knowledge to say that the perissad nature of the reducing element is an essential feature of the formation of active oxygen. As I have repeatedly stated, the essential part of my hypothesis is the reduction of the oxygen molecule at a temperature compatible with the stability of the ozone molecule. Even without chemical intervention, the silent electrical discharge will do this, and form primarily active oxygen and secondarily ozone. That such is the case is shown by the formation of carbonic dioxide when a mixture of carbon monoxide and oxygen are submitted to the silent discharge.

ABSTRACTS.

Abstracts from the Journal of the *London Chemical Society*, by E. Waller, Ph. D.

On the Constitution of some Bromine-derivatives of Naphthalene. (Third notice.) R. Meldola (XLIII. p. 1.)

Description of the preparation of meta di brom naphthalene, Beta-di brom naphthalene, tri-brom naphthalene, and ortho-di brom naphthalene.

On the Constitution of Lophine.. T. R. Japp. (XLIII. p. 9.) An argument against the view of Radziszewski, regarding the composition of the lophine molecule.

Contributions to the Chemistry of Lignification. C. F. F. Cross and E. J. Bevan. (XLIII. p. 18.)

The hypothesis of the authors previously adopted that *bastose* is a chemical whole in the sense of presenting a true combination rather than a mixture of cellulose with its own cellulosic constituent, has received further confirmation from their researches.

The close connection between these plant constituents and the trihydric phenols seems to be established.

A chlorinated derivative of bastose was obtained, which, though amorphous, was the same in composition when obtained from different sources, from jute, and from manilla. (*musa paradisiaca.*) The composition corresponded to the formula $C_{38}H_{44}Cl_{11}O_{16}$.

A note is appended remarking on the resemblance between the chloroderivatives from the alkaline liquors from Esparto boilers, and the halogen derivatives of the sacchulmic compounds recently described by Sestini. (Gazetta 1882, 292).

On the Oxidation of Cellulose. C. F. Cross and E. J. Bevan. (XLIII. p. 22.) A compound to which the name *oxycellulose* has provisionally been given, has been found to be one of the products intermediate between cellulose and oxalic acid by the reaction of nitric acid (of 60 per cent.) on cellulose. The amount obtained was about 30 per cent. of the cellulose used. Oxycellulose prepared from different sources, and by different methods of purification, had a constitution indicating the formula $C_{18} H_{26} O_{16}$. A nitro compound of this product was prepared, the examination of which by Eder's method (Ferrous sulphate) indicated the composition $C_{18} H_{23} (NO_2)_3 O_{16}$.

The Analysis of Certain Plant Fibres. C. S. Webster. A table is given embodying the results of the examination of the fibro vascular bundles of several monocotyledonous plants and of the bast fibres of several decotyledonous plants. The reactions of these fibres with various reagents are also given. Also the ground upon which the several determinations included in the method of diagnosis employed, is based.

On a Condensation Product of Phenanthraquinone with Ethylic Aceto-acetate. F. R. Japp and F. W. Streatfield. (XLIII, p. 27.)

On mixing 100 grms. of phenanthraquinone with 90 grms. ethylic aceto acetate, and then adding 150 c c of dilute KHO (1:6) and warming gently with agitation, ethylic-phenanthraoxylene-aceto acetate is formed. The compound was purified by boiling with alcohol, washing with water, and finally recrystallizing two or three times from boiling benzene. It is deposited in tufts of fine white silky needles. Fuses with blackening and evolution of gas at 184.°5C. Soluble in alcoholic and acetic acid. By oxidation with chromic acid it yields phenanthraquinone.

Composition, $C_{20} H_{16} O_4$.

	Calculated	Mean of 3 Analyses
C	75·	74.93
H	5.	5.06
O	20.	

Mixed with amorphous phosphorus and fuming hydriodic acid and heated, a compound $C_{20}H_{18}C_4$ was obtained.

Dissolved in KHO, a new dibasic acid, $C_{18}H_{14}O_4$ was precipitated by addition of HCl. The silver and barium salts of this acid, were isolated and analyzed. These results appear to afford a strong argument in favor of Fittig's formula for phenanthraquinone as against that of Graebe.

Note on the Preparation of Diphenylene-Ketone Oxide. W. H. Perkin. (XLIII, p. 35.) On heating salicylic acid with acetic anhydride, and then distilling off the acetic acid and excess of acetic anhydride, a mass was obtained which, by distillation, afforded an oily product, solidifying in the neck of the retort. On washing and purifying by recrystallization from alcohol, pale yellow needles (not, as had been anticipated of salicylic anhydride,) but of diphenylene-ketone oxide $C_{13}H_8O_2$, were obtained.

	Calculated.	Found.	
C........................	79.59	79.41	79.45
H........................	4.08	4.37	4.17

On Certain Brominated Carbon Compounds Obtained in the Manufacture of Bromine. S. Dyson. (XLIII, p. 36.) In a liquor obtained as a by-product at the works of the North British Chemical Company, chlorobromoform, as well as carbon tetrabromide and bromoform were found. The presence of the first has not before been noted.

On Ethylene Chlorobromide, and some Compounds Obtained from it. J. W. James. (XLIII, p. 37.) A summary of the principal results is given as follows :

1. In preparing ethylene chlorobromide, by passing the gas into a solution of Cl Br., it is necessary, in order to obtain a pure product and good percentage, that the chlorine be passed into the bromine at a temperature of about 0°, otherwise a substance is formed boiling some 3 to 4° higher than pure C_2H_4 Cl. Br., which is useless for the advantageous preparation of ethylene chlorothiocyanate.

2. If an aqueous solution of neutral sodium sulphite and ethylene chlorothiocyanate be brought together in direct sunlight, the sodium salt of a new acid, viz., ethylene-thiocyansulphuric acid, $C_2H_4\left\langle\begin{matrix}SO_3H\\SCN\end{matrix}\right.$ appears to be produced.

3. By passing ammonia into an ethereal solution of chlorethyl

sulphonic chloride, no amide is formed: with ethyl sulphonic chloride, however, the corresponding amide is easily obtained.

4. By the action of neutral sodium, sulphite in aqueous solution upon ethylene dibromide or chlorobromide, isethionate of sodium is apparently produced, with evolution of SO_2, in addition to the well-known ethylene-disulphonate of sodium obtained by Strecker.

On the Condensation Products of Oenanthaldehyde. Part I. and II. W. H. PERKIN, JR. (XLIII, p. 45.) A review of the most important researches on this subject is first given. The principal products of the action of KHO on œnanthaldehyde are heptoic acid, the acid $C_{14}H_{26}O_2$, and the aldehydes $C_{14}H_{26}O$ and $C_{28}H_{50}O$.

The products of the action of KHO, of nascent hydrogen, &c., upon these derivatives and upon œnanthaldehyde are described. At the end of the paper a table of the different derivatives is given, as follows:

Formula.	Boiling Point.	Sp. Gr. at 15°
Œnanthaldehyde,	153–154°	0.8231
$C_{14}H_{26}O$,	277–279°	0.8494
$C_{13}H_{27}COH$,	266–268° (m. p. 29.05)	....
$C_{13}H_{25}CH_2OH$,	280–283°	0.8520
$C_{13}H_{27}CH_2OH$,	270–275°	0.8368
$C_{13}H_{25}CH_2OC_2H_3O$,	285–290°	0.8680
$C_{13}H_{27}CH_2OC_2H_3O$,	275–280°	0.8559
$C_{13}H_{25}COOH$,	275–285° (at 250 min.)	....
$C_{13}H_{27}COOH$,	300–310°	....
$C_{21}H_{40}O$,	310–315° (at 300 min.)	0.8744
$C_{28}H_{50}O$,	330–340° (at 200 min.)	0.8831
$C_{28}H_{54}O_3$,	330–340° (at 200 min.)	....
$C_{28}H_{56}O_4$,	melts at 52–53°	....
$C_{21}H_{44}O_2$,	397–300°	....

The Sp. Gr. at 30° and at 35° are also given.

On the Condensation Products of Isobutaldehyde, Obtained by Means of Alcoholic Potash. W. H. PERKIN, JR. (XLIII, p. 90). The products obtained were as follows:

Formulæ.	Boiling Point.	Remarks.
$C_{12}H_{22}O_2$	154–157°	Condensation products.
$C_{16}H_{30}O_3$ (?)	190–200°	
$C_{20}H_{38}O_4$	223–225°	
$C_{24}H_{44}O_4$	250–255°	
$C_{28}H_{48}O_3$	227–229°	
	(100 mm. pressure).	
$C_{12}H_{26}O_2$	170–175°	Alcohol (and acetate) produced by the action of nascent hydrogen on $C_{12}H_{22}O_2$.
$C_{12}H_{24}O_2(C_2H_3O)_2$	185–190°	
$C_{20}H_{37}O_4(C_2H_3O)$	240–242°	Acetates produced by the action of acetic anhydride on $C_{20}H_{38}O_4$.
$C_{20}H_{36}O_4(C_2H_3O)_2$	248–252°	
$C_{20}H_{42}O_4$	217–223°	Produced by saponifying $C_{20}H_{38}O_4(C_2H_3O)_2$.
$C_{12}H_{22}O_3$	245–255°	Acid produced by the action of potash on isobutaldehyde.

The Alkaloids of Nux Vomica. No. II—**On Brucine.** W. A. SHENSTONE. (XLIII, p. 101.) The results show that there is reason to think that brucine is a dimethoxyl derivative of strychnine. Brucine, heated with hydrochloric acid, gave amounts of methyl chloride varying from 64.6 cc. to 90.2 cc. methyl chloride per gramme of brucine. Prolonged heating at low temperatures gave the highest results. Dimethoxy strychnine would yield theoretically 113 cc.

The Behavior of the Nitrogen of Coal during Destructive Distillation: with some Observations on the Estimation of Nitrogen in Coal and Coke. W. FOSTER. (XLIII, p. 105.) Experiments were made on a coal containing 1.73 per cent. of nitrogen. The most satisfactory results were obtained by combustion with copper oxide in vacuo. In this case it was found advantageous to place the tube in an outer tube of wrought iron, just sufficiently wide and long enough to encircle the whole length of the highly heated part. Wide tubes with large quantities of copper oxide were found to serve best. Of 100 parts of the nitrogen in the coal, it was found that the distribution was as follows :

Nitrogen of coal evolved as ammonia.............	14.50
" " " cyanogen.............	1.56
" " present in the coal gas in the elementary condition............................	35.26
Nitrogen remaining behind in the coke...........	48.68
	100.

Preliminary note on some Diazo derivatives of nitro-benzyl cyanide. W. H. Perkin. (XLIII, p. 111.)

By adding an aqueous solution of diazo benzene chloride to an alcoholic solution of nitro-benzyl cynanide freshly mixed with alcoholic potash, until the color became yellowish, a brown precipitate was obtained, which on filtering, and purifying by re-crystallization from alcohol and acetic acid, proved to be $C_{14} H_{10} N_4 O_2$. The alcoholic solution gives a violet color with alkalies, which disappears with acids.

It fuses at 201-202°. A second body fusing at 45°C, probably orthonitro benzyl chloride was also obtained in preparing the nitro-benzyl cyanide. The investigation is still in progress.

Researches on the Induline Group. Part I.—O. N. Witt and E. G. P. Thomas. (XLIII, p. 112.)

The "indulines" are defined as those colored compounds formed by the action of amidazo compounds upon the hydrochlorides of aromatic amines, with elimination of ammonia.

In studying the action of amidazobenzene on aniline hydrochloide, the re-action has been found to afford several different coloring matters varying in quantities and properties, according to the temperatures at which the process may be conducted, and the manner of it. The following compounds were obtained :

Designation.	Formula.	Remarks.
Azophenine,	$C_{36} H_{29} N_5$, melts at 236-237°	Identical with [Kunich's Azophenine.
Induline, 3 B,	$C_{30} H_{23} N_5 HCl$.	Sky Blue color.
Induline, 6 B,	$C_{36} H_{27} N_5 HCl$,	Dark-bluish purple.

The bases were also separated from these hydrochlorides, and analyzed. The researches on this subject are as yet uncompleted.

On a New Method of Estimating the Halogens in Volatile Organic Compounds. R. T. Plimpton and E. E. Graves. (XLIII, p. 119.)

The appparatus is so arranged that a stream of illuminating gas and air, mixed as in the Bunsen burner, passes over the volatile compound, taking up its vapors. The mixture is then burned under a trumpet tube, similar to that used in the Letheby apparatus for sulphur determinations in gas.

The products of combustion are drawn through U tubes, fitted with glass beads, moistened with caustic soda solution, and finally through a solution of silver nitrate, which acts as a guide to the completeness of absorption. Several analyses are quoted showing the accuracy attainable.

A Modified Liebig's Condenser. W. A. Shenstone. (XLIII, 123.)

The condenser is set vertically ; just below the water jacket, an annular ledge of glass is placed inside the condensing tube, to catch the condensed liquid as it runs down the sides. This space is connected with a tube extending laterally to carry off the products of condensation. A reference to the accompanying cut is necessary for a complete understanding of the operation of the apparatus.

On some Fluorine Compounds of Uranium. A. Smithells. (XLIII, p. 125.) By the action of HF on $U_3 O_8$ a green powder and a yellow solution are obtained. According to Ditte, hydrogen is given off in the process. The author was unable to obtain any. The green powder is stated by Ditte to be $UO_2 F_2$, by Bolton to be $U F_4$. The examination showed Bolton to be correct. This powder, by heating affords a white crystalline sublimate—Alpha Uranium oxyfluoride. $U O_2 F_2$.

The yellow solution was found to contain Beta Uranium oxyfluoride. On fusing $U_3 O_8$ with alkaline fluorides, compounds containing apparently alkaline uranates, but no fluorine except as impurity, were obtained. U_3O_8 fused with $K F H F$, afforded $U O_2F F_3 K F$. The results all through are altogether at variance with the conclusions of Ditte.

On the Volume Alteration Attending the Mixtures of Salt Solutions. W. W. J. Nicol. (XLIII. 135.)

The conclusions are: 1. When two salt solutions which cannot experience double decomposition, are mixed, a change of volume takes place due to the different affinities of the salts for water.

2. That double decomposition takes place in solution, and that the volume change is an index, and even a measure of this.

Two New Aluminous Mineral Species, Evigtokite and Liskeardite. W. Flight. (XLIII. p. 140)

The Evigtokite from the Greenland cryolite beds, was in white transparent crystals, quite soft. It contained

Al	16.23
Ca	22.39
Na	0.43
H_2O	5.71

Indicating the formula, Al_2F_6. 2 Ca F 2 H_2O.

The Liskeardite from Cornwall, first described by Mr. R. Talling, in 1874, contained :

Fe_2O_3	7.640		
Al_2O_3	28.229		
As_2O_5	26.962		
SO_3	1.111		
CuO	1.027		
CaO	0.719		
H_3O at ordinary temp.	4.351		
" at 100°	10.962	$6H_2O$	34.053
" at 120°	5.551	$3H_2O$	
" at 140–190°	8.220	$7H_2O$	
" with PbO	4.969		
	99.741		

The formula is put as $R'''AsO_4$. $8H_2O$.

On the Absorption of Weak Reagents by Cotton, Silk and Wool. By E. J. Mills and J. Takimine. (XLIII. p. 142.)

The absorption of H_2SO_4 HCl and NaHO were tried upon these different textures. The ratio of absorption for cotton and silk are:

	Cotton.		Silk.
H_2SO_4	1	:	2.6
H Cl	1	:	2.2
NaHO	1	:	2.3

Wool and silk resemble one another with NaHO but with the acids the wool takes up much more.

The resemblance between silk and cotton with these reagents is most marked, probably indicating a similarity in chemical composition between the two.

On the Action of Chlorine on Certain Metals. R. Cowper. (XLIII, p. 153.) With perfectly dry chlorine gas no action was observed on Dutch metal, Zinc, Magnesium, and Sodium.

Very slow action on Silver and Bismuth.

Rapid action on Tin, Arsenic, Antimony and Mercury.

With Potassium the action was very slow, a rich purple colored compound forming; by heating to fusion the action was accelerated, but the metal did not take fire until heated considerably above the fusing point. Very minute quantities of water determined the attack of almost all the above metals by the chlorine.

Some Notes on Hydrated Ferric Oxide, and its Behavior with Hydrogen Sulphide. L. T. Wright. XLIII. p. 156.

It was found impossible to obtain absolutely pure ferric hydrate by precipitating ferric chloride with ammonia, some basic chloride always remaining in the precipitate.

Freshly precipitated ferric hydrate suspended in water on being saturated with hydrogen sulphide, turned black and then dissolved in potassium cyanide, the reaction being:

$$FeS+6KCN=K_2S+K_4Fe(CN)_6$$

After washing and drying at 100°C. it did not exhibit the same phenomena.

Ferric hydrate boiled with H_2S afforded some ferrous sulphate. Free sulphur always resulted from this reaction, when conducted in such a way as to imitate the action going on in gas purifiers. It appeared that 17 to 30 per cent. reacted thus: $Fe_2O_3,H_2O+3H_2S=2FeS+S+4H_2O$ and the remainder thus: $Fe_2O_3,H_2O+3H_2S=Fe_2S_3-+4H_2O$.

Note on some Derivatives of Fluorene $C_{13}H_{10}$. W. R. Hodgkinson and F. E. Matthews. (XLIII, p. 163) The compound used as a standing point was ortho fluorene, $C_{13}H_{10}$ melting at 113°.

The main object was the preparation of fluorol $C_{13}H_{10}O$. The compounds made were: alpha dibromfluorene melting at 165° $C_{13}H_8Br$. Monobromfluorence $C_{13}H_9Br$. melting at 101–102°. Dibromodephenylene ketone $C_{13}H_6Br_2O$, melting at 198°. Bromdipheylene ketone, $C_{13}H_7BrO$, melting at 104°. The sulphonic acid, $C_{13}H_9SO_3H$. The barium salt of this acid containing $2H_2O$, and the cadmium salt containing $6H_2O$ were analyzed.

On fusing the potassium sulphate with potash instead of fluorol, trihydroxyphenol $C_{12}H_{10}O_3$ (melting at 204–205°) and dihydroxyphenol $C_{12}H_{10}O_2$ (melting at 98°) were obtained, the methylene group having been split off.

Alpha dichlorofluorene $C_{13}H_8Cl_2$ melting at 128° and its corresponding ketone melting at 158° were also obtained, as well as $C_{13}H_3Cl_7$ melting at 104°. Alcoholic potash reacted with this last compound affording a red body of the formula $C_{13}H_4Cl_5$.

The sulphonic acid corresponding to the alpha dibromofluorine were prepared (melting at 142°) and the barium salt $(C_{13}H_7Br_2SO_3)_2$ Ba was analyzed.

On alpha-ethyl-valero lactone, alpha-ethyl-beta-methyl-valero lactone, and on a Remarkable Decomposition of beta-ethyl-aceto-succinic ether. S. Young. (XLIII, p. 172).

On the Constitution of Molecular Compounds. The Molecular Weight of basic Ferric Sulphate. S. U. Pickering (XLIII., p. 182). The experiments were conducted by means of ascertaining the unit of water removable. The choice was between the formula $2Fe_2O_3SO_3$ (molecular weight 400) and $Fe_2(SO_4)_3$, $5Fe_2O_3$, (molecular weight 1200.) The results indicate that the latter formula Fe_2 $(SO_4)_3$, $5Fe_2O_3$, xH_2O) is most probably correct.

The Phenates of Amido Bases. R. S. Dale and C. Schorlemmer. (Vol. XLIII., p. 185.) Red aurin was found to be nothing but aurin containing pararosanilin.

On dissolving equal molecules of aurin and rosanilin in alcohol, and evaporating rosanilin aurinate was found to remain. Anilin phenate $C_6H_7N.C_6H_6O$ was obtained, fusing at 29.5° and boiling at 184.5° (uncorr.) This salt was found to be a powerful antiseptic. From an alkaline solution of aurin which, though originally red, had turned brown, the addition of an acid caused the separation of di-oxy-phenyl-ketone $CO(C_6H_4\ OH.)_2$.

On some Derivatives of Diphenyl Ketone Oxide. A. G. Perkin. (Vol. XLIII., p. 187.) A by-product in the preparation of this oxide (by distilling a mixture of salicylic acid and acetic anhydride) was found to be a compound $C_{14}H_8O_3$, fusing at 192° and distilling with partial decomposition. This compound, boiled with alcoholic potash, afforded an acid $C_{14}H_8O_4$. Both this acid and its silver salt were analyzed. The acid fused at 275°.

Diphenyl ketone oxide treated with nitric acid (Gr. 1.45) and a little sulphuric, yielded the di-nitro compound, $C_{13}H_6(NO_2)_2O_2$ crystallizing in satiny needles having electrical properties and fusing at 262°. Tin and hydrochloric acid afford with this compound the corresponding diamido-phenylene ketone oxide $C_{13}H_6(NH_2)_2O_2$ forming orange to ruby colored needles. Both of these last compounds affect polarized light.

Nordhausen sulphuric acid heated with the oxide, on dilution, neutralizing with $BaCO_3$ &c., afforded the barium disulphonate $C_{13}H_6O_2Ba(SO_3)_2$ moderately soluble in boiling water, and quite stable even at 200°.

Bromine with the oxide afforded $C_{13}H_6O_2Br_2$ forming transparent needles fusing at 210°, and subliming a few degrees higher.

Chemico-Microscopical Researches on the Cell-contents of Certain Plants. A. B. GRIFFITHS. (Vol. XLIII., p. 195.) Savoy cabbages grown in a soil to which no iron compounds were added, were less healthy than those grown in a soil to which ferrous sulphate had been added. The ashes of the plants also showed more iron where it had been added to the soil, and in all cases crystals of ferrous sulphate were found by the microscope in the cells of the plants.

On Condensations of Compounds which Contain the Dicarbonyl Group with Aldehydes and Ammonia. F. R. JAPP. (Vol. XLIII., p. 197.) Controversial.

On some Condensation-Products of Aldehydes with Aceto-Acetic Ether and Substituted Aceto-Acetic Ethers. F. E. MATTHEWS. (Vol. XLIII., p. 200.)

The results given are those from an examination of,

1. The condensations of aceto-acetic ether with isobutylicaldehyde, valeric aldehyde, chloral, furfural, and acrolein. The relations of di-substituted aceto-acetic ethers to benzoic aldehyde. 2. Benzoic aldehyde with aceto diethyl acetic ether, aceto dichloracetic ether, and aceto benzliden acetic ether. Also, 3. Benzoic aldehyde with aceto-monoethyl acetic ether. The condensation takes place only in the methylene group, quite readily in the case of aceto-acetic ether, but with more difficulty with the mono and di-substitution products of that ether.

Contribution to the Chemistry of "Fairy Rings." J. B. Lawes, J. H. Gilbert and R. Warrington. (Vol. XLIII., p. 208.)

The "fairy rings" are rings of grass, growing more luxuriantly than that in the immediate neighborhood, the ground within the ring sometimes appearing almost barren. A growth of fungi is usually observable around the outside of these rings, which increase perceptibly in size from year to year.

The theory has been advanced that the fungi assimilate nitrogen from the air, and by their death and decay, render this nitrogen assimilable by the grass. The examination of the soil within, on, and outside of the ring, shows that, though poor in nitrogen within the ring, the soil is somewhat richer in nitrogen outside of it than on the ring. The conclusion is, that the fungi have the power of assimilating the organic nitrogen of the soil to a greater extent than the grass, and that the atmospheric nitrogen has no essential connection with the phenomenon.

The report of the Anniversary Meeting of the Chemical Society, held March 30th, 1883, is here inserted p. 224.