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COMPOSITION  
OF  
*FOODS, WATERS, MINERALS,*  
*MANURES*  
AND  
*Miscellaneous Substances*

COMPILED BY  
E. T. KENSINGTON, F. C. S.

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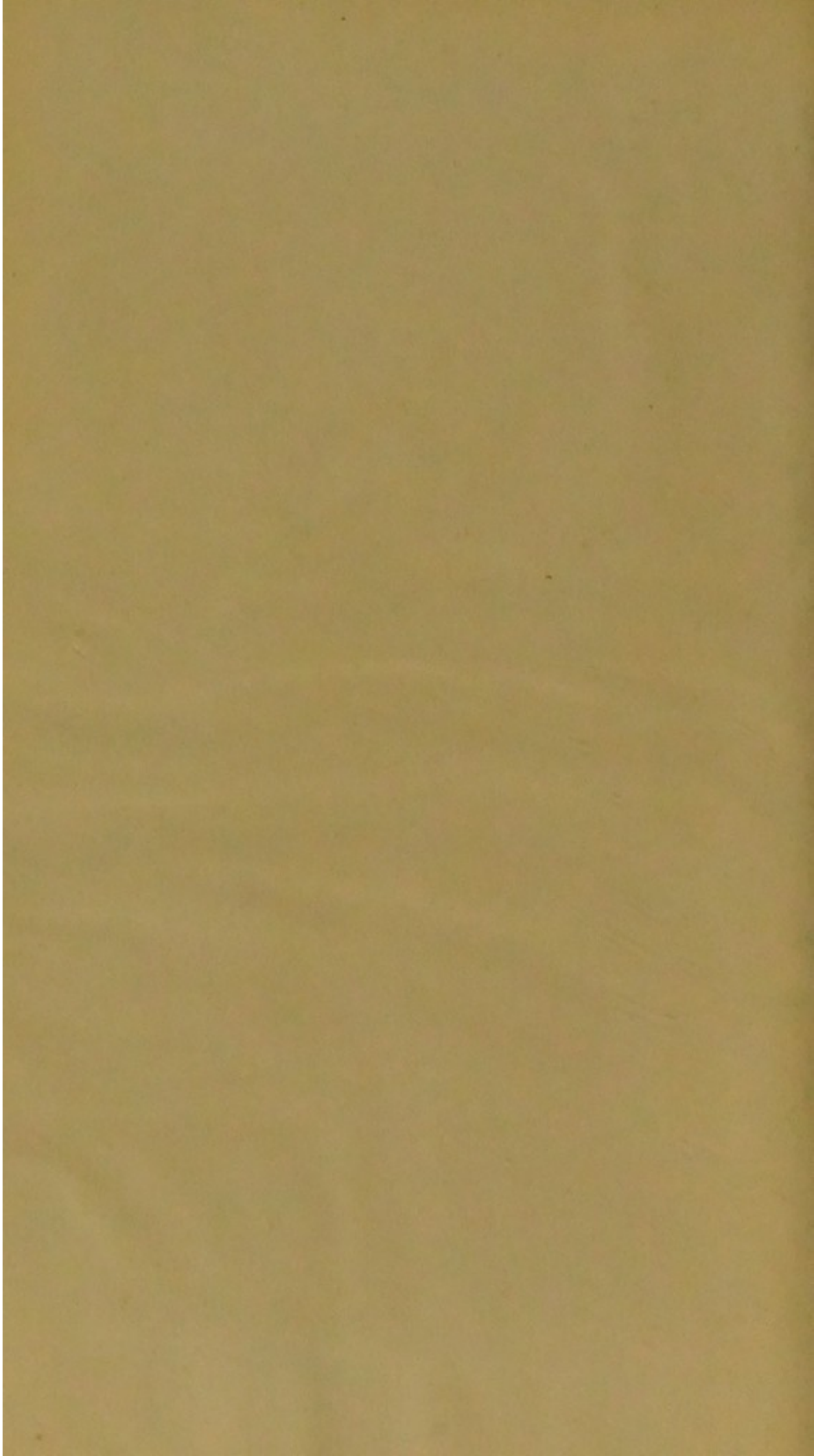
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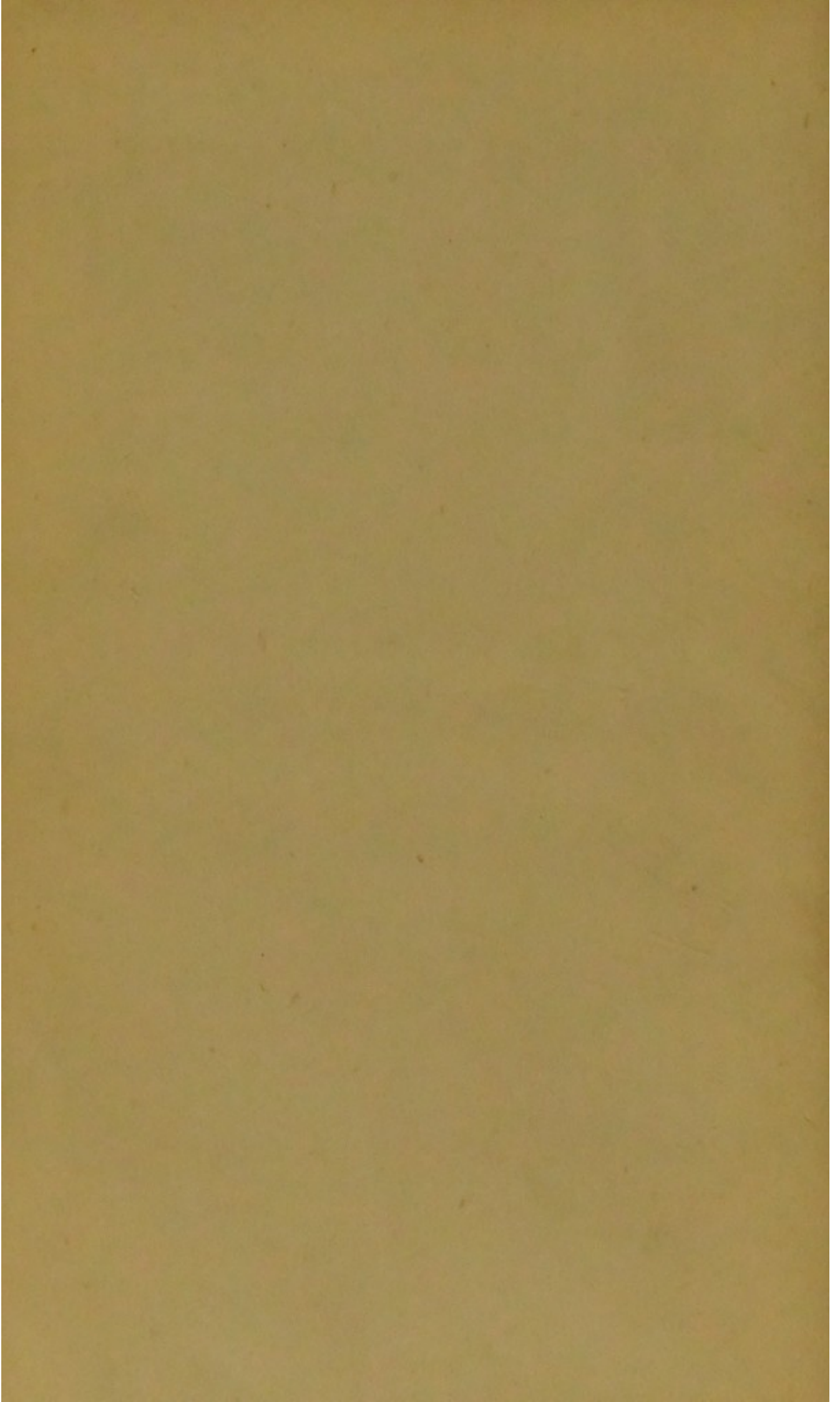
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HISTORICAL







CHEMICAL COMPOSITION  
OF  
FOODS, WATERS, SOILS, MINERALS,  
MANURES & MISCELLANEOUS SUBSTANCES.

COMPILED BY

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The Parkes Museum

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## P R E F A C E .

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THE object of compiling this Manual is to furnish the public with a ready means of ascertaining the Chemical composition of the various Foods, Waters, Minerals, &c., &c., many of which they are continually brought in contact with in every day life. The Manual contains a large number of analyses, the results obtained by some of our most eminent scientific men, amongst whom may be named LIEBIG, DANA, URE, SIMEON, VOELCKER, HASSALL, ANDERSON, and a great many others whose especial attention have been directed to the several branches of Analytical Chemistry, of which these Analyses are the results.

The compiling of the book has been the work of several years' research, the Analyses being collected from various Standard Works and Societies' Journals, nearly down to the present date, and as far as possible they have been arranged alphabetically under the various heads, so as to form a Book of Reference especially useful for persons who have not time to consult the various Works.

## PREFACE.

For the information of those who are unacquainted with the meaning of various terms used by Chemists in expressing the composition of a substance, there is given an "Explanation of Terms," which will show more clearly the nature of the substances mentioned and their utility in the animal economy, especially with reference to the composition of Foods.

Most of the Analyses represent the proportion of each ingredient in every hundred parts and decimal parts thereof, but in the case of Waters the proportions are calculated per imperial gallon.

In a few instances there appear to be some errors in the Analysis, but the figures here given are correctly copied from the original Works.

## EXPLANATION OF TERMS.

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**Albumen, or Albuminous Substances.**—Contains Carbon, Hydrogen, Nitrogen, Oxygen and Sulphur, and builds up the tissues of the body; coagulates on heating. These substances occur in both the animal and vegetable kingdom.

**Amyloid Substances, or Lardacein.**—Contains Hydrogen, Nitrogen, Oxygen and Sulphur, and is found in certain diseases deposited in the liver.

**Amidine, or Starch.**—Consists of Carbon, Hydrogen and Oxygen, and is found more or less in all plants.

**Casein.**—Contains Carbon, Hydrogen, Oxygen, Nitrogen and Sulphur. It is the protein compound of milk, and forms the basis of cheese.

**Chondrin.**—Contains Carbon, Hydrogen, Oxygen, Nitrogen and Sulphur, but no Phosphorus. It is obtained from Cartilage of the ribs and joints. It is a kind of Gelatine.

**Caffeine, or Theine.**—The active principles of Coffee and Tea contains Carbon, Hydrogen, Nitrogen and Oxygen.

**Carbo-hydrates.**—Conduce to the production of Fat. They are such as Starch, Sugar, Gum, Lactin, Dextrin, &c., &c., and consist of Carbon, Hydrogen and Oxygen.

**Cellulose, or Lignin.**—This is a Carbo-hydrate, and constitutes the fundamental material of the structures of plants; forms a large portion of the solid parts of every vegetable.

**Creatin.**—Consists of Carbon, Hydrogen, Nitrogen, Oxygen and Water, and is obtained from the juice of raw flesh.

**Creatinin.**—Creatinin is obtained from the above.

**Cholesterin.**—Consists of Carbon, Hydrogen, Oxygen. It is found in Bile, Brains, Nerves and the Blood.

**Chyle.**—The fluid of the lacteal vessels.

## EXPLANATION OF TERMS.

**Dextrin**, sometimes called British Gum.—It is obtained from Potato Starch by heating it to 400°.

**Diastase**.—A peculiar Nitrogenous substance which acts as a ferment on Starch, in Grain converting a portion into Sugar.

**Fibrin**.—Is composed of the Albuminous elements, with excess of Sulphur and Oxygen. It is found in the blood and Muscular Tissues.

**Globulin**.—Albuminoid matter existing in the fluid contents of Blood, Corpuscles, and in the Crystalline Lens of the Eye.

**Glucose**.—Consists of Carbon, Hydrogen and Oxygen. It is a Sugar found in Grapes and Honey. May be produced by the action of dilute acids on Starch.

**Hydro-carbons, or Fats**.—Consist of Stearin, Margarin and Olein. In the animal economy they form a store for force, producing material; assist in the production and retention of animal heat; promote digestion; but are insufficient to sustain animal life.

**Hæmotoglobulin, or Hæmoglobin**.—Contains Oxygen, Hydrogen, Iron, Nitrogen, Sulphur. It forms the chief part of the red globules of the Blood.

**Hæmatin**.—Occurs in the body as a product of decomposition of Hæmoglobin.

**Inosite**.—A variety of Glucose occurring in the muscular substance of the Heart and other organs of the animal body. It also occurs in Kidney Beans and the unripe fruit of *Phaseolus vulgaris* and other plants.

**Inulin**.—This substance differs from common Starch in important particulars. It is found in the roots of *Inula*, *Helenium*, *Dahlia* and *Helianthus tuberosus* and other plants.

**Lupulin**.—The bitter resinous principle of Hops.

**Lactin, or Lactose**.—A Carbo-hydrate commonly called Milk Sugar, being obtained from Whey.

**Lignin**.—*See* Cellulose.

**Legumin, or Vegetable Casein**.—Found in Peas, Beans, Almonds, &c.

## EXPLANATION OF TERMS.

**Mucin, or Mucus.**—A substance related to the Proteids, and obtained from Ox-gall and the Salivary Glands.

**Margarin.**—A substance found extensively in animal and most vegetable fats.

**Myosin.**—An Albuminous matter occurring in the contractile muscular substance that causes the rigor mortis.

**Nitrogenous Principles.**—Form structures that possess living properties, and are sub-divided into Albuminous or Protein and Gelatinous compounds.

**Non-Nitrogenous Principles.**—These form the source of power of structures which possess living properties. They consist of Carbon, Hydrogen and Oxygen. They are Starch, Gum, Sugar, Alcohol and Vegetable Acids.

**Organic Principles.**—Consist of only a small number of elements, chiefly Carbon, Hydrogen, Oxygen and Nitrogen, and generally speaking are distinguished by the facility with which they decompose under the influence of heat.

**Olien.**—A substance found in animal and vegetable Fats.

**Protein Compounds.**—*See Nitrogenous Compounds.*

**Pectin.**—The Jelly of Fruits.

**Sarcosin.**—A substance obtained from animal Flesh.

**Syntonin.**—Obtained from Muscle Fibre, and is an Acid Albumin.

**Theine.**—*See Caffeine.*

**Theobromine.**—The crystalizable principle obtained from the seeds of "Theobroma Cacao."

**Vegeto-Alkalis.**—A numerous class of bodies met with in various plants (and some of them in the animal organism). They contain a considerable quantity of Nitrogen, and in solution are very bitter to taste. Morphia, Narcotine and Quinine belong to this class.

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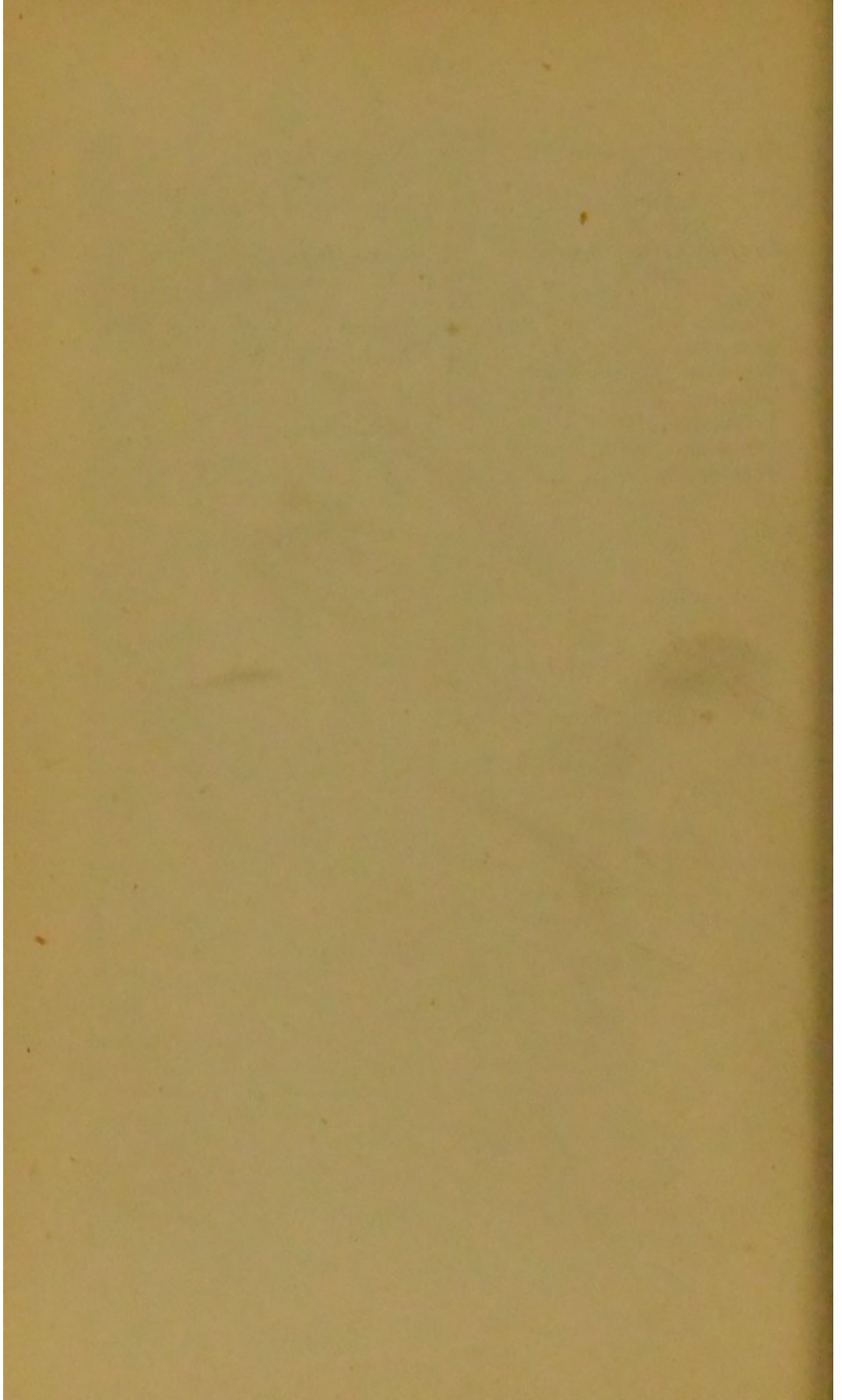
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# F O O D S .

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## APPLE, Ash of Fruit.

Potash	...	35·68
Soda	...	26·09
Lime	...	4·08
Magnesia	...	8·75
Sulphuric acid	...	6·09
Silicic acid	...	4·32
Phosphoric acid	...	12·34
Phosphate of sesquioxide of iron	...	2·65

## APPLE.

Water	...	86·28
Sugar	...	6·45
Ligneous matter	...	3·80
Gum	...	3·17
Malic acid	...	·11
Albumen	...	·08
Chlorophyl	...	·08
Lime	...	·03
		100·00

## APPLE JUICE, Ash of.

Potash	...	35·68
Soda	...	26·09
Lime	...	4·08
Magnesia	...	8·75
Sulphuric acid	...	6·09
Silicic acid	...	4·32
Phosphoric	...	12·34
Phosphate of iron	...	2·65
		100·00

## ASPARAGUS, Ash of.

Potash ... ..	6.01
Soda ... ..	34.21
Magnesia ... ..	3.03
Lime ... ..	4.39
Phosphoric acid ... ..	18.51
Sulphuric acid ... ..	4.13
Silica ... ..	13.47
Phosphate of iron ... ..	3.31
Chloride of sodium ... ..	12.94

## ARTICHOKE, Jerusalem.

Grape sugar... ..	14.800
Inuline ... ..	3.000
Gum ... ..	1.220
Albumen ... ..	.900
Fat... ..	.090
Citrate of potash ... ..	1.070
Phosphate of potash ... ..	.060
Sulphate of potash ... ..	.120
Phosphate of lime ... ..	.140
Citrate of lime ... ..	.080
Chloride of potassium ... ..	.080
Malate of potash ... ..	.030
Tartarate of lime ... ..	.015
Woody fibre ... ..	1.220
Silica ... ..	.025
Water ... ..	77.150
	<hr/>
	100.000

## ARTICHOKE, Jerusalem, Ash of.

Carbonic acid ... ..	11.0
Sulphuric acid ... ..	2.2
Phosphoric acid ... ..	10.8
Chlorine ... ..	1.6
Magnesia ... ..	1.8
Lime ... ..	2.3
Potass ... ..	44.5
Soda ... ..	trace
Silica ... ..	13.0
Oxide of iron and alumina ... ..	5.2
Carbon, water, and loss ... ..	7.6
	<hr/>
	100.0

## ALBUMINOIDS, Albumin, Fibrin, Casein, &amp;c.

Carbon...	52.7 to 54.5
Hydrogen	6.9 " 7.3
Nitrogen	15.4 " 16.5
Oxygen	20.9 " 23.5
Sulphur	.8 " 1.6

## VEGETABLE ALBUMEN &amp; FIBRIN.

	Albumen.	Fibrin.
Carbon...	55.01	54.60
Hydrogen	7.23	7.30
Nitrogen	15.92	15.81
Oxygen, sulphur and phosphorus	21.84	22.29
	<u>100.00</u>	<u>100.00</u>

## AZOTENE, New Orleans.

Moisture	11.26
*Organic matter	80.31
Phosphate of Lime	3.09
Carbonate of lime and alkalies	4.65
Sand	.69
	<u>100.00</u>
** Containing nitrogen	11.34
Equal to Ammonia	13.77

## BEEF POWDER, Queensland.

Moisture	7.48
**Flesh forming matters	67.56
Fat and extractive matters	21.55
Mineral matters	3.41
	<u>100.00</u>
** Containing nitrogen	10.80

## BEEF, Cooked.

Water	40.5
Fibrine, gelatine, albumen, &c.	23.9
Fat...	34.5
Mineral matter	1.1
	<u>100.0</u>

## BREAD.

Water ... ..	32.5
Gluten and nitrogenous substances ... ..	8.8
Modified starch, gum and sugar ... ..	57.6
Mineral matters ... ..	1.1
	<hr/>
	100.0

## BEE-BREAD, or Pollen collected by Bees.

Water ... ..	29.89
Ash ... ..	3.08
Albumen and peptones ... ..	17.81
Sugar ... ..	25.12
Fat cerotic acid, oleic acid, myricin, colouring matter, &c. ... ..	8.98
Cell membrane ... ..	7.56
Pectin ... ..	7.42
	<hr/>
	99.86

## BEECHNUTS, Ash of.

Potash ... ..	22.82
Soda ... ..	9.50
Magnesia ... ..	11.64
Lime ... ..	24.50
Phosphoric acid ... ..	20.81
Sulphuric acid ... ..	2.20
Silica ... ..	1.38
Peroxide of iron... ..	2.67
Chloride of sodium ... ..	.87
	<hr/>
	96.89
Red oxide of manganese ... ..	3.11
	<hr/>
	100.00

## BROCOLI LEAVES, Ash of.

Potash ... ..	22.10
Soda ... ..	7.55
Magnesia ... ..	3.43
Lime ... ..	26.44
Phosphoric acid ... ..	16.62
Sulphuric acid ... ..	16.10
Silica ... ..	1.83
Phosphate of iron .. ..	6.21
Chloride of sodium ... ..	<hr/>

## BROCOLI HEART, Ash of.

Potash ... ..	47.16
Soda ... ..	—
Magnesia ... ..	3.93
Lime ... ..	4.70
Phosphoric acid ... ..	24.83
Sulphuric acid ... ..	10.35
Silica ... ..	.69
Phosphate of iron ... ..	2.12
Chloride of sodium ... ..	trace
Chloride of potassium ... ..	6.22

## BUTTER, Salt and Fresh.

	Salt.	Fresh.
Water ... ..	9.59	13.00
Fat ... ..	86.92	85.69
Casein ... ..	0.45	0.62
Milk sugar ... ..	0.36	0.49
Ash ... ..	2.68	0.20
	<hr/>	<hr/>
	100.00	100.00

## BUTTER &amp; BUTTERINE.

	Isle of Wight.			Sussex.	Jersey.
Water ... ..	11.68	13.62	9.70	11.16	6.46
Fat ... ..	84.97	83.97	84.74	83.68	89.48
Curd ... ..	1.18	1.54	3.46	3.14	2.45
Salt ... ..	2.17	.87	2.08	2.00	1.59
	Guildford.	London.		Butterine.	
Water ... ..	8.58	23.98	42.35		5.83
Fat ... ..	85.48	67.58	47.11		92.77
Curd ... ..	2.78	6.88	7.83		.53
Salt ... ..	3.15	1.55	2.68		.83

## BARLEY.

	Meal.	Whole.	Scotch. air dried.
Starch ... ..	59.95	42.00	52.7
Fat ... ..	2.17	2.96	2.6
Cellulose ... ..	—	19.40	11.5
Gum ... ..	6.74	6.88	4.2
Sugar ... ..	3.20	1.94	
Nitrogenous matter... ..	12.981	14.84	13.2
Ash ... ..	—	—	2.8
Water... ..	15.00	12.00	12.0

## BARLEY.

Water ... ..	14.35
Ash ... ..	2.71
Protein compounds ... ..	9.34
Respiratory principles ... ..	64.98
Fibre ... ..	8.62
	<hr/>
	100.00
	<hr/>
Nitrogen ... ..	1.61

## BARLEY, Ash of.

Potash ... ..	3.91
Soda ... ..	16.79
Magnesia ... ..	10.05
Lime ... ..	3.36
Phosphoric acid ... ..	40.63
Sulphuric acid ... ..	.26
Silica ... ..	21.99
Peroxide of iron... ..	1.93
	<hr/>
	98.92

## BRAN.

Moisture ... ..	12.86
Albuminous compounds ... ..	13.88
Starch ... ..	55.56
Fibre ... ..	11.50
Mineral matter ... ..	6.20
	<hr/>
	100.00

## BRAN.

Gluten ... ..	10.84
Albumen ... ..	1.60
Starch ... ..	22.66
Sugar ... ..	<hr/>
Gum ... ..	5.28
Fat ... ..	2.82
Water ... ..	10.30
Ligneous matter ... ..	43.98
Chloride of potassium ... ..	.23
Sulphate potash ... ..	.24
Phosphate of magnesia ... ..	.93
Carbonate of lime ... ..	.37
Silica ... ..	.75

BEETS, Silesian Sugar Beets.	Long red		Pear-shaped white root.
Moisture ... ..	83·43	82·70	82·27
Albuminous compounds ... ..	1·53	1·23	1·08
Crude fibre ... ..	3·49	3·60	3·73
Crystallizable sugar ... ..	10·04	10·72	11·14
Pectin and colouring matter ... ..	·50	·68	·74
Ash ... ..	1·01	1·07	1·04
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## BEETS, Silesian Sugar Beets—Suffolk.

	1.	2.	3.
Moisture ... ..	83·11	82·72	83·03
Albuminous compounds ... ..	1·25	1·44	1·71
Crude fibre ... ..	3·43	3·38	4·31
Crystallizable sugar ... ..	10·51	10·94	9·31
Pectin and colouring matter ... ..	·63	·45	·60
Ash ... ..	1·07	1·07	1·04
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## BEET ROOT.

Water ... ..	70·11
Albuminous compounds (flesh forming matters) ... ..	2·25
Sugar ... ..	3·39
Mucilage, pectin and other substances soluble in water	1·93
Digestible fibre ... ..	15·13
Woody fibre (cellulose) ... ..	5·32
Mineral matter (ash) soluble in water ... ..	} 1·87
Mineral matter (ash) insoluble in water ... ..	
	<hr/>
	100·00

## RED BEET, Ash of.

Carbonic acid ... ..	16·1
Sulphuric acid ... ..	1·6
Phosphoric acid ... ..	6·0
Chlorine ... ..	5·2
Magnesia ... ..	4·4
Lime ... ..	7·0
Potash ... ..	39·0
Soda ... ..	6·0
Silica ... ..	8·0
Oxide of iron and alumina ... ..	2·5
Water, carbon and loss ... ..	4·2
	<hr/>
	100·0

## BILBERRY, Ash of.

	No. 1.	No. 2.
Carbonate of potash ... ..	} 16.38	23.50
Sulphate of potash ... ..		
Chloride of potassium... ..		
Carbonate of lime... ..	40.35	53.70
Carbonate of magnesia ... ..	5.85	—
Alumina ... ..	17.54	14.25
Silica ... ..	13.45	1.75
Oxide of iron and manganese ... ..	6.43	6.80
	<hr/> 100.00	<hr/> 100.00

## BUCKWHEAT, Ash of.

Potash ... ..	8.74
Soda ... ..	20.10
Magnesia ... ..	10.38
Lime ... ..	6.66
Phosphoric acid ... ..	50.07
Sulphuric acid ... ..	2.16
Silica ... ..	.69
Peroxide of iron... ..	1.05
	<hr/> 99.85

## BEERS, Sweet.

	Strasburg.	Munich.	Vienna.
Alcohol by vol. cubic cents. ... ..	47.0	56.25	52.5
Glucose, grams. ... ..	16.3	15.1	11.0
Albuminoid substances ... ..	} 45.0	58.4	55.3
Dextrin, &c., grams. ... ..			
Salts, grams. ... ..	2.65	2.52	2.3

## BEERS, Bitter—North of Fance.

Alcohol by vol. in cubic cents. ... ..	40.0	32.5	36.0
Glucose in grams. ... ..	7.03	4.8	6.6
Dextrin in grams., and ... ..	} 31.77	31.0	33.1
Albuminoid substances ... ..			
Salts in grams.... ..	1.6	2.1	2.2

## BEERS.

	Allsop's.	Bass's.
Specific gravity ... ..	1.010	1.006
Alcohol ... ..	6.000	7.000
Extractive ... ..	5.000	4.800
Acetic acid... ..	.200	.180
Water ... ..	88.800	88.020
	<hr/> 100.000	<hr/> 100.000

## BEERS—C. Place &amp; Co., Somerset.

	XX.	XXX.	Pale Ale.
Specific gravity ... ..	1·012	1·011	1·002
Alcohol ... ..	4·620	6·750	6·750
Acetic acid ... ..	·180	·356	·254
Sugar and extractive... ..	4·515	4·923	4·746
Albuminous compounds ...	1·375	·437	·350
Ash ... ..	·201	·200	·196
Water ... ..	89·109	87·334	87·704
	<hr/> 100·000	<hr/> 100·000	<hr/> 100·000

## BEER, German.

	Lichtenhain.	Jena*
Alcohol ... ..	3·168	3·018
Albumen ... ..	·048	·045
Extractive matter ... ..	4·485	6·144
Water ... ..	92·299	90·793
	<hr/> 100·000	<hr/> 100·000

	Bockbier.	Heilliger Vater.
Alcohol ... ..	4·000	5·000
Extractive matter ... ..	8·200	13·500
Carbonic acid ... ..	·085	·077
Water ... ..	87·393	81·923
	<hr/>	<hr/>
Specific gravity ... ..	1·020	1·030

## BEERS, Austrian Lager.

	St. Marxer.	Hütteldorf.	Liesinger.
Specific gravity ... ..	1·018	1·017	1·017
Alcohol ... ..	2·760	3·670	3·110
Carbonic acid ... ..	·240	·160	·200
Extractive matter ... ..	6·000	6·050	6·550
Ash ... ..	·243	·200	·220
Water ... ..	91·240	90·280	90·340

## BEERS, Austrian.

	Prague.	Ale.	Ladies' Beer.
Specific gravity ... ..	1·016	1·020	1·018
Alcohol ... ..	4·320	3·680	2·890
Carbonic acid ... ..	·290	·280	·150
Extractive matter ... ..	5·950	7·100	5·950
Ash ... ..	—	·227	·213
Water ... ..	89·730	89·220	91·160

## BEER, Ashes of.

	London.	Munich.	Ale, Scotch.	Porter, Dublin.
Potash ... ..	38·35	36·58	29·8	32·0
Soda ... ..	7·68	9·03	38·5	42·7
Lime ... ..	2·45	1·48	2·0	1·5
Magnesia ... ..	3·78	5·64	5·6	1·2
Sulphuric acid ... ..	1·36	1·68	19·2	10·1
Chlorine ... ..	2·75	3·14	18·0	10·1
Silica ... ..	9·87	9·96	19·1	19·7
Phosphoric acid ... ..	33·75	31·69	25·7	20·0

## BEER, Stout.

Water ... ..	87·44
Alcohol ... ..	6·32
Ash ... ..	·45
Albuminous compounds ... ..	·47
Acetic acid ... ..	·03
Gum, sugar, &c. ... ..	5·29
	<hr/>
	100·00

## BEER, No. 1.

Water ... ..	89·78
Alcohol ... ..	4·30
Grape sugar ... ..	2·07
Acetic acid ... ..	·08
Mineral matters ... ..	·32
Albuminous compounds ... ..	·68
Gum, colouring matter, &c. ... ..	2·77
	<hr/>
	100·00

## BEER, 2nd Sample.

Water ... ..	91.60
Alcohol ... ..	3.60
Grape sugar ... ..	1.26
Acetic acid ... ..	.17
Mineral matter ... ..	.20
Albuminous compounds ... ..	.52
Gum, colouring matter, &c. ... ..	2.65
	<hr/>
	100.00

## BEAN (Windsor), Ash of.

Potash ... ..	20.82
Soda ... ..	17.40
Magnesia ... ..	8.87
Lime ... ..	7.26
Phosphoric acid ... ..	37.94
Sulphuric " ... ..	1.34
Silica ... ..	2.46
Peroxide of iron ... ..	1.03
Chloride of sodium ... ..	2.45
	<hr/>
	99.57

## BEANS (Common), Ash of.

Carbonic acid ... ..	1.0
Sulphuric acid ... ..	1.6
Phosphoric acid ... ..	34.2
Chlorine ... ..	0.7
Magnesia ... ..	8.6
Lime ... ..	5.1
Potass ... ..	45.2
Soda ... ..	0.0
Silica ... ..	0.5
Oxide of iron and alumina ... ..	trace
Carbon, water, and loss ... ..	3.1
	<hr/>
	100.0

## BEAN (Common), Ash of.

Potash ... ..	38.89
Soda ... ..	11.41
Magnesia ... ..	9.03
Lime ... ..	5.90
Phosphoric acid ... ..	31.34
Sulphuric acid ... ..	2.47
Silica ... ..	.44
Peroxide of iron ... ..	.11
Chloride of sodium ... ..	.54
	<hr/>
	100.13

## BEANS, Kidney.

Fat...	2.56
Sugar	1.17
Gummy matter	11.39
Starchy	19.60
Cellulose	2.34
Protein compounds	24.93
Non-nitrogenous matter	33.98
Ash	4.03
	<hr/>
	100.00

## BEANS, Kidney, Ash of.

Potash	36.83
Soda	18.40
Magnesia	6.33
Lime	7.75
Phosphoric acid	14.60
Sulphuric acid	3.96
Silica	4.09
Phosphate of iron	5.24
Chloride of sodium	2.80
	<hr/>

## BEANS, French, Ash of.

Carbonic acid	3.3
Sulphuric acid	1.3
Phosphoric acid	26.8
Chlorine	0.1
Magnesia	11.5
Lime	5.8
Potash	49.1
Soda	0.0
Silica	1.0
Oxide of iron and alumina	trace
Carbon, water and loss	1.1
	<hr/>
	100.0

## BEAN MEAL.

Moisture	14.80
Legumin and nitrogenous compounds	23.30
Starch, &c.	48.50
Fibre	10.00
Mineral matter	3.40
	<hr/>
	100.00

## CHEESE, made with Rennet (Gruyère), Ash of.

	Rennett.	With sour milk.
Alkalies... ..	13·48	42·69
Lime ... ..	39·32	8·92
Magnesia ... ..	1·77	—
Peroxide of iron ... ..	·35	·40
Phosphoric acid ... ..	45·00	47·88
Silicic acid ... ..	·18	·11
	<hr/>	<hr/>
	100·10	100·00

## CHEESE, American.

	No. 1.	No. 2.
Water ... ..	27·29	33·04
Butter ... ..	35·41	33·38
*Casein ... ..	25·87	27·37
Milk sugar, lactic acid, &c. ... ..	6·21	2·82
†Ash ... ..	5·22	3·39
	<hr/>	<hr/>
	100·00	100·00
** Containing nitrogen ... ..	4·14	4·38
†+ " salt ... ..	1·97	·47

## CHEESE.

	Leicester.	Wiltshire	Warwickshire.
Water ... ..	35·21	34·44	31·97
Butter ... ..	27·28	28·71	29·08
*Casein ... ..	27·93	29·00	27·43
Milk sugar, lactic acid, &c. ... ..	5·54	3·60	7·16
†Ash ... ..	4·04	4·25	4·36
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
** Containing nitrogen ... ..	4·47	4·64	4·39
†+ " salt ... ..	1·03	1·03	·72

## CHEESE, Stilton and Cotherstone.

Water ... ..	32·18	38·28
Butter ... ..	37·36	30·89
*Casein ... ..	24·31	23·93
Milk sugar, and extractive matters ... ..	2·22	3·70
†Mineral matters ... ..	3·93	3·20
	<hr/>	<hr/>
	100·00	100·00
** Containing nitrogen... ..	3·89	3·88
†+ " common salt ... ..	·89	·79

## CHEESE.

	Cheddar.	Double Gloucester.	Skim.
Water ... ..	36·64	35·61	43·64
Casein ... ..	23·38	21·76	45·64
Fatty matter ... ..	35·44	38·16	5·76
Mineral matter... ..	4·54	4·47	4·96
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## CHEESE, Swedish Whey.

Water ... ..	24·21
Fatty matter ... ..	20·80
*Casein and albumen ... ..	9·06
Milk sugar and extractive matters ... ..	41·01
Mineral matters ... ..	4·92
	<hr/>
	100·00
* Containing nitrogen ... ..	1·45

## CHEESE, Norwegian Skim Milk, called Gamelost.

Water ... ..	42·44
Butter ... ..	3·36
*Casein ... ..	42·12
Milk sugar ... ..	9·85
Ash ... ..	2·22
	<hr/>
* Containing nitrogen ... ..	6·72

## CHERRY, Ash of.

	Whole frunt.	Stalk.
Potash ... ..	51·85	42·66
Soda ... ..	1·12	6·17
Magnesia... ..	5·46	2·71
Lime ... ..	7·47	22·26
Phosphoric acid ... ..	14·21	14·89
Sulphuric acid ... ..	5·09	2·98
Silica ... ..	9·04	2·59
Phosphate of iron... ..	3·74	2·35
Chloride of sodium ... ..	2·02	2·39
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## CABBAGE, Winter, Ash of.

	Leaves.	Stalk.
Potash ... ..	31·728	39·415
Soda... ..	2·015	3·517
Lime ... ..	14·426	12·355
Magnesia... ..	2·845	4·887
Ferric oxide ... ..	8·108	1·347
Phosphoric acid ... ..	10·093	12·263
Sulphuric acid ... ..	6·087	9·203
Silica ... ..	1·198	0·845
Chlorine ... ..	7·640	6·805
Carbonic acid... ..	13·114	7·878
Sand and charcoal... ..	2·692	1·325
	<hr/>	<hr/>
	99·946	99·840

## CABBAGE.

Water ... ..	89·42
Oil ... ..	·08
*Soluble protein compounds ... ..	1·19
Sugar, digestible fibre, &c. ... ..	7·01
Soluble mineral matter ... ..	·73
†Insoluble protein compounds ... ..	·31
Woody fibre... ..	1·14
Insoluble mineral matter ... ..	·12
	<hr/>
	100·00
* Containing nitrogen ... ..	·19
† Containing nitrogen ... ..	·05

## CABBAGE, Boiled and Natural State.

	Boiled.	Natural state.
Water ... ..	91·50	89·40
Oil ... ..	—	·10
Albumen, &c.... ..	1·61	1·50
Woody fibre ... ..	1·02	1·14
Cellular tissue and sugar ... ..	4·09	7·01
Mineral matters ... ..	1·78	·85



## CAYENNE.

Acrid soft resin	4.0
Wax...	7.6
Bitter aromatic extract	8.6
Gum and extractive matter...	21.0
Albuminous	3.2
Gum...	9.2
Fibre	28.0
Water	12.0
Loss...	6.4

## CELERY, Ash of.

Potash	22.07
Soda...	—
Magnesia...	5.82
Lime	13.11
Phosphoric acid	11.58
Sulphuric acid	5.58
Silica	3.85
Phosphate of iron...	2.66
Chloride of sodium	—
Chloride of potassium...	33.41

## COCOA NUT, Ash of.

Potash	40.57
Soda...	2.30
Lime	4.71
Magnesia...	2.95
Oxide of iron...	3.54
Phosphoric acid	26.98
Sulphuric acid	3.78
Silicic acid	3.38
Chlorine	13.42

## COCOA.

	Caked.	Flaked
Water	3.77	3.60
Fatty matter	50.20	54.90
Albuminoid matter	16.64	16.51
Starch, gum, cellulose, &c....	25.47	21.27
Theobromine	.70	.47
Mineral matter	3.22	3.25
	<hr/> 100.00	<hr/> 100.00

## COCOA.

Fatty matter ... ..	53·10
Albuminous matter, containing the aroma of the bean ... ..	16·70
Starch ... ..	10·91
Gum ... ..	7·75
Lignine ... ..	·90
Red pigment ... ..	2·01
Water ... ..	5·20
Loss ... ..	3·43
	<hr/>
	100·00

## COCOA NIBS.

Water ... ..	15·56
Theobromine ... ..	·50
Albuminous compounds ... ..	15·06
Solid and liquid fat ... ..	36·68
Cellular tissue, gum, and other non-nitrogenous compounds ... ..	24·04
Woody fibre ... ..	5·20
Mineral matter ... ..	2·96
	<hr/>
	100·00

## COCOA NUT, Oil.

Oil ... ..	71·488
Zymome ... ..	7·665
Mucilage ... ..	3·588
Crystalizable glycerine.. ... ..	1·595
Yellow colouring matter ... ..	0·325
Ligneous matter ... ..	14·950
Loss ... ..	0·389
	<hr/>
	100·000

## COCOA NUT, Kernel.

Fat oil ... ..	53·10
Azotized substances ... ..	16·70
Starch ... ..	10·91
Gum ... ..	7·75
Colouring matter ... ..	2·01
Woody fibre ... ..	·90
Water ... ..	5·28
Ash ... ..	2·00
Loss ... ..	1·35

## COCOA BEAN, Ash of.

Potash ... ..	33·4	37·14
Soda... ..	—	1·23
Lime ... ..	11·0	2·90
Magnesia... ..	17·0	16·00
Sulphuric acid ... ..	4·5	1·50
Carbonic “ ... ..	1·0	1·20
Phosphoric “ ... ..	29·6	39·60
Phosphate of iron... ..	—	0·70
Chlorine ... ..	0·2	1·70
Silica ... ..	3·3	—

## COCOA, Nuts and Cake of.

	Nut.	Cake.
Water ... ..	5·80	11·89
Fat ... ..	67·85	12·34
Cellulose ... ..	24·80	69·66
Ash ... ..	1·55	6·11
	<hr/>	<hr/>
	100·00	100·00

## CIDER, Common Devonshire.

Water ... ..	94·21
Alcohol ... ..	4·17
Sugar (grape) ... ..	·35
Dextrine ... ..	·51
Albuminous compounds ... ..	·02
Acid... ..	·54
Mineral matter ... ..	·20
	<hr/>
	100·00

## CIDER, Grains per Pint,

Water ... ..	8292·41
Alcohol ... ..	367·69
Sugar (grape) ... ..	31·67
Dextrine ... ..	45·05
Albuminous compounds ... ..	1·94
Acid... ..	44·86
Mineral matter ... ..	18·38
	<hr/>
	8802·00



## COFFEE, Roasted.

Caffeic principle ... ..	12.50
Extractive ... ..	4.80
Gum and mucilage ... ..	10.42
Oil and resin ... ..	2.08
Solid residue ... ..	68.75
Loss ... ..	1.45
	<hr/>
	100.00

## COFFEE.

	Raw.	Roasted.
Water ... ..	8.26	0.36
Cane sugar ... ..	8.18	1.84
Caffeine ... ..	1.10	1.06
Fat ... ..	11.42	8.30
Gluten ... ..	10.68	12.03
Gum tannin, &c. ... ..	14.03	26.28
Cellulose ... ..	42.36	44.96
Ash ... ..	3.97	5.17
	<hr/>	<hr/>
	100.00	100.00

## COFFEE, Raw.

Peculiar caffeic principle ... ..	17.58
Gummy extract ... ..	3.64
Extractive ... ..	.62
Resin ... ..	.41
Fatty oil... ..	.52
Solid residue ... ..	66.66
Loss and water ... ..	10.57
	<hr/>
	100.00

## COFFEE, Berry.

Water ... ..	13.0
Theine ... ..	.5
Nitrogenous matter ... ..	13.0
Essential oil ... ..	10.0
Tannic acid ... ..	5.5
Woody fibre ... ..	30.0
Gum, cellular fibre, &c. ... ..	21.5
Mineral matter ... ..	6.5
	<hr/>
	100.0

## COFFEE, a cup of 10 oz. liquid.

Casein (from the cream) ... ..	7.5
Fatty substances with little sugar from cream ...	41.0
Sugar ... ..	140.0
Extract of coffee ... ..	52.5
Mineral substances ... ..	(10.75)
Organic " ... ..	(41.75)
Mineral substances (from cream) ... ..	1.5
	<hr/>
Total solid matters ... ..	242.5

## COFFEE, Ash of.

	Ceylon.	Java.	Jamaica.	Mocha.
Potash ... ..	55.10	54.00	53.72	51.52
Soda ... ..	—	—	—	—
Lime ... ..	4.10	4.11	6.16	5.87
Magnesia ... ..	8.42	8.20	8.37	8.87
Sesquioxide of iron ...	.45	.73	.44	.44
Sulphuric acid... ..	3.62	3.49	3.10	5.26
Chlorine ... ..	1.11	.26	.72	.59
Carbonic acid ... ..	17.47	18.13	16.54	16.98
Phosphoric acid ... ..	10.36	11.05	11.13	10.15
Silica... ..	—	—	—	—
Sand ... ..	—	—	—	—
	<hr/>	<hr/>	<hr/>	<hr/>
	100.63	99.97	100.18	99.68

## COFFEE, Infusion, Ash of.

Potash ... ..	51.45
Lime ... ..	3.58
Magnesia... ..	8.67
Peroxide of iron ... ..	0.25
Phosphoric acid ... ..	10.02
Sulphuric " ... ..	4.01
Silicic " ... ..	0.73
Carbonic " ... ..	20.50
Oxide of manganese ... ..	—
Chloride of potassium ... ..	1.98
Soda... ..	—
Charcoal and sand ... ..	0.49
	<hr/>
	101.68

## CHESTNUT, Kernel, Brazil.

Water	8.00
Oil	65.60
Nitrogenous substances	15.31
Organic matter (non-nitrogenous)	7.39
Phosphoric acid	1.35
Lime, potash, silica, &c.	2.35
	<hr/>
	100.00

## DATES.

Water	21.60
Oil	.19
Sugar	56.41
Albuminous compounds	10.93
Woody fibre	2.38
Mineral matter	1.50
Pectin, mucilage, &c.	6.99
	<hr/>
	100.00

## DATES, Babylon.

Water	20.83
Gum and sugar	61.20
Albumen	2.48
Fibre	6.23
Ash	2.01
Pectin, &c.	7.25
	<hr/>
	100.00

## EGG.

Water	74.02
Albumen	14.08
Oil and fat	10.25
Mineral matter	1.65
	<hr/>
	100.00

## EGG, dry,

Fibrin, casein, albumen	55.00
Fat	40.00
Mineral matter (ash)	5.00
	<hr/>
	100.00

## ENDIVE, Ash of.

Potash ... ..	37·87
Soda... ..	12·12
Magnesia... ..	1·77
Lime ... ..	12·03
Phosphoric acid ... ..	—
Sulphuric “ ... ..	5·21
Silica ... ..	24·62
Phosphate of iron... ..	6·36
Chloride of sodium ... ..	trace

## FOOD, “ Neave's Farinaceous.”

Moisture ... ..	4·9
Flesh forming matters, gluten, &c. ... ..	13·6
Respiratory food, starch, sugar, gum &c. ... ..	78·0
Saline matters, phosphates ... ..	1·2
Cellulose ... ..	2·3
	<hr/>
	100·0

## SALMON, Roe of.

Lecithin ... ..	7·5
Cholesterin ... ..	2·2
Fat ... ..	4·5
Albumen... ..	10·3
*Nuclein ... ..	48·7
Protamine ... ..	28·8

\* An albuminoid substance rich in phosphorus.

## FISH.

	Carp.	Trout.
Water ... ..	80·10	80·5
Muscular fibre ... ..	12·00	11·1
Albumen and hæmatoglobulin ... ..	5·20	4·4
Alcohol extract ... ..	1·00	1·6
Water “ ... ..	1·70	0·2
Phosphate of lime, &c... ..	—	2·2

## FISH.

	Fibrin.	Oil.
Skate ... ..	97	3
Haddock ... ..	92	8
Herring ... ..	92	8
Salmon ... ..	78	22
Eels ... ..	44	56



## HORSE FLESH.

Creatine ... ..	7.60
Sarcine ... ..	1.28
Xanthine... ..	0.11
Inosite ... ..	0.30
Sarcolactic acid ... ..	4.47
Taurine ... ..	0.70

## FLESH OF PORPOISE.

Creatine ... ..	6.10
Sarcine ... ..	1.05
Xanthine... ..	traces
Inosite ... ..	0.08
Sarcolactic acid ... ..	7.45
Taurine ... ..	—

## FLESH, Lean Cow.

	Neck.	Leg.	Paunch.	Loin.
Water ... ..	76.49	77.09	77.53	76.58
Fixed material ... ..	23.51	22.91	22.47	23.42
Fat ... ..	1.28	0.92	0.783	2.62
Muscle substance ... ..	21.23	20.99	20.687	19.80

## Fat Ox.

Water ... ..	77.97	74.88	76.80	70.60
Fixed material ... ..	22.03	25.02	23.20	23.40
Fat ... ..	0.95	4.00	4.33	7.96
Muscle substance ... ..	20.08	20.02	17.87	20.44

## Very Fat Ox.

Water ... ..	76.15	73.26	67.81	67.35
Fixed material ... ..	23.85	26.74	32.19	32.65
Fat ... ..	2.82	5.76	8.812	12.86
Muscle substance ... ..	20.03	19.98	22.378	18.79

## FLESH OF OXEN.

Water ... ..	77.17	77.03	77.50	77.50
Fibrin cells, vessels and nerves ... ..	17.70	18.18	17.50	15.00
Albumen and hæmatoglobulin ... ..	2.20	2.70	2.20	4.30
Alcohol extracts and salts	1.80	1.94	1.50	1.32
Water ditto ... ..	1.05	1.15	1.30	1.80
Phosphate of lime with albumen ... ..	0.08	—	traces	—
Fat and loss ... ..	—	—	—	0.08



## GINGER.

Pale yellow volatile oil	...	...	...	...	...	...	1.56
Aromatic acrid soft resin	...	...	...	...	...	...	3.60
Extractive soluble in alcohol	...	...	...	...	...	...	.65
Acidulous and acrid extractive insoluble in alcohol	...	...	...	...	...	...	10.50
Gum...	...	...	...	...	...	...	12.05
Starch analogous to bassorin	...	...	...	...	...	...	19.75
Apothème extracted by potash (ulmin?)	...	...	...	...	...	...	26.00
Bassorin	...	...	...	...	...	...	8.30
Woody fibre	...	...	...	...	...	...	8.00
Water	...	...	...	...	...	...	11.90
							102.31

## ASH OF GRAPES, Entire.

Sulphate of potash	...	...	...	...	...	...	5.0
Chloride of potassium	...	...	...	...	...	...	2.7
Carbonated alkali	...	...	...	...	...	...	44.4
Carbonate of lime...	...	...	...	...	...	...	10.5
Phosphate of lime...	...	...	...	...	...	...	23.5
Silicic acid	...	...	...	...	...	...	1.4
Carbonate of magnesia...	...	...	...	...	...	...	12.5

## GRAPE SKINS, Ash of, Purple and White.

	Purple.	White.
Potash	41.65	46.89
Soda...	2.13	1.62
Lime	20.31	21.73
Magnesia...	6.02	4.45
Oxide of manganese	.76	.51
Iron ...	2.11	1.97
Sulphuric acid	3.48	3.88
Chlorine	.49	.71
Silica	3.46	2.57
Phosphoric acid	19.57	15.66

## GRAPE STONES, Ash of.

	Purple.	White.
Potash	27.89	29.45
Soda	—	—
Lime	32.18	35.57
Magnesia...	8.53	8.51
Oxide of manganese	.35	.45
Iron ...	.45	.65
Sulphuric acid	2.40	2.61
Chlorine	.27	.35
Silica	.95	1.27
Phosphoric acid	27.00	21.05

## GRAPE JUICE, Ash of.

Potash ... ..	·251
Soda... ..	·011
Lime ... ..	·020
Magnesia... ..	·016
Oxide of manganese ... ..	·001
Iron ... ..	·002
Sulphuric acid ... ..	·019
Silica ... ..	·009
Phosphoric acid ... ..	·068
	<hr/>
	·397

## GRAPE MUST (Ash of), White Ripe.

Potash ... ..	62·74
Soda... ..	2·66
Lime ... ..	5·11
Magnesia... ..	3·95
Oxide of manganese ... ..	·30
Iron ... ..	·40
Sulphuric acid ... ..	4·89
Chlorine ... ..	·70
Silica ... ..	2·18
Phosphoric acid ... ..	17·04

## GELATIN.

	Theory.	Mulder.	Scherer.
Carbon ... ..	50·00	50·04	50·4
Hydrogen ... ..	6·41	6·47	6·9
Oxygen ... ..	25·64	25·13	23·8
Nitrogen ... ..	17·95	18·36	18·9
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·0

## GELATIN, Sugar of.

	Theory.	Mulder.
Carbon ... ..	34·04	34·06
Hydrogen ... ..	6·38	6·49
Oxygen ... ..	39·72	39·61
Nitrogen... ..	19·86	19·84
	<hr/>	<hr/>
	100·00	100·00



## ICELAND MOSS.

Water	15.04
Protein	4.47
Crude fat...	5.79
Crude fibre	1.49
Extractive matter (non-nitrogenous)...	72.03
Ash, minus sand and carbonic acid	1.19

## ISINGLASS.

Gelatin	70.0
Osmazon	16.0
Membrane insoluble in boiling water	2.5
Free acid and salts of soda, potash, and phosphate of lime	4.0
Water	7.5

---

 100.0

## KOUUMISS.

Specific gravity	1.1286
Water	80.62
Alcohol	36.22
Lactic acid	2.56
Sugar	23.76
Albuminates	20.99
Butter	20.08
Inorganic salts	5.74
Free carbonic acid	1.99

Per litre.

## KOHL-RABI.

	Green top.	Purple top.
Water	86.020	89.002
Oil	.227	.177
*Soluble protein compounds	2.056	2.006
Sugar, gum and pectin...	6.007	4.486
Salts soluble in water	.970	.919
+Insoluble protein compounds	.300	.269
Digestible fibre and insoluble pectinous compounds	2.993	1.896
Woody fibre	1.230	1.106
Insoluble mineral matters	.197	.139
	<hr/> 100.000	<hr/> 100.000
* Containing nitrogen	.329	.321
+ Containing nitrogen	.048	.043

## LEMON SEEDS, Ash of.

Potash ... ..	33·89
Soda... ..	3·56
Magnesia... ..	8·67
Lime ... ..	12·87
Phosphoric acid ... ..	34·81
Sulphuric acid ... ..	3·30
Silica ... ..	·35
Peroxide of iron ... ..	·24
Chloride of sodium ... ..	2·31

## LETTUCE, Ash of.

Potash ... ..	46·01
Soda ... ..	5·29
Magnesia ... ..	2·17
Lime ... ..	6·05
Phosphoric acid ... ..	8·52
Sulphuric acid ... ..	3·89
Silica ... ..	20·23
Phosphate of iron... ..	trace
Chloride of sodium ... ..	7·82

## LIQUORICE ROOT.

Glycyrrhisin ... ..	8·60
Gum... ..	26·60
Soluble matter in alcohol ... ..	·75
Albumen... ..	·97
Starch ... ..	22·91
Fibre ... ..	13·36
Water ... ..	26·81

100·00

Ash ... .. 3·07 per cent.

## LIME JUICE.

Specific gravity ... ..	1036·04	1018·40
Citric acid ... ..	7·16	3·47
Total solids ... ..	8·91	5·05
Mineral matter ... ..	·46	·39
Sulphuric acid ... ..	—	·43

## LEMON.

	Leaves.	Rind	Seeds.	Juice.
Potash ... ..	10.15	34.42	41.89	54.56
Soda ... ..	1.78	2.07	1.88	1.42
Lime ... ..	61.83	38.87	16.75	15.19
Magnesia ... ..	11.06	11.33	4.52	4.85
Sulphuric acid ... ..	4.85	3.44	3.39	4.94
Phosphoric acid ... ..	4.67	8.38	29.18	15.63
Silica ... ..	3.49	.66	1.13	1.77
Loss and undetermined matter ... ..	2.17	.83	1.26	1.64

## LEMON JUICE.

	1.	2.	3.
Specific gravity ... ..	1035.16	1034.72	1020.96
Citric acid ... ..	7.77	7.640	2.72
Total solids ... ..	8.99	8.970	4.61
Mineral matter ... ..	.26	.310	.21
Sulphuric acid ... ..	.002	.002	.82

## LARD.

Stearine ... ..	}	38
Margarine ... ..		
Oleine ... ..		
		100

## LEEKS.

Water ... ..	90.00	
Oil ... ..	.27	} Insoluble in water.
Woody fibre ... ..	4.07	
Ash (mineral matter) ... ..	.35	
Albuminous compounds ... ..	.25	} Soluble in water.
Gum, sugar, &c. ... ..	4.62	
Mineral matter ... ..	.44	
	100.00	

## LEEKs, Ash of.

Insoluble silica	...	...	...	...	...	...	...	...	5.785
Soluble silica	...	...	...	...	...	...	...	...	1.635
Lime	...	...	...	...	...	...	...	...	9.955
Peroxide of iron	...	...	...	...	...	...	...	...	1.727
Magnesia...	...	...	...	...	...	...	...	...	5.295
Soda...	...	...	...	...	...	...	...	...	5.457
Potash	...	...	...	...	...	...	...	...	33.115
Sulphuric acid	...	...	...	...	...	...	...	...	8.197
Phosphoric acid	...	...	...	...	...	...	...	...	11.764
Carbonic acid...	...	...	...	...	...	...	...	...	9.721
Chlorine	...	...	...	...	...	...	...	...	7.349
									100.000

## MILK, Condensed and Powder.

			Milk powder.	
Water	...	24.30	26.50	3.10
Casein	...	18.52	16.30	26.74
Sugar of milk	...	16.50	17.54	17.20
Cane sugar	...	27.11	27.06	39.17
Fat	...	10.80	9.50	10.94
Mineral matter	...	2.12	2.39	.26
Phosphoric acid	...	.64	0.70	

## MILK, Whey of.

	1.	2.
Water	92.80	93.05
Butter	.59	.40
Albuminous compounds	.91	.95
Milk sugar, lactic acid, &c.	5.04	4.96
Ash	.66	.64
100.00		100.00

## MILK, Cream of.

	1.	2.
Water	74.46	61.67
Fat	18.18	33.43
Casein	2.69	2.62
Sugar of milk	4.08	1.56
Ash	.59	.72



## MILK, Ash of.

	No. 1.	No. 2.
Phosphate of lime ... ..	47·14	50·81
Phosphate of magnesia ... ..	8·57	9·45
Perphosphate of iron ... ..	1·43	1·04
Chloride of potassium ... ..	29·38	27·03
Chloride of sodium ... ..	4·89	5·00
Soda... ..	8·57	6·64
	<hr/>	<hr/>
	99·98	99·97

## MILK, Human, in 1000 grs.

	Average of 14 analyses.	Woman age 36.	Woman age 20.
Water ... ..	883·6	894·0	898·0
Solid constituents... ..	116·4	106·0	102·0
	<hr/>	<hr/>	<hr/>
Butter ... ..	25·3	38·0	28·8
Casein ... ..	34·3	34·0	32·0
Sugar of milk, &c. ... ..	48·2	40·5	36·0
Fixed salts ... ..	2·3	1·8	—

## MILK, Human.

	4th day after delivery.	9th day after delivery.	12th day after delivery.
Water ... ..	879·848	885·818	905·809
Solid constituents... ..	120·152	114·182	94·191
	<hr/>	<hr/>	<hr/>
Butter ... ..	42·968	35·316	33·454
Casein ... ..	35·333	36·912	29·111
Sugar of milk, &c. ... ..	41·135	42·979	31·537
Salts... ..	2·095	1·691	1·939

## MILK, Human, Ash of

Carbonate of lime... ..	6·9
Phosphate of lime ... ..	70·6
Chloride of sodium ... ..	9·8
Other salts ... ..	5·3
Sulphate of soda .. ..	7·4

## SOW'S MILK.

Water ... ..	81·80
Fats ... ..	6·00
Casein and other nitrogenous matters ... ..	5·30
Lactin ... ..	6·07
Mineral matter ... ..	·83
	<hr/>
	100·00
Total solids ... ..	18·20

## MILK.

	Asses.	Goats.
Water ... ..	91·65	85·54
Casein ... ..	1·80	4·52
Butter ... ..	1·12	4·08
Sugar ... ..	5·03	5·40
Mineral matters ... ..	·40	·46
	<hr/>	<hr/>
	100·00	100·00

## MILK OF COCOA NUT.

Water ... ..	91·50
Protein ... ..	·46
Fat ... ..	·07
Non-nitrogenous extractive matter ... ..	6·78
Ash of ... ..	1·19

## MILK OF COCOA NUT, Ash of.

Potash ... ..	55·200
Soda... ..	·728
Lime ... ..	3·679
Magnesia... ..	6·606
Chlorine ... ..	10·373
Phosphoric acid ... ..	20·510
Sulphuric acid ... ..	5·235
Silicic acid ... ..	—

102·331

Deducting oxygen replaceable by chlorine ... .. 2·338

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99·993

## MANNA.

Manna sugar or mannite ... ..	40
Grape sugar (?) ... ..	10
Gum, with gluten, &c.... ..	40
Water ... ..	10

---

100

## MANGOLDS.

	1.	2.
Water ... ..	89·0	87·440
Flesh forming substances ... ..	1·5	1·100
Gum sugar, &c. ... ..	5·5	7·408
Fibre ... ..	3·0	2·583
Ash ... ..	1·0	1·469
Oil ... ..	none	none

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100·0

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100·00

## MAIZE.

Moisture ... ..	14·96
Oil ... ..	6·50
Albuminous compounds ... ..	11·27
Sugar, mucilage, starch, &c. ... ..	60·98
Woody fibre ... ..	5·02
Mineral matters ... ..	1·27
	<hr/>
	100·00

## MAIZE.

Starch ... ..	50·1	54·8
Fat ... ..	4·4	4·7
Cellulose &c. ... ..	14·9	20·4
Gum and sugar ... ..	2·3	2·9
Nitrogenous matter ... ..	8·7	8·9
Ash ... ..	1·6	1·8
Water ... ..	11·5	13·2

## MAIZE SEED, Ash of.

Potash ... ..	14·00
Phosphate of lime... ..	47·50
Chloride of potassium... ..	·25
Sulphate of potash ... ..	·25
Earthy phosphates ... ..	36·00
Silica ... ..	1·00
Metallic oxides ... ..	·12
Loss ... ..	·88
	<hr/>
	100·00

## MILLET, Ash of.

Potash ... ..	9·58
Soda... ..	1·31
Magnesia... ..	7·66
Lime ... ..	·86
Phosphoric acid ... ..	18·19
Sulphuric acid .. ..	·35
Silica ... ..	59·63
Peroxide of iron ... ..	·63
Chloride of sodium ... ..	1·43
	<hr/>
	99·64

## MUSTARD FARINA, Mixed Brown and White.

	1.	2.	3.
Water ... ..	5·702	5·163	5·084
Fixed oil... ..	36·491	35·942	33·979
Myronic acid ... ..	2·704	2·212	·963
Myrosin and albumen ... ..	31·686	27·360	27·616
Acrid salt ... ..	5·714	9·085	11·258
Cellulose... ..	13·373	15·574	16·807
Ash ... ..	4·330	4·664	4·293
<hr/>			
{ Oil of mustard ... ..	0·710	·581	·253
{ Nitrogen ... ..	5·341	5·047	5·208
{ Sulphur ... ..	1·308	1·424	1·403

## BROWN MUSTARD FARINA.

Water ... ..	4·845
Fixed oil ... ..	35·701
Myronic oil ... ..	4·840
Myrosin and albumen ... ..	29·536
Acrid salt ... ..	3·588
Cellulose ... ..	16·765
Ash ... ..	4·725
Nitrogen ... ..	5·068
Sulphur ... ..	1·413

## WHITE MUSTARD FARINA.

Water ... ..	5·360
Fixed oil... ..	35·768
Acrid salt ... ..	10·983
Myrosin and albumen ... ..	27·414
Cellulose ... ..	16·295
Ash ... ..	4·110
Sulphur ... ..	1·224
Nitrogen ... ..	5·285

## MUSTARD, Black, Ash of.

Potash ... ..	39·51
Soda... ..	3·98
Magnesia... ..	6·43
Lime ... ..	5·91
Phosphoric acid ... ..	34·50
Sulphuric acid ... ..	4·91
Silica ... ..	—
Peroxide of iron ... ..	1·05
Chloride of sodium ... ..	3·71

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 100·00

## MUSTARD, White, Ash of.

Potash ... ..	9.80
Soda... ..	9.18
Magnesia... ..	11.00
Lime ... ..	20.81
Phosphoric acid ... ..	36.60
Sulphuric acid ... ..	5.29
Silica ... ..	3.29
Peroxide of iron ... ..	1.43
Chloride of sodium ... ..	.33
	<hr/>
	97.73

## MUTTON SOUP, Concentrated Australian.

Water .. ..	31.29
Fatty matter ... ..	.35
*Nitrogenous matters, gelatine and meat extract ...	64.27
Saline matters ... ..	4.09
	<hr/>
	100.00
* Containing nitrogen ... ..	10.75

## MEAT, Extract of (Monte Video).

Soluble in 80 per cent. alcohol ... ..	81.00
Water ... ..	16.50
Fat and albumen ... ..	<hr/>
Nitrogen . . . . .	9.78
Total ash... ..	21.36
Phosphoric acid ... ..	6.10
Potash ... ..	8.87
Soda... ..	2.30

## MEAT, Fresh.

Water ... ..	73.4
Soluble albumen and hæmatin ... ..	2.25
Insoluble albuminous substances as fibrin ... ..	15.2
Gelatinous substances ... ..	3.3
Fat ... ..	2.87
Extractive matters ... ..	1.38
Kreatin ... ..	.068
Ash ... ..	1.6

## MEAT, Ash of Fresh Beef and Salt.

	Fresh.	Salt.
Chloride of sodium ... ..	·310	·691
“ potassium ... ..	·154	—
Potash ... ..	·540	·398
Soda... ..	·026	—
Lime ... ..	·051	·012
Magnesia... ..	·023	·030
Oxide or phosphate of iron... ..	·011	·017
Phosphoric acid ... ..	·435	·346
Sulphuric acid ... ..	·036	·010
Chlorine ... ..	—	—
Silica ... ..	·014	·004

## MEAT, Ash of Fresh and Salt Pork.

	Fresh.	Salt.
Chloride of sodium ... ..	·012	5·700
“ potassium ... ..	—	·173
Potash ... ..	·420	·350
Soda... ..	·045	—
Lime ... ..	·083	·027
Magnesia.. ..	·004	·035
Oxide or phosphate of iron... ..	·494	·006
Phosphoric acid ... ..	·054	·312
Sulphuric acid ... ..	·000	·013
Chlorine ... ..	—	—
Silica ... ..	—	—

## MEAT FLOUR, from Fray-Bentes.

Water ... ..	10·48
Fat ... ..	12·42
Albuminoids (containing nitrogen 12·01)... ..	72·06
* Ash, contains per cent. ... ..	4·88
* Potash ... ..	1·99
Soda ... ..	1·33
Lime ... ..	8·79
Magnesia ... ..	1·16
Ferric oxide ... ..	5·80
Phosphoric acid ... ..	15·33
Sulphuric acid ... ..	·82
Silica ... ..	·66
Chlorine ... ..	·31
Sand... ..	53·33
Carbonic acid and loss... ..	7·48

## VEAL, Ash of (common salt deducted).

Phosphate of potash ... ..	68.05
“ soda ... ..	5.66
“ lime ... ..	3.72
“ magnesia ... ..	6.24
Free phosphoric acid ... ..	15.10
Peroxide of iron ... ..	.30
Silicic acid ... ..	.92
	<hr/>
	99.99

## FLESH OF ANIMALS, Ash of.

	Horse.	Ox, washed out.	Ox-brain.
Free phosphoric acid ... ..	2.62	80.96	16.42
Alkaline phosphates ... ..	17.23	48.06	26.26
Earthy phosphates ... ..	16.57	74.41	9.02

## FLESH, Ashes of.

Phosphoric acid ... ..	36.60
Potash ... ..	40.20
Earths and oxide of iron ... ..	5.69
Sulphuric acid ... ..	2.95
Chloride of potassium ... ..	14.81
	<hr/>
	100.25

	When boiled there enter into soup.	There remains in the ex- hausted meat.
Phosphoric acid ... ..	26.24	10.36
Potash ... ..	35.42	4.78
Earths and iron ... ..	3.15	2.54
Sulphuric acid ... ..	2.95	—
Chloride of potassium ... ..	14.81	—
	<hr/>	<hr/>
	82.57	17.68

## NUTMEG.

Volatile oil ... ..	6.0
Liquid fat ... ..	7.6
Solid fat ... ..	24.0
Acid... ..	.8
Starch ... ..	2.4
Gum... ..	1.2
Fibre ... ..	54.0
Loss ... ..	4.0
	<hr/>
	100.0

## ONIONS.

Moisture ... ..	87·684
Albumen, &c. ... ..	1·432
Mucilage ... ..	9·770
Woody fibre ... ..	·639
Ash ... ..	·475
	<hr/>
	100·000

## ONIONS, Portugal.

	Water ... ..	88·880	
	Oil ... ..	·240	
Insoluble in water.	{ Woody fibre ... ..	2·177	
		{ Albumen ... ..	·240
		{ Ash ... ..	·033
Soluble in water.	{ Albumen ... ..	·234	
		{ Gum ... ..	7·653
		{ Sugar ... ..	1·450
		<hr/>	
		100·907	

## ONIONSTALK, Ash of.

Potash ... ..	13·98
Soda ... ..	14·43
Magnesia ... ..	trace
Lime ... ..	25·10
Phosphoric acid ... ..	trace
Sulphuric acid ... ..	10·50
Silica ... ..	19·77
Phosphate of iron ... ..	10·61
Chloride of sodium ... ..	trace

## ONIONS, Ash of Portugal.

Insoluble silica ... ..	·552
Soluble silica ... ..	·000
Peroxide of iron ... ..	·357
Lime ... ..	9·326
Magnesia ... ..	4·244
Chloride of sodium ... ..	2·833
“ potassium ... ..	4·529
Potass ... ..	39·005
Sulphuric acid ... ..	11·658
Phosphoric acid ... ..	19·339
Carbonic acid ... ..	8·157
	<hr/>
	100·000



## PEAR, Ash of.

Potash	54.69
Soda...	8.69
Lime	7.98
Magnesia...	5.22
Sulphuric acid	5.69
Silicic acid	1.49
Phosphoric acid	14.28
Phosphate of sesquioxide of iron	1.96
Chloride of sodium	trace

## PLUM, Orleans, Ash of.

	Kerne <sup>l</sup> .	Shell.
Potash	26.52	21.69
Soda...	1.94	7.69
Magnesia...	16.17	3.77
Lime	8.49	28.06
Phosphoric acid	33.05	25.24
Sulphuric acid	7.11	6.61
Silica	2.38	2.57
Phosphate of iron	3.83	4.37
Chloride of sodium	.49	trace

## PLUM, Orleans, Ash of.

	Skin.	Pulp.
Potash	58.86	54.59
Soda...	3.52	8.72
Magnesia	9.29	4.69
Lime	8.25	4.86
Phosphoric acid	9.85	15.44
Sulphuric acid	1.96	3.23
Silica	.81	3.15
Phosphate of iron	7.45	4.80
Chloride of sodium	trace.	.62

## PINEAPPLE, Ash of.

Potash	49.42
Soda...	—
Magnesia	8.80
Lime	12.15
Phosphoric acid	4.08
Sulphuric acid	trace
Silica	4.02
Phosphate of Peroxide of iron	2.93
Chloride of sodium	17.01
Chloride of Potassium	.88

## PEAS, Ash of.

Potash ... ..	36.31
Soda... ..	1.30
Magnesia ... ..	12.24
Lime ... ..	10.39
Phosphoric acid ... ..	31.00
Sulphuric acid ... ..	4.84
Silica ... ..	1.54
Peroxide of iron ... ..	—
Chloride of sodium ... ..	1.87
	<hr/>
	99.49

## PEAS, Ash of.

Carbonic acid... ..	.05
Sulphuric acid ... ..	4.7
Phosphoric acid ... ..	30.1
Chlorine ... ..	1.1
Magnesia... ..	11.9
Lime ... ..	10.1
Potass ... ..	35.3
Soda.. ..	2.5
Silica ... ..	1.5
Oxide of iron and alumina ... ..	trace
Carbon, water and loss ... ..	2.3
	<hr/>
	100.0

## PEPPER, White.

Water and loss ... ..	19.29
Acrid Resin ... ..	16.60
Volatile oil ... ..	1.61
Gum and salts ... ..	12.50
Starch ... ..	18.50
Albumen... ..	2.50
Fibre ... ..	29.00
	<hr/>
	100.00

## PARSNIPS.

Water ... ..	82.20
Albumen, &c. ... ..	1.28
Cellular tissue, gum and non-nitrogenous matter... ..	8.92
Sugar ... ..	3.20
Fibre ... ..	3.47
Mineral matter (ash) ... ..	.93
	<hr/>
	100.00

## POTATOES.

Water	75.0
**Albuminous compounds	2.3
§Starch, &c.	18.7
¶Woody fibre	3.0
††Mineral matter	1.0
	<hr/>
	100.00
**Containing nitrogen	.37
††Containing phosphoric acid	.14
and potash	.48

## POTATO, Ash of.

	No. 1.
ⒸCarbonic acid...	13.4
§Sulphuric acid	7.1
¶Phosphoric acid	11.3
ⒸChlorine	2.7
¶Magnesia...	5.4
¶Lime	1.8
¶Potash	51.5
§Soda...	trace
§Silica	5.6
ⒸOxide of iron and alumina	.5
ⒸCarbon, water and loss	.7
	<hr/>
	100.0

## POTATOES, Ash of.

	No. 2.
¶Potash	46.80
§Soda...	.28
¶Magnesia...	9.40
¶Lime	3.44
¶Phosphoric acid	13.55
§Sulphuric acid	4.34
§Silica	5.25
¶Peroxide of iron	5.10
ⒸChloride of sodium	2.56
ⒸChloride of potassium	2.50

QUINCE, *Pyrus Cydonia* Seeds, Ash of.

Potash	27.09
Soda...	3.01
Magnesia...	13.01
Lime	7.69
Phosphoric acid	42.02
Sulphuric acid	2.67
Silica	.75
Peroxide of iron	1.19
Chloride of sodium	2.57
	<hr/>
	100.00

## RHUBARB, Stalks.

Water	96.72
Malic and other acids	1.41
Soluble albumen	.04
Insoluble albumen	trace
Gum...	.66
Sugar	.21
Cellulose...	.67
Mineral matter	.29
	<hr/>
	100.00

## RHUBARB, Ash of.

	Stalk.	Leaves.
Potash	59.59	14.47
Soda...	.46	31.77
Magnesia...	—	5.59
Lime	10.04	3.95
Phosphoric acid	12.83	30.04
Sulphuric acid	1.89	9.52
Silica	2.77	2.33
Phosphate of iron	2.77	2.33
Chloride of sodium	8.84	trace

## RADISH, Ash of.

	Root.	Top.
Potash ... ..	21·16	5·05
Soda... ..	—	11·09
Magnesia... ..	3·53	7·08
Lime ... ..	8·78	27·90
Phosphoric acid ... ..	40·09	6·07
Sulphuric acid ... ..	7·71	9·64
Silica ... ..	8·17	8·22
Phosphate of iron ... ..	2·19	16·45
Chloride of sodium ... ..	7·07	8·50
“ Potassium ... ..	1·29	—

## RYE GRAIN and FLOUR.

	Flour.	Flour.	Mean of samples grain.
Gluten ... ..	9·48	12·8	—
Albumen ... ..	3·28	3·0	8·8
Starch ... ..	61·07	58·8	65·5
Sugar ... ..	3·28	10·4	—
Gum .. ..	11·09	7·2	—
Cellulose... ..	6·38	—	6·4
Fat, acid and loss... ..	5·62	7·8	2·0
Ash ... ..	—	—	1·8
Water ... ..	—	—	15·5

## RICE.

	Raw.	Boiled.
Water ... ..	14·20	77·02
Gluten ... ..	6·40	1·44
Starch ... ..	75·70	20·54
Fibre ... ..	3·01	·80
Mineral matter ... ..	·69	·20
	100·00	100·00

## RICE HUSKS.

Moisture ... ..	9·80
Oil ... ..	1·10
*Flesh forming matters .. ..	4·18
Starch, mucilage, &c. ... ..	44·94
Cellulose ... ..	26·80
†Ash ... ..	13·18
	100·00
*Containing nitrogen ... ..	·67
† “ sand ... ..	12·34

## RICE MEAL.

Moisture ... ..	8.83
Oil and fatty matters ... ..	9.50
*Albuminous compounds ... ..	12.75
Starch, mucilage and digestible fibre ... ..	50.69
Cellulose ... ..	10.14
†Ash ... ..	8.09
	<hr/>
	100.00
*Containing nitrogen ... ..	2.04
+ " sand ... ..	3.17

## RICE, Ash of.

Potash ... ..	18.48
Soda... ..	10.67
Lime... ..	1.27
Magnesia... ..	11.96
Oxide of iron ... ..	.45
Phosphoric acid ... ..	53.36
Sulphuric acid ... ..	—
Chlorine ... ..	.27
Silica ... ..	3.35
Alumina ... ..	—
	<hr/>
	99.81

## RUM, Very Old.

Alcohol ... ..	32.50
Acetic acid ... ..	1.88
Extractive matters ... ..	.43
Ash ... ..	.03
Water ... ..	65.16
	<hr/>
	100.00

## SEAKALE.

Water ... ..	93.72
Soluble albumen ... ..	.34
Insoluble albumen... ..	trace
Sugar ... ..	.55
Gummy matter ... ..	4.17
Cellulose ... ..	.57
Mineral matter ... ..	.65
	<hr/>
	100.00

## STRAWBERRIES, Ash of.

Potash ... ..	21·07
Soda... ..	27·01
Magnesia... ..	trace
Lime ... ..	14·21
Phosphoric acid ... ..	8·59
Sulphuric acid ... ..	3·15
Silica ... ..	12·05
Phosphate of iron .. ..	11·12
Chloride of sodium ... ..	2·78

## SPINACH, Ash of.

Potash ... ..	9·69
Soda... ..	34·96
Magnesia... ..	5·29
Lime ... ..	13·11
Phosphoric acid ... ..	7·89
Sulphuric acid ... ..	9·30
Silica ... ..	3·16
Phosphate of iron ... ..	8·67
Chloride of sodium ... ..	7·93

## SUGARCANE, Ash of.

	No. 1.	No. 2.	No. 3. Demerara.
Potash ... ..	14·11	11·03	20·42
Soda... ..	1·16	5·43	8·24
Magnesia... ..	6·84	11·78	3·80
Lime ... ..	8·96	4·45	2·26
Phosphoric acid ... ..	4·53	4·84	7·12
Sulphuric acid ... ..	10·80	7·67	7·70
Silica ... ..	40·85	44·68	17·04
Chloride of potassium ... ..	11·51	9·14	30·18
	<hr/>	<hr/>	<hr/>
	98·76	99·02	96·76

## SUGARCANE, North China, Sorghun Sacchratum.

Water	...	...	...	...	...	...	...	...	...	85·17
* { Albumen	...	...	...	...	...	...	...	...	...	·36
* { Other soluble protein compounds	...	...	...	...	...	...	...	...	...	·90
Mucilage, pectin and digestible fibre	...	...	...	...	...	...	...	...	...	6·63
Soluble mineral matters	...	...	...	...	...	...	...	...	...	·81
+ Insoluble protein compounds	...	...	...	...	...	...	...	...	...	1·25
Indigestible woody fibre	...	...	...	...	...	...	...	...	...	4·57
Insoluble mineral matters	...	...	...	...	...	...	...	...	...	·31
										<hr/> 100·00
* Containing nitrogen	...	...	...	...	...	...	...	...	...	·21
+ " "	...	...	...	...	...	...	...	...	...	·20
										<hr/> ·41
Total nitrogen	...	...	...	...	...	...	...	...	...	·41

## SUGARCANE, Sorghum Saccharatum.

Water	...	...	...	...	...	...	...	...	...	81·80
* { Albumen	...	...	...	...	...	...	...	...	...	·37
* { Other soluble protein compounds	...	...	...	...	...	...	...	...	...	1·16
Sugar	...	...	...	...	...	...	...	...	...	5·85
Wax and fatty matter	...	...	...	...	...	...	...	...	...	2·55
Mucilage, pectin and fibre	...	...	...	...	...	...	...	...	...	2·59
Soluble mineral matters	...	...	...	...	...	...	...	...	...	·74
+ Insoluble protein compounds	...	...	...	...	...	...	...	...	...	·66
Cellular fibre	...	...	...	...	...	...	...	...	...	4·05
Insoluble mineral matters	...	...	...	...	...	...	...	...	...	·23
										<hr/> 100·00
* Containing nitrogen	...	...	...	...	...	...	...	...	...	·245
+ " "	...	...	...	...	...	...	...	...	...	·106

## SUGARCANE.

	Tahiti cane.	Ribbon cane.
Sugar	14·280	13·392
Cellulose	8·867	9·071
Mucilagenous, resinous, fatty and } albuminous matter	·415	·440
Salts, silica, iron	·358	·368
Water	76·080	76·729
	<hr/> 100·000	<hr/> 100·000

## SUGARS.

	Maple.	French beet.	German beet.
Cane sugar ... ..	72·60	94·30	87·80
Fruit sugar ... ..	13·95	·25	·33
Extractive ... ..	2·11	·27	·75
Soluble salts ... ..	1·35	1·30	5·92
Insoluble salts ... ..	·03	—	·13
Water ... ..	9·96	3·88	5·07
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## SUGARS.

	Trinidad.	Demerara.	Molasses.
Cane sugar ... ..	90·41	90·80	47·0
Fruit sugar ... ..	3·84	4·11	20·4
Extractive ... ..	·95	·77	2·7
Soluble salts ... ..	·86	·92	2·6
Insoluble salts ... ..	·22	·20	—
Water ... ..	3·72	3·20	27·3
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·0

	Pernambuco.	Bahia.	Cuba Muscavado.
Cane sugar ... ..	88·31	86·80	92·35
Fruit sugar ... ..	4·82	5·03	3·38
Extractive ... ..	·94	1·72	·66
Soluble salts ... ..	·80	1·21	·62
Insoluble salts ... ..	·73	·92	·15
Water .. ..	4·40	4·32	2·84
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

	Trinidad.	St. Vincent.	Pernam- buco.
Cane sugar ... ..	90·41	89·00	88·31
Fruit sugar ... ..	3·84	5·85	4·82
Extractive, &c. ... ..	·95	·76	·94
Soluble salts ... ..	·86	·62	·80
Insoluble salts ... ..	·22	·05	·73
Water ... ..	3·72	3·72	4·40
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

SUGARS.					Bahia.	Maple.	Molasses.
Cane sugar	...	...	...	...	86·80	72·60	47·0
Fruit sugar	...	...	...	...	5·03	13·95	20·4
Extractive, &c.	...	...	...	...	1·72	2·11	2·7
Soluble salts	...	...	...	...	1·21	1·35	2·6
Insoluble salts	...	...	...	...	·92	·03	—
Water	...	...	...	...	4·32	9·96	27·3
					<hr/>	<hr/>	<hr/>
					100·00	100·00	100·0

## SUGARS and STARCH.

	Cane.	Grape.	Starch.
Carbon	42·10	40·00	44·44
Hydrogen	6·43	6·66	6·17
Oxygen	51·47	53·34	49·39
<hr/>			
	100·00	100·00	100·00

## TEA.

	Black.	Green
Water	11·56	9·37
Tannin	15·24	18·69
Gum...	5·70	5·89
Albuminous matter	15·55	24·39
Theine	2·53	2·79
Ash ..	5·82	5·38
Chlorophyll and extractive matters	5·24	1·83
Matter insoluble in water, cellulose, &c....	38·36	31·66
<hr/>		
	100·00	100·00
Nitrogen	3·20	4·55

## TEA.

	Green.	Black.
Essential oil	·79	·60
Chlorophyll	2·22	1·84
Wax...	·28	—
Resin	2·22	3·64
Gum...	8·56	7·28
Tannin	17·80	12·88
Theine	·43	·46
Extractive	22·80	19·88
“ dark coloured	—	1·48
Colourable matter...	23·60	19·12
Albumen...	3·00	2·80
Vegetable fibre	17·08	28·32
Ash	5·56	5·24
<hr/>		
	104·34	103·54

## TEA INFUSION, Ash of.

Potash ... ..	47.45
Lime ... ..	1.24
Magnesia... ..	6.84
Peroxide of iron ... ..	3.29
Phosphoric acid ... ..	9.88
Sulphuric acid ... ..	8.72
Silicic acid ... ..	2.31
Carbonic acid ... ..	10.09
Oxide of manganese ... ..	.71
Chloride of sodium ... ..	3.62
Soda... ..	5.03
Charcoal and sand... ..	1.09
	<hr/>
	100.27

## TEA LEAVES, Ash of.

	Assam.	
	Young.	Old.
Chloride of sodium .. ..	2.213	1.972
Soda ... ..	3.521	9.432
Magnesia... ..	11.876	7.277
Potash .. ..	35.336	13.043
Lime ... ..	11.751	31.983
Oxides of iron and manganese ... ..	6.985	8.767
Phosphoric anhydride ... ..	16.014	14.738
Sulphuric anhydride ... ..	11.018	9.429
Silica ... ..	1.118	2.554
	<hr/>	<hr/>
	99.832	99.195

## TEA SEED, Ash of.

Chloride of sodium ... ..	—
Soda... ..	—
Potassium chloride ... ..	1.396
Potash ... ..	47.336
Magnesia... ..	9.464
Lime ... ..	6.467
Oxide of iron and manganese ... ..	2.529
Phosphoric anhydride ... ..	12.962
Sulphuric anhydride ... ..	18.809
Silica ... ..	1.037
	<hr/>
	100.000
Nitrogen... ..	2.91

**TURNIP, Swede.**

Water	89.460
Flesh forming substances	1.443
Gum, sugar, &c.	5.932
Fibre	2.542
Mineral matters	.623
Oil	none
	<hr/>
	100.000

**TURNIPS, White.**

Water	90.43
*Albuminous compounds	1.04
Pectin, sugar and other carbonaceous principles	5.46
Woody fibre	2.44
†Mineral matter	.63
	<hr/>
	100.00

*Containing nitrogen	.16
† " Phosphoric acid and	.06
Potash	.23

**TURNIP, Swede, Ash of.**

Carbonic acid	14.0
Sulphuric acid	10.9
Phosphoric acid	6.1
Chlorine	2.9
Magnesia...	4.3
Lime	10.9
Potash	33.7
Soda...	4.1
Silica	6.4
Oxide of iron and alumina	1.2
Carbon, water and loss	5.5
	<hr/>
	100.00

**VINEGAR, Crosse & Blackwell's.**

Specific gravity	1.02040
	<hr/>
Glacial acetic acid in 1000 parts	68.200
Sulphate of lime	0.115
Free sulphuric acid	none
Total residue	24.960
Ash	3.640

## WHEAT, Grain of.

Water	15.27
Gluten, with little albumen	11.64
Starch and sugar	68.74
Fibre	2.60
Mineral matter	1.75
	<hr/>
	100.00

## WHEAT.

	White.	Odessa.	Polish.
Water	14.6	15.2	13.2
Fatty matters	1.0	1.5	1.5
Nitrogenous matters insoluble in water	8.3	12.7	19.8
Soluble nitrogenous matters	2.4	1.6	1.7
Soluble non-nitrogenous matter dextrin	9.2	6.3	6.8
Starch	62.7	61.3	55.1
Cellulose	1.8	<hr/>	<hr/>
Saline matter	—	1.4	1.9

## WHEAT FLOUR.

	French.	Odessa.	Paris.	Inferior.
Starch	71.49	56.5	72.8	67.78
Gluten	10.96	14.55	10.2	9.02
Sugar	4.72	8.48	4.2	4.80
Gum	3.82	4.90	2.8	4.60
Bran	—	2.30	—	—
Water	10.00	12.00	10.0	12.00

## WHEAT BRAN.

Starch	52.0
Gluten	14.9
Sugar	1.0
Fat	3.6
Woody fibre	9.7
Salts	5.0
Water	13.8
	<hr/>
	100.0

## WHEAT, Ash of.

	White.	Red.
Potash ... ..	33·84	21·87
Soda ... ..	—	15·75
Magnesia ... ..	13·54	9·60
Lime ... ..	3·09	1·93
Phosphoric acid ... ..	49·21	49·32
Sulphuric acid ... ..	—	·17
Silica ... ..	—	—
Peroxide of iron ... ..	·31	1·36
	<hr/>	<hr/>
	99·99	100·00

## WHEAT, Grain, Ash of.

Carbonic acid... ..	—
Sulphuric acid ... ..	1·0
Phosphoric acid ... ..	47·0
Chlorine ... ..	trace
Magnesia... ..	15·9
Lime ... ..	2·9
Potash ... ..	29·5
Soda... ..	trace
Silica ... ..	1·3
Oxide of iron and alumina ... ..	—
Carbon, water and loss ... ..	2·4
	<hr/>
	100·0

## WHEAT, Ash of.

	French.	Egyptian.	Mean of 23.
Potash ... ..	32·40	36·6	29·35
Soda ... ..	2·30	0·5	1·10
Lime... ..	3·50	4·3	3·40
Magnesia... ..	13·90	11·1	10·70
Oxide of iron ... ..	1·00	1·2	2·40
Sulphuric acid ... ..	·35	0·2	—
Silica ... ..	3·03	5·0	2·50
Carbonic acid ... ..	—	—	—
Chloride of sodium ... ..	—	—	0·13
Phosphoric acid ... ..	43·50	41·0	49·70

## WALNUT, Kernel, Ash of.

Potash ... ..	31·11
Soda... ..	2·25
Magnesia... ..	13·03
Lime ... ..	8·59
Phosphoric acid ... ..	42·53
Sulphuric acid ... ..	trace
Silica ... ..	—
Phosphate of iron ... ..	2·49
Chloride of sodium ... ..	trace
Chloride of potassium ... ..	—

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## W I N E S .

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## CHAMPAGNE.

Water ... ..	90·00
Alcohol ... ..	5·00
Sugar ... ..	4·00
Acid... ..	1·00
	<hr/>
	100·00

## CLARET.

Water ... ..	92·00
Alcohol ... ..	6·00
Sugar ... ..	trace
Acid .. ...	2·00
	<hr/>
	100·00

## PUBLIC-HOUSE SHERRY—30/- ½ dozen.

		Grains in one bottle.
Specific gravity ... ..	997·900	—
Absolute alcohol ... ..	18·154	2117·9
Proof spirit ... ..	36·868	4301·3
Grape sugar ... ..	1·421	165·8
Cane sugar ... ..	1·741	203·1
Tartaric acid ... ..	·360	42·0
Acetic acid ... ..	·066	7·7
Sulphuric acid ... ..	·135	15·7
Phosphoric acid ... ..	·017	2·0
Total residue ... ..	5·776	673·9
Ash ... ..	·390	45·5
Alkalinity of ash ... ..	·010	1·2
Nitrogen ... ..	·027	3·1
Sulphate of potash ... ..	—	33·9
Bitartarate of potash ... ..	—	4·8

## IMITATION SHERRY.

Specific gravity ... ..	996·000
Alcohol ... ..	16·480
Grape sugar ... ..	2·230
Tartaric acid ... ..	·010
Acetic acid ... ..	·111
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·027
Residue ... ..	3·602
Ash ... ..	·327
Alkalinity of ash ... ..	·028
Bitartarate of potash ... ..	—

HAMBORO SHERRY—18/-  $\text{p}$  dozen.

		Grains in one bottle.
Specific gravity ... ..	995·300	—
Absolute alcohol ... ..	18·613	2171·5
Proof spirit ... ..	37·800	4410·0
Grape sugar ... ..	4·383	511·4
Cane sugar ... ..	—	—
Fixed acid ... ..	·285	33·3
Acetic acid ... ..	·006	·7
Sulphuric acid ... ..	·034	3·9
Phosphoric acid ... ..	·015	1·7
Total residue ... ..	4·976	560·5
Ash ... ..	·124	14·5
Alkalinity of ash ... ..	·013	1·5
Nitrogen ... ..	·018	2·1
Sulphate of potash ... ..	—	8·5
Bitartrate of potash ... ..	—	6·0

RESTAURANT SHERRY—24/-  $\text{p}$  dozen.

		Grains in one bottle.
Specific gravity ... ..	991·800	—
Absolute alcohol ... ..	18·538	2162·8
Proof spirit ... ..	37·648	4392·3
Grape sugar ... ..	2·493	290·9
Cane sugar ... ..	—	—
Tartaric acid ... ..	·360	42·0
Acetic acid ... ..	·045	5·3
Sulphuric acid ... ..	·096	11·2
Phosphoric acid ... ..	·022	2·6
Total residue ... ..	3·926	458·0
Ash ... ..	·326	38·0
Alkalinity of ash ... ..	·016	1·9
Nitrogen ... ..	·017	2·0
Sulphate of potash ... ..	—	24·4
Bitartrate of potash ... ..	—	7·6

## PALE SHERRY.

		Grains in one bottle.
Specific gravity ... ..	990·230	—
Absolute alcohol ... ..	17·903	2088·7
Proof spirit ... ..	36·359	4241·9
Grape sugar ... ..	1·018	118·8
Cane sugar ... ..	—	—
Tartaric acid ... ..	·360	42·0
Acetic acid ... ..	·036	4·2
Sulphuric acid ... ..	·178	20·7
Phosphoric acid ... ..	·012	1·4
Total residue ... ..	3·594	419·3
Ash ... ..	·466	54·4
Alkalinity of ash ... ..	·010	1·2
Nitrogen ... ..	·027	45·0
Sulphate of potash ... ..	—	4·8
Bitartrate of potash ... ..	—	—

## CADIS SHERRY—30/- ½ dozen.

		Grains in one bottle.
Specific gravity ... ..	9901·000	—
Absolute alcohol ... ..	17·584	2051·4
Proof spirit ... ..	35·701	4165·1
Grape sugar ... ..	1·243	145·1
Cane sugar ... ..	—	—
Tartaric acid ... ..	·432	50·4
Acetic acid ... ..	·026	3·0
Sulphuric acid ... ..	·210	24·5
Phosphoric acid ... ..	·010	1·2
Total residue ... ..	2·764	322·5
Ash ... ..	·500	58·3
Alkalinity of ash ... ..	·009	1·0
Nitrogen ... ..	·025	2·9
Sulphate of potash ... ..	—	53·3
Bitartrate of potash ... ..	—	4·0

## OLD BROWN SHERRY.

Specific gravity	1004.480
Absolute alcohol by weight	16.210
Proof spirit	32.920
Grape sugar	4.015
Cane sugar	nil
Tartaric acid	.405
Acetic acid	.049
Sulphuric acid	.113
Phosphoric acid	.027
Total residue	6.493
Ash	.411
Nitrogen	.030
Alkalinity of ash	.028
Sulphate of potash	nil
Bitartrate of potash	nil

## SUPERIOR OLD MADEIRA.

		Grains in one bottle.
Specific gravity	1000.650	—
Absolute alcohol	16.155	1884.7
Proof Spirit	32.809	3827.7
Grape sugar	3.652	426.0
Cane sugar	—	—
Tartaric acid	.531	61.9
Acetic acid	.054	6.3
Sulphuric acid	.134	15.7
Phosphoric acid	.067	7.8
Total residue	5.925	691.2
Ash	.342	39.9
Alkalinity of ash	.053	6.2
Nitrogen	.018	2.1
Sulphate of potash	—	34.8
Bitartrate of potash	—	24.1

## SUPERIOR OLD BUHOL MADEIRA.

		Grains in one bottle.
Specific gravity	1002·080	
Absolute alcohol	16·084	1876·5
Proof spirit	32·664	3810·8
Grape sugar	2·348	273·9
Cane sugar	—	—
Tartaric acid	0·526	61·4
Acetic acid	·088	10·3
Sulphuric acid	·132	15·4
Phosphoric acid	·084	9·8
Total residue	6·409	747·7
Ash	·349	40·7
Alkalinity of ash	·036	4·2
Nitrogen	·022	2·6
Sulphate of potash	—	33·5
Bitartrate of potash	—	16·8

## BEST MARSALA.

		Grains in one bottle.
Specific gravity	1003·340	
Absolute alcohol by weight	15·523	1811·5
Proof spirit	31·545	3681·3
Grape sugar	3·598	419·8
Cane sugar	—	—
Tartaric acid	·465	54·2
Acetic acid	·054	6·3
Sulphuric acid	·136	15·9
Phosphoric acid	·059	6·9
Total residue	5·963	695·7
Ash	·412	48·1
Alkalinity of ash	·026	3·0
Nitrogen	·034	4·0
Sulphate of potash	—	34·6
Bitartrate of potash	—	12·0

## MANZANILLA (ORDINARY).

	Per cent.	Grains in one bottle= one-sixth of a gall.
Specific gravity ... ..	984·000	
Absolute alcohol by weight ... ..	20·333	2372·2
Proof spirit ... ..	41·294	4819·6
Grape sugar ... ..	·780	91·0
Cane sugar ... ..	—	—
Tartaric acid ... ..	·306	25·7
Acetic acid ... ..	·050	5·8
Sulphuric acid ... ..	·163	19·0
Phosphoric acid ... ..	·023	2·7
Total residue ... ..	2·464	287·4
Ash ... ..	·404	47·1
Alkalinity of ash ... ..	·028	3·2
Nitrogen ... ..	·028	3·2
Sulphate of potash ... ..	—	41·3
Bitartrate of potash ... ..	—	12·8

## FINEST MONTILLA SHERRY.

Specific gravity ... ..	990·500
Absolute alcohol by weight ... ..	15·830
Grape sugar ... ..	1·553
Cane sugar ... ..	—
Tartaric acid ... ..	·411
Acetic acid ... ..	·042
Sulphuric acid ... ..	·087
Phosphoric acid .. ..	·026
Total residue ... ..	3·322
Ash ... ..	·629
Alkalinity of ash ... ..	·019
Nitrogen ... ..	·025
Sulphate of potash ... ..	—
Bitartrate of potash ... ..	—
Proof spirit... ..	32·140

## SANTIAGO SHERRY.

Specific gravity ... ..	990·000
Absolute alcohol by weight ... ..	14·640
Proof spirit... ..	29·723
Grape sugar ... ..	·087
Cane sugar ... ..	—
Tartaric acid ... ..	·426
Acetic acid ... ..	·067
Sulphuric acid ... ..	·206
Phosphoric acid... ..	·021
Total residue ... ..	3·005
Ash ... ..	·602
Alkalinity of ash ... ..	·044
Sulphate of potash ... ..	—
Bitartrate of potash ... ..	—
Nitrogen ... ..	·024

## AMONTILLADO SHERRY.

Specific gravity @ 60° Fahrenheit... ..	987·6000
Absolute alcohol by weight ... ..	17·0980
Proof spirit... ..	34·7230
Grape sugar ... ..	·9910
Cane sugar .. ..	—
Tartaric acid ... ..	·3750
Acetic acid ... ..	·0210
Sulphuric acid ... ..	·0870
Phosphoric acid... ..	·0168
Total residue ... ..	2 4220
Ash ... ..	·5320
Alkalinity of ash ... ..	·0190
Nitrogen ... ..	·0200
Sulphate of potash ... ..	—
Bitartrate of potash ... ..	—

## WINE, Sediment first formed in "Bragonnot."

Albuminous matter ... ..	21
(Cream of tartar ... ..	61
Tartarate of lime ... ..	5
Phosphate of lime ... ..	6
Sulphate of lime ... ..	2
Alumina—wax-like, fat, &c., &c. ... ..	5
	<hr/>
	100

## PORT WINE.

	No. 1.	No. 2.
Specific gravity ... ..	999·500	992·200
	<hr/>	<hr/>
Alcohol ... ..	17·730	12·082
(Grape sugar ... ..	3·332	·669
Tartaric acid ... ..	·424	—
Acetic acid ... ..	·122	·048
Sulphuric acid ... ..	—	·032
Phosphoric acid... ..	·510	—
Residue ... ..	4·234	2·778
Ash ... ..	·237	·247
Alkalinity of ash ... ..	·670	·084

## GREEK WHITE WINE.

Specific gravity ... ..	1004·200
	<hr/>
Alcohol ... ..	11·240
(Grape sugar ... ..	6·171
Tartaric acid ... ..	·059
Acetic acid ... ..	·185
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·032
Residue ... ..	6·567
Ash ... ..	·348
Alkalinity of ash ... ..	·470
Bitartarate of potash ... ..	—

## HUNGARIAN WHITE WINE.

Specific gravity ... ..	991·600
Alcohol ... ..	10·230
Grape sugar ... ..	—
Tartaric acid ... ..	·056
Acetic acid ... ..	·179
Sulphuric acid ... ..	—
Phosphoric acid... ..	·031
Residue ... ..	1·026
Ash ... ..	·189
Alkalinity of ash ... ..	·025
Bitartrate of potash... ..	·047

## HUNGARIAN RED WINE.

Specific gravity ... ..	992·500
Alcohol ... ..	10·810
Grape sugar ... ..	—
Cane sugar ... ..	—
Tartaric acid ... ..	·122
Acetic acid ... ..	·191
Sulphuric acid ... ..	—
Phosphoric acid... ..	·035
Residue ... ..	1·677
Ash ... ..	·192
Alkalinity of ash ... ..	·054
Bitartrate of potash... ..	·122

## FRENCH RED WINE.

Specific gravity ... ..	999·800
Alcohol ... ..	10·440
Grape sugar ... ..	2·255
Cane sugar ... ..	—
Tartaric acid ... ..	·126
Acetic acid ... ..	·137
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·031
Ash ... ..	·223
Alkalinity of ash ... ..	·044
Bitartrate of potash ... ..	·081
Residue ... ..	2·145

## FRENCH WHITE WINE.

Specific gravity ... ..	992·200
Alcohol ... ..	10·840
Grape sugar ... ..	·088
Cane sugar ... ..	—
Tartaric acid ... ..	·102
Acetic acid ... ..	·169
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·031
Residue ... ..	1·257
Ash ... ..	·197
Alkalinity of ash ... ..	·024
Bitartrate of potash... ..	—

## WINES —SPANISH "NOVARINTA."

Total solid residue ... ..	7·685
Ash ... ..	·337
Potash ... ..	·112
Bitartrate of potash... ..	·135
Phosphoric acid ... ..	·055
Total acidity ... ..	·465
Tartaric acid (fixed) ... ..	·401
Acetic acid (volatile)... ..	·063
Alcohol by weight ... ..	14·934
Alcohol by volume ... ..	18·000
Equal to proof spirit... ..	32·580
Grape sugar... ..	6·330

## GERMAN WHITE WINE.

Specific gravity ... ..	993·500
Absolute alcohol ... ..	9·980
Grape sugar ... ..	·310
Cane sugar ... ..	—
Tartaric acid ... ..	·124
Acetic acid ... ..	·217
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·031
Residue ... ..	1·337
Ash ... ..	·182
Alkalinity of ash ... ..	·025
Bitartrate of potash... ..	·079

## GREEK RED WINE.

Specific gravity ... ..	1004·200
Alcohol ... ..	9·820
Grape sugar ... ..	—
Tartaric acid ... ..	—
Acetic acid ... ..	·170
Sulphuric acid ... ..	—
Phosphoric acid ... ..	—
Residue .. ..	2·790
Ash ... ..	·250
Alkalinity of ash ... ..	·090
Bitartrate of potash ... ..	—

## MARSALA.

Specific gravity ... ..	999·500
Alcohol ... ..	16·380
Grape sugar... ..	2·750
Tartaric acid ... ..	—
Acetic acid ... ..	·117
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·010
Residue ... ..	5·007
Ash ... ..	·311
Alkalinity of ash ... ..	·021
Bitartrate of potash... ..	—

## AUSTRALIAN RED WINE.

Specific gravity ... ..	1000·200
Alcohol ... ..	13·190
Grape sugar ... ..	2·642
Tartaric acid ... ..	·070
Acetic acid ... ..	·332
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·024
Residue ... ..	4·055
Ash ... ..	·266
Alkalinity of ash ... ..	·038
Bitartrate of potash... ..	—

## AUSTRALIAN WHITE WINE.

Specific gravity ... ..	989·500
Alcohol ... ..	13·370
Grape sugar ... ..	·183
Tartaric acid ... ..	·052
Acetic acid ... ..	·211
Sulphuric acid ... ..	—
Phosphoric acid ... ..	·012
Residue ... ..	1·639
Ash ... ..	·234
Alkalinity of ash ... ..	·031
Bitartrate of potash... ..	—

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## W A T E R S.

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## WATER of Neuragoczi, on the Saale.

	In 100·000 parts.
Silica ... ..	3·16
Alumina .. ..	2·12
Ferrous carbonate ... ..	2·68
Potassic sulphate ... ..	30·06
Calcic carbonate... ..	21·30
Calcic sulphate ... ..	32·24
Magnesian carbonate ... ..	—
Magnesian sulphate ... ..	14·47
Sodic carbonate ... ..	50·08
Magnesian chloride ... ..	—
Sodic chloride ... ..	1010·00
Organic matter ... ..	5·49
Total constituents ... ..	1171·60

## WATER of the Rhine, near Koln.

	Grammes in 10 litres.
Chlorine ... ..	·0247
Sulphuric acid ... ..	·1957
Lime ... ..	·7494
Magnesia ... ..	·2254
Soda ... ..	·0160
Potash ... ..	trace
Ferrie oxide... ..	·0012
Alumina ... ..	·0010
Silica ... ..	·0040
Phosphoric acid ... ..	·0061
Nitric acid ... ..	trace
Carbonic acid ... ..	·7071
Water ... ..	·0696
Organic matter ... ..	·5198

## WATER, New River Company.

	19·3 grs. $\text{℥}$ imp. gallon.
Carbonate of lime and magnesia ... ..	12·6
Sulphate of lime... ..	1·9
Alkaline sulphates ... ..	·2
Alkaline chlorides ... ..	1·2
Alkaline nitrates ... ..	1·0
Silica, alumina, &c. ... ..	·5
Organic matter ... ..	1·9

## WATER, Thames at high tide at London Bridge.

Carbonates of lime and magnesia ... ..	11·7
Sulphate of lime... ..	4·3
Alkaline sulphates ... ..	·6
Alkaline chlorides ... ..	11·1
Alkaline nitrates ... ..	2·0
Silica, alumina, &c. ... ..	·4
Organic matters ... ..	3·7
Amount of grains per imperial gallon ... ..	33·8

## WATER, River Mahanuddy.

	Centigrs. per litre.
Potassium ... ..	·137
Sodium ... ..	·493
Magnesium ... ..	·385
Calcium ... ..	1.314
Iron ... ..	·015
Chlorine ... ..	·170
Sulphuric acid ... ..	·090
Nitric acid ... ..	·620
Phosphoric acid ... ..	·060
Silicic anhydride ... ..	2·785
Oxygen of silicates ... ..	·247
Carbonic acid ... ..	2·253

## WATERS.

	Seine.	Rhine.	Garonne.
Carbonate of lime ... ..	11·609	9·511	4·524
Sulphate of lime ... ..	1·886	1·030	—
Carbonate of magnesia ... ..	·189	·350	·238
Sulphate of soda... ..	—	·946	·371
Carbonate of soda ... ..	—	—	·455
Chloride of sodium ... ..	·862	·140	·224
Sulphate of potassa ... ..	·350	—	·533
Nitrate of potassa ... ..	—	2·660	—
Nitrate of soda ... ..	·659	—	—
Nitrate of magnesia ... ..	·364	—	—
Alumina ... ..	·035	·175	—
Oxide of iron ... ..	·175	·406	·217
Silicic acid ... ..	1·711	3·423	2·813
	<hr/>	<hr/>	<hr/>
	17·840	18·641	9·375

## WATER.

	Grains per Imperial Gallon.		
	Loire.	Rhone.	Doubs.
Carbonate of lime ... ..	3·374	5·334	13·397
Carbonate of magnesia ... ..	·427	3·430	·161
Chloride of magnesium ... ..	—	—	·035
Sulphate of soda ... ..	·238	·519	·357
Carbonate of soda ... ..	1·023	—	—
Chloride of sodium ... ..	·336	·119	·161
Nitrate of potassa ... ..	—	·280	·287
Nitrate of soda ... ..	—	·315	·273
Earthy phosphates ... ..	—	·333	—
Alumina ... ..	·498	nil.	·147
Oxide of iron ... ..	·385	nil.	·210
Silicic acid ... ..	2·848	1·669	1·114
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	9·129	11·999	16·142

## WATER, Nile.

17·87 grains residue, consisting of

Organic matter ... ..	2·12
Oxides of iron and alumina, with traces of phosphoric acid ... ..	·07
Silicate of lime ... ..	1·85
Carbonate of lime ... ..	4·36
Carbonate of magnesia ... ..	2·81
Carbonate of potash ... ..	·66
Carbonate of soda ... ..	3·26
Chloride of sodium ... ..	2·30
Sulphate of potash ... ..	·93
Nitrate of potash ... ..	·18

## WATER, Nile.

11·88 solid residue per imperial gallon.

Organic matter ... ..	1·54
Oxides of iron and alumina ... ..	1·04
Carbonate of lime ... ..	1·41
Silicate of lime ... ..	3·87
Sulphate of lime... ..	1·32
Chloride of sodium ... ..	·79
Carbonate of soda ... ..	·48
Nitrate of potash ... ..	·84
Carbonate of magnesia ... ..	1·15

## WATER—River.

Grains per imperial gallon.

	Trent.	Dea.	Don.
Carbonate of lime ... ..	·32	·85	2·23
Sulphate of lime... ..	21·55	·12	·13
Nitrate of lime ... ..	—	—	—
Carbonate of magnesia ... ..	5·66	·36	1·07
Chloride of sodium ... ..	17·63	·72	1·26
Silica ... ..	·72	·14	·52
Iron and alumina ... ..	·50	·06	·27
Phosphate of lime ... ..	trace	trace	trace
Organic matter ... ..	3·68	1·64	3·06
	—	—	—
	50·06	3·89	8·54

WATERS.						South Esk.	Tweeddale Burn.
Carbonate of lime	...	...	...	...	...	1·430	1·550
Carbonate of magnesia	...	...	...	...	...	·970	·640
Sulphate of lime...	...	...	...	...	...	·980	·420
Chloride of sodium	...	...	...	...	...	1·540	1·040
Silica and oxide of iron	...	...	...	...	...	·270	·360
Organic matter	...	...	...	...	...	·520	1·260
Total grains per gallon						5·710	5·270
Saline ammonia						·005	·002
Organic ammonia						·009	·005
Hardness before boiling						3·60°	3·60°
Hardness after boiling						3·10°	2·40°

WATERS.						Grains per imperial gallon.	
						River Clyde.	River Severn.
Carbonate of lime	...	...	...	...	...	2·52	·50
Sulphate of lime...	...	...	...	...	...	·26	·52
Carbonate of magnesia	...	...	...	...	...	·72	nil.
Chloride of magnesium	...	...	...	...	...	·40	·66
Sulphate of soda...	...	...	...	...	...	1·94	·39
Chloride of sodium	...	...	...	...	...	·54	·73
Sulphate of potash	...	...	...	...	...	1·94	·39
Earthy phosphates	...	...	...	...	...	·31	·18
Alumina	...	...	...	...	...	·28	·32
Silicic acid	...	...	...	...	...	·28	·32
Organic matter	...	...	...	...	...	·89	·45
						10·08	4·46

## WATER—Dunne Canal.

Sulphate of lime...	...	...	...	...	...	3·70
Chloride of sodium	...	...	...	...	...	4·10
Carbonate of lime	...	...	...	...	...	5·60
Carbonate of magnesia	...	...	...	...	...	3·97
Silica	...	...	...	...	...	·16
Iron, alumina and phosphates...	...	...	...	...	...	·95
Organic matter	...	...	...	...	...	2·10
						20·58

WATERS.	Loch Katrine.	St. Mary's Loch.	Portmore Loch.
Organic matter ... ..	·80	2·00	·92
Earthy carbonates ... ..	·35	·79	1·93
Sulphate of lime... ..	·64	·81	·45
Chloride of sodium ... ..	·79	·59	1·01
Nitrate of magnesia ... ..	trace	trace	trace
Silica, oxide of iron and alumina ... .. }	·10	·20	·23
Total grains per gallon ...	2·68	4·39	4·54
Hardness before boiling ...	1·3°	1·6°	2·4°
Hardness after boiling ...	1·0°	1·4°	2·0°
Free ammonia ... ..	·003	·005	·002
Organic ammonia ... ..	·010	·012	·004
Nitric acid ... ..	trace	trace	trace

## WATER, Ben Rhydding, Yorkshire.

Carbonate of lime ... ..	}	merest
Carbonate of magnesia ... ..		traces
Chloride of sodium ... ..		·914
Chloride of magnesium ... ..		trace
Sulphate of lime... ..		2·295
Sulphate of soda ... ..		·511
Silicate of potash ... ..		1·315
Amount of grains per imperial gallon ... ..		5·035

WATERS.	Hawes- water Lake.	Ulls- water Lake.	Thirl- mere Lake.
Lime ... ..	·50	·81	·42
Magnesia ... ..	·18	·20	·14
Soda ... ..	·71	·51	·46
Chloride of sodium and potassium ... .. }	·40	·69	·77
Oxide of iron, silica ... ..	·25	·20	·05
Sulphuric acid ... ..	·51	·37	·44
Carbonic acid ... ..	·82	1·03	·56
Organic matter ... ..	·62	·35	·77
Total grains per gallon ...	3·99	4·16	3·61
Hardness before boiling ...	2·0°	2·1°	1·5°
Hardness after boiling ...	1·8°	2·1°	1·5°

## WATERS of Surrey.

	Critch- mere.	Punch bowl.
Carbonate of lime ... ..	—	—
Sulphate of lime... ..	1·07	·590
Silicate of lime ... ..	—	1·000
Silicate of magnesia ... ..	—	·300
Carbonate of magnesia ... ..	traces	—
Chloride of sodium ... ..	·88	·740
Sulphate of soda ... ..	—	·040
Chloride of potassium ... ..	·26	—
Sulphate of potass ... ..	·03	·090
Silica ... ..	1·00	·100
Iron, alumina, &c. ... ..	—	·020
Organic matter ... ..	·90	1·300
Total fixed residue ... ..	4·14	4·180
Hardness ... ..	1·86°	2·45°

## WATER, British Channel, Brighton.

	In 1000 grs.
Water ... ..	964·745
Chloride of sodium ... ..	27·059
Chloride of potassium ... ..	·766
Chloride of magnesium ... ..	3·666
Bromide of magnesium ... ..	·029
Sulphate of magnesia ... ..	2·296
Sulphate of calcium ... ..	1·406
Carbonate of lime ... ..	·033
Iodine and ammoniacal salts ... ..	—
	1000·000

## WATER, Dead Sea.

Chloride of sodium ... ..	10·360
Chloride of calcium ... ..	3·920
Chloride of magnesium ... ..	10·246
Sulphate of lime ... ..	·054
Water ... ..	75·420
	100·000

WATERS.				English Channel.	Mediterranean.
Chloride of sodium	...	...	...	27·05948	27·22
Chloride of potassium	...	...	...	·76552	·01
Chloride of magnesium	...	...	...	3·66658	6·14
Bromide of magnesium	...	...	...	·02919	nil.
Sulphate of magnesia	...	...	...	2·29578	7·02
Sulphate of lime	...	...	...	1·40662	·15
Carbonate of lime	...	...	...	·03301	} -20
Carbonate of magnesia	...	...	...	—	
Water	...	...	...	964·74382	959·26
				<hr/>	<hr/>
				1000·0000	1000·00

WATER, Irish Sea.				In grains per litre.
Chlorine	...	...	...	18·62650
Bromine	...	...	...	·06133
Sulphuric acid	...	...	...	2·59280
Lime	..	...	...	·57512
Calcium carbonate	...	...	...	·04754
Magnesia	...	...	...	2·03233
Alkaline chlorides	...	...	...	27·18363
Potassium	...	...	...	·39131
Sodium	...	...	...	10·40200
Ferric oxide...	...	...	...	·00465
Ammonia	...	...	...	·00011
Nitric acid	...	...	...	·00156
				<hr/>
Total solid contents	...	...	...	33·83855

WATER, St. Winnifred's Well, Holywell, N. Wales.

Carbonate of lime	...	...	...	13·685
Carbonate of magnesia	...	...	...	2·688
Proto-carbonate of iron	...	...	...	traces
Sulphate of lime	...	...	...	5·202
Chloride of sodium	...	...	...	·851
Chloride of calcium	...	...	...	3·094
Carbonate of soda	...	...	...	1·432
Sulphate of magnesia	...	...	...	traces
Silicic acid	...	...	...	2·737
				<hr/>
Total solids 30·450 per gallon	...	...	...	29·689

WATER, Malvern.	St. Ann's Well.	Holy Well.
Alumina ... ..	—	traces
Carbonate of iron ... ..	·0331	·22470
Carbonate of lime ... ..	·4310	1·02480
Carbonate of magnesia ... ..	·4111	1·48400
Carbonate of soda ... ..	·2844	·93310
Chloride of magnesium ... ..	·1448	—
Chloride of sodium ... ..	·8768	·94570
Iodide of potassium ... ..	·0002	—
Iodide of sodium ... ..	—	·00029
Silicic acid ... ..	·2057	·19250
Sulphate of lime... ..	1·1521	1·65690
Sulphate of soda ... ..	·4382	·09660
Organic matter ... ..	—	traces
	<hr/>	<hr/>
	3·9774	6·55859

## WATERS, Bromine Spring, Tenbury, Worcestershire.

	Imp. gall.
Chloride of sodium ... ..	1301·4
Chloride of lime... ..	425·6
Chloride of magnesium ... ..	51·3
Sulphate of lime... ..	6·0
Proto-carbonate of iron ... ..	1·5
Bromide of sodium ... ..	16·2
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Total saline contents... ..	1802·0

## WATER, Saline, from Purton, N. Wilts.

Carbonate of lime ... ..	40·608
Carbonate of magnesia ... ..	2·104
Lime ... ..	25·760
Magnesia ... ..	38·060
Potash ... ..	5·544
Soda ... ..	76·360
Chloride of sodium ... ..	—
Chlorine ... ..	22·480
Sulphuric acid ... ..	191·200
Carbonic acid ... ..	—
Silica .. ..	2·240
Phosphoric acid ... ..	·248
Iodine ... ..	·075
Bromine ... ..	traces
Apocrenic acid ... ..	·896
Crenic acid ... ..	traces
Organic matter ... ..	—
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Grains per imperial gallon ... ..	405·575

## SPRING WATER, Bridgwater Brewery.

	In one gallon.
Chloride of magnesium ... ..	trace
Nitrate of magnesia ... ..	2·55
Chloride of sodium ... ..	1·60
Carbonate of lime and magnesia ... ..	14·40
Sulphate of lime... ..	1·60
Sulphate of magnesia ... ..	·64
Silica ... ..	2·24

## WATERS.

	Burton. Allsopp's.	Leeds. Teltey's.
Carbonate of lime ... ..	15·51	19·78
Carbonate of magnesia ... ..	1·70	
Carbonate of protoxide of iron ... ..	·70	·93
Sulphate of lime... ..	18·96	4·97
Sulphate of potash ... ..	7·65	—
Sulphate of soda... ..	—	13·09
Sulphate of magnesia... ..	9·95	9·73
Chloride of sodium ... ..	10·12	7·11
Chloride of magnesium ... ..	—	4·74
Silica and loss ... ..	·79	1·72
Total grains per gallon ... ..	65·38	62·07

## WATER, Leamington.

Muriate of soda ... ..	40·700
Sulphate of soda ... ..	40·398
Muriate of lime ... ..	20·561
Muriate of magnesia... ..	3·266

With carbonic acid, azote and oxygen.

## WATER, Montpellier—Strong Sulphur Well.

Ammonia ... ..	trace
Carbonate of iron ... ..	trace
Carbonate of lime ... ..	24·182
Chloride of calcium ... ..	61·910
Chloride of magnesium ... ..	54·667
Chloride of potassium ... ..	5·750
Chloride of sodium ... ..	803·093
Silica ... ..	1·840
Sulphate of lime... ..	·594
Sulphide of sodium ... ..	14·414
Grains in one gallon ... ..	966·450

## WATER, Mild Sulphur, Montpelier.

Ammonia, bromide of sodium, carbonate of iron...	traces
Carbonate of lime ... ..	20·457
Carbonate of magnesia ... ..	3·251
Chloride of magnesium ... ..	17·140
Chloride of potassium ... ..	3·975
Chloride of sodium ... ..	232·413
Silica ... ..	·165
Sulphate of lime... ..	12·104
Sulphide of sodium ... ..	3·398
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Total grains in one gallon... ..	292·903

## WATER, Starbeck Sulphur Spa.

Ammonia, bromide of sodium, carbonate of iron...	traces
Carbonate of lime ... ..	6·960
Carbonate of potash ... ..	12·207
Carbonate of soda ... ..	5·133
Chloride of sodium ... ..	121·798
Organic matter ... ..	1·740
Silica ... ..	1·753
Sulphate of lime... ..	·870
Sulphide of sodium ... ..	1·711
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Total grains in one gallon... ..	157·562

## WATER, Baden Baden.

	Grs. per imp. gall.
Alumina ... ..	trace
Carbonate of iron ... ..	1·356
Carbonate of lime ... ..	14·184
Chloride of calcium ... ..	11·040
Chloride of potassium ... ..	13·720
Chloride of sodium ... ..	132·644
Organic matter ... ..	trace
Phosphate of lime ... ..	trace
Silicic acid ... ..	2·947
Sulphate of magnesia ... ..	5·236
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	181·127

## WATER, Warm Springs of Costa Rica.

	In 16 ozs.
Sulphate of potash ... ..	1·15
Sulphate of soda... ..	4·78
Chloride of sodium ... ..	7·55
Carbonate of lime ... ..	3·28
Carbonate of soda ... ..	1·11
Carbonate of magnesia ... ..	·86
Silica ... ..	·47
Loss ... ..	·54
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Grains in 16 ounces of water ... ..	19·74

## WATERS, Acidulous.

	Kilburn.
Carbonate of lime ... ..	2·40
Carbonate of magnesia ... ..	1·25
Carbonate of iron ... ..	·35
Sulphate of soda ... ..	18·20
Sulphate of lime... ..	13·00
Sulphate of magnesia ... ..	91·00
Chloride of sodium ... ..	6·00
Chloride of lime... ..	·06
Chloride of magnesia ... ..	2·80
Resins ... ..	6·00
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## WATER, Apollinaris.

Carbonate of soda ... ..	12·57
Chloride of sodium ... ..	4·66
Sulphate of soda ... ..	3·00
Phosphate of soda ... ..	traces
Salts of potass ... ..	traces
Carbonate of magnesia ... ..	4·42
Carbonate of lime ... ..	·59
Oxide of iron and alumina ... ..	·20
Silicic acid ... ..	·08
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Grains per gallon ... ..	25·52
Free and semi-combined carbonic acid ... ..	27·76
Combined carbonic acid ... ..	8·07

## WATERS, Calcareous, nearly pure.

	Bath. In 15360 grs. of water.	Buxton. In 58309 grs. of water.	Bristol. In 58309 grs. of water.
( Carbonate of lime ... ..	1·600	10·50	13·50
( Carbonate of iron ... ..	·004	—	—
( Sulphate of soda ... ..	3·000	—	11·20
( Sulphate of lime ... ..	18·000	2·50	11·70
( Chloride of sodium ... ..	6·600	1·50	4·00
( Silica ... ..	·400	—	—
( Chloride of magnesium ... ..	—	—	7·25

## WATERS, Chalybeate.

	Tunbridge. In 103643 grs. of water.	Brighton. In 58309 grs. of water.
( Carbonate of iron ... ..	1·00	—
( Sulphate of lime ... ..	1·25	32·70
( Chloride of sodium ... ..	·50	12·20
( Chloride of magnesium ... ..	2·25	6·00
( Sulphate of iron... ..	—	11·20
( Silica ... ..	—	1·12

## WATER, Chalybeate—Melrose.

( Carbonate of iron ... ..	17·5
( Alumina ... ..	1·8
( Silica ... ..	8·5
( Sulphate of magnesia ... ..	7·8
( Chloride of calcium ... ..	16·0
( Carbonate of lime ... ..	4·1
( Alkaline chlorides ... ..	11·4
( Grains per gallon ... ..	78·1

## WATERS, Pure (from Granite).

	100·000 parts.
( Solid constituents ... ..	2·44
( Organic matters... ..	1·57
( Chlorine ... ..	·33
( Sulphuric acid ... ..	·39
( Magnesia ... ..	·25
( Lime ... ..	·97
( Hardness ... ..	1·27

## WATERS, Pure.

	In 100,000 parts.	
	Clay slate.	Muschel chalk.
Solid constituents ... ..	8.80	32.50
Organic matter .. ..	.73	.90
Nitric acid ... ..	.05	.02
Chlorine ... ..	.25	.37
Sulphuric acid ... ..	2 to 4	1.37
Magnesia ... ..	.65	2.90
Lime ... ..	2.25	12.90
Hardness ... ..	3.15	16.95

## WATERS, Siliceous.

	Kissengen.	Kreuznach.
Carbonate of iron .. ..	6.80	3.64
Carbonate of lime ... ..	35.50	6.13
Carbonate of manganese ... ..	trace	6.54
Carbonate of magnesia ... ..	25.00	4.73
Carbonate of soda ... ..	8.20	—
Sulphate of lime... ..	25.00	—
Sulphate of soda... ..	20.00	—
Phosphate of soda ... ..	1.70	—
Chloride of ammonium .. ..	.50	—
Chloride of calcium ... ..	—	25.61
Chloride of lithium ... ..	—	.56
Chloride of magnesium ... ..	68.50	6.79
Chloride of potassium ... ..	9.10	4.07
Chloride of sodium ... ..	620.50	596.65
Iodide of sodium ... ..	—	.44
Bromide of magnesium ... ..	7.00	66.02
Alumina ... ..	1.80	4.32
Silicic acid ... ..	22.50	.31
Glairine ... ..	5.30	14.72
Grains in one gallon ... ..	857.40	760.53

## WATERS, Siliceous.

	Gastein.	Teplitz.	Wildbad.
Carbonate of iron ... ..	·22	·37	·20
Carbonate of lithia ... ..	—	1·82	—
Carbonate of lime ... ..	3·97	3·25	3·40
Carbonate of manganese ...	trace	·80	—
Carbonate of magnesia ...	·35	·53	·70
Carbonate of soda ... ..	6·90	26·84	5·30
Carbonate of strontia ...	trace	·19	—
Sulphate of potash ... ..	·55	4·34	·20
Sulphate of soda ... ..	14·95	—	4·00
Phosphate of alumina ...	—	·22	—
Phosphate of soda ... ..	—	trace	—
Chloride of potassium ...	—	1·04	—
Chloride of sodium ... ..	3·40	4·33	18·20
Iodide of sodium ... ..	—	·56	—
Flouride of sodium ... ..	—	1·30	—
Flouride of alumina ... ..	·50	—	—
Silicic acid ... ..	2·02	3·12	3·90
Glairine ... ..	trace	·90	—
Total grains in 1 gallon ...	25·96	49·61	35·90

## WATERS, Siliceous.

	Carlsbad.	Ems.	Selters.
Carbonate of baryta ... ..	—	·030	—
Carbonate of iron ... ..	·27	·260	1·54
Carbonate of lime ... ..	23·70	11·400	18·86
Carbonate of manganese ...	·06	·030	—
Carbonate of magnesia ...	13·69	7·880	15·95
Carbonate of soda ... ..	96·95	107·500	58·55
Carbonate of strontia ...	·07	·100	trace
Sulphate of potash ... ..	—	5·400	—
Sulphate of soda... ..	198·69	—	2·48
Phosphate of alumina ...	·02	·018	—
Phosphate of lime ... ..	·01	—	—
Phosphate of soda ... ..	—	—	2·81
Chloride of potassium ...	—	·450	3·58
Chloride of sodium ... ..	79·75	76·340	162·85
Flouride of calcium ... ..	·24	·019	—
Silicic acid ... ..	5·77	4·140	2·89
Total grains per gallon ...	419·22	213·567	269·32

# S O I L S .

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## SHEBAH, Egyptian nitre earth.

Organic matter ... ..	5·25
Oxide of iron ... ..	5·31
Alumina ... ..	7·86
Sulphate of lime... ..	1·05
Phosphate of lime ... ..	·46
Carbonate of lime ... ..	3·06
Magnesia ... ..	1·60
Nitrate of potash ... ..	1·01
Chloride of sodium ... ..	1·42
Soda ... ..	·16
Potash ... ..	·79
Clay and sand ... ..	72·03
	100·00

## SOIL, reclaimed from Haarlem Lake, Holland.

Dried at 212° Fahrenheit.

Organic matter and water of combination ... ..	14·71
Oxides of iron and alumina ... ..	9·27
Ferrous sulphate (green vitriol) ... ..	·74
Bisulphide of iron ... ..	·71
Sulphuric acid, united with oxide of iron as } basic sulphate of iron ... .. }	1·08
Sulphate of lime... ..	1·72
Magnesia ... ..	·73
Phosphoric acid ... ..	·27
Potash ... ..	·53
Soda ... ..	·32
Chloride of sodium ... ..	·09
Insoluble matter... ..	69·83
	100·00
Ammonia ... ..	·62

## SOIL, of Tanah (Lower Egypt).

	Recent.	Ancient.
Organic matter ... ..	9·915	4·308
Clay, silica, oxide of iron, phosphates of iron and magnesia }	84·093	89·605
Chloride of sodium ... ..	5·147	4·520
Calcium sulphate ... ..	·015	·129
Nitric acid of nitrates ... ..	·171	·949
Ammonia ready formed ... ..	·039	·365
Nitrogen of the organic matter ...	·620	·124
	<hr/>	<hr/>
	100·000	100·000
	<hr/>	<hr/>
Total Nitrogen ... ..	·696	·670

## SOILS, Fertile Sandy Loam.

Moisture ... ..	2·95
Organic matter and water of combination ... ..	6·75
Oxides of iron and alumina ... ..	6·10
Carbonate of lime ... ..	1·22
Alkalies and magnesia ... ..	1·20
Sand and clay ... ..	82·22
	<hr/>
	100·44

## SOIL. Sandy, Growing luxuriant pulse crops.

Silica and quartz sand ... ..	90·221
Alumina ... ..	2·106
Oxide of iron ... ..	3·951
Oxide of manganese ... ..	·960
Lime ... ..	·539
Magnesia ... ..	·730
Potash ... ..	·066
Soda ... ..	·010
Phosphoric acid ... ..	·367
Sulphuric acid ... ..	trace
Chlorine ... ..	·010
Organic matter ... ..	1·040
	<hr/>
	100·000





## SOIL. Loamy, fine wheat land.

Silica ... ..	63·19
Peroxide of iron...	4·87
Alumina ... ..	14·04
Lime ... ..	·83
Magnesia ... ..	1·02
Potash ... ..	2·80
Soda ... ..	1·43
Sulphuric acid ... ..	·09
Phosphoric acid ... ..	·24
Organic matter ... ..	8·55
Water ... ..	2·94
	<hr/>
	100·00

SOILS. Vegetable moulds, boggy and sterile.  
(Germany.)

Organic matter and water of combination ... ..	90·44	
Potash ... ..	}	·01
Soda ... ..		
Ammonia ... ..		trace
Lime ... ..		·55
Magnesia ... ..		·08
Peroxide of iron...	}	·12
Protoxide of iron ... ..		
Alumina ... ..		·63
Phosphoric acid ... ..		·02
Sulphuric acid ... ..		·19
Chlorine ... ..		trace
Soluble and insoluble silica ... ..		7·96
		<hr/>
		100·00

## SOIL. Pasture land.

Moisture ... ..	2·420
Organic matter ... ..	11·700
Oxides of iron and alumina ... ..	11·860
Carbonate of lime .. ..	1·240
Sulphate of lime... ..	·306
Phosphoric acid ... ..	·080
Sulphuric acid ... ..	<hr/>
Chloride of sodium ... ..	·112
Potash ... ..	·910
Soluble silica ... ..	4·090
Insoluble silica ... ..	67·530
	<hr/>
	100·248

## SOILS. Fertile vegetable moulds.

Organic matter and combined water	...	...	...	12.502
Potash	...	...	...	1.430
Soda	...	...	...	2.069
Ammonia	...	...	...	.078
Lime	...	...	...	5.096
Magnesia	...	...	...	.140
Peroxide of iron	...	...	...	10.305
Protoxide of iron	...	...	...	.563
Protoxide of manganese	...	...	...	.354
Alumina	...	...	...	2.576
Phosphoric acid	...	...	...	.324
Sulphuric acid	...	...	...	1.104
Carbonic acid	...	...	...	6.940
Chlorine	...	...	...	1.382
Soluble silica	...	...	...	2.496
Insoluble silicates	...	...	...	51.706
Loss	...	...	...	.935
				<hr/>
				100.000

## SOILS. Suitable for growth of lupines. Oxon.

Moisture	...	...	...	...	.96
*Organic matter	...	...	...	...	1.46
Oxide of iron and alumina	...	...	...	...	1.84
Phosphoric acid	...	...	...	...	.17
Carbonate of lime	...	...	...	...	.23
Sulphate of lime	...	...	...	...	.04
Magnesia	...	...	...	...	.24
Potash	...	...	...	...	.12
Chloride of sodium	...	...	...	...	traces
Fine quartz sand	...	...	...	...	95.01
					<hr/>
					100.07
*Containing nitrogen...	...	...	...	...	.075
Equal to ammonia	...	...	...	...	.091

## SOIL. Marly.

Moisture	4.72
Organic matter	11.03
Oxide of iron	9.98
Alumina	6.06
Carbonate of lime	12.10
Sulphate of lime	.75
Magnesia and alkalies	1.43
Soluble silica	17.93
Insoluble silica	36.00
	<hr/>
	100.00

## SOILS. Marly. Gloucestershire.

Organic matter and water of combination	10.50
Oxide of iron and alumina	11.92
Carbonate of lime	19.92
Carbonate of magnesia	.25
Potash	.62
Soda	.09
Phosphoric acid	.38
Sulphuric acid	.04
Soluble silica	13.45
Insoluble silicates and sand	42.07
Loss	.76
	<hr/>
	100.00

## SOILS. Clay. Cirencester.

	No. 1.	No. 2.
Water driven off at 212° Fah.	5.539	—
Organic matter and water of combination	3.621	3.38
Oxides of iron	3.070	8.82
Alumina		6.67
Carbonate of lime	.740	—
Lime	—	1.44
Magnesia	.605	.92
Potash	.269	1.48
Soda	.220	1.08
Phosphoric acid	.386	.51
Soluble silica	1.450	72.83
Insoluble silicates	84.100	
Chlorine and sulphuric acid	traces	traces
Carbonic acid and loss	traces	2.87
	<hr/>	<hr/>
	100.000	100.00

## TEA PLANTATION, Soils of

	No. 1.	No. 2.
Moisture ... ..	4·543	5·325
*Organic and volatile matters ... ..	4·920	4·745
Sand and insoluble substances ...	76·144	74·660
Soda ... ..	·278	·175
Potash ... ..	·247	·265
Magnesia ... ..	·176	·258
Lime ... ..	·092	·141
Oxide of iron manganese ... ..	8·208	7·410
Alumina ... ..	4·451	5·940
Phosphoric acid ... ..	·124	·160
Sulphuric acid ... ..	·163	·129
Carbonic acid ... ..	trace	trace
Chlorine ... ..	·062	·210
	<hr/>	<hr/>
	99·408	99·418
*Nitrogen ... ..	·438	·134

# M A N U R E S .

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## AMMONIA. Sulphate of

Moisture ... ..	6·59
Sulphate of ammonia ... ..	91·94
Mineral impurities ... ..	1·47
	100·00

## AMMONIA. Ulmate of

Moisture ... ..	11·59
Organic matter and ammoniacal salts ... ..	75·94
Oxides of iron, alumina, &c. ... ..	2·52
Alkalies and magnesia ... ..	1·26
Sand ... ..	6·47
Carbonate of lime ... ..	2·22
	100·00

## BONES.

	No. 1.	No. 2.	No. 3.
Moisture ... ..	12·67	12·02	12·31
*Organic matter ... ..	30·12	28·71	30·73
Phospate of lime and magnesia	48·14	49·28	49·72
Carbonate of lime ... ..	6·99	4·37	4·25
Alkaline salts ... ..	1·91	4·55	2·78
Sand ... ..	·17	1·07	·21
	100·00	100·00	100·00
*Containing nitrogen... ..		3·44	3·73

**BONES, Boiled.**

	No. 1.	No. 2.
Moisture ... ..	8·06	7·70
*Organic matter ... ..	25·45	25·27
Phosphate of lime and magnesia ... ..	60·48	43·73
Carbonate of lime ... ..	3·25	9·77
Alkaline salts ... ..	·43	
Sand ... ..	2·33	13·53
	<hr/>	<hr/>
	100·00	100·00
*Ammonia ... ..	2·24	3·37

**BONE DUST.**

	No. 1.	No. 2.
Moisture ... ..	10·36	12·06
*Organic matter ... ..	30·92	29·12
Phosphates of lime and magnesia ... ..	52·44	49·54
Carbonate of lime ... ..	5·16	6·99
Alkaline salts ... ..	·84	1·91
Sand ... ..	·28	·38
	<hr/>	<hr/>
	100·00	100·00
*Containing nitrogen... ..	3·51	3·69
Equal to ammonia ... ..	4·56	4·49

**BONE SHAVINGS.**

Moisture ... ..	13·12
*Organic matter ... ..	26·12
Phosphates ... ..	53·74
Carbonate of lime ... ..	5·39
Alkaline salts ... ..	·78
Sand ... ..	·85
	<hr/>
	100·00
*Containing ammonia ... ..	3·98

**BONE DUST (Rotten).**

	No. 1.	No. 2.
Moisture ... ..	21·55	12·02
*Organic matter ... ..	18·52	28·71
Phosphates of lime and magnesia ... ..	39·24	49·28
Carbonate of lime and salt ... ..	19·14	8·92
Sand ... ..	1·55	1·07
	<hr/>	<hr/>
	100·00	100·00
*Containing nitrogen... ..	1·82	3·47
Equal to ammonia ... ..	2·21	4·14

BONE ASH.		Pure from Shank Bone of Horse.	From Ox Bone.
*Phosphoric acid	...	40·29	39·81
Lime	...	55·01	55·43
Magnesia	...	·84	·80
Potash	...	·25	·49
Soda	...	·03	·60
Carbonic acid	...	2·99	3·52
Sulphuric acid	...	} traces	·04
Chlorine	...		·06
		<hr/>	<hr/>
		99·41	100·75
*Equal to bone earth...	...	87·29	86·25

### BONE PHOSPHATES (precipitated).

Moisture and water of combination	...	30·20
Phosphoric acid	...	23·83
Lime	...	34·52
Magnesia, chlorine, &c.	...	9·92
Sand	...	1·53
		<hr/>
		100·00

### BONE BLACK. From Sugar Refineries.

	No. 1.	No. 2.	No. 3.
Carbon nitrogenous	9·74	10·60	12·86
Calcic phosphate	82·80	83·20	81·80
Calcic carbonate	5·92	4·15	2·92
Calcic sulphate	·67	·64	·42
Ferric oxide	·33	·55	·67
Siliceous matters	·54	·86	1·33
		<hr/>	<hr/>
		100·00	100·00
		<hr/>	<hr/>
	No. 4.	No. 5.	No. 6.
Carbon nitrogenous	19·64	7·42	10·64
Calcic phosphate	73·20	87·08	80·56
Calcic carbonate	3·18	1·92	4·52
Calcic sulphate	1·12	·95	2·24
Ferric oxide	·66	·85	·72
Siliceous matters	2·20	1·78	1·32
		<hr/>	<hr/>
		100·00	100·00
		<hr/>	<hr/>

## IVORY DUST.

Moisture ... ..	13.12
*Organic matter ... ..	26.12
Phosphates of lime and magnesia ... ..	53.74
Carbonate of lime ... ..	5.39
Alkaline salts ... ..	.78
Sulphate of lime... ..	—
Sand ... ..	.85
	<hr/>
	100.00
	<hr/>
*Containing nitrogen... ..	3.28
Equal to ammonia ... ..	3.98

## COPROLITES. French, Boulogne.

	No. 1.	No. 2.	No. 3.
Moisture ... ..	3.86	1.15	3.38
Water of combination ... ..		1.70	
*Phosphoric acid ... ..	19.82	21.15	20.51
Lime ... ..	30.52	33.71	32.67
Oxides of iron and alumina ... ..	19.10	16.93	20.04
Insoluble matter... ..	26.70	25.36	23.40
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.00
*Equal to tribasic phosphate } of lime ... ..	43.28	44.94	44.77

## COPROLITES. Found near Bath.

Insoluble siliceous matter ... ..	6.15
Moisture ... ..	2.33
Organic matter and water of combination ... ..	9.87
Phosphates of lime and magnesia ... ..	51.51
Carbonate of lime ... ..	25.23
Carbonate of magnesia ... ..	1.99
Alkalies and loss ... ..	2.92
	<hr/>
	100.00

## COPROLITES. Suffolk or Pseudo.

	No. 1.	No. 2.
Moisture and water of combination, } with a trace of organic matter }	5.76	2.53
Lime ... ..	40.70	38.20
Magnesia ... ..	.34	1.34
*Phosphoric acid ... ..	28.34	24.24
Oxide of iron ... ..	4.87	4.81
Alumina ... ..		3.72
Carbonic acid ... ..	5.08	5.37
Sulphuric acid ... ..	.87	1.40
Potash ... ..	.78	.56
Soda ... ..	.25	1.18
Chlorine ... ..	traces	.07
Flourine and loss ... ..	3.00	4.31
Insoluble siliceous matter... ..	10.01	12.27
	<hr/>	<hr/>
	100.00	100.00
*Equal to bone earth... ..	61.30	52.52

## COPROLITES. Cambridge.

	No. 1.	No. 2.
Moisture and organic matter ... ..	4.01	4.63
Lime ... ..	45.39	43.21
Magnesia ... ..	.48	1.12
Oxide of iron ... ..	1.87	2.46
Alumina ... ..	2.57	1.36
*Phosphoric acid ... ..	26.75	25.29
Carbonic acid ... ..	5.13	6.66
Sulphuric acid ... ..	1.06	.76
Chloride of sodium ... ..	traces	.09
Potash ... ..	.84	.32
Soda ... ..	.73	.50
Insoluble siliceous matter... ..	6.22	8.64
Flourine and loss ... ..	4.95	4.96
	<hr/>	<hr/>
	100.00	100.00
*Equal to bone earth... ..	57.12	54.89

## COPROLITES. Bedfordshire.

Moisture and water of combination	...	...	...	3.35
*Phosphoric acid	...	...	...	23.47
Lime	...	...	...	35.29
Oxide of iron	...	...	...	5.39
Alumina, magnesia and flourine	...	...	...	7.24
†Carbonic acid	...	...	...	3.45
Insoluble matters	...	...	...	20.81
				<hr/>
				100.00
				<hr/>
*Equal to tribasic phosphate of lime	...	...	...	51.24
†Equal to carbonate of lime	...	...	...	7.84

## COPROLITES. Russian.

Moisture and water of combination	...	...	...	3.55
*Phosphoric acid	...	...	...	22.42
Lime	...	...	...	33.84
Oxide of iron, alumina, flourine, &c.	...	...	...	9.94
Insoluble siliceous matters	...	...	...	30.25
				<hr/>
				100.00
				<hr/>
*Equal to tribasic phosphate of lime	...	...	...	48.94

## DUNG OF NIGHTINGALES.

Sal ammoniac	...	...	...	20
Urate of ammonia with potass	...	...	...	52.70
Phosphate of ammonia with potass	...	...	...	80
Sulphate of potash	...	...	...	3.30
Phosphate of ammonia and magnesia	...	...	...	20
Chloride of sodium	...	...	...	80
Phosphate of lime	...	...	...	4.30
Water, ammonia and organic matter	...	...	...	37.70
				<hr/>
				100.00

## MANURE. Detailed Composition.

Water ... ..	66·17
Soluble organic matter ... ..	2·48
Soluble inorganic matter (ash) containing:—	
Soluble silica ... ..	·237
Phosphate of lime ... ..	·299
Lime ... ..	·066
Magnesia ... ..	·011
Potash ... ..	·573
Soda ... ..	·051
Chloride of sodium ... ..	·030
Sulphuric acid ... ..	·055
Carbonic acid and loss ... ..	·218
	— 1·54
Insoluble organic matter ... ..	25·76
Insoluble inorganic matter (ash) containing:—	
Soluble silica ... ..	·967
Insoluble silica ... ..	·561
Oxide of iron and alumina, with phosphates	·596
Containing phosphoric acid ... ..	(·178)
Equal to bone earth ... ..	(·386)
Lime ... ..	1·120
Magnesia ... ..	·143
Potash ... ..	·099
Soda ... ..	·019
Sulphuric acid ... ..	·061
Carbonic acid and loss ... ..	·484
	— 4·05
Total percentage... ..	100·00

## STABLE MANURE, Fresh.

Water ... ..	64·96
Organic matters ... ..	24·71
Mineral matters (ash) ... ..	10·33
	— 100·00

MANURE, Rotten Dung in Natural State.

(Detailed Composition.)

Water ... ..	75·42
*Soluble organic matter ... ..	3·71
‡Soluble inorganic matter consists of—	
Soluble silica ... ..	·254
Phosphate of lime ... ..	·382
Lime ... ..	·117
Magnesia ... ..	·047
Potash ... ..	·446
Soda ... ..	·023
Chloride of sodium... ..	·037
Sulphuric acid ... ..	·058
Carbonic acid and loss ... ..	·106
	1·47
†Insoluble organic matter ... ..	12·82
Insoluble inorganic matter (ash) soluble silica	1·424
Insoluble silica ... ..	1·010
Oxides of iron and alumina with phosphates	·947
Containing phosphoric acid ... ..	(·274)
Equal to bone earth ... ..	(·573)
Lime ... ..	1·667
Magnesia ... ..	·091
Potash ... ..	·045
Soda ... ..	·038
Sulphuric acid ... ..	·063
Carbonic acid and loss ... ..	1·295
	6·58
	<hr/> 100·00
* Containing nitrogen ... ..	·297
† Containing nitrogen. ... ..	·309

HORSE DUNG, Ash of.

Phosphate of lime ... ..	5·00
Carbonate of lime ... ..	18·75
Phosphate of magnesia ... ..	36·25
Silica ... ..	40·00
	<hr/> 100·00



## MANURE, Farm Yard, Scotch mixed.

Water ... ..	72·48
+Organic matter ... ..	13·94
Potash ... ..	·32
Soda ... ..	·16
Lime ... ..	·59
Magnesia ... ..	·02
Phosphoric acid... ..	·31
Sulphuric acid ... ..	·12
Carbonic acid ... ..	·52
Ferric oxide and alumina ... ..	·45
Sand ... ..	11·09
	<hr/>
	100·00
Nitrogen ... ..	·38

## MANURE, mixed long fresh Dung in natural state.

(General Composition.)

Water ... ..	66·17
*Soluble organic matter ... ..	2·48
Soluble inorganic matter ... ..	1·54
+Insoluble organic matter ... ..	25·76
Insoluble inorganic matter ... ..	4·05
	<hr/>
	100·00
* Containing nitrogen ... ..	·149
Equal to ammonia ... ..	·181
+Containing nitrogen ... ..	·494
Equal to ammonia ... ..	·599

## COW DUNG, Ash of.

Phosphate of lime ... ..	10·90
Phosphate of magnesia ... ..	10·00
Peroxide of iron ... ..	8·50
Lime ... ..	1·50
Sulphate of lime (gypsum) ... ..	3·10
Chloride of potassium ... ..	traces
Silica ... ..	63·70
Loss ... ..	2·30
	<hr/>
	100·00



West Riding Prison, Wakefield.

Earth Closet Manure.    Earth once used.    Earth twice used.    Earth thrice used.

Moisture ... ..	21·69	11·81	13·81
*Organic matter and water of combination ... ..	7·67	10·17	10·53
Oxide of iron and alumina ...	12·65	12·43	10·76
Phosphoric acid ... ..	·19	·39	·44
Carbonate of lime ... ..	1·76	1·88	1·84
Magnesia ... ..	2·06	·68	·78
Alkalies and loss ... ..		·64	·64
Sand and clay ... ..	53·98	62·00	61·20
	100·00	100·00	100·00
*Containing nitrogen ... ..	·29	·37	·44
Equal to ammonia ... ..	·35	·45	·53

HUMAN FÆCES, DRIED.—No. 1.

	Ash.	Dried excrement.
Organic matter ... ..		88·52
Insoluble matter ... ..	12·79	1·48
Oxide of iron ... ..	4·66	·54
Lime .. ... ..	14·98	1·72
Magnesia ... ..	13·48	1·55
Phosphoric acid ... ..	37·17	4·27
Sulphuric acid ... ..	2·10	·24
Potash ... ..	10·40	1·19
Soda ... ..	2·83	·31
Chloride of sodium ... ..	1·59	·18
	100·00	100·00
Nitrogen ... ..		5·00

## HUMAN FÆCES. Dried.—No. 2.

*Organic matter ... ..	88.52
Insoluble siliceous matter ... ..	1.48
Oxide of iron ... ..	.54
Lime ... ..	1.72
Magnesia ... ..	1.55
Phosphoric acid ... ..	4.27
Sulphuric acid ... ..	.24
Potash ... ..	1.19
Soda ... ..	.31
Chloride of sodium ... ..	.18
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	6.00
Equal to ammonia ... ..	7.28

## HUMAN FÆCES.—No. 3.

Water ... ..	75.00
*Organic matter ... ..	22.13
Insoluble siliceous matter ... ..	.37
Oxide of iron ... ..	.13
Lime ... ..	.43
Magnesia .. ...	.38
Phosphoric acid ... ..	1.07
Sulphuric acid ... ..	.06
Potash ... ..	.30
Soda ... ..	.08
Chloride of sodium ... ..	.05
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	1.50
Equal to ammonia ... ..	1.82

## HUMAN FÆCES.—No. 4.

Organic matter ... ..	850
Phosphate of lime ... ..	} 100
"    of magnesia ... ..	
Sulphate of lime ... ..	} traces.
"    of soda ... ..	
"    of potash ... ..	
Phosphate of soda ... ..	} 8
Carbonate of soda ... ..	
Silica ... ..	8
Loss and carbonaceous residue ... ..	16
	18
	<hr/>
	1000

# GUANOS.

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## GUANO. Guanape Island.

	No. 1.	No. 2.
Moisture ... ..	17·79	20·10
**Organic matter and ammoniacal salts ...	42·62	38·67
Phosphate of lime and magnesia ... ..	25·45	32·53
†Alkaline salts ... ..	11·92	5·97
Sand ... ..	2·22	2·73
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
**Containing nitrogen ... ..	10·04	7·87
Equal to ammonia ... ..	19·19	8·95
††Containing soluble phosphoric acid ...	4·75	3·19

## GUANO. Pacquico.

Water ... ..	9·54
Organic matter ... ..	30·54
Phosphates ... ..	18·43
Sulphate of lime ... ..	·93
Alkaline salts ... ..	34·58
Sand ... ..	5·98
	<hr/>
Ammonia ... ..	6·51

## GUANO. Native. A. B. C. Process.

	No. 1.	No. 2.
Water ... ..	7·91	6·12
**Organic matter... ..	19·40	22·45
Bone earth ... ..	2·40	2·81
Carbonate of lime ... ..	20·93	6·37
Magnesia and alkalies ... ..	2·92	3·56
Oxides of iron and alumina ... ..	9·78	6·59
Clay and sand ... ..	37·66	52·10
	<hr/>	<hr/>
	101·00	100·00
	<hr/>	<hr/>
**Containing nitrogen ... ..	·96	1·92
Equal to ammonia ... ..	1·16	2·23

## GUANOS. Ballestas Islands.

	1.	2.	3.	4.
Moisture ... ..	18·04	18·06	19·19	17·01
*Organic matter and ammonia salts ... }	49·22	46·81	48·19	50·35
Phosphates ... ..	22·18	23·20	20·69	22·09
†Alkalies ... ..	8·40	9·49	9·40	9·20
Silica ... ..	2·16	2·44	2·53	1·35
	<hr/> 100·00	<hr/> 100·00	<hr/> 100·00	<hr/> 100·00
*Containing nitrogen ...	12·91	12·27	13·60	13·26
Equal to ammonia ... ..	15·67	14·89	16·51	16·10
†Containing phosphoric acid	2·82	2·70	2·47	2·74
Equal to tribasic phosphate of lime ... }	6·16	5·89	5·39	5·98

## GUANO. Egyptian.

	1.	2.
Moisture ... ..	17·19	15·06
*Organic matter and salts of ammonia ...	39·50	39·30
Bone earth ... ..	18·28	19·89
Sulphate of lime ... ..	2·76	3·15
Alkaline salts ... ..	20·93	20·39
Insoluble siliceous matter ... ..	1·34	2·21
	<hr/> 100·00	<hr/> 100·00
*Containing nitrogen ... ..	11·81	10·93
Equal to ammonia ... ..	13·97	13·27

## GUANO.

	Ichaboe Bay.	Saldanah Bay.	Patagonian.	Bolivian.
Moisture ... ..	27·3	20·0	25·0	10·0
Organic matter and amoniactal salts ... }	34·3	14·9	18·3	21·7
Phosphates ... ..	30·3	56·4	44·0	51·5
Alkaline salts ... ..	5·0	5·8	2·1	14·1
Carbonate of lime ... ..	<hr/> 3·1	<hr/> 2·9	<hr/> 10·6	<hr/> 2·7
Sand ... ..	<hr/> 100·0	<hr/> 100·0	<hr/> 100·0	<hr/> 100·0

GUANO. Adulterated.

	1.	2.
Water ... ..	5.33	8.28
Organic matter ... ..	3.52	13.11
Oxide of iron and alumina ... ..	—	3.59
Phosphate of lime ... ..	18.10	2.35
Sulphate of lime ... ..	—	15.17
Carbonate of lime ... ..	69.75	8.00
Chloride of sodium ... ..	1.75	15.80
Sand ... ..	—	34.29
Magnesia ... ..	1.35	
Loss ... ..	.20	
	<hr/>	<hr/>
	100.00	100.50
	<hr/>	<hr/>
Containing nitrogen ... ..	.19	.52
Equal to ammonia ... ..	.23	.64

GUANOS. Good

	1.	2.
Water ... ..	12.42	12.00
Organic matter and ammoniacal salts ...	52.98	59.11
Bone earth ... ..	25.06	19.31
Alkaline salts, chiefly chlorides of } potassium and sodium ... .. }	8.26	8.13
Gypsum ... ..	—	—
Insoluble matters (sand) ... ..	1.50	1.45
	<hr/>	<hr/>
	100.22	100.00
	<hr/>	<hr/>
Yielding ammonia ... ..	17.21	19.30

GUANO. Kooria Moorla.

	No. 1.	No. 2.
Moisture ... ..	5.94	9.63
Organic matter ... ..	8.49	5.68
Phosphate of lime and magnesia ... ..	46.39	53.93
Sulphate of lime ... ..	11.73	4.37
Alkaline salts ... ..	5.12	6.48
Insoluble siliceous matter ... ..	22.33	19.91
	<hr/>	<hr/>
	100.00	100.00
	<hr/>	<hr/>
Containing nitrogen ... ..	.30	.33

## GUANO. Peruvian.

Moisture ... ..	15.14
*Organic matter and salts of ammonia ... ..	52.81
Bone earth ... ..	20.26
†Alkaline salts ... ..	10.52
Insoluble siliceous matter ... ..	1.27
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	15.41
Equal to ammonia ... ..	18.56
†Containing phosphoric acid ... ..	2.48
Equal to bone earth ... ..	5.36

## GUANO. Punta de Lobos.

	1.	2.	3.
Moisture ... ..	14.53	14.06	4.79
*Organic matter and ammonia } salts ... ..	35.77	49.74	17.14
Phosphate of lime ... ..	26.50	21.40	23.09
†Alkaline salts ... ..	20.35	13.45	27.04
Insoluble matters ... ..	2.85	1.35	27.94
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.00
	<hr/>	<hr/>	<hr/>
*Containing nitrogen ... ..	6.55	9.99	2.64
Equal to ammonia ... ..	7.95	12.13	3.21
†Containing phosphoric acid ... ..	3.20	1.21	.38
Equal to phosphate of lime ... ..	6.98	2.64	.84
Total phosphoric acid ... ..	15.34	11.01	10.95

## GUANOS. Papillon de Pica.

	1.	2.	3.
Moisture ... ..	4.13	3.20	5.45
Organic matter and ammonia- } cal salts ... ..	59.01	46.17	49.40
Earthy phosphates ... ..	21.82	25.51	27.01
Alkaline salts ... ..	9.00	15.49	15.99
Sand ... ..	6.04	9.63	2.15
	<hr/>	<hr/>	<hr/>
Phosphoric acid .. ..	11.67	13.49	14.06
Nitrogen ... ..	15.08	9.81	9.15
Nitric acid ... ..	.04	.01	.51

GUANO. Huanillos.

	1.	2.
Moisture ... ..	8.23	5.25
Organic matter and ammoniacal salts ...	46.46	41.90
Phosphates ... ..	22.45	30.21
Alkalies ... ..	19.22	16.73
Sand ... ..	3.64	5.91
	<hr/>	<hr/>
Phosphoric acid ... ..	15.62	15.30
Nitrogen ... ..	10.40	7.45
Nitric acid ... ..	2.87	2.46

GUANO. Malden Island.

Iron oxide ... ..	.26
Potash ... ..	.28
Soda ... ..	1.71
Magnesia ... ..	1.86
Lime ... ..	43.51
Phosphoric acid ... ..	37.58
Sulphuric acid .. ..	.22
Carbonic acid ... ..	2.61
Chlorine ... ..	.82
Sand ... ..	.01
Organic matter ... ..	6.64
Water ... ..	4.70
Nitrogen ... ..	.29

GUANO. Patagonian.

Moisture ... ..	35.86
**Organic matter and ammonial salts ... ..	26.07
Phosphate of lime ... ..	22.01
Carbonate of lime ... ..	5.64
Alkaline salts ... ..	7.34
Insoluble matter ... ..	3.08
	<hr/>
	100.00
	<hr/>
**Nitrogen ... ..	4.42
Equal to ammonia ... ..	5.37

## ANIMAL GUANO. Australia.

Moisture	...	...	...	...	...	...	...	...	18.20
*Organic matter	...	...	...	...	...	...	...	...	41.78
†Phosphoric acid	...	...	...	...	...	...	...	...	15.01
Lime	...	...	...	...	...	...	...	...	18.52
Alkaline salts	...	...	...	...	...	...	...	...	.90
Insoluble matters	...	...	...	...	...	...	...	...	5.59
									<hr/> 100.00
*Containing nitrogen	...	...	...	...	...	...	...	...	3.85
†Equal to tribasic phosphate	...	...	...	...	...	...	...	...	32.75

## GUANO. Mejillones.

Moisture	..	...	...	...	..	...	...	...	7.09
*Organic matter	...	...	...	...	...	...	...	...	7.44
†Phosphoric acid	...	...	...	...	...	...	...	...	33.97
Lime	...	...	...	...	...	...	...	...	37.01
Magnesia	...	..	...	...	...	...	...	...	2.83
Chloride of sodium	...	...	...	...	...	...	...	...	2.87
Potash	...	...	...	...	...	...	...	...	.34
Sulphuric acid	...	...	...	...	...	...	...	...	2.53
‡Carbonic acid	...	...	...	...	...	...	...	...	2.76
Oxide of iron	...	...	...	...	...	...	...	...	.69
Insoluble matters	...	...	...	...	...	...	...	...	2.47
									<hr/> 100.00
*Containing nitrogen	...	...	...	...	...	...	...	...	.93
†Equal to tribasic phosphate	...	...	...	...	...	...	...	...	74.15
‡Equal to carbonate of lime	...	...	...	...	...	...	...	...	6.25

## GUANO. Produced by Bats.

	No. 1.	No. 2.
Nitrogen	... .. .98	.84 per cent.
Phosphoric acid	... .. 11.03	10.56
Sand	... ..	32.80
Loss on ignition	... ..	31.62
	No. 3.	
Water	... ..	42.689
Volatile matter	... ..	20.799
Nitrogen	... ..	2.021
Ash	... ..	36.512
Phosphoric acid	... ..	1.170

GUANO. Patagonian.

	1.	2.	3.
Moisture ... ..	21·46	19·55	6·59
**Organic matter and salts of ammonia ... ..	11·74	11·08	10·23
Phosphates of lime and magnesia	27·61	16·58	23·44
(Carbonate and sulphate of lime	2·99	8·92	—
Alkaline salts ... ..	6·07	9·39	9·05
Sand ... ..	30·13	34·48	50·69
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Containing nitrogen ... ..	1·83	1·20	·90
Equal to ammonia ... ..	2·22	1·45	1·09

PHOSPHATIC GUANOS.

	Falkland Island.	Patos Island.
Moisture ... ..	33·43	35·86
**Organic matter and ammoniacal salts ... ..	21·42	26·07
Bone phosphates ... ..	32·04	22·01
(Carbonate of lime ... ..	2·52	5·64
Alkaline salts ... ..	6·22	7·34
Insoluble matter ... ..	4·37	3·08
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	4·31	4·42
Equal to ammonia ... ..	5·23	5·37

GUANO. Angamos Island.

Moisture ... ..	7·24	8·76
*Organic matter and salts of ammonia ...	69·01	69·96
†Bone phosphates ... ..	12·06	12·07
Alkaline salts ... ..	9·02	8·27
Insoluble matter ... ..	2·67	·94
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	21·15	19·30
Equal to ammonia ... ..	25·68	23·44
†Containing soluble phosphoric acid..	{ not deter- }	{ 3·01 }
	{ mined }	

## GUANO. Mejillones.

Moisture and organic matter ...	14.46	15.07	13.87
*Phosphoric acid ... ..	32.35	34.75	33.79
Lime ... ..	37.56	31.75	30.61
Magnesia, carbonic acid, sul- phuric acid and alkaline salts }	12.54	13.63	14.30
Insoluble matter ... ..	3.09	4.90	7.43
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate of lime	70.62	75.77	73.76

## GUANO. Gulf of California.

	1.	2.	3.
Moisture ... ..	4.83	1.30	3.70
*Organic matter and water... ..	12.72	9.80	11.13
+Phosphoric acid ... ..	34.33	40.31	34.81
Lime ... ..	37.36	37.21	34.07
Magnesia... ..	1.76	7.18	9.54
Oxide of iron... ..	.50		
Alumina ... ..	.81		
Carbonic acid... ..	.46		
Alkaline salts... ..	5.54		
Siliceous matter ... ..	1.69	4.20	6.75
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.00
	<hr/>	<hr/>	<hr/>
*Containing nitrogen ... ..	1.04	.37	.86
Equal to ammonia... ..	1.26	.45	1.04
*Equal to tribasic phosphate of lime	74.94	88.01	75.99

## GUANO. Curagoa.

	1.	2.	3.
Moisture ... ..	11.53	8.05	16.80
Organic matter ... ..	7.11	8.70	6.30
*Phosphoric acid ... ..	32.65	30.96	30.02
Lime ... ..	40.19	42.05	37.40
+Carbonic acid .. ..	2.30	3.79	1.19
Magnesia, sulphuric acid and alkalies ... .. }	6.02	6.21	8.05
Insoluble matter ... ..	.20	.24	.24
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate of lime	71.27	67.59	65.23
+Equal to carbonate of lime ...	5.22	8.61	2.70

GUANOS.

	Quito Serrano.	Petrel Island.	Coral Island.	Booby Island.
Moisture ... ..	8.50	9.51	7.04	6.10
*Organic matter ...			11.76	10.18
+Phosphoric acid ... ..	32.44	30.50	35.29	21.77
Lime ... ..	39.41	36.44	41.76	45.36
Magnesia ... ..	17.10	18.05	3.55	16.50
Sulphuric acid ... ..				
Alkaline salts ... ..				
Carbonic acid ... ..	2.55	5.50	.60	.09
Insoluble matter .. ..				
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
Containing nitrogen }			.38	
*Equal to ammonia }			.46	
+Equal to phosphate }	70.82	66.58	77.05	47.52
of lime ... ..				

GUANO. Baker Island.

	1.	2.	3.
Moisture ... ..	12.05	4.71	19.16
*Organic matter ... ..	6.25	6.17	8.61
+Phosphoric acid ... ..	32.32	39.44	29.55
Lime ... ..	42.34	43.01	34.69
‡Carbonic acid ... ..	2.99	.27	7.26
Magnesia ... ..	.71	2.32	
Oxide of iron ... ..	.14	.96	
Alumina ... ..	.09		
Sulphuric acid ... ..	1.19		
Alkalies and loss ... ..	1.78	2.33	
Insoluble matter ... ..	.14	.79	.73
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
*Containing nitrogen ... ..	—	.34	.72
Equal to ammonia ... ..	—	.41	.87
+Equal to tribasic phosphate ...	70.55	86.11	64.51
‡Equal to carbonate of lime ...	6.79	.61	—

## GUANO. Howland Island.

	1.	2.	3.
Moisture ... ..	10·01	15·31	8·95
Organic matter ... ..	5·72	7·26	6·15
*Phosphoric acid ... ..	34·21	33·35	34·80
Lime ... ..	43·03	39·36	43·26
Magnesia, sulphuric acid, } alkalies, &c. ... .. }	6·83	4·56	6·54
Insoluble matter ... ..	·20	·16	·30
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate } of lime ... .. }	74·68	72·80	75·97

## GUANOS.

	Jarvis Island.	Enderbury Island.
Moisture ... ..	11·27	8·76
Organic matter ... ..	9·93	‡8·81
*Phosphoric acid ... ..	23·88	28·74
Lime ... ..	37·18	40·76
†Carbonic acid ... ..	5·02	§7·26
Magnesia, &c. ... ..	12·63	5·58
Insoluble matter ... ..	·09	·09
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to phosphate of lime ... ..	52·13	
†Equal to carbonate of lime ... ..	11·41	
‡Containing nitrogen ... ..		·38
Equal to ammonia ... ..		·46
§Equal to phosphate of lime ... ..		62·74
Equal to carbonate of lime ... ..		16·50

## GUANO. Bird Island.

Moisture ... ..	6·92
Organic matter... ..	4·80
Phosphate of lime ... ..	80·44
Carbonate of lime ... ..	6·38
Magnesia ... ..	1·34
Alkaline salts ... ..	·12
Silica ... ..	—
	<hr/>
	100·00
	<hr/>

GUANO.

	Shaw's Island.	Flint Island
Moisture and organic matter... ..	13·67	13·26
**Phosphoric acid ... ..	34·69	37·13
Lime ... ..	43·26	43·43
Magnesia, alkalies, &c. ... ..	7·53	5·99
Insoluble matter ... ..	·85	·19
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
**Equal to phosphate of lime... ..	75·73	81·05

GUANO.

	Starbuck Island.	Starbuck Island Crust.		
Moisture ... ..	11·56	8·75	10·01	
**Organic matter ... ..	7·25			
††Phosphoric acid ... ..	33·61	45·57	40·12	
Lime ... ..	41·04	40·94	44·96	
Magnesia ... ..	1·16	64	—	
§Sulphuric acid ... ..	·88		§3·56	4·87
††Carbonic acid ... ..	1·05		—	—
Alkalies and loss ... ..	3·43	·47	—	
§Silica ... ..	·02	·07	·04	
	<hr/>	<hr/>	<hr/>	
	100·00	100·00	100·00	
**Equal to ammonia... ..	·47	—	—	
††Equal to phosphate of lime... ..	73·67	99·48	87·58	
††Equal to carbonate of lime ... ..	2·38	—	—	
§Sulphate of lime .. ..	—	6·05	—	

GUANO.

	Monk's Island.	Raza Island.
Moisture ... ..	2·39	12·34
**Organic matter and water of com- bination ... ..	7·93	
Lime ... ..	39·48	36·57
Magnesia ... ..	1·17	—
Phosphoric acid... ..	41·34	38·35
Sulphuric acid ... ..	4·57	—
Soluble silica and sand ... ..	2·28	4·03
	<hr/>	<hr/>
	99·16	
**Containing nitrogen ... ..	·139	

## SOMBRERO GUANOS.

	1.	2.	3.
Moisture ... ..	9·06	7·51	10·09
Water of combination and a } little organic matter... }	4·38	6·19	4·90
*Phosphoric acid ... ..	34·41	35·09	34·11
Lime ... ..	36·17	38·19	38·42
Magnesia ... ..	·36	·44	·41
Alkalies and flourine ... ..	1·86	1·87	1·61
Oxide of iron ... ..	2·82	3·22	2·85
Alumina ... ..	6·89	4·26	4·23
Carbonic acid ... ..	1·55	1·36	1·68
Sulphuric acid ... ..	·66	·44	·36
Chlorine ... ..	{ undeter- } { mined }	·39	·31
Insoluble matters ... ..	1·84	1·04	1·03
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Equal to bone earth ... ..	74·55	76·02	73·90

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 MANURES.
 

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## GAS LIME.

	Guyard.	Graham.
Calcium hydrate ... ..	15·10	17·72
„ Carbonate ... ..	24·20	44·48
„ Sulphate ... ..	·25	2·80
„ Sulphite ... ..	1·50	14·57
„ Sulphide ... ..	6·90	—
„ Oxysulphide ... ..	3·20	—
„ Hyposulphite ... ..	11·80	12·30
„ Cyanide ... ..	·25	—
Iron sulphide ... ..	·55	—
Sulphur ... ..	4·30	5·14
Silica ... ..	1·80	·71
Alumina ... ..	·70	—
Magnesia ... ..	traces.	—
Tar ... ..	·25	—
Water ... ..	19·20	32·28

MANURE (Liquid). Imperial gallon.

Carbonate and humate of ammonia	...	...	...	...	35.58
Organic matters	...	...	...	...	20.59
{ Containing nitrogen	...	...	...	1.49	}
{ Equal to ammonia	...	...	...	1.81	
Inorganic matters consisting of—					
Soluble silica	...	...	...	...	2.34
Lime	...	...	...	...	11.48
Magnesia	...	...	...	...	2.87
Potash	...	...	...	...	16.92
Chloride of potassium	...	...	...	...	2.74
Chloride of sodium	...	...	...	...	40.35
Phosphoric acid	...	...	...	...	4.83
Sulphuric acid	...	...	...	...	3.94
Carbonic acid and loss	...	...	...	...	5.80
					91.27

147.44

SUPERPHOSPHATE, (Good.)

Moisture	...	...	...	...	10.23
Water of combination and *organic matter	...	...	...	...	22.65
Bi-phosphate of lime	...	...	...	...	18.91
Equal to bone earth rendered soluble by acid	...	...	...	...	(29.60)
Insoluble phosphates	...	...	...	...	12.05
Sulphate of lime, alkaline salts and magnesia	...	...	...	...	32.06
Insoluble siliceous matter	...	...	...	...	4.10
					100.00
**Containing nitrogen	...	...	...	...	1.66
Equal to ammonia	...	...	...	...	2.02

Superphosphates of lime.

		Good.	Bad.
		1.	2.
Water	...	20.53	14.40
Organic matter	...	14.76	8.93
Soluble phosphate of lime	...	10.31	3.60
Equal to bone earth	...	(16.09)	(5.61)
Insoluble phosphate	...	17.72	6.83
Sulphate of lime	...	28.39	44.23
Alkaline salts	...	1.56	2.51
Sand	...	6.73	19.50
		100.00	100.00

Percentage of nitrogen	...	0.853	1.44
Equal to ammonia	...	1.065	1.75

## MANURE. Wheat.

Moisture ... ..	13.60
*Sulphate of ammonia ... ..	10.97
+ { Soluble nitrogenized organic matter ... ..	8.08
{ Insoluble " " " " ... ..	14.72
Bi-phosphate of lime ... ..	3.54
Insoluble phosphate of lime ... ..	9.45
Sulphate of magnesia ... ..	.61
Hydrated sulphate of lime ... ..	19.73
Chloride of sodium ... ..	16.84
Sand ... ..	2.46
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	2.32
+ " " " " ... ..	3.53

## MANURE. For wheat.

Moisture ... ..	12.36
*Organic matter and ammoniacal salts and water } of combination ... ..	22.35
Bi-phosphate of lime ... ..	2.91
Equal to bone earth rendered soluble ... ..	(4.54)
Insoluble phosphates ... ..	6.97
Sulphate of lime ... ..	20.89
Sulphate of magnesia ... ..	1.26
Chloride of sodium... ..	24.70
Nitrate of soda ... ..	4.63
Insoluble siliceous matter ... ..	3.93
	<hr/>
	100.00
*Containing nitrogen ... ..	3.38
Equal to ammonia ... ..	4.10

## MANURE. British Economical.

Moisture ... ..	9.86
Green vitriol ... ..	28.81
Sulphate of lime (gypsum) ... ..	2.05
Chloride of sodium (salt) ... ..	13.39
Bisulphate of soda... ..	30.69
Sand ... ..	15.20
	<hr/>
	100.00
	<hr/>
Nitrogen ... ..	.06

MANURE. Made from boiled bones and bone dust.

	Boiled Bones.	Bone Dust.
Moisture ... ..	25·04	9·28
*Organic matter ... ..	15·28	31·23
Phosphate of lime ... ..	34·10	45·49
Sulphate and carbonate of lime ... ..	13·44	9·32
Alkalies and magnesia ... ..	4·01	
Sand ... ..	8·13	4·68
	<hr/>	<hr/>
	100·00	100·00
*Containing nitrogen ... ..	1·37	3·54

MEAT FIBRE REFUSE.

	South American.	Aus- tralian.
Moisture ... ..	9·07	6·73
*Organic matter ... ..	87·41	89·54
Phosphate of lime ... ..	3·52	·89
Carbonate of lime and alkalies ... ..		1·13
Sand ... ..		1·71
	<hr/>	<hr/>
	100·00	100·00
*Containing nitrogen ... ..	11·97	10·94
Equal to ammonia ... ..	14·67	13·28

# PHOSPHATES.

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## WOOD. Fossil from Bedfordshire.

Moisture ... ..	1·12
Organic matter ... ..	3·49
Lime ... ..	47·75
*Phosphoric acid ... ..	32·96
Oxide of iron, alumina, and carbonic acid ... ..	10·49
Insoluble matters ... ..	4·19
	100·00
*Equal to tribasic phosphate of lime... ..	71·95

## ESTRAMADURA PHOSPHATE.

Moisture and water of combination ... ..	·68
Lime ... ..	42·68
Phosphoric acid ... ..	36·36
Oxide of iron and alumina and flourine ... ..	8·81
Insoluble siliceous matter ... ..	11·47
	100·00

## PHOSPHATE. (American, or Maracaibo Guano.)

Moisture ... ..	2·39
Organic matter and water of combination... ..	7·93
Lime ... ..	39·48
Magnesia ... ..	1·17
Phosphoric acid ... ..	41·34
Sulphuric acid .. ...	4·57
Soluble silica and sand ... ..	2·28
	99·16
Nitrogen... ..	·139
Equal to ammonia ... ..	·169

PHOSPHATES. Pedro Keys.

Moisture and water of combination ... ..	9.34
*Phosphoric acid ... ..	29.69
Lime ... ..	36.01
Oxide of iron, alumina, magnesia and carbonic acid	19.69
Insoluble matter ... ..	5.27
	<hr/>
	100.00
	<hr/>
*Equal to tribasic phosphate ... ..	64.81

PHOSPHATE. Somberero.

	1.	2.
Moisture ... ..	7.03	7.63
Water of combination ... ..	1.64	1.49
*Phosphoric acid ... ..	32.45	31.70
Lime ... ..	46.11	45.92
+Carbonic acid ... ..	7.33	7.30
Oxide of iron and alumina ... ..	4.29	4.87
Insoluble matter ... ..	1.15	1.09
	<hr/>	<hr/>
	100.00	100.00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	70.84	69.20
+Equal to carbonate of lime ... ..	16.64	16.54

PHOSPHATES. Bordeaux. Rich.

	1.	2.
Moisture ... ..	2.28	3.28
Water of combination ... ..	2.52	1.24
*Phosphoric acid ... ..	35.51	33.72
Lime ... ..	47.81	44.23
Magnesia ... ..	.12	1.74
Flourine ... ..	.89	—
+Carbonic acid ... ..	5.06	3.26
Sulphuric acid ... ..	.64	—
Oxide of iron ... ..	2.80	2.66
Alumina ... ..		6.42
Insoluble matter ... ..	2.37	3.45
	<hr/>	<hr/>
	100.00	100.00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	77.52	73.61
+Equal to carbonate of lime ... ..	11.50	7.40

## PHOSPHORITE. Spanish.

	Caceres.	Montan- chez.
Moisture ... ..	·21	·16
*Phosphoric acid ... ..	38·85	39·09
Lime ... ..	51·65	51·77
Flourine, carbonic acid, oxide of iron, and alumina ... ..	2·61	3·02
Insoluble siliceous matter ... ..	6·68	5·96
	<hr/>	<hr/>
	100·00	100·00
*Equal to tribasic phosphate ... ..	84·33	85·33

## PHOSPHATES. German.

	1.	2.
Moisture and water of combination ... ..	1·78	2·74
*Phosphoric acid ... ..	35·73	30·91
Lime ... ..	44·22	43·81
Magnesia ... ..	·42	—
Oxide of iron ... ..	7·38	6·66
†Carbonic acid ... ..	1·65	2·18
Alumina and flourine ... ..	5·34	8·45
Insoluble matter ... ..	3·48	5·25
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	77·99	67·48
†Equal to carbonate of lime ... ..	3·75	4·95

## PHOSPHORITE. Rich Nassau (Staffelite).

	1.	2.
Water ... ..	·65	·25
*Phosphoric acid ... ..	40·56	38·12
Lime ... ..	56·29	53·92
Oxide of iron and alumina ... ..	1·21	·93
Magnesia ... ..	} ·97	·69
Flourine ... ..		3·16
†Carbonic acid ... ..	—	2·75
Sulphuric acid... ..	—	·09
Silica... ..	·32	·09
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	88·54	83·21
†Equal to carbonate of lime ... ..	—	6·25

PHOSPHATES. Canadian.

	1.	2.	3.
Moisture and water of combination, and loss on heating } ... ..	·62	·10	·11
*Phosphoric acid... ..	33·51	41·54	37·68
Oxide of iron, alumina, flourine, &c. } ... ..	7·83	3·03	6·88
Insoluble siliceous matter ... ..	11·90	·59	4·29
Lime ... ..	46·14	54·74	51·04
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate of lime } ... ..	73·15	90·68	82·25

PHOSPHATE. Silurian.

Organic matter and loss on heating ... ..	3·98
*Phosphoric acid ... ..	29·67
Lime ... ..	37·16
Magnesia ... ..	·14
Oxide of iron ... ..	1·07
Alumina, flourine and loss ... ..	5·84
Insoluble siliceous matter ... ..	22·14
	<hr/>
	100·00
	<hr/>
*Equal to tribasic phosphate ... ..	64·77

PHOSPHATE.

	St. Domingo.	Alta Velta.
Moisture and water of combination ... ..	18·51	19·33
*Phosphoric acid ... ..	20·07	26·23
Oxide of iron ... ..	7·38	7·23
Alumina ... ..	21·20	20·22
Insoluble matter ... ..	32·84	26·99
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	43·81	57·26

## PHOSPHATE. Redonda.

	1.	2.
Moisture and water of combination ... ..	23·23	27·70
*Phosphoric acid ... ..	36·95	19·40
Alumina and oxide of iron ... ..	36·38	25·65
Insoluble matter ... ..	3·44	27·25
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	80·66	42·35

## PHOSPHATES. Navassa.

	1.	2.
Moisture ... ..	5·91	8·50
Water of combination and organic matter...	5·46	4·15
*Phosphoric acid ... ..	31·18	28·47
Lime ... ..	37·70	34·07
Magnesia ... ..	—	·45
†Carbonic acid ... ..	2·38	2·30
Oxide of iron ... ..	4·18	4·49
Alumina ... ..	9·11	9·48
Sulphuric acid flourine ... ..	1·16	1·81
Insoluble matters ... ..	2·92	6·28
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	68·07	62·15
†Equal to carbonate of lime ... ..	5·41	5·22

## PHOSPHATES. South Carolina lands.

	1.	2.	3.
Moisture, water of combination ...	7·40	2·29	10·30
*Phosphoric acid ... ..	26·50	24·29	22·06
Lime ... ..	37·20	38·71	37·24
Oxide of iron, alumina, magnesia } and carbonic acid, &c. ... }	16·27	17·28	15·45
Insoluble matters ... ..	12·63	17·43	14·95
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate ...	57·85	53·02	48·16

PHOSPHATES. South Carolina river.

	1.	2.
Moisture, water of combination, and loss } on ignition ... ..	4·07	1·56
*Phosphoric acid ... ..	28·44	26·89
Lime ... ..	45·07	42·28
Magnesia, carbonic acid, oxide of iron } and alumina... ..	15·16	18·47
Insoluble matter ... ..	7·26	10·80
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	62·09	58·70

PHOSPHATES. St. Martin's.

	1.	2.	3.
Moisture and water of combination	5·50	2·94	4·01
*Phosphoric acid ... ..	36·94	31·18	35·22
Lime ... ..	48·87	53·48	50·15
†Carbonic acid ... ..	2·89	10·73	5·79
Oxide of iron and alumina ... ..	4·78	1·14	4·59
Insoluble matters ... ..	1·02	·53	·24
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Equal to tribasic phosphate .. ..	80·64	68·07	76·88
†Equal to carbonate of lime ... ..	6·57	24·39	13·15

PHOSPHATES. Aruba.

	1.	2.
Moisture and water of combination ... ..	5·55	3·79
*Phosphoric acid ... ..	31·11	33·04
Lime ... ..	41·69	47·53
†Carbonic acid... ..	6·69	} 14·60
Oxide of iron, alumina, &c. ... ..	14·72	
Insoluble matter ... ..	·24	1·04
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Equal to tribasic phosphate ... ..	67·91	72·13
†Equal to carbonate of lime... ..	15·20	—

## PHOSPHATES. Curagao.

Moisture .. ...	8.72
Organic matter ...	5.79
*Phosphoric acid ...	33.51
Lime ...	43.01
†Carbonic acid ...	2.96
Magnesia and alkalies ...	5.71
Sand ...	.30
	<hr/>
	100.00
	<hr/>
*Equal to tribasic phosphate ...	73.15
†Equal to carbonate of lime ...	6.72

## POTASH SALTS. Crude German.

Moisture ...	11.63
Organic matter ...	.73
Oxide of iron ...	.34
Sulphate of potash ...	24.03
Sulphate of magnesia ...	1.14
Chloride of magnesium... ..	12.01
Chloride of sodium ...	47.85
Sulphate of lime ...	.78
Magnesia ...	.52
Sand ...	.97
	<hr/>
	100.00

## SODA. Nitrate of.

	1.	2.	3.
Moisture .. ...	1.87	2.09	3.427
Nitrate of soda ...	95.68	96.65	94.210
Chloride of sodium ...	.79	1.07	1.184
Sulphate of soda ...	1.17	<hr/>	<hr/>
Sand... ..	.49	.19	1.179
	<hr/>	<hr/>	<hr/>
	100.00	100.00	100.000

## SOOT.

Moisture ... ..	7·39
*Organic matter ... ..	43·09
†Sulphate of ammonia ... ..	12·72
Insoluble siliceous matter ... ..	15·12
Oxide of iron and alumina ... ..	6·51
Carbonate of lime ... ..	10·63
Carbonate of magnesia ... ..	1·84
Alkaline salts ... ..	2·70
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	·21
Equal to ammonia ... ..	·25
†Containing ammonia ... ..	3·29

## SALT. Russian, produced by the freezing process.

	Sea of Okhotsk.	Oustkout.	Irkoutsk.	Seleu- ginsk.
Chloride of sodium ... ..	77·60	74·84	91·49	74·71
“ aluminium ... ..	6·20	1·17	2·60	6·50
“ calcium ... ..	·94	5·21	1·10	1·44
“ magnesium ... ..	1·66	3·57	2·05	3·55
Sulphate of soda ... ..	13·60	15·21	2·76	13·80
	<hr/>	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>	<hr/>

## SALT CAKE. (Crude).

Sulphate of soda ... ..	96·515
“ lime ... ..	·923
Sulphuric acid ... ..	·616
Chloride of sodium... ..	1·345
Sesquioxide of iron ... ..	·191
Water ... ..	·187
Insoluble matter ... ..	·130
Loss ... ..	·093
	<hr/>
	100·000



## URINE of the HORSE.

Urea ... ..	31·00
Hippurate of potash ... ..	4·74
Lactate of potash ... ..	20·09
Carbonate of magnesia ... ..	4·16
"    lime ... ..	10·82
Sulphate of potash ... ..	1·18
Phosphate of potash ... ..	—
Chloride of sodium ... ..	·74
Silica... ..	1·01
Water and organic matter ... ..	910·76
	<hr/>
	1000·00

## URINE of the COW.

Urea ... ..	18·48
Hippurate of potash ... ..	16·51
Lactate of potash ... ..	17·16
Carbonate of magnesia ... ..	4·74
"    lime ... ..	·55
Sulphate of potash ... ..	3·60
Phosphate of potash ... ..	—
Chloride of sodium ... ..	1·52
Silica... ..	spur
Water and organic matter ... ..	921·32
	<hr/>
	1000·00

## URINE of GOAT.

Urea ... ..	·76
Hippuric acid ... ..	·88
Mucus ... ..	·05
Salts soluble in water ... ..	8·70
Salts insoluble in water ... ..	·40
Extractive matter soluble in alcohol ... ..	4·66
Extractive matter soluble in water ... ..	·56
Water ... ..	983·99
	<hr/>
	1000·00

# CATTLE FOODS.

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## ACORNS.

Moisture ... ..	40·80
Fatty matters ... ..	2·64
*Flesh-forming matters...	4·39
Starch, gum and sugar ... ..	46·82
Cellulose ... ..	3·94
Ash ... ..	1·41
	100·00
*Containing nitrogen ... ..	·703

## ACORNS. Ash of.

Potash ... ..	64·64
Soda ... ..	—
Magnesia ... ..	5·57
Lime ... ..	6·86
Phosphoric acid ... ..	19·19
Sulphuric acid.. ... ..	—
Silica ... ..	·96
Peroxide of iron ... ..	1·89
Chloride of sodium ... ..	·98
	100·09

## ACORNS. Decorticated.

Moisture ... ..	40·88
Oil ... ..	2·64
*Albuminous compounds ... ..	4·39
Mucilage, sugar, &c. ... ..	46·74
Woody fibre ... ..	3·94
Ash ... ..	1·41
	100·00
*Containing nitrogen ... ..	·703

## ACACIA NILOTICA. Ash of seeds.

Potash ... ..	33·388
Soda ... ..	5·360
Lime ... ..	14·212
Magnesia ... ..	12·103
Oxide of iron ... ..	·612
Phosphoric acid ... ..	16·229
Sulphuric acid... ..	3·650
Silicic acid ... ..	1·809
Chlorine ... ..	·345
Carbonic acid ... ..	12·112
	<hr/>
	99·820

## APPLE. Pumice.

Water ... ..	58·30
Flesh-forming substances ... ..	4·94
Sugar, gum, &c. ... ..	12·44
Fibre ... ..	22·15
Ash ... ..	1·65
Oil ... ..	·52
	<hr/>
	100·00

## BARLEY STRAW.

Water ... ..	15·20
Oil ... ..	1·36
*Albumen and other soluble protein compounds ... ..	·68
Sugar, mucilage, extractive matters soluble in water	2·24
Digestible fibre ... ..	5·97
Soluble inorganic matters ... ..	2·88
†Insoluble protein compounds ... ..	3·75
Indigestible woody fibre ... ..	66·54
Insoluble inorganic matter ... ..	1·38
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	·11
†Containing nitrogen ... ..	·60



## BELGIUM PULP. 1 year old.

Moisture ... ..	70·00
*Flesh-forming matters...	2·43
Digestible fibre ... ..	18·67
Cellulose ... ..	6·48
Ash ... ..	2·42
	<hr/>
	100·00
*Containing nitrogen ... ..	·39

## BEETROOT PULP. Lavenham.

Moisture ... ..	70·11
*Flesh-forming matters ... ..	2·25
Sugar ... ..	3·39
Mucilage and pectinous compounds ... ..	1·93
Digestible cellular fibre... ..	15·13
Woody fibre ... ..	5·32
Ash ... ..	1·87
	<hr/>
	100·00
*Containing nitrogen ... ..	·361

## BASSIA NUTS.

Moisture ... ..	6·54
Oil ... ..	40·40
*Albuminous matters ... ..	9·31
Mucilage, sugar, &c. ... ..	32·41
Woody fibre ... ..	8·24
Ash ... ..	3·10
	<hr/>
	100·00
*Containing nitrogen ... ..	1·49

## BASSIA NUT CAKE. Indian.

Moisture ... ..	13·54
*Organic matter ... ..	80·79
Phosphates ... ..	1·43
Magnesia, &c. ... ..	3·63
Sand ... ..	·61
	<hr/>
	100·00
*Containing nitrogen ... ..	2·73
Equal to ammonia ... ..	3·31

## BEECH NUT CAKE.

Moisture ... ..	11.44
Oil ... ..	5.22
*Albuminous compounds ... ..	18.81
Mucilage, sugar and digestible fibre .. ..	36.17
Woody fibre ... ..	23.52
†Ash ... ..	4.84
	<hr/>
	100.00
*Containing nitrogen ... ..	3.01
†Containing sand ... ..	.62

## BREWERS' GRAINS.

Water ... ..	69.70
Mineral matter .. ..	1.98
Protein compounds ... ..	5.87
Respiratory principles ... ..	15.24
Fibre... ..	7.21
	<hr/>
	100.00
Nitrogen ... ..	.94

## BEAN STRAW.

Water ... ..	19.40
Fatty matters ... ..	1.02
*Albuminous compounds ... ..	3.36
Gum and other carbonaceous principles ... ..	6.93
Woody fibre ... ..	65.58
†Mineral matters ... ..	3.71
	<hr/>
	100.00
*Containing nitrogen ... ..	.54
†Containing phosphoric acid ... ..	.27
Potash ... ..	.78

CAROB BEANS. Natural state.

	1.	2.
Water ... ..	14·22	17·11
Sugar ... ..	54·07	51·42
Mucilage and other digestible respiratory principles ... ..	17·41	13·75
Woody fibre ... ..	3·88	6·01
Oil ... ..	·96	1·19
Protein compounds ... ..	7·72	7·50
Insoluble ash ... ..	·62	ash 3·02
Soluble organic matters ... ..	1·12	
	<hr/> 100·00	<hr/> 100·00
Nitrogen ... ..		1·20

COCOA CAKE. Theobroma Cacao.

Moisture ... ..	14·95
Oil ... ..	8·02
*Albuminous compounds ... ..	19·87
Woody fibre ... ..	18·26
Mucilage, sugar and digestible fibre ... ..	32·46
Ash ... ..	6·44
	<hr/> 100·00
*Containing nitrogen ... ..	3·18

COCOA NUT FIBRE REFUSE. Dry and wet.

	Wet.	Dry.
Moisture ... ..	71·51	—
Cellulose ... ..	9·29	32·61
*Nitrogen compounds ... ..	·36	1·26
Other organic compounds ... ..	15·81	55·49
†Ash ... ..	3·03	10·64
	<hr/> 100·00	<hr/> 100·00
*Containing nitrogen ... ..	·058	·23
†Containing sand ... ..	·77	2·70

## COCOA NUT CAKE.

Moisture ... ..	8·97
Oil ... ..	11·44
*Flesh-forming substances ... ..	20·75
Gum, sugar, mucilage and digestible fibre ... ..	39·41
Cellulose ... ..	14·27
Ash ... ..	5·16
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	3·32

## CHINA OIL CAKE.

Water ... ..	14·44
Oil ... ..	6·88
*Albuminous compounds ... ..	45·87
Starch, &c. ... ..	21·48
Fibre... ..	5·25
Ash ... ..	6·08
	<hr/>
	100·00
	<hr/>
*Nitrogen... ..	7·34

## CASTOR OIL CAKE.

Moisture ... ..	9·95
*Organic matter ... ..	81·07
Phosphate of lime and magnesia... ..	4·49
†Alkaline salts ... ..	1·80
Sand ... ..	2·69
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	8·69
Equal to ammonia ... ..	10·55
†Containing phosphoric acid ... ..	·06
Equal to tribasic phosphate... ..	·13

## COTTON SEED MEAL.

Moisture ... ..	8.61
Oil ... ..	12.57
*Albuminous compounds ... ..	43.12
Mucilage, sugar, &c. ... ..	24.86
Cellulose ... ..	5.82
Mineral matter ... ..	5.02
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	6.90

## COTTON CAKE. Decorticated.

Moisture ... ..	9.18
Oil ... ..	16.05
*Albuminous compounds ... ..	41.25
Non-nitrogenous principles ... ..	16.45
†Phosphates and insoluble earthy matters ... ..	8.15
Woody fibre ... ..	8.92
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	6.58
†Containing { phosphoric acid ... ..	3.16
{ potash ... ..	3.12

## CABBAGE. Cattle.

Water ... ..	89.42
Oil ... ..	.08
*Soluble protein compounds... ..	1.19
Sugar, digestible fibre, &c. ..	7.01
Soluble mineral matters ... ..	.73
†Insoluble protein compounds ... ..	.31
Woody fibre ... ..	1.14
Insoluble mineral matter ... ..	.12
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	.19
†Containing nitrogen ... ..	.05



## CLOVER. Ash of. No. 1.

Carbonic acid ... ..	25·0
Sulphuric acid... ..	2·5
Phosphoric acid ... ..	6·3
Chlorine ... ..	2·6
Magnesia ... ..	6·3
Lime ... ..	24·6
Potash ... ..	26·6
Soda ... ..	·5
Silica ... ..	5·3
Oxide of iron and alumina ... ..	·3
Carbon, water and loss ... ..	—
	<hr/>
	100·0

## CLOVER (Red). Ash of. No. 2.

Potash ... ..	16·10
Soda ... ..	40·71
Magnesia ... ..	8·28
Lime ... ..	21·91
Phosphoric acid ... ..	4·12
Sulphuric acid... ..	1·06
Silica ... ..	2·60
Peroxide of iron ... ..	·46
Chloride of sodium ... ..	4·73
	<hr/>
	99·97

## CLOVER. Ash.

Silica ... ..	5·438
Sulphate of potash... ..	3·080
Chloride of sodium... ..	1·670
Carbonate of potash ... ..	12·728
“ soda ... ..	13·528
“ lime ... ..	38·216
Magnesia ... ..	4·160
Phosphate of iron ... ..	1·240
“ lime ... ..	11·970
“ magnesia ... ..	6·790
Carbonaceous matter ... ..	·160
	<hr/>
	98·980



## EARTH NUT CAKE.

	Decorti- cated.	Undecor- ticated.
Moisture ... ..	9·26	8·10
Oil ... ..	5·58	8·76
*Albuminous compounds ... ..	43·43	30·50
Mucilage, sugar, and digestible fibre ... ..	31·39	27·78
Woody fibre ... ..	5·18	19·12
†Ash ... ..	5·16	5·74
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	6·95	4·88
†Containing sand		

## EARTH NUT, and husks of.

	Husks.	Nut.
Moisture ... ..	6·54	6·24
Oil ... ..	20·37	41·23
*Albuminous compounds ... ..	15·18	28·25
Gum mucilage and digestible fibre ... ..	30·39	7·16
Woody fibre ... ..	19·98	13·87
†Ash ... ..	7·54	3·25
	<hr/>	<hr/>
	100·00	
	<hr/>	<hr/>
*Containing nitrogen ... ..	2·43	
†Containing sand ... ..	3·34	

## FLAX CHAFF.

Moisture ... ..	14·60
Oil ... ..	2·82
*Albuminous matters ... ..	4·75
Gum, sugar, &c. ... ..	8·72
Digestible fibre ... ..	18·56
Cellulose ... ..	43·12
Ash ... ..	7·43
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	·76

## GRASS. Ash of.

Potash ... ..	25·40
Lime ... ..	15·21
Magnesia ... ..	5·30
Soda ... ..	6·24
Oxide of iron ... ..	·18
Phosphoric acid ... ..	5·45
Sulphuric acid .. ...	7·08
Silicic acid ... ..	24·30
Chlorine ... ..	4·76
Carbonic acid and loss ... ..	6·08
	<hr/>
	100·00

## HEMPSEED.

Fixed oil .. ...	19·10
Resin... ..	1·60
Sugar and extractive ... ..	1·60
Gummy extract ... ..	9·00
Soluble albumen ... ..	24·70
Ligneous fibre... ..	5·00
Husk... ..	38·30
Loss ... ..	·70
	<hr/>
	100·00

## HEMP CAKE.

	1.	2.
Moisture ... ..	11·59	10·57
Oil ... ..	7·23	11·17
*Albuminous matters ... ..	33·50	29·56
Sugar, mucilage and digestible fibre ... ..	15·56	18·03
Woody fibre ... ..	23·74	24·20
†Ash ... ..	8·38	6·47
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	5·36	4·73
†Containing sand ... ..	2·14	

## HEMPSEED. Ash of.

Potash ... ..	21·67
Soda ... ..	·66
Magnesia ... ..	1·00
Lime ... ..	26·71
Phosphoric acid ... ..	34·96
Sulphuric acid... ..	·10
Silica ... ..	14·04
Peroxide of iron ... ..	·77
Chloride of sodium ... ..	·90
	<hr/>
	100·81

## HAY (Meadow). Dried at 212° Fah.

Fatty matter ... ..	2·99
*Albuminous compounds ... ..	9·88
Sugar, gum, &c. ... ..	48·09
Indigestible woody fibre ... ..	31·80
Mineral matter (ash) ... ..	7·24
	<hr/>
	100·00
*Containing nitrogen ... ..	1·58

## HAY (Ash of). Grown in meadows near Durrenbach.

Carbonic acid ... ..	7·3
Phosphoric acid ... ..	5·4
Sulphuric acid... ..	2·7
Chlorine ... ..	2·6
Lime ... ..	17·9
Magnesia ... ..	7·2
Potash ... ..	21·7
Soda ... ..	1·8
Silica... ..	31·5
Oxide of iron ... ..	·9
Loss ... ..	1·0
	<hr/>
	100·0

## HAY. Anthyllis vulneraria. Kidney vetch.

Moisture ... ..	10.46
*Organic substances soluble in water...	26.47
Organic substances insoluble in water ... ..	57.99
Mineral matter (ash) ... ..	5.08
	<hr/>
	100.00
	<hr/>
*Nitrogen ... ..	1.19

## HAY (Clover). Dried at 212° Fah.

Fatty matters ... ..	3.81
*Albuminous compounds ... ..	18.96
Sugar, gum, &c. ... ..	41.27
Indigestible woody fibre ... ..	26.95
Mineral matter (ash) ... ..	9.01
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	3.03

## HAY. Made from kidney vetch.

Moisture ... ..	10.46
Oil and wax ... ..	1.18
*Soluble albuminous compounds...	2.87
†Insoluble albuminous compounds ... ..	4.52
Gum, sugar, and hydro-carbons readily convertible { into sugar .. .. }	43.91
Cellulose ... ..	31.98
Mineral matters soluble in water ... ..	4.50
Mineral matters insoluble in water ... ..	.58
	<hr/>
	100.00
	<hr/>
*Containing nitrogen ... ..	.47
†Containing nitrogen ... ..	.72

## HAY (Meadow). Ash of.

Silica	60.1
Phosphate of lime	16.1
Phosphate of peroxide of iron	5.0
Lime	2.7
Magnesia	8.6
Sulphate of lime	1.2
“ potash	2.2
Chloride of potassium	1.3
Carbonate of soda	2.0
Loss	.8
	<hr/>
	100.0

## INDIGO SEED CAKE.

Moisture	11.91
Oil	4.01
*Albuminous matters	18.15
Mucilage, sugar, &c.	47.96
Woody fibre	11.88
†Ash	6.09

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100.00

*Containing nitrogen	2.90
†Containing sand	.99

## LUPINES. (Yellow, in green state.)

Water	89.20
Soluble organic matters	3.29
Soluble mineral matters	.61
Insoluble organic matters	6.71
Insoluble mineral matters (crude fibre 6.90)	.19

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100.00

## Detailed composition.

Water	89.20
Oil	.37
*Soluble albuminous compounds	1.37
Soluble mineral matters	.61
†Insoluble albuminous compounds	1.01
Sugar, gum, bitter extractive matter and digestible fibre	3.96
Indigestible woody fibre	3.29
Insoluble mineral matters	.19

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100.00

*Containing nitrogen	.22
†Containing nitrogen	.16

## LOCUST MEAL.

Moisture ... ..	12·61
Oil ... ..	1·08
Albuminous matters ... ..	5·87
Sugar... ..	44·30
Pectin, mucilage, &c. ... ..	26·13
Cellulose ... ..	7·14
Ash ... ..	2·87
	<hr/>
	100·00

## LINSEED.

Moisture ... ..	7·50
Oil ... ..	34·01
Albuminous compounds ... ..	24·44
Sugar ... ..	—
Mucilage, starch, woody fibre, &c. ... ..	30·72
Mineral matters ... ..	3·33
	<hr/>
	100·00

## LINSEED (Pure).

	Bombay.	Black Sea.	Alexan- dria.
Moisture ... ..	8·01	10·40	5·47
Oil ... ..	38·21	30·78	35·73
*Albuminous compounds, } and flesh-forming matters }	21·81	26·62	19·31
Mucilage, sugar, and diges- } tible fibre ... .. }	20·85	17·30	26·22
Woody fibre ... ..	8·36	11·40	8·70
Ash ... ..	2·76	3·50	4·57
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Containing nitrogen ... ..	3·49	4·26	3·09

LINSEED CAKES.

	1. English.	2. American.
Moisture ... ..	12.70	11.56
Oil ... ..	11.32	11.56
*Albuminous compounds .. ..	28.21	26.37
Mucilage and other carbonaceous } principles ... ..	29.42	28.47
+Phosphates of lime and magnesia } and other mineral constituents of } food ... ..		
Woody fibre ... ..	12.46	13.92
Insoluble mineral matters ... ..	1.05	8.12
	<hr/> 100.00	<hr/> 100.00
*Containing nitrogen ... ..	4.50	4.22
+Containing phosphoric acid and } Potash ... ..	1.28	—
	1.34	—

LINSEED CAKES. Pure and rich in albuminous compounds.

	3. American.	4. English.
Moisture ... ..	9.90	10.26
Oil ... ..	11.62	12.28
*Albuminous matters ... ..	35.31	31.94
Mucilage, sugar and digestible fibre ...	25.55	30.22
Woody fibre ... ..	11.94	8.58
+Ash ... ..	5.68	6.72
	<hr/> 100.00	<hr/> 100.00
*Containing nitrogen ... ..	5.65	5.11
+Containing sand ... ..	.78	1.82

LINSEED CAKES. Pure, but poor in albuminous matters.

	5. American.	6. English.
Moisture ... ..	11.98	11.28
Oil ... ..	12.14	10.35
*Albuminous matters ... ..	25.12	23.50
Mucilage, sugar, and digestible fibre...	31.01	35.51
Woody fibre ... ..	11.74	11.80
+Ash ... ..	8.01	7.56
	<hr/> 100.00	<hr/> 100.00
*Containing nitrogen ... ..	4.02	3.76
+Containing sand ... ..	2.66	2.32

## LUCERNE.

Moisture .. .. .	73·41
Albuminous compounds .. .. .	4·40
Carbonaceous principles and woody fibre... .. .	19·11
Mineral matters .. .. .	3·08
	<hr/>
	100·00

## MANGOLD. Yellow globe.

Water .. .. .	87·440
Sugar, gum, pectin .. .. .	7·408
Soluble mineral matters .. .. .	1·356
*Soluble albuminous compounds .. .. .	·956
†Insoluble albuminous compounds .. .. .	·144
Cellular fibre, &c. ... .. .	2·583
Insoluble mineral matters .. .. .	·113
	<hr/>
	100·000
*Containing nitrogen .. .. .	·153
†Containing nitrogen .. .. .	·023

## MANGOLD. Pulp.

Water .. .. .	91·84
*Soluble protein compounds .. .. .	·64
Gum, mucilage, little sugar, and free acid .. .. .	1·98
Soluble mineral matter... .. .	·38
†Insoluble protein compounds .. .. .	·69
Woody fibre .. .. .	3·99
Insoluble mineral matter .. .. .	·48
	<hr/>
	100·00
*Containing nitrogen .. .. .	·09
†Containing nitrogen .. .. .	·11

## MELON. Cattle.

Water .. .. .	90·66
*Flesh-forming matters... .. .	1·66
Sugar, mucilage, &c. .. .. .	5·74
Cellulose .. .. .	1·17
Ash .. .. .	·77
	<hr/>
	100·00
*Containing nitrogen .. .. .	·265



## OLIVE CAKE.

	1.	2.
Moisture ... ..	17·11	13·41
Oil ... ..	11·29	3·10
*Flesh-forming matters ... ..	3·50	6·01
Mucilage, sugar, &c. ... ..	27·18	30·66
Woody fibre ... ..	33·19	38·24
Ash ... ..	7·73	8·58
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	·56	·96

## STRAW (Oat).

## Detailed analysis.

Water ... ..	13·70
Oil ... ..	1·69
*Albumen and other soluble protein compounds ... ..	·44
Mucilage, extractive matters soluble in water... ..	7·60
Digestible fibre ... ..	29·27
Soluble inorganic matter ... ..	2·76
†Insoluble protein compounds ... ..	2·31
Indigestible woody fibre ... ..	39·57
Insoluble inorganic matter ... ..	2·66
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	·07
+ “ “ ... ..	·57

## OAT HUSKS.

Moisture ... ..	11·98
Oil ... ..	·36
*Albuminous matters ... ..	1·25
Mucilage, sugar, &c. ... ..	53·63
Woody fibre ... ..	28·48
†Ash ... ..	4·30
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	·20
+ “ sand soluble ... ..	3·64

OATS. Exclusive of husk.	Northumber-land.	Ayr-shire.
Starch ... ..	65·24	64·80
Sugar ... ..	4·51	2·58
Gum ... ..	2·10	2·41
Oil ... ..	5·44	6·97
Nitrogenous matter ... ..	18·69	19·01
Epidermis ... ..	1·18	2·39
Ash ... ..	2·84	1·84
	<hr/>	<hr/>
	100·00	100·00

OATS. Grain.	
Moisture ... ..	15·09
*Albuminous compounds ... ..	11·85
Starch, sugar, &c. ... ..	63·34
Woody fibre ... ..	7·02
†Mineral matters ... ..	2·70
	<hr/>
	100·00
*Containing nitrogen ... ..	1·89
† " phosphoric acid ... ..	·67
" potash ... ..	·40

OATMEAL.	
Water ... ..	13·09
Nitrogenous compounds ... ..	15·68
Starch, a little oil and sugar ... ..	68·17
Fibre ... ..	1·90
Mineral matter ... ..	1·16
	<hr/>
	100·00

OATS. Ash of.	Potato oat.	Hope-ton.
Potash ... ..	31·60	20·6
Soda ... ..	<hr/>	<hr/>
Lime ... ..	5·30	6·7
Magnesia ... ..	8·70	7·8
Oxide of iron ... ..	·90	·4
Sulphuric acid... ..	<hr/>	17·4
Silica... ..	·90	1·3
Carbonic acid ... ..	<hr/>	<hr/>
Chlorides of sodium and potassium ... ..	·35	1·6
Phosphoric acid ... ..	49·20	38·5

## OATS. Grain, ash of.

Carbonic acid ... ..	1·7
Sulphuric acid... ..	1·0
Phosphoric acid ... ..	14·9
Chlorine ... ..	·5
Magnesia ... ..	7·7
Lime .. ..	3·7
Potass ... ..	12·9
Soda ... ..	<hr/>
Silica... ..	53·3
Oxide of iron and alumina ... ..	1·3
Carbon, water and loss ... ..	3·0
	<hr/>
	100·0

## POTATO REFUSE. (Spirit factory.)

Water ... ..	96·05
Protein compounds... ..	·79
Crude fat ... ..	·23
Crude fibre ... ..	1·40
Extractive matter (non-nitrogenous) ... ..	1·12
Ash (minus sand and carbonic acid) ... ..	·41
Potash .. ..	<hr/>
	100·00

## PALM NUT.

	Meal.
Moisture ... ..	10·77
Fatty matters ... ..	13·79
*Flesh-forming matters... ..	13·75
Mucilage, sugar, starch and digestible } fibre ... ..	42·67
Cellulose ... ..	15·17
Ash ... ..	3·85
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	2·20

## PALM NUT.

	Shells.	Cake.
Moisture ... ..	10·12	11·91
Oil ... ..	1·51	7·48
*Albuminous or flesh-forming matters	2·93	18·25
Digestible fibre, starch, &c. ... ..	16·37	41·16
Woody fibre ... ..	67·90	17·90
Ash .. ...	1·17	3·30
	<hr/>	<hr/>
	100·00	100·00
	<hr/>	<hr/>
*Containing nitrogen ... ..	·47	2·92

## POPPY CAKE.

Moisture ... ..	11·63
Oil ... ..	5·75
*Albuminous matters ... ..	31·46
Mucilage, sugar, &c. ... ..	38·18
†Ash ... ..	12·98
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	5·11
† " sand ... ..	7·58

## PEA SHELLS.

Moisture ... ..	13·68
Oil ... ..	1·09
*Albuminous compounds ... ..	7·12
Mucilage, starch and fibre ... ..	21·65
Woody fibre ... ..	53·71
Ash ... ..	2·75
	<hr/>
	100·00
	<hr/>
*Containing nitrogen ... ..	1·14

## PEA STRAW.

Water	...	...	...	...	...	...	...	...	...	16.02
Fatty matters	...	...	...	...	...	...	...	...	...	2.34
*Albuminous matters	...	...	...	...	...	...	...	...	...	8.86
Gum and carbonaceous principles	..	...	...	...	...	...	...	...	...	25.06
Woody fibre	...	...	...	...	...	...	...	...	...	42.79
†Mineral matters	...	...	...	...	...	...	...	...	...	4.93
										<hr/> 100.00
*Containing nitrogen	...	...	...	...	...	...	...	...	...	1.41
† “ phosphoric acid	...	...	...	...	...	...	...	...	...	.41
“ potash	...	...	...	...	...	...	...	...	...	.59

## RAPE. Green.

Water	...	...	...	...	...	...	...	...	...	87.050
Nitrogenous substances, flesh-forming principles	...	...	...	...	...	...	...	...	...	3.133
Woody fibre	...	...	...	..	...	...	...	...	...	3.560
Fatty matter	...	...	...	...	...	...	...	...	...	.649
Respiratory substances	...	...	...	...	...	...	...	...	...	4.000
Inorganic matters (ash)	...	...	...	...	...	...	...	...	...	1.608
										<hr/> 100.000

## RAPE CAKE.

	No. 1.
Moisture	11.28
Oil	11.20
*Albuminous compounds	30.54
Non-nitrogenous matters	28.45
†Phosphates and other mineral constituents of food	5.60
Woody fibre	11.51
Insoluble matter	1.42
	<hr/> 100.00
*Containing nitrogen	5.66
† “ phosphoric acid	1.17
“ potash	1.54

## RAPE CAKES.

	2. English.	3. Green German.	4. Indian.
Moisture ... ..	9·14	10·82	12·07
Oil ... ..	10·84	8·72	10·31
*Albuminous compounds ...	28·31	33·81	34·12
Mucilage, sugar and digesti- ble fibre... ..	25·84	28·06	29·15
Woody fibre ... ..	11·16	11·49	7·38
†Ash ... ..	14·71	7·10	6·97
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00
	<hr/>	<hr/>	<hr/>
*Containing nitrogen ... ..	4·53	5·41	5·46
† " sand ... ..	6·15	·32	·75

## RYE. Green.

Water ... ..	75·423
Flesh-forming substances ... ..	2·705
Woody fibre ... ..	10·488
Fatty matters ... ..	·892
Respiratory substances ... ..	9·134
Ash ... ..	1·358
	<hr/>
	100·000

## STRAW. Rye.

Potash with silicic acid... ..	16·09
Sulphate of potash... ..	1·75
Chloride of potassium ... ..	·25
Chloride of sodium ... ..	·56
Lime silicate ... ..	7·62
Magnesia ... ..	1·92
Phosphate of lime ... ..	2·50
Phosphate of magnesia ... ..	1·28
Phosphate of oxide of iron ... ..	3·20
Silicic acid ... ..	63·89
Carbonaceous matter ... ..	·94
	<hr/>
	100·00

RYE GRASS. Italian.

Water ... ..	75·61
Fatty matters ... ..	·80
Albuminous matters ... ..	2·45
Cellular tissue... ..	14·11
Woody fibre ... ..	4·82
Mineral matters ... ..	2·21
	<hr/>
	100·00

SESAME CAKE.

Moisture ... ..	8·06
Oil ... ..	11·34
*Albuminous matters ... ..	36·87
Mucilage, sugar, &c. ... ..	25·05
Woody fibre ... ..	8·14
Ash ... ..	10·54
	<hr/>
	100·00
*Containing nitrogen ... ..	5·90

SORGHUM SEED.

Moisture ... ..	12·32	12·02
Oil ... ..	2·37	3·80
*Albuminous compounds, flesh-forming } matters ... ..	7·75	7·19
Starch, sugar and digestible fibre ...	73·06	71·82
Cellulose ... ..	3·20	3·50
Mineral matter ... ..	1·30	1·67
	<hr/>	<hr/>
	100·00	100·00
*Containing nitrogen ... ..	1·24	1·15

SPURRY SEED.

Moisture ... ..	12·53
Oil ... ..	10·19
*Nitrogenous compounds ... ..	5·62
Starch and digestible fibre ... ..	59·13
Woody fibre ... ..	8·86
Ash ... ..	3·67
	<hr/>
	100·00
*Containing nitrogen ... ..	·90

## SARRADELLA SEED.

Water ... ..	10.0
Albuminoids ... ..	22.3
Non-nitrogenous extractive matters ... ..	37.2
Fat ... ..	6.0
Crude fibre ... ..	21.0
Ash ... ..	3.5
	<hr/>
	100.00

## NIGER SEED and CAKE.

	Cake.	Seed.
Moisture ... ..	12.56	7.02
Oil ... ..	5.38	43.22
*Albuminous compounds, flesh-forming } matters... ..	32.81	19.37
Mucilage, sugar and digestible fibre ...	20.31	12.37
Woody fibre ... ..	21.08	14.33
†Ash ... ..	7.86	3.48
	<hr/>	<hr/>
	100.00	99.79
	<hr/>	
*Containing nitrogen ... ..	5.25	
† " sand ... ..	1.20	

## SUNFLOWER SEED.

Water ... ..	6.19
Oil ... ..	34.74
Albuminous compounds ... ..	13.29
Gum, sugar, &c. ... ..	13.95
Fibre... ..	28.48
Ash ... ..	3.35
	<hr/>
	100.00

## TEEL, or SESAMUM SEED.

Water ... ..	4.54
Oil ... ..	37.02
Albuminous compounds ... ..	18.87
Gum, sugar, &c. ... ..	19.13
Fibre... ..	11.71
Ash ... ..	8.73
	<hr/>
	100.00



## WHEAT STRAW. Ash of.

Carbonic acid ... ..	—
Sulphuric acid... ..	1·0
Phosphoric acid ... ..	3·1
Chlorine ... ..	·6
Magnesia ... ..	5·0
Lime ... ..	8·5
Potash ... ..	9·2
Soda ... ..	·3
Silica ... ..	67·6
Oxide of iron and alumina ... ..	1·0
Carbon, water and loss ... ..	3·7

100·0

## STUBBLE. Wheat.

Water ... ..	17·66
Oil ... ..	·42
*Albuminous compounds ... ..	2·94
Extractive matters soluble in water ... ..	5·01
Crude woody fibre ... ..	71·04
Mineral matter (ash) ... ..	2·93

100·00

\*Containing nitrogen ... .. ·47

## WHEAT STRAW CHAFF.

Moisture ... ..	13·33
Oil and fatty matters ... ..	1·74
Flesh-forming matters ... ..	2·93
Gum, sugar, &c. ... ..	4·26
Digestible fibre ... ..	19·40
Cellulose ... ..	54·13
Insoluble matter (silica) ... ..	3·08
Saline soluble mineral matters ... ..	1·13

100·00

Nitrogen ... .. ·47

## YEAST. Compressed.

Moisture ... ..	73·19
Oil ... ..	·27
*Albuminous compounds ... ..	13·31
Gum, sugar, &c. ... ..	9·16
Cellular fibre ... ..	1·35
Ash ... ..	2·72

100·00

\*Containing nitrogen ... .. 2·13

## DIGESTIBILITY OF FOODS.

	hr. min.		hr. m.
Alcohol ... ..	1 30	Hare ... ..	3 0
Almond (sweet) ... ..	4 0	Harricots ... ..	3 0
Barley ... ..	2 0	Herring, salt ... ..	3 0
Beans ... ..	3 0	Indian corn ... ..	3 30
Beef (no bone) roasted	3 0	Lamb boiled ... ..	2 30
Beer, strong ... ..	1 30	Lard ... ..	4 30
Boiled salt beef ... ..	4 15	Lentils... ..	3 0
Bread, white ... ..	3 15	Lobster, fleshy ... ..	4 0
“ household ... ..	3 0	“ internal, soft	3 30
Buckwheat... ..	4 0	Mackerel ... ..	2 0
Butter, fresh ... ..	3 30	Mushrooms ... ..	4 0
Cabbage ... ..	4 30	Mutton, roast ... ..	3 0
Calves liver ... ..	3 30	Nuts, fresh... ..	4 0
Carrots ... ..	4 0	Oatmeal ... ..	3 0
Caviare ... ..	3 0	Olive Oil ... ..	3 30
Cheese, Brie ... ..	3 30	Oysters, raw ... ..	2 55
“ Gruyère ... ..	3 30	“ stewed... ..	3 0
“ Chester ... ..	3 30	Parsnips ... ..	4 0
“ Parmesan ... ..	4 0	Peas, dry ... ..	2 30
“ Roquefort ... ..	3 0	Plums, dry... ..	3 30
“ Cream ... ..	3 30	Pork, roast... ..	5 15
“ Dutch ... ..	3 30	Potatoes, roast ... ..	2 30
“ Neufchatel ... ..	3 30	“ boiled ... ..	3 30
Chestnuts ... ..	4 0	Rabbit ... ..	3 0
Chicken ... ..	2 30	Rice ... ..	1 0
Chocolate ... ..	2 30	Sago ... ..	1 45
Codfish (salt) ... ..	3 30	Salmon trout ... ..	1 30
Coffee ... ..	2 0	Sardines, in oil ... ..	3 30
Cow's milk... ..	2 15	Sheep's kidneys... ..	3 45
Eels ... ..	2 30	Sole ... ..	1 30
Eggs, whipped ... ..	1 30	Spirits of wine ... ..	1 30
“ raw ... ..	2 0	Sucking pig, roast ... ..	2 30
“ boiled ... ..	3 0	Tea ... ..	2 0
Figs, dried ... ..	3 0	Truffles ... ..	4 0
Foie-gras ... ..	3 30	Turnips ... ..	2 30
Fowls, ducks, &c. ... ..	3 0	Turkey, boiled ... ..	2 25
Flour, white ... ..	3 0	Veal ... ..	4 0
Flour, rye ... ..	3 30	Venison ... ..	1 35
Fresh fried beef... ..	4 0	Wheat, hard ... ..	3 15
Gelatine ... ..	2 30	Wheat, soft ... ..	3 0
Goat's milk... ..	2 0	Wine ... ..	2 0
Gooseberries ... ..	3 0	Wild goose... ..	3 0
Goose ... ..	3 30		

## SEAWEEDS. Ash in 100 parts of plants.

## "POLYSIPHONIA ELONGATA."

Potash ... ..	3·43
Soda ... ..	·52
Magnesia ... ..	2·32
Lime ... ..	·69
Phosphoric acid ... ..	·26
Sulphuric acid... ..	4·63
Silica... ..	·48
Chloride of sodium ... ..	2·22

The seaweeds were analysed by Forchamoner.

## "SARGASSUM VULGARE."

Potash ... ..	5·00
Soda ... ..	1·02
Lime ... ..	4·39
Magnesia ... ..	1·09
Phosphoric acid ... ..	·45
Sulphuric acid... ..	3·61
Chloride of sodium... ..	7·09

## "SARGASSUM COCCIFERUM."

Potash ... ..	·09
Soda ... ..	·81
Magnesia ... ..	·68
Lime ... ..	5·69
Phosphoric acid ... ..	·38
Sulphuric acid... ..	2·22
Peroxide of iron ... ..	·19

## "HALIDRY'S SILIQUOSA."

Sulphuric acid... ..	3·44
Chloride of sodium ... ..	4·70

## "FURCELLARIA FASTIGATA."

Potash ... ..	3·83
Soda ... ..	4·44
Magnesia ... ..	1·98
Lime ... ..	1·40
Phosphoric acid ... ..	·39
Sulphuric acid... ..	5·85

## "PADINA PAVONIA."

Lime ... ..	25.29
Phosphoric acid ... ..	3.93
Sulphuric acid... ..	4.46

## "DURVILLŒA UTILIS."

Potash ... ..	2.46
Soda ... ..	1.30
Magnesia ... ..	.17
Lime ... ..	2.87
Phosphoric acid ... ..	.55
Sulphuric acid... ..	4.04
Silica... ..	—
Chloride of sodium... ..	6.80

## "LAMINARIA LATIFOLIA."

Potash ... ..	—
Soda ... ..	—
Magnesia ... ..	.78
Lime ... ..	1.61
Phosphoric acid ... ..	.81
Sulphuric acid... ..	1.45
Silica... ..	.08
Chloride of sodium... ..	2.24
Chloride of potassium ... ..	4.24

## "LAMINARIA DIGITATA."

Potash ... ..	4.24
Lime ... ..	2.50
Phosphoric acid ... ..	.79
Sulphuric acid... ..	5.05
Silica... ..	.11
Chloride of sodium... ..	7.90

## "ECKLONIA BUCCINALIS."

Potash ... ..	2.67
Soda ... ..	.94
Magnesia ... ..	.73
Lime ... ..	3.11
Phosphoric acid ... ..	.43
Sulphuric acid .. ..	1.84
Silica... ..	.48
Chloride of sodium ... ..	2.15

## " IRIDŒEA EDULIS."

Potash	...	...	...	...	...	...	...	...	...	1·19
Soda	...	...	...	...	...	...	...	...	...	·78
Lime	...	...	...	...	...	...	...	...	...	1·05
Phosphoric acid	...	...	...	...	...	...	...	...	...	·65
Sulphuric acid...	...	...	...	...	...	...	...	...	...	1·28
Chloride of sodium...	...	...	...	...	...	...	...	...	...	·08

## " DELESSERIA SANGUINEA."

Potash	...	...	...	...	...	...	...	...	...	1·73
Soda	...	...	...	...	...	...	...	...	...	2·69
Magnesia	...	...	...	...	...	...	...	...	...	·75
Lime	...	...	...	...	...	...	...	...	...	·51
Phosphoric acid	...	...	...	...	...	...	...	...	...	·27
Sulphuric acid...	...	...	...	...	...	...	...	...	...	5·13

## " CHONDRUS CRISPUS."

Potash	...	...	...	...	...	...	...	...	...	3·57
Soda	...	...	...	...	...	...	...	...	...	3·86
Magnesia	...	...	...	...	...	...	...	...	...	2·34
Lime	...	...	...	...	...	...	...	...	...	1·48
Phosphoric acid	...	...	...	...	...	...	...	...	...	·08
Sulphuric acid...	...	...	...	...	...	...	...	...	...	8·50

## " CHONDRUS PLICATUS."

Potash	...	...	...	...	...	...	...	...	...	·76
Soda	...	...	...	...	...	...	...	...	...	·91
Magnesia	...	...	...	...	...	...	...	...	...	·70
Lime	...	...	...	...	...	...	...	...	...	1·38
Phosphoric acid	...	...	...	...	...	...	...	...	...	·44
Sulphuric acid...	...	...	...	...	...	...	...	...	...	1·64
Chloride of sodium...	...	...	...	...	...	...	...	...	...	1·98

## SEAWEEEDS. Ashes per cent.

	Fucus digitatus.	Fucus vesiculosus.
Potash	20·66	13·01
Soda	7·65	9·54
Magnesia	6·86	6·12
Lime	10·94	8·36
Phosphoric acid	2·36	1·16
Sulphuric acid...	12·33	24·06
Silica	1·44	1·15
Peroxide of iron	·57	·28
Chloride of sodium	26·18	21·45

## SEAWEEEDS. Ashes per cent.

	Fucus nodosus.	Fucus serratus.
Potash ... ..	9·13	3·98
Soda ... ..	14·33	18·67
Magnesia ... ..	9·91	10·29
Lime ... ..	11·60	14·41
Phosphoric acid ... ..	1·38	3·89
Sulphuric acid... ..	24·20	18·59
Silica... ..	1·09	·38
Peroxide of iron ... ..	·26	·30
Chloride of sodium... ..	18·28	16·56

## URINE OF THE HARE.

Urea ... ..	8·54
Hippuric acid ... ..	—
Mucus ... ..	—
Salts insoluble in water ... ..	12·64
Salts soluble in water ... ..	23·70
Extractive matter soluble in alcohol ... ..	9·58
Extractive matter soluble in water ... ..	32·68
Water ... ..	912·86
	<hr/>
	1000·00

## URINE OF A BOY, Eight years old.

Water ... ..	948·00
Urea ... ..	19·20
Uric acid ... ..	·23
Chloride of sodium ... ..	3·80
Alkaline sulphates... ..	3·21
Phosphates of soda and ammonia ... ..	·52
Phosphates of lime and magnesia ... ..	·85
	<hr/>

## URINE OF A GIRL, 19 years of age.

Water ... ..	941·00
Urea ... ..	24·59
Uric acid ... ..	·63
Chloride of sodium ... ..	·80
Alkaline sulphates... ..	7·85
Phosphates of soda and ammonia ... ..	2·43
Phosphates of lime and magnesia ... ..	·62
	<hr/>





## MINERAL SUBSTANCES.

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### ÄÄRINITE, a new mineral.

Silica	...	...	...	...	...	...	...	...	...	48·528
Alumina	...	...	...	...	...	...	...	...	...	7·551
Peroxide of iron and protoxide of iron	...	...	...	...	...	...	...	...	...	32·785
Manganic oxide	...	...	...	...	...	...	...	...	...	1·167
Lime	...	...	...	...	...	...	...	...	...	3·586
Magnesia	...	...	...	...	...	...	...	...	...	·900
Water	...	...	...	...	...	...	...	...	...	6·158
										100·675

### ALBITE.

Silica	...	...	...	...	...	...	...	...	...	68·5
Alumina	...	...	...	...	...	...	...	...	...	19·3
Peroxide of iron and manganese	...	...	...	...	...	...	...	...	...	·3
Lime	...	...	...	...	...	...	...	...	...	·7
Soda	..	...	...	...	...	...	...	...	...	9·1

### ALLOPHANE.

Alumina	...	...	...	...	...	...	...	...	...	29·2
Silica	...	...	...	...	...	...	...	...	...	21·9
Water	...	...	...	...	...	...	...	...	...	44·2
Mixed clay	...	...	...	...	...	...	...	...	...	4·7

### ALMANDINE or GARNET.

Silica	...	...	...	...	...	...	...	...	...	42·50
Alumina	...	...	...	...	...	...	...	...	...	19·15
Protoxide of iron	...	...	...	...	...	...	...	...	...	33·60
Protoxide of manganese	...	...	...	...	...	...	...	...	...	5·50

## MAGNESIAN GARNET.

Silica	...	...	...	...	...	...	...	...	...	35·8
Alumina	...	...	...	...	...	...	...	...	...	18·1
Protoxide of iron	...	...	...	...	...	...	...	...	...	14·9
Protoxide of manganese	...	...	...	...	...	...	...	...	...	31·0

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## ANALCINE.

Silica	...	...	...	...	...	...	...	...	...	55·1
Alumina	...	...	...	...	...	...	...	...	...	23·0
Soda	...	...	...	...	...	...	...	...	...	13·5
Water	...	...	...	...	...	...	...	...	...	8·3

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## ANDALUSITE.

Silica	...	...	...	...	...	...	...	...	...	36·5
Alumina	...	...	...	...	...	...	...	...	...	60·5
Peroxide of iron	...	...	...	...	...	...	...	...	...	4·0

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## APOPHYLLITE.

Silica	...	...	...	...	...	...	...	...	...	51·9
Lime	...	...	...	...	...	...	...	...	...	25·2
Potash	...	...	...	...	...	...	...	...	...	5·1
Water	...	...	...	...	...	...	...	...	...	16·0

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## AXINITE.

Silica	...	...	...	...	...	...	...	...	...	45·00
Alumina	...	...	...	...	...	...	...	...	...	19·00
Lime	...	...	...	...	...	...	...	...	...	12·50
Peroxide of iron	...	...	...	...	...	...	...	...	...	12·25
Peroxide of manganese	...	...	...	...	...	...	...	...	...	9·00
Boracic acid	...	...	...	...	...	...	...	...	...	2·00
Magnesia	...	...	...	...	...	...	...	...	...	·20

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## ASBESTOS.

		1.	2.	3.
Silica	...	43·50	43·25	40·95
Magnesia	...	40·00	33·85	34·70
Oxide of iron	...	2·08	10·90	10·05
Alumina	...	·40		
Water	...	13·80	7·00	12·00
Loss	...	·22	5·00	1·00
		<hr/> 100·00	<hr/> 100·00	<hr/> 100·00

SODA ALUM.

	1.	2.	3.
Soda ... ..	6·29	6·48	6·67
Alumina ... ..	10·19	10·75	11·00
Sulphuric acid... ..	35·10	34·00	34·32
Water ... ..	48·22	49·00	48·01

AMMONIA ALUM.

	1.	2.	3. Theory.
Ammonia ... ..	—	—	3·75
Alumina ... ..	11·906	11·24	11·34
Sulphuric acid... ..	36·042	35·90	35·29
Water ... ..	—	—	49·62

ALUM (CHINESE).

Sulphuric acid... ..	34·06
Alumina ... ..	11·38
Potash ... ..	10·44
Water ... ..	43·12
Loss ... ..	1·00

ALUM EARTH.

	1.	2.
Alumina ... ..	16·00	10·90
Silica ... ..	40·00	45·40
Magnesia ... ..	·25	—
Sulphur ... ..	2·85	3·94
Carbon .. ..	19·45	5·95
Protoxide of iron ... ..	6·40	5·50
Protoxide of manganese ... ..	—	·60
Protosulphate of iron ... ..	1·80	5·73
Sulphate of alumina ... ..	—	1·20
Sulphate of lime ... ..	1·50	1·71
Sulphate of potassa ... ..	·50	1·75
Chloride of potassium ... ..	·50	·35
Sulphuric acid... ..	—	·47
Water ... ..	10·75	16·60
	<u>100·00</u>	<u>100·10</u>

ALUM. Residue from the Ores after burning and washing out the alum. "Campsie."

Silica	...	...	...	...	...	...	...	...	...	38·40
Alumina	..	...	...	...	...	...	...	...	...	12·70
Sesquioxide of iron	...	...	...	...	...	...	...	...	...	20·80
Oxide of manganese	...	...	...	...	...	...	...	...	...	traces
Lime	...	...	...	...	...	...	...	...	...	2·07
Magnesia	...	...	...	...	...	...	...	...	...	2·00
Potash	...	...	...	...	...	...	...	...	...	1·00
Sulphuric acid...	...	...	...	...	...	...	...	...	...	10·76
Water	...	...	...	...	...	...	...	...	...	12·27
										100·00

ALUMINOUS SULPHATE OF IRON. "Campsie."

	1.	2.	3.
Sulphuric acid...	34·40	30·90	35·600
Protoxide of iron	12·00	20·70	13·560
Alumina	8·80	5·20	7·127
Magnesia	·80	—	—
Water	44·00	43·20	43·713
		100·00	100·00
		100·00	100·00

POTASS ALUM.

	1.	2.	3.
Potash	9·86	10·02	10·40
Alumina	11·09	12·53	10·50
Sulphuric acid...	32·85	26·04	30·52
Water	46·20	51·41	48·58
		100·00	100·00
		100·00	100·00

ALUM STONE.

	Tolfa.	Beregszaz.	Montione.	Mont d'or.
Silica	56·5	62·3	—	28·4
Alumina	19·0	17·5	40·0	31·8
Sulphuric acid...	16·5	12·5	35·6	27·0
Potash	4·0	1·0	13·8	5·8
Water	3·0	5·0	10·0	3·7
Sesquioxide of iron	—	—	—	1·4
Loss	1·0	1·7	·6	1·9
		100·0	100·0	100·0
		100·0	100·0	100·0

## ALUM SHALES.

	1.	2.	3.
Carbonaceous matters ... ..	41·10	27·92	34·20
Silica ... ..	44·02	51·32	50·21
Sesquioxide of iron ... ..	6·23	8·40	·42
Alumina ... ..	5·60	7·62	5·21
Magnesia ... ..	·32	·26	·53
Oxide of manganese ... ..	·12	traces	traces
Sulphur ... ..	1·25	2·89	1·72
Sulphate of lime ... ..	traces	traces	traces
Loss ... ..	1·36	1·59	7·71
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## ALUM SHALE.

Sesquisulphate of alumina ... ..			2·68
Potassa alum ... ..			·47
Sulphate of iron ... ..			·95
Sulphate of lime ... ..			1·70
Silica ... ..			10·32
Alumina ... ..			9·21
Magnesia ... ..			traces
Sesquioxide of iron ... ..			2·30
Oxide of manganese ... ..			·31
Sulphur ... ..			7·13
Water ... ..			33·90
Carbon, &c. ... ..			31·03
			<hr/>
			100·00

## ALUMINA. Crude Sulphate of.

	1.	2.
Silica ... ..	41·85	39·05
Alumina and traces of iron ... ..	18·40	25·55
Sulphuric acid... ..	4·45	8·47
Sulphate of lime ... ..	4·01	traces
Water ... ..	29·53	27·50
Loss ... ..	1·76	—
	<hr/>	<hr/>
	100·00	

## SULPHATE OF ALUMINA. Native from Peru.

Sulphuric acid... ..		35·56
Alumina ... ..		15·88
Water ... ..		48·56
Chlorine, silica and oxide of iron ... ..		traces
		<hr/>
		100·00

## ACTINOLITE.

Silica	...	...	...	...	...	...	...	...	...	59·75
Magnesia	...	...	...	...	...	...	...	...	...	21·10
Lime	...	...	...	...	...	...	...	...	...	14·25
Protoxide of iron	...	...	...	...	...	...	...	...	...	3·90
Protoxide of manganese	...	...	...	...	...	...	...	...	...	·30
Hydrofluoric acid	...	...	...	...	...	...	...	...	...	·80
										<hr/> 100·10

## AGALMATOLITE.

Silica	...	...	...	...	...	...	...	...	...	55·00
Alumina	...	...	...	...	...	...	...	...	...	30·00
Potash	...	...	...	...	...	...	...	...	...	7·00
Water	...	...	...	...	...	...	...	...	...	3 to 5·00
Oxide of iron	...	...	...	...	...	...	...	...	...	traces
										<hr/> <hr/>

## AUGITE.

Silica	...	...	...	...	...	...	...	...	...	54·10
Lime	...	...	...	...	...	...	...	...	...	23·50
Magnesia	...	...	...	...	...	...	...	...	...	11·50
Protoxide of iron	...	...	...	...	...	...	...	...	...	10·00
Protoxide of manganese	...	...	...	...	...	...	...	...	...	·60
										<hr/> 99·70

## ANDREWSITE.

	1.	2.
Ferric oxide	44·639	73·917
Alumina	·916	—
Ferrous oxide	7·109	—
Cupric acid	10·857	traces
Phosphoric acid	26·088	12·280
Water	8·791	7·847
Manganous oxide	·597	4·309
Lime	·094	
Silica	·493	1·485
	<hr/> 99·584	<hr/>

## AMMONIA. Ulmate of.

Moisture ... ..	11.59
*Organic matter and ammoniacal salts ... ..	75.94
Oxides of iron and alumina and traces of potash ...	2.52
Carbonate of lime ... ..	2.22
Alkalies and magnesia ... ..	1.26
Sand ... ..	6.47
	<hr/>
	100.00
*Containing nitrogen ... ..	11.93
Equal to ammonia ... ..	14.49

## AMMONIA. Sulphate of.

Sulphuric acid... ..	54.66
Ammonia ... ..	14.24
Water ... ..	31.10
	<hr/>
	100.00

## AMMONIA. Carbonate.

Carbonic acid ... ..	45.00
Ammonia ... ..	43.00
Water ... ..	12.00
	<hr/>
	100.00

## AMMONIA. Chloride of.

Hydrochloric acid ... ..	49.55
Ammonia ... ..	31.95
Water ... ..	18.50
	<hr/>
	100.00

## APATITE. Norwegian.

Moisture, driven off at 212° Fahrenheit ... ..	.24
Water of combination ... ..	.66
Lime ... ..	45.12
Chloride of calcium ... ..	2.53
Magnesia ... ..	.74
Oxide of iron ... ..	1.29
Alumina ... ..	1.53
Potash ... ..	.36
Sulphuric acid... ..	.29
Phosphoric acid ... ..	35.69
Insoluble siliceous matter ... ..	11.62
	<hr/>
	100.07



## ATACAMITE, or Arenillo and Asurite.

		Asurite.
Oxide of copper ... ..	76·6	69·2
Hydrochloric acid ... ..	10·6	—
Water ... ..	12·8	5·2
Carbonic acid ... ..	—	25·6
	—	—
	100·0	100·0

## ARDENNITE.

	Light- Coloured.	Brown.
Silica ... ..	27·50	27·84
Alumina ... ..	22·76	24·22
Peroxide of iron ... ..	1·15	
Manganic oxide ... ..	30·61	26·70
Lime ... ..	1·83	2·17
Magnesia ... ..	1·38	3·01
Oxide of copper ... ..	·17	—
Vanadic acid ... ..	·53	9·20
Arsenic acid ... ..	9·33	2·76
Water ... ..	5·13	5·01
	—	—
	100·39	100·91

## BORACIC ACID. Crude.

Boracic acid crystallized ... ..	76·494
Water ... ..	6·557
Sulphuric acid... ..	1·322
Silicic acid ... ..	1·200
Sulphate of ammonia ... ..	8·508
„ manganese ... ..	traces
„ magnesia ... ..	2·632
„ lime ... ..	1·018
„ soda ... ..	·917
„ potassa ... ..	·369
Sesquisulphate of iron ... ..	·365
„ alumina ... ..	·320
Chloride of ammonium... ..	·298
Organic matter ... ..	traces
	—
	100·000

## BARYTA MICA.

Silica...	49.44
Alumina ..	26.05
Oxide of iron ...	2.02
Oxide of manganese ...	.29
Magnesia ...	3.03
Baryta ...	5.76
Lime ...	1.81
Potash ...	7.54
Water ...	4.24
	<hr/>
	100.18

## BLUE. Fragment of Egyptian (antique).

Silica ...	70.25
Oxide of copper ...	16.44
Iron and alumina ...	2.36
Calcium carbonate ...	8.35
Soda ...	2.83
	<hr/>
	100.23

## BEAUXITE. Employed for preparation of Alumina.

	1.	2.	3.
Silica ...	20.7	2.8	4.8
Titanium ...	3.2	3.1	3.2
Ferric oxide ...	3.8	25.3	24.8
Alumina ...	58.1	57.6	55.4
Calcium carbonate ...	trace	.4	.2
Water ...	14.2	10.8	11.6
	<hr/>	<hr/>	<hr/>
	100.0	100.0	100.0

## BELL-METAL ORE.

Sulphur ...	25.0
Tin ...	34.0
Copper ...	36.0
Iron ...	2.0
	<hr/>

## BERYL.

	1.	From Elba.
Silica ... ..	66·5	70·00
Alumina ... ..	16·8	26·33
Glucina ... ..	15·5	3·31
Peroxide of iron ... ..	·6	·40
Cæsia ... ..	—	·88
	<hr/>	<hr/>

## BOURNONITE.

Sulphur ... ..	20·3
Antimony... ..	26·3
Lead ... ..	40·8
Copper ... ..	12·7
	<hr/>

## BUCKLANDITE.

Silica ... ..	37·0
Alumina .. ..	26·6
Lime ... ..	20·0
Protoxide of iron ... ..	13·0
Protoxide of manganese ... ..	·6
Water ... ..	1·8
	<hr/>

## BUCKOLZITE.

Silica ... ..	46·4
Alumina ... ..	52·9
	<hr/>

## BOULANGERITE.

Antimony... ..	24·1
Lead ... ..	58·0
Sulphur ... ..	18·0
	<hr/>

## BRICKS. English Quartz or Dinas Bricks.

	1.	2
Silica ... ..	95·93	96·65
Iron oxide ... ..	·48	2·20
Alumina ... ..	1·20	
Lime ... ..	2·15	·50
Magnesia ... ..	·24	·14
Manganous oxide ... ..	trace	—
	<hr/>	<hr/>

## BARILLA.

	Alicante.	Cherbourg.	Spain.	Villette.
Sulphate of soda ... ..	—	22·19	15·85	20·35
Chloride of potassium ... ..	—	16·00	10·55	10·53
Chloride of sodium... ..	65·00	45·78	68·35	54·11
Carbonate of soda ... ..	2·00	9·53	traces	13·76
Sulphate of lime ... ..	—	—	1·10	—
Insoluble matters ... ..	3·00	1·50	—	—
Iodine compounds ... ..	—	traces	—	traces
Sulphate of soda ... ..	30·00	—	—	—
Water ... ..	—	5·00	4·00	1·25
Loss ... ..	—	—	·15	—
	<hr/>	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00	100·00

## BITUMEN.

		Crude.	Pure.	Crude.
Oily matters ... ..	20·0	—	—	—
Carbon ... ..	3·7	76·13	77·5	77·64
Hydrogen ... ..	—	9·41	9·6	7·86
Nitrogen ... ..	—	—	12·4	1·02
Oxygen ... ..	—	12·66	·5	8·35
Quartz, sand and mica ... ..	76·3	—	—	—
Ashes ... ..	—	1·80	—	5·13
	<hr/>	<hr/>	<hr/>	<hr/>

## BIOTITE.

Silica ... ..	39·9
Alumina ... ..	15·0
Peroxide of iron ... ..	7·7
Magnesia ... ..	23·7
Soda ... ..	1·1
Potash ... ..	9·1
Flourine ... ..	·9
Chlorine ... ..	·4
Water ... ..	1·3
	<hr/>

## BUSTATNITE.

Oxide of manganese ... ..	52·6
Silica ... ..	39·6
Oxide of iron ... ..	4·6
Lime and magnesia ... ..	1·5
Water ... ..	2·7
	<hr/>



## CLAY. Stourbridge.

	1.	2.	3.	4.
Silicic acid ... ..	68·05	63·70	63·99	61·77
Alumina ... ..	18·85	20·70	20·84	18·97
Lime .. ...	·80	1·30	·30	1·53
Magnesia ... ..	—	—	·94	·91
Iron ... ..	5·10	1·00	·75	·17
Water ... ..	6·00	10·30	11·67	14·79
Loss ... ..	1·20	3·00	1·51	1·86

## CLAYS, Fire. Newcastle.

	1.	2.	3.	4.
Silica ... ..	51·10	47·55	48·55	51·11
Alumina ... ..	31·35	29·50	30·25	30·40
Lime ... ..	1·46	1·34	1·66	1·76
Magnesia ... ..	1·54	·71	1·91	trace
Water and organic matter	10·47	12·01	10·67	12·29
Oxide of iron ... ..	4·63	9·13	4·06	4·91

## CLAY. Stourbridge.

	1.	2.	3.	Monmouth.	Pembroke.
Silica ... ..	63·7	45·25	63·3	75·3	88·43
Alumina ... ..	20·7	28·77	25·3	16·8	6·90
Oxide of iron ... ..	4·0	7·72	1·8	1·0	1·50
Lime ... ..	—	·47	1·5	·9	3·40
Magnesia ... ..	—	—	trace	—	trace
Water ... ..	10·3	17·34	10·3	6·0	dried

## COALS. Welsh, Ashes of.

	Pontypool.	Bedwas.	Porthmawr.	Ebbw Vale.
Silica ... ..	40·00	26·87	34·21	53·00
Alumina and Oxide of iron } ... ..	44·78	56·95	52·00	35·01
Lime ... ..	12·00	5·10	6·19	3·94
Magnesia ... ..	trace	1·19	·65	2·20
Sulphuric acid ... ..	2·22	7·23	4·12	4·89
Phosphoric acid ... ..	·75	·74	6·63	·88

## COALS Scotch, Ashes of.

	Fordell.	Splint.	Wallsend.	Elgin.
Silica ... ..	—	37·60	—	61·66
Alumina and Oxide of iron } ... ..	—	52·00	—	24·42
Lime ... ..	—	3·73	—	2·62
Magnesia ... ..	—	1·10	—	1·73
Sulphuric acid ... ..	—	4·14	—	8·38
Phosphoric acid ... ..	—	·88	—	1·18

## COAL. Gas by measure.

Olifant gas ... ..	13 parts.
Light carburetted Hydrogen } ... ..	83 “
Carbonic oxide ... ..	2 “
Hydrogen ... ..	1 “
Nitrogen ... ..	1 “
Carbonic acid gas ... ..	trace

## COAL. Ash.

Silica ... ..	61·50
Oxide of iron and alumina ... ..	26·72
Magnesia ... ..	1·70
Lime ... ..	2·05
Potash ... ..	trace
Soda ... ..	trace
Phosphoric acid ... ..	·30
Sulphuric acid ... ..	5·72
Carbonic acid ... ..	2·01
	<hr/>
	100·00

## COAL.

	Newcastle.	Anthracite.
Carbon ... ..	80·0	91·0
Hydrogen ... ..	6·0	3·5
Oxygen ... ..	8·0	2·0
Nitrogen ... ..	·7	·5
Sulphur ... ..	·3	·5
Ash ... ..	5·0	2·5
	<hr/>	<hr/>
	100·0	100·0

## CHARCOAL. Old, from Sugar Refiners.

	1.	2.
Carbon nitrogenous ... ..	9·74	10·60
Calcic phosphate ... ..	82·80	83·20
Calcic carbonate ... ..	5·92	4·15
Calcic sulphate ... ..	·67	·64
Ferric oxide ... ..	·33	·55
Siliceous matters ... ..	·54	·86
	<hr/>	<hr/>
	100·00	100·00
	3.	4.
Carbon nitrogenous ... ..	12·86	19·64
Calcic phosphate ... ..	81·80	73·20
Calcic carbonate ... ..	2·92	3·18
Calcic sulphate ... ..	·42	1·12
Ferric oxide ... ..	·67	·66
Siliceous matters ... ..	1·33	2·20
	<hr/>	<hr/>
	100·00	100·00

## CHALKS.

	Red.	White.
Carbonate of calcium ... ..	80·04	95·80
Sulphate of calcium ... ..	·10	trace
Sesquioxide of iron ... ..	9·60	1·08
Alumina ... ..	1·42	·52
Magnesia ... ..	<hr/>	·48
Silica ... ..	9·28	2·28
Manganese ... ..	trace	·11
	<hr/>	<hr/>
	100·44	100·27

## CHALK MARL.

Moisture ... ..	2·49
Carbonate of lime ... ..	69·23
Oxides of iron and alumina ... ..	·36
Phosphate of lime ... ..	·63
Sulphate of lime ... ..	trace
Magnesia and alkalies ... ..	·45
Soluble silica ... ..	8·29
Fine sand ... ..	18·55
	<hr/>
	100·00

## CHLORALUM.

		Liquid.
Aluminium chloride	... ..	16·00
Calcium chloride	... ..	1·70
Alkalies (as sulphates)	... ..	·10
Hydrochloric acid	... ..	1·20
Water	... ..	81·00
		<hr/>
		Solid.
Soluble in water.		
Aluminium chloride	... ..	13·40
“ Sulphate	... ..	4·10
Calcium “	... ..	9·10
Sodium “	... ..	14·10
		<hr/>
		40·70
		<hr/>
Soluble in hydrochloric acid	... ..	15·20
Insoluble “ “	... ..	*22·90
Water	... ..	20·90

\* Kaolin, silicic acid.

## CHALKOSIDERITE.

Iron oxide	... ..	42·810
Alumina	... ..	4·449
Copper oxide	... ..	8·148
Phosphoric acid	... ..	29·929
Arsenic acid	... ..	·609
Water	... ..	14·999
Uranium oxide	... ..	trace
		<hr/>
		100·944

## CALAITE or TURQUOIS.

		1.	2.
Phosphoric acid	... ..	30·9	27·34
Alumina	... ..	44·5	47·45
Oxide of copper	... ..	3·7	2·02
Protoxide of iron	... ..	1·8	—
Water	... ..	19·00	18·18
		<hr/>	<hr/>

## CANAAHITE or SCAPOLITE.

Silica	...	...	...	...	...	...	...	...	...	41·25
Alumina	...	...	...	...	...	...	...	...	...	33·60
Lime	...	...	...	...	...	...	...	...	...	20·40
Protoxide of manganese	...	...	...	...	...	...	...	...	...	·5
Water	...	...	...	...	...	...	...	...	...	3·2

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## CASTOR.

Silica	...	...	...	...	...	...	...	...	...	78·0
Alumina	...	...	...	...	...	...	...	...	...	18·9
Oxides of iron and manganese	...	...	...	...	...	...	...	...	...	1·6
Lithia, potash and soda	...	...	...	...	...	...	...	...	...	2·8

---

## COBALT. Arsenical.

	1.	2.
Cobalt	20·31	28·00
Arsenic	74·21	65·75
Iron	3·42	—
Copper	·15	6·25
Sulphur	·88	—
Loss	1·03	—

---

## COBALT. Glance.

	1.	2.	3.
Cobalt	33·10	36·66	44·00
Arsenic	43·47	49·00	55·00
Sulphur	20·08	6·66	·50
Iron	3·23	5·66	—
Loss	·12	2·02	·50

---

## COBALT. Pyrites.

	1.	2.
Cobalt	43·20	43·86
Copper	14·40	4·10
Iron	3·53	5·34
Sulphur	38·50	41·00
Loss	·37	5·70

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## SPEISS.

	1.	2.	3.
Nickel ... ..	49·0	52·6	52·70
Arsenic ... ..	37·8	40·5	44·00
Iron ... ..	—	2·7	1·60
Copper ... ..	1·6	1·6	
Manganese ... ..	—	—	
Cobalt ... ..	3·2	trace	—
Antimony ... ..	trace	—	—
Sulphur ... ..	7·8	2·5	1·65
Loss ... ..	·6	·1	·05

## SMALT.

Protoxide of cobalt ... ..	15·00
Oxide of iron ... ..	4·50
Oxide of lead ... ..	4·90
Alumina ... ..	5·40
Potash ... ..	14·50
Silicic acid ... ..	55·70

## COPPER ORE. Crude and Calcined.

	1.	2.
Oxide of copper ... ..	·374	5·401
Copper pyrites ... ..	22·710	11·228
Iron pyrites ... ..	22·442	11·226
Various sulphides ... ..	1·001	·600
Oxide of iron ... ..	·608	11·718
Other oxides ... ..	·269	·608
Quartz and silica ... ..	34·420	34·408
Earthy bases ... ..	1·871	1·874
Water and carbonic acid ... ..	·491	·491
Oxygen consumed ... ..	15·806	—

## COPPER. Scoria.

	Blue.	Black.	Red.
Silica ... ..	55·0	56·0	58·6
Alumina ... ..	7·0	9·0	5·0
Lime ... ..	24·6	27·0	16·0
Protoxide of iron ... ..	11·9	7·0	12·6
Protoxide of copper ... ..	·5	·7	—
Suboxide of copper ... ..	—	—	6·6
Loss ... ..	1·0	·3	1·2



## CHLOROPHYLLITE.

		Chlorite.
Silica	45.2	30.4
Alumina	27.6	17.0
Magnesia	9.6	34.0
Protoxide of iron	8.2	4.4
Water	3.6	12.6
Protoxide of manganese	4.1	—

## CHONDRODITE.

Silica	33.1
Magnesia	55.5
Protoxide of iron	3.6
Flourine	7.6

## CHRYSOBERYL.

Alumina	73.6
Glucina	15.8
Silica	4.0
Protoxide of iron	3.4

## CHRY SOLITE.

Silica	38.5
Magnesia	48.4
Peroxide of iron	11.2
Oxide of manganese	.3
Alumina	.2

## CLINTONITE.

Silica	17.0
Alumina	37.6
Magnesia	24.3
Lime	10.7
Protoxide of iron	5.0
Water	3.6

## COLUMBITE.

Columbic with niobic acid	...	...	...	...	...	...	...	...	80.1
Protoxide of iron	...	...	...	...	...	...	...	...	12.6
Protoxide of manganese	...	...	...	...	...	...	...	...	6.0
Oxide of tin	...	...	...	...	...	...	...	...	.1
Oxide of copper and lead	...	...	...	...	...	...	...	...	.4

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## CHRONSTEDTITE.

Iron protoxide	...	...	...	...	...	...	...	...	38.570
Iron peroxide	...	...	...	...	...	...	...	...	32.752
Silicic acid	...	...	...	...	...	...	...	...	18.546
Water	...	...	...	...	...	...	...	...	10.132

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100.000

## CHRYSOCOLLA. Silicate of Copper.

Soluble silica	...	...	...	...	...	...	...	...	62.42
Insoluble silica	...	...	...	...	...	...	...	...	3.83
Oxide copper	...	...	...	...	...	...	...	...	25.69
“ lead	...	...	...	...	...	...	...	...	.12
“ iron	...	...	...	...	...	...	...	...	.26
“ manganese	...	...	...	...	...	...	...	...	trace
Alumina	...	...	...	...	...	...	...	...	—
Oxide cobalt	...	...	...	...	...	...	...	...	trace
“ zinc	...	...	...	...	...	...	...	...	.34
Lime	...	...	...	...	...	...	...	...	.74
Magnesia	...	...	...	...	...	...	...	...	1.06
Oxygen	...	...	...	...	...	...	...	...	—
Water	...	...	...	...	...	...	...	...	6.13

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100.59

## CHRYSOCOLLA.

	Siberian.	New Jersey.	
Oxide of copper	40.0	55.1	45.2
Silica	36.5	35.4	37.3
Water	20.2	28.5	17.0
Carbonic acid	2.1	1.0	—
Oxide of iron	1.0	—	—



## DICHROITE.

Silica ... ..	48·3
Alumina ... ..	32·5
Magnesia ... ..	10·0
Protoxide of iron ... ..	6·0
Protoxide of manganese ... ..	·1
Water ... ..	3·1
	<hr/>

## DURANGITE.

Arsenic oxide ... ..	55·10
Alumina ... ..	20·68
Ferric oxide ... ..	4·78
Manganic oxide ... ..	1·30
Soda ... ..	11·66
Silicic acid ... ..	·81
Flourine ... ..	5·67
	<hr/>
	100·00

## ECLOGITE. Upper Franconia.

Silica ... ..	57·10
Phosphoric acid ... ..	traces
Alumina ... ..	11·66
Peroxide of iron ... ..	3·22
Protoxide of iron ... ..	2·84
Manganese oxide ... ..	·31
Lime ... ..	13·80
Magnesia ... ..	6·37
Potash ... ..	·81
Soda ... ..	2·21
Water ... ..	·54
	<hr/>
	98·86

## EMERALD.

Silica ... ..	68·50
Alumina ... ..	15·75
Glucina ... ..	12·50
Peroxide of iron ... ..	1·00
Lime ... ..	·25
Oxide of chrome ... ..	·30
Lime, magnesia and soda ... ..	traces
	<hr/>

## EPSOM SALTS. Crude.

Sulphuric acid .. .. .	32·26
Magnesia ... .. .	15·35
Protoxide of iron ... .. .	1·73
Oxides of nickel and cobalt ... .. .	·12
Lime ... .. .	·09
Alumina ... .. .	1·33
Potash ... .. .	·83
Water ... .. .	48·29
	<hr/>
	100·00

## EPSOM SALTS. Pure.

	Theory.	Found.
1 Eq. Magnesia ... .. .	16·26	16·04
1 Eq. Sulphuric acid ... .. .	32·52	32·53
7 Eqs. Water ... .. .	51·22	51·43
	<hr/>	<hr/>
	100·00	100·00

## EDELFORSITE.

Silica ... .. .	61·8
Lime ... .. .	38·2
	<hr/>

## EPIDOTE. Green.

Silica ... .. .	37·0
Alumina ... .. .	26·6
Lime ... .. .	20·0
Protoxide of iron ... .. .	13·0
Protoxide of manganese ... .. .	·6
Water ... .. .	1·8
	<hr/>

## EUCHROITE.

Arsenic acid ... .. .	33·0
Oxide of copper ... .. .	48·0
	<hr/>

## ERINITE.

Arsenic acid ... .. .	33·8
Oxide of copper ... .. .	59·4
	<hr/>



## FLOURSPAR.

Flourine ... ..	47·7
Calcium ... ..	52·3

## FRANKLINITE.

Peroxide of iron ... ..	66·0
Sesquioxide of manganese ... ..	16·0
Oxide of zinc ... ..	17·0

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## FULLER'S EARTH.

Silica... ..	44·0
Alumina ... ..	23·1
Lime ... ..	4·1
Magnesia ... ..	2·0
Protoxide of iron ... ..	2·0

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## FUSIBLE METAL.

Bismuth ... ..	8 parts
Lead ... ..	5 "
Tin ... ..	3 "

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## FAHLUNITE.

Silica... ..	44·9
Alumina ... ..	30·7
Peroxide of iron ... ..	7·2
Potash ... ..	1·3
Magnesia ... ..	6·0
Lime ... ..	·9
Protoxide of manganese ... ..	1·9
Water ... ..	8·6

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## GUNPOWDER. Musket.

	Saltpetre.	Sulphur.	Charcoal.
England ... ..	76·5	9·0	14·5
Austria ... ..	72·0	16·0	17·0
France ... ..	75·0	12·5	12·5
Russia ... ..	80·0	8·7	11·3
Saxony ... ..	76·5	10·5	13·0
Baden ... ..	76·0	10·0	14·0

## GUNPOWDER. Sporting.

	Saltpetre.	Sulphur.	Charcoal.
England ... ..	79·7	7·8	12·5
“ ... ..	78·0	8·0	14·0
Austria ... ..	80·0	12·0	14·0
Russia ... ..	80·0	8·0	12·0
Baden ... ..	76·0	10·0	14·0

## GUNPOWDER. Artillery.

	Saltpetre.	Sulphur.	Charcoal.
England ... ..	} 75·0	10·0	15·0
Government mills ... ..		8·0	17·0
Waltham Abbey ... ..		9·5	14·5
Austria ... ..	70·0	16·0	17·0
France .. ...	75·0	12·5	12·5
United States ... ..	75·0	12·5	12·5
Russia ... ..	71·0	11·5	17·5
Prussia ... ..	75·0	11·5	13·5
Spain... ..	76·5	10·8	12·7
Hanover ... ..	71·2	10·8	15·0
Holland ... ..	70·0	14·0	16·0
Italy .. ...	76·0	12·0	12·0
Portugal ... ..	75·7	10·7	13·6
Sweden ... ..	75·0	9·0	16·0
China... ..	61·5	15·5	23·0
China... ..	75·7	9·9	14·4

## GLASS. Flint, Strass and Enamel.

	1.	2.	3.
Silica... ..	44·30	38·50	31·6
Potash ... ..	11·75	7·90	8·3
Lime ... ..	—	—	—
Alumina ... ..	—	1·0	—
Oxide of lead ... ..	43·05	53·0	50·3
Oxide of tin ... ..	—	—	9·8

GLASS.	Bohemian glass.	Bohemian opal glass.	Venetian Aventurine.	Bohemian mirror glass.
Silica ... ..	76·0	80·9	67·7	67·7
Potash ... ..	15·0	17·6	5·5	21·0
Soda ... ..	—	—	7·1	9·9
Lime ... ..	8·0	·7	8·9	1·4
Alumina ... ..	1·0	·8	—	—
Oxide of tin ... ..	—	—	2·3	—
Oxide of lead ... ..	—	—	1·1	—
Copper ... ..	—	—	3·9	—
Oxide of iron ... ..	—	traces	3·5	—

GLASS. From volcanic products.	Lipari pumice.	Basalt of Hassenburg.	Basalt of Staffa.	Pitchstone of Misnai.
Silica ... ..	77·5	44·5	48·0	73·00
Alumina ... ..	17·5	16·7	16·0	14·50
Oxide of iron ... ..	1·7	20·0	16·0	1·00
Soda and potass ... ..	3·0	2·6	4·0	1·75
Lime ... ..	—	9·5	9·0	1·00
Magnesia ... ..	—	2·2	—	—
Water ... ..	—	2·0	5·0	8·50
Hydrochloric acid ... ..	—	—	1·0	·25
Loss ... ..	·30	2·5	1·0	·25

GLASS. Bohemian.	
Silica ... ..	73·0
Potassa ... ..	11·5
Soda ... ..	3·0
Lime ... ..	10·5
Magnesia, alumina, sesquioxide of iron, and oxide of manganese ... ..	2·0

GLASS. Medicinal.	1.	2.
Silica ... ..	71·6	62·5
Soda ... ..	—	—
Potash ... ..	10·6	10·5
Lime ... ..	10·0	16·2
Magnesia ... ..	—	—
Alumina ... ..	3·0	4·5
Oxide of manganese ... ..	·3	1·2
Oxide of lead ... ..	1·5	2·5

## GLASS. Plate.

	1.	2.	3.	4.
Silica ... ..	72·0	76·0	75·9	73·85
Soda ... ..	—	—	—	5·50
Potash ... ..	17·0	17·0	17·5	12·05
Lime ... ..	6·4	6·0	3·8	5·60
Magnesia ... ..	—	—	—	—
Alumina ... ..	2·6	—	2·8	3·50
Oxide of manganese ...	—	—	—	—
Oxide of iron ... ..	1·9	1·0	—	—

## GLASS. Crystal.

	1.	2.	3.	4.
Silica ... ..	59·2	56·0	51·4	56·0
Potash ... ..	9·0	6·6	9·4	8·9
Lime ... ..	—	—	—	2·6
Alumina ... ..	—	1·0	1·2	—
Oxide of lead ... ..	28·2	34·4	37·4	32·5
Oxide of manganese ...	1·0	—	—	—
Oxide of iron ... ..	·4	—	·8	trace

## GLASS. White.

	1.	2.	3.	4.
Silica ... ..	71·7	71·6	69·4	69·2
Soda ... ..	12·7	11·0	11·8	15·8
Potash ... ..	2·5	—	—	3·0
Lime ... ..	10·3	10·0	9·2	7·6
Magnesia ... ..	—	2·3	—	2·0
Oxide of manganese ...	·2	·2	—	—
Oxide of iron ... ..	·3	3·9	—	·5
Alumina ... ..	·4	2·2	9·6	1·2

## GLASS. Window.

	1.	2.	3.	4.	5.	6.
Silica ... ..	69·65	69·25	68·55	68·65	68·5	68·0
Soda ... ..	15·22	11·30	12·88	17·70	13·7	10·1
Lime ... ..	13·31	17·25	16·17	9·65	7·8	14·3
Alumina ... ..	1·82	2·20	2·40	4·00	10·0	7·6

## GLASS. Bottle.

	1.	2.	3.
Silica ... ..	60·0	60·4	53·55
Soda ... ..	3·1	3·2	—
Potash ... ..	3·1	3·2	5·48
Lime ... ..	22·3	20·7	29·22
Magnesia ... ..	—	·6	—
Baryta ... ..	—	·9	—
Oxide of manganese .. ..	1·2	—	—
Alumina ... ..	8·0	10·4	6·01
Oxide of iron ... ..	4·0	3·8	4·40

## GLAZE. English for Earthenware.

Silica ... ..	40·56
Alumina ... ..	6·07
Lead oxide ... ..	40·04
Ferric oxide ... ..	2·59
Manganous oxide ... ..	7·14
Lime ... ..	2·58
Alkalies and loss ... ..	1·02
	<hr/>
	100·00

## GLAUCONITE.

Silica ... ..	50·42
Alumina ... ..	4·79
Protoxide of iron ... ..	19·90
Peroxide of iron ... ..	5·96
Lime ... ..	3·21
Magnesia ... ..	2·28
Potash ... ..	7·87
Soda ... ..	·21
Water ... ..	5·28
Phosphoric acid ... ..	trace
	<hr/>
	99·92

## GARNET. Melanite.

Silica ... ..	35·6
Alumina ... ..	12·2
Sesquioxide of iron ... ..	16·8
Lime ... ..	33·3
Magnesia ... ..	1·2

## GEHLENITE.

Silica...	29·6
Alumina ...	24·8
Lime ...	35·3
Protoxide of iron ...	6·6
Water ...	3·3
	<hr/>

## GERMAN SILVER.

Copper ...	8 parts
Nickel ...	3 “
Zinc ...	3½ “

## GILBERTITE.

Silica ...	45·2
Alumina ...	40·1
Lime ...	4·2
Magnesia ...	1·9
Peroxide of iron ...	2·4
Water ...	4·25
	<hr/>

## GREEN EARTH.

Silica ...	51·5
Alumina ...	6·4
Protoxide of iron ...	24·3
Potash ...	9·96
Water ...	7·7
	<hr/>

## GÜMBELITE. Upper Franconia.

Silicic acid ...	50·52
Alumina ...	31·04
Iron oxide ...	3·00
Magnesia ...	1·88
Potash ...	3·18
Water ...	7·00
Undecomposed substance ...	1·46
	<hr/>
	98·08

## HUMITE.

	Vesuvius.	Sweden.
Silica ... ..	35·63	33·96
Magnesia ... ..	54·45	53·51
Ferrous oxide ... ..	5·12	6·83
Lime ... ..	·23	—
Alumina ... ..	·82	·72
Flourine ... ..	2·43	4·24
	<hr/>	<hr/>
	98·68	99·26

## HARMATONE.

Silica ... ..	46·6
Alumina ... ..	16·8
Baryta ... ..	20·3
Lime ... ..	·3
Potash ... ..	1·0
Water ... ..	15·0
	<hr/>

## HAUYNE.

Silica ... ..	35·0
Alumina ... ..	27·4
Soda ... ..	9·1
Lime ... ..	12·6
Sulphuric acid ... ..	12·6
Sulphur and chlorine ... ..	traces
	<hr/>

## HALLOYLITE.

Silica ... ..	39·5
Alumina ... ..	34·0
Water ... ..	26·5
	<hr/>

## HERRERITE.

Carbonic acid ... ..	31·9
Tellurium ... ..	55·6
Peroxide of nickel ... ..	12·3
	<hr/>



## ISENITE. New Volcanic Rock.

Silica	...	...	...	...	...	...	...	...	...	48.02
Alumina	...	...	...	...	...	...	...	...	...	16.92
Ferric oxide	...	...	...	...	...	...	...	...	...	11.63
Ferrous oxide	...	...	...	...	...	...	...	...	...	4.70
Manganous oxide	...	...	...	...	...	...	...	...	...	2.44
Magnesia	...	...	...	...	...	...	...	...	...	1.45
Lime	...	...	...	...	...	...	...	...	...	8.58
Soda	...	...	...	...	...	...	...	...	...	2.36
Water	...	...	...	...	...	...	...	...	...	1.78
Titanic acid	...	...	...	...	...	...	...	...	...	.15
Phosphoric acid	...	...	...	...	...	...	...	...	...	1.55
Sulphuric acid	...	...	...	...	...	...	...	...	...	.56
Chlorine	...	...	...	...	...	...	...	...	...	.53
										100.67

## IONA PEBBLES.

								Light.	Dark.
Silica	...	...	...	...	...	...	...	37.20	43.20
Lime	...	...	...	...	...	...	...	5.03	5.10
Magnesia	...	...	...	...	...	...	...	36.73	33.60
Ferrous oxide	...	...	...	...	...	...	...	5.39	6.00
Manganese oxide	...	...	...	...	...	...	...	4.19	.94
Water	...	...	...	...	...	...	...	11.42	9.60
								99.96	98.44

## IDOCRASE.

Silica	...	...	...	...	...	...	...	...	37.4
Alumina	...	...	...	...	...	...	...	...	23.5
Protoxide of iron	...	...	...	...	...	...	...	...	4.0
Lime	...	...	...	...	...	...	...	...	29.7
Magnesia and protoxide of manganese	...	...	...	...	...	...	...	...	5.2

## ISOPYRE.

Silica	...	...	...	...	...	...	...	...	47.1
Alumina	...	...	...	...	...	...	...	...	13.9
Peroxide of iron	...	...	...	...	...	...	...	...	20.1
Lime	...	...	...	...	...	...	...	...	15.4
Oxide of copper	...	...	...	...	...	...	...	...	1.9

## ILVAITE.

Oxide of iron ... ..	50 to 55
Lime ... ..	14
Silica ... ..	29
	<hr/>

## IOLITE.

Silica ... ..	48·3
Alumina ... ..	32·5
Magnesia ... ..	10·0
Protoxide of iron ... ..	6·0
Protoxide of manganese ... ..	·1
Water ... ..	3·0
	<hr/>

## IRON ORE (Chromic).

Green oxide of chromium ... ..	60·0
Protoxide of iron ... ..	20·1
Alumina ... ..	11·8
Magnesia ... ..	7·5
	<hr/>

## IRON ORE (Magnetic).

Peroxide of iron ... ..	69·0
Protoxide of iron ... ..	31·0
	or
Iron ... ..	71·8
Oxygen ... ..	28·2
	<hr/>

## IRON ORES.

	Spathic.	Pyrites.	Arsenical Pyrites.	Magnetic.
Protoxide of iron ... ..	61·37	45·74	36·0	59·6
Sulphur ... ..	—	54·26	21·1	40·4
Arsenic ... ..	—	—	42·9	—
Carbonic acid A. ... ..	38·63	—	—	—
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## IRON ORE. Bog.

	1.	2.	3.
Sesquioxide of iron ... ..	78·57	43·4	66·0
Oxide of manganese ... ..	—	15·0	1·5
Phosphoric acid ... ..	—	—	8·0
Water and organic matters ... ..	21·43	15·0	23·0
Silica ... ..	—	23·0	—
Alumina ... ..	—	3·2	—
	<hr/>	<hr/>	<hr/>
	100·00	99·6	98·5

## IRON ORE. Black Band.

	1.	2.	3.
Protoxide of iron ... ..	49·4	49·6	46·6
Carbonic acid ... ..	35·2	30·4	30·1
Magnesia ... ..	4·0	8·1	—
Alumina ... ..	1·8	1·8	—
Lime ... ..	—	—	6·3
Silica ... ..	—	—	5·4
Coaly matter ... ..	9·6	9·6	8·4
Loss ... ..	—	·5	3·2
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## IRON ORES. From Persberg.

	1.	2.
Silica ... ..	17·10	17·31
Alumina ... ..	·55	1·16
Lime ... ..	1·35	1·13
Magnesia ... ..	7·50	1·15
Protoxide of manganese ... ..	·14	·18
Protoxide of iron ... ..	72·79	79·27
Sulphur ... ..	—	·06
Phosphorus ... ..	—	·01
Metallic iron ... ..	56·61	60·65
	<hr/>	<hr/>
	3.	4.
Silica ... ..	15·248	17·930
Alumina ... ..	2·997	2·944
Lime .. ...	9·166	4·391
Magnesia ... ..	5·236	5·594
Protoxide of manganese ... ..	·044	·044
Protoxide of iron ... ..	73·384	69·220
Sulphur ... ..	trace	trace
Phosphorus ... ..	trace	trace
Metallic iron ... ..	57·070	53·820
	<hr/>	<hr/>

IRON (Meteoric).								1.	2.
Iron	...	...	...	...	...	...	...	88·706	88·365
Nickel	...	...	...	...	...	...	...	10·163	10·242
Cobalt	...	...	...	...	...	...	...	·396	·428
Copper	...	...	...	...	...	...	...	·003	·004
Tin	...	...	...	...	...	...	...	·002	·002
Manganese	...	...	...	...	...	...	...	trace	—
Phosphorus	...	...	...	...	...	...	...	·341	·362
Sulphur	...	...	...	...	...	...	...	·019	·008
Chlorine	...	...	...	...	...	...	...	·003	·002
Carbon	...	...	...	...	...	...	...	·172	·185
Silica	...	...	...	...	...	...	...	·067	·061
								<hr/>	<hr/>
								99·872	99·659

IRON ORES. Oolitic.								1.	2.
Clay and sand	...	...	...	...	...	...	...	18·80	18·42
Organic matter	...	...	...	...	...	...	...	·60	·60
Iron pyrites	...	...	...	...	...	...	...	·35	·45
Peroxide of iron	...	...	...	...	...	...	...	49·97	47·98
Protoxide of iron	...	...	...	...	...	...	...	5·36	5·31
Oxide of manganese	...	...	...	...	...	...	...	·20	·44
Alumina	...	...	...	...	...	...	...	5·09	6·48
Lime	...	...	...	...	...	...	...	5·20	5·02
Magnesia	...	...	...	...	...	...	...	1·32	1·32
Phosphoric acid	...	...	...	...	...	...	...	1·71	1·88
Carbonic acid	...	...	...	...	...	...	...	4·61	4·93
Combined water	...	...	...	...	...	...	...	6·92	7·15
								<hr/>	<hr/>
								100·13	99·98
Metallic iron	...	...	...	...	...	...	...	39·39	37·95

IRONSTONES (Clay).								Low Moor.	Dowlais.
Protoxide of iron	...	...	...	...	...	...	...	47·13	38·77
Peroxide of iron	...	...	...	...	...	...	...	—	—
Protoxide of manganese	...	...	...	...	...	...	...	2·20	1·30
Alumina	...	...	...	...	...	...	...	—	·32
Lime	...	...	...	...	...	...	...	2·58	4·45
Magnesia	...	...	...	...	...	...	...	1·12	4·25
Silica	...	...	...	...	...	...	...	—	·08
Carbonic acid	...	...	...	...	...	...	...	32·55	30·53
Phosphoric acid	...	...	...	...	...	...	...	·96	·46
Sulphuric acid	...	...	...	...	...	...	...	trace	—
Water	{	hygroscopic	...	...	...	...	...	·25	·35
		combined	...	...	...	...	...	1·75	1·08
Organic matter	...	...	...	...	...	...	...	·30	·29
Ignited insoluble residue	...	...	...	...	...	...	...	11·30	17·95
								<hr/>	<hr/>
								100·14	99·83

## IRON. Cleveland Pig.

	1.	2.
Carbon as graphite... ..	2·97	2·881
Carbon combined ... ..	·51	·352
Silicum ... ..	1·48	1·491
Phosphorus ... ..	1·82	1·739
Sulphur ... ..	·20	·223
Iron ... ..	91·92	92·445
Manganese ... ..	·66	·344
Titanium and vanadium ... ..	·24	·252
	<hr/>	<hr/>
	99·80	99·727

## IRON. South Wales Pig.

	Grey.	Mottled.	White.
Carbon ... ..	3·14	2·95	2·84
Silicon ... ..	2·16	1·96	1·21
Sulphur ... ..	·11	·28	·46
Phosphorus ... ..	·63	·63	·64
Iron ... ..	94·56	95·39	95·10
Manganese ... ..	·50	·23	·14
Nickel and cobalt ... ..	·05	·04	·03
	<hr/>	<hr/>	<hr/>
	101·15	101·48	100·42

## IRON. Grey pig smelted with coke.

	1.	2.	3.
Iron ... ..	95·15	95·81	94·84
Carbon ... ..	2·45	2·55	1·67
Silica ... ..	1·62	1·20	3·00
Phosphorus ... ..	·78	·44	·49
Manganese ... ..	trace	trace	trace
	<hr/>	<hr/>	<hr/>

## IRON. Smelted with coal (Scotland).

	1.	2.	3.	4.	5.
Iron ... ..	93·6	93·4	92·3	89·7	91·6
Carbon, free ... ..	1·4	·5	1·8	2·5	1·5
Carbon, combined ... ..	1·2	1·9	·4	·7	·3
Silica ... ..	1·5	1·2	2·8	2·2	1·8
Sulphur ... ..	·4	1·4	1·4	—	·6
Phosphorus ... ..	·4	1·2	1·3	—	·9
Manganese ... ..	·5	·4	—	2·8	2·6
Slag ... ..	1·0	—	—	2·1	·6
Loss ... ..	—	—	—	—	·1
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>

IRON. Pig, containing Molybdenum and other metals.

	1.	2.	3.	4.
Manganese ... ..	—	—	·01	·02
Iron ... ..	57·91	73·26	74·60	76·77
Cobalt ... ..	·67	·77	3·07	3·25
Nickel ... ..	3·42	4·63	1·28	1·15
Copper ... ..	2·45	1·79	4·32	3·40
Silver ... ..	—	—	—	—
Molybdenum ... ..	28·49	9·13	10·19	9·97
Silica ... ..	—	—	·39	·35
Carbon ... ..	·87	1·42	·48	·38
Arsenic ... ..	—	—	2·47	1·40
Phosphorus ... ..	3·52	6·05	2·27	1·25
Sulphur ... ..	·60	·09	·92	2·06
Loss ... ..	·07	2·86	—	—

IRON. From hot and cold blast.

	Cold blast.		Hot blast.	
Iron ... ..	93·29	93·66	91·42	91·98
Carbon, combined ... ..	2·78	·48	1·44	·95
Carbon, free ... ..	1·99	3·85	2·71	3·48
Phosphorus ... ..	1·23	1·22	1·22	1·68
Sulphur ... ..	trace	trace	trace	trace
Lime ... ..	trace	—	trace	—
Silica ... ..	·71	·79	3·21	1·99
Manganese ... ..	trace	trace	trace	trace
	100·00	100·00	100·00	100·08

IRON. Bowling pig.

	1.	2.
Carbon, as graphite ... ..	3·421	3·155
Carbon, combined ... ..	·583	·581
Silicium ... ..	1·708	1·646
Iron ... ..	92·070	92·644
Manganese ... ..	1·606	1·472
Phosphorus ... ..	·630	·635
Sulphur ... ..	·073	·070
Titanium ... ..	traces	traces
	100·091	100·203

## IRON. Refined.

	1.	2.	3.	4.
Carbon ... ..	3·070	3·250	2·000	3·200
Silicium ... ..	·630	·500	·540	·550
Sulphur ... ..	·157	·575	1·250	·870
Phosphorus ... ..	·734	·835	·985	·920
Manganese ... ..	trace	—	·056	trace
Insoluble matter ... ..	·530	·050	—	—
Iron ... ..	95·140	96·300	94·255	95·000
	<u>100·261</u>	<u>101·510</u>	<u>99·086</u>	<u>100·540</u>

## IRON. Hæmatite Pig.

	1.	2.
Carbon, as graphite ... ..	3·548	3·173
Carbon combined ... ..	·257	1·096
Silicium ... ..	3·294	1·660
Phosphorus ... ..	·044	·075
Sulphur ... ..	·065	·071
Iron ... ..	92·780	93·957
Manganese ... ..	·182	trace
Titanium ... ..	—	·041
	<u>100·170</u>	<u>100·073</u>

## STEEL.

	Brescia.	Cast steel.	Best razor steel.	Siegen.	Good for tools.
Iron ... ..	98·06	97·90	93·80	97·88	97·316
Carbon ... ..	1·94	1·72	1·43	1·70	1·283
Sulphur ... ..	trace	·22	1·00	trace	·074
Silica ... ..	trace	·07	—	·04	1·343
Copper ... ..	trace	·02	—	·38	—
Arsenic ... ..	—	—	·93	—	—
Antimony ... ..	—	—	·12	—	—
Nitrogen ... ..	—	—	·18	—	—
Manganese ... ..	—	—	1·92	—	·480
Loss ... ..	—	—	·10	—	—
Phosphorus ... ..	—	—	—	—	·045

## IRON. Cast Steel Wheels.

	Ingot steel.	Wheels.	Wheels.
Carbon ... ..	·435	1·233	1·237
Silicium .. ...	·155	·297	·303
Sulphur ... ..	·017	·022	·017
Phosphorus ... ..	·131	·069	·069
Iron ... ..	99·499	97·544	97·882
Manganese ... ..	·367	·881	·955
Copper ... ..	traces	traces	—
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	100·604	100·046	100·463

## IRON SLAGS.

	1.	2.	3.	4.	5.	6.
Silica ... ..	38·05	38·76	37·63	37·91	39·52	28·32
Alumina ... ..	14·11	14·48	12·78	13·01	15·11	24·24
Lime ... ..	35·70	35·68	33·46	31·43	32·52	40·12
Magnesia ... ..	7·61	6·84	6·64	7·24	3·49	2·79
Manganese ... ..	·40	·23	2·64	2·79	2·89	·07
Protoxide of iron	1·27	1·18	3·91	·93	2·02	·27
Potassa ... ..	1·85	1·11	1·92	2·60	1·06	·64
Sulphide of calcium	·82	·98	·68	3·65	2·15	3·64
Sulphur ... ..	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Loss ... ..	·19	·74	·34	·44	1·24	·09

## IRON SLAGS.

	1.	2.	3.	4.	5.
Silica ... ..	43·75	38·12	40·4	36·6	55·48
Alumina ... ..	12·50	16·97	11·2	37·5	19·32
Lime ... ..	31·22	32·77	38·4	20·7	14·57
Magnesia ... ..	17·15	6·22	5·2	1·5	2·54
Protoxide of iron and manganese }	4·88	5·92	3·8	1·0	4·36
Sulphur ... ..	<hr/>	<hr/>	<hr/>	2·7	2·43
Loss ... ..	·50	<hr/>	1·0	<hr/>	1·30

## IRON SLAG. White iron made from pisolitic ores.

	1.	2.
Silica ... ..	41·11	37·84
Alumina ... ..	13·45	13·20
Lime ... ..	29·82	20·68
Protoxide of iron ... ..	6·44	20·83
Magnesia ... ..	4·75	2·93
Protoxide of manganese ... ..	·66	·80
Alkalies ... ..	1·84	1·08
Phosphoric acid ... ..	·15	1·77
Sulphide of calcium ... ..	1·34	·87
Loss ... ..	·44	·05

## IRON SLAGS. Average of 13 furnaces.

Silica ... ..	43·07
Alumina ... ..	14·85
Protoxide of iron ... ..	2·53
Protoxide of manganese ... ..	1·37
Lime ... ..	28·92
Magnesia ... ..	5·87
Potash ... ..	1·84
Lime ... ..	1·01
Sulphur ... ..	·89
Phosphoric acid ... ..	traces
	<hr/>
	100·35
Metallic iron ... ..	1·97

## IRON RUST.

	Conway Bridge.	Llangollen.
Sesquioxide of iron ... ..	93·094	92·900
Protoxide of iron ... ..	5·810	6·177
Carbonate of iron ... ..	·900	·617
Silica ... ..	·196	·121
Ammonia ... ..	trace	trace
Carbonate of lime ... ..	—	·295

## JAMESONITE.

Antimony... ..	35
Lead ... ..	41
Sulphur ... ..	23

## KAOLIN.

Silica	...	...	...	...	...	...	...	...	...	43·6
Alumina	...	...	...	...	...	...	...	...	...	37·7
Peroxide of iron	...	...	...	...	...	...	...	...	...	1·5
Water	...	...	...	...	...	...	...	...	...	12·6

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## KEILHANITE.

Silica	...	...	...	...	...	...	...	...	...	30·0
Titanic acid	...	...	...	...	...	...	...	...	...	29·0
Yttria	...	...	...	...	...	...	...	...	...	9·6
Lime	...	...	...	...	...	...	...	...	...	18·9
Peroxide of iron	...	...	...	...	...	...	...	...	...	6·4
Alumina	...	...	...	...	...	...	...	...	...	6·1

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## KIANITE.

Moisture (loss 212° Fah.)	...	...	...	...	...	...	...	...	...	3·36
Water of combination	...	...	...	...	...	...	...	...	...	10·88
*Sulphate of potash	...	...	...	...	...	...	...	...	...	24·43
Sulphate of lime	...	...	...	...	...	...	...	...	...	2·72
Sulphate of magnesia	...	...	...	...	...	...	...	...	...	13·22
Chloride of magnesium...	...	...	...	...	...	...	...	...	...	14·33
Chloride of sodium...	...	...	...	...	...	...	...	...	...	30·35
Insoluble siliceous matters	...	...	...	...	...	...	...	...	...	·71

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										100·00
*Containing potash	...	...	...	...	...	...	...	...	...	13·20

## KIESERITE.

Sulphuric acid...	...	...	...	...	...	...	...	...	...	57·87
Magnesia	...	...	...	...	...	...	...	...	...	28·89
Oxide of iron	...	...	...	...	...	...	...	...	...	·05
Soda	...	...	...	...	...	...	...	...	...	·05
Chlorine	...	...	...	...	...	...	...	...	...	·06
Water	...	...	...	...	...	...	...	...	...	13·24

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100·16

## KJERULFIN.

Phosphoric acid	...	...	...	...	...	...	...	...	42·22
Magnesia	...	...	...	...	...	...	...	...	37·00
Lime	...	...	...	...	...	...	...	...	7·56
Soda	...	...	...	...	...	...	...	...	1·56
Flourine	...	...	...	...	...	...	...	...	4·78
Silica	...	...	...	...	...	...	...	...	1·50
Alumina	...	...	...	...	...	...	...	...	5·40
									100·02

## KELP. Isle of Skye.

		1.	2.
Soluble	{ Sulphate of soda	8·0	19·0
	{ Carbonate and sulphide of soda	8·5	5·5
	{ Chlorides of potassium and sodium	36·5	37·5
		53·0	62·0
Insoluble	{ Carbonate of lime	24·0	10·0
	{ Silica	8·0	—
	{ Alumina and oxide of iron	9·0	10·0
	{ Sulphate of lime	—	9·5
	{ Sulphur and loss	6·0	8·5
		100·0	100·0

## KOBELLITE.

Sulphuret of bismuth	...	...	...	...	...	...	...	33·0
Sulphuret of lead	...	...	...	...	...	...	...	46·0
Sulphuret of antimony	...	...	...	...	...	...	...	13·0

## LIMESTONES. Cumberlandshire.

		1.	2.	3.
Carbonate of lime	...	94·86	94·56	95·95
Carbonate of magnesia	...	1·26	2·32	·54
Sulphate of lime	...	·23	·32	·24
Phosphate of lime	...	—	·33	—
Alumina and oxide of iron	...	·73	1·18	1·21
Silica	...	2·92	1·29	2·06
		—	—	—

## LIMESTONES.

	Inferior Oolite.	Great Oolite.	Combrash.	Stonefield Slate.	Forest Marble.
Carbonate of lime	89·20	95·346	39·145	84·264	81·242
Sulphate of lime	·09	·204	·241	·649	·737
Magnesia .. .. .	·34	·730	·791	·454	·324
Alumina and oxide of iron .. .. .	4·14	1·422	2·998	1·804	·142
Phosphoric acid...	·06	·124	·177	·117	·003
Silicic acid ... ..	2·75	1·016	1·231	·582	1·312
Insoluble matters	3·27	·573	4·827	11·558	15·240
Alkalies .. .. .	—	—	—	—	—

## LIMESTONES. Norfolkshire.

	1.	2.	3.	4.	5.
Carbonate of lime ... ..	62·95	81·55	69·90	47·90	88·40
Carbonate of magnesia ..	—	trace	5·85	—	—
Oxide of iron and alumina	7·40	4·65	6·45	trace	4·55
Clay ... .. .	29·35	14·15	17·45	8·22	5·25
Loss ... .. .	·30	—	·35	3·88	1·80

## LIMESTONES. Northumberlandshire.

	Hasting- ton.	Kirk- heaton.	Belsay.	Aller- wash.	Dry- burn.	Oxford.
Carbonate of lime ... ..	97·5	93·1	95·6	98·39	99·0	96·2
Carbonate of magnesia	·6	4·4	1·4	—	—	—
Silica ... .. .	1·3	2·2	3·0	2·40	1·0	3·6
Loss ... .. .	·6	·3	—	—	—	·2

## LIMESTONES. Continental.

	Calcareous spar. Andreasberg.	Limestone. Paris.	Limestone. Dreshbach.	Chalk. Bongival.
Carbonate of lime ... ..	99·54	98·5	96·30	95·50
Carbonate of magnesia	—	—	2·42	·80
Protoxide of iron ... ..	—	—	·72	·80
Protoxide of manganese	—	—	·40	—
Silica ... .. .	—	—	—	—
Alumina ... .. .	—	—	—	—
Oxide of iron ... .. .	—	1·5	trace	1·70
Oxide of manganese	·36	—	—	—
Water ... .. .	·10	—	1·20	1·20
	100·00	100·00	101·04	100·00

## LIMESTONES.

	Limestone, near Lyons.	Muschelkalk, Hollenhagen.
Carbonate of lime ... ..	94·0	83·83
Carbonate of magnesia ... ..	1·6	1·76
Silica ... ..	—	10·66
Alumina ... ..	—	·03
Oxide of iron ... ..	3·9	1·73
Oxide of manganese ... ..	—	·06
Water ... ..	—	1·93
	<hr/>	<hr/>
	99·5	100·00

## LIMESTONES. Hydraulic.

	1.	2.	3.	4.
Carbonate of Lime ... ..	89·0	82·5	80·0	79·2
Magnesia ... ..	2·0	4·1	1·0	2·5
Protoxide of iron ... ..	—	—	—	6·0
Protoxide of Manganese	—	—	—	—
Silica ... ..	} 9·0	} 13·4	17·0	6·5
Alumina ... ..			1·0	3·8
Oxide of iron ... ..			—	—
Carbon ... ..	—	—	—	2·0
Water ... ..	—	—	1·0	—
Loss ... ..	—	—	—	—

## LIMESTONE. Stirlingshire.

	1.	2.
Carbonate of lime ... ..	93·32	97·80
Carbonate of magnesia ... ..	—	—
Sesquioxide of iron ... ..	2·79	·63
Carbonaceous matter ... ..	·28	·64
Silica and alumina ... ..	1·36	1·92
Loss ... ..	2·25	—
	<hr/>	<hr/>
	100·00	100·99

## LIMESTONE. Sunderlandshire.

Carbonate of lime ... ..	49·92
Carbonate of magnesia ... ..	36·23
Oxide of iron and alumina ... ..	4·70
Siliceous matter ... ..	7·92
Alkaline salts ... ..	·20
Sulphate of lime ... ..	·27
Loss ... ..	·76
	<hr/>
	100·00

## LIMESTONES. Argyleshire.

	1.	2.	3.	4.
Carbonate of lime ... ..	90·14	89·15	98·05	90·96
Carbonate of magnesia ...	·31	2·56	·44	·62
Alumina and oxide of iron	·51	·51	·29	1·81
Siliceous matter ... ..	9·08	7·48	1·27	6·40
Loss ... ..	—	·30	—	·21
	<hr/>	<hr/>	<hr/>	<hr/>
	100·04	100·00	100·05	100·00

## LIMESTONES. Invernesshire.

	1.	2.
Carbonate of lime ... ..	93·82	94·10
Carbonate of magnesia ...	1·64	1·00
Alumina and oxide of iron ...	·99	2·16
Siliceous matter ... ..	3·55	2·74
	<hr/>	<hr/>
	100·00	100·00

## LITHIOPHORITE.

		Laumonite.	
		1.	2.
Silica ... ..	—	51·1	48·3
Potash ... ..	·73	—	—
Soda ... ..	1·23	—	—
Baryta ... ..	2·78	—	—
Lime ... ..	trace	11·9	12·1
Cobalt ... ..	2·42	—	—
Nickel ... ..	2·42	—	—
Copper ... ..	1·74	—	—
Manganese ... ..	55·12	—	—
Oxygen ... ..	10·28	—	—
Iron ... ..	1·48	—	—
Alumina ... ..	10·54	21·8	22·7
Water ... ..	12·64	15·2	16·0
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## LABRADORITE.

Silica ... ..	55·75
Alumina ... ..	26·50
Peroxide of iron ... ..	1·25
Lime ... ..	11·00
Soda ... ..	4·00
Water ... ..	·05
	<hr/>



## LEAD. Chromate of.

Chromic acid ... ..	31·85
Protoxide of lead ... ..	68·15

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## LEAD. Molybdate.

Molybdic acid... ..	34·25
Protoxide of lead ... ..	64·42

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## LEAD. Phosphate of.

Phosphoric acid ... ..	19·73
Oxide of lead ... ..	78·58
Muriatic acid ... ..	1·65

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## LEAD. Tungstate.

Tungstic acid ... ..	52·00
Lead ... ..	48·00

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## LEPIDOLITE.

Silica ... ..	47·7
Alumina ... ..	20·3
Lime... ..	6·1
Protoxide of manganese	4·7
Potash ... ..	11·0
Lithia ... ..	2·8
Soda ... ..	2·2
Flourine ... ..	10·2
Chlorine ... ..	1·2

---

## LEPIDMELANE.

Silica ... ..	37·4
Alumina ... ..	11·6
Peroxide of iron ... ..	27·7
Magnesia and lime... ..	·3
Potash ... ..	9·2
Protoxide of iron ... ..	12·4
Water ... ..	·6

---

## LEUCITE.

Silica	...	...	...	...	...	...	...	...	...	54.00
Alumina	...	...	...	...	...	...	...	...	...	23.00
Potash	...	...	...	...	...	...	...	...	...	22.00

---

## LEUCOPHANE.

Silica	..	...	...	...	...	...	...	...	...	47.80
Glucina	...	...	...	...	...	...	...	...	...	11.50
Lime	...	...	...	...	...	...	...	...	...	25.00
Protoxide of manganese	...	...	...	...	...	...	...	...	...	1.01
Potassium...	...	...	...	...	...	...	...	...	...	.30
Sodium	...	..	...	...	...	...	...	...	...	7.60
Flourine	...	...	...	...	...	...	...	...	...	6.20

---

## LEUCOPYRITE.

Iron	...	...	...	...	...	...	...	...	...	32.4
Arsenic	...	...	...	...	...	...	...	...	...	65.9
And some sulphur										

---

## LIME, Borosilicate.

Silica	...	...	...	...	...	...	...	...	...	37.4
Lime	...	...	...	...	...	...	...	...	...	35.7
Boracic acid	...	...	...	...	...	...	...	...	...	21.3
Water	...	...	...	...	...	...	...	...	...	5.7

---

## LIME. Tungstate.

Tungstic acid	...	...	...	...	...	...	...	...	...	7.80
Lime	...	...	...	...	...	...	...	...	...	19.06

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## LIEVRITE.

Silica	...	...	...	...	...	...	...	...	...	29.67
Peroxide of iron	...	...	...	...	...	...	...	...	...	21.26
Protoxide of iron	...	...	...	...	...	...	...	...	...	33.09
Oxide of manganese	...	...	...	...	...	...	...	...	...	.74
Lime	...	...	...	...	...	...	...	...	...	13.33
Water	...	...	...	...	...	...	...	...	...	2.32

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100.41



## MEERSCHAUM.

	Levant.	Madrid.	Natiolia.	Morocco.
Silica ... ..	60·87	53·80	42·00	55·00
Magnesia ... ..	27·80	23·80	30·50	28·00
Lime ... ..	—	—	2·30	1·00
Alumina and ... ..	—	—	—	{ 1·20
Oxide of iron ... ..	·09	1·20	2·00	{ 1·40
Water ... ..	11·24	20·00	23·00	10·35
Potassa ... ..	—	—	—	·52
Sand ... ..	—	—	—	2·50
Loss ... ..	—	1·20	·20	·03
	<hr/> 100·00	<hr/> 100·00	<hr/> 100·00	<hr/> 100·00

## MONAZITE.

Oxide of cerium ... ..	26·00
Oxide of lanthanum ... ..	23·40
Thoria ... ..	17·95
Phosphoric acid ... ..	28·50
Oxide of tin ... ..	2·10
Protoxide of manganese ... ..	1·90
Lime ... ..	1·70

## MONZONITE.

Silica ... ..	62·60
Alumina ... ..	17·10
Oxide of iron ... ..	9·00
Lime ... ..	9·65
Magnesia ... ..	2·10
Soda ... ..	6·60
Potash ... ..	1·90
Water ... ..	1·50

There is some error in this analysis in the Chemical Society's Journal, 1871, page 1178.

## MELAPHYRE.

	Violet Black.	Blackish Grey.
Silica ... ..	52·75	50·41
Alumina ... ..	10·80	21·40
Peroxide of iron ... ..	20·24	11·07
Protoxide of iron ... ..	3·84	4·95
Lime ... ..	2·36	3·31
Magnesia ... ..	·41	·94
Potash ... ..	1·54	2·26
Soda ... ..	3·62	3·91
Carbonic acid ... ..	1·99	—
Water ... ..	3·10	3·33
	<hr/>	<hr/>
	100·65	101·58

## MORDENITE.

	1.	2.
Potass ... ..	·09	·23
Soda ... ..	2·25	2·34
Lime ... ..	3·94	3·21
Alumina ... ..	13·28	12·55
Silica ... ..	67·33	68·85
Water ... ..	12·88	13·32
	<hr/>	<hr/>
	99·77	100·50

## MANGANOPHYLL.

Silica ... ..	38·50
Alumina ... ..	11·00
Manganous oxide ... ..	21·40
Ferrous oxide ... ..	3·78
Lime ... ..	3·20
Magnesia ... ..	15·01
Potash .. ..	5·51
Loss on ignition ... ..	1·60
	<hr/>
	100·00

## MICA. Black.

Silica	...	...	...	...	...	...	...	...	...	38·49
Alumina	...	...	...	...	...	...	...	...	...	14·43
Protoxide of iron	...	...	...	...	...	...	...	...	...	5·44
Peroxide of iron	...	...	...	...	...	...	...	...	...	14·75
Manganese oxide	...	...	...	...	...	...	...	...	...	16·35
Potash	...	...	...	...	...	...	...	...	...	8·12
Soda	...	...	...	...	...	...	...	...	...	·53
Water	...	...	...	...	...	...	...	...	...	·89
										<hr/>
										99·00

## METEORITE.

Nickel iron	...	...	...	...	...	...	...	...	...	29·72
Triolite	...	...	...	...	...	...	...	...	...	6·02
Schreibersite	...	...	...	...	...	...	...	...	...	1·59
Silica and silicates	...	...	...	...	...	...	...	...	...	61·53
Carbon, oxygen, &c., and loss	...	...	...	...	...	...	...	...	...	1·14
										<hr/>
										100·00

## MESOLITE.

Silicic acid	...	...	...	...	...	...	...	...	...	46·583
Alumina, with traces of oxide of iron	...	...	...	...	...	...	...	...	...	27·566
Lime	...	...	...	...	...	...	...	...	...	9·105
Magnesia	...	...	...	...	...	...	...	...	...	·076
Soda	...	...	...	...	...	...	...	...	...	3·638
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Specific gravity	...	...	...	...	...	...	...	...	...	2·18

## MEJONITE.

Silica	...	...	...	...	...	...	...	...	43·36	Meionite.	42·1
Alumina	...	...	...	...	...	...	...	...	32·09		31·9
Lime	...	...	...	...	...	...	...	...	21·45		26·0
Magnesia	...	...	...	...	...	...	...	...	·31		—
Potass	...	...	...	...	...	...	...	...	1·35		—
Soda	...	...	...	...	...	...	...	...	·76		—
Water	...	...	...	...	...	...	...	...	1·01		—
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										100·33	



## NEPHRITE. Jade.

	1.	2.
Silica ... ..	59·30	59·50
Alumina ... ..	·53	·75
Peroxide of iron ... ..	—	—
Protoxide of iron ... ..	·70	1·35
Manganese oxide ... ..	·55	·79
Lime ... ..	10·47	11·60
Magnesia ... ..	25·64	24·24
Potash ... ..	1·02	1·57
Fluo-silicic acid ... ..	1·28	—
Water ... ..	·62	·85
	<hr/>	<hr/>
	100·11	100·65

## NEMALITE.

Magnesia ... ..	62·0
Protoxide of iron ... ..	4·6
Water ... ..	28·4
Carbonic acid ... ..	4·1
	<hr/>

## NEPHELINE.

Silica ... ..	43·4
Alumina ... ..	33·5
Peroxide of iron ... ..	1·5
Lime ... ..	·9
Soda ... ..	13·4
Potash ... ..	7·1
Water ... ..	1·4
	<hr/>

## OLIVINE. Vesuvius.

		Oligoclase.
Silica ... ..	42·30	63·5
Magnesia ... ..	51·64	·8
Ferric oxide ... ..	5·01	—
Alumina ... ..	·42	23·1
Lime ... ..	1·08	2·4
Potash ... ..	—	2·2
Soda ... ..	—	9·4
	<hr/>	<hr/>

## OPAL. From Abyssinia.

Soluble silicic acid ... ..	90·562
Insoluble silicic acid ... ..	2·049
Water ... ..	5·656
Peroxide of iron ... ..	·933
Oxide of manganese ... ..	trace
Oxide of calcium ... ..	·137
Oxide of magnesium ... ..	·311
	<hr/>
	99·648

## PORPHYRY.

Silicic acid ... ..	77·48
Alumina ... ..	17·10
Iron oxide ... ..	2·83
Manganese ... ..	·84
Lime ... ..	·38
Magnesia ... ..	·10
Potash ... ..	1·03
Soda ... ..	·13
Phosphoric acid ... ..	trace
	<hr/>
	99·89

## PARGASITE.

Silica ... ..	46·3
Magnesia ... ..	19·0
Lime ... ..	14·0
Alumina ... ..	11·5
Protoxide of iron ... ..	3·5
Protoxide of manganese ... ..	·4
Hydrofluoric acid and water ... ..	2·2
	<hr/>

## PARISITE.

Carbonic acid ... ..	23·5
Protoxides of cerium, lanthanum and didymium ... ..	59·4
Lime ... ..	3·2
Fluoride of calcium ... ..	11·5
Water ... ..	2·4
	<hr/>



## POLYBASITE.

	1.	2.
Silver ... ..	66·50	68·34
Copper and arsenic...	·50	·64
Iron ... ..	5·00	—
Antimony...	10·00	14·60
Sulphur ... ..	12·00	16·42
Loss ... ..	6·00	—
	<hr/>	<hr/>

## PICKERINGITE.

Alumina ... ..	12·130
Magnesia ... ..	4·682
Iron and manganese	·430
Lime ... ..	1·260
Hydrochloric acid ...	·604
Sulphuric acid...	36·322
Water ... ..	45·450
	<hr/>
	100·878

## POTTERY. Pipe Clays.

	Forcha- moner.	Stras- burg.	Forges les eaux.	Coteau de Prairie, N. America.	Eng- lish.
Silica ... ..	15·906	66·70	52·00	48·20	53·66
Alumina ... ..	11·170	18·29	27·00	28·20	32·00
Lime ... ..	—	—	—	2·60	·40
Magnesia ... ..	3·504	·60	—	6·00	trace
Potass ... ..	·786	—	—	—	—
Water ... ..	4·119	12·00	19·00	—	12·08
Oxide of iron ... ..	—	1·60	2·00	5·00	1·35
Oxide of manganese	—	—	—	·60	—
Residue .. ..	64·030	—	—	—	—
Loss ... ..	·485	·90	—	10·00	·51

## POTTERY. Kaolin.

	Bluebarrow.	St. Stephens.
Silica ... ..	45·52	46·38
Alumina and oxide of iron ... ..	40·76	38·60
Lime ... ..	2·17	3·47
Alkalies ... ..	1·90	1·77
Magnesia, phosphoric acid and sulphuric acid ... .. }	traces	traces
Water and organic matter ... ..	9·61	9·08
	<hr/>	<hr/>

POTTERY. Kaolin.

	St. Yriex.	Aue.	Passau.	Halle.
Silica ... ..	47·09	47·64	43·65	39·62
Alumina ... ..	36·41	35·97	35·93	45·00
Potash ... ..	1·56	—	—	—
Magnesia ... ..	2·94	—	—	3·32
Lime ... ..	—	1·57	·88	·07
Oxide of iron ... ..	—	—	1·00	—
Oxide of manganese ... ..	—	—	—	·19
Water ... ..	12·00	13·18	18·50	10·00
Loss ... ..	—	1·64	·04	1·80

CORNISH STONE CLAY.

	1.	2.	3.
Silica ... ..	46·32	46·29	35·65
Alumina ... ..	39·74	40·09	32·50
Protoxide of iron ... ..	·27	·27	1·65
Lime ... ..	·36	·50	} traces
Magnesia ... ..	·44	—	
Water ... ..	12·67	12·67	30·05
Loss ... ..	·20	·18	·15

POTTERY. Black glaze.

	1.	2.	3.
Silica ... ..	63·00	55·49	55·88
Alumina ... ..	20·00	19·21	18·88
Oxide of iron ... ..	4·00	16·55	15·80
Carbonate of lime ... ..	9·00	7·48	7·48
Magnesia ... ..	2·00	1·27	1·63
Water ... ..	2·00	—	—
Loss ... ..	—	—	·73
	100·00	100·00	100·00

ROMAN RED LUSTROUS POTTERY.

	1.	2.	3.
Silica ... ..	54·45	60·67	64·00
Alumina ... ..	22·08	20·96	17·77
Sesquioxide of iron ... ..	7·31	5·95	10·23
Lime ... ..	9·76	6·77	4·86
Magnesia ... ..	1·67	1·22	—
Water ... ..	—	—	2·29
Potassa ... ..	3·22	} alkalies in small quantities.	
Soda ... ..	1·76		

## POTTERY. Potter's Clays.

	French.			English.	Blue Clay.	Red Clay.
	57·0	61·0	60·0			
Silica ... ..	57·0	61·0	60·0	66·68	46·38	49·44
Alumina ... ..	37·0	30·0	24·0	26·08	38·04	34·26
Protoxide of iron	4·0	7·6	7·5	1·26	1·04	7·74
Lime ... ..	1·7	2·4	·5	·84	1·20	1·48
Water ... ..	—	—	—	5·14	13·44	1·94
Magnesia ... ..	—	—	—	trace	trace	5·14
Loss ... ..	—	—	—	—	—	—

	Yellow Clay.	English China Ware.		Berlin Ware.	Common English White Ware.
		39·88	40·60		
Silica ... ..	65·06	39·88	40·60	72·96	68·55
Alumina ... ..	30·68	21·48	24·15	24·78	29·13
Protoxide of iron	3·70	—	—	—	—
Lime ... ..	·56	10·06	14·22	1·04	1·24
Magnesia ... ..	—	—	·43	trace	—
Alkalies ... ..	—	2·14	5·28	1·22	—
Phosphate of lime	—	26·44	15·32	—	—

## POTTERY. English tender porcelain.

	1.	2.	3.
Silica ... ..	39·88	40·60	39·685
Alumina ... ..	21·48	24·15	24·650
Lime ... ..	10·06	14·22	14·175
Protoxide of iron and phosphate of lime ... ..	26·44	15·32	15·386
Magnesia ... ..	—	·43	·311
Alkalies and loss ... ..	2·14	5·28	5·792

## FOREIGN PORCELAIN.

	Berlin.	Chinese.	
Silica ... ..	72·96	71·04	68·96
Alumina and iron ... ..	24·78	22·46	29·24
Lime ... ..	1·04	3·82	1·60
Alkalies ... ..	1·22	2·68	—

## POTTERY. Stoneware glazed.

	St. Amand.	Helsing- borg.	Voisinlieu.	Vauxhall.	Freehen.
Silica ..	75·00	74·60	74·30	74·00	64·01
Alumina ...	22·10	19·00	19·50	27·04	24·50
Oxide of iron	1·00	4·25	3·90	2·00	8·50
Lime ... ..	·25	·62	·50	·60	·56
Magnesia ...	trace	trace	·80	·17	·92
Alkalies ...	·84	1·30	·50	1·06	1·42
Loss ... ..	·81	·23	·50	·13	·09

## Stoneware unglazed.

	Baltimore.	Wedgwood.	Saveignies.	Japan.	China.
Silica ... ..	67·40	66·49	65·80	62·04	62·00
Alumina ... ..	29·00	26·00	27·64	20·30	22·00
Oxide of iron ...	2·00	6·12	4·25	15·58	14·00
Lime ... ..	·60	1·04	1·12	1·08	·50
Magnesia ... ..	—	·15	·64	trace	trace
Alkalies ... ..	·60	·20	·24	trace	1·00
Loss ... ..	·40	—	·31	1·00	·50

## POTTERY. Common earthenware or delftware.

	Italian.	Majolica.	Old Spanish.	Delft.	Persian.	Paris.
Silica ... ..	49·65	48·00	46·04	49·07	48·54	61·50
Alumina ... ..	15·50	17·50	18·45	16·19	12·05	12·99
Lime ... ..	22·40	20·12	17·64	18·01	19·25	16·24
Magnesia ..	·17	1·17	·87	·82	·30	·15
Oxide of iron	3·70	3·75	3·04	2·82	3·14	3·01
Carbonic acid	8·58	9·46	13·96	13·09	16·72	6·10

## POTTERY. Italo-Greek vase.

Silica ... ..	55·49
Alumina ... ..	19·21
Oxide of iron ...	16·55
Carbonate of lime ...	7·48
Magnesia ... ..	1·76
	100·00

## CAMPANIAN GLAZE.

Silica	...	...	...	...	...	...	...	...	...	46.30
Alumina	...	...	...	...	...	...	...	...	...	11.90
Lime	...	...	...	...	...	...	...	...	...	5.70
Soda	...	...	...	...	...	...	...	...	...	17.10
Oxide of iron	...	...	...	...	...	...	...	...	...	16.10
Loss	...	...	...	...	...	...	...	...	...	2.90
										100.00

## POTTERY. Etruscan vase. Black.

Silica	...	...	...	...	...	...	...	...	...	63.24
Alumina	...	...	...	...	...	...	...	...	...	14.42
Oxide of iron and manganese	...	...	...	...	...	...	...	...	...	7.80
Carbonate of lime	...	...	...	...	...	...	...	...	...	3.25
Carbonate of magnesia	...	...	...	...	...	...	...	...	...	2.12
Carbon	...	...	...	...	...	...	...	...	...	1.83
Water	...	...	...	...	...	...	...	...	...	7.34
										100.00

## SEVRES.

Silica	...	...	...	...	...	...	...	...	...	55.88
Alumina	...	...	...	...	...	...	...	...	...	18.88
Oxide of iron	...	...	...	...	...	...	...	...	...	15.80
Lime	...	...	...	...	...	...	...	...	...	7.48
Magnesia	...	...	...	...	...	...	...	...	...	1.63
Loss	...	...	...	...	...	...	...	...	...	.33
										100.00

## PLATINUM ORES.

	1.	2.	3.	4.	5.
Platinum...	78.94	73.58	86.50	84.30	86.16
Palladium	.28	.30	1.10	1.06	.35
Rhodium	.86	1.15	1.15	3.46	2.16
Iridium	4.97	2.35	—	1.46	1.09
Osmium	—	—	—	1.03	.97
Iron	11.04	12.98	8.32	5.31	8.03
Copper	.70	5.20	.45	.74	.40
Manganese	—	—	—	—	.10
Osmium iridium	1.97	2.30	1.40	—	1.91
Grains of sand	—			—	.60
Lime	—	—	—	.12	—
Loss	1.25	2.14	1.08	1.92	—
	100.00	100.00	100.00	100.00	101.17

## PYROLUSITE.

Binoxide of manganese...	97·84	97·22
Baryta ...	·53	·66
Silica ...	·51	·55
Water ...	1·12	1·57
Chloride of calcium ...	—	traces
	<hr/>	<hr/>
	100·00	100·00

## POLLUX.

Silica ...	46·0
Potash ...	16·5
Soda ...	14·5
	<hr/>

## PRASEOLITE.

Silica ...	40·9
Alumina ...	28·8
Protoxide of iron ...	7·0
Magnesia ...	13·7
Water ...	7·4
	<hr/>

## PRENHITE.

Silica ...	43·00
Alumina ...	23·25
Lime ...	26·00
Protoxide of iron and manganese ...	2·25
Water ...	4·00
	<hr/>

## PYROPE, or Bohemian Garnet.

Silica ...	43·0
Alumina ...	22·3
Oxide of chromium ...	1·8
Magnesia ...	18·5
Protoxide of iron ...	8·7
Lime ...	5·7
Yttria ...	3·0
	<hr/>



## SAUSSARITE.

	1.	2.
Silica ... ..	49·00	48·86
Alumina ... ..	24·00	29·27
Lime ... ..	10·50	11·74
Magnesia ... ..	3·75	5·43
Peroxide of iron ... ..	6·50	1·67
Soda ... ..	5·50	3·58
Water ... ..	—	·50
	<hr/>	<hr/>

## SCAPOLITE.

Silica ... ..	41·25
Alumina ... ..	33·60
Lime ... ..	20·40
Protoxide of manganese ... ..	·50
Water ... ..	3·20
	<hr/>

## SCHILLER SPAR.

Silica ... ..	43·9
Magnesia ... ..	25·9
Oxide of iron and chromium ... ..	13·0
Water ... ..	12·4
Alumina ... ..	1·3
Lime ... ..	2·6
Protoxide of manganese ... ..	·5
	<hr/>

## STAUROTIDE.

Silica ... ..	37·50
Alumina ... ..	41·00
Protoxide of iron ... ..	18·25
Protoxide of manganese and magnesia ... ..	1·00
	<hr/>

## STEATITIC PSEUDOMORPHS.

Silica ... ..	34·7
Alumina ... ..	25·3
Lime ... ..	5·1
Magnesia ... ..	25·2
Water ... ..	9·1
	<hr/>



## SCHROETTERITE.

Silica	...	...	...	...	...	...	...	...	...	12.0
Alumina	...	...	...	...	...	...	...	...	...	46.3
Water	...	...	...	...	...	...	...	...	...	36.2
Iron, copper and lime	...	...	...	...	...	...	...	...	...	traces

## SILLIMANITE.

Silica	...	...	...	...	...	...	...	...	...	37.70
Alumina	...	...	...	...	...	...	...	...	...	62.75
Oxide of iron	...	...	...	...	...	...	...	...	...	2.28

## SERPENTINE. From Iona.

	1.	2.
Silicic acid	41.792	41.103
Iron protoxide	2.537	5.734
Calcium oxide	1.864	5.734
Magnesium oxide	39.262	32.882
Water	14.012	14.481
	<u>99.467</u>	<u>99.934</u>

## SOMBRERITE.

Water	...	...	...	...	...	...	...	...	9.00
Phosphate of lime	...	...	...	...	...	...	...	...	65.00
Phosphate of alumina	...	...	...	...	...	...	...	...	17.00
Carbonate of lime	...	...	...	...	...	...	...	...	5.00
Chloride of sodium	...	...	...	...	...	...	...	...	1.44
Sulphate of lime	...	...	...	...	...	...	...	...	1.36
Silica	...	...	...	...	...	...	...	...	1.00
Crenate of ammonia	...	...	...	...	...	...	...	...	.20
									<u>100.00</u>

## SODA. Nitrate.

	1.	2.	3.
Nitrate of soda	94.29	96.70	99.63
Nitrate of potassa	.43	—	—
Nitrate of magnesia	.86	—	—
Nitrate of lime	—	trace	trace
Chloride of sodium	1.99	1.30	.37
Sulphate of potass	.24	trace	—
Water	1.99	2.00	—
Insoluble matter	.20	—	—
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>

## SODA. Phosphate of.

Soda ... ..	40·00
Phosphoric acid ... ..	45·62
Water ... ..	14·38
	<hr/>
	100·00

## SODIUM. Black Ash.

	1.	2.	3.
Sulphate of soda ... ..	1·99	3·64	·748
Chloride of sodium ... ..	2·54	·60	1·308
Carbonate of soda ... ..	23·57	9·89	41·489
Hydrate of soda ... ..	11·12	25·64	—
Carbonate of lime ... ..	12·90	15·57	·857
Oxysulphide of calcium ... ..	34·76	35·57	33·193
Sulphide of iron ... ..	2·45	1·22	—
Silicate of magnesia ... ..	4·74	·88	—
Charcoal ... ..	1·59	4·28	4·724
Sand ... ..	2·02	·44	2·259
Water ... ..	2·10	2·17	—
Loss ... ..	·22	—	—
Aluminate of soda ... ..	—	—	·392
Silicate of soda ... ..	—	—	1·162
Caustic lime ... ..	—	—	9·320
Sesquioxide of iron ... ..	—	—	3·020
Alumina ... ..	—	—	1·020
	<hr/>	<hr/>	<hr/>
	100·00	100·00	100·00

## SODA WASTE.

Carbonate of lime ... ..	19·56
Oxysulphide of calcium (3 Ca S + Ca O) ... ..	32·80
Sulphate of lime ... ..	3·69
Hydrosulphate of lime ... ..	4·12
Hydrate of lime ... ..	10·69
Bisulphide of calcium ... ..	4·67
Sulphide of calcium ... ..	3·25
Sulphide of sodium ... ..	1·78
Oxide of iron ... ..	3·70
Silicate of manganese ... ..	6·91
Charcoal ... ..	2·60
Sand ... ..	3·09
Water ... ..	3·45
	<hr/>
	100·31

## SODA ASH.

	1.	2.
Carbonate of soda ... ..	67·891	73·626
Hydrate of soda ... ..	14·245	13·600
Sulphate of soda ... ..	4·579	6·127
Chloride of sodium... ..	6·061	4·431
Sulphide of sodium ... ..	·556	·361
Aluminate of soda ... ..	1·214	—
Silicate of soda ... ..	·389	·511
Insoluble matter ... ..	·217	1·579
Water ... ..	5·005	
Ultramarine ... ..	·140	—
	<hr/>	<hr/>

## SCORIA, found in flue of iron furnace, &amp;c.

		Tapcinder.
Silica ... ..	29·60	23·86
Protoxide of iron ... ..	48·43	39·83
Sesquioxide of iron ... ..	17·11	23·75
Protoxide of manganese ... ..	1·13	6·17
Alumina ... ..	1·28	·91
Lime ... ..	·47	·28
Magnesia ... ..	·35	·24
Phosphoric acid ... ..	1·34	6·42
Sulphide of iron ... ..	1·61	·62
	<hr/>	<hr/>
	101·32	102·08

## SPINEL. Red variety.

Alumina ... ..	69·01
Magnesia ... ..	26·21
Protoxide of iron ... ..	·71
Oxide of chrome ... ..	1·10
Silica... ..	2·02
	<hr/>

## SYNGENITE.

Lime ... ..	16·97
Magnesia ... ..	·46
Potash ... ..	28·03
Sulphuric acid... ..	49·04
Water ... ..	5·81
	<hr/>
	100·31

## STEATITE.

Silica	...	...	...	...	...	...	...	...	...	62·2
Magnesia	...	...	...	...	...	...	...	...	...	30·5
Protoxide of iron	...	...	...	...	...	...	...	...	...	2·5
Water	...	...	...	...	...	...	...	...	...	5·0

---

## TOURMALINE.

	Black.	Green.	Red.
Silica	37·70	39·16	38·38
Boracic acid	7·36	4·59	7·41
Alumina	34·53	40·00	43·97
Peroxide of iron	4·63	—	—
Protoxide of iron	·25	—	—
Magnesia	9·51	5·96	1·60
Lime	1·25	—	·62
Soda	2·00	—	1·97
Potash	·43	3·59	·21
Phosphorus	·11	—	·27
Flourine	2·23	—	2·47
Peroxide of manganese	—	2·14	2·60
Lithia	—	—	·48

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## TOURMALINE.

	Black.	Red.
Silica	36·71	39·4
Alumina	31·57	44·0
Peroxide of iron	9·30	—
Protoxide of manganese	8·51	—
Lime	·64	—
Magnesia	·49	5·0
Soda	2·83	—
Potash	·70	1·3
Glucina	5·56	—
Flourine	1·85	—
	<hr/> 98·16	
Boracic acid		4·2
Lithia		2·5

## TUFA.

Silica	...	...	...	...	...	...	...	...	...	34.5
Alumina	...	...	...	...	...	...	...	...	...	15.0
Lime	...	...	...	...	...	...	...	...	...	8.8
Magnesia	...	...	...	...	...	...	...	...	...	4.7
Potash	...	...	...	...	...	...	...	...	...	1.4
Soda	...	...	...	...	...	...	...	...	...	4.1
Oxides of iron and titanium	...	...	...	...	...	...	...	...	...	12.0
Water	...	...	...	...	...	...	...	...	...	9.2

---

## TUNGSTATE OF LIME.

Tungstic acid	...	...	...	...	...	...	...	...	...	7.80
Lime	...	...	...	...	...	...	...	...	...	19.06

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## TAPIOLITE.

Tantallic acid	...	...	...	...	...	...	...	...	...	73.91
Niobic acid	...	...	...	...	...	...	...	...	...	11.22
Stannic acid	...	...	...	...	...	...	...	...	...	.48
Protoxide of iron	...	...	...	...	...	...	...	...	...	14.47
Protoxide of manganese	...	...	...	...	...	...	...	...	...	.81

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100.89

## TALC. North Carolina.

Silica	...	...	...	...	...	...	...	...	...	57.72
Magnesia	...	...	...	...	...	...	...	...	...	33.76
Alumina	...	...	...	...	...	...	...	...	...	2.52
Oxide of iron	...	...	...	...	...	...	...	...	...	.64
Water	...	...	...	...	...	...	...	...	...	6.01

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100.65

## TABULAR SPAR.

Silica	...	...	...	...	...	...	...	...	...	52.0
Lime	...	...	...	...	...	...	...	...	...	48.0

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## TELLURIC SILVER.

Silver	...	...	...	...	...	...	...	...	...	62.3
Tellurium	...	...	...	...	...	...	...	...	...	36.9

---



## ULTRAMARINE.

	1.	2.
Silicic acid ... ..	49·00	45·50
Sulphuric acid... ..	2·00	5·90
Alumina ... ..	11·00	31·80
Soda ... ..	8·00	9·10
Lime ... ..	16·00	3·50
Magnesia ... ..	2·00	—
Sesquioxide of iron ... ..	4·00	·80
Sulphur ... ..	trace	—
Water ... ..	trace	—
Chlorine ... ..	—	·40
Loss ... ..	8·00	2·00
	<hr/>	<hr/>
	100·00	100·00

## URANITE.

Phosphoric acid ... ..	15·0
Oxide of uranium ... ..	64·0
Lime ... ..	6·0
Water ... ..	15·0
	<hr/>

## VIVIANITE.

	Brown Crystalline.	No. 2.
Protoxide of iron ... ..	42·889	42·709
Peroxide of iron ... ..	·801	1·126
Phosphoric acid ... ..	28·792	28·526
Water ... ..	29·433	28·984
	<hr/>	<hr/>
	101·915	101·345

## WAVELLITE.

Alumina ... ..	37·2
Phosphoric acid ... ..	35·1
Water ... ..	28·0
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## WEISSITE.

Silica ... ..	53·7
Alumina ... ..	21·7
Magnesia ... ..	9·0
Potash ... ..	4·1
Soda ... ..	·7
Protoxide of iron, manganese and zinc ... ..	2·1
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## WICHTINE.

Silica	...	...	...	...	...	...	...	...	...	56·3
Alumina	...	...	...	...	...	...	...	...	...	13·3
Protoxide of iron	...	...	...	...	...	...	...	...	...	13·0
Peroxide of iron	...	...	...	...	...	...	...	...	...	4·0
Soda	...	...	...	...	...	...	...	...	...	3·5
Lime	...	...	...	...	...	...	...	...	...	6·0
Magnesia	...	...	...	...	...	...	...	...	...	3·0

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## WITHERITE.

Baryta	...	...	...	...	...	...	...	...	...	77·6
Carbonic acid	...	...	...	...	...	...	...	...	...	22·4

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## WOLFRAM.

Tungstic acid	...	...	...	...	...	...	...	...	...	75·89
Protoxide of iron	...	...	...	...	...	...	...	...	...	19·24
Protoxide of manganese	...	...	...	...	...	...	...	...	...	4·97

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## WOEHLERITE.

Niobic acid	...	...	...	...	...	...	...	...	...	14·41
Silicic acid	...	...	...	...	...	...	...	...	...	28·43
Zirconic acid	...	...	...	...	...	...	...	...	...	19·63
Lime	...	...	...	...	...	...	...	...	...	26·18
Protoxide of iron	...	...	...	...	...	...	...	...	...	2·50
Soda	...	...	...	...	...	...	...	...	...	7·78

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98·93

## WAGNERITE.

Phosphoric acid	...	...	...	...	...	...	...	...	...	40·30
Magnesia	...	...	...	...	...	...	...	...	...	32·78
Lime	...	...	...	...	...	...	...	...	...	2·24
Potash and soda	...	...	...	...	...	...	...	...	...	5·12
Iron	...	...	...	...	...	...	...	...	...	8·00
Alumina	...	...	...	...	...	...	...	...	...	1·11
Flourine	...	...	...	...	...	...	...	...	...	10·00
Water	...	...	...	...	...	...	...	...	...	·50

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100·05

## WOLLASTONITE.

Silica	...	...	...	...	...	...	...	...	...	46·2
Lime	...	...	...	...	...	...	...	...	...	41·8
Magnesia	...	...	...	...	...	...	...	...	...	1·5
Alumina	...	...	...	...	...	...	...	...	...	7·1
Sesquioxide of iron	...	...	...	...	...	...	...	...	...	2·9

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## WARWICKITE.

Boric acid	...	...	...	...	...	...	...	...	...	27·80
Titanic acid	...	...	...	...	...	...	...	...	...	23·82
Magnesia	...	...	...	...	...	...	...	...	...	36·80
Oxide of iron	...	...	...	...	...	...	...	...	...	7·02
Silica	...	...	...	...	...	...	...	...	} impurities }	1·00
Alumina	...	...	...	...	...	...	...	...		2·21

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## YENITE.

Oxide of iron	...	...	...	...	...	...	...	...	50 to 55 per cent.
Lime	...	...	...	...	...	...	...	...	14 "
Silica	...	...	...	...	...	...	...	...	29 "

---

## YETTROCERITE.

Fluoric acid	...	...	...	...	...	...	...	...	...	25·1
Lime	...	...	...	...	...	...	...	...	...	47·6
Oxide of cerium	...	...	...	...	...	...	...	...	...	18·2
Yttria	...	...	...	...	...	...	...	...	...	9·1

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## ZIRCONIA.

Silica	...	...	...	...	...	...	...	...	...	33·5
Zirconia	...	...	...	...	...	...	...	...	...	67·2

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## ZENNERITE.

Uranium oxide	...	...	...	...	...	...	...	...	...	55·6
Copper oxide	...	...	...	...	...	...	...	...	...	8·7
Arsenic acid	...	...	...	...	...	...	...	...	...	15·1
Water	...	...	...	...	...	...	...	...	...	14·5
Iron oxide	...	...	...	...	...	...	...	...	...	5·2
Lime	...	...	...	...	...	...	...	...	...	1·2

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100·3

## ZEOLITE, from Waago.

Silicic acid	...	...	...	...	...	...	...	...	...	56·300
Alumina	...	...	...	...	...	...	...	...	...	17·633
Lime	...	...	...	...	...	...	...	...	...	7·497
Magnesia	...	...	...	...	...	...	...	...	...	·051
Soda	...	...	...	...	...	...	...	...	...	2·094
Water	...	...	...	...	...	...	...	...	...	17·362
										100·937

## ZINC ORES, Calamine.

	1.	2.
Carbonate of oxide of zinc	84·92	85·78
Carbonate of protoxide of iron	1·58	2·24
Carbonate of protoxide of manganese	6·80	7·62
Carbonate of oxide of lead	—	—
Carbonate of lime	1·58	·98
Carbonate of magnesia	2·84	4·44
Silicate of oxide of zinc	1·85	—
Silica	—	·09
Volatile matter	—	—
Loss	·43	—
100·00		101·15

## SPARTALITE, Oxide of zinc.

	1.	2.	3.
Oxide of zinc	94·45	96·19	93·48
Oxide of manganese	trace	3·70	5·50
Franklinite	4·49	—	—
Oxide of iron	—	·10	·80
Loss by ignition, &c.	1·06	·01	·22
100·00		100·00	100·00

## CARBONATE OF ZINC.

	1.	2.	3.
Oxide of zinc	64·8	65·2	57·76
Carbonic acid	35·2	34·8	35·62
Protoxide of manganese	—	—	6·62
Oxide of lead	—	—	—
Oxide of iron	—	—	—
100·0		100·0	100·00

## ZINC. Silicate of zinc or electric calamine.

	1.	2.	3.	4.
Oxide of zinc ... ..	66·84	66·0	68·3	66·8
Silica ... ..	24·89	25·0	25·0	23·2
Oxides of lead and tin ... ..	·28	—	—	—
Water ... ..	7·45	9·0	4·4	10·8
Carbonic acid ... ..	·54	—	—	—
Loss ... ..	—	—	3·3	—
	<u>100·00</u>	<u>100·0</u>	<u>101·0</u>	<u>100·8</u>

## SULPHIDE OF ZINC.

	1.	2.	3.
Zinc ... ..	61·40	66·34	66·46
Iron ... ..	1·29	—	—
Cadmium ... ..	1·50	—	trace
Antimony, lead and oxygen... ..	—	—	—
Manganese ... ..	—	—	—
Sulphur ... ..	33·15	33·66	32·22
Water ... ..	—	—	—
Loss ... ..	2·66	—	1·32
	<u>        </u>	<u>        </u>	<u>        </u>

## MISCELLANEOUS VEGETABLE AND ANIMAL MATTERS.

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### ACACIA NILOLICA. Ash of seeds.

Potash ... ..	33·388
Soda ... ..	5·360
Lime ... ..	14·212
Magnesia ... ..	12·103
Oxide of iron ... ..	·612
Phosphoric acid ... ..	16·229
Sulphuric acid... ..	3·650
Silicic acid ... ..	1·809
Chlorine ... ..	·345
Carbonic acid ... ..	12·112
	99·820

### AGARICUS FŒTENS.

Water ... ..	67·20
Mannite ... ..	·60
Pectic acid ... ..	·09
Fibrine ... ..	4·66
Bassorine ... ..	1·55
Ligneous matter ... ..	20·09
Fat, acid, colouring matter, &c. ... ..	·68
Ash ... ..	5·13

## ANNATTO. Ash of. 100 grains weighed 62·40

Carbonate of lime ... ..	37·88
Sulphate of lime ... ..	8·82
Alkaline sulphates ... ..	4·34
Chloride of sodium ... ..	6·42
Iron and alumina ... ..	2·14
Lead, traces, sand, &c. ... ..	2·80
	<hr/>
	62·40

## APPLEWOOD. Ash of.

Potash ... ..	19·24
Soda ... ..	·45
Magnesia ... ..	7·46
Lime ... ..	63·60
Phosphoric acid ... ..	4·90
Sulphuric acid ... ..	·93
Silica ... ..	1·31
Peroxide of iron ... ..	1·66
Chloride of sodium ... ..	·45
	<hr/>
	100·00

## ASH OF APPLE PUMICE.

Water ... ..	10·790
Organic matter ... ..	42·161
Insoluble silica ... ..	25·850
Soluble silica ... ..	·929
Oxide of iron and alumina ... ..	1·989
Lime ... ..	3·754
Magnesia ... ..	trace
Potash ... ..	5·488
Soda ... ..	2·942
Sulphuric acid ... ..	·878
Phosphoric acid ... ..	2·577
Carbonic acid ... ..	1·920
Chlorine ... ..	·389
Loss ... ..	·333
	<hr/>
	100·000

## BALSAMS. Of Peru.

Brown slightly soluble resin	...	...	...	...	...	2.40
Brown resin	...	...	...	...	...	20.70
Oil cinnamein	...	...	...	...	...	69.00
Benzoic and cinnamic acids	...	...	...	...	...	6.40
Extract	...	...	...	...	...	.60
Loss and water	...	...	...	...	...	.90
						<hr/> 100.00

## Styrax Calamita.

	1.	2.	3.
Volatile oil	?	.5	.4
Resin...	41.6	53.7	32.7
Subresin	?	.6	.5
Benzoic acid	2.4	1.1	2.6
Gum and extract	14.0	9.3	7.9
Matter extracted by potass	15.0	9.6	23.9
Woody fibre	22.0	20.2	27.0
Ammonia	traces	stronger traces	strongest traces
Water	5.0	5.0	5.0
	<hr/> 100.0	<hr/> 100.0	<hr/> 100.0

## Inferior Bombay Benzoin.

	1.	2.	3.	4.
Volatile oil aroma	—	—	traces	traces
Benzoic acid	12.5	12.00	19.80	19.42
Resin { yellow, soluble in æther	83.3	84.50	{ 79.83	27.10
{ brown, insoluble in æther				
Matter like Peru balsam	1.7	—	—	—
Aromatic extract	.5	.50	—	.25
Ligneous matter and other impurities	2.0	2.00	{ —	2.60
			{ —	.10
Water and loss	—	.25	.12	—
Salts, benzoates and phosphates	—	.75	—	—
	<hr/> 100.0	<hr/> 100.00	<hr/> 100.00	<hr/> 100.00

## Opobalsam.

Volatile oil	...	...	...	...	...	...	...	...	30·00
Soft resin, insoluble in alcohol	...	...	...	...	...	...	...	...	4·00
Hard resin, soluble in alcohol	...	...	...	...	...	...	...	...	64·00
Extractive	...	...	...	...	...	...	...	...	·40
Loss	...	...	...	...	...	...	...	...	1·60
									<hr/>

## Benzoin.

		1.	2.
Benzoic acid	...	14·5	14·0
Resin, soluble in æther	...	48·0	52·0
Resin soluble in alcohol only	...	28·0	25·0
Resin soluble in carbonate of soda	...	3·5	3·0
Brown resin deposited by æther	...	·5	·8
Impurities	...	5·5	5·2
		<hr/>	<hr/>

## Canada.

Essential oil	...	...	...	...	...	...	...	18·60
Resin soluble in alcohol	...	...	...	...	...	...	...	40·00
Resin difficultly soluble	...	...	...	...	...	...	...	33·40
Elastic resin	...	...	...	...	...	...	...	4·00
Bitter extractive and salts	...	...	...	...	...	...	...	4·00
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## COPAIBA.

Volatile oil	...	...	...	...	...	...	...	38·00
Copaivic acid	...	...	...	...	...	...	...	52·75
Brown soft resin	...	...	...	...	...	...	...	1·66
Water and loss	...	...	...	...	...	...	...	7·59
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BLOOD.

	Albumen of Blood.	Fibrine of Blood.
Sulphur ... ..	1.30	1.0
Carbon ... ..	53.50	53.2
Nitrogen ... ..	15.50	17.2
Hydrogen... ..	7.16	6.9
Oxygen ... ..	22.54	21.7
	<hr/>	<hr/>
	100.00	100.0
		Gelatinous Tissue.
Carbon ... ..	Chondrine. 49.2	49.4
Nitrogen ... ..	14.6	18.5
Hydrogen... ..	6.9	6.9
Oxygen ... ..	29.3	25.2
	<hr/>	<hr/>
	100.0	100.0

BLOOD. Fish.

	Carp.	Tench.
Water ... ..	872.000	900.000
Solid constituents ... ..	128.000	100.000
Fibrine ... ..	trace	trace
Fat ... ..	2.967	4.670
Albumen ... ..	83.850	68.800
Hæmatoglobulin ... ..	24.635	15.650
Extractive matter and salts... ..	6.129	2.770
	<hr/>	<hr/>

BLOOD. Ashes of.

	Sheep.	Ox.	Dog.	Pig.
Phosphoric acid ... ..	14.80	14.04	36.82	36.5
Alkalies ... ..	55.79	59.97	55.24	49.8
Alkaline earths ... ..	4.87	3.64	2.07	3.8
Carbonic acid ... ..	19.47	18.85	—	—
Silicic and sulphuric acids	—	—	5.87	9.9
	Fowl.	Human.	Calves.	Sheep.
Phosphoric acid ... ..	47.26	31.78	20.14	14.80
Alkalies ... ..	48.41	58.99	66.57	60.57
Alkaline earths ... ..	2.22			
Carbonic acid ... ..	—	3.78	9.84	19.47
Silicic and sulphuric acids	2.11	—	—	—

## BLOOD.

	From cases of Typhoid Fever.	
	1.	2.
Density of defibrinated blood ... ..	1054·00	1051·400
Density of serum ... ..	1025·00	1024·700
Water ... ..	801·00	814·500
Solid constituents ... ..	199·00	185·500
Fibrine ... ..	2·30	1·300
Fat ... ..	1·52	1·408
Albumen ... ..	64·40	62·000
Blood corpuscles ... ..	124·50	113·500
Extractive matter and salts... ..	6·00	7·300
Salts consist of :		
Chloride of sodium... ..	3·60	3·50
Other soluble salts... ..	2·60	2·70
Phosphates ... ..	·54	·25
Iron ... ..	·58	·51
	From Cholera.	From Dropsy.
Water ... ..	740·000	885·3
Solid residue ... ..	260·000	114·7
Fibrine ... ..	11·000	6·2
Albumen ... ..	110·420	—
Blood corpuscles ... ..	124·460	56·4
Extractive matter and salts... ..	14·100	—
	From Diabetes.	
	1.	2.
Water ... ..	794·663	802·000
Solid constituents ... ..	205·337	198·000
Fibrine ... ..	2·432	2·030
Fat ... ..	2·010	2·250
Albumen ... ..	114·570	97·450
Globulin ... ..	66·000	74·350
Hæmatin ... ..	5·425	3·700
Sugar... ..	2·500	traces
Extractive matter and salts... ..	9·070	12·680

## BLOOD.

	Dog,	Dog,
	3 months old.	1 day old.
Water ... ..	830·0	780·0
Solid residue ... ..	170·0	220·0
Fibrine ... ..	2·4	2·0
Blood corpuscles ... ..	97·0	165·0
Albumen ... ..	58·6	46·0
Extractive matter and salts... ..	12·0	7·0

BLOOD.

	In Pneumonia.		
	1.	2.	3.
Water ... ..	839·848	803·179	803·400
Solid residue ... ..	160·152	196·821	196·600
Fibrine ... ..	9·152	5·632	3·443
Fat ... ..	2·265	4·336	·697
Albumen ... ..	100·415	121·721	102·100
Globulin ... ..	34·730	52·071	74·948
Hæmatin ... ..	1·800	2·752	2·466
Extractive matter and salts...	8·003	10·309	11·258

No. 1 from a female aged 40.

No. 2 from a male aged 40.

No. 3 from a male aged 60.

BLOOD. From two Horses.

	Arterial.	Vena portæ.
Water ... ..	760·084	724·972
Solid residue ... ..	239·952	257·028
Fibrine ... ..	11·200	8·370
Fat ... ..	1·856	3·186
Albumen .. ..	78·880	92·400
Globulin ... ..	136·148	152·592
Hæmatin ... ..	4·827	6·600
Extractive matter and salts... ..	6·960	11·880

100 parts blood corpuscles con- } tain of hæmatin ... .. }	3·400	4·100
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HUMAN BLOOD.

Water ... ..	798·402
Solid constituents ... ..	201·598
Fibrine ... ..	2·233
Fat ... ..	1·970
Albumen ... ..	74·194
Blood corpuscles ... ..	116·529
Soluble salts—Alkaline phosphates ... ..	·823
Alkaline sulphates ... ..	·202
Alkaline carbonates ... ..	·957
Chloride of sodium ... ..	4·690
Insoluble salts—Peroxide of iron ... ..	·834
Lime ... ..	·183
Phosphoric acid ... ..	·201
Sulphuric acid ... ..	·052
	6·672
	1·270

## BLOOD.

	Water.	Fibrine.	Fat.	Blood Corpuscles.	Albumen.	Soluble Salts.
Dog ... ..	790·50	1·93	2·25	123·85	65·19	6·28
Cat ... ..	810·02	2·42	2·70	113·39	64·46	7·01
Horse ... ..	804·75	2·41	1·31	117·13	67·85	6·82
Ox ... ..	799·59	3·62	2·04	121·86	66·90	5·98
Calf ... ..	826·71	5·76	1·61	102·50	56·41	7·00
Goat... ..	839·44	3·90	·91	86·00	62·70	7·04
Sheep ... ..	827·76	2·97	1·16	92·42	68·77	6·91
Rabbit ... ..	817·30	3·80	1·90	170·72		6·28
Swine ... ..	768·94	3·95	1·95	145·35	72·78	6·74
Goose ... ..	814·88	3·46	2·56	121·45	50·78	6·87
Hen ... ..	793·24	4·67	2·03	144·75	48·25	6·97

## Soluble salts :—

	Alkaline Phosphates.	Alkaline Sulphates.	Alkaline Carbonates.	Chloride of Sodium.
Dog ... ..	·730	·197	·789	4·490
Cat ... ..	·607	·210	·919	5·274
Horse ... ..	·844	·213	1·104	4·659
Ox ... ..	·468	·181	1·071	4·321
Calf ... ..	·957	·269	1·263	4·864
Goat ... ..	·402	·265	1·202	5·176
Sheep ... ..	·395	·348	1·498	4·895
Rabbit ... ..	·637	·202	·970	4·092
Swine ... ..	1·362	·189	1·198	4·281
Goose ... ..	1·135	·090	·824	4·246
Hen ... ..	·945	·100	·350	5·392

## BRAIN. No. 1.

Water ... ..	80·00
Albumen ... ..	1·00
Cephalin ... ..	7·00
Cholestrin ... ..	1·00
Cerebin ... ..	3·00
Lecithin ... ..	5·50
Olien and margarine ... ..	—
Inosite, creatine, xanthine, &c. ... ..	—
Extractive matters... ..	1·50
Chlorides of potassium and sodium, phosphates of } potassium, calcium, &c. ... .. }	1·00
	<hr/> 100·00

## BRAIN. No. 2.

	Water.	Albumen.	Fat.	Osmazome and salts.	Phos- phorus.
Infants ... ..	82·79	7·00	3·45	5·96	·80
Youths ... ..	74·26	10·20	5·30	8·59	1·65
Adults ... ..	72·51	9·40	6·10	10·19	1·80
Aged persons ...	73·85	8·65	4·32	12·18	1·00
Idiots ... ..	70·93	8·40	5·00	14·82	·85

## BILE. In 1000 parts.

Water ... ..	909·0
Yellow and very bitter resin ... ..	37·3
Brown pigment and mucus ... ..	9·0
Albumen ... ..	38·2
Soda, holding the resin in solution ... ..	5·1
Salts of potash, soda and oxide of iron ... ..	4·1

## BLUEBOTTLE, Common. Ash of. "Centauréa."

Potash ... ..	7·32
Soda ... ..	36·54
Lime ... ..	4·56
Phosphoric acid ... ..	15·49
Sulphuric acid... ..	2·69
Silica .. ..	3·29
Chloride of sodium ... ..	—
Peroxide of iron .. ..	1·61
Chloride of potassium ... ..	11·88

## BEETROOT TOPS. Ash of.

Potash ... ..	21·26
Soda ... ..	7·01
Magnesia ... ..	8·66
Lime ... ..	8·65
Phosphoric acid ... ..	5·15
Sulphuric acid... ..	5·80
Silica... ..	1·99
Peroxide of iron ... ..	·96
Chloride of sodium ... ..	33·96
Carbonic acid, mean of six analyses ... ..	6·49

## BEECHWOOD BARK. Ash of. No 1.

Alkalies and their salts... ..	34·88
Phosphates of lime and magnesia ... ..	4·50
Phosphates of iron and alumina... ..	·12
Carbonates of lime and magnesia ... ..	59·00
Silica... ..	1·50
	<hr/>
	100·00

## BEECHWOOD. Ash of.

	White wood.	Sap.
Alkalies and their salts... ..	48·63	47·00
Phosphates of lime and magnesia ... ..	23·00	36·00
Phosphates of iron and alumina... ..	2·25	1·00
Carbonates of lime and magnesia ... ..	26·00	15·00
Silica... ..	·12	1·00
	<hr/>	<hr/>
	100·00	100·00

## BEECHWOOD. Ash of.

Water and loss ... ..	2·58
Carbonate of potash ... ..	11·72
Carbonate of soda ... ..	12·37
Sulphate of potash... ..	3·49
Salt ... ..	—
Sulphate of soda ... ..	—
Silicate of soda ... ..	—
Carbonate of lime ... ..	49·54
Magnesia ... ..	7·74
Phosphate of lime ... ..	3·32
Phosphate of magnesia ... ..	2·92
Phosphate of iron ... ..	·76
Phosphate of alumina ... ..	1·51
Phosphate of manganese ... ..	1·59
Silica... ..	2·46
	<hr/>
	100·00

BEECH BARK. Ash of. No. 2.

Water and loss	...	...	...	...	...	...	...	1.61
Carbonate of potash, carbonate of soda, sulphate	}	...	...	...	...	...	...	3.02
of potash								
Carbonate of lime	...	...	...	...	...	...	...	64.76
Magnesia	...	...	...	...	...	...	...	16.90
Phosphate of lime	...	...	...	...	...	...	...	2.71
Phosphate of magnesia	...	...	...	...	...	...	...	.66
Phosphate of iron	...	...	...	...	...	...	...	.46
Phosphate of alumina	...	...	...	...	...	...	...	.84
Silica	...	...	...	...	...	...	...	9.04
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								100.00

BRASS.

Copper	...	...	...	...	61.6	65.8	64.8	64.6
Zinc	...	...	...	...	35.3	31.8	32.8	33.7
Lead	...	...	...	...	2.9	2.2	2.0	1.5
Tin	...	...	...	...	.2	.2	.4	.2
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WIRE BRASS.

Copper	...	...	...	...	...	66.2	67.0	Bell metal. 80.0
Zinc	...	...	...	...	...	33.0	32.0	5.6
Tin	...	...	...	...	}	.8	—	10.0
Lead	...	...	...	...				.5
Antimony	...	...	...	...	...	—	.5	—
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GERMAN SILVER.

Copper	...	...	...	43.8	40.4	53.4	50.0	65.4
Nickel	...	...	...	15.6	31.6	17.5	18.7	16.8
Zinc	...	...	...	40.6	25.4	29.1	31.3	13.4
Iron	...	...	...	—	2.6	—	—	3.4
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CHYLE.

Water	...	...	...	...	...	...	...	940.670
Solid matters	...	...	...	...	...	...	...	59.330
Fibrine	...	...	...	...	...	...	...	.440
Fat	...	...	...	...	...	...	...	1.186
Albumen	...	...	...	...	...	...	...	42.717
Hæmatoglobulin	...	...	...	...	...	...	...	.474
Extractive matter and salts	...	...	...	...	...	...	...	8.360
Ptyalin and globulin, or casein with lactate of soda	...	...	...	...	...	...	...	1.780
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## CARTILAGE. Ash of.

	Of man.	Woman.
Carbonate of soda ... ..	35·10	trace
Sulphate of soda ... ..	24·20	·95
Chloride of sodium... ..	8·20	1·30
Phosphate of soda ... ..	·90	trace
Sulphate of potash... ..	1·20	soda ·95
Carbonate of lime ... ..	18·30	—
Phosphate of lime ... ..	4·10	6·33
Phosphate of magnesia ... ..	6·90	4·10
Peroxide of iron and loss ... ..	·90	—

## CHAMOMILE, Common and Wild. Ash of.

	Common.	Wild.
Potash ... ..	9·66	9·69
Soda ... ..	30·58	32·39
Lime ... ..	3·67	4·79
Phosphoric acid ... ..	16·01	16·42
Sulphuric acid... ..	4·60	4·34
Silica... ..	6·80	1·53
Peroxide of iron ... ..	3·28	1·65
Chloride of potassium ... ..	7·15	14·26

## CORNCOCKLE. Ash of.

Potash ... ..	13·20
Soda ... ..	22·86
Lime ... ..	6·14
Phosphoric acid ... ..	29·27
Sulphuric acid... ..	2·39
Silica... ..	2·39
Peroxide of iron ... ..	1·21
Chloride of sodium ... ..	—
Chloride of potassium ... ..	7·55

## CHESNUT, Horse. Ash of.

Potash ... ..	51·00
Alkaline phosphates ... ..	28·00
Chloride of potassium and sulphate of potash... ..	3·00
Earthy phosphates... ..	12·00
Silica... ..	·50
Metallic oxides ... ..	·25
Loss ... ..	5·25
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	100·00

## CITRUS MEDICA SEEDS. Ash of.

Potash ... ..	33·89
Soda ... ..	3·56
Magnesia ... ..	8·67
Lime ... ..	12·87
Phosphoric acid ... ..	34·81
Sulphuric acid ... ..	3·30
Silica .. ..	·35
Peroxide of iron ... ..	·24
Chloride of sodium ... ..	2·31
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	100·00

## COUCH GRASS. Ash of.

Carbonate of potash ... ..	14·10
Silicate of potash ... ..	·27
Silicate of soda ... ..	5·69
Silicate of magnesia ... ..	·04
Chloride of sodium ... ..	3·34
Oxide of iron and alumina ... ..	12·40
Phosphoric acid ... ..	9·38
Sulphate of lime ... ..	9·06
Carbonate of lime ... ..	3·30
Soluble silica ... ..	24·92
Insoluble silica ... ..	17·50
	<hr/>
	100·00

## DYEING. Catechu.

	Bombay.	Bengal.
Tannic acid ... ..	54·5	48·5
Extractive matter ... ..	34·0	36·5
Mucilage ... ..	6·5	8·0
Insoluble matters ... ..	5·0	7·0
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## MALABAR CUTCH.

Tannic acid	...	...	...	...	...	...	...	...	45·8
Extractive matter	...	...	...	...	...	...	...	...	39·9
Mucilage	...	...	...	...	...	...	...	...	8·0
Impurities	...	...	...	...	...	...	...	...	6·3

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## COCHINEAL.

Colouring matter	..	...	...	...	...	...	...	...	50·00
Gelatin	...	...	...	...	...	...	...	...	10·50
Waxy fat	...	...	...	...	...	...	...	...	10·00
Modified mucus	...	...	...	...	...	...	...	...	14·00
Membrane	...	...	...	...	...	...	...	...	14·00
Alkaline phosphates and phosphates of lime, iron and ammonia	...	...	...	...	...	...	...	...	1·50

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## CROTON OIL SEED.

Volatile oil	...	...	...	...	...	...	...	...	traces
Fixed oil, with crotonic acid, &c.	...	...	...	...	...	...	...	...	17·00
Crotonates and colouring matter	...	...	...	...	...	...	...	...	·32
Brownish yellow resin	...	...	...	...	...	...	...	...	1·00
Stearin and wax	...	...	...	...	...	...	...	...	·65
Extractive sugar and malates of potash and lime	...	...	...	...	...	...	...	...	2·05
Starch, with phosphates of lime and magnesia	...	...	...	...	...	...	...	...	5·71
Gum and gummosin	...	...	...	...	...	...	...	...	10·17
Albumen	...	...	...	...	...	...	...	...	1·01
Gluten	...	...	...	...	...	...	...	...	2·00
Ligneous fibre, &c.	...	...	...	...	...	...	...	...	38·00
Water	...	...	...	...	...	...	...	...	22·09

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100·00

COD LIVER OIL.

	Pale oil.	Brown oil.	Black oil.
Oleic acid, with gaduin and } two other bodies... .. }	74·03300	71·75700	69·78500
Margaric acid ... ..	11·75700	15·42100	16·14500
Glycerine ... ..	10·17700	9·07300	9·71100
Butyric acid ... ..	·07436	—	·15875
Acetic acid ... ..	·04571	—	·12506
Fellinic acid and cholic acid, } with a small quantity of } margarin, olein, &c. ... }	·04300	·06200	·29900
Bilifuloin, bilifellinic acid } and two peculiar substances }	·26800	·44500	·87600
Substance soluble in alcohol	·00600	·01300	·03800
Substance insoluble in water, } alcohol and æther ... }	·00100	·00200	·00500
Iodine ... ..	·03740	·04060	·02950
Chlorine and traces of bromine	·14880	·15880	·08400
Phosphoric acid ... ..	·09135	·07890	·05365
Sulphuric acid ... ..	·07100	·08595	·01010
Phosphorus ... ..	·02125	·01136	·00754
Lime ... ..	·15150	·16780	·08170
Magnesia ... ..	·00880	·01230	·00380
Soda ... ..	·05540	·06810	·01790
Iron ... ..	—	—	a trace
Loss ... ..	3·00943	2·60319	2·56900
	<hr/>	<hr/>	<hr/>
	100·00000	100·00000	100·00000

DOTTER SEED.

Water ... ..	5·75
Oil ... ..	28·18
Albuminous compounds	28·31
Gum, sugar, &c. ... ..	12·16
Fibre ... ..	9·05
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CONCRETIONS. Gouty.

	1.	2.
Uric acid ... ..	16·7	20·0
Soda ... ..	16·7	20·0
Lime ... ..	8·3	10·0
Chloride of sodium	16·7	18·0
Chloride of potassium	—	2·2
Animal matter	16·7	19·5
Water ... ..	8·3	10·3
	<hr/>	<hr/>

## CONCRETIONS. Intestinal, Horses.

	1.	2.
Ammoniaco magnesian phosphate ... ..	93·10	93·02
Phosphate of lime ... ..	1·18	1·01
Alcoholic extract ... ..	·43	·41
Potass extract... ..	·36	·33
Chloride of sodium ... ..	·63	sand 40
Phosphate of soda ... ..	·31	·51
Water, fibre, iron and loss ... ..	3·99	4·32
	<hr/>	<hr/>

## ELDER BARK. Ash of.

Potash ... ..	13·956
Soda ... ..	·965
Lime ... ..	30·924
Magnesia ... ..	10·730
Alumina ... ..	·250
Oxide of iron ... ..	·350
Chlorine ... ..	·179
Sulphuric acid... ..	5·818
Phosphoric acid ... ..	8·045
Silicic acid ... ..	5·455
Carbonic acid ... ..	23·274
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	99·946

## ERGOT. Ash of.

Potash ... ..	38·97
Soda ... ..	12·12
Magnesia ... ..	4·58
Lime ... ..	1·43
Phosphoric acid ... ..	13·24
Sulphuric acid... ..	·02
Silica... ..	9·13
Phosphate of iron ... ..	2·00
Chloride of sodium ... ..	3·36
	<hr/>

ELMWOOD. Ash of.

		Bark.
Potash ... ..	21·92	2·22
Soda ... ..	13·72	10·09
Magnesia ... ..	7·71	3·19
Lime ... ..	47·80	72·70
Phosphoric acid ... ..	3·33	1·59
Sulphuric acid... ..	1·28	·62
Silica... ..	3·07	8·77
Peroxide of iron ... ..	1·17	·82
Chloride of sodium ... ..	—	—
	100·00	100·00

ESPARSETTE.

Potash ... ..	6·75
Soda ... ..	20·33
Magnesia ... ..	8·57
Lime ... ..	31·01
Phosphoric acid ... ..	26·10
Sulphuric acid... ..	1·68
Silica... ..	1·10
Peroxide of iron ... ..	2·28
Chloride of sodium ... ..	2·18
	100·00

EYES. Crystalline lens.

	Ox.	Horse.
Water ... ..	65·762	60·000
Albumen ... ..	23·290	25·531
Crystallin ... ..	10·480	14·200
Fat ... ..	·045	·142
Extractive matter and chloride of } sodium and lactates ... .. }	·495	·426

	Opaque lens of a bear.	Opaque lens of a horse.
Phosphate of lime ... ..	68·90	57·40
Carbonate of lime ... ..	12·60	1·60
Carbonate of magnesia ... ..	3·60	—
Peroxide of iron and manganese... ..	·70	—
Mucus (?) ... ..	7·50	albumen 29·30
Phosphate of lime and animal } matter ... .. }	2·10	—
Chloride of sodium and animal } matter ... .. }	3·20	—
Solid fat ... ..	1·10	—

## EDIBLE EARTH, from Neograd in Hungary.

Carbonic acid ... ..	40·357
Lime ... ..	51·488
Magnesia ... ..	·110
*Volatile matter ... ..	5·545
Ferrous oxide ... ..	·158
Alumina ... ..	2·272
Water ... ..	·067
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*Nitrogen... ..	·010

## FLAG, Sweet. Ash of.

Potash .. ..	6·90
Soda ... ..	32·93
Lime ... ..	7·70
Phosphoric acid ... ..	11·48
Sulphuric acid... ..	5·06
Silica... ..	2·39
Peroxide of iron ... ..	1·91
Chloride of potassium ... ..	14·66
Chloride of sodium... ..	2·84
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## FLAX. Ash of whole plant.

Potash ... ..	·57
Soda ... ..	9·82
Magnesia ... ..	7·79
Lime ... ..	12·33
Phosphoric acid ... ..	10·84
Sulphuric acid... ..	2·65
Silica... ..	21·35
Chloride of potassium ... ..	3·22
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## FOXGLOVE SEED. Ash of.

	Seed.
Potash ... ..	43·53
Soda ... ..	3·70
Magnesia ... ..	6·53
Lime ... ..	15·65
Phosphoric acid ... ..	1·68
Sulphuric acid... ..	3·91
Silica... ..	12·78
Peroxide of iron ... ..	3·19
Chloride of sodium ... ..	9·03
<hr/>	

100·00

## FIRWOOD. Ash of.

		Bark.
Carbonate of potash ... ..	11·30	} 2·95
Carbonate of soda ... ..	7·42	
Carbonate of lime ... ..	50·94	64·98
Magnesia ... ..	5·60	·93
Phosphate of lime ... ..	3·43	5·03
Phosphate of magnesia... ..	2·90	4·18
Phosphate of iron ... ..	1·04	1·04
Phosphate of alumina ... ..	1·75	2·42
Silica... ..	13·37	17·28
Water and loss ... ..	2·25	1·79
	<hr/>	<hr/>
	100·00	

## FERN. Ash of.

	Rhine.	Common.
Sulphate of potash... ..	3·3	·70
Chloride of potassium ... ..	9·0	trace
Carbonate of potash ... ..	16·7	—
Silica... ..	16·5	73·00
Carbonate of lime ... ..	43·4	24·80
Phosphate of lime ... ..	10·0	1·00
Magnesia ... ..	·2	·50
Oxide of iron ... ..	·7	—
Oxide of manganese ... ..	·2	—
	<hr/>	<hr/>
	100·00	100·00

## GALLS.

Tannic acid ... ..	65·0
Gallic acid ... ..	2·0
Ellagic and luteogallic acids ... ..	2·0
Brown extractive matter ... ..	2·5
Gum ... ..	2·5
Starch ... ..	2·0
Sugar ... ..	1·3
Chlorophyle and volalite oil ... ..	·7
Woody fibre ... ..	10·5
Water ... ..	11·5
Albumen and salts... ..	—
	<hr/>
	100·00



GUM. Sagapenum.

Resin...	50.0
Gum, with lime salts	32.5
Volatile oil	3.5
Bassorin	4.2
Malate and phosphate of lime	1.1
Impurities	4.2
Water	4.5
	<hr/>
	100.0

GUM. Gamboge.

	Pipe.	Cake.	Coarse.
Resin...	72.5	64.7	48.2
Soluble gum	22.7	20.3	15.2
Woody fibre	trace	5.3	13.3
Fecula	—	5.6	14.5
Moisture	4.8	4.1	8.8
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GUM. Myrrh.

	1.	2.
Volatile oil	2.60	2.5
Resin...	27.80	23.0
Soluble gum	54.38	46.0
Insoluble gum	9.32	12.0
Salts	1.36	—
Impurities	1.60	16.5
Loss	2.94	
	<hr/>	<hr/>
	100.00	100.0

GUM. Ammoniacum.

Resin...	70.00
Gum	18.40
Gluten	4.40
Water	6.00
Loss	1.20
	<hr/>
	100.00

## GUM. Assafœtida.

Resin...	48.5
Gum, with traces of saline matters	19.0
Bassorin	6.4
Volatile oil	4.5
Extractive, with saline matters	1.4
Sulphate and carbonate of lime	9.3
Oxide of iron and alumina	.4
Sand and lignin	4.5
Water	6.0
	<hr/>
	100.0

## GUM. Bdellium,

Resin...	59.0
Soluble gum	9.2
Bassorin	30.6
Volatile oil and loss	1.2
	<hr/>
	100.0

## GUM. Galbanum.

Resin...	65.8
Gum	22.6
Bassorin	1.8
Volatile oil	3.4
Bitter matter and malic acid	.2
Vegetable remains	2.8
Water	2.0
Loss	1.4
	<hr/>
	100.0

## GUM. Mezgnite.

Arabin	84.967
Bassorin	.206
Water	11.640
Inorganic matter	3.000
Impurities	.236
	<hr/>
	100.049

GUM. Tragacanth.

Tragacanthin or arabin ... ..	53·3
Bassorin and starch ... ..	33·1
Water ... ..	11·1
Inorganic matter ... ..	2·5
	<hr/>
	100·0

GUM. Arabic.

	1.	2.	3.
Carbon ... ..	41·906	41·4	45·10
Hydrogen ... ..	6·788	6·5	6·10
Oxygen ... ..	51·306	52·1	48·80
	<hr/>	<hr/>	<hr/>
	100·00	100·0	100·00

GUM. Butea.

Gum, with gallic acid and other soluble substances	73·26
Tannic acid ... ..	21·67
Soluble extractive ... ..	5·07
	<hr/>
	100·00

GUM. Kino.

Tannic acid and peculiar extractive ... ..	75
Red gum ... ..	24
Insoluble matter ... ..	1
	<hr/>
	100

GRAPE MUST. Ash of unripe purple Burgundy.

	1.	2.
Potash ... ..	66·33	36·9
Soda ... ..	·33	·4
Lime ... ..	5·20	10·7
Magnesia ... ..	3·27	2·2
Oxide of manganese ... ..	·82	<hr/>
Iron ... ..	·73	3·4
Sulphuric acid... ..	5·19	5·4
Chlorine ... ..	·74	·4
Silica ... ..	1·99	15·3
Phosphoric acid ... ..	15·38	<hr/>
Carbonic acid ... ..	<hr/>	12·4
	<hr/>	<hr/>

## GUTTA PERCHA.

Pure gutta-percha ... ..	79·70
Soft resin... ..	15·10
Vegetable fibre ... ..	2·18
Moisture ... ..	2·50
Ash ... ..	·52
	<hr/>
	100·00

## GLUTEN. Ash of.

Potash ... ..	7·87
Soda ... ..	2·14
Lime ... ..	17·31
Magnesia ... ..	12·08
Peroxide of iron ... ..	7·13
Phosphoric acid ... ..	52·08
Sulphuric acid... ..	·69
Chlorine ... ..	·09
	<hr/>

## GASTRIC JUICE OF A HORSE.

Water ... ..	984·00
Solid residue ... ..	16·00
Organic matters ... ..	10·52
Salts soluble in water ... ..	5·02
Salts insoluble in water ... ..	·46
	<hr/>

## HAIR.

Color.	Ash.	Soluble portion.	Insoluble portion.	Peroxide of iron.
Brown hair ... ..	·54	·17	·312	·058
Brown hair ... ..	1·10	·51	·200	·395
Black hair ... ..	1·02	·29	·516	·214
Red hair ... ..	1·30	·93	·200	·170
Red hair ... ..	·54	·27	—	·275
Grey hair ... ..	1·00	·24	·528	·232

The soluble portion consists of chloride of sodium, sulphate of lime, and sulphate of magnesia. The insoluble portion is phosphate of lime and silica.

HIBISCUS ESCULENTENS. Egypt Bammgé.

Potash	...	...	...	...	...	...	...	...	...	38·842
Soda	...	...	...	...	...	...	...	...	...	4·576
Lime	...	...	...	...	...	...	...	...	...	7·813
Magnesia	...	...	...	...	...	...	...	...	...	12·021
Oxide of iron	...	...	...	...	...	...	...	...	...	·861
Phosphoric acid	...	...	...	...	...	...	...	...	...	24·690
Sulphuric acid...	...	...	...	...	...	...	...	...	...	·561
Silicic acid	...	...	...	...	...	...	...	...	...	·747
Chlorine	...	...	...	...	...	...	...	...	...	1·537
Carbonic acid	...	...	...	...	...	...	...	...	...	8·252
<hr/>										
99·900										

HYOSCYAMUS NIGER. Ash of.

Potash	...	...	...	...	...	...	...	...	...	17·54
Soda	...	...	...	...	...	...	...	...	...	5·40
Lime	...	...	...	...	...	...	...	...	...	6·02
Magnesia	...	...	...	...	...	...	...	...	...	19·98
Oxide of iron	...	...	...	...	...	...	...	...	...	1·92
Alumina	...	...	...	...	...	...	...	...	...	·63
Phosphoric acid	...	...	...	...	...	...	...	...	...	42·45
Sulphuric acid...	...	...	...	...	...	...	...	...	...	·73
Chlorine	...	...	...	...	...	...	...	...	...	·30
Carbonic acid	...	...	...	...	...	...	...	...	...	·15
Silicic acid	...	...	...	...	...	...	...	...	...	·68
Sand	...	...	...	...	...	...	...	...	...	3·20
<hr/>										
99·00										

HOPS. Stalks and tendrils. Ash of.

Potash	...	...	...	...	...	...	...	24·35	Leaves.	14·95
Soda	...	...	...	...	...	...	...	—		·39
Magnesia	...	...	...	...	...	...	...	4·10		2·39
Lime	...	...	...	...	...	...	...	38·73		49·67
Phosphoric acid	...	...	...	...	...	...	...	6·92		3·52
Sulphuric acid...	...	...	...	...	...	...	...	3·44		5·04
Silica...	...	...	...	...	...	...	...	6·07		12·14
Chloride of sodium...	...	...	...	...	...	...	...	6·47		9·49
Chloride of potassium	...	...	...	...	...	...	...	9·64		—
Peroxide of iron	...	...	...	...	...	...	...	·28		2·41
<hr/>										
100·00									100·00	

## HEMLOCK. Ash of.

		Seeds
Potash ... ..	12·80	21·69
Soda ... ..	21·69	9·64
Magnesia ... ..	9·64	8·39
Lime ... ..	8·39	24·96
Phosphoric acid ... ..	24·96	10·31
Sulphuric acid... ..	3·43	3·43
Silica... ..	2·62	—
Peroxide of iron ... ..	2·40	—
Chloride of sodium ... ..	16·61	—
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## HAZELNUT. Ash of.

	Leaves.	Peeled branches.
Alkalies and salts with alkaline bases ... ..	44·00	28·00
Phosphates of lime and magnesia ... ..	14·00	12·00
Oxides of iron and manganese ... ..	1·50	2·00
Carbonates of lime and magnesia ... ..	29·00	36·00
Silica... ..	11·30	22·00
	<hr/>	<hr/>
	99·80	

## HAZELNUT BARK. Ash of.

Alkalies and salts with alkaline bases ... ..	56·70
Phosphates of lime and magnesia ... ..	35·00
Oxides of iron and manganese ... ..	·12
Carbonates of lime and magnesia ... ..	8·00
Silica... ..	·25
	<hr/>
	100·07

## HEATH. Ash of.

Sulphate of potash ... ..	5·0
Chloride of potassium ... ..	1·2
Carbonate of potash ... ..	6·8
Silica... ..	37·5
Carbonate of lime ... ..	28·0
Phosphate of lime ... ..	13·0
Magnesia .. ..	1·0
Oxide of iron ... ..	1·4
Oxide of manganese ... ..	6·1
	<hr/>
	100·0

## IPECACUANHA.

Emetina ... ..	4.13
Soft resin ... ..	2.43
Wax ... ..	.75
Gum ... ..	25.17
Starch ... ..	9.00
Woody fibre ... ..	10.80
Bitter extractive ... ..	10.12
Sugar ... ..	2.00
Gum, starch, extracted by potash ... ..	34.80
Loss ... ..	.80

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## JALAP.

Hard resin ... ..	7.8
Soft resin ... ..	3.2
Slightly acrid extract ... ..	17.9
Gummy extractive... ..	14.4
Colouring matter ... ..	8.2
Uncrystalizable sugar ... ..	1.9
Gum and salts... ..	15.6
Bassorin ... ..	3.2
Vegetable albumen ... ..	3.9
Starch ... ..	6.0
Water ... ..	4.8
Malic acid and malates of potash ... ..	2.4
Chlorides of calcium and potassium ... ..	1.4
Phosphates of lime and magnesia ... ..	1.7
Carbonate of lime ... ..	3.0
Loss ... ..	4.6

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## JALAP. False Rose Scented.

Resin ... ..	3.23
Liquid sugar extracted by alcohol ... ..	16.47
Brown sugar, extract by water ... ..	5.92
Gum ... ..	3.88
Starch ... ..	22.69
Woody fibre ... ..	46.00
Loss ... ..	1.81

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## JUNIPER BERRIES.

Water	...	...	...	...	...	...	...	...	...	29·44
Essential oil	...	...	...	...	...	...	...	...	...	·91
Formic acid	...	...	...	...	...	...	...	...	...	1·86
Acetic acid	...	...	...	...	...	...	...	...	...	·94
Malic acid	...	...	...	...	...	...	...	...	...	·21
Oxalic acid	...	...	...	...	...	...	...	...	...	—
Fat	...	...	...	...	...	...	...	...	...	·64
Green resin	...	...	...	...	...	...	...	...	...	8·46
Hard brown resin	...	...	...	...	...	...	...	...	...	1·29
Juniperin	..	...	...	...	...	...	...	...	...	·37
Pectin	...	...	...	...	...	...	...	...	...	·73
Protein substances	...	...	...	...	...	...	...	...	...	4·45
Sugar	...	...	...	...	...	...	...	...	...	29·65
Cellulose	...	...	...	...	...	...	...	...	...	15·83
Ash	...	...	...	...	...	...	...	...	...	2·33

## LIVER.

	Fatty liver.	Healthy liver.
Water	55·15	76·39
Solid constituents	44·85	23·61
Animal matter, dried at 212°	13·32	21·00
Saponifiable fat	30·20	1·60
Cholesterin	1·33	·17

## LIQUOR AMNII.

	4th month.	6th month.
Water	979·45	990·29
Alcohol extract and lactate of soda	3·69	·34
Albumen	10·77	6·67
Chloride of sodium	5·95	2·40
Sulphate and phosphate of lime	·14	·30

## LYMPH.

Water	...	...	...	...	...	...	...	961·0
Solid matters	...	...	...	...	...	...	...	39·0
Fibrine	...	...	...	...	...	...	...	2·5
Albumen	...	...	...	...	...	...	...	27·5
Chloride of sodium, phosphates of potash and soda, and salivary matter...	...	...	...	...	...	...	...	2·1
Extractive matters and lactate of soda	..	...	...	...	...	...	...	6·9

## LUCERNE. Ash of.

Potash ... ..	14·03
Soda ... ..	6·44
Magnesia ... ..	3·64
Lime ... ..	50·57
Phosphoric acid ... ..	13·68
Sulphuric acid... ..	4·23
Silica ... ..	3·46
Peroxide of iron ... ..	·63
Chlorine ... ..	3·30
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	99·98

## LINSEED. Ash of.

Potash ... ..	25·85
Soda ... ..	·71
Magnesia ... ..	·22
Lime ... ..	25·98
Phosphoric acid ... ..	40·11
Sulphuric acid... ..	·99
Silica.. ... ..	·92
Peroxide of iron ... ..	3·67
Chloride of sodium ... ..	1·55
	<hr/>
	100·00

## LAUREL BERRIES.

Volatile oil ... ..	·8
Laurin ... ..	1·0
Fixed oil ... ..	12·8
Stearin ... ..	7·1
Resin... ..	1·6
Uncrystalizable sugar ... ..	·4
Gummy extractive... ..	17·2
Bassorin ... ..	6·4
Starch ... ..	25·9
Lignin ... ..	18·8
Soluble albumen ... ..	traces
Acid ... ..	·1
Water ... ..	6·4
Salts ... ..	1·5
	<hr/>
	100·0

## LEES.

	French.	Spanish.
Water ... ..	11·305	10·694
Sand ... ..	4·600	4·900
Silica... ..	2·130	1·960
Ferric oxide ... ..	·394	·351
Alumina ... ..	·844	·832
Phosphoric acid ... ..	·527	·486
Lime ... ..	10·567	10·600
Magnesia ... ..	·327	·363
Potash ... ..	1·868	2·123
Soda ... ..	·100	·060
Sulphuric acid... ..	4·566	5·729
Chlorine ... ..	·040	·042
Carbonic acid ... ..	·435	·388
Tartaric acid ... ..	22·721	21·472
Combined water ... ..	5·904	5·552
Vegetable matter ... ..	33·672	34·448

## LAURUS PERSEA.

	Kernel.	Rind.
Water ... ..	58·876	78·470
Fatty oil ... ..	·129	1·165
Grape sugar ... ..	1·081	19·065
Starch ... ..	8·534	
Albumen ... ..	1·301	
Tannic and gallic acids... ..	1·572	
Red colouring matter, succinic acid } traces and gum ... .. }	4·420	—
Cellulose ... ..	26·087	—

## LAURUS PERSEA. Pulp of.

Water ... ..	80·670
Yellow fatty oil ... ..	8·500
Grape sugar ... ..	3·175
Starch ... ..	1·877
Malic acid ... { combined with calcium and }	·043
Tartaric acid ... { potassium }	·082
Albumen ... ..	·075
Glutenous substance ... ..	1·559
Dextrin, mucus, &c. ... ..	2·775
Cellulose ... ..	1·244
Ash ... ..	·982

MAN. Weighing 140lbs. or 10 stone.

Dry substance.	}	Water ... ..	101lbs.	}	=	}	Carbon ...	14	9½
		Albumen ... ..	8½lbs.				Hydrogen	5	0
		Globulin ... ..					Oxygen ...	5	12
		Fibrine of flesh ...	13lbs.				Nitrogen...	3	12
		Gelatine and fibrine of blood ... ..					Inorganic com- bination.		
		Fatty substances ...	7½lbs.				Phosphorus	250	grs.
		Mineral matter ... ..	10lbs.				Sulphur ...	700	grs.
		140lbs.							

MAN. Mineral matter of.

From bones.	}	Phosphate of lime ... ..	8	0	0
		Phosphate of magnesia ... ..	0	5	37
		Carbonate of lime ... ..	1	0	0
		Flouride of calcium ... ..	0	0	20
		9	5	57	

From other parts.	}	Phosphate of lime ... ..	353
		Phosphate of magnesia ... ..	218
		Phosphate of potash ... ..	2149
		Phosphate of soda ... ..	610
		Chloride of sodium ... ..	710
		Chloride of potassium ... ..	473
		Oxide of iron ... ..	106
		Carbonate of soda ... ..	104
		Sulphate of potass ... ..	27

4750 = 10oz. 380gr.

MOSS. Sparganum Palustre. Ash of.

Potash ... ..	3·78
Soda ... ..	4·81
Magnesia ... ..	9·77
Lime ... ..	2·83
Phosphoric acid ... ..	61·76
Sulphuric acid... ..	13·80
Silica... ..	
Phosphate of iron ... ..	
Chloride of sodium ... ..	

## MOSS. Dargavel.

	1.	2.	3.
Iron peroxide ... ..	7·00	4·10	3·32
Alumina ... ..	7·18	27·76	8·79
Lime ... ..	12·64	11·10	5·18
Magnesia ... ..	3·54	1·82	2·21
Potash ... ..	1·70	2·71	2·48
Soda ... ..	3·19	2·83	3·49
Common salt ... ..	1·84	3·32	·52
Sulphuric acid... ..	8·12	12·50	5·52
Phosphoric acid ... ..	·79	2·74	3·73
Carbonic acid ... ..	2·58	—	—
Silica .. ..	16·67	9·57	18·24
Sand ... ..	34·45	22·38	45·87
Ash per cent. in dry moss ... ..	10·92	2·38	4·49
Nitrogen ... ..	1·52	1·14	1·86

## MYALL WOOD.

Silicic acid ... ..	·401
Carbonic acid ... ..	43·721
Sulphuric acid... ..	·488
Phosphoric acid ... ..	·103
Chlorine ... ..	·098
Potash ... ..	2·621
Soda ... ..	2·054
Lime ... ..	47·533
Magnesia ... ..	3·879
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	100·898

## MISTLETOE. Ash of.

		Madia seeds.
Potash ... ..	40·71	9·53
Soda ... ..	—	11·24
Magnesia ... ..	11·06	15·42
Lime ... ..	22·37	7·74
Phosphoric acid ... ..	19·74	54·99
Sulphuric acid... ..	1·62	—
Silica... ..	1·87	—
Phosphate of iron ... ..	1·46	1·08
Chloride of sodium .. ..	1·17	—
	<hr/>	<hr/>

MADDER ROOT. Ash of.

Potash ... ..	20·39
Soda ... ..	7·37
Magnesia ... ..	2·60
Lime ... ..	24·00
Phosphoric acid ... ..	3·13
Sulphuric acid... ..	1·45
Silica... ..	3·63
Phosphate of iron ... ..	2·13
Chloride of sodium ... ..	10·04
	<hr/>

MAIZE STALK. Ash of.

Potash ... ..	59·00
Phosphate of lime ... ..	9·70
Chloride of potassium ... ..	·52
Sulphate of potash ... ..	1·25
Earthy phosphates... ..	5·00
Earthy carbonates ... ..	1·00
Silica... ..	18·00
Oxide of iron and alumina ... ..	·05
Loss .. ..	3·05
	<hr/>
	97·57

NASAL MUCUS.

Water ... ..	933·7
Mucin ... ..	53·3
Alcohol extract and alkaline lactates... ..	3·0
Chlorides of potassium and sodium ... ..	5·6
Water extract, with traces of albumen and phosphates	3·5
Soda with mucus ... ..	3·9
	<hr/>

OX GALL STONES.

Soluble portion ... ..	18·09
Fat ... ..	5·28
Phosphates, with bilirubin ... ..	1·41
Bilirubin ... ..	28·10
Residue and loss ... ..	47·12
	<hr/>
	100·00

## OX GALL.

Mucus	...	2.310
Extractive matter insoluble in alcohol, with alkaline sulphates and phosphates	... } ... }	4.334
Chloride of sodium, lactate of soda and extractive matter soluble in alcohol	... } ... }	15.000
Bilin cholepyrrhin	...	50.000
Cholosterin	...	.001
Water	...	928.380

## OLEANDER. Ash of.

	1.	2.
Carbonate, sulphate and chloride of potassium	12.25	17.76
Carbonate of lime	57.00	71.54
Alumina	13.31	5.93
Silica...	5.44	—
Oxide of iron and manganese	11.00	4.86
	<u>99.00</u>	<u>100.09</u>

## OAK. Ash of.

	Peeled branches.	Mould.
Alkalies and salts, with alkaline bases	58.58	32.50
Phosphates of lime and magnesia	28.25	10.50
Oxides of iron and manganese	1.00	14.00
Carbonates of lime and magnesia	12.25	10.00
Silica...	.12	32.00
	<u>100.20</u>	<u>99.00</u>

## OAK. Ash of. Sept. 27th.

	Leaves.	Sap.
Alkalies and salts, with alkaline bases	42.50	55.30
Phosphates of lime and magnesia	18.25	24.00
Oxides of iron and manganese	1.75	2.00
Carbonates of lime and magnesia	23.00	11.00
Silica...	14.50	7.50
	<u>100.00</u>	<u>99.80</u>

OAK. Ash of.

	Wood.	Bark.
Alkalies and salts, with alkaline bases ...	59·25	29·75
Phosphates of lime and magnesia ... ..	4·50	4·50
Oxides of iron and manganese ... ..	2·25	1·75
Carbonates of lime and magnesia ... ..	32·00	63·25
Silica... ..	2·00	·25
	<hr/>	<hr/>
	100·00	99·50

OAK. Ash of.

	Inner bark.	Leaves.
Alkalies and salts, with alkaline bases ...	29·75	72·24
Phosphates of lime and magnesia ... ..	3·75	24·00
Oxides of iron and manganese ... ..	1·00	·64
Carbonates of lime and magnesia ... ..	65·00	·12
Silica... ..	·05	3·00
	<hr/>	<hr/>
	99·55	100·00

OXALIS CRENATA.

Starch ... ..	2·50
Albumen ... ..	1·50
Gum, &c ... ..	5·50
Woody fibre ... ..	4·40
Water ... ..	86·10
	<hr/>
	100·00

ORANGE TREE. Ash of.

	Leaves.	Root.
Potash ... ..	16·51	15·43
Soda ... ..	1·68	4·52
Magnesia ... ..	5·72	6·91
Lime ... ..	56·38	49·89
Phosphoric acid ... ..	3·27	13·47
Sulphuric acid... ..	4·43	5·78
Silica... ..	4·83	1·75
Peroxide of iron ... ..	·52	1·02
Chloride of sodium... ..	6·66	1·18
	<hr/>	<hr/>

## ORANGE TREE. Ash of.

	Stem.	Seed.
Potash ... ..	11·69	40·28
Soda ... ..	3·07	·92
Magnesia ... ..	6·34	8·74
Lime ... ..	55·13	18·97
Phosphoric acid ... ..	17·09	23·24
Sulphuric acid... ..	4·64	5·10
Silica... ..	1·22	1·13
Peroxide of iron ... ..	·57	·80
Chloride of sodium... ..	·25	·82

## OAT STRAW. Ash of.

	1.	2.
Carbonic acid ... ..	3·2	—
Sulphuric acid... ..	4·1	2·15
Phosphoric acid ... ..	3·0	1·94
Chlorine ... ..	4·7	2·48
Magnesia ... ..	2·8	4·58
Lime ... ..	8·3	7·29
Potash ... ..	24·5	12·18
Soda ... ..	4·4	13·01
Silica... ..	40·0	54·25
Oxide of iron and alumina ... ..	2·1	1·41
Carbon, water and loss ... ..	2·9	—
	100·0	99·29

## OPIUM. Oriental.

Morphia ... ..	9·25
Narcotina... ..	7·50
Meconic acid ... ..	13·75
Bitter extract ... ..	22·00
Deposit ... ..	7·75
Albumen ... ..	20·00
Balsamic matter ... ..	6·25
Caoutchouc ... ..	2·00
Gum, with lime ... ..	1·25
Sulphate of potash... ..	2·00
Iron, alumina and phosphoric acid ... ..	1·50
Woody fibre ... ..	3·75
Ammonia, volatile oil and loss ... ..	3·00

OPIUM. Constantinople.

Morphia ... ..	4.50
Narcotina... ..	3.47
Codeia ... ..	.52
Narceine ... ..	.42
Meconine ... ..	.30
Meconic acid ... ..	4.38
Resin... ..	8.10
Bassorin, caoutchouc, fat and lignin ... ..	17.18
Salts and volatile oil ... ..	3.60
Lime and magnesia ... ..	.42
Alumina, oxide of iron, silica and phosphate of lime ... ..	.22
Brown acid, soluble in alcohol and water... ..	.40
Brown acid, gum and loss ... ..	56.49

OPIUM. Smyrna.

	1.	2.	3.
Morphia ... ..	10.842	4.106	9.852
Narcotina... ..	6.808	8.150	9.360
Codeia ... ..	.678	.834	.848
Narceine ... ..	6.662	7.506	7.684
Meconine ... ..	.804	.846	.314
Meconic acid ... ..	5.124	3.968	7.620
Fat ... ..	2.166	1.350	1.816
Caoutchouc ... ..	6.012	5.026	3.674
Resin... ..	3.582	2.028	4.112
Gummy extractive... ..	25.200	31.470	21.834
Gum ... ..	1.042	2.896	.698
Mucus ... ..	19.086	17.098	21.068
Water ... ..	9.846	12.226	11.422
Loss ... ..	2.148	2.496	.568

PINUS LARIX WOOD. Ash of.

Potash ... ..	15.24
Soda ... ..	7.27
Magnesia ... ..	24.50
Lime ... ..	26.97
Phosphoric acid ... ..	1.93
Sulphuric acid... ..	1.79
Silica... ..	3.60
Peroxide of iron ... ..	4.25
Red oxide of manganese ... ..	13.15
Chloride of sodium ... ..	.92
	<hr/>
	99.62

## PINUS PICEA SEEDS. Ash of.

Potash ... ..	21·75
Soda ... ..	6·76
Magnesia ... ..	16·79
Lime ... ..	1·54
Phosphoric acid ... ..	39·65
Sulphuric acid... ..	—
Silica... ..	11·71
Peroxide of iron ... ..	1·31
Chloride of sodium... ..	·57
	<hr/>
	100·08

## PINE. Ash of.

	1.	2.
Carbonate of potash ... ..	3·60	7·36
Chloride of potassium ... ..	4·24	12·63
Carbonate of lime ... ..	46·34	51·19
Carbonate of magnesia ... ..	6·77	—
Alumina ... ..	14·86	11·95
Silica... ..	13·49	6·87
Oxide of iron and manganese ... ..	10·52	10·00
	<hr/>	<hr/>
	99·82	100·00

## PINE LEAVES. Ash of. From Jura.

Alkalies and their salts... ..	40·13
Phosphates of lime and magnesia ... ..	12·27
Phosphates of iron, &c. ... ..	1·60
Carbonates of lime and magnesia ... ..	43·50
Silica... ..	2·40
	<hr/>
	99·90

## POPULUS NIGRA. Ash of.

	Leaves.	Stem.
Alkalies and salts, with alkaline bases ... ..	51·50	50·50
Phosphates of lime and magnesia ... ..	13·00	16·75
Oxides of iron and manganese ... ..	1·25	1·50
Carbonates of lime and magnesia ... ..	29·00	27·00
Silica... ..	5·00	3·30
	<hr/>	<hr/>
	99·75	99·05



## PEAPODS. Ash of.

Potash ... ..	22·31
Soda ... ..	17·99
Magnesia ... ..	9·54
Lime ... ..	31·08
Phosphoric acid ... ..	10·59
Sulphuric acid... ..	6·96
Silica... ..	·29
Phosphate of iron ... ..	1·16
Chloride of sodium... ..	trace

## POPPY. Ash of.

Potash ... ..	6·85
Soda ... ..	33·11
Lime ... ..	5·06
Phosphoric acid ... ..	23·37
Sulphuric acid... ..	2·26
Silica... ..	1·41
Peroxide of iron ... ..	1·21
Chloride of sodium ... ..	—
Chloride of potassium ... ..	3·40

## PEAT. Ash of.

	Light.	Surface.	Dense.	Lower layer.
Potash ... ..	·362	1·323	·198	·247
Soda ... ..	1·427	1·902	·590	·496
Lime ... ..	26·113	36·496	25·860	24·944
Magnesia ... ..	3·392	7·634	1·207	1·285
Alumina ... ..	4·180	5·411	·371	·360
Sesquioxide of iron ... ..	11·591	15·608	18·746	19·405
Phosphoric acid ... ..	1·461	2·571	·874	·242
Sulphuric acid... ..	12·403	14·092	23·630	10·742
Hydrochloric acid ... ..	1·568	1·482	·622	·335
Silica in compounds, } decomposable by acids }	·980	3·595	·896	1·082
Sand and silicates, in- } decomposable by acids }	22·519	2·168	14·430	26·789
Carbonic acid ... ..	13·695	7·761	12·240	13·890
	<u>99·691</u>	<u>100·043</u>	<u>99·664</u>	<u>99·817</u>

PEAT. Ash of.	Compact and good.	Extremely hard.	Light surface.	Dense.
Potash ... ..	·641	·347	·668	·271
Soda ... ..	1·875	·679	1·709	1·491
Lime ... ..	22·702	45·581	31·553	13·667
Magnesia ... ..	6·809	1·256	9·439	16·994
Alumina ... ..	1·109	·129	1·707	·259
Sesquioxide of iron ... ..	29·854	15·974	6·012	26·644
Phosphoric acid ... ..	2·019	·188	1·286	1·339
Sulphuric acid... ..	16·381	44·371	25·602	22·691
Hydrochloric acid ... ..	1·591	·337	·698	1·180
Silica in compounds, de- composable by acids	·737	1·043	5·159	2·719
Sand and silicates, inde- composable by acids	14·505	2·653	6·282	11·673
Carbonic acid ... ..	1·470	16·120	9·864	—
	<u>99·693</u>	<u>*128·678</u>	<u>99·979</u>	<u>98·928</u>

\* Error in analysis.

### PIMENTO BERRIES.

	Husks.	Kernels.
Volatile oil ... ..	10·0	5·0
Green oil ... ..	8·4	2·5
Solid fat oil ... ..	·9	1·2
Astringent extract... ..	11·4	39·8
Gummy extract ... ..	3·0	7·2
Colouring matter ... ..	4·0	—
Resinous matter ... ..	1·2	—
Uncrystalizable sugar ... ..	3·0	8·0
Malic or gallic acid ... ..	·6	1·6
Lignin ... ..	50·0	—
Saline ashes ... ..	2·8	1·9
Water ... ..	3·5	3·0
Loss ... ..	1·6	1·8
Red matter insoluble in water ... ..	—	8·8
Pellicular matter ... ..	—	16·0
Brown flocculi... ..	—	3·2
	<u>100·4</u>	<u>100·0</u>

## PUFF BALLS. Ash of.

Phosphoric acid	...	...	...	...	...	...	...	...	...	46.19
Potash	..	...	...	...	...	...	...	...	...	35.48
Soda	...	...	...	...	...	...	...	...	...	6.95
Lime	...	...	...	...	...	...	...	...	...	2.47
Iron oxide	...	...	...	...	...	...	...	...	...	1.08
Silicic acid	...	...	...	...	...	...	...	...	...	.66
Undetermined...	...	...	...	...	...	...	...	...	...	7.17

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## PUFF BALLS. Giant.

Water	...	...	...	...	...	...	...	...	...	90.87
Albuminoids	...	...	...	...	...	...	...	...	...	5.48
Oil	...	...	...	...	...	...	...	...	...	.90
Cellulose, &c.	...	...	...	...	...	...	...	...	...	2.10
Ash	...	...	...	...	...	...	...	...	...	.63

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## PULMONARY MUCUS OF A HEALTHY MAN.

Water	...	...	...	...	...	...	...	...	...	955.520
Solid constituents	...	...	...	...	...	...	...	...	...	44.480
Mucus and albumen	...	...	...	...	...	...	...	...	...	23.754
Water extract...	...	...	...	...	...	...	...	...	...	8.006
Alcohol	...	...	...	...	...	...	...	...	...	1.810
Fat	...	...	...	...	...	...	...	...	...	2.887
Chloride of sodium	...	...	...	...	...	...	...	...	...	5.825
Sulphate of soda	...	...	...	...	...	...	...	...	...	.400
Carbonate of soda	...	...	...	...	...	...	...	...	...	.198
Phosphate of soda	...	...	...	...	...	...	...	...	...	.080
Phosphate of potash, with traces of oxide of iron...	...	...	...	...	...	...	...	...	...	.974
Carbonate of potash	...	...	...	...	...	...	...	...	...	.291
Silica and sulphate of potash	...	...	...	...	...	...	...	...	...	.255

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## PANCREATIC FLUID. In 1000 parts.

	Dog.	Sheep.
Water	917.2	963.5
Extractive matter and salts soluble in alcohol	36.8	15.5
Caseous matter and soda salts soluble in water	15.3	2.8
Albumen and salts...	35.5	22.4

## PUS. From a Mammary Abscess.

Water ... ..	861·0
Solid constituents ... ..	139·0
Fat soluble only in hot alcohol ... ..	16·0
Fat and extractive matter soluble in cold alcohol ...	43·0
Albumen, pyin and pus corpustules ... ..	74·0
Loss ... ..	6·0
	<hr/>

## RICINUS COMMUNIS. Ash of leaves.

Lime ... ..	33·40
Magnesia ... ..	6·20
Potash ... ..	27·15
Soda ... ..	2·12
Oxide of iron ... ..	·70
Phosphoric acid ... ..	6·68
Sulphuric acid... ..	2·90
Chlorine ... ..	1·63
Carbonic acid ... ..	16·20
Silica... ..	2·41
Loss ... ..	·61
	<hr/>
	100·00

## RESIN. Elemi.

Volatile oil ... ..	12·5
Resins soluble in both hot and cold alcohol ... ..	60·0
Elemen ... ..	24·0
Bitter extractive ... ..	2·0
Impurities ... ..	1·5
	<hr/>
	100·0

## SHELLAC.

	Stick.	Seed.	Shell.
Resin... ..	68·0	88·5	90·9
Colouring matter .. ..	10·0	2·5	·5
Wax ... ..	6·0	4·5	4·0
Gluten ... ..	5·5	2·0	2·8
Foreign bodies ... ..	6·5	—	—
Loss ... ..	4·0	2·5	1·8
	<hr/>	<hr/>	<hr/>
	100·0	100·0	100·0

## RATTANY ROOT.

	1.	2.
Tannin ... ..	38·3	42·6
Gallic acid ... ..	—	·3
Sweet matter ... ..	6·7	—
Nitrogenous matter ... ..	2·5	—
Mucilage ... ..	8·3	—
Lignin ... ..	43·3	—
Krameric acid... ..	—	·4
Gum, &c. ... ..	—	56·0
Loss ... ..	·9	—
	<hr/> 100·0	<hr/> 100·0

## RYE GRAIN. Ash of.

Potash ... ..	32·76
Soda ... ..	4·45
Magnesia ... ..	10·13
Lime ... ..	2·92
Phosphoric acid ... ..	47·29
Sulphuric acid... ..	1·46
Silica... ..	·17
Peroxide of iron ... ..	·82
	<hr/> 100·00

## SALIVA. Human.

Water ... ..	991·225
Solid matters ... ..	8·775
Fat containing cholesterin ... ..	·525
Ptyalin with extractive matter ... ..	4·375
Extractive matter and salts... ..	2·450
Albumen, mucus and salts ... ..	1·400
	<hr/>

## SWEAT.

	1.	2.
Water ... ..	995·000	987·500
Epidermis and salts of lime .. ..	·100	·250
Water extracts and sulphates ... ..	1·050	2·625
Spirit extracts, chlorides of potassium and sodium ... ..	2·400	6·000
Alcohol extract, acetates, lactates, and free lactic acid ... ..	1·450	3·625
	<hr/>	<hr/>



## SAINFOIN. Ash of.

Silica...	2.79
Sulphate of potash...	3.87
Chloride of sodium	2.37
Carbonate of potash	9.93
Carbonate of soda	17.16
Carbonate of lime	32.55
Magnesia	9.11
Phosphate of iron	.64
Phosphate of lime	15.37
Phosphate of magnesia	3.98
Carbonaceous matter	.36
	<hr/>
	98.13

## SABINE WOOD. Ash of.

Potash	.83
Soda	3.29
Magnesia	2.97
Lime	77.32
Phosphoric acid	3.49
Sulphuric acid...	2.42
Silica...	.39
Peroxide of iron	1.36
Chloride of sodium	
Chloride of potassium	6.63
	<hr/>
	98.70

## SUNFLOWER. Ash of. Before blossoming.

Alkalies and their salts...	79.67
Phosphates of lime and magnesia	6.70
Phosphates of iron, &c.	.13
Carbonates of lime and magnesia	11.56
Silica...	1.50
	<hr/>
	99.56

## SHARE GRASS. Ash of.

Sulphate of potash...	12.0
Chloride of potassium	11.4
Silica...	50.8
Carbonate of lime	6.2
Sulphate of lime	14.4
Phosphate of lime	2.2
Magnesia	3.0
	<hr/>
	100.0

## SPONGE. Ash of.

Insoluble silica	...	...	...	...	...	...	...	...	34·565
Soluble silica	...	...	...	...	...	...	...	...	2·892
Lime	...	...	...	...	...	...	...	...	20·881
Magnesia	...	...	...	...	...	...	...	...	·705
Oxide of iron	...	...	...	...	...	...	...	...	traces
Potass	...	...	...	...	...	...	...	..	·163
Soda	...	...	...	...	...	...	...	...	9·319
Phosphoric acid	...	...	...	...	...	...	...	...	2·024
Carbonic acid	...	...	...	...	...	...	...	...	8·470
Sulphuric acid...	...	...	...	...	...	...	...	...	2·979
Chlorine	...	...	...	...	...	...	...	...	18·002
									<hr/>
									100·000

## SILVER SOAP.

Water	...	...	...	...	...	...	...	...	2·40
Fat	...	...	...	...	...	...	...	...	33·43
Phosphates of iron and alumina	...	...	...	...	...	...	...	...	·75
Carbonate of lime	...	...	...	...	...	...	...	...	62·86
Soda	...	...	...	...	...	...	...	...	·75
Magnesia	...	...	...	...	...	...	...	...	trace
Insoluble matter	...	...	...	...	...	...	...	...	—
									<hr/>
									100·00

## SCAMMONY. Pure.

	Old.	Old.	Moist.
Resin...	81·8	83·0	77·0
Gum	6·0	8·0	6·0
Starch	1·0	—	—
Lignin and sand	3·5	3·2	5·0
Water	7·7	7·2	12·6
	<hr/>	<hr/>	<hr/>
	100·0	100·0	100·0

## TOBACCO. Fresh leaves.

Nicotina ... ..	·060
Concrete volatile oil ... ..	·010
Bitter extractive ... ..	2·870
Gum, with malate of lime ... ..	1·740
Chlorophylle ... ..	·267
Albumen and gluten ... ..	1·308
Malic acid ... ..	·510
Lignin, and a trace of starch ... ..	4·969
Salts of potash, lime and ammonia ... ..	·734
Silica... ..	·088
Water ... ..	88·280
	<hr/>
	100·836

## TOBACCO. Ash of.

	1.	2.	3.
Potash ... ..	27·88	19·55	29·08
Soda ... ..	—	·27	2·26
Magnesia ... ..	7·31	11·07	7·22
Lime ... ..	33·84	48·68	30·35
Phosphoric acid ... ..	1·99	3·66	2·74
Sulphuric acid... ..	3·75	3·29	3·75
Silica... ..	—	—	—
Peroxide of iron ... ..	4·40	2·99	6·04
Chloride of sodium... ..	9·34	3·54	·91
Chloride of potassium ... ..	4·90	—	—
	<hr/>	<hr/>	<hr/>

## TOBACCO. Ash of. Virginian.

Silica... ..	1·717
Chlorine ... ..	2·812
Sulphuric acid .. ..	5·490
Phosphoric acid ... ..	3·296
Potash ... ..	35·576
Soda ... ..	2·784
Lime ... ..	37·600
Magnesia ... ..	10·725
	<hr/>

TILLIA EUROPŒA. Ash of.

	Bark.	Wood.
Potash ... ..	16·14	35·80
Soda ... ..	4·53	5·23
Magnesia ... ..	8·03	4·15
Lime ... ..	60·81	29·93
Phosphoric acid ... ..	4·02	4·85
Sulphuric acid... ..	·75	5·30
Silica... ..	2·27	5·26
Peroxide of iron ... ..	1·24	7·97
Chloride of sodium ... ..	2·21	1·49
	<hr/>	<hr/>
	100·00	99·98

THISTLE. Ash of.

Potash and chloride of potassium ... ..	27·40
Chloride of sodium ... ..	·90
Lime ... ..	41·44
Magnesia ... ..	4·40
Oxide of iron and alumina ... ..	2·01
Phosphoric acid ... ..	5·36
Sulphuric acid... ..	2·92
Soluble silica and sand ... ..	3·50
Carbonic acid and loss ... ..	12·07
	<hr/>
	100·00

TEETH.

	Female, 25 years.		Adult Male.	
	Enamel.	Osseous	Enamel.	Osseous.
Phosphate of lime and } flouride of calcium }	81·63	67·54	89·82	66·72
Carbonate of lime ... ..	8·88	7·97	4·37	3·36
Phosphate of magnesia ... ..	2·55	2·49	1·34	1·08
Salts ... ..	·97	1·00	·88	·83
Cartilage ... ..	5·97	20·42	3·39	27·61
Fat ... ..	trace	·58	·20	·40
	Child	Child	Male	
	1 day old.	6 years.	81 years of age.	
Organic matter ... ..	35·00	28·57	33·00	
Phosphate of lime ... ..	51·00	60·01	66·00	
Carbonate of lime ... ..	14·00	11·42	1·00	

## VETCH. Ash of.

Potash ... ..	30·57
Soda ... ..	9·56
Magnesia ... ..	8·49
Lime ... ..	4·79
Phosphoric acid ... ..	38·05
Sulphuric acid... ..	4·10
Silica... ..	2·01
Peroxide of iron ... ..	·75
Chloride of sodium... ..	2·00
	<hr/>
	100·33

## VINE. Ash of.

	Styria.	Misnia.
Potash ... ..	34·13	37·48
Soda ... ..	7·59	1·33
Magnesia ... ..	6·55	1·05
Lime ... ..	30·28	43·88
Phosphoric acid ... ..	16·35	9·20
Sulphuric acid... ..	2·66	3·61
Silica... ..	1·45	·72
Peroxide of iron ... ..	·16	1·08
Chloride of sodium ... ..	·83	1·61
	<hr/>	<hr/>
	100·00	99·86

## WALNUT SHELL. Ash of.

Potash ... ..	23·10
Soda ... ..	2·74
Magnesia ... ..	4·13
Lime ... ..	30·57
Phosphoric acid ... ..	—
Sulphuric acid... ..	14·96
Silica... ..	14·43
Phosphate of iron ... ..	10·07
Chloride of sodium ... ..	—
Chloride of potassium ... ..	—
	<hr/>

## WHEAT EMBRYOS.

Water ... ..	12·53
Albuminoids ... ..	35·70
Oil ... ..	4·18
Cellulose, &c. ... ..	41·83
Ash ... ..	5·76
	<hr/>
	100·00

YEAST. From Beer. Ash of.

	Superior.	Inferior.
Sulphuric acid... ..	—	—
Phosphoric acid ... ..	53·730	34·13
Potash ... ..	39·500	40·80
Soda ... ..	—	·50
Lime ... ..	1·020	1·15
Magnesia ... ..	6·150	7·32
Ferric oxide ... ..	—	—
Alumina ... ..	—	—
Silica... ..	—	16·60
	<hr/>	<hr/>
	100·400	100·50
Per centage of ash in dry yeast... ..	7·65	

YEAST. Ash of.

	1.	2.
Sulphuric acid... ..	6·376	5·046
Phosphoric acid ... ..	63·866	53·443
Potash ... ..	28·791	31·521
Soda ... ..	1·929	·771
Lime ... ..	2·491	2·395
Magnesia ... ..	6·546	3·772
Ferric oxide ... ..	7·342	2·734
Alumina ... ..	—	traces
Silica... ..	traces	traces
	<hr/>	<hr/>
	100·000	99·682

# APPENDIX.

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TABLE FOR CALCULATING DIETS.

	Water.	Albuminates.	Fats.	Carbo- Hydrates.	Salts.
Lean raw meat, } bone free	75	15	8·4	—	1·6
Fattened meats...	63	14	19	—	3·7
Roast meats } Boiled "	54	27·6	15·45	—	2·95
Bread ... ..	40	8	1·5	49·2	1·3
Flour ... ..	15	11	2	70·3	1·7
Biscuit ... ..	8	15·6	1·3	73·4	1·7
Rice ... ..	10	5	·8	83·2	·5
Oatmeal ... ..	12	16	6·8	63	2
Maize ... ..	13·5	10	6·7	64·5	1·4
Peas, dry ... ..	15	22	2	53	2·4
Potatoes ... ..	74	1·5	·1	23·4	1
Carrots, all cellu- } lose excluded	85	·6	·25	8·4	·7
Cabbage ... ..	91	·2	·5	5·8	·7
Butter ... ..	8·8	2·7	85	—	3·5
Eggs, less 10 per } cent. for shell	73·5	13·5	11·6	—	1·0
Cheese ... ..	36·8	33·5	24·3	—	5·4
Milk, sp. gr. 1030	86·7	4	3·7	5	·6
" " 1026	90	3	2·5	3·9	·5
Sugar ... ..	3	—	—	96·5	·5

## COCOA.

	Caracas.	Trinidad.	Surinam.
Husk ... ..	13·80	15·50	15·50
Fat ... ..	48·40	49·40	54·40
Nitrogen ... ..	1·76	1·76	1·76
Albuminoid substances ... ..	11·14	11·14	11·14
Ash ... ..	3·95	2·80	2·35
Starch, gum, &c. ... ..	32·19	32·82	28·35
Moisture ... ..	4·32	3·84	3·76
	Grenada.	Bahia.	Cuba.
Husk ... ..	14·60	9·60	12·00
Fat ... ..	45·60	50·30	45·30
Nitrogen ... ..	1·96	1·17	1·37
Albuminoid substances ... ..	12·40	7·40	8·67
Ash ... ..	2·40	2·60	2·90
Starch, gum, &c. ... ..	35·70	35·30	39·41
Moisture ... ..	3·90	4·40	3·72

## COCKCHAFERS.

Protein compounds ... ..	64·09
Fat ... ..	7·29
Fibre ... ..	16·06
Non-nitrogenous extractive matter ... ..	4·73
Ash ... ..	7·83

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 100·00

## FLESH.

	Mutton.		Dried Bacon.	Green Bacon.
	Lean.	Fat.		
Nitrogenous matters ...	18·3	12·4	8·8	7·1
Fat ... ..	4·9	31·1	73·3	66·8
Salts ... ..	4·8	3·5	2·9	2·1
Water .. ..	72·0	53·0	15·0	24·0
	<hr/> 100·0	<hr/> 100·0	<hr/> 100·0	<hr/> 100·0
		Sheep kidney.	Calves' liver.	Foie Gras.
Nitrogenous matter ...	Tripe. 13·2	17·250	20·10	13·75
Fat ... ..	16·4	2·125	5·58	54·57
Salts ... ..	2·4	1·100	1·54	2·58
Water ... ..	68·0	78·200	72·33	22·70
Non-nitrogenous organic matter and loss ...	—	1·325	—	—
Carbo-hydrates, amyloid matter ... ..	—	—	·45	6·40
	<hr/> 100·0	<hr/> 100·000	<hr/> 100·00	<hr/> 100·00

## FISH.

	White fish.	Salmon.	Eels.	Oysters.
Nitrogenous matters ...	18·1	16·1	9·9	14·010
Fat ... ..	2·9	5·5	13·8	1·515
Mineral matters ... ..	1·0	1·4	1·3	2·695
Non-nitrogenous matters	—	—	—	1·395
Water ... ..	78·0	77·0	75·0	80·385
	<u>100·0</u>	<u>100·0</u>	<u>100·0</u>	<u>100·000</u>

## FISH.

	Mussels.	Spawn.	Lobster.	
			Flesh.	Soft substance internal.
Nitrogenous matters	11·72	21·892	19·170	12·140
Fat ... ..	2·42	8·234	1·170	1·444
Salts ... ..	2·73	1·998	1·823	1·749
Non-nitrogenous matters ... ..	} 7·39	4·893	1·219	·354
Water ... ..	75·74	62·983	76·618	84·313
	<u>100·00</u>	<u>100·000</u>	<u>100·000</u>	<u>100·000</u>

## FUNGI (Edible).

	Mushrooms.	Morelle.	White Truffles.	Black Truffles.
Nitrogenous matter and sulphur ... ..	} 4·680	4·40	9·958	8·775
Fatty matters ... ..	·396	·56	·442	·560
Cellulose, dextrin, man- nite and other non- nitrogenous substances	} 3·456	3·68	15·158	16·585
Mineral matters ... ..	·458	1·36	2·102	2·070
Water ... ..	91·010	90·00	72·340	72·000
	<u>100·000</u>	<u>100·00</u>	<u>100·000</u>	<u>100·980</u>

FRUITS.

		Bilberry.	Strawberry.		Black Mulberry.
			Wild.	Red Pine.	
Soluble.	Sugar ... ..	5·780	4·550	7·575	9·192
	Acid ... ..	1·341	1·332	1·133	1·860
	Albuminous matters ... }	·794	·567	·359	·394
	Pectous matters	·555	·049	·119	2·031
Insoluble.	Ash ... ..	·858	·603	·480	·566
	Seeds and skins	12·864	5·580	1·960	·905
	Pectose ... ..	·256	·300	·900	·345
	Ash (included above) ... }	(·550)	(·345)	(·154)	(·089)
	Water ... ..	77·552	87·019	87·474	84·707
		<u>100·000</u>	<u>100·000</u>	<u>100·000</u>	<u>100·000</u>

		Raspberry.			Black-berry.
		Wild.	Red.	White.	
Soluble.	Sugar ... ..	3·597	4·708	3·703	9·192
	Acids ... ..	1·980	1·356	1·115	1·860
	Albuminous matters ... }	·546	·544	·665	·394
	Pectous matters	1·107	1·746	1·397	2·031
Insoluble.	Ash ... ..	·270	·481	·380	·566
	Seeds and skins	8·460	4·106	4·520	·905
	Pectose ... ..	·180	·502	·040	·345
	Ash (included above) ... }	(·134)	(·296)	(·081)	(·089)
	Water ... ..	83·860	86·557	88·180	84·707
		<u>100·000</u>	<u>100·000</u>	<u>100·000</u>	<u>100·000</u>

		Gooseberries.		Currants.	
		Large Red.	Yellow.	Red.	White.
Soluble.	Sugar ... ..	8·063	6·383	6·44	7·692
	Acid ... ..	1·358	1·078	1·84	2·258
	Albuminous substances ... }	·441	·578	·49	·300
	Pectous substances ... }	·969	2·112	·19	
Insoluble.	Ash ... ..	·317	·200	·57	·560
	Seed and skins	2·993	3·822	4·48	4·144
	Pectose ... ..	·294	·308	·72	·240
	Ash (included above) ... }	(·146)	(·100)	(·23)	—
	Water ... ..	85·565	85·519	85·27	84·806
		<u>100·000</u>	<u>100·000</u>	<u>100·00</u>	<u>100·000</u>

## FRUITS.

		Apples.	Apricots.	Peaches.
Soluble.	Sugar ... ..	7.58	1.140	1.580
	Free acid ... ..	1.04	.898	.612
	Albuminous substances...	.22	.832	.463
	Pectous substances ...	2.72	5.929	6.313
	Ash ... ..	.44	.820	.422
Insoluble.	Seeds... ..	.38	4.300	4.629
	Skins, &c. ... ..	1.42	.967	.991
	Pectose ... ..	1.16	.148	—
	Ash (included above) ...	(.03)	(.071)	(.042)
	Water ... ..	85.04	84.966	84.990
		<u>100.00</u>	<u>100.000</u>	<u>100.000</u>

		Plums.		Cherries.	
		Mirabelle.	Mussel.	Red heart.	Black.
Soluble.	Sugar ... ..	3.584	5.793	13.110	10.700
	Free acid ... ..	.582	.952	.351	.560
	Albuminous substances } ... ..	.197	.785	.903	1.010
	Pectous substances } ... ..	5.772	3.646	2.286	.670
	Ash ... ..	.570	.734	.600	.600
Insoluble.	Seeds... ..	5.780	3.540	5.480	5.730
	Skins, &c. ... ..	.179	1.990	.450	.366
	Pectose ... ..	1.080	.630	1.450	.664
	Ash (included above) } ... ..	(.082)	(.094)	(.090)	(.078)
	Water ... ..	82.256	81.930	75.370	79.700
		<u>100.000</u>	<u>100.000</u>	<u>100.000</u>	<u>100.000</u>

Nitrogenous matters ... ..	Sweet Potato.	Bananas Pulp.
Starch ... ..	1.50	4.820
Cellulose ... ..	16.05	—
Sugar and gum ... ..	.45	.200
Organic matter and } ... ..	10.20	19.657
Mineral matter ... }	3.70	fatty matter .632
Water ... ..	67.50	salts .791
	<u>99.70</u>	<u>73.900</u>
		100.000

GROUND PEA (*Arachis Hypogæa*, Virginia).

	Root.	Stem.	Leaves.	Husk.	Seed.
Potash ...	23·043	25·902	15·880	37·395	37·134
Soda ... ..	18·816	3·063	2·897	3·763	3·342
Lime ... ..	28·180	43·440	53·712	20·145	3·749
Magnesia ...	8·706	13·296	4·844	13·506	14·262
Phosphoric acid	3·684	1·590	4·679	5·062	29·102
Sulphuric acid	13·015	10·613	15·235	17·749	11·742
Chlorine ...	1·162	1·501	2·533	·486	·346
Silica... ..	3·705	·933	·791	2·003	·401
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	100·261	100·338	100·571	100·109	100·078

## SHERRIES. Pure Wine Association.

	1.	2.	3.
Specific gravity ... ..	988·80	992·10	985·90
Absolute alcohol ... ..	12·06	14·90	15·66
Proof spirit ... ..	26·12	32·38	33·97
Grape sugar ... ..	·24	3·26	1·68
Tartaric acid ... ..	·30	·33	·30
Acetic acid ... ..	·06	·10	·03
Total solids ... ..	1·94	3·47	2·44
Ash ... ..	·27	·24	·27

## PORTS. Pure Wine Association.

	1.	2.	3.
Specific gravity ... ..	988·80	996·30	991·30
Absolute alcohol ... ..	13·30	15·16	11·23
Proof spirit ... ..	28·79	32·91	24·36
Grape sugar ... ..	·58	1·30	·35
Tartaric acid ... ..	·46	·53	·60
Acetic acid ... ..	·03	·03	·06
Total solids ... ..	2·42	4·55	2·06
Ash ... ..	·18	·29	·23









