it is quite obvious that the whole increase of inhabitants which the census demonstrates cannot thus be explained.

Typhoid fever, under which head are included apparently more than one variety of continued fever, is neither more prevalent nor more fatal in Rome than in several of the larger capitals of Europe, such as Berlin and Vienna; but it is, unfortunately, impossible to compare the mortality from the disease in 1872 with that of the whole preceding year, as the necessary data for 1871 have only been supplied for the six months of that year, beginning with May. During those six months, the death-rate from typhoid fever in 1871 was materially higher than in the same period of last year. The water-supply of Rome is still good, though by no means so abundant as in the days of its great glory. All its chief sources are ancient and well known, though often cut off and renewed. The four principal waters are the Acqua Vergine, or Trevi, so called from supplying the famed fountain of that name; the Acqua Felice, the Acqua Paola, and the Acqua Marcia; the first and last named being much the most pleasant to drink, and containing least organic matter. In one litre of the water of Trevi there are fixed principles to the extent of gr. 0.26381; in the same quantity of Acqua Felice, gr. 0.27045; and in the Acqua Paola, gr. 0.14084, chiefly chloride of sodium, carbonates of lime and magnesia, and sulphate of soda. The Acqua Trevi contains more gaseous elements than the other two. Of the Acqua Marcia, re-introduced into the city only in 1870, no good analysis has as yet been published. It is to be feared, however, that all the three waters, Acqua Trevi, Felice, and Paola, receive organic impurities; the Acqua Trevi from the aqueduct in which it runs, being open here and there in the Campagna; the Acqua Felice at its source, and the Acqua Paola on the Janiculum, as Professor Scalzi points out, in an article on the subject in the *Giornale Medico di Roma* for December, 1869. There are besides several other sources of water-supply of minor importance, and many wells, unfortunately still in use, within the walls; but as regards the quantity, no city in the world is better off than Rome, as the four chief aqueducts alone provide 1,439 litres, or 317 gallons per day, for each inhabitant.

The present article would not be complete without some reference to the chief meteorological features of the year; and those I have been able to obtain from the observatories of the Capitol and of the Collegium Romanum, and now present in the following table.

Table showing the Temperature, Rainfall, and Deaths in each Month of the Year.

[The observations on the temperature were made at the Capitol at a height of nearly two hundred feet above the level of the sea; those on the rainfall at the Collegium Romanum at a height of one hundred and sixty-two feet above the level of the sea.]

1872. Month.	TEMPERATURE.*				RAIN.		DEATHS.		
	Highest Day Temperature.	Lowest Day Temperature.	Mean Temperature.	Mean monthly range.	Number of days it fell.	Amount in inches.	Daily average.	From prevalent zymotic diseases.†	Total ‡
January ..	60.8	26.6	46.7	12.6	13	3.622	34	288	1041
February ..	57.7	34.5	50.3	13.6	14	3.385	27	220	782
March	64.7	35.7	54.6	13.6	15	4.527	26	208	792
April	73	43.5	59.9	15.4	9	2.952	25	163	758
May	84.2	46.5	66	19.2	8	2.322	24	201	742
June	85.3	51.9	71.7	17.4	5	1.889	27	147	810
July	92.1	57.7	79.1	18.9	1	0.118	27	164	839
August	89.9	59.1	78	19	3	1.181	29	237	911
September ..	88.5	50	74.4	18.9	3	3.582	30	230	890
October	75.9	48.2	66.5	14.2	16	9.370	26	158	808
November ..	68.3	37.4	55.2	14	14	4.133	27	139	818
December ..	75.7	35.7	53.7	13.3	15	4.015	25	137	786
Total					116	41.096	27	2202	9977

Temperature.—The mean temperature of all the months of the year, except May, June, and July, was above the average mean monthly temperature, as deduced from the observations taken at the Collegium Romanum for the ten years from 1863 to 1872 inclusive. May and June were slightly colder than usual, while July had almost exactly the average mean temperature. March, October and December, were remarkably hot months, and their mean temperatures were greatly in excess of the average.

Rainfall.—The amount of rain which fell at Rome in 1872 exceeds the average rainfall taken from eighty-five years observations, by nearly ten inches. Much of this excess of rain fell in March and October,

when double the mean quantity for those months was registered; but January, February, April and September, were all wet months, their rainfalls considerably exceeding the average. The number of rainy days throughout the year was one hundred and sixteen, or fourteen more than the average in the last ten years.

Winds.—The prevailing winds of the year were directly north or south. For periods of four hours observations the north wind was registered four hundred and nine times, the south wind four hundred and thirty-five times, in the eleven months of the year ending with November. The next most prevalent directions of the wind were S.W. and W., chiefly in the five months from May to September. December presented the peculiarity that for the first twelve days the wind blew steadily from the south and south-east, while from the 13th to the end of the month the direction was just as persistently from the north and north-east.

Births.—The birth-rate in Rome has often been stated to be exceedingly low by those who have not noticed that, according to the census returns, the city contains a surplus male population of over 34,000 souls. This excess of males is usually supposed to be due to the number of unmarried men belonging to the priesthood, and to the various monastic orders; but as there are only about 3,600 members of both these classes, we can thus account for but an insignificant part of the surplus. The garrison of Rome does not amount to 6,000 men; and indeed the true explanation of the large excess of males is found in the fact, that the shepherds and farm labourers inhabiting the Agro Romano outnumber the female population there by nine to one, there being 18,000 males to 2,000 females. True, a great number of those men are married; but, as most of the wives live elsewhere, their children are not registered in Rome, and the birthrate, as compared with the population, is thus proportionately diminished.

In the past year there has been a considerable improvement in the birth-rate, as it has risen from 25.4 per 1000 in 1870, and 27 per 1000 in 1871, to 29.4 per 1000 in 1872. The number of male children born is surprisingly large, the proportion for the year being 111 boys to 100 girls, which is very much above the average excess of male births in civilised countries. In close relation to this high proportion of male births, we find that the still-births among the boys outnumber those among the girls by two to one; and on deducting those still-born children, the proportion of boys to girls born alive is reduced to 109.2 to 100.

ON THE TESTING OF FLOUR AND BREAD.

By J. ALFRED WANKLYN.

In the course of my work for the chemical section of a Manual, which Messrs. Smith and Elder are publishing, for the Guidance of Medical Officers of Health and Public Analysts, I have had occasion to make some original observations on the subject of flour and bread, which appear to be called for at the present time. Notoriously, the detection of alum in bread is beset with difficulties, and is in a very unsatisfactory condition. This depends partly on the excessively small proportion of alum which is put into bread, and partly on the difficulty in dealing with alumina in presence of the ash of bread, which, as is well known, contains phosphoric acid, along with magnesia and lime, as well as silica. It has already been insisted upon by various authorities, that the testing for alum should not be on too small a scale: 100 grammes of flour or 200 grammes of bread appear to me to be proper quantities to operate upon; and I find that similar quantities have been recommended before. The novelties that I am introducing are, first, the acceleration of the incineration by the use of a jet of oxygen gas directed on the ignited mass. This is by no means unimportant, inasmuch as otherwise the task of incinerating 100 grammes of flour might last for a few days. Secondly, instead of using nitric or hydrochloric acid for the attack of the ash, I use sulphuric acid; and, thirdly, I use weighed quantities of reagents, and as little as possible of them, and at the same time avoid all unnecessary dilution. Attention to these particulars renders the detection of alum in bread a certainty. I will give an outline of the process.

The ash from 100 grammes of flour weighs 700 milligrammes, and, in a case of aluminised flour, may contain some 30 milligrammes of alumina in addition. I moisten this ash with a measured 0.5 cubic centimetre of oil of vitriol, then heat up until the oil of vitriol begins to volatilise, whereby the silica is rendered insoluble and the attack of the alumina in the ash is insured. Having done this, and allowed the ash to cool, I dilute with a little water and filter. The filtrate is then treated with 1½ gramme of pure caustic potash, which renders it alkaline and redissolves the alumina. The solution is then filtered, and

* Taken six times daily: at 7 and 10 A.M., and at 1, 4, 7, and 10 P.M.

† Only approximately correct, owing to the causes of death being returned as per week.

‡ Stillbirths alone deducted.

the filtrate treated with $1\frac{1}{2}$ gramme of chloride of ammonium, and boiled and allowed to stand, whereupon the alumina is precipitated as phosphate of alumina, which admits of being got on a filter, washed, ignited, and weighed.

The advantage gained in this instance by using weighed quantities of reagents, and by avoiding dilution, will commend itself to chemists, who will not fail to recognise that, though there be difficulty in insuring that an indefinite quantity of acid and alkali shall be quite free from alumina and silica, there is not much difficulty in getting 1 gramme of sulphuric acid, $1\frac{1}{2}$ gramme of potash or soda, and $1\frac{1}{2}$ gramme of chloride of ammonium, so as collectively not to contain a couple of milligrammes of alumina or of silica.

The testing whether flour be sound or not by the strength of the aqueous extract is not new, but has been developed and rendered easily practicable in the course of my experiments. The basis of the method is, that in sound flour there is very little sugar and dextrine, but that in unsound flour there is either much sugar and dextrine, or else that a short exposure to the action of water converts much of the starch of the flour into dextrine and sugar. In the space of an hour and a half, I can by a little management make a determination of the quantity of extractive given by a sample of flour. I take 100 grammes of the flour, mix it well with some water, and then dilute the whole mass with water until it occupies exactly half a litre. I then pour it on a dry paper filter in a dry funnel, whereupon the liquid runs through tolerably rapidly at first; by and by, as is known, such a filter will become clogged up, but not until at least some 50 cubic centimètres of filtrate have run through. These may be measured and evaporated down to dryness in the water-bath, and the residue weighed. Ten times the residue yielded by the 50 cubic centimètres is equal to the amount of extractive yielded by 100 grammes of the flour. The extractive furnished by 100 grammes of sound flour is 4.69 grammes. Of this, 0.44 gramme is ash and 0.92 gramme vegetable albumen, leaving 3.33 grammes of dextrine, sugar, and gum. If sound flour be left for twenty hours in contact with cold water, and then the aqueous extract be taken, it will be found to be increased somewhat: I found it to be 6.01 grammes. In unsound flour, Odling has found 12 and 18.2 grammes of extractive per 100 grammes of flour. I believe that Odling first proposed the determination of the amount of extractive yielded by flour to cold water as a test of the soundness of flour. I am inclined to the belief that this test may be made very practicable and valuable.

METHYLENE ETHER AS AN ANÆSTHETIC.

By J. O. BROOKHOUSE, M.D., Surgeon to the Eye Infirmary, Nottingham.

SINCE a more prominent professional attention has been generally directed to the subject of anæsthetics, in consequence of the number of recent fatal accidents with chloroform, I have made use of Dr. Richardson's new compound, methylene ether ($C^2H^5O^2$, CH^2Cl^2 , specific gravity 1000, prepared by Messrs. Hearon, Squire, and Francis, of Coleman Street, London. The opinion formed is deduced from a limited number of cases, and would have been valueless, by reason of such limitation, had it not happened that the special lethal influence of the agent was manifested on more than one occasion.

The ether was given on a wire skeleton mask covered with one thickness of flannel closely fitting the nose and mouth; over this was then laid one fold of an ordinary towel. The majority of the patients were under twenty years, and all free from vital organic disease. The following are some of the cases and facts observed.

CASE I.—H. B., aged 26, married woman. About three drachms of ether were used. Anæsthesia was produced in three minutes. The time of operation was two minutes (the operation was for closed pupils). The pulse was 104 before, during and after operation. Respiration was unaffected. The facial aspect was unchanged. There was no excitement. The time of recovery was four minutes. The sickness was very slight.

CASE II.—C. Y., aged 17, single woman. About three drachms of ether were used. Anæsthesia was produced in two minutes. The time of operation was six minutes. The pupils were medium-sized and fixed. The pulse before operation was 84; it fell to 60 during the anæsthesia, and became intermittent. The respiration was slow and very feeble. The face was pale. Excitement was small. She recovered in four minutes, and was subsequently very sick. The symptoms shown by this girl were most alarming.

CASE III.—W. S., a boy aged 13. About three drachms of ether

were used. Anæsthesia was produced in three minutes; he was under its influence three or four minutes, when the pulse fell away quickly—14 beats per minute. He was allowed to recover, when the pulse rose 20. He was put under a second time, without any alteration of pulse, rate or quality. His face was flushed; the lips purple in colour. The excitement was very slight. The time of recovery was four minutes. He was afterwards sick.

CASE IV.—L. T., a girl aged 11. About one drachm of ether was used. Anæsthesia was produced in two minutes. The pulse was 100 before and during insensibility. The excitement was very slight. Recovery was quick. The face was flushed; the pupils contracted. This girl had the ether three days before, and took it well.

CASE V.—R. C., a boy aged 5. About two drachms of ether were used. Anæsthesia was produced in a minute and a half. The time of operation was three minutes. There was no excitement. The pupils were medium-sized and fixed. The pulse was 120 before employing ether (this boy was nervous and frightened); it fell 16 per minute during insensibility. The respiration was unaffected. The face was pallid. He recovered in five minutes.

CASE VI.—C. M., a girl aged 15. About four drachms of ether were used. The time in producing anæsthesia was eight or ten minutes; of operation, five minutes. The pulse before the operation was 104; during the inhalation of ether, it fell to 78, and was unsatisfactory in quality. The respiration was not specially affected. The face was suffused and purple, with marked capillary blood-stasis. Recovery was quick. He was subsequently sick. This patient did not take the ether well. As soon as she began to get fully under its influence, her pulse fell away; whilst, if only under it in a degree hardly less than dangerous, she struggled. She was a fine, well developed girl, and, during partial unconsciousness, manifested feelings of a sensuous character.

CASE VII.—C. B., a girl aged 16. About three drachms of ether were used. Anæsthesia was produced in five minutes; she was under its influence eight minutes. The excitement was small. The pupils were medium-sized and fixed. The pulse before the operation was 96; it fell to 68, and was small and weak. The respiration was not specially affected. The face was suffused and purple; capillary congestion was marked. She recovered quickly, and was subsequently sick.

All the above patients were in the recumbent posture, and their dress was loosened about the neck and chest.

It appears clearly, therefore, from these cases, that this ether is a direct paralysant of the heart, and not certainly in any less degree than chloroform. This, indeed, so far as I can judge, is its only objection; whilst in many ways it possesses advantages. It is quicker in its action and time of recovery. Sickness, although almost always present, is not so persistent; and the patient does not complain of feeling so altogether "seedy". It does not blister the skin. The leading question, however, is the question of comparative safety; and if this, as I fear, cannot be answered satisfactorily, the anxious expectancy of the profession and public is still indefinitely continued.

THERAPEUTIC MEMORANDA.

CARBOLIC ACID DRESSINGS.

I HAVE watched with great interest the recent communications in your paper on the above subject, and am bound to say I feel considerable difficulty in explaining to myself the different statements regarding this (in my estimation) most valuable agent. Might I, therefore, take the liberty to give my experiences on the matter? For the last five or six years I have used carbolie acid in almost every possible form and under the most varying circumstances, and always with the most happy results. In wounds, accidents, and surgical operations, I invariably use it either in the form of lotion or mixed with oil, or the acid undiluted. In the latter case, I consider it acts as a caustic; and in all cases where I have had a dirty unhealthy wound to deal with I have found it to serve my purpose well. Recently I used the pure acid in a case where sloughing took place after the operation (flap) on the leg. Under its use in a short time the sloughs were thrown off, and the wound filled up rapidly with healthy granulations. The stump is now progressing most favourably under a dressing of carbolie acid and oil (one pint in twelve). In this case there is no perceptible change in the urine. In conclusion, I beg to state that I have never observed the slightest symptom of injurious action in all my varied experience in the use of this valuable agent.

E. CROCKETT,
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