liquefied. The decomposition of chlorosulphurous acid takes place as follows :

$$SO_2HCl + C = SO_2 + HCl + Cl.$$

$$\text{And } 2SO_3HCl + C = 2SO_2 + 2HCl + CO_2.$$

Chlorosulphurous acid hence has a direct chloridizing action upon sulphur, phosphorous, arsenic, antimony and tin, at the same time sulphurous anhydride and sulphuric acid are produced. The latter produces secondary reactions with the respective elements and their chlorides and hence oxygen compounds of the metalloids are formed. Carbon reacts in a different manner and produces $COCO_2HCl$ and SO_2.

Contributions to the Knowledge of Piperidine.

C. SCHOTTEN (Vol. XV. p. 421).

Preparation of : 1. Amyl-piperidine from piperidine, amylbromide and aqueous solution of caustic potash.

2. Methyl-amyl-piperidine from amyl-piperidine and methyl iodide. Methyl-amyl-piperyl-ammonium-iodide is at first formed. The product of distillation of the ammonium base which was formed from the iodide by means of oxide of silver, almost completely dissolved in hydrochloric acid.

3. Benzyl-piperidine from benzyl-chloride and piperidine. After the reaction, water is added to the product and benzyl-piperidine is separated.

4. Methyl-benzyl-piperidine from benzyl-piperidine and methyl-iodide.

5. Nitroso-piperidine from piperidine and nitrous acid.

6. Piperyl-carbonicacidether by dropping ethyl-chloro-carbonate into piperidine. It is heavier than water and almost insoluble in it.

7. Acetyl and oxalyl-piperidine from acetyl-chloride and piperidine and oxalic ether and piperidine respectively. The author also produced pyridine from piperidine by means of bromine substitution products.

On the Dry Products of Distillation of Tartaric Acid. Leo Liebermann. (Vol. XV. p. 428.). The products from 250 grms. of tartaric acid were:

Pyroracemic acid	9.24 grms.
Methylsuccinic acid	2.11 "
Formic acid	0.4 "
Tarry substances	3.0 "
Pitch-like substances, Aldehyde and Volatile acid	2.0 "

The larger proportion of the acid is hence decomposed according to this formula:

$$C_4H_6O_6 = C_3H_4O_3 + H_2O + CO_2.$$

A smaller portion thus:

$$2C_4H_6O_6 = C_5H_8O_4 + 2H_2O + 3CO_2.$$

and a third still smaller portion:

$$C_4H_6O_6 = CH_2O_2 + 2CH_2O + CO_2.$$

and judging from the copious generation of carbonic acid and carbonic oxide:

$$C_4H_6O_6 = H_2O + CO_2 + CO + 2CH_2O.$$

An Apparatus for Determining the Melting Point of Easily Liquified Metals and Alloys. Leo Liebermann. (Vol. XV. p. 435). Description of apparatus.

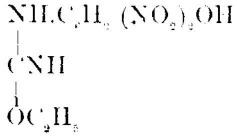
Sulphurous Acid in Wine. Leo Liebermann. (Vol. XV. p. 437). Controversial.

Detection of Sulphurous Acid in Wine and other Liquids. Leo Liebermann. (Vol. XV. p. 439). Two methods.

On the Optical Power of Rotation of Malic Acid and its Salts at Different Temperatures. Th. Thomsen. (Vol. XV. p. 441). Results of experiments are tabulated.

The Action of Chlorine on Sulphonic Compounds and Organic Oxysulphides. W. Spring and C. Winssinger. (Vol. XV. p. 445). Resumé of articles on the subject published in Bulletins de l'Académie de Belgique; III. Série. t. II. Déc. 1881.

On the Action of Cyanogen upon Picraminic Acid. PETER GRIESS. (Vol. XV. p. 447). The author finds the formula for the product of a reaction between these two substances as

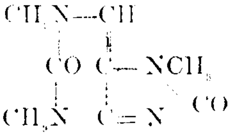


$$\begin{array}{l} NH.C_6H_2(NO_2)_2OH \\ | \\ CNH \\ | \\ OC_2H_5 \end{array}$$

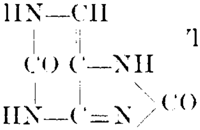
and terms it ethyl-oxy-carbimid-amido=dinitro-phenol.

On the Transformation of Xanthin into Theobromin and Coffein. EMIL FISCHER. (Vol. XV. p. 453). The author repeats an experiment, previously performed by *Strecker*, and by altering the conditions obtains evident proof of the constitution and formulæ, which latter are as follows:

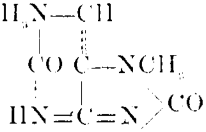
Coffein:



Xanthin



Theobromin :



On the Action of Iodine on the Silver Salts of some Acids of the Aromatic Series. K. BIRNBAUM and H. REINHERZ. (Vol. XV. p. 456). Experiments with benzoic, salicylic, and phtalic acids.

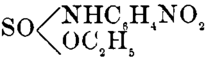
On the Critical Temperatures of Liquid Bodies. BR. PAWLEWSKI. (Vol. XV. p. 460). Controversial.

On Tropin. K. KRAUT. (Vol. XV. p. 462). Controversial.

Action of Pentacloride of Phosphorous on Acetyl and Benzoyl-diphenylamin. AD. CLAUS. (Vol. XV. p. 464). Controversial.

On same relations between Physical Constants of Chemical Compounds as set forth by Messrs. J. W. BRUEHL and V. ZENGER. (Vol. XV. p. 467).

On the Action of Bisulphide of Carbon on P-nitranilin. S. M. LOSANITSCH. (Vol. XV. p. 470). P-nitranilin and bisulphide of carbon boiled in alcoholic solution in the presence of caustic potassa give rise to a thio-urethane, but not, as would be supposed, to a thio-urate. The analysis led to the formula



$$SO\left\langle\begin{matrix}NHC_6H_4NO_2\\OC_2H_5\end{matrix}\right.$$

The compound is termed p-nitro-phenyl-xanthogenamid.

On the Action of Nitric Acid on Tribromanilin (common). S. M. Losanitsch. (Vol. XV. p. 471). Concentrated nitric acts energetically upon tribromanilin. The reaction is very complicated. 100 grms. of tribromanilin gave:

30 grms. dibrom-dinitro-methane.
5 " tetrabrombenzol.
10 " bromanil.
24 " dark red mass.

The remaining tribromanilin is converted into picric, oxalic and carbonic acids.

The action of nitric acid on tribromanilin in glacial acetic acid solution gives rise to the same products when boiled. If allowed only to be heated until red fumes appear dibrom-nitranilin is formed.

The action of nitric acid on tribromanilin in glacial acetic acid solution and alcohol results in the production of tribrombenzol.

On the Bases resulting from the Products of Addition of Chinalin and Halogen Alhydes. Ad. Claus. (Vol. XV. p. 475). Controversial.

On the Action of Amines on Chinones. Th. Zincke. (Vol. XV. p. 481). Continued from Vol. XIV.

On the Action of Amines on Dichlor Naphtochinone. A. Plagemann. (Vol. XV. p. 484). All experiments show that only one chlorine atom can be replaced by an amine rest, and that the second chlorine atom is not capable of any such interchange. The reaction takes place in accordance with the following equation: $C_{10}H_4Cl_2O_2 + NH_2R^1 = C_{10}H_4Cl.(NHR^1)O_2 + HCl$. The action of primary amines proceeds smoothly, and the resulting products can be classed in general with those of alpha naphtochinan. The action of secondary amines has also been experimented upon, and they have been found to act in the same manner.

On the Behavior of Nitrogen Tetroxide with Sulphuric Acid, and on the Process of Lasne and Benker for the Manufacture of Sulphuric Acid. G. Lunge. (Vol. XV. p. 488). In opposition to some previous statements, the author has found that the tetroxide of nitrogen is not soluble as such in sulphuric acid, but is split up directly into nitrosyl sulphuric acid and nitric acid. $N_2O_4+SO_2(OH)_2 = SO_2(OH)(ONO)+NO_3H$. The author proceeds to show that the theoretical assumptions of Lasne and Benker, given by these gentlemen in Vol. 92, p. 191, of Comptes Rendus, are not correct. This, however, does not mean that their process can not be of practical value.

On the Existence of Nitrous Anhydride in the form of Vapor. G. LUNGE. (Vol. XV. p. 495). Controversial.

On the Constitution of Cumic Acid. RICHARD MEYER and ERWIN MUELLER. (Vol XV. p. 496). The authors prepared cumic acid synthetically, and found a different melting point from that obtained in the usual manner, but have not yet been able to give any pronounced reasons. More extensive experiments are in progress, and results may be looked for soon.

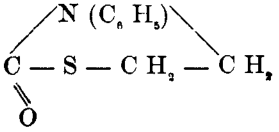
On Tungsten Bronzes. J. PHILLIP. (Vol. XV. p. 499). Elaborate discussion on the preparation and analysis of various bronzes. There are four distinct colors, gold yellow, reddish yellow, red and blue. The yellow bronzes are most easily prepared pure, and can be obtained in large crystals. A mixture of 2 molecules of normal sodium tungstate, and 1 molecule of tungstic anhydride is employed (hence a mixture of 2 molecules of Na_2O to 3 molecules of WO_3). The tin is gradually added. The entire mixture is kept in quiet fusion for one or two hours. Red bronzes are obtained when 2 molecules of Na_2O and 5 or 6 molecules of WO_3 are melted with tin. Blue bronzes are obtained when more than 3 molecules of WO_3 to 1 molecule of Na_2O and tin are so treated. Tungsten bronzes are also prepared by reduction of acid sodium tungstates by means of hydrogen.

The Azoanthrol Dyes. C. LIEBERMANN. (Vol. XV. p. 510). The author prepared and tested a number of the dyes, and found that some of them dyed silk and wool directly, the tints produced being similar to the napthol dyes, falling between blood red and red brown. The dyes were prepared in the usual manner, by bringing solutions of diazatised bases or their sulpho acids, in contact with alkaline solutions of anthrol.

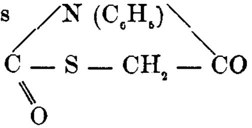
Contributions to the Thermometric Knowledge of Ozone. E. MULDER and H. G. L. VAN DER MEULEN. (Vol. XV., p. 511). Berthelot found the value for As_2O_3 aq 3000 as 137600^c, and the authors find that they can assume with appropriate certainty the figure 145000^c for $As_2 O_3$ aq 2000.

On Cyanic and Cyanuric Acid Ethers. J. Ponomareff. (Vol. XV. p. 513). The object of the experimentor is to study more closely the isomerism of the neutral and acid cyanuric acid ethers which are deduced from the salts of cyanuric acid, and which are formed by the action of bromcyanogen upon sodium ethylate. Experiments are still in progress.

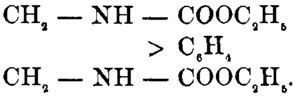
On Mustard Oil Glycolide. Paul T. Meyer. (Vol. XV. p. 516). It having been made possible to replace oxygen in the hydro-sulpho-diphenyl-hydantoïn of the group N $(C_6 H_5)$ and to obtain a compound having the constitution



the author definitely assumes the constitution of phenyl mustard oil glycolide as



Action of Chlor Acetic Acid Ether on Phenylendiamin. J. Zimmermann. (Vol. XV. p. 518). The product of a reaction between monochloracetic acid ethyl ether and phenylendiamin, 2 molecules of each, is a compound to which the author gives the formula



$$\begin{array}{l} CH_2 - NH - COOC_2H_5 \\ \qquad\qquad\qquad > C_6H_4 \\ CH_2 - NH - COOC_2H_5. \end{array}$$

Continuation of Observations on the Behavior and Occurrence of Cinchotin, Hydrocinchonidin and Hydrochinidin. C. Forst and Chr. Boehringer. (Vol. XV. p. 519). The result of experiments by the authors is that the basis obtained by oxidation were present in the original materials, and because of their great resistance remained unaltered.—*Ann. Chem. Pharm.*, 197–368.

On the Evolution of Free Nitrogen in Fermentation. B. E. Dietzell. (Vol. XV., p. 551.) A series of experiments showed that nitrogen had been evolved in organic form as follows: I., 5.04 per cent.; II, 17.07 per cent.; III., 9.90 per cent.; IV., 8.97 per cent. The gases evolved from the fermentation of a mixture of blood and cow urine were passed through dilute sulphuric acid, then over hot soda lime and titrated sulphuric acid. In all cases the sulphuric acid employed at the end remained unaltered. The author also found primary amines, leucin and free sulphurous acid. In presence of carbonate of lime solution no formation of ammonium nitrate can take place, and fatty acids which decompose nitrites cannot be formed, It seems to be advantageous to allow fertilizers, such as dried blood, bone dust, fish guano, etc., to ferment, with addition of a quantity of lime, until all nitrous acid has disappeared before they are brought into the receptacles containing the liquid excrement of domestic animals.

On Resorcin Dyes. G. Damm and L. Schreiner. (Vol. XV. p. 555.) Numerous attempts to obtain a body homologous to phenol-phatalein proved unsuccessful. A black mass was formed from which succinic acid could readily be obtained. Fusing succinic anhydride with resorcin in the air-bath at 140° resulted in the production of a body very similar to fluorescein. With bromine a body is produced which dyes similar to rosine.

On Halogen Derivatives of Chinolins. W. La Coste. (Vol. XV., p. 557.) The author prepares these derivatives in a manner differing from the original of Skraup, 86 grms. of bromanilin and the corresponding quantity of glycerin, sulphuric acid and nitrobenzol are carefully heated. The product was distilled with steam after diluting with water. The residue contained 70 grms. of pure monobromchinolin. Dinitrochinolin and phenylchinolin were prepared by similar methods.

On Normal Dithiurethanes. A. Bernthsen and G. Friese. (Vol. XV., p. 563.) Partly controversial. The results of experiments agree satisfactorily with those of W. Will. Ber. d. d. chem. Ges. XV. 338.

Remarks on a Note of C. Binzard and H. Schulz: On the Chemical Theory of Effects of Arsenic J. Dogiel. (Vol. XV., p. 572.) Controversial.

Remarks on M. Foerster's Article on the Presence of Furfurol in Fermented Liquids. W. A. Jorissen. (Vol. XV., p. 572.) Controversial.

The Condensation of Acetone. A. Pinner. (Vol. XV., p. 576.) Continued from Vol. XIV., p. 576. Cyanide of potash was to act upon acetone which allowed had been saturated with hydrochloric acid gas and thus condensed. Three combinations which could be easily separated were obtained; an acid $C_7H_{12}O_3$ called mesitonic acid, an acid of the composition $C_{18}H_{13}NO_3 + H_2O$ called (for the present) mesitylic acid, and a cyanide $C_{11}H_{18}N_2O_2$ from which an acid $C_{11}H_{18}O_4$ (phoronic acid) could be obtained.

Formation of Alloys by Pressure. W. SPRING. (Vol. XV., p. 595.) The author propounds the law, that the state of matter is dependent upon the volume it is forced to occupy. Coarsely powdered bismuth, cadmium and tin, mixed in the proportions corresponding to Wood's alloy, were subjected to a pressure of 7,500 atmospheres. This alloy melts at 65^{c}. The block obtained was filed and again subjected to the same pressure. Its properties correspond exactly with those of Wood's alloy. Two other alloys, one known as Rose's and common brass, were treated in a similar manner, and the results obtained gave sufficient strength for the argument of the law set forth.

On Orthodinitro Compounds. AUG. LAUBENHEIMER (Vol XV., p. 597.) Continued from Vols. IX., 768 and 1826 ; XI., 1155; XI., 303; IX., 760. The author finds that orthodinitrocompounds also react with sulphite of sodium.

On Bromchloral, Chlorobromal, Bromochloroform and Chlorobromoform. OSCAR JACOBSEN and R. NEUMEISTER. (Vol. XV., p. 599.). Description of these compounds obtained by the action of bromine on dichloracetal and monochloracetal and further decomposition of the products produced.

Bromdichloracetic Acid and Chlordibromacetic Acid. R. NEUMEISTER. (Vol. XV., p. 602.) When bromchloral or chlorobromal is heated with double its quantity of fuming nitric acid for about one hour, with vertical condenser, the corresponding substituted acetic acid crystallizes from it after cooling. Bromdichloracetic acid is $CCl_2Br.\ CO_2H$ and chlordibromacetic acid is $CCl\,Br._2CO_2H$. A number of derivatives of both compounds are described.

Note on Bodies Combustible with Difficulty. W. DEML (Vol. XV. p. 604.)

In elementary analysis some substances are burned imcompletely by the usual methods. The author finds an improvement in covering the substance to be analyzed in the platinum boat with three or four times its weight of previously ignited spongy platinum or platinum black.

On Chloromalonic Acid and its Derivatives. M. CONRAD and M. GUTHZEIT. Vol. XV. p. 605.

The free acid was produced from monochloromalonic acid ether by means of the potash salt. When monochloromalonic acid is heated until all carbon acid is driven off monochloracetic acid remains. By the action of ammonia upon monochloromalonic acid imido-dimalonyl-amid and amido-malonyl-amid were produced.

On Propylic and Isopropyl Succinic Acid. G. WALTZ. (Vol. XV. p. 608.)

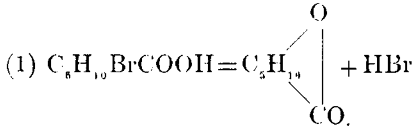
Description of method of preparation of derivatives.

On the Transformation of Alpha and Betanaphtal into Amidated Naphtalines. ARTHUR CALM. (Vol. XV. p. 609.)

Beta naphtylamine was obtained by the action of acetamid (ammoniumacetate) after distillation. The residue was found to be in part beta-acet-naphtalide, and in part beta-dinaphtylamine. A table giving the various temperatures and time required and results is appended.

On Caprolactone. ED. HJELT. (Vol. XV. p. 617.)

The caprolactone was obtained from monobrom-capranic acid with water The reactions take place as follows:



$$(1)\ C_6H_{10}BrCOOH = C_5H_{10}\begin{matrix} O \\ CO \end{matrix} + HBr$$

Caprolacton.

$$(2)\ C_6H_{10}BrCOCH = C_6H_9COOH + HBr.$$

Isohydrosorbinic acid.

Action of Water on Isodibromcapronic Acid. ED. HJELT. (Vol. XV. p. 619.)

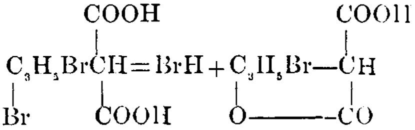
A mixture of a lactone containing bromine and of a lactone free from bromine were the result of boiling dibromcapronic acid for one hour with ten times its weight of water. All bromocapronic acids prepared from sorbinic and hydrosorbinic acids, when heated with water or alkaline solution produce lactones.

Oxypropylmalonic Acid and its Lactone. ED. HJELT. (Vol. XV. p. 621.)

Allylmalonic acid dissolves quite readily in fuming hydrobromic acid. The acid formed was found to be the lactonic acid, having the same composition as the allylmalonic acid. It is a monobasic lactonic acid, the lactone of an oxypropylmalonic acid.

Action of Bromine on Allylmalonic Acid. Ed. Hjelt. (Vol. XV. p. 624.)

Besides the dibromide an oil poorer in bromine is produced. The reaction takes place as follows:



$$\begin{array}{ccccc} & COOH & & & COOH \\ & | & & & | \\ C_3H_5Br & CH & = BrH + & C_3H_5Br\text{—} & CH \\ | & | & & | & | \\ Br & COOH & & O\text{———} & CO \end{array}$$

On Dilactones. Ed. Hjelt. (Vol. XV. p. 625.)

By the action of 2 mol. of bromine upon diallylmalonic acid a dibromide is produced. Hydrobromic acid is freely produced. The quantity of bromine present as hydrobromic acid after the reaction is completed was 50 per cent. of the amount of bromine employed. The bromide being a neutral body its formation can only be comprehended by assuming the formation of a tetrabromide at first, from which 2 mol. of bromine were driven which combined with the two hydrogen atoms of the carboxyls. The compound is hence an example of a dilactone.

Action of Hydrobromic Acid and Bromine on Diallylacetic Acid. Ed. Hjelt. (Vol. XV. p. 627.)

Hydrobromic acid reacts with diallylacetic acid forming a thick oil termed brom-dipropyl-aceto-lactone. Bromine reacts with it, producing tribrom-dipropyl-aceto-lactone.

On the Boiling Points of Lactones. Ed. Hjelt. (Vol. XV. p. 629.)

Gives the boiling points of lactones hitherto discovered.

On the Formation of Lactone. Ed. Hjelt. (Vol. XV. p. 629.)

From the researches of Fittig it is comparatively certain that the lactones are generated from the oxyacids and bromine substitution acids, which have their hydroxyl group or the bromine atom respectively attached to the third carbon atom, beginning at the carboxyl group. . For this theory the investigations of the author on the addition products of bromine and hydrobromic acid with allylmalonic, diallylmalonic and diallylacetic acids give sufficient evidence.

Abstracts from the Comptes Rendus; by A. Bourgougnon.

Action of Ethylenic Chlorhydrine upon the Pyride bases and Quinolein. By A Wurtz. (No. 6, Aug. 7th, 1882).

Upon the Composition of the Iodides of Phosphorus. By L. Froost. (No. 6. Aug. 7th, 1882).

The composition off the Iodides of Phosphorus is represented by PI_3 and $P._2I_4$.

Upon Quinolein and Lutidin.. By A. Pictet. (No. 6. Aug. 7th, 1882).

Neutral Arsenates. By E. Filhol & Senderns. (No. 7. Aug. 14th, 1882).

The arsenates $2\ As_2O_5\ 3\ Na.\ OH + 6\ H_2O$ and $+ 4\ As_2O_6\ 3\ Na\ OH\ 3\ KOH + 18\ H_2O$ have no action upon litmus.

Upon the the Chemical Composition of the ripe and unripe Banana. By L. Ricciardi. (No. 8. Aug. 21st, 1882).

	Ripe.	Unripe.
Water	66.78	7.92
Cellulose	0.17	0.36
Starch	traces	12.06
Tannic substances	0.34	6.53
Fatty "	0.58	0.21
Interverted sugar	20.07	0.08
Cane sugar	4.50	1.34
Proteic substances	4.92	3.04
Not determined	1.69	4.42
Ashes	0.95	1.04

The green banana contains a large amount of starch, about $\frac{1}{8}$ of its weight which disappears in the ripe fruit. When the fruits are left to ripen on the trees nearly all the sugar formed is cane sugar, whilst the sugar contained in the fruits taken from the trees in a green state and allowed to ripen afterwards is composed of $\frac{4}{5}$ of interverted sugar and $\frac{1}{5}$ of cane sugar. The tannic substances and the organic acids of the green fruits disappears when the bananas are ripe.

The ashes of bananas are very rich in phosphoric acid (23.18 per cent.) and potassium oxide (45.23 per cent.)

On Black Phosphorus. By P. Thenard. (No. 9. Aug. 28th, 1882).

Separation of Gallium.

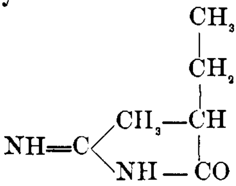
By L. de Boisbaudran. (No. 9. Aug. 28th, 1882).

Separation of Gallium from Indium and Cadmium.

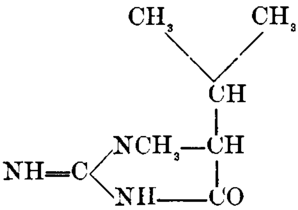
On some combinations belonging to creatin groups.

By E. Duvillier. (No. 10, Sept. 4th, 1882).

The following combinations have been obtained: 1° Methylamido Alpha-butyrocyamidin:



2° Methylamids isovalerocyamidin.



Separation of Gallium.

By L. de Boisbaudran. (No. 12 Sept. 18th, 1882).

Separation of Gallium from Uranium and Lead.