ABSTRACTS.

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

On the Solubility of Glass in Certain Reagents. By Richard Cowper, A. R. S. M. (Vol. XL., p. 254.)

Author kept a measured quantity of each reagent in a sealed tube of hard glass for six days at 100°C. Two series of experiments, A. and B., gave the results shown in table below, on neutralizing with hydrochloric acid and evaporating to dryness and igniting in a platinum dish.

Reagent.	No. Mgrms. dissolved by 100 cc. A.	B.
Water	8.0	10.0
H_2 S	12.5	8.7
$(N H_4)_2$ S dilute, preprared from NH_4 OH of sp. gr. 0.982	49.6	52.5
$(NH_4)_2$ S concentrated, prepared from NH_4 OH of sp. gr. 0.88	34.	47.2
NH_4 OH dilute, sp. gr. 0.982	25.8	42.5
NH_4 OH concentrated, sp. gr. 0.88	7.5	7.7
NH_4 HS, prepared from NH_4 OH sp. gr. 0.982	——	51.2

Another experiment in which dilute $(NH_4)_2$ S was boiled in a flask, 60 cc., gave 0.008 grm. residue.

A series of experiments to find the degree of dilution of Am OH for maximum effect gave following results:

40 cc., taken.	Dissolved in 100 cc.
NH_4 OH sp. gr. 0.88+1 vol H_2 O	22.5
“ “ “ “ +2 vols “	26.2
“ “ “ “ +3 “ “	30.0
“ “ “ “ +4 “ “	26.7
“ “ “ “ +5 “ “	41.2
“ “ “ “ +6 “ “	32.0

Analysis of a Piece of Oxidized Iron from the Condenser of H. M. S. “Spartan.” (Vol. XL., p. 256.) By Richard Cowper, A. R., S. M.

The details of the methods of analysis are given, and the following results:

Insoluble Residue dried at 120° C	30.14	C	12.57	SiO_2	16.98
		H	.24	Fe_2O_3	.12
		Mineral	17.54	Al_2O_3	.06
				CaO	.15
				MgO	.02

Cupric oxide	.38
Ferric "	2.21
Ferrous oxide	42.33
Alumina	.16
Manganic oxide	1.02
Cobalt oxide	.05
Sodium oxide	.11
Phosphoric acid	5.24
Sulphuric "	.31
Vanadic "	.11
Chlorine	2.08
Water	16.71

Note on a Convenient Apparatus for the Liquefaction of Ammonia. (Vol. XL., p. 259.) By J. Emerson Reynolds, M. D., F. R. S.

The apparatus consists of two vertical wrought iron tubes joined below by a horizontal tube of the same metal. The vertical tubes are 40 and 30 cm. high and 12 cm. internal diameter. The horizontal tube is 25 cm. long and .5 or 6 cm. internal diameter. The higher vertical tube has a gas-tight screw cap. The lower vertical tube also has a tight-fitting cap, which is perforated to receive the slender stem of a tube very much like a thermometer, which is cemented into this cap. The tube in the cap is about 25 c. m. long and the bulb below terminates in a beak which is always open. To fill the tube with dry ammonia gas, both ends are left open, and the gas allowed to flow through to expel all air. Now the upper end is sealed by a blow-pipe, and the lower beak dipped into mercury, which enters and prevents the escape of the gas.

The cap of the highest vertical iron tube is now removed and the iron apparatus mentioned above is filled with mercury until the lower tube is nearly full. The glass tube with the ammonia gas is now placed in the lower iron tube, and the cap which holds the glass tube is screwed tightly home, with a leather washer. From the higher iron tube remove enough mercury to leave about 12 cm. below the surface of the cap ; fill this space with strongest liquor ammonia and screw the cap into its place. By heating carefully the higher iron tube containing the ammonia solution, a pressure is exerted upon the glass apparatus in the lower tube and the ammonia gas is liquified. This apparatus may be used for other gases.

Transformation of Urea into Cyanamide. (Vol. XL. p. 262) By H. J. H. Fenton, M.A.

Author dehydrates urea by heating with metallic sodium and obtain cyanamide according to the following reaction. $2\ CON_2H_4+Na_2=2CN_2H_2+2NaOH+H_2$. Ammonium carbamate and ammonium carbonate behave similarly under like circumstances.

On the action of Haloid Acids upon Hydrocyanic Acid. (Vol. XL. p. 264). By L. Claisen, Ph. D. and F. E. Matthews, F.C.S.

After giving details of their experiments, the authors, conclude that, "when hydrocyanic acid unites with haloid acids in presence of ethers, a simple addition compound is not formed, but a more complex one, 2 mols. of hydrocyanic acid uniting with the haloid acid." The body $2HCN+3HCl$. when acted upon by alcohol gave *formamidine.*

On the action of Acetyl Chloride on Fumaric Acid. (Vol. XL. p. 268). By W. H. Perkin, F.R.S.

This paper gives some results of experiments in answer to the criticisms of Anschütz (Ber. 14, 2792) and C. Bennert (Ber. 15, 640). The author concludes that acetyl chloride acts upon fumaric acid in the same way as it does on other dibasic acids, forming the anhydride by the removal of a molecule of water, the anhydride in this case being maleic anhydride ; and as a secondary result, part of the maleic anhydride thus formed unites with the hydrochloric acid present and forms chlorosuccinic anhydride.

On the Action of Acetone on Phenanthraquinone, both alone and in Presence of Ammonia. (Vol. XL., p. 270.) By Francis R. Japp, M.A., Ph. D., and Fred. W. Streatfield.

Fifty grms. of phenanthraquinone were mixed with 60 grms. of acetone, and 40 cc. of strong aqueous ammonia. The quinone is converted into a white powder, and the temperature rises. When cool, ether was added, and the white powder was washed with ether.

The crude product was dissolved in boiling acetone (b. p. 56-58) containing a little aqueous ammonia. The filtered solution gave colorless rhomboidal laminæ. The fusing point could not be determined accurately; the body changes color at about 120° and fuses about 130°. Analysis leads to the formula $C_{17}H_{15}NO_2$. It dissolves readily in cold concentrated hydrochloric acid, the solution deposits a blue substance which was filtered out, and the filtrate treated with water. Water caused the deposition of fine white needles, which crystallized from ether gave large thin colorless blades, fusing at 89.5-9°, and containing no nitrogen or chlorine. Analysis gave formula $C_{17}H_{14}O_3$, according to the reaction $C_{17}H_{15}NO_2+OH_2=C_{17}H_{14}O_3+NH_3$ since the hydrochloric acid filtrate from needles contains ammonic chloride. The body $C_{17}H_{14}O_3$ is insoluble in water; ether, alcohol and acetone dissolve it freely. In the alcoholic solution boiling converts it into phenanthraquinone; below 40° it can be crystallized from alcohol. By passing NH_3 into the ether solution of the body $C_{17}H_{14}O_3$, the former body $C_{17}H_{15}NO_2$ is obtained according to the reaction $C_{17}H_{14}O_3+NH_3=C_{17}H_{15}NO_2+OH_2$. By heating the body $C_{17}H_{14}O_3$, it is decomposed into acetone and phenanthraquinone. This same body can be formed synthetically by heating phenanthraquinone with acetone in sealed tubes for four hours at 200°.

The authors give a number of theoretical considerations as to the constitution of the body formed, but seem to arrive at no definite conclusions. For the body $C_{17}H_{14}O_3$ they suggest the name *acetonquin of phenanthrene*, and for $C_{17}H_{15}NO_2$ the name *acetonquinimide of phenanthrene*. They will continue their studies on these bodies.

A Study of Some of the Earth-metals contained in Samarskite. (Vol. XL., p. 277.) By Henry E. Roscoe, V.P.R.S.

Author gives the details of experiments upon the separation of terbia, yttria, and the so-called phillippia in the form of formates by fractional precipitation. A very careful series of measurements of of the so-called phillippian formate crystals as rhombic prisms is given, for comparison. A solution of the earths terbia, phillippia and yttria was passed through the processes of fractionation, and no oxide having an unalterable atomic weight of 122 could be detected. Author gives details of experiments which serve to prove that the formates of terbium and yttrium crystallize together in a form ascribed to phillippium.

The Spectrum of Terbium. (Vol. XL., p. 283.) By H. E. Roscoe and A. Schuster.

The spectrum was obtained with "a grating of Mr. Rutherford containing 17,290 lines to the inch, and all measurements were taken in the spectrum of the second order. The focal length of the observing telescope was 17.4 inches, and the measurements were taken by means of a micrometer eye-piece, the screw of which had 100 turns to the inch." A table of the lines observed is given, showing their wave-lengths and relative intensity.

On the Behavior of Zinc, Magnesium, and Iron as Reducing Agents with Acidulated Solutions of Ferric Salts. (Vol. XL., p. 287). By T. E. Thorpe, F.R.S.

In the case of zinc the author states: "It results from these observations that, provided there is sufficient acid present to dissolve the zinc, the maximum reducing action possible with a given weight of metal is obtained by concentrating the ferric sulphate solution and diminishing the amount of free acid. The effect of concentration is to multiply the chances of contact of the hydrogen and ferric sulphate molecules; increase of temperature brings about the same result, by augmenting the molecular movement within the liquid." By using platinum in contact with the zinc, the time of solution is diminished, but very little difference in the reducing effect is observed.

With magnesium the amount of reduction is only $\frac{1}{4}$ to $\frac{1}{3}$ of that effected by zinc under corresponding conditions. The presence of platinum but slightly augments the reducing power of magnesium.

With iron the rate of solution is extremely slow, and the reducing action *apparently* decreases with the temperature. In contact with platinum both the rate of solution and the reducing action are increased; the action is *decreased*, however, on warming the liquid.

The author remarks: "These experiments seem to me to be in entire harmony with the view that the reducing action of so-called nascent hydrogen is connected with the existence of this body in the atomic state, and that any conditions tending to prolong the duration of this atomic condition augment the reducing power of the hydrogen."

Note on the Action of the Oxychlorides of Sulphur on Silver Nitrate. (Vol. XL., p. 297). By T. E. Thorpe, F.R.S.

Thionyl chloride $SOCl_2$ with silver nitrate gives nitrosulphonic chloride and silver chloride. Sulphuryl chloride SO_2Cl_2 has no action. Chlorosulphonic acid' SO_2OHCl acts violently on silver nitrate, forming silver chloride and nitrosulphonic acid (chamber crystals.)

On the Action of Thiophosphoryl Chloride upon Silver Nitrate. (Vol. XL., p. 297). By T. E. Thorpe, Ph. D., F. R. S., and Septimus Dyson, Esq.

By adding thiophosphoryl chloride drop by drop to dry silver nitrate and condensing the products of the action, the authors obtained nitrogen peroxide, nitric oxide and nitroxyl chloride, and *nitrosulphonic anhydride.* The authors say : "We have no hope, therefore, of being able to form a mixed anhydride, on the type of nitric anhydride in which more or less of the oxygen is replaced by sulphur, by the substitution of thiophosphoryl chloride in Odet and Vignon's reaction."

Experiments on the action of Potassium Amalgam Sulphuretted Hydrogen, and Potassic Hydrate respectively, on Tetra and Pentathionate of Potassium. (Vol. XL., p. 300.) By Vivian Lewes, Royal Naval College.

By the action of potassium amalgam upon potassium tetrathionate in solution the thiosulphate ($K_2S_2O_3$) is found when no excess of amalgam is used; in the latter case sulphide is formed. With potassic pentathionate potassium amalgam gives first tetrathionate and sulphur, then thiosulphate.

By the action of sulphuretted hydrogen upon potassic tetrathionate, the thiosulphate is formed and sulphur separates.

By the action of potassic hydrate upon a solution of potassic pentathionate thiosulphate, sulphite and sulphur result from the decomposition. In the case of potassic hydrate and tetrathionate the results are thiosulphate and sulphite.

On the Estimation of Retrograde Phosphates. (Vol. XL., p. 306.) By Fred. J. Lloyd.

Author reviews the work of Fresenius, Neubauer, Luck and others in this field. He then proceeds to find out the relative dissolving powers of citric acid, partly neutralized, wholly neutralized, and more than neutralized by ammonia, upon the phosphates and other substances present in manures. He concludes that no satisfactory determination of retrograde phosphates can be made by an acid or slightly acid solution of ammonium citrate, owing to the powerful action upon other substances. From another set of experiments the author states that an ammonical solution of ammonium citrate, no matter what its strength, whilst dissolving precipitated calcic phosphate, does not act upon mineral phosphates, bone ash, and but slightly upon raw bones. This paper is a most valuable one, as the author gives a number of details of experiments upon the methods of other chemists, and a comparison with that proposed by himself.

Action of Heat upon Mercuric Chloride under low pressure. (Vol. XL., p. 322). By Thos. Carnelley, D.Sc.

The general results of the author's experiments are: "When mercuric chloride is strongly heated under pressures less that the critical pressure, then the temperatures attained by the salt as indicated by the thermometer, the turpentine calorimeter, and the petroleum or benzine calorimeter, are as follows:

By the thermometer.—As a compact powder the salt rises 21° C., and sometimes 50° C., above the melting point. When the salt is solidified around the thermometer bulb it rises 15° C. above the melting point. *By the turpentine calorimeter.*—the temperature rises 100° C. above the melting point. *By the petroleum calorimeter.*—The temperature cannot be obtained above the melting point; but is generally a few degrees less.

The author concludes that the high temperature registered by the turpentine calorimeter is due to the heat developed by the action of the mercuric chloride upon the hydrocarbon.

On the Constitution of Amarine and Lophine. Vol. XL., p. 323. By Francis K. Japp, M. A, Ph.D. and H. H. Robinson.

From a consideration of Emil Fischer and H. Troshke (Ber. 13. 706) and a comparison with the formula obtained by one of the authors and Mr. Streatland (Jour. Chem. Soc., xl. p. 149) for the compounds formed by the action of hydroxyaldehydes and ammonia upon phenanthraquinone, an unmistakable resemblance was noticed. Acting upon this resemblance, and submitting benzil to the action of parahydroxybenzaldehyde in presence of ammonia, they obtained the body $C_{21}H_{16}N_2O$, which by distillation with zinc dust in a current of hydrogen gave *lophine.* The body $C_{21}H_{16}N_2O$ is *parahydroxylophine,* and lophine is considered to be one of Hubner's anhydro-bases, and is called *anhydrobenzayldiamidostilbene.* From these facts and others connected with amarine, which differs from lophine in that it contains two more atoms of hydrogen, the authors give new constitutional formulæ for both these bodies.

Abstracts from *Berichte der Deutschen Chemischen Gerellschaft*, by Percy Neymann. Ph. B

On a New Combination of Carbon with Sulphur and Bromine. Carl Hell and Fr. Uhech, (Vol. XV, p. 283.)

A mixture of bisulphide of carbon and bromine (the proportion $1CS_2 : 2 Br_2$ has been found best) after having been left to itself several days and then subjected to a slow distillation leaves a less volatile brownish-red oily residue which does not solidify until brought in contact with water, but then gradually crystallizes. A more rapid method is to cover the oily residue with alcohol instead of with water, or to dissolve the residue in ether and add alcohol. The composition of the new body, termed by the authors carbotrithiohexabromide corresponds to the formula $C_2S_3Br_6$.

The action of concentrated caustic alkali at waterbath temperature and presence of a current of hydrogen to prevent oxidation corresponds exactly to the formula :

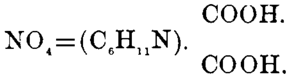
$C_2S_3Br_6 + 12NaOH = 2NA_2CO_3 + Na_2S_3 + 6NaBr + 6H_2O$. The constitution of the new combination cannot be fixed upon either from the conditions under which it is formed or from the products of decomposition.

On the action of Amines upon Chinones. H. Fincke. (Vol. XV. p. 279), continued from Vol. XIV. p. 1310, derivatives.

On Tropin. G. Merling. (Vol. XV. p. 287), continued from Vol. XIV. p. 1829.

The author starting with 40 grms. tropin obtained only 1 grm. of the neutral oil by the distillation of the dimethyltopinhydroxide. Oxidation of tropin with permanganate of potash in alkaline solution gives rise to a base which by the separation of one atom of carbon as carbonic acid and the formation of a nitroso compound by the action of nitrous acid and also by the regeneration tropin when treated with methyl iodide, must be characterised as a secondary base. Excess of oxidizing agent must be avoided.

Oxidation of tropin by means of bichromate of potash and sulphuric acid or by chromic acid produces (without the separation of carbonic acid) a well characterised dibasic acid of the formula $C_8H_{13}NO_4 = (C_6H_{11}N).\begin{matrix} COOH. \\ COOH. \end{matrix}$



$$NO_4 = (C_6H_{11}N).\begin{array}{l} COOH. \\ COOH. \end{array}$$

The author expects at some future day, to be able to contribute something more certain on the constitution of tropin.

On Terebenthenic acid. W. ROSER. (Vol. XV. p. 293). Sodium reacts with terebenthenic acid ether $C_9H_{14}O_4$ and generates hydrogen ; the white crystals which are the product of the reaction are not a sodium combination, analogous to that obtained by J. Bredt* from isocapralacton, but it is the sodium salt of the acid teraconicacidether after liberating the ether by means of acids this yields teraconic acid ($C_7H_{10}O_4$) by saponification which Geissler found among the products of distillation of terebenthenic acid. Terebenthenic acid ether treated in alcoholic solution with one equivalent of sodium ethylate also produces the sodium salt of the acid teraconic acid ether, a second equivalent of ethylate of sodium acts as a saponifying agent upon the primary salt and teraconate of sodium is produced. It was also shown that unless a certain quantity of water was present succinate of sodium was produced. In order to explain the formation of teraconic acid from terebenthenic acid it must be aceepted that by the action of sodium upon terebenthenic acidether a sodium compound is at first produced, analogous to the sodium acetosuccinicacidether but that this is immediately converted into the sodium salt of the acid teraconicacidether.

Lecture Experiments. V. MEYER. (Vol. XV. p. 297). Demonstrations: Pure water is not colorless but blue. Transformation of yellow phosphorous into the red by heating in vapor of diphenylamin. Description of apparatus.

On a new Isomer of Orcin. EDM. KNECHT. (Vol. XV. p. 298).

Preparation of bioxytoluol (cresorcin) by consecutive steps from dinitrotoluol, nitrocresol, amidocresol, bioxytoluol. The new body which is a genuine homologue of resorcin (because it also has the OH groups in the meta position) is easily mistaken for resorcin. It differs from resorcin in its crystallographic forms. The author proposes the name cresorcin in order to point out its derivation from cresol and at the same time its great similarity to resorcin.

On Phosphorouspentasulphide. H. GOLDSCHMIDT. (Vol. XV., p. 303.) Determination of boiling paint by means of Meyer's and Goldschmidt's air thermometer. Mean boiling point for barometric pressure 728.5-734 mm., was found to be 518°C.

On Naphtylsulphuric Acid. R. WIETZKI. (Vol. XV., p. 305.)

It has of late repeatedly been observed that the naphthols in

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*J. Bredt. Ann. Chem. 208.58.

reference to the ease with which their O H groups can be replaced, are more similar to the alcohols of the fatty series than to the phenols. Pulverized and dried naphthol rubbed in a mortar with 1½ to 2 parts of common conc. sulphuric acid at first forms a thick syrupy mass, no perceptible rise of temperature being observed. This takes place, however, after a time, and the mass crystallizes. The mass dissolved in water, neutralized with soda and a larger quantity of salt added, separates fine colorless crystals. From the reactions and characteristics of this body it is shown that it is analogous to the class of bodies known as ethersulphuric acids. The author states that an ethersulphuric acid of alpha-naphthol also exists, but he has not been able to isolate its salts. These acids cannot be combined as such with diazo compounds.

On the Capronic Acid occurring in Resin Oil.

WERNER KELBE and CONSTANTIN WARTH. (Vol. XV., p. 308.)

Capronic acid was obtained from the mixture of acids occurring in resin oil by fractional distillation of the ethers of these acids. The fractions were taken at 150°-155°C. After saponifying the ether with caustic potash, the capronic acid was liberated by means of hydrochloric acid, and the free capronic acid was driven off with steam. The calcium salt was used for purification. The author finds from the properties and reactions of this capronic acid that it is identical with methylpropylacetic acid :

$$\begin{matrix} CH_3 \\ C_3H_7 \end{matrix} > CH—COOH.$$

On the Action of Pentachloride of Phosphorus on Alpha-Naphtholsulphonic Acid.

AD. CLAUS and H. OEHLER. (Vol. XV., p. 312.)

The action of pentachloride of phosphorus upon the sulphonic acid of alpha-naphthol differs from that upon beta-naphtholsulphonic acid in as much as the formation does not take place by ether-like combinations between the alpha-naphtholhydroxyl and sulphonic groups or from phosphoric acid ethers. Below 100° alpha-naphtholsulphonic chloride is formed. If the mixture of the alpha-naphtholsulphonic salt and pentachloride of phosphorus is heated to 100° or 150°, two new bodies—chlornaphthol and dichlornaphthaline can be isolated.

Synthesis of the Homologues of Anilin from Bromanilines, Bromtoluidines, etc., by the action of Sodium and

Alkylbromides in Ethereal Solution. AD. CLAUS. (Vol. XV., p. 315).

Xylidine from Bromtoluidine. Bromparatoluidine was employed. The effect of sodium on a mixture of this body with an excess of methyliodide in ethereal solution takes place without the formation of much pitch like substance. The oil obtained by the usual method of acidifying with hydrochloric acid, and liberating the base with caustic potash, was found not to be pure xylidine. Azotoluol and toluidin are formed in small quantities. The base or bases obtained by the same process from normal propylbromide and parabromaniline remain to be experimented upon.

On Dichlornaphtralin and Chlornaphthol from Beta-Naphtholsulphonic Acid. AD. CLAUS and M. DEHNE. (Vol. XV., p. 319).

The authors conclude as to the difference between alpha and beta naphtholsulphonic acid as follows: the tendency of the former to form basic salts is scarcely at all shared by the latter; while from the first by means of nitric acid, dinitronaphthol can easily be formed, the latter does *not* yield sulphuric acid when boiled with nitric acid, but apparently produces a new *nitrated* sulphonic acid. By treating with chlorate of potash and hydrochloric acid the alpha-naphtholsulphonic acid is converted into dichlornaphthachinon in the cold, while the same reagent acts upon beta-naphthosulphonic acid only at boiling heat, and then but very slowly.

On the Quantity of Furfurol contained in Fermented Liquids. K. FOERSTER. (Vol. XV., p. 322).

Small quantities were found in the distillates of beer and pure wines. It was also found in the liquid filtered, but not distilled from a fermented solution of 300 grains of starch-sugar (artificial dextrose). The author sums up as follows:

1. That all conclusions on the presence of amylic alcohol by the aid of Jorissen's reaction are wrong.

2. That no means have yet been found by which small quantities of amylic alcohol can be quantitatively determined with safety in fermented solutions.

3. That all suspicions referring to the use of starch sugar for improving the wine because the quantity of fusel oil was found larger, are either uncertain or false.

Benzol, Dipropargyl and Acetylene. Constitution of Benzol. JUL. THOMSEN. (Vol. XV., p, 328).

Experiments in thermo-chemistry. Difference in heat of combustion:

Dipropargyl	883230c
Benzol	787950c
Difference	95280c

3 molecules of Acetylene	931350c
1 molecule of Benzol	787950c
Difference	143400c

Author holds that this is an argument for the assertion that the carbon atoms of benzol are connected with each other by nine single bands, and not, as the customary hypothesis requires, by three single and three double bends.

On Carbostyril. P. Friedlander and H. Ostermaier. (Vol. XV., p. 362). Continued from Vol. XIV., p. 1916.

On the Bodies Produced from Sulpho-Carbanilid by Adition of Iodine Alkalies. W. Will. (Vol. XV., p. 338.

Description of the methods of preparation of several of these products. The investigation is still incomplete.

On Anthracylamin. H. Roemer. (Vol. XV., p. 223).

From amido-anthrachinon, hydroiodic acid and red phosphorus.

Instead of using litmus to indicate the limit of saturation of phosphoric acid by soluble bases, "Orange No. 3" of Poirrier (Azodemiethylamide), and "Helianthine" have been employed. The aqueous solution of these substances is yellow, but it turns red when in contact with free acids only, as demonstrated by W. Miller for "Tropeoline" (Potassium Phenylamidoazophenylsulphite).

Abstracts from the *Comptes Rendus*, By A. Bourgougnon.

Magnesium Oxychlorides. By G. Andre. (No. 7, Feb. 13th, 1882).

Prepared by heating 500 grammes of water, 400 gms. of crystalized magnesium chloride, and adding to the mass when boiling 20 grs. calcined magnesia. A clear liquid is separated by filtration, and after some time a deposit having the appearance of fine needles is formed, having the composition $Mg. Cl_2$, $Mg. O$, $16 H_2 O$. Dried in vacuo until a constant weight is obtained, it gives $Mg. Cl_2 MgO. 6 H_2 O$.

These two oxychlorides are immediately decomposed by water or alcohol.

A New Oxychloride of Sulphur. By J. Ogier. (No. 7, Feb. 13th, 1882).

This new oxychloride has been prepared by treating in strong sealed tubes a mixture of equal weights of sulphur chloride and sulfuryl chloride. Boiling point 60°—61° C. Very easily decomposed by heat. Composition $S_2 O Cl_2$. Its formation is represented by the equation

$$2 S_2 Cl + 2 S O_2 Cl = 2 S_2OCl_2 + SO_4 + S.$$

Vapor density with Meyer apparatus at 100° C. 3.28 ; 3.84 ; 3.75. Dumas' method at 60° C., under a pressure of 10 cc. of mercury gives 3.9.

Action of Potassium Cyanide upon Potassium Trichloracetate. By E. Bourgoin. (No. 7, Feb. 13th, 1882).

The action of potassium cyanide upon a concentrated solution of potassium trichloracetate is similar to the action of an alkali upon the trichloracetate.

$$C_4 K Cl_3 O_4 + K H O_2 = C_2 K_2 O_6 + C_2 H Cl_3$$

Heat Developed During the Formation of Ferricyanhydric Acid. By M. Joannis. (No. 7, Feb 13th, 1882).

(The articles upon Thermochemistry do not admit of abstraction).

On Galactin. By A. Muntz. (No. 7, Feb. 13th, 1882). Extracted from the seeds of Lucerne (Medicago arborea L.)

White, translucent mass, swelling and slowly dissolved by water, giving a limpid solution ; is not precipitated by neutral lead acetate, but by basic acetate. Same composition as the gums. Dextrogyrate. Treated with nitric acid, gives mucic acid.

Aconitates. By E. Guinochet. (No. 7, Feb. 13th, 1882).

(This article does admit of abstraction.)

Double Salts of Mercury. (Thermochemistry.) By M. Berthelot. (No. 8, Feb. 20th, 1882).

On Ferrocyanhydric Acid. (Thermochemistry). By M. Joannis. (No. 8, Feb. 20th, 1882).

Upon the Saturation of Phosphoric Acid by Bases and upon Chemical Neutrality. By A. Joly. (No. 8, Feb. 20th, 1882.)

Ferricyanhydric Acid. By M. Joannis. (No. 8 Feb. 20, 1882). (Thermochemistry.)

Action of Iodine upon Naphthaline at a High Temperature. By A. Bleunard and G. Vrau. (No. 8 Feb. 20, 1882).

Naphthaline is dehydrogenized by iodine; hydriodic acid is formed, and a new compound $(C_{10}H_6)_x$ has been obtained, which represents naphtaline less two atoms of hydrogen.

Double Salts of Mercury. By M. Berthelot. (No. 9 Feb. 27, 1882). (Thermochemistry.)

Analysis of a Volcanic Ash from Mt. Etna. By L. Ricciardi. (No. 9 Feb. 27, 1882).

Silica	37.82
Sulphuric acid	20.57
Alumina	9.97
Protonide of iron	14.05
Lime	11.98
Magnesia	3.64
Chlorine	1.02
Soda and Potassa	0.95
	100.00

Normal Carbonic Acid of the Atmosphere. By M. Dumas. (No. 10 March 6, 1882.

Among the causes which concur to equilibrate the quantity of carbonic acid in the atmosphere, the author relates an explanation given lately by Schlosing, and derived from the principle of dissociation. The proportion of carbonic acid contained in the atmosphere is in proportion with the quantity of calcium bi-carbonate dissolved in the waters of the seas. When the quantity of carbonic acid decreases, the marine calcium bi-carbonate is dissociated; half of its carbonic acid gas goes in the atmosphere and neutral calcium carbonate is deposited. When the aqueous vapor is condensed in the atmosphere, it now dissolves a portion of the carbonic acid present, and when the rain, so charged with carbonic acid, comes in contact with the earth it dissolves lime, calcium bi-carbonate is formed and carried to the sea.

The variation of the proportion of carbonic acid in the atmosphere is very small; this variation is about $\frac{3}{10000}$ in volume.

Upon the Double Decompositions of the Haloid Salts of Mercury by the Hydracids and the Haloids Salts of Potassium. By M. Berthelot. (No. 10 March 6, 1882). (Thermochemistry.)

The formation of two Dibasic Acids, Sebacic and Suberic During the Distillation of Crude Fatty Acid in a Current of Superheated Steam. By A. Cahours and E. Demarcy. (No. 10 March 6, 1882).

The distillation of crude fatty acids in a current of superheated steam transforms these acids into saturated hydrocarbons, homologous with marsh gas, in acids of the acetic group belonging to the normal series, and finally into two dibasic acids, suberic and sebacic acids, homologous with succinic acid.

Double Decompositions of the Haloid Salts of Mercury. By M. Berthelot. (No. 11 March 13, 1882). (Thermochemistry).

Crystallized Oxychloride of Gallium. By L. de Boisbaudran. (No. 11 Mar. 13th, 1882) After three years a sample of gelatinous hydrated chloride of gallium was transformed in small crystals surrounded by a liquid. The analysis of the crystals (octahedrons) has been given. $(Ga_2\,Cl_6 + 12\,H_2\,O) + 2\,(Ga_3O_2 + H_2\,O)$.

Heat of Formation of Ferricyanhydric Acid, and of some Ferrocyanides. By M. Joannis. (No. 11. Mar. 13th, 1882). (Thermo-chemistry).

Products of Distillation of Colophony. By A. Renard. (No. 11. Mar. 13th, 1882). The distillate of colophony boiling at about 150° C. contains three hydrocarbons, a terebenthen $C_{10}\,H_{16}$ and two isomeric hydrocarbons $C_{10}H_{18}$. These three hydrocarbons can not be separated by distillation; their mixture is laevogyrate.

Dichloride of Camphor. By P. Cazeneuve. (No. 11. Mar. 13th 1882.) Obtained by the action of dry chlorine upon camphor, dissolved in absolute alcohol. Corresponds to $C_{10}H_{14}Cl_2O$.

Essential Oil of Licari Kanali. By H. Morin. (No. 11. Mar. 13th, 1882).

Determination of Tannic and Oenogallic Acid in Wine. By F. Jean. (No. 11. Mar. 13th, 1882).

Gastric Digestion. By E. DUCLAUX. (No. 11. Mar. 13th, 1882).

Double Decompositions of the Haloids Salts of Mercury. Conclusions. By M. BERTHELOT. (No. 12. Mar. 20th, 2882) (Thermo-chemistry).

New Combinations of Nitric Acid and Acetic Acid with Ammonia. By L. TROOST. (No. 12. Mar. 20, 1882). By the action of dry ammonia upon dry nitrate of ammonium two nitrates were obtained.

$$N_2O_5\ HO,\ NH_3 + \tfrac{3}{2}\,NH_3$$
$$\text{and } N_2O_5\ HO,\ NH_3 + 3NH_3$$

The new combinations of acetic acid and ammonia are

$$C_2H_4O_2\ NH_3 + 3\ NH_3$$
$$\text{and } C_2H_4O_2\ NH_3 + 6\ NH_3$$

Action of Acid Solutions upon Protoxide of Iron. By A. DITTE. (No. 12. Mar. 20th, 1882).

Action of Ozone upon the Salts Manganese. By M. MAQUENNE. (No. 12. Mar. 20th, 1882). Ozone produces in the solutions of salts of protoxide of manganese a brown precipitate of hydrated oxide of manganese. In acidifying the solutions, other products, such as permanganic acid, are formed.

Heat of Formation Sulphocyanic Acid and of some Sulphocantes. By M. JOANNIS. (No. 12. Mar. 20th, 1882). (Thermo-Chemistry).

Clarification of Champagne Wines. By F. JEAN. (No. 12. Mar. 20th, 1882). Tannic acid in solution in the must is titrated with a solution of iodine. When the amount of tannic acid is known an equivalent quantity of gelatine is added, the gelatine and tannic acid form with albuminoid matter an insoluble precipitate —82.8 ot tannic acid requires 100 of gelatine.

Kola Nut, Seeds of Sterculia Acuminata. BY E. HECKEL and F. SCHLAGDENHAUFFER. (No. 12. March 20, 1882.)

Caffein	2.348	Soluble in Chloroform.
Theobromin	0.023	
Tannic acid	0.027	
Fat	0.585	

Tannic acid	1.591	Soluble in Alcohol.
Coloring matter, (red)	1.290	
Glucose	2,875	
Salts	0.070	
Starch	33.754	
Gum	3.040	
Coloring matter	2.561	
Proteids	6.761	
Ashes	3.325	
Water	11.919	
Cellulose	29.831	
Total	100,000	

Double Decompositions of Haloid Salts of Silver. By M. Berthelot. (No. 13, March 27th, 1882), (Thermochemistry).

Researches Upon Ozone. By M. Mailfert. (No. 13. March 27th, 1882). The object of these researches is the action of Ozone upon organic matter, and upon several oxides and metallic sulphides, and also upon salts from which the bases can be suboxodized.

Action of Alkaline Solutions Upon Protoxide of Tin. By A. Ditte. (No. 13. March 27th, 1882.)

Upon Campholurethane. By A. Haller. (No. 13. March 27th, 1882.)

Preparation of Pure Carbon for Electric Light. By M. Jacquelain (No. 12. March 27th, 1882.) The impurities in carbon are removed by treatment with chlorine, caustic soda or hydrofluoric acid, and the carbon is then washed in water.

Haloids Salts of Silver and Potassium. By M. Berthelot. (No. 14. April 3d, 1882).

Union of Free Hydrogen with Ethylen. By M. Berthelot. (No. 14. April 3d, 1882).

The combination is limited by the dissociation of the hydrides, and the degree of dissociation varies rapidly with the temperature.

Effects of Compression upon the Hardness of Steel. By M. Lan. (No. 14. April 3d, 1882).

Steel is hardened by compression. In compressed steel the proportion of combined carbon is increased and the proportion of free carbon diminished, as shown by the following determinations:

	Compressed.		Non-Compressed.	
Carbon, total,	0.70 per ct.		0.70	
Combined carbon, A,	0.60 "	Average 0.585	0.49	Average 0.490
" " B,	0.59 "		0.50	
" " C,	0.55 "		0.47	
" " D,	0.60 "		0.50	
Free carbon (by difference)	0.115		0.21	

Upon the Composition of Hydrated Carbonic Acid. By M. Wroblenski. (No. 14. April 3d, 1882).

At 0°C and under the pressure of about 16atm. hydrated carbonic cid has the composition $CO_2 8H_2O$.

Synthesis of Quinine. By E. G. Maumene. (No. 14. April 3d, 1882).

The author states that having discovered the compound NH_2 he has been able to prepare artificially some very pure sulphate of quinine, but that before describing his process he will make some comparative experiments in order to test the medical properties of this artificially prepared quinine.

Action of Fuming Nitric Acid Hydrochloric Acid, upon Pilocarpin. By P. Chastaing. (No. 14. April 3d, 1882).

Fuming nitric acid transforms pilocarpin into nitrate of Jaborandin $C_{20}H_{13}N_2O_6NHO_0$.

By the action of hydrochloric acid pilocarpin is transformed into chloride of jaborandin

Transformation of Carbon Oxysulphide into Ordinary and Sulphurretted Ureas. By M. Berthelot. (No. 16. April 17th, 1882).

Chemical Monography of the Cucurbitaces of Uruguay. By F. Sacc. No. 16. (April 16th, 1882).

The author gives several analyses of the melons coming to the Montevideo market, also the analysis of the roots of Briony, which are often mistaken for wild potatoes. They have the following composition:

Pectic acid	0.33	per cent.
Lignine	9.65	"
Inulin	5.32	"
Grape sugar	4.86	"
Water and loss	79.84	"
	100.00	

Separation of Gallium. By M. LECOQ DE BOISBAUDRAN. (No. 17. April 24th, 1882).

Upon the Atomic Weight of Carbon by the Combustion of Diamond. By H. E. ROSCOE. (No. 17. April 24th, 1882).

African diamonds were employed. They did not yield a trace of hydrogen. Average of six experiments 11.07, oxygen being 15.96.

Decomposition of Lead Salts by Alkalies. By A. DITTE. (No. 17. April 24th, 1882).

Researches upon Ozone. By M. MAILFERT. (No. 17. April 24th, 1882.)

A study of the action of ozone upon sulphur, selenium, tellurium, sulphides and some organic matters.

Insoluble Modification of Pepsine. By A. GAUTIER. No. 17. April 24th, 1882).

Oxydation of Pyrogallol in the Presence of Gum Arabic. BY P. de CLERMONT AND P. CHAUTARD. No. 18. (May 1st, 1882). The produce of oxidation is Purpurogallin, having the appearance of yellow needles $C_{20} H_{16} O_9$.

Chemical Studies of Several Products of Uruguay. BY F. SACC. No. 18. (May 1st, 1882).

Composition and Atomic Weight of Pernitric Acid. BY P. HAUTEFEUILLE AND G. CHAPIUS. No. 19. (May 8th, 1882).

Action of Potassa Upon Lead Oxide. BY A. DITTE. No. 19. (May 8th, 1882).

New Compounds of Carbon and Silicium. BY A. COLSON. No. 19. (May 8th, 1882).

This new compound is made by means of a stream of hydrogen saturated with benzol, passing over silicium placed in a red-hot porcelain tube.

Upon the Homologous and Isomeric Rosanilin. BY. A. ROSENSTIEHL AND M. GERBER. No. 19. (May 8th, 1882).

Composition of Ashes from Vesuvius. BY L. RICCIARDI. No. 19. (May 8th, 1882).

Eruption of February 25th, 1882.

Silica	47.84
Anhydr. Sulphuric Acid	0.17
“ Phosphoric Acid	1.83

Chlorine	1.32
Alumina	18.67
Protoxide of Iron	5.07
Peroxide of "	4.38
Lime	9.42
Magnesia	3.77
Potassa	5.64
Soda	2.04
	100.15

Studies of the Antiseptic Properties of Salicylic Acid. By E. Robinet and H. Pellet. No. 19. (May 8th, 1882).

Upon Some Reactions of Mercuric Chloride. By H. Debray. No. 18. (May 1st, 1882).

Mercuric chloride is reduced to mercurous chloride by the solution of sulphurous acid, the presence of sodium chloride prevents the reduction.

When a solution of an alkali is mixed slowly with a solution of mercuric chloride, the precipitate varies in color from yellow to black, especially in warm liquids, these different colorations are produced by the formation of oxychlorides of variable composition. With an excess of alkali, all the oxychlorides are destroyed, and the precipitate is formed only of yellow oxide of mercury. The presence of sodium chloride prevents the formation of these intermediary products.

Liquefied Gases, and Particularly Ethylen, for the Production of Low Temperatures. By L. Cailletet. No. 18. (May 1st, 1882).

The evaporation of ethylen in an open vessel produces a temperature of—105° C.; this temperature is far lower than that produced by nitrous oxide which boils at—88° C.

Separation of Gallium. By M. Lecoq de Boisbaudran. No. 18. (May 1st, 1882).

Liquefaction of Ozone. By P. Hautefeuille and G. Chapuis. No. 18. (May 1st, 1882).

Drops of liquefied ozone had been obtained with a Cailletet's apparatus, the liquid is dark-blue indigo, and had been preserved for thirty minutes under a pressure of 75 atm. Its vaporization is not very rapid even under atmospheric pressure. The liquefaction has been obtained by compressing a mixture of oxygen and ozone under 125 atm., the refrigerating liquid being ethylen, and the temperature was below—100 C°.

Action of Insoluble Metallic Sulphides upon a Solution of Acid Sulphate of Nickel in the presence of H_2S. By. H. Baubigny. No. 18. (May 1st, 1882).'

Synthesis of Organic Compounds by Means of Electrolysis of Water, Acid, Alkaline and Alcoholic Solution with Carbon Electrodes. By A. Bartoli and G. Papasogli. No. 20. (May 15, 1882).

On the Absorption of Gases by Platinum. By M. Berthelot. No. 21. (May 22, 1882).

Action of Peroxide of Hydrogen upon Organic Matter and Fermentation. By P. Bert and P. Regnard. No. 21. (May 22, 1882). Very diluted peroxide of hydrogen stops the fermentations produced by living organisms and the putrefaction of all substances which do not decompose it. It has no action upon the diastasic fermentations. Diluted peroxide of hydrogen is not destroyed by fats, amylaceous matter, soluble ferments, egg albumen, casein, peptones, creatin,creatinin, or urea,but is quickly decomposed by musculin, fibrin and generally by vegetable nitrogenized matter.

Separation of Gallium. By Lecoq de Boisbaudran. No. 22. (May 29, 1882). Analytical methods for the separation of gallium from glucinium, cerium, lanthanum, didymium, samarium, yttrium, erbium, holmium, thalium, iron and thorium.

Determination of Glycerin in Fatty Matters. By J. David. No. 22. (May 29, 1882). The saponification is made with crystals of barium hydrate, alcohol and water; alcohol is separated by boiling and barium with suphuric acid. The clear liquid is evaporated to a determined volume, its sp. gr. taken and compared with the sp. gr. of a solution of glycerin and water of a known composition.

Double Salts Prepared by Fusion. By MM. Berthelot and Flosray. No. 23. (June 5, 1882).

Oxychloride of Zinc. By G. Andre. No. 23. (June 5, 1882). A new oxychloride of zinc. 2 ZnCl 5 Zn_2O $26H_2O$ is described.

Action of Carbon Di-Sulphide upon Silicium. By A. Colson. No. 23. (June 5, 1882).

Preliminary Note on Didymium. By T. Cleve. No. 23. (June 5, 1882). The differences obtained in the determinations of the atomic weight of didymium have induced the author to believe in the existence of a new element which he calls beta-didymium.

Explosible Alloys of Zinc with the Platinum Metals. By Sainte-Claire Deville and H. Debray. No. 24. (June 12, 1882).

Separation of Gallium. By Lecoq de Boisbaudran. No. 25. (June 19, 1882). Separation of gallium fron zirconium, manganese and zinc.

Upon Silicium. By P. Schutzenberger and A. Colson. No. 26. (June 26, 1882).

On the Compound NH_2. By M. Combes. No. 26. June 26. 1882). According to the author, the compound NH_2 has not been obtained. NH_3 and carbonic acid had been formed in the reaction alluded to by M. Maumene.

On Didymium. By B. Brauner. No. 26. (June 26, 1882). Ordinary didymium is a mixture of three elements—didymium, beta-didymium and perhaps samarium.

Action of Peroxide of Hydrogen upon the Coloring Matter of Blood and upon Hematosin. By A. Bechamp. No. 26. (June 26, 1882). Description of the action of peroxide of hydrogen upon hemoglobin and hematosin and upon the white matter of hemoglobin.

Electrolysis of Hydrogen Dioxide. By M. Berthelot. (No. 1, July 3d, 1882.)

Remarks on Didymium. By P. T. Cleves. (No. 1, July 3d, 1882.) In a preliminary note the author suggested the existence of a new element which he named Beta-Didymium, but further experiments have shown the non-existence of this new element.

Action of Hydrogen Sulphide upon Nickel Chloride. By H. Baubigny. (No. 1, July 3d, 1882.) The transformation into sulphides of some metallic chlorides is more difficult than the transformation of the corresponding sulphates, under the same conditions, by the action of hydrogen sulphide. Equivalent weights of sulphate and chloride of nickel being taken and submitted under the same conditions to the action of hydrogen sulphide, it has been observed that the conversion of the sulphate into sulphide was quicker than for the chloride.

Isomery of Cuprous Sulphites. By M. ETARD. (No. 1, July 3d, 1882.)

Reduction of Some Silver Ores by Hydrogen and the Wet Way. By P. LAUR. (No. 1, July 3d, 1882.) The silver ore, sulphide, chloride, iodide or bromide in fine powder is placed in a cast iron pan with a weak alkaline solution (1 part of soda for 100 of water) and an amalgam of 3 parts of tin for 100 of mercury and submitted to ebullition, nascent hydrogen decomposes the argentiferous compounds, the silver forms an amalgams, and the sulphur is transformed into an alkaline sulphostannate, chlorine, bromine and iodine give corresponding soda salts.

Action of Chloroform on Beta-Naphtol. By G. ROUSSEAU. (No. 1, July 3d, 1882.) By the action of chloroform upon beta naphtol several products are formed which can be separated into two distinct groups. 1 Insoluble in alkalies. 1 Glycol $C_{22}H_{14}O_2$. 2. Ether derived of the glycol $C_{22}H_{12}O$. 3. A monoatomic alcohol $C_{22}H_{14}O$. 4. A rosin containing 96 per cent. of carbon. 2d. Soluble in alkalies.—1. Aldelyde $C_{11}H_8O_2$. 2. A rosin containing oxygen. During the reaction carbon monoxide is continually evolved.

Extraction of Vanadium from the Basic Slags of "Le Creuzot." By G. WITZ and F. OSMOND. (No. 1, July 3d, 1882.) These slags have the following composition:

Silica	16.50		
Alumina	3.80		
Lime	46.30		
Magnesia	4.00		
Protoxide of iron	7.07	Iron	5.50
" manganese	5.30	Manganese	4.10
Sulphuric acid	0.63	Sulphur	0.25
Phosphoric "	13.74	Phosphorus	6.00
Vanadic "	1.92	Vanadium	1.08
	99.26		

In the metallurgical establishments of Le Creuzot alone about 60,000 kilogr. of vanadium are annually produced in the slags, and it can be extracted as ammonium metavanadate or transformed into new products especially adapted for the fabrication of aniline black.

Basic Salts of Manganese. By A. Gorgen. (No, 2, July 10th, 1882.)

Action of Bromine upon Quinolein and Pyridin. By E. Grimaux. (No. 2, July 10th, 1882.) By the action of bromine upon quinolein a bromide C_8HNB^2 is produced which is very instable and easily converted into $C_9H_7NB^2$, H Br. Similar products are obtained by the action of bromine upon pyridin.

Upon the Presence of Glycol in Wine. By A. Henninger. (No. 2, July 10th, 1882.) Glycol is one of the products formed during the vinous fermentation.

Analyses of Water from the Isthmus of Panama. By M. Aillaud. (No. 2, July 10th, 1882.) Analyses of well water and of the river Rio Grande taken to the south and near Panama.

Hydrate of Hydrogen Sulphide. By M. De Forcrand, (No. 3, July 17th, 1882.) A claim of priority.

On the Gastric Juice. By P. Chapotreaut. (No. 3, July 17th, 1882.) The aqueous solution of gastric juice acidified with sulphuric acid deposits and white pulverulent mass which is considered by the author as the active principle of gastric juice, it is insoluble in an excess of sulphuric acid, but soluble in hydrochloric acid. Its percentage of carbon, hydrogen and nitrogen is:

C	51
H	7.2
N	15.4

This white precipitate transforms meat into peptone.

Two New Antiseptics. By G. Lebon. (No. 3, July 11th, 1882.) Calcium and sodium, Glyceroborates.

Separation of Gallium. By Lecog de Boisbauerau. (No. 4, July 24th, 1882.) Description of methods for the separation of gallium from cobalt, nickel, thallium.

Vaporisation of Metals in Vacuo. By E. Demarcay. (No. 4. July 24th, 1882.)

Determination of Astringent Matters in Wine. By A. Girare. (No. 4, July 24th, 1882.)