A METHOD OF DISCRIMINATING BETWEEN OXYGEN ABSORBED BY NITRITES AND ORGANIC MATTER.

By FRANK P. PERKINS.

BEAUTIFUL as the permanganate process, elaborated by Dr. Tidy, undoubtedly is, its usefulness in relation to water analysis would be much enhanced were it possible to determine and definitely fix by its aid the limits of absorption of oxygen by nitrites and organic matter. The artifice at present employed—viz. : to allow the standardized permanganate to act for a few moments, and then place the oxygen consumed in that time to the credit of the nitrites—appears unsatisfactory, for evidently an approximation to the truth can only be arrived at by acting in this way. It occurred to me that oxygen absorbed by nitrites may be more correctly estimated (in an indirect manner) by altogether destroying them before applying the permanganate.

When my last paper was submitted to you, I was not aware that the action of magnesium on water was sufficient, in the cold, to decompose it rapidly enough for the purpose there required ; but experiments since performed have assured me of the fact. It is advantageous, however, to favour the reaction by the addition of a small quantity of sodium chloride. Contact with platinum is unnecessary, although, if preferred, increase of power may also be gained in that way. It will be needless to enter into minute particulars : it is enough to say that the nitrites (and nitrates) having been broken up (and care must be taken by the application of some qualitative test to a portion of the water that this is effectually done) 250 c.c. of the prepared water and 250 c.c. of the water in its original condition are placed in flasks, and 10 c.c. of dilute sulphuric acid, prepared in the usual way, added to each.

The flasks are now heated, and the water brought to the boiling point ; the lamp is then removed, and after a short interval 10 c.c. of the standard permanganate run into

either vessel and allowed to act for three hours, the water gradually cooling during the time. The usual manipulations accompanying the titration with hyposulphite are then gone through with, and the experiments being concluded the difference between the two represents the amount of oxygen consumed by the nitrites contained in the water.

EXETER WATER FROM TANK.

	Per 100,000 pts. oxygen absorbed.
1. The water before being acted on by Mg.	·101
The water after being acted on by Mg.	·068
Difference due to Nitrites	·033 = ·028 N.
2. The water before being acted on by Mg.	·103
The water after being acted on by Mg.	·081
Difference due to Nitrites	·022 = ·019 N.

FROM LABORATORY TAP.

	Per 100,000 pts. oxygen absorbed.
3. The water before being acted on by Mg.	·0937
The water after being acted on by Mg.	·0593
Difference due to Nitrites	·0344 = ·0301 N.
4. Experiment with Copper-Zinc Couple—	
Water before being acted on	·098
Water after being acted on	·0644
Difference due to Nitrites	·0336 = ·0294 N.

ANHYDROUS BINOXIDE OF BARIUM.

ANHYDROUS binoxide of barium, as is well known, is a powerful bleaching agent. Treated by almost any acid, in presence of water it yields peroxide of hydrogen, the discoloring action of which chemical on the organic matters has been made use of for various purposes. In this manner raw silks, woollen and cotton fabrics, straws, skins and furs, feathers and hair can be bleached, and articles of little commercial value otherwise, or even worthless, can be made to bring remunerative prices. There is a demand for anhydrous binoxide of barium made in this country for the different uses quoted above; but until lately we have been entirely dependent upon Europe for the supply of this product. It is now manufactured in this country. An exchange says that the qualities imported have been in many cases inferior, and the prices asked entirely out of proportion with the purity of the article. But even when carefully manufactured, and of a proper strength and purity, the anhydrous binoxide imported presents a drawback. Its usefulness depends upon the amount of active peroxide of hydrogen it can yield under chemical treatment, and this quantity, which, in fact, does represent its real value, is much diminished when it has been prepared for a length of time, even a few weeks—a fact well known to chemists, and well established amongst those who know how to employ the chemical. This loss of action or of energy, so to speak, can reach as much as 15 per cent. of the original value of the substance as first prepared after a month or so, whatever care and skill might first have been given to its manufacture, and however pure it might have been originally. It is easy to realize that a transportation on steamers, besides the time it requires to make the transit, is very objectionable. Notwithstanding all the precautions taken, it is impossible to guard against the access of moisture and other sources of deterioration; and the article, however superior it might have been, is necessarily, as it reaches us, inferior to what it was when first prepared in Europe.—*New York Oil and Drug News.*

Analyses of English Public Water Supplies in March, 1882. All results are expressed in grains per gallon.

Description of Sample	Date when drawn.	Appearance in Two-foot Tube.	Small when heated to 100° Fahr.	Chlorine in Chlorides.	Phosphoric Acid in Phosphates.	Nitrogen in Nitrates.	Ammonia	Albuminoid Ammonia.	Oxygen Absorbed in		Hardness, Clark's Scale, in degrees.		Microscopical Examination of Deposit.	ANALYSTS.
									15 mins. at 80° Fahr.	4 hours at 80° Fahr.	Before Boiling.	After Boiling.		
Kent Co.	Mar. 27	p. blue clear	none	1.84	trace	.46	.0020	.0053	.014	.024	21.4°	6.9°	33.0	Wigner & Harland.
New River	" 14	clear	none	1.12	trace	.23	.0007	.0021	.062	.019	14.0°	5.0°	20.7	B. Dyer.
East London ...	" 9	clear greenish	none	1.20	none	.38	.0017	.0025	.036	.082	15.0°	5.0°	25.4	Wigner & Harland.
Southwark & Vauxhall ...	" 25	p. y. & clear	none	1.24	trace	.23	none	.0056	.027	.052	15.5°	3.5°	19.2	J. Muter.
West Middlesex	" 22	greenish yellow	none	.98	trace	.18	.0007	.0053	.027	.062	12.5°	2.0°	20.5	O. Iehner.
Grand Junction	" 22	p. yellow	none	1.14	trace	.26	.0020	.0060	.028	.094	14.2°	3.7°	19.8	A. Wynter-Blyth.
Lambeth	" 25	p. y. & clear	none	1.49	trace	.29	.0007	.0049	.026	.049	16.0°	3.5°	20.7	J. Muter.
Chelsea	" 15	c. p. green	none	1.12	trace	.95	.0028	.0056	.036	.084	18.0°	5.0°	19.7	A. Dupré.
Birmingham ...	Mar. 7	grnsh. v. s. turb	none	2.66	trace	.31	.0028	.0028	.022	.064	11.5°	6.3°	20.4	A. Hill.
Brighton	" 9	pale blue clear	none	2.13	none	.36	none	.0031	.008	.040	13.0°	5.0°	20.6	Wigner & Harland.
Bolton	" 14	s. turbid	none	.50	none	.04	.0003	.0032	.018	.040	3.6°	3.4°	8.8	W. H. Watson.
Bristol	" 6	grnsh brown	none	.90	none	.05	.0020	.0048	.018	.040	17.4°	2.9°	19.6	F. W. Stoddart.
Cambridge	" 16	c. p. blue	none	1.40	trace	.45	.0014	.0028	none	.026	16.0°	5.0°	20.5	J. West Knights.
Canterbury	" 17	p. blue	none	1.47	none	.33	.0050	.0050	.003	.006	4.9°	4.0°	10.0	S. Harvey.
Croydon	" 21	brgt. colourless	none	1.19	trace	.30	none	.0030	none	.012	15.0°	6.5°	24.6	C. Hensch.
Dublin	Feb. 28	s. yellow	none	.89	trace	traces	.0010	.0040	.060	.190	1.3°	.7°	4.3	C. A. Cameron.
Edinburgh	Mar. 16	s. brown	none	.80	none	f. trace	.0008	.0040	.012	.050	4.7°	4.4°	5.5	J. Falconer King.
Exeter	" 7	f. brnsh. yellow	none	.98	trace	.15	.0014	.0056	.018	.045	2.4°	2.4°	7.0	F. P. Perkins.
Grantham	" 8	c. p. blue	none	1.69	trace	.59	.0009	.0015	.006	.007	15.6°	6.6°	23.9	A. Ashby.
Hastings	" 15	blue	none	4.80	trace	.01	.0007	.0014	.002	.005	11.0°	6.0°	27.5	H. F. Cheshire.
Hastings	" 18	e. colourless	none	2.30	trace	.28	.0036	.0060	.007	.010	19.2°	8.2°	31.2	J. Napier.
King's Lynn ...	" 17	dirty yellow	weedy	1.10	trace	.31	.0007	.0063	.152	.250	19.0°	5.5°	21.2	W. Johnstone.
Liverpool	" 7	yell. green	s. peaty	.95	trace	.04	.0014	.0028	.042	.100	3.4°	3.1°	7.8	A. Smetman.
Maidstone—	"													
Wtr. Company	" 13	c. p. green	none	2.60	trace	.63	.0007	.0007	.011	.018	17.0°	7.6°	37.5	M. A. Adams.
Public Conduit	" 13	c. p. blue	none	2.39	trace	.62	.0007	.0007	.007	.009	16.6°	7.3°	33.9	M. A. Adams.
Manchester	" 16	s. turb. f. yell.	none	.74	none	none	.0029	.0028	.017	.076	1.8°	1.7°	4.7	W. Thomson.

SOCIETY OF PUBLIC ANALYSTS.

Analyses of English Public Water Supplies in March, 1882. All results are expressed in GRAINS PER GALLON.

Description of Sample.	Date when drawn.	Appearance in Two-foot Tube.	Smell when heated to 100° Fahr.	Chlorine in Chlorides.	Phosphoric Acid in Phosphates.	Nitrogen in Nitrates.	Ammonia.	Albuminoid Ammonia.	Oxygen, Absorbed in		HARDNESS, Clark's Scale, in degrees.		Total Matter dried at 220° Fahr.	Microscopical Examination of Deposit.	ANALYSTS.
									15 mins at 80° Fahr.	4 hours at 80° Fahr.	Before Boiling.	After Boiling.			
* Newark	Mar. 4	v. turb. p. brwn.	none	1.19	trace	.09	.0013	.0084	.046	.099	16.2°	11.2°	26.4	amorphs.mtr.mvg.organs	A. Ashby.
Newcastle-on-Tyne.....	" 8	s. turb. f. yell.	none	.94	trace	.04	.0010	.0090	.060	.107	16.0°	6.0°	20.0	satisfactory	J. Pattinson.
Nottingham ..	" 15	bluish green	none	1.91	trace	.74	.0020	.0124	.018	.026	10.4°	6.4°	23.4	veg. deb.	Wigner & Harland.
Norwich	" 9	f. grnsh. yell.	none	1.85	trace	.52	trace	.0060	.054	.094	14.0°	4.0°	20.0	diatoms, veg. deb., peaty	W. G. Crook.
Peole	" 4	s. turbid	none	12.50	trace	.05	trace	.0032	.039	.039	1.5°	1.3°	3.6	veg. deb., diatoms	A. Angell.
Portsmouth ..	" 11	c. greenish	f. weedy	1.00	trace	.12	.0007	.0056	none	none	11.5°	2.0°	18.3	none	W. J. Sykes.
Reading	" 20	light green	none	.66	none	.09	.003	.004	.0007	.006	2.80°	3.8°	19.1	satisfactory	J. Shea.
Rochdale.....	" 5	p. yellow turb.	none	1.03	h. trace	.38	.0056	.0280	.035	.102	8.0°	6.5°	14.5	veg. deb., animal.	T. A. Collinge.
Rugby	" 5	c. l. yellow	none	.90	none	none	.0014	.0028	.003	.035	3.0°	2.5°	5.5	none	A. P. Smith.
Salford	" 17	c. colourless	none	1.45	h. trace	.33	.0025	.0030	.004	.004	22.0°	6.0°	25.0	none	J. Carter Bell.
Shrewsbury ..	" 17	clear	none	.90	trace	.19	.0051	.0087	.015	.089	12.6°	5.0°	20.0	satisfactory	T. P. Blunt.
Southampton..	" 3	c. f. green	none	.39	none	.01	none	.0056	.003	.004	1.4°	1.4°	4.2	none	A. Angell.
Swansea	" 3	c. f. green	none	.39	none	.01	none	.0008	.006	.016	.4°	.4°	2.1	veg. deb., diatoms	W. Morgan.
Whitehaven ..	" 3	c. f. green	none	.39	none	.01	none	.0008	.006	.016	.4°	.4°	2.1	veg. deb., diatoms	A. Kitchin.
Schuyllkill	Feb. 21	turb. yellow	none	.32	trace	.107	.0063	.0084			4.0°	4.0°	6.44	veg. deb., diatoms animal.	H. Leffmann.
Philadelphia	"	this sample was taken.													

Abbreviations:—c., clear; f., faint; h., heavy; p., pale; v. h., very heavy; v. s., very slight.

ERRATA.—In the February Table the West Middlesex Free Ammonia should have been .0013 instead of .0130; Exeter Albuminoid Ammonia should have been .0039 instead of .0004; Reading Chlorine should have been .95 instead of 1.95.

THE WORK DONE BY PUBLIC ANALYSTS DURING 1881, UNDER THE
SALE OF FOOD AND DRUGS ACT.

In the course of a few days we purpose issuing forms to all Public Analysts, in order to enable us to prepare the tabulated statement which we have published for several years past. As the compilation of such a table, which is becoming larger and larger every year, necessarily occupies some considerable time, we shall be greatly obliged if analysts will fill up and return the forms with as little delay as possible.

DEFENCE ANALYSTS.

THE refusal of the Home Secretary to permit a third analyst to be present on behalf of the defence during the analysis of the viscera of Percy Malcolm John, has elicited adverse comments in the public press. The reply of the Home Secretary to Lamson's solicitor, stating that the application must be refused, as it was contrary to precedent, is of course indefensible. The refusal might, however, have been made on other and better grounds. The right course was pursued of having a second analyst present in a case of such a serious nature. In his evidence, Dr. Stevenson stated that it was at his request that Dr. Dupré was appointed to assist. Both of these gentlemen were in the position of independent experts appointed by the Home Office, at the request of the coroner, to assist in the determination of the cause of death; and they were not responsible to the actual prosecuting authority, viz., the Treasury. It was not until nearly a week after the analyses were entrusted to Dr. Stevenson, that application was made for the presence of a third analyst on Lamson's behalf. By this time, the analyses must have been well in hand; and we fail to see what good result could have ensued from the presence of a gentleman responsible only to his employer, the prisoner. Were the rule introduced of having an analyst present on behalf of the defence, grave results might ensue, and the public interests would not be subserved by the change. The third party would usually be introduced at a late stage in the analysis; he could have no voice in, or control of, the analyses; his objections might or might not have weight with the official analysts. Moreover, it would be practically impossible to secure the collective attendance of three analysts eminent in their profession day by day for perhaps two or three weeks. The semblance of injustice done to Lamson by the refusal of the Home Secretary was, we believe, a semblance only; though we must admit that the refusal was made on quite insufficient and erroneous grounds.—*British Medical Journal*.