LII. An inquiry into the amount of inorganic constituents contained in ale and porter

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mical causes, that is in general physical causes, for its explanation. It is not, however, my intention to enter rashly on any such speculation, though I think myself justified in at least drawing attention to the simultaneity of the two great phenomena here alluded to, namely, the first fall of aërolites and the commencement of glacial action, leaving it to astronomers to decide how far it is possible, under the present most generally received theory of aërolites, as being either condensed nebulous matter, or planetary fragments moving regularly in an orbit, that either the one may have been the cause of the other, or both the effects of some one great common cause.

LII. *An Inquiry into the Amount of Inorganic Constituents contained in Ale and Porter.* By THOMAS DICKSON, Manchester, late Assistant in the University Laboratory, Edinburgh*.

THE object in view in commencing the series of analyses given below, was to ascertain if a standard could be formed of the nutritive powers of the ales and porters in general use, in order that a correct estimate of their real value as an article of diet might be deduced.

The analyses show, as might have been expected, a very great variety in the amount of their respective constituents, partly arising from the various modifications each brewer finds himself under the necessity of adopting, from local circumstances over which he has no control, or from personal experience, though the main steps of the process are essentially the same throughout.

The ash consists of that portion of the grain, and other substances employed in the process, which is soluble in water; whilst owing to the various proportions of malt and water employed, to the length of time the infusion is continued, to the temperature at which the infusion is made, to the concentration the liquor undergoes in the boiling to which it is subsequently subjected, and to the process of fermentation, the proportional amount of the constituents varies considerably.

The method given by Fresenius and Will for the analysis of Ash was that followed in the present instance. The amount of iron has been omitted, as in most of the cases it was altogether wanting; and in the few instances in which it did occur, it was so minute as to be inappreciable, and apparently was only an accidental impurity.

In order to save needless repetition, the analyses have been calculated after the deduction of the carbon and moisture, and are as follows:—

* Communicated by the Author.

No. I. Scotch ale at 3s. per gallon.

Potash	24·547
Soda	34·429
Lime	1·203
Magnesia . . .	0·399
Chlorine . . .	5·095
Sulphuric acid .	2·131
Phosphoric acid	25·657
Silica	6·539

100·000

No. III. Another variety of Scotch ale at 3s. per gallon.

Potash	20·925
Soda	53·083
Lime	0·172
Magnesia . . .	0·331
Chlorine . . .	4·283
Sulphuric acid .	1·615
Phosphoric acid	12·513
Silica	7·078

100·000

No. V. Another variety of Scotch ale at 2s. 6d. per gallon.

Potash	15·913
Soda	42·758
Lime	0·707
Magnesia . . .	0·963
Chlorine . . .	10·085
Sulphuric acid .	4·657
Phosphoric acid	16·346
Silica	8·571

100·000

No. VII. Another variety at 2s. per gallon.

Potash	10·484
Soda	48·394
Lime	0·257
Magnesia . . .	2·269
Chlorine . . .	6·649
Sulphuric acid .	5·562
Phosphoric acid	15·333
Silica	11·052

100·000

No. II. Another variety of Scotch ale at 3s. per gallon.

Potash	26·603
Soda	35·715
Lime	0·555
Magnesia . . .	0·232
Chlorine . . .	9·754
Sulphuric acid .	2·272
Phosphoric acid	20·005
Silica	4·864

100·000

No. IV. Scotch ale at 2s. 6d. per gallon.

Potash	22·119
Soda	33·480
Lime	0·862
Magnesia . . .	4·642
Chlorine . . .	6·925
Sulphuric acid .	3·214
Phosphoric acid	24·172
Silica	4·586

100·000

No. VI. Scotch ale at 2s. per gallon.

Potash	23·710
Soda	46·085
Lime	1·979
Magnesia . . .	5·650
Chlorine . . .	3·052
Sulphuric acid .	0·130
Phosphoric acid	12·049
Silica	7·345

100·000

No. VIII. Scotch ale at 1s. 9d. per gallon.

Potash	27·564
Soda	40·520
Lime	1·341
Magnesia . . .	1·633
Chlorine . . .	8·121
Sulphuric acid .	7·014
Phosphoric acid	7·923
Silica	5·884

100·000

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No. IX. Scotch ale at 1s. 6d. per gallon.

Potash	3·162
Soda	58·508
Lime	0·874
Magnesia . . .	1·032
Chlorine . . .	6·450
Sulphuric acid .	6·277
Phosphoric acid	17·622
Silica	6·075

100·000

No. XI. Scotch ale at 1s. 3d. per gallon.

Potash	31·907
Soda	20·871
Lime	6·694
Magnesia . . .	1·558
Chlorine . . .	9·454
Sulphuric acid .	2·665
Phosphoric acid	16·851
Silica	10·000

100·000

No. XIII. Another variety at 1s. per gallon.

Potash	11·635
Soda	24·862
Lime	0·646
Magnesia . . .	0·064
Chlorine . . .	18·255
Sulphuric acid .	14·566
Phosphoric acid	10·925
Silica	19·047

100·000

No. XV. London porter at 3s. per gallon.

Potash	26·357
Soda	21·777
Lime	6·893
Magnesia . . .	0·394
Chlorine . . .	9·133
Sulphuric acid .	6·615
Phosphoric acid	20·576
Silica	8·255

100·000

No. X. Another variety at 1s. 6d. per gallon.

Potash	29·828
Soda	38·390
Lime	0·740
Magnesia . . .	0·505
Chlorine . . .	5·557
Sulphuric acid .	2·773
Phosphoric acid	16·827
Silica	5·380

100·000

No. XII. Scotch ale at 1s. per gallon.

Potash	17·570
Soda	31·285
Lime	1·536
Magnesia . . .	2·163
Chlorine . . .	8·802
Sulphuric acid .	7·072
Phosphoric acid	16·657
Silica	14·915

100·000

No. XIV. Export ale at 3s. per gallon.

Potash	19·418
Soda	37·131
Lime	1·242
Magnesia . . .	0·528
Chlorine . . .	6·559
Sulphuric acid .	19·160
Phosphoric acid	5·984
Silica	9·978

100·000

No. XVI. Another variety at 3s. per gallon.

Potash	31·140
Soda	32·933
Lime	1·514
Magnesia . . .	0·122
Chlorine . . .	6·459
Sulphuric acid .	4·637
Phosphoric acid	9·261
Silica	13·934

100·000

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No. XVII. London porter at 2s. 6d.
per gallon.

Potash	11·938
Soda	24·330
Lime	3·868
Magnesia . . .	0·659
Chlorine . . .	14·528
Sulphuric acid .	12·198
Phosphoric acid	19·545
Silica	12·934

100·000

No. XVIII. Dublin porter at 2s. 6d.
per gallon.

Potash	32·042
Soda	42·722
Lime	1·543
Magnesia . . .	0·512
Chlorine . . .	6·777
Sulphuric acid .	1·574
Phosphoric acid	7·893
Silica	6·937

100·000

No. XIX. Scotch porter at 2s. per
gallon.

Potash	20·883
Soda	38·766
Lime	1·623
Magnesia . . .	0·166
Chlorine . . .	0·151
Sulphuric acid .	6·358
Phosphoric acid	18·773
Silica	13·280

100·000

No. XX. London porter at 2s. per
gallon.

Potash	16·032
Soda	50·820
Lime	1·306
Magnesia . . .	0·097
Chlorine . . .	7·420
Sulphuric acid .	4·526
Phosphoric acid	10·279
Silica	9·520

100·000

No. XXI. Another variety at 2s.
per gallon.

Potash	22·879
Soda	30·521
Lime	1·335
Magnesia . . .	1·272
Chlorine . . .	10·919
Sulphuric acid .	4·973
Phosphoric acid	12·859
Silica	15·242

100·000

No. XXII. Dublin porter at 2s.
per gallon.

Potash	21·382
Soda	24·008
Lime	0·833
Magnesia . . .	1·187
Chlorine . . .	10·097
Sulphuric acid .	2·763
Phosphoric acid	19·987
Silica	19·743

100·000

No. XXIII. Scotch porter at 1s. per gallon.

Potash	18·861
Soda	33·765
Lime	1·344
Magnesia . . .	1·386
Chlorine . . .	11·386
Sulphuric acid .	2·177
Phosphoric acid	12·480
Silica	18·601

100·000

The dried residue of No. I. yielded			4·800	per cent. of ash.
...	...	II.	...	3·395
...	...	III.	...	3·797
...	...	IV.	...	5·475
...	...	V.	...	3·500
...	...	VI.	...	4·621
...	...	VII.	...	3·595
...	...	VIII.	...	4·673
...	...	IX.	...	4·152
...	...	X.	...	3·885
...	...	XI.	...	8·186
...	...	XII.	...	7·626
...	...	XIII.	...	12·035
...	...	XIV.	...	8·666
...	...	XV.	...	7·863
...	...	XVI.	...	8·822
...	...	XVII.	...	6·864
...	...	XVIII.	...	5·720
...	...	XIX.	...	6·050
...	...	XX.	...	9·001
...	...	XXI.	...	14·579
...	...	XXII.	...	11·113
...	...	XXIII.	...	6·054

LIII. *On the Apparent Motion of the Figures in certain Patterns of Blue and Red Worsted.* By HENRY TAYLOR, Esq.

To the Editors of the Philosophical Magazine and Journal.

GENTLEMEN,

Guildford, Oct. 12, 1848.

THE apparent motion of the figures in certain patterns of blue and red worsted is sufficiently well-known to have excited some attention among the learned as well as the unlearned, but, so far as I know, without receiving any satisfactory explanation. After having examined the subject for some time, I believe I have succeeded in making out the cause of this singular phænomenon; and if the following observations are deemed of sufficient importance, I should be glad to have them inserted in the pages of your Journal.

If certain patterns of blue and red worsted-work are examined by candle-light, it is found that when they are moved about, the figures have a tremulous appearance as if they were moving faster than the ground of the pattern—and blue and red are the only colours exhibiting this remarkable property—although it must be observed that some persons are so constituted as not to perceive the illusion under any circumstances.

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