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**BEER:**

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2. Adulteration with *Cocculus Indicus*.
3. Adulteration with Sugar.
4. Doubt as to Adulteration with *Strychnia*.
5. Absence of Adulteration by the Brewer.
6. Means of detecting Adulteration.

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*Belgium.* Severe system of imprisonment and fine adopted in Belgium for the sale or exposure to sale of adulterated food or drink, *Rep. p. v, vi.*

*Bell, Jacob (Editor of the Pharmaceutical Journal).* (Analysis of his Evidence.)—Wholesale and retail chemist and druggist, 2313—Has for many years paid considerable attention to the question of adulteration of drugs, 2314-2316—Establishment, in 1841, of the Pharmaceutical Society, for the better education of chemists as a check upon adulteration and other abuses, 2315, 2316, 2318—Remarks made by witness at a meeting of the society in December 1841, relative to the existence of adulteration in drugs, and the means for remedying the same, 2316, 2317—Considerable improvement since the establishment, and, through the operation of the society, in the quality of drugs and chemicals, as sold to the public, 2317-2321.

Scammony was never pure twenty years ago, 2321—Cessation of adulteration in any drug if the demand cease for the impure article, 2321-2326—Extent of the adulteration of scammony at the present time, 2321-2325—Cessation of adulteration of senna through measures adopted by the Pharmaceutical Society, 2326—There are three distinct classes of impurity in medicines, two of which, arising either from fraudulent admixture or from articles spoiled or deteriorated in keeping, should carry penalties with them, 2327-2331—Impurity arising from unskilful preparation should not be punishable, 2327, 2328.

Facility for procuring genuine opium by properly paying for it, 2332—Skill required to judge of the purity of opium, 2332—Skill also required to judge of the purity of bark, 2332, 2333, 2340—Discontinuance for several years past of the extensive adulterations which used to be practised by drug-grinders, 2334, 2335—Reference to powdered gentian as chiefly or entirely used for horses and cattle, 2335—Relative qualities of different kinds of rhubarb adverted to, 2336-2339.

Undue facilities for persons to become chemists, no certificate as to qualification being required, 2342-2346, 2348—Salutary check in France and Germany upon persons setting up as chemists, 2347, 2348—Failure of steps taken by witness and others for providing that every chemist should be properly qualified, 2348-2360—As regards the sale of poisons, witness differs from Dr. Neligan's suggestions as to differently-shaped bottles, &c., and considers that the best safeguard is that of marking the word "poison" upon everything which is poisonous, 2349-2357—Belief as to cocculus indicus being chiefly used for adulterating beer, 2359-2363.

Reference to, and summary of, a circular or memorial addressed by the president of the College of Pharmacy of New York to the House of Representatives in 1847, praying for the introduction of a law to prevent the importation of drugs unfit for use, 2364-2366—Advocacy by witness in 1847, and at the present time, of a system of inspection of imported drugs on arrival in this country, 2366-2383, 2395—Principal provisions of the Act passed by the American Congress for preventing the importation of impure drugs, 2367, 2369, 2378-2380—Proof of the beneficial operation of the Act, 2367-2370.

Advantageous co-operation of pharmacists in America for checking adulteration, 2368, 2372-2375—Considerable adulteration of drugs in America, the only legislative inspection being when in bond, 2371, 2380-2382—Advantage if chemists in this country were all licensed, 2376—Difficulty of fixing on a remedy against the sale of impure drugs, 2377—Probable improvement if the power of inspection possessed by the College of Physicians were more fully exercised, 2384—Improvement to be expected from the co-operation of the better educated and more respectable chemists, 2384, 2385, 2406, 2407—Main importance of exposure as a check on adulteration, 2385, 2386.

Principles by which the inspection of drugs in bond should be guided; all damaged or inferior goods should not be rejected; 2387-2395—Demand for cheap medicines adverted to; it is a primary cause of adulteration; 2396, 2397—Great demand for secret or quack medicines, which do an immense deal of mischief, and should be rendered illegal, as in France, 2396-2404—Disapproval of the tax levied on quack medicines, as tending to encourage their sale, 2400-2402.

Disuse into which the inspection by the Apothecaries' Company has fallen, 2405—The Pharmaceutical Society will gladly assist the object for which the present Committee has been appointed, 2406, 2407—Doubt as to any good result being produced by the publicity of the Committee, 2408, 2409—Necessity of legislative interference for the prevention of adulteration generally, the public being evidently unable to protect themselves, 2410-2416—Some of the statements made to the Committee have been exaggerated, and have unduly frightened the public mind, 2411.

*Bingley, Dr. Charles William.* (Analysis of his Evidence.)—Professor of Chemistry to the Medical Institution at Sheffield, 4092—Instances of adulteration in matters of agricultural produce, 4094, 4095—Instances of adulteration in drugs, 4096—Belief that there

*Bingley, Dr. Charles William.* (Analysis of his Evidence)—continued.

there is less adulteration in drugs than was formerly the case, and that small dealers are the ones who chiefly practise it, 4097-4101, 4165-4169, 4172—Instances of butter being adulterated with water, with inferior kinds of butter, and with lard, 4101-4105—Adulteration in black and white pepper, 4106, 4107.

Case of chicory said to be adulterated with peat dust, 4108-4113—Instances of extensive and injurious adulteration of lime juice as sold in Liverpool, 4114-4125, 4131-4136—Small demand for lime-juice in Sheffield; it is probably adulterated there also; 4126-4130—Cases of adulteration of flour, as examined by witness; use of foreign meal, gypsum, and bone-dust; 4137-4141—Circumstance in one case of there having been no conviction (though the adulteration was proved), in consequence of the information not having been made within forty-eight hours after the seizure; clause of the Act hereon; 4141-4152, 4201-4204.

Particulars relative to the case of seizure of flour belonging to Mr. Crosby of Rotherham; possibility of the flour having been tampered with after seizure; 4153-4159—4194-4197—Impression that there is not any large amount of injurious adulteration at Sheffield, 4160-4164, 4170-4172—Statement relative to some drugs supplied at extremely low prices to the Sheffield poor-law union, which drugs were found to be extensively adulterated, 4172-4193, 4214.

Expediency of some arrangement for ensuring that fraud is not practised by the person selecting the samples for analysis, 4194-4197—With regard to the Act 6 & 7 Will. 4, c. 37, it is not generally known that a clause therein provides for the marking of all loaves of bread with the letter M, if the flour be mixed with other articles; importance of this clause; 4198-4200—Incompetency of inspectors, under the Nuisances Removal Act, to inspect flour or wheat, 4205-4208—When seizures of flour are made the space of a week should be allowed for laying informations, 4209-4211.

*Blyth, Lindsey.* (Analysis of his Evidence.)—Analytical Chemist and Lecturer on Natural Philosophy at St. Mary's Hospital, Paddington, 659, 660—Examines the drugs supplied to the hospital by the wholesale druggists, 661-663—Supply at first to the hospital of samples of drugs, many of which were naturally inferior in quality, 664-666—Inferior article sent to the hospital as a sample of cinchona bark, 667-671—Considerable adulteration in the case of four samples of lime-juice examined by witness, 671-674—Material effect of adulteration upon the value of lime-juice, &c., medical men generally not allowing for adulteration, 673-679.

Extensive and injurious adulteration in the case of three out of five samples of sweet spirits of nitre tested by witness for the hospital, 680-684—Very considerable adulteration in several samples of solution of ammonia, 684-688—The vendors, in sending impure samples of drugs, were not aware that they would undergo examination, 689—The desire of greater gain, and not the effect of competition, or the ignorance of the manufacturers, is one of the chief causes of the adulteration of drugs, 690-694, 746-749.

Importance of purity in the article chloroform, 695, 696—Impurity of every sample of chloroform sent at first to St. Mary's Hospital, 697-700—Means for testing chloroform, and for distinguishing whether it is adulterated or deteriorated through imperfect preparation, 699—A sample of hydro-chloric acid contained four or five grains of arsenious acid, 700—Naturally inferior quality of the great mass of opium samples; adulteration generally taking place abroad, 700-707.

Great improvement in the drugs supplied to the hospital when it became known that there was a chemical analysis; some of the vendors sending adulterated samples no longer competed for the supply, 708-711—Good quality of the bread supplied to the hospital; admixture of potatoes without detriment to health, 712, 715-719—Dilution of samples of milk with water; one sample only contained chalk, 712-714—Large cultivation of rhubarb in this country on the recommendation, probably of Dr. Pereira, that it might be substituted for Turkey rhubarb, 720-728.

Witness has examined drugs in Paris, but never detected adulteration, 729-731, 733-735—Advantage of the superior education of the French pharmacists, 732—Efficacious system of public examination of drugs in France; punishments in the event of adulteration, 732, 736, 756-759, 827, 828—Power and practice of the College of Physicians in regard to visiting chemists' shops in the City of London, 737-739.

Approval of the appointment of a central Board for the inspection of drugs, food, &c., and for the infliction of penalties for fraudulent and injurious adulteration, 740-742, 801, 810-814, 828—Importance of checking the importation of impure drugs, 743-745—In the majority of cases the impurity is accidental rather than fraudulent, 747, 748—In France every chemist grinds his own drugs, 750-755—Competency of students obtaining degrees from the Pharmaceutical Society to detect impurities in drugs, 760-763.

As regards beer, witness has examined some hundreds of samples, and has found less adulteration than has generally been stated; instances, however, of considerable dilution and of supposed adulteration with cocculus indicus, 764-775—Means of ascertaining whether

Report, 1856—continued.

*Blyth, Lindsey.* (Analysis of his Evidence)—continued.

whether beer is diluted; standard of strength taken for calculation, 776-786—Purity of port and sherry wines as examined by witness, 787-789—Adulteration of Cayenne pepper, as imported, with red lead; instance of illness produced thereby, 790-800—Purity of coffee bought by witness as genuine, 804-807.

Facility for testing bread by means of the microscope, 815, 816—Decomposition of alum when used in bread, 817-821, 823—Effect of alum in checking the decomposition of bad flour, 824—Expediency of some check upon the sale of bad bread, 825-828—The French bread is lighter than the English; probable reason, 829-835—Witness has never detected plaster of Paris in bread, 836.

*Board of Health.* See *General Board of Health.**Board of Inland Revenue.* See *Inland Revenue Department.*

*Brandy.* Frequent substitution of British for foreign brandy, to the great prejudice of health, *Challice* 1530-1535.

BREAD:

I. *As to Adulteration with Alum:*

1. Extent of the Adulteration.
2. Form in which the Alum is found.
3. How far Injurious to Health.
4. Objects of the Use of Alum; how far objectionable independently of the score of Health.
5. Means of Detection.
6. Case of Mr. Clapperton.

II. *Adulteration with other Substances than Alum.*III. *Remedial Measures considered.*IV. *France.*I. *As to Adulteration with Alum:*

## 1. Extent of the Adulteration;

Witness has examined several samples of what may be termed best bread, and has not detected alum, save in one instance, *Taylor* 35, 36—Within the last eight months witness has examined samples of bread procured chiefly by working people at 78 different shops in London, *Thompson* 438-440, 478—The constituents of alum were found in all these samples, but alum, as such, did not exist, *ib.* 440-445.

General practice of bakers in the metropolis to use alum in bread, *Bastick* 887-891; *Challice* 1400-1408, 1416, 1417—Large quantity of alum in Leeds bread, as analysed by Mr. C. L. Dresser, *Emerson* 1132, 1133—Use of alum in greater quantities as the flour is inferior, *Carpenter* 2429, 2440, 2441.

Witness has recently examined a considerable number of samples, comprising the description used in workhouses, up to that used at Buckingham Palace, and has in every case detected alum, *Rodgers* 3257, 3279, 3280—Impression that the quantity of alum used generally varies from eight ounces to two pounds in a batch of 116 loaves, *ib.* 3257, 3294-3296—The cheaper the bread the larger the amount of alum, *ib.* 3177—Whatever the price of wheat, there is the same use of alum, *ib.* 3281.

In order to disprove the evidence of Mr. Thompson as to the invariable use of alum by London bakers, witness produces letters from forty-three bakers, denying that they use it; how these letters were obtained, *Callard* 3528-3535, 3542, 3543, 3561-3571—Has not himself used alum in bread for more than ten years, *ib.* 3530—Considers, however, that it is used by the majority of London bakers, *ib.* 3535, 3536, 3599.

Witness recently found thirteen grains of alum in half a pound of bread, *Postgate* 4228.

## 2. Form in which the Alum is found:

Doubt as to any one having found in bread alum "in crystals the size of a large pea," *Taylor* 47, 48—Erroneous impression produced by witnesses who have assumed that alum remains in bread after the process of baking, the fact being, that only the constituents then exist; error of Liebig hereon, *Thompson* 440-445, 447-455, 470-477, 491—Decomposition of alum when used in bread, *Blyth* 817-821, 823—Crystals of alum could not exist in bread, on account of the heat in the process of baking, *Neligan* 1832-1834.

Instance of witness having found alum crystallized in bread, *Carpenter* 2420, 2429—The heat in baking would not prevent powdered alum from appearing in a crystalline form, *Rodgers* 3311, 3312.

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BREAD—continued.

I. *As to Adulteration with Alum*—continued.

## 3. How far Injurious to Health:

Injurious property of alum when introduced day by day into the human system, *Taylor* 37; *Wakley* 2285, 2299-2301; *Callard* 3557—Belief that the constituent parts of alum as found in bread are not injurious to health, the injurious properties being destroyed by the heat, *Thompson* 456-458, 491, 516, 522-524, 528—The use of alum, unless much more largely than at present, does not call for legislative interference, *ib.* 492-510, 529-538—Constant adulteration of bread with alum, to an extent injurious to health, *Bastick* 887-891; *Challice* 1400-1408, 1416, 1417.

Denial that the astringent or injurious properties of alum are destroyed by the heat to which it is subjected, *Challice* 1404-1407, 1418-1422—Evidence to the effect that alum as used in bread in London or the provinces produces costiveness, and is decidedly injurious to health, *Carpenter* 2420-2441—Though used in very small quantities, alum is decidedly injurious to health, *Rodgers* 3258-3264, 3273, 3286, 3289, 3309—Alum in bread is exceedingly injurious; proof of this, *Postgate* 4228-4231—Authority of Baron Leibig adverted to, as showing the injurious property of alum in bread, *Hassall* 4389.

## 4. Objects of the use of Alum; how far objectionable, independently of the score of Health:

Respects in which the admixture of alum is advantageous, *Thompson* 459-462, 500, 502-504, 525-527—The use of alum expressly for the purpose of improving the appearance of inferior flour so that it may be sold as good flour, is not considered unjustifiable by witness, *ib.* 462-464, 499-501, 506-510—Belief that it is quite notorious to the public that alum is always used in bread, and that notice by bakers of the fact would not diminish their trade, *ib.* 511-521.

Effect of alum in checking the decomposition of bad flour, *Blyth* 824—Advantage of the present inquiry in disabusing the public mind in regard to the preference for white bread, *Farrant* 1228, 1229, 1292, 1293, 1301, 1311—Alum improves the appearance of the bread, and saves trouble in the manufacture, *Challice* 1409-1412—Preference of the public for white bread, though generally most adulterated with alum, *Carpenter* 2447-2450.

The main objects in using alum are to enable bakers to use very inferior kinds of flour, and to cause loaves when baked in batch to separate nicely, *Rodgers* 3264, 3265, 3301-3306, 3315—The only advantage of alum is that it prevents bread from turning mouldy, *ib.* 3285-3288—Importance of alum as improving the colour, *Brown* 3458, 3473-3476—Prejudice to honest bakers by the use of alum by the trade, *Callard* 3556—Objections to alum in bread, independently of the question of its being injurious, *Hassall* 4390.

## 5. Means of Detection:

The maceration of bread in water does not leave any taste of alum in the water, *Thompson* 465, 466, 469—Fallacious evidence given by Mr. Postgate before the Committee in 1855 (Q. 2123), as to the means of detecting alum in bread; illustration in proof of this statement, *ib.* 466-468—Erroneous evidence also of Dr. Normandy (Q. 568), as to the detection of alum, *ib.* 468, 470-477—Doubt as to bread with alum in it absorbing more water than bread without alum, *ib.* 485-490.

Explanation of means by which alum may be detected, *Challice* 1413, 1423, 1424—Precautions necessary in the detection, *Rodgers* 3257—The means of detection are not so simple that the public can adopt them; such means explained, *ib.* 3290-3293, 3297-3300, 3316, 3317.

## 6. Case of Mr. Clapperton:

Grounds upon which witness (in business till lately as a baker) complains of injustice having been done to him by a statement in the "Lancet," in 1851, that his bread was adulterated with alum, *Clapperton* 3634 *et seq.*—Refusal of Mr. Wakley to supply witness with a portion of the bread said to be adulterated; this prevented witness from undertaking legal proceedings, *ib.* 3638, 3639, 3648-3650, 3652, 3655—Intended exoneration of witness subsequently through Dr. Hassall, *ib.* 3638, 3665-3667—Testimony borne by Doctors Bachoffner and Pepper, of the Polytechnic Institution, to the purity of the flour of which the bread was made, *ib.* 3638-3641—In consequence of the publication in the "Lancet," witness's business was completely ruined, and he was compelled to retire from the trade, *ib.* 3644-3646, 3651, 3654, 3656, 3657, 3667—Witness never used alum or any other ingredient, except potatoes, for adulteration, *ib.* 3658-3660—Possibility of flour, as supplied to witness, already containing alum, *ib.* 3660, 3664.

Explanatory statement relative to the evidence of Mr. Clapperton, *Hassall* 4400-4413—Accuracy of witness's analysis of the samples submitted to him, *ib.* 4401, 4409—Mr. Clapperton continued in business four or five years after the publication in the "Lancet," *ib.* 4401, 4405, 4406—No portion of the sample of flour analysed by witness.

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## BREAD—continued.

## I. As to Adulteration with Alum—6. Case of Mr. Clapperton—continued.

ness was submitted to other analysis, and found to be free from alum, *Hassall* 4407-4411—Reference to the statement that witness refused to return Mr. Clapperton any portion of the bread analysed, *ib.* 4412, 4813.

## II. Adulteration with other Substances than Alum:

Though witness has not found alum, save in one instance, he has found phosphate and carbonate of lime, *Taylor* 35, 36. 42-44—The baking powders, as used in what is called digestive bread, are not generally injurious to health, *ib.* 38-40—By microscopic examination, witness has found potato starch and bean starch in bread, but cannot detect alum by such examination, *ib.* 411-416—Greater price per lb. of flour than of bread; explanation that 3½ lbs. of flour will make more than 4 lbs. of bread, on account of the absorption of water, *Thompson* 478-484.

Good quality of the bread supplied to St. Mary's Hospital, Paddington; admixture of potatoes without detriment to health, *Blyth* 712, 715-719—Facility for testing bread by means of the microscope, *ib.* 815, 816—Witness has never detected plaster of Paris, *ib.* 836—Advantage of substituting an increased quantity of salt for alum, *Challice* 1409, 1410, 1414, 1415—Rice is largely used in bread, in order to add to the weight by the absorption of water, *Challice* 1425-1428; *Rodgers* 3266, 3267.

Means for detecting the presence of an excess of water, *Calvert* 2105, 2106—Injurious effects produced by too much water, *ib.* 2094—The use of potato starch and rice flour enables the baker unduly to increase the weight by an over absorption of water, *ib.* 2095-2104, 2107.

Use of potatoes to increase the size and moisture of the bread and to give it softness, *Brown* 3440—Legitimate use of salt, *Callard* 3549-3554—Explanation for the purpose of disproving a statement in the "Times," that potatoes are used as an adulteration, *ib.* 3587-3593—Liebig recommended lime-water in lieu of alum as a means of improving the colour of bread; disapproval thereof, *Hassall* 4389, 4390, 4651, 4652—Statement as to bread being sometimes adulterated with sulphate of copper in this country, as well as in France and Germany, *ib.* 4470-4474.

## III. Remedial Measures considered:

Expediency of checking the sale of bad bread by punishing all adulterations thereof, which are injurious to health, *Blyth* 825-828—Inoperativeness of the Act which prohibits alum, &c. in bread, but leaves the task of detection and prosecution to the public, *Carpenter* 2442-2446; *Rodgers* 3268-3271, 3275, 3276; *Postgate* 4295-4297, 4344, 4345—Inexpediency of compelling the poor man to eat pure and dear bread when a mixed article is cheaper and more wholesome, *Brown* 3452, 3497, 3498—Importance, in interdicting the use of alum or other ingredients, that all improvements on the present mode of making bread be not at the same time checked, *Callard* 3573-3580—Possible improvement by mixing a small proportion of rice with new flour, flour made from new wheat not being now available for bread, *ib.* 3578-3587.

Willingness of respectable bakers to submit to a system of inspection, *Rodgers* 3310—Feeling expressed in forty-three letters from London bakers that the use of alum should be prohibited, *Callard* 3573, 3595, 3596—Strong objection of bakers to leave it to analytical chemists to decide whether there is alum in bread; instances of discrepancies and mistakes among chemists on this point, *ib.* 3594, 3596, 3599-3602—System of appeal from the conclusions of chemists which would be satisfactory to bakers hereon, *ib.* 3597-3599, 3603.

## IV. France:

Advantage of the assize of bread in France, *Lewis* 358-361, 367—Similar constituents of alum found by witness in bread lately bought by him in Paris as in London bread, *Thompson* 516, 517, 522-524—Control exercised by the municipal authorities in Paris, *Blyth* 825-828—The French bread is lighter than the English; probable reason, *ib.* 829-853.

See also Act 3 Geo. 4, c. 106. Act 6 & 7 Will. 4, c. 37. Flour. Leeds. Normandy, Dr. Rochdale, I. Unfermented Bread.

Brewers. See Beer, 5.

*Brown, Potts.* (Analysis of his Evidence.)—Engaged extensively in trade as a miller, 3435, 3436—Propriety of abolishing the restrictions which exist under the Act 6 & 7 Will. 4, c. 37, in regard to the manufacture of good flour, 3437—Better character of foreign than of English wheat, on account of the land producing a less quantity per acre, or being virgin soil, 3437, 3477-3496, 3507—Particulars as to the addition by witness of a small proportion of bean flour to wheat flour, in order to produce the qualities required by bakers in bread; increase in the strength of the flour and improvement in the quality by this admixture, 3437-3442, 3452 *et seq.*

Beans

*Brown, Potts.* (Analysis of his Evidence)—continued.

Beans contain twenty-four per cent. of gluten, whereas wheat contains only ten per cent., 3437—In selling barley flour in Northamptonshire, witness improves it by an admixture of wheat, 3440, 3444-3452—Use of potatoes by bakers to increase the size and moisture of the bread, and to give it softness, 3440—Inexpediency of compelling the poor man to eat pure and dear bread, when a mixed article is cheaper and more wholesome, 3452, 3497, 3498—Peas and alum are the only ingredients which witness has understood to be used for improving the colour of flour, 3445, 3446, 3474, 3475.

Greater restrictions lately upon the use of alum and bean flour than was the case a short time since, 3456-3459, 3523-3526—Importance of alum as improving the colour, 3458, 3473-3476—Mixture occasionally by witness of rice with flour; belief that the bread is not rendered inferior or moister thereby, 3470-3472, 3499-3505—Inexpediency of interdicting the admixture of bean flour; such prohibition would injure the country millers, without benefiting the public, 3506-3522.

*Burnt Sponge.* Instances of adulteration in Somersetshire, in the year 1811, in the preparation called burnt sponge; this was all meant for the London market, *Wakley* 2204, 2205.

*Butter.* Butter is adulterated with foreign ingredients, but witness cannot say of what kind, *MacKenzie* 4015-4023—Instances of butter being adulterated with water, with inferior kinds of butter, and with lard, *Bingley* 4101-4105—Adulteration of butter, as imported from Ostend, with flour and water, *Postgate* 4231-4237.

An excess of water in butter, one-third of the article for instance, should certainly be considered an adulteration, *Hassall* 4476-4481, 4487, 4488—Various quantities of water found by witness in butter, *ib.* 4482-4486—Question as to the expediency of preventing the importation of butter containing an excess of water; a system of drawback would be a better plan, *ib.* 4489-4497.

## C.

*Callard, Thomas Karr.* (Analysis of his Evidence.)—Baker at St. John's Wood, 3527, 3531. In order to disprove the evidence of Mr. Lewis Thompson as to the invariable use of alum by London bakers, produces letters from forty-three bakers denying that they use it; how these letters were obtained, 3528-3535, 3542, 3543, 3561-3571—Has not himself used alum in bread for more than ten years, 3530—Considers, however, that it is used by the majority of London bakers, 3535, 3536, 3596.

Strong impression that the flour, as bought by witness and other bakers generally, does not contain alum, 3537-3548—Legitimate use of salt by bakers in bread, 3549-3554—Prejudice to honest bakers by the use of alum in the trade, 3556—Injury to health by the constant use of alum, 3557—The finest dressed wheat, but not the purest wheat, is the most unwholesome, 3558-3560—Feeling expressed in the forty-three letters referred to, that the use of alum should be prohibited, 3573, 3595, 3596.

Importance, in interdicting the use of alum or other ingredients, that all improvements on the present mode of making bread be not at the same time checked, 3573-3580—Possible improvement by mixing a small proportion of rice with new flour, flour made from new wheat not being now available for bread, 3578-3587—Fraud if millers use beans or rice to any large extent, 3581-3585.

Explanation, for the purpose of disproving a statement in the "Times," that potatoes are used as an adulteration of bread, 3587-3593—Strong objection of bakers to leave it to analytical chemists to decide whether there is alum in bread; instances of discrepancies and mistakes among chemists on this point, 3594-3596, 3599-3602—System of appeal from the conclusions of chemists, which would be satisfactory to bakers hereon, 3597-3599, 3603.

*Calomel.* Instances of adulteration in Somersetshire forty-five years ago, *Wakley* 2204, 2205—Witness has found in calomel an admixture of a very fine kind of pipeclay, *Bingley* 4096.

*Calvert, Grace.* (Analysis of his Evidence.)—Professor of chemistry at the Royal Institution in Manchester, 2076—Has had considerable experience in regard to the adulteration of food and drugs, 2077, 2078—Particulars relative to extensive adulterations detected by witness in flour, bread, milk, butter, &c., as supplied to poor law unions in Lancashire, &c., 2078 *et seq.* 2084, 2085, 2094—Defective state of the law in regard to the adulteration of wheat flour, 2080-2083, 2086, 2087.

Extensive deterioration of some wheat flour in Manchester by an admixture of rice or maize, 2081—Impossibility of workhouse authorities detecting the presence of adulteration from the appearance; an officer is wanted for the purpose, 2084, 2115-2119—Instances of rice flour sold as wheat flour at Uttoxeter; penalties inflicted on the millers, 2088, 2090, 2091—Reduction of the nutritive properties of wheat flour, by the admixture of rice flour, 2089, 2092, 2093—Injurious effects produced by too much water in bread, 2094—The use of potato starch and rice flour, enables the baker

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*Calvert, Grace.* (Analysis of his Evidence)—continued.

unduly to increase the weight of bread by an undue absorption of water, 2095-2104. 2107—Means for detecting the presence of an excess of water, 2105, 2106.

Oatmeal as supplied to unions, and generally, has been found invariably to consist of a large proportion of rice and maize, whereby its nutritive quality is much reduced, 2108-2110—Constant tendency of competition in price to lower the quality of articles, 2110, 2111—Expediency of correcting the present system of supplies to workhouses, the lowest tender being generally accepted without any proper inquiry into the quality of the articles, suggestions hereon, 2112-2119. 2127-2133.

Out of 289 analyses made by witness for workhouses, there were 138 instances of adulteration or bad quality, 2124—In some instances the workhouse contracts were accepted at prices which did not admit of a genuine supply, 2125-2128—Calculation showing a loss of 2,271 l. to a union on a supply of 14,629 l.; 2128-2133.

Extensive adulteration in the case of samples of drugs procured by witness from twelve shops in Manchester, 2134-2138—Importance to the public of a system of inspection for the detection and punishment of adulteration of drugs, 2138. 2150—Systems in Paris and the French provinces for the discovery of adulteration in drugs and food; beneficial operation of the penalties inflicted, 2139-2149.

*Candles.* Excellent quality and low price of candles manufactured with stearic acid, and sold incorrectly as sperm and wax, *Taylor* 197-200. 202-206.

*Carpenter, William B., M. D.* (Analysis of his Evidence.)—Examiner in physiology in the University of London, and professor of medical jurisprudence in University College, 2418—Bears testimony to the injurious effect of certain adulterations upon the public health, 2419 *et seq.*—In pickles and other things the adulteration is frequently practised in ignorance of its being injurious, 2420—Evidence to the effect that alum as used in bread in London or the provinces produces costiveness, and is decidedly injurious to health, 2420-2441—Instance of witness having found alum crystallised in bread, 2420-2429—Use of alum in greater quantities as the flour is inferior, 2429. 2440, 2441.

Inoperativeness of the Act which prohibits alum in bread, but leaves the task of detection to the public, 2442-2446—Recommended adoption of a system of Government inspection to apply not only to flour and bread, but all other articles of public consumption, 2444, 2445. 2452, 2453. 2474 *et seq.*—Preference of the public for white bread, though generally most adulterated with alum, 2447-2450.

Instance of the successful effect of the principle of publicity, 2454-2456—Discontinuance in two of the colonies, and in this country of Scoffer's process of sugar refining on account of its involving the use of acetate of lead, which was pronounced by witness and others to be injurious to health, 2454-2458.

Grounds upon which Dr. Alfred Taylor and witness recommended the adoption of the present distinction between the sale of pure coffee, and the sale of coffee mixed with chicory, 2459-2471—Advantage both as regards price and quality by an admixture of chicory, 2461. 2464-2469—Simple test for ascertaining the presence of chicory; this should be printed on each label, which contains pure coffee, 2462, 2463.

Injurious effect of the practice of adulteration on the public morality, 2472, 2473—Necessity of special education and qualification in the parties to conduct analyses of articles, 2475. 2492, 2493—All analyses should be conducted by a central board in London for whom articles should be procured throughout the country, through means of the Inland Revenue department, 2474-2478. 2494-2499—Economy in employing the machinery of the Inland Revenue department, 2979.

Instances of inaccuracy in the analyses conducted by Dr. Hassall for the "Lancet," 2479. 2485-2491—Inadequacy of one person to make the number of analyses published weekly by Dr. Hassall, 2479-2484—Probability that several persons would have brought actions against the "Lancet," but for the expense, 2488-2491.

Minor regulations advisable, as in France, in regard to the use of colouring matters, 2500—The public should be protected by Government against all adulterations injurious to health, and against the sale of articles under a wrong name, 2501-2509—The poorer classes should have increased facilities for bringing offenders to justice, 2510-2512—Means for guarding against abuse in the purchase of samples for analysis, 2513-2516—Increase of adulteration of late years through the publicity given by publications on the subject several years ago, 2517, 2518—Prevalence of adulteration in the poorer neighbourhoods, 2519.

*Cassia.* See *Cinnamon.*

*Cayenne Pepper.* Adulteration of Cayenne pepper, as imported, with red lead; instance of illness produced thereby, *Blyth*, 790-800—Witness has detected red lead in Cayenne as sold to the public, *Bastick* 892-894—Cayenne may be adulterated by pickle manufacturers, but not by respectable druggists, *Drew* 2944-2948.

Central

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*Central Board.* A Central Board of five or more persons to decide upon adulterations generally is far preferable to a system of local analysts, one analyst moreover being inadequate to the task, *Taylor* 213-226. 234. 238-240—The members of the proposed Board should have a fixed salary, *ib.* 237—Possibility of the public placing too much reliance on the certificate of the Board as to the purity of any article sold by a particular tradesman, *ib.* 241-246—Suggested formation of a central department to be attached to the General Board of Health, and to have powers similar in the main to those of the Conseil de Santé Publique in Paris, *Lewis* 368-376—Approval of the appointment of a central Board for the inspection of drugs, food, &c. and for the infliction of penalties for fraudulent and injurious adulterations, *Blyth* 740-742. 801. 810-814. 828.

There should be a central Board in London, with provincial Boards in large towns to whom meats, &c. might be sent for chemical analysis, *Richardson* 2182-2184. 2196—In cases of difficulty articles might be sent from the country to the central Board in London, *Wakley* 2275-2277. 2292—All analysis should be conducted by a central Board, for whom articles should be procured throughout the country through the means of the Inland Revenue department, *Carpenter* 2474-2478. 2494-2499—Importance, in the first instance, of a central authority to issue regulations, *Postgate* 4238 *et seq.*; *Hassall*, 4439, 4440.

Objection to which a system of a central Board and local inspectors would be open, *Neligan* 1826-1828.

See also *Board of Health.* *Inland Revenue Department.*

*Challice, John, M. D.* (Analysis of his Evidence.)—Resides at Bermondsey, 1398, 1399—General practice of bakers in the metropolis to use alum in bread to an extent injurious to health, 1400-1408, 1416, 1417—Denial that the astringent or injurious properties of alum are destroyed by the heat to which it is subjected, 1404-1407. 1418-1422—The main object in using alum is to improve the appearance of the bread, and to save trouble in the manufacture, 1409-1412—Advantage of substituting an increased quantity of salt for alum, 1409, 1410. 1414, 1415—Means by which alum in bread may be detected, 1413, 1423, 1424—Frequent use of rice in making bread, the quality of which is much deteriorated thereby, 1425-1428.

As regards beer, witness is convinced that narcotics are used by the publicans for the sake of producing an intoxicating effect; he cannot however speak directly as to such narcotics, whether cocculus indicus or tobacco juice, &c. 1429-1445—Belief as to the purity of brewers' beer, 1435, 1436—Evidence as to the constant sale of diseased and unhealthy meat to the poorer classes, 1446-1466—Illustration of the inadequacy of the present law for preventing the sale of bad meat, 1460-1464—The poor can protect themselves against the sale of bad fish, as they can easily detect it, 1467.

Liability, especially of the lower classes, to the evil of adulteration, 1468, 1469. 1547, 1548—General and extensive adulteration of mustard with flour and turmeric, so that as a medical appliance it is constantly quite ineffective, 1470-1472—Advantage of the mustard husks for medical purposes, 1472—Constant adulteration of arrowroot with potato starch, frequently to the extent of fifty per cent., whereby its value is greatly reduced, 1473-1481.

Different prices and qualities of milk, the difference being the result of using chalk and water for adulteration; instance of this in the case of milk supplied by contract to the Bermondsey Board of Guardians, in which there was a great sediment, most probably chalk, 1482. 1497—Reluctance or inability of the poor to take steps against shopkeepers for adulteration, 1485. 1507-1510.

Compound mixture sold to the poor as port wine; injurious properties thereof; 1498-1501. 1505—Belief as to the manufacture of sherry out of brandy and water, 1502-1504.

Opportunity, under the Metropolis Management Bill, to empower vestries, through means of the inspectors of nuisances and sanitary officers, to detect adulteration, 1505, 1506. 1511-1513—There should be a fine on the first conviction for injurious adulteration, to be quadrupled on the second conviction, 1505—As regards the prevalence of adulteration, witness refers to the whole metropolis, and not merely to Bermondsey, 1513-1516.

Facility for detecting adulteration in port wine, 1517—Tea, generally speaking, is pretty good, 1518—Coffee is largely adulterated, not only with chicory, but sometimes with other vegetable roots, dried and ground up, 1519-1528—Substitution constantly of British for foreign brandy, to the prejudice of health, 1530-1535—Large adulteration, or rather substitution in the case of drugs, so that life is often endangered, 1536-1539—Pure drugs are sold by some chemists, and at Apothecaries' Hall, 1540-1542.

Necessity of some system of inspection of drugs, &c.; the power alone would be of great use; 1543-1565—Advantage of requiring every trade to be licensed, 1550—There should be a check upon the importation of impure drugs, 1552-1562—What-

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*Challice, John, M. D.* (Analysis of his Evidence)—continued.

ever system be adopted, the Legislature should protect the public from all adulterations injurious to health, 1563-1567.

*Chemical Analyses.* See *Analysts.*

*Chemists and Druggists.* System of licensing of chemists in France, *Neligan* 1765-1767—Advantage if chemists in this country were all licensed, *Neligan* 1768, 1769; *Bell* 2376; *Postgate* 4351—A system of licence and inspection might also be desirable in the case of drug-grinders and wholesale druggists, *Neligan* 1769-1773—Great advantage if chemists and druggists were licensed; they would not object to it, *Wakley* 2306-2308.

Undue facilities for persons to become chemists, no certificate as to qualification being required, *Bell* 2342-2346. 2348; *Rep. p. ix*—Salutary check in France and Germany upon persons setting up as chemists, *Bell* 2347, 2348—Failure of steps taken by witness and others for providing that every chemist in this country should be properly qualified, *ib.* 2348. 2366—Improvements to be expected from the co-operation of the better educated and more respectable chemists, *ib.* 2384, 2385. 2406, 2407—Willingness of druggists to submit to a system of inspection, *Atkinson* 2863.

Expediency of a system of examination of chemists, *Richter* 3779. 3787-3789—Importance of a much higher state of education of chemists and druggists, *ib.* 3783-3787—Suggestion for the adoption of a system of licensing, whereby not only would there be a check against unqualified chemists, but funds would be raised towards defraying the expense of inspection, *ib.* 3787-3790—The 1,200 chemists in London might each pay an annual license fee of 1*l.*, which should go towards paying for the inspection, *ib.* 3790.

The question of licences may perhaps be properly deferred till it be seen how far the efforts of the Pharmaceutical Society, and a more general system of inspection, may prove successful, *Rep. p. ix.*

See also *Drugs.*

*Chicory.* Conclusion arrived at by Dr. Carpenter and witness, that there was nothing in chicory injurious to health, *Taylor* 85—Properties and component parts of chicory; it is less nutritious than coffee, *ib.* 85. 132-134.

Frequent adulteration of chicory when it used to be dear; there is but little adulteration now practised, *Gay* 1640. 1695—Instance of large adulteration of chicory with white carrots and parsnips, *ib.* 1640-1642. 1644—Rye is sometimes mixed with chicory to the extent of from 25 to 75 per cent. *ib.* 1644.

Consideration of the data on which witness states that 12,000 tons of chicory are annually used in this country, *Woodin* 2770-2801—Chicory chiefly comes from Holland and Belgium, and is not much grown in England, *ib.* 2802-2806—Case of chicory said to be adulterated with peat dust, *Bingley* 4108-4113—Advantage if there were a duty on chicory, so as to bring it up to the price of coffee, *Postgate* 4357-4367.

Reference to former evidence before the Committee (in 1855), in regard to the use of chicory on the continent, *Hassall* 4390—Circumstance of chicory being used in France and Germany as an aperient, in the case of children, *ib.* 4390. 4653—Diuretic as well as aperient property of chicory, *ib.* 4653, 4654.

See also *Coffee.* *Fry, Messrs.*

*China Clay.* Witness produces a sample of China clay, and explains its properties and the facility for mixing it with flour, *Jackson* 3686-3692. 3699—China clay comes from Cornwall, and costs, in its ground state, about 18*s.* a ton, *ib.* 3688. 3696-3698.

*Chloroform.* Importance of purity in this article, *Blyth* 695, 686—Impurity of every sample of chloroform sent at first to St. Mary's Hospital, Paddington, *ib.* 697-700—Means of testing chloroform, and for distinguishing whether it is adulterated or deteriorated through imperfect preparation, *ib.* 699.

*Cinnamon.* The alleged adulteration of cinnamon with cassia is very improbable, there being scarcely any difference of price between the two, *Drew* 2938-2943. 2955-2960. 2962.

Statement as to cassia in the stick being sometimes sold for cinnamon in the stick, *Hassall* 4498-4503.

*Clapperton, Alexander.* (Analysis of his Evidence.)—Grounds upon which witness (in business, till lately, as a baker) complains of injustice having been done to him by a statement in the "Lancet" in 1851 that his bread was adulterated with alum, 3634 *et seq.*

*Cocculus Indicus.* See *Beer, 2.*

*Cocoa.* Objection to the mixture of sugar with cocoa, even though an improvement, unless the article be sold as a specified mixture, *Hassall* 4507. 4510-4513. 4661—Relative prices of sugar and cocoa adverted to, *ib.* 4514-4517. 4524-4526—Protection afforded by

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*Cocoa*—continued.

by buying the cocoa nibs, *Hassall* 4518—Genuine flake cocoa obtainable at Ridgways, of King William-street, *ib.* 4518-4521.

*Cod Liver Oil.* Constant adulteration of cod-liver oil with other fish oils, *Challice* 1536—Sale of an article as brown cod-liver oil which witness believes to be common cod oil; they are, however, essentially the same, *Drew* 3197-3202.

*COFFEE:*

1. *Extent of Adulteration with Chicory, &c.*
2. *Views of Drs. Taylor and Carpenter in recommending, conditionally, a right of Admixture.*
3. *Defence of the Admixture of Chicory.*
4. *Use of Chicory in France.*
5. *Objections to the Right of Admixture.*
6. *Tests for the Discovery of Chicory.*

1. *Extent of Adulteration with Chicory, &c.:*

Witness never detected more than fifty per cent of chicory in coffee, *Taylor* 104-106—Coffee, with fifty per cent. of chicory in it, is quite exceptional, *Abbiss* 315, 316—Witness has found chicory and beans in coffee; until lately indeed chicory was almost always to be found in cheap coffee, *Quekett* 404-409—Purity of coffee bought by witness as genuine, *Blyth* 804-807.

Detection by witness of about twenty-five per cent. of chicory in what was sold as pure coffee, *Bastick* 905, 906. 909—Coffee is largely adulterated, not only with chicory, but sometimes with other vegetable roots, dried and ground up, *Challice* 1519-1528—Effect of the publicity through the "Lancet," in lessening the adulteration of coffee, *Wakley* 2219.

Belief that coffee is not adulterated with any other article than chicory, *Woodin* 2770. 2805—The annual consumption of chicory is about 12,000 tons, and of coffee about 18,000 tons, *ib.* 2770—In the case of the co-operative society or agency to which witness belongs, it is found that the public buy 1 lb. of chicory to 9 lbs. of coffee; inference therefrom as to the undue consumption of chicory under the present deceptive system, *ib.* 2770. 2775, 2776—Chicory is introduced sometimes by the coffee roasters, but more generally by the grocers themselves, *ib.* 2802-2804.

2. *Views of Drs. Taylor and Carpenter in recommending, conditionally, a right of Admixture:*

Dr. Carpenter and witness were consulted by Government in 1853 relative to the mixture of chicory and coffee, *Taylor* 84, 85—Certain proportions of the mixture of chicory with coffee are preferred by the public, *ib.* 85. 87-92—Chicory may be mixed with coffee, up to a certain proportion, without materially affecting the quality of the latter, *ib.* 85—Preference given by witness to unmixed coffee, *ib.* 87. 93-96.

The maximum admixture of coffee and chicory suggested by Dr. Carpenter and witness, was 10 ounces of coffee to six ounces of chicory, *Taylor* 87-89. 103—Questions laid by Government before Dr. Carpenter and witness, and answers thereto, *ib.* 87. 145—How far more desirable to compel a separate sale of chicory and coffee than to adopt the maximum admixture suggested by Dr. Carpenter and witness; difficulty in properly securing the public from fraud under the former system as compared to the inconvenience to them under the latter plan, *ib.* 107-128. 135-145.

Grounds upon which Dr. Alfred Taylor and witness recommended the adoption of the present distinction between the sale of pure coffee and the sale of coffee mixed with chicory, *Carpenter* 2459-2471—Advantage both as regards price and quality by an admixture of chicory, *ib.* 2461. 2464-2469.

3. *Defence of the Admixture of Chicory:*

Witness submits, that from 70 to 80 per cent. of the public prefer an admixture of chicory, *Abbiss* 305. 317-319. 322. 329. 331-334. 338-340—The mixture preferred is one-fourth of chicory to three-fourths of coffee, *ib.* 306-308. 335—Cheapness of chicory as compared with coffee, temptation to fraud thereby, *ib.* 310-313—Advantage to the public as regards price, quality, and convenience in the admixture of chicory by the vendor, *Abbiss* 313. 317. 331-340; *Carpenter* 2461. 2464-2469.

Objection to the proportions of the mixture being stated to the purchaser, *Abbiss* 314-319. 328-331—Objection to a separate sale of each article, the public being opposed thereto, *ib.* 317-319—Approval generally of the present regulations as regards the sale of "genuine" coffee; the label on the mixed article is a sufficient protection to the public, *ib.* 320-340.

Witness sells ten times as much of the mixture as he does pure coffee, *Abbiss* 322—Any attempt to compel the dealer to state the proportions would be utterly impracticable, *ib.* 328—Improvement in the quality of coffee when chicory is mixed with it in being ground; the volatile oil of the coffee is thus retained, *ib.* 336—Opinion that coffee is improved by an admixture of chicory, *Bastick* 907, 908.

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4. *Use*



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## 4. Use of Chicory in France :

In France and in Belgium there is almost universally an admixture of chicory, *Taylor* 98, 99—The practice, however, in France is, that the public generally grind the coffee themselves, and introduce chicory knowingly, *ib.* 100-102.

## 5. Objections to the right of Admixture :

Argument that the admixture of chicory is prejudicial to the fair trader, the consumer, and the revenue, and should therefore be prohibited, *Woodin* 2753-2759, 2807—Coffee sold at 1 s. a pound generally consists of half chicory; fraud on the consumer thereby, *ib.* 2755-2757—Amendment desirable in regard to the permission to sell a mixture of chicory and coffee, *Postgate* 4238-4241.

## 6. Tests for the discovery of Chicory :

Facilities for detecting chicory in coffee by means of the microscope existed long previously to 1851, *Taylor* 129-131—Definition of a simple test for ascertaining the presence of chicory; this should be printed on each label which contains pure coffee, *Carpenter* 2462, 2463—Distinction shown by the microscope between the coffee and chicory roots, *Hassall* 4388.

See also *Chicory*.

*College of Physicians.* Power and practice of the College of Physicians in regard to visiting chemists shops in the city of London, *Blyth* 737-739; *Baiss* 989-992; *Bastick* 934-941—Disuse, to a great extent, of the power of inspection, *Bastick* 934, 935; *Atkinson* 2875—Advantage if the inspection were strictly carried out, *Bastick* 938, 940; *Bell* 2384; *Drew* 3040, 3041, 3101-3106—The inspection seems to be too cursory to be of any great utility, *Rep.* p. ix.

*Colocynth.* Adulterations in the case of colocynth powder and extract of colocynth, *Hassall* 4398.

*Coloured Confectionery.* See *Colouring Substances.* *Confectionery.*

*Colouring Substances.* Noxious character of the yellow colouring matters of oxide of lead, chromate of lead, and sulphuret of arsenic, as used in sugar confectionery, *Taylor* 8—Suggested substitution by law or regulation of harmless colouring matters for those now employed, *Taylor* 8, 9; *Carpenter* 2500—All injurious colouring substances should be prohibited for use in confectionery, *Rep.* p. viii—See also *Confectionery.* *Tea*, IV.

*Competition.* Effect of competition in trade in leading to adulteration, *Taylor* 232, 233; *Gay* 1713, 1714; *Calvert* 2110, 2111; *Mackenzie* 4046—The desire of greater gain, and not the effect of competition or the ignorance of the manufacturers, is one of the chief causes of the adulteration of drugs, *Blyth* 690-694, 746-749—Many honest tradesmen adulterate in self-defence, but object to the practice, *Guy* 1638, 1639, 1659, 1660—Encouragement to dishonesty by the system of competition, *Wakley* 2206.

*Confectionery.* Extensive and ingenious use of Scheele's green in coloured confectionery, *Taylor* 4-8—Prussian blue and ultramarine (as used in confectionery) are not poisonous, *ib.* 8—Noxious character of vermilion and red lead used in confectionery, *ib.*—Ordonnance of police in Paris, relative to the prohibition of noxious substances in sugar confectionery, *Lewis* 366—Adulteration and colouring matters employed in the case of certain articles of confectionery, *Gay* 1698-1700—There is still considerable and injurious adulteration of sugar confectionery, though much less than was the case a few years ago, *Hassall* 4391.

Special regulations in France for the punishment and prevention of adulteration of confectionery, *Rep.* p. v—The use of mineral or poisonous vegetable matters for the purpose of colouring should be prohibited, *ib.* viii.

See also *Colouring Substances.* *Flavouring Substances.*

*Co-operative Societies.* Sundry flour societies in Yorkshire besides the one at Leeds, with which witness is connected, *Emerson* 1073, 1074—There has been no conviction for adulteration of flour against any co-operative society, *Farrant* 1284, 1285.

See also *Leeds (People's Flour Mill).* *Rochdale.* *Tea*, I. 2.

*Copper.* Frequent use, till lately, of sulphate of copper in pickles and preserved fruits, *Taylor* 28—A small quantity of copper or red lead is a large adulteration, *Hassall* 4528, 4532, 4533, 4604, 4606.

*Cream.* Flour and annatto are mixed with cream, but these are not injurious to health, *Taylor* 83—Belief that cream, like milk, is not adulterated save with water, *Quekett* 425, 426.

*Cream of Tartar.* Extensive adulteration of this article, *Postgate* 4323-4328.

*Creosote.* Frequent adulteration of creosote with carbonic acid, *Bastick* 862, 863.

*Criminal*

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*Criminal Offence.* Pernicious adulteration should be declared a criminal offence, *Postgate* 4238.

*Curry Powder.* The admixture of rice with curry powder can hardly be termed an adulteration of the latter, *Drew* 2993.

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*Detection of Adulterations.* There are some adulterations impossible to detect, *Gay* 1643.

See also *Analysts.* *Beer*, 6. *Bread*, I. 5. *Coffee*, 6. *Inland Revenue Department.* *Microscope*, *The.* *Tea*, VI.

*Divett, Edward, M.P.* (Analysis of his Evidence.)—Attends before the Committee, in consequence of information received from a respectable London tea-dealer, in order to controvert the allegation that lie tea is not now imported, nor to be had in the market, 3203-3206—Unwillingness of witness's informant to give evidence in person, 3205, 3214, 3237—Particulars as to the information received from this person, in proof of the recent importation and sale of different kinds of spurious or lie tea; samples of such tea (given by him to witness) laid before the Committee, 3206, 3212-3253.

Instances of ingenious adulteration of tea in this country, by turning what is called scented caper into pearl-leaved gunpowder, 3206-3209—Witness has no direct experience in regard to adulterated or lie tea, 3210—The adulteration or mixture of inferior with good teas is chiefly practised by small dealers, 3211.

With a view to check the importation of unwholesome or spurious articles, witness approves of the suggestion that a duty should be placed upon them, 3253, 3254.

*Draft Reports.* Report proposed by the chairman, *Rep.* p. xiv-xix—Report proposed by Mr. Moffatt, *ib.* xix-xxv.

*Drew, Hayward, & Barrow, Messrs.* Witness can safely say that no adulterations in drugs were ever practised by his firm, *Drew* 2906.

*Drew, James.* (Analysis of his Evidence.)—Member of the firm of Drew, Hayward, & Barrow, wholesale druggists, in the City, 2902—Totally dissents from the evidence which has been given as to the frauds and adulterations practised by druggists, 2903 *et seq.*—Can safely say that no adulterations were ever practised by his firm, 2906—Considers that most of the adulterations alleged to have taken place are quite incompatible, and almost impossible; absence of motive for the practice, 2907 *et seq.*

Evidence showing the great improbability of the adulteration of annatto with turmeric, 2908-2924—Belief that annatto is not adulterated at all, either with turmeric, red lead, or anything else, 2925-2930—Statement as to the great improbability of the adulteration of arrowroot with sago and tapioca, 2931-2937, 2955-2957—The alleged adulteration of cinnamon with cassia is equally improbable, there being scarcely any difference of price between the two, 2938-2943, 2955-2960, 2962.

As regards cayenne, it may be adulterated by pickle manufacturers, but not by respectable druggists, 2944-2948—Good arrowroot is more likely to be adulterated with inferior arrowroot than with potato starch, 2949-2954, 2961—Belief that spices are not adulterated, as alleged by Dr. Hassall, 2963-2965—Impossibility of the alleged adulteration of ipecacuanha with chalk, 2966—Facility of detecting the adulteration of jalap with powdered wood, 2966.

The establishment of the Pharmaceutical Society has given rise to a salutary spirit of inquiry in regard to drugs, but has not tended to prevent adulteration, 2967-2970, 2974-2978—Fallacy of relying upon the microscope as a means of judging of adulteration, 2967—Insufficient allowance made for the fact of the decomposition or deterioration of drugs through being improperly cared for, 2967, 2983, 2984.

Disuse, ever since witness has been in the trade, of the four per cent. system in grinding drugs, 2970-2973—Witness has never heard of flour being mixed with jalap, 2979, 2980—Probability of jalap being often decomposed instead of adulterated, 2981-2984—Desuetude long since of the practice of some druggists to mix lignum vitæ with some powders, 2987-2992—The admixture of rice with curry powder can hardly be termed an adulteration, 2993—The best ginger may be adulterated with inferior ginger but it is not at all likely to be adulterated with turmeric, 2993-3001—Witness never heard of ginger being adulterated with potato flour, cayenne pepper, or mustard husks, 3002.

Exceptions taken to the evidence given in respect to the quantity of English rhubarb grown and used in this country, 3002-3006, 3009, 3019-3030—Large quantity of English rhubarb used as such by Irish poor-law unions, 3005, 3010-3013—High price of Russia rhubarb, as compared with English rhubarb, 3006, 3007—English rhubarb by no means possesses the good properties attributed to it by Dr. Pereira and the authorities at the London Hospital, 3014, 3015, 3017, 3024, 3025.

Belief that, as a rule, wholesale druggists do not adulterate, and that the practice is confined to the non-respectable houses, 3031-3038—Difficulty in establishing an efficient

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*Drew, James.* (Analysis of his Evidence)—continued.

efficient check upon the importation of impure drugs, or in finding fit inspectors for the purpose, 3039. 3064, 3065. 3071-3074. 3089-3096—The supervision system has not been found to answer in America; articles rejected at one port being admitted at another, 3039. 3057-3063. 3074-3088—Advantage, if the power of inspection vested in the College of Physicians were carried out, 3040, 3041. 3101-3106.

Necessary importation of some articles known to be impure, 3044-3047—Opium and scammony, two most important drugs, are both liable to accidental impurity before importation, 3047. 3050. 3066—Statement relative to opium, to the effect that it is imported in a much purer state than has been alleged, 3047-3050. 3054-3056. 3067-3070—Inferior character lately of Egyptian opium, 3051—East India opium is very pure, but it is not imported into England, 3052, 3053.

Professors of pharmacy know less about drugs than pharmaceutical chemists, or wholesale druggists, 3089-3096—As regards prescriptions, medical men are doubtless generally in the hands of the chemists, 3097—Origin of the check in America upon the importation of drugs, 3098, 3099—Great difference in the price and quality of scammony, some being sold at 40 s., and some as low as about 6s. per pound, 3106-3109. 3115-3121—Exaggerated character of evidence as to the adulteration of scammony, 3110-3115.

Doubt as to the mode of disposal of the really worthless scammony, 3122-3128—Belief that inferior drugs generally find their way to the provincial wholesale houses, and through them to the retailers and the public, 3129-3135—The Apothecaries' Company buy their goods of the wholesale druggists, 3135—Mode of supply of drugs to Government adverted to, 3135, 3136.

Suggested imposition of a tax upon the importation of some spurious or inferior drugs, 3137-3158—Reference to the importation and sale of jalap stalks as jalaps, as showing that the same might, to a certain extent, be checked by a tax on the spurious article, 3139-3157—Many articles of medicine, &c. are not admitted into France 3159-3165—Injurious effect of patent or quack medicines upon the public health, 3166-3168. 3180-3183. 3191—Consideration of the means for checking the large sale of patent medicines; suggestion that the stamp duty be doubled, 3169-3179. 3191-3196.

Advantage of simplifying the nomenclature in regard to medicines, and of labelling all goods in English, instead of in Latin, 3184-3189—Persons professing to sell genuine articles should pay a stamp duty, 3196-3198—Fraud in the importation from America, of an article under the name of sarsaparilla, which is not sarsaparilla, 3196, 3197—Sale of an article as brown cod liver oil, which witness believes to be common cod oil; they are, however, essentially the same, 3197-3202.

*Druggists.* See *Chemists and Druggists.* *Drugs.**Drug Grinders.* See *Drugs.***DRUGS:**

1. *As to Adulteration by Drug Grinders; exculpatory Evidence hereon.*
2. *Extent of Adulteration generally, before Drugs are sold to the Consumers.*
3. *America.*
4. *France.*
5. *Germany.*
6. *Ireland.*
7. *As to the Propriety of a check upon imported Drugs.*
8. *Expediency of an Inspection of Chemists' Shops, together with a System of Penalties.*

1. *As to Adulteration by Drug Grinders; exculpatory Evidence hereon:*

Witness denies *in toto* on behalf of his own firm, and on the authority of the principal drug-grinders, that when drugs are sent to be ground, the loss in the process of grinding is made up by the admixture of some other powders (as stated before the Committee in 1855); this practice has been discontinued for many years, *Baiss* 957-959. 962-968. 977 *et seq.*—In sending goods to the drug-grinder, the practice of witness's firm is to receive them back minus the loss in grinding; loss incurred upon several articles, *ib.* 962-968.

The loss of weight in the process of grinding is borne by the owner; instance, however, of the weight being made up with satinwood sawdust, *Gay* 1652-1655. 1679—Witness was engaged for 30 years as a spice and drug-grinder for wholesale druggists, during which time he rarely ground genuine articles unmixed, *ib.* 1655-1657. 1659. 1667-1687.

Discontinuance for several years past of the extensive adulterations which used to be practised by drug-grinders, *Bell* 2334, 2335—System termed the four per cent. system, existing throughout the drug-grinding trade, when witness commenced business in 1819, *Atkinson*, 2810—This system was, that the drugs sent to be ground were required to be

Report, 1856—continued.

*DRUGS*—continued.1. *As to Adulteration by Drug Grinders; exculpatory Evidence hereon*—continued.

be returned with a loss in weight or quantity of only four per cent., *Atkinson* 2810. 2817, 2818—Witness recommended the abolition of the system, and it has, since 1819, gradually declined, till now it no longer exists, so far as witness is aware, *ib.* 2810. 2815, 2816. 2856-2869—Some doubt existed as to the policy of making medicines stronger than they were considered to be, *ib.* 2810. 2813, 2814.

Loss sustained by various articles during the process of grinding and drying, *Atkinson* 2811, 2812. 2819-2832—The loss of each drug was made up to within four per cent. by the substitution of some inert innocuous matter analogous to itself, *ib.* 2833-2841. 2847-2850—Reason for not making up the loss with water, when there was much evaporation in drying, *ib.* 2834-2836. 2849, 2850—Witness never made up the loss with the sawdust used in the mill, *ib.* 2837-2841.

Articles of inferior quality are, as a matter of course, ground by witness, *Atkinson* 2842-2846—Witness does not understand the original object of the four per cent. system, *ib.* 2851, 2852—The loss of quantity by evaporation in drying, in connexion with the adulteration, does not of necessity reduce the strength of the article, *ib.* 2853. 2855, 2856—Comments upon the evidence given by Mr. Warrington in 1855, in which he testifies to the adulteration by drug-grinders, without specifying the date, *ib.* 2857-2861.

Disuse ever since witness has been in the trade, of the four per cent. system in grinding drugs, *Drew* 2970-2973—Exaggerated character of the evidence given by Mr. Gay and others relative to the adulteration practised in drug-grinding, *Allen* 3856 *et seq.*—Establishment of witness's firm as drug-grinders in 1833, since which period the trade in drugs has greatly improved as regards the purity of the articles, *ib.* 3857-3866. 3890, 3891—Belief that there have not been for several years many dishonest drug-grinders in the trade, though in 1833 there were some whose practices were not correct, *ib.* 3858-3866. 3890, 3891. 3897-3900—Few exceptions to the rule not to adopt the four per cent. system, *Allen* 3864-3873—This system was never practised by witness's firm, *ib.* 3864, 3865—Unfairness of the system, the loss in grinding being very different on different articles, *ib.* 3867—Witness's firm grind any article that is sent to them, but decline to mix any two articles, *ib.* 3879-3881. 3897, 3898.

2. *Extent of Adulteration generally, before Drugs are sold to the Consumers:*

The adulteration of drugs introduces into the practice of medicine the greatest uncertainty and confusion, and often defeats the best-directed efforts of the physician, *Blyth* 673-679; *Hassall* 4398. 4432, 4433—In the majority of cases, however, impurities are accidental rather than fraudulent, *Blyth* 747, 748—Practice of druggists to have books of recipes for making imitations of pure drugs, *Bastick* 922-931—Contradictory statements as to druggists keeping a book of recipes for manufacturing spurious articles, *Baiss* and *Bastick* 971. 993-996.

Some dishonest firms may sell impure drugs to the retail chemists, but the practice of the trade is to sell the pure articles, *Baiss* 977 *et seq.*; *Drew* 3031-3038—Belief that the retail and wholesale dealers abstain generally from adulteration, *Baiss* 1024. 1031-1040—Articles bought by witness's firm for manufacturing purposes are duly tested, and are generally found to be pure, *ib.* 1037-1039.

Large adulteration, or rather substitution in the case of drugs, so that life is often endangered, *Challice* 1536-1539—Pure drugs are sold by some chemists, and at Apothecaries' Hall, *ib.* 1540-1542—Facility with which wholesale druggists can guard against impure drugs, *Neligan* 1779. 1791, 1792—Extensive and dangerous adulteration practised, about the year 1811, at a druggist's in Somersetshire, to whom, at the time, witness was articled as pupil; the articles adulterated were always sent to London, *Wahley* 2204, 2205. 2211—There is a great deal of adulteration in opium, scammony, and other drugs, *ib.* 2286, 2287.

There are three distinct classes of impurity in medicines, two of which, arising either from fraudulent admixture or from articles spoiled or deteriorated in keeping, should carry penalties with them, *Bell* 2327-2331—Facility for procuring pure medicines, *Atkinson* 2883-2885. 2895-2899—Witness totally dissents from the evidence which has been given, as to the frauds and adulterations practised by druggists, *Drew* 2903 *et seq.*—Considers that most of the adulterations alleged to have taken place are quite incompatible, and almost impossible; absence of motive for the practice, *ib.* 2907 *et seq.*

Belief that inferior drugs generally find their way to the provincial wholesale houses, and through them to the retailers and the public, *Drew* 3129-3135—Mode of supply of drugs to Government adverted to, *ib.* 3135, 3136—Drugs are now sold generally in so pure a state that legislative interference is not necessary, *Allen* 3862-3864. 3890-3896—Instances of adulteration in different kinds of drugs, *Bingley* 4096—Belief that there is less adulteration than was formerly the case, and that small dealers are the ones who chiefly practise it, *ib.* 4097-4101. 4165-4169. 4172.

Report, 1856—continued.

## DRUGS—continued.

2. *Extent of Adulteration generally, &c.*—continued.

Evidence in confirmation of evidence of last session, in regard to the adulteration of drugs, *Hassall* 4391-4398—Nature of the adulteration detected by witness in liquorice, turmeric, powdered rhubarb, colocynth, compound scammony powder, and aromatic confection, *ib.*—Adulteration takes place previously to importation, as well as by the drug-grinder, and by the wholesale and retail chemists, *ib.* 4399, 4400.

The Committee conclude that drugs are extensively adulterated, and that it is difficult to exaggerate the evils arising from the prevalence of the practice, *Rep. p. iv.*

3. *America:*

Origin of the check upon the importation of impure drugs, *Neligan* 1789, 1790; *Drew* 3098, 3099—Inadequacy of the check, *Neligan* 1808—Instances of seizures of impure drugs, as imported, *ib.* 1809-1813.

Reference to, and summary of, a circular or memorial addressed by the President of the College of Pharmacy of New York to the House of Representatives, in 1847, praying for the introduction of a law to prevent the importation of drugs unfit for use, *Bell* 2364-2366—Principal provisions of the Act passed by the American Congress for preventing the importation of impure drugs, *ib.* 2367, 2369, 2378-2380—Proof of the beneficial operations of the Act, *ib.* 2367-2370—Advantageous co-operation of pharmacutists for checking adulteration, *ib.* 2368, 2372-2375—Considerable adulteration, however, the only legislative inspection being when in bond, *ib.* 2371, 2380-2382.

The supervision system has not been found to answer, articles rejected at one port being admitted at another, *Drew* 3039, 3057-3063, 3074-3078—Advantage if the strength and quality of drugs and chemicals, as sold to the public, were fixed by regulation in this country as in America, *Postgate* 4350, 4373-4386.

Explanatory comment by the Committee upon the special laws which have been passed, and the mode of carrying them out, *Rep. p. vi.*

4. *France:*

Witness has examined drugs in Paris, but never detected adulteration, *Blyth* 729-731, 733-735—Advantage of the superior education of the French pharmacutists, *ib.* 732—Efficacious system of public examination of drugs; punishment in the event of adulteration, *Blyth* 732, 736, 756-759, 827, 828; *Calvert* 2139-2149—Every chemist grinds his own drugs, *Blyth* 750-755.

5. *Germany:*

Outline of the system pursued in Germany, whereby chemists are well educated, and drugs are sold in a pure state and at a fixed price, *Richter* 3777-3782, 3806-3830, 3843-3854—System for regulating the prices at which drugs are sold by the chemists, *ib.* 3778, 3779, 3812-3823—Stringent examinations necessary in order to become a chemist, *ib.* 3779—Oath imposed upon the vendor of drugs to obey the laws of the country in regard to the sale of drugs; advantage thereof, *ib.* 3779, 3811, 3825-3830—In some respects the German system might advantageously and without resistance be adopted in England, *ib.* 3780-3783—The Pharmacopœias of Germany differ, but not so much as those of this country, *ib.* 3802, 3803, 3807-3810.

6. *Ireland:*

Greater purity of drugs in Ireland than in England, on account of the power of inspection in the Dublin College of Physicians, *Neligan* 1719-1721—Practice of the College of Physicians in Dublin in carrying out the inspection, *ib.* 1721-1724, 1727-1733—It is contemplated to publish the result of the inspection, *ib.* 1721, 1776, 1777—System of classification of shops under the inspection, *ib.* 1724-1726—Hitherto there has not been any penalty for adulteration, not even publicity; power to burn adulterated drugs adverted to, *ib.* 1728-1733, 1774-1777.

Some of the impure drugs in Dublin are imported impure from England, *Neligan* 1733, 1734—Inducement to adulteration in the practice of workhouses and dispensaries to contract for drugs at very low prices, *ib.* 1746-1749—Beneficial operation of the Dublin Apothecaries' Hall, where medicines are always sold in a pure state, *ib.* 1749-1752, 1760-1764—Advantage of the examination and licence necessary before any one can open an apothecary's shop in Ireland, *ib.* 1753-1757—Distinction between apothecaries and chemists, *ib.* 1758, 1759.

Insufficiency of the means and powers of the Dublin College of Physicians for detecting and checking adulterations throughout Ireland generally, *Neligan* 1793-1796, 1818, 1819—Words of the Act by which the Dublin College of Physicians are empowered to inspect and examine, *ib.* 1805, 1806—Belief that in Dublin drugs are more adulterated than anything else, *ib.* 1850, 1871, 1875.

7. *As to the Propriety of a Check upon imported Drugs:*

Advantage of a system of inspection for preventing the importation of impure drugs, *Blyth* 743-745; *Buiss* 960, 961, 969-973; *Challice* 1552-1562—Extensive adulteration

Report, 1856—continued.

## DRUGS—continued.

7. *As to the propriety of a Check upon imported Drugs*—continued.

tion of drugs, both before and after importation, *Bastick* 841-843—Slight security to the consumer by an examination of drugs in bond, *Neligan* 1778, 1788, 1807, 1808, *Rep. p. ix*—Inexpediency of prohibiting the importation of impure opium, &c., *Neligan* 1779-1787, 1814, 1815; *Richter* 3791-3793, 3834-3838, *Rep. p. ix.*

Advocacy by witness, in 1847, and at the present time, of a system of inspection of imported drugs on arrival in this country, *Bell* 2366, 2383, 2395—Principles by which the inspection of drugs in bond should be guided; all damaged or inferior goods should not be rejected, *ib.* 2387-2395—Difficulty in establishing an efficient check upon the importation of impure drugs, or in finding fit inspectors for the purpose, *Drew* 3039, 3064, 3065, 3071-3074, 3089-3096—Suggested imposition of a tax upon the importation of some spurious or inferior drugs, *Drew* 3137-3158; *Postgate* 4356 *et seq.*—There might be an inspection of drugs as imported, though it would not be expedient to reject all which were not pure, *Postgate* 4350, 4355-4357, 4368-4380.

8. *Expediency of an Inspection of Chemists' Shops, together with a System of Penalties:*

Advantage to the public if the retail as well as the wholesale druggists were subject to a system of inspection, and, in the event of adulteration, to punishment, *Buiss* 969-976, 989; *Neligan* 1804, 1805, 1816-1828, 1872; *Calvert* 2138, 2150; *Postgate* 4352-4354, *Rep. p. ix*—Expediency of a system of Government inspection in connexion with a central analytical Board, *Atkinson* 2863, 2875-2893—Difficulty in fixing on a remedy against the sale of impure drugs, *Bell* 2377.

Recommended system of inspection of chemists' and druggists' shops, *Richter* 3787, 3789-3794—There might be six inspectors for the 1,200 chemists' shops in London, *ib.* 3789—Chemists might pay a licence fee of 1 l., and chemists' apprentices might pay a fee of about 5 l. to go towards the inspection, *ib.* 3790—If drugs be certified by competent analysts to be adulterated, the onus of proving their genuineness should rest with the vendor, *Goodman* 3943, 3944.

See also *Apothecaries' Company. Bark. Calomel. Chemists and Druggists. Chloroform. Cod Liver Oil. Dublin. Dudley. Duty on Imports. Gentian Powder. Gray's Supplement to the Pharmacopœia. Impurities. Jalap. Lime-Juice. Mary's, St., Hospital, Paddington. Newry, Ireland. Nomenclature of Medicines. Opium. Pharmaceutical Society. Pharmacopœias. Powdered Medicines. Prices. Quack Medicines. Rhubarb. Scammony. Spain.*

*Dublin.* Belief that there is not in Dublin any general adulteration of food prejudicial to health, *Neligan* 1829, 1848, 1849, 1859-1861—Facility for obtaining good bread in Dublin, though adulteration is resorted to, *ib.* 1829-1839—Weekly inspection of meat in the Dublin market by the corporation, under a Local Act, *ib.* 1841-1847—Medical men are frequently disappointed in the effect produced by their prescriptions, through the inferiority of the medicines, *ib.* 1850, 1871, 1875.—See also *Drugs*, 6.

*Dudley.* Sundry instances of adulteration in this town, *Postgate* 4217-4221—Circumstance of drugs having been supplied to some institution in Dudley, at a price less than the price current, and in a very adulterated state, *ib.* 4219-4221.

*Duty on Imports.* Suggested imposition of a tax upon the importation of inferior drugs, *Drew* 3137-3158.

Witness approves of the suggestion that a duty should be placed upon certain unwholesome or spurious articles, *Divett* 3253, 3254; *Postgate* 4356, 4370.

See also *Ad valorem Duties.*

## E.

*Egyptian Beans.* Instance of large adulteration with water in the case of Egyptian beans sent to a grist mill to be split, *Gay* 1646, 1647.

*Emerson, William.* (Analysis of his Evidence.)—Manager of the People's Flour Mill at Leeds, established in 1847 in consequence of the dearth and impurity of the flour sold to the public, 1041-1043, 1093, 1157-1159—Before the mill was established, it was generally understood that the bread in Leeds was dear in price and bad in quality, 1044-1046—Case of a person being fined, or rather imprisoned, for putting plaster of Paris into flour, 1045, 1097-1099—The society in question comprises 3,100 members, chiefly of the working classes, 1047, 1048, 1071, 1113, 1114—Amount of business done by the society, 1049, 1050, 1068-1070, 1117-1122—The flour made in the People's Flour Mill is of the best quality, and is never adulterated, 1051, 1052, 1058-1061, 1104, 1105, 1198, 1199—The bread made from it is not so white as the bakers' bread, 1062.

*Emerson, William.* (Analysis of his Evidence)—continued.

The flour of the society is not cheaper, but is doubtless much better, than that of the dealers generally, 1054-1065. 1096—Admixture generally of inferior flour, in order that low prices may be taken, 1062-1065—Adulteration frequently of oatmeal with the "sharps" taken out of flour, 1066, 1067—The society owning the People's Flour Mill was first under the Friendly Societies Act, but is now under the Provident Societies Act, 1072. 1075-1077—Sundry flour societies in Yorkshire besides the one at Leeds, 1073, 1074—The society sells flour to others than members, and does all the business it can, 1078-1080. 1118-1121.

Checks upon the flour being impure or adulterated before it reaches the hands of the consumers, 1083-1095. 1100, 1101. 1106, 1107—Sundry instances adduced in which there have been convictions for adulterated flour in different parts of Yorkshire, 1102, 1103. 1146, 1147. 1165, 1166—Duties of the directors of the society; they are unpaid, 1108-1112—The shares in the society were one guinea each, and no one can hold more than one share, 1111. 1115—Profitable character of the undertaking; the shares are now worth 2 l. 10 s. each, 1116. 1123-1126. 1148-1150—About one-third of the customers are not shareholders, 1117—The society takes no direct steps to check adulteration in flour generally, 1127-1132—Large quantity of alum in Leeds bread, as analysed by Mr. C. L. Dresser, 1132, 1133—The liability of the shareholders of the Leeds society, in case of failure, is not limited, 1134-1137.

Expediency of appointing public inspectors in order to check adulteration of flour, &c., 1138-1147. 1161-1165. 1168-1172—Opposition at first to the establishment of the People's Flour Mill, 1151-1153—Benefits, as regards price and quality, resulting from the mill, 1154-1160—Liability of witness, as manager of the society, in the event of the adulteration of the flour, 1173-1175—Distinction drawn by the Leeds magistrates between deleterious and harmless adulterations, 1176-1182—Difficulties in the way of operatives proceeding against shopkeepers or manufacturers, for adulteration, 1184-1197.

*Essential Oils.* Adulteration, both at home and abroad, of essential oils with turpentine and other fixed oils, *Bastick* 854.—See also *Almonds*, *Essential Oil of*.

*Exaggeration.* See *Prevalence of Adulteration*.

*Excise, The.* See *Inland Revenue Department*.

*Exposure.* See *Publicity*.

## F.

*Farrant, Edward.* (Analysis of his Evidence.)—Bookkeeper and traveller to a corn-mill society at Rochdale, 1200-1202. 1239. 1248—The society was established in order to meet the demand of the public for a pure article, 1203-1208—Loss of 450 l. by the society during the first nine months of its existence on account of the dissatisfaction felt with the dark colour of the bread through the absence of alum in the flour, and some defect in the grinding, 1209-1211. 1244-1260. 1263-1268—The price of the flour made by the society was about the same as that of the trade, 1212, 1213.

Particulars as to the society having at the end of nine months resorted to the use of alum in order the better to sell their flour, and to prevent further loss; complete success of this experiment, which was continued in practice for three years, 1214-1218. 1261, 1262. 1269-1272. 1287, 1288. 1296, 1297, 1302-1315—Disuse of alum by the society chiefly in consequence of convictions against some persons in other places for using it, 1219-1222. 1298-1300. 1319—After three years' use of alum the society returned to the sale of pure flour, the prejudice against the colour having to a great extent been removed; further increase of business under this arrangement, 1221-1229. 1272-1279. 1292, 1293. 1298-1300.

Rice is now put into the flour, but witness does not consider this an adulteration, 1221. 1280-1282. 1286. 1316, 1317. 1332-1343—Advantage of the present inquiry in disabusing the public mind in regard to their preference for white bread, 1228, 1229. 1292, 1293. 1301. 1311—Constitution and general operation of the Rochdale society, which numbers about three hundred members, 1230-1239. 1344-1347—The mill was established in 1851; 1240—Legal check only upon adulteration by the society, 1283—There has been no conviction for adulteration of flour against any co-operative society, 1284, 1285.

The flour of the Rochdale society is used chiefly by shareholders; how distributed, 1289-1291. 1294—About ten thousand persons use the flour, 1295—Witness has not heard that the alum when used was unhealthy, 1303-1306—Partial disuse of alum by the bakers when the society left it off, 1311, 1312—Approval of a system of public inspection, such system being much wanted by the public, who are not independent enough to prosecute for adulteration, 1320-1331. 1395.

Particulars

*Farrant, Edward.* (Analysis of his Evidence)—continued.

Particulars relative to a co-operative society in Rochdale with which witness is connected, established in 1844 for the purpose of supplying the members, who are all working men, with pure provisions, and for retaining the profits among themselves; beneficial and successful operation of this society, the annual returns of which are about 70,000 l.; 1347-1397.

*Fines.* There should be a fine on the first conviction for injurious adulteration, to be quadrupled on the second conviction, *Challice* 1505—Inadequacy of fines to prevent adulteration, *Hassall* 4452. 4621-4625—Check, however, to the practice of selling chicory and coffee for pure coffee by the fine of 100 l. for so doing, *ib.* 4621-4623.

See also *Penalties*.

*Fish.* The poor can protect themselves against the sale of bad fish, as they can so easily detect it, *Challice* 1467.

*Flavouring Substances.* Poisonous properties of a substance termed almond flavour, and of compounds sold to imitate the flavour of Jargonelle pear, Ribstone pippin, &c., *Taylor* 14-28.

*FLOUR:*

1. *Extent and Character of the Adulterations.*
2. *Law upon the Subject; Amendment desirable.*

1. *Extent and Character of the Adulterations:*

Purity generally of flour, as analysed by witness, *Taylor* 37. 43, 44—Opportunity for largely adulterating bread by the use of bean flour and lentil flour, *ib.* 45, 46. 49—Sundry instances adduced in which there have been convictions for adulterated flour in different parts of Yorkshire, *Emerson* 1102, 1103. 1146, 1147. 1165, 1166—Reduction of the nutritive properties of wheat flour by the admixture of rice flour, *Calvert* 2089. 2092, 2093—The practice of adulterating with alum is prevalent with millers, *Rodgers* 3313.

Particulars as to the addition by witness of a small proportion of bean flour, in order to produce the qualities required by bakers in bread; increase in the strength of the flour, and improvement in the quality by this admixture, *Brown* 3437-3442. 3452 *et seq.*—Beans contain 24 per cent. of gluten, whereas wheat contains only 10 per cent., *ib.* 3437—In selling barley flour in Northamptonshire, witness improves it by an admixture of wheat, *ib.* 3440. 3444-3452—Peas and alum are the only ingredients which witness has understood to be used for improving the colour of flour, *ib.* 3445, 3446. 3474, 3475—Mixture occasionally by witness of rice with flour; belief that the bread is not rendered inferior thereby, *Brown* 3470-3472. 3499-3505.

Strong impression that flour, as bought by witness and other bakers generally, does not contain alum, *Callard* 3537-3548—Fraud if millers use beans or rice to any large extent, *ib.* 3581-3585—Alum is, or has been, extensively used by millers, it being less discoverable when ground with the wheat than when mixed with the flour, *Jackson* 3719-3724—Cases of adulteration of flour as examined by witness; use of foreign meal, gypsum, and bone-dust, *Bingley* 4137-4141—Instance at Lincoln of flour being adulterated with plaster of Paris, *Postgate* 4215-4217—Frequent mixture of rice flour or bean flour with wheat flour, in order to whiten it, *Hassall* 4389. 4534—Grounds for witness's evidence last Session, that flour is adulterated with "mineral white or hydrated-sulphate of lime," *ib.* 4607-4609.

2. *Law upon the Subject; Amendment desirable:*

Defective state of the law in regard to the adulteration of wheat flour, *Calvert* 2080-2083. 2086, 2087—The restrictions as to manufacture under the Act 6 & 7 Will. 4, c. 37, should be abolished, *Brown* 3437—Greater restrictions lately upon the use of alum and bean flour than was the case a short time since, *ib.* 3456-3459. 3523-3526—Inexpediency of interdicting the admixture of bean flour; such prohibition would injure the country millers without benefitting the public, *ib.* 3506-3522.

Witness, who is a miller near Wakefield, has recently been prosecuted on a charge of adulterating flour, which charge was disproved on the trial; sundry ingredients said to have been used, *Jackson* 3673-3676. 3711-3713. 3724. 3772, 3773—Process, under the law, relative to prosecutions, *ib.* 3679, 3680. 3705—Unsatisfactory state of the law in regard to the inspection of mills devolving on persons totally incompetent to judge of the quality of flour, *ib.* 3715, 3718. 3724. 3730-3739. 3742.

Suggested inspection of mills by persons well conversant with flour; they might inspect all flour in mills and wheat within certain districts, and should not inspect any thing else, *Jackson* 3716-3718. 3441, 3742—The inspection should be very frequent and should take place at any hour of the day or night, *ib.* 3717. 3729. 3735—Expediency of a night inspection, *ib.* 3717. 3735-3737—Effect of the power to seize impure flour in deterring adulteration, *ib.* 3724-3728—Statement to the effect that the prohibition against mixing the flour of peas, or beans, or barley with wheat flour, is not desirable, and that such mixture should, under certain conditions, be allowable, *ib.* 3752-3762. 3765—

## FLOUR—continued.

## 2. Law upon the Subject, &amp;c.—continued.

The use of alum by millers should certainly be interdicted, *Jackson* 3764-3767—Instead of large quantities of flour being liable to be seized under the Nuisances Removal Act, smaller quantities should first be taken and tested before proceedings are taken, *ib.* 3772, 3773.

Circumstance in one case of there having been no conviction (though the adulteration was proved), in consequence of the information not having been made within forty-eight hours after the seizure; clause of the Act hereon, *Bingley* 4141-4152. 4201-4204—Nature of the restrictions upon the ingredients of flour, *ib.* 4198—Particulars relative to the case of seizure of flour belonging to Mr. Crosby, of Roherham; possibility of the flour having been tampered with after seizure, *ib.* 6153-6159. 4194-4197—When seizures are made, the space of a week should be allowed for laying informations, *ib.* 4209-4211.

See also Act 6 & 7 Will. 4, c. 37. *Bread.* *China Clay.* *Goole.* *Leeds* (*People's Flour Mill*). *Nuisances Removal Act.* *Poor Law Unions.* *Rochdale*, 1.

*France.* Legislative interference in France for the prevention of injurious adulterations; sundry substances prohibited, *Taylor* 10-13. 229, 230. 235—Penalties simple and cumulative inflicted in cases of adulteration, *Taylor* 188-190. 247; *Lewis* 350-356—Many of the sanitary measures in France might be imitated with advantage in this country, *ib.* 343-368.

Particulars relative to the constitution and mode of operation of the Conseil de Salubrité Publique, and the Conseil de Santé Publique, the two Boards in Paris, for regulating all matters relative to the public health, *Lewis* 345; *et seq.* 376—Ordonnances of the police in 1851, which regulate the proceedings of the Conseil de Santé Publique, which more particularly deals with the question of adulteration of food, *ib.* 346-351. 376—The public may bring cases of adulteration before the council, and inspectors are also employed for purposes of detection, *ib.* 351-357. 362—The Conseil de Santé Publique is proposed to be extended to the French Provinces, where confectionery, &c. is much worse than in the capital, *ib.* 363. 382-385.

Systems in Paris and the French provinces for the discovery of adulteration in drugs and food; beneficial operation of the penalties inflicted, *Calvert* 2139-2149—Many articles of medicine, &c. are not admitted into France, *Drew* 3159-3165.

Resumé by the Committee of the French law and police regulations, and of the several punishments provided therein, *Rep.* p. v.

See also *Bread*, IV. *Chemists and Druggists.* *Coffee*, 4. *Drugs*, 4.

*Fraudulent Adulterations.* An adulteration which is a commercial fraud, though not injurious to health, should be punishable, *Lewis* 386-391—Sundry articles, more especially drugs, in which witness has detected fraudulent adulteration; particulars hereon, *Bastick* 847 *et seq.*—Fraud upon the public in selling any article under a false name, *Bastick* 944-955; *Gay* 1703. 1706. 1710-1712.

Proposition for dealing with fraudulent adulterations, not only in food and drugs, but in all other matters, through means of a public prosecutor, who should proceed on evidence supplied by local analysts or inspectors, *Postgate* 4238. 4255-4261—Definition of fraudulent adulterations, *ib.* 4248. 4318-4343—Fraud upon the poor in the case of tea and coffee, *ib.* 4261.

Legislative interference recommended whenever the adulteration involves a direct pecuniary fraud, *Rep.* p. iv—Whenever a fraudulent intention can be proved, a penalty should be inflicted, *ib.* p. vii—What constitutes fraud must be left to the interpretation of the administrators of the law, *ib.* p. vii, viii.

*Fry, Messrs.* Inaccurate analysis by Dr. Hassall in the case of chicory sold by Messrs. Fry, of Bristol; heavy expense to Messrs. Fry in proving this inaccuracy, *Carpenter* 2479-2488.

## G.

*Gay, Richard.* (Analysis of his Evidence.)—Superintendent of the Government mustard manufactory at Deptford, which was erected about eighteen months ago, in consequence of the great difficulty of obtaining pure mustard, 1598, 1599. 1601-1603. 1622—Was formerly a mustard and chicory manufacturer, and drug and spice grinder, 1600, 1601—The difficulty in obtaining pure mustard arises partly from the fact of its turning black after it has been some hours mixed, 1604, 1605. 1660, 1661—The adulteration is practised more on account of the price than for the sake of improving the colour, 1605.

Use invariably of turmeric for colouring mustard, the other main adulteration being wheat flour; other substances used, 1607-1613—Character and extent of the adulteration practised

*Gay, Richard.* (Analysis of his Evidence)—continued.

practised by witness when in the trade, 1610-1612—Belief that turmeric is not prejudicial to health, 1613—Large quantity of gypsum and other ingredients found by witness in mustard supplied to Government, 1613-1621. 1629-1631—Purity of the mustard now supplied to the Royal Navy, 1624, 1625—Facility for detecting turmeric in mustard by means of ammonia; illustration of this, 1625-1628. 1631—Wholesomeness of good mustard, 1633—Circumstance of there being as much essential oil in the refuse of the mustard as in the mustard flour, 1633-1638

Many honest tradesmen adulterate in self-defence, but object to the practice, 1638, 1639. 1659, 1660—Frequent adulteration of chicory when it used to be dear, there being but little adulteration now practised, 1640, 1695—Instance of large adulteration of chicory with white carrots and parsnips, 1640-1642. 1644—There are some adulterations impossible to detect, 1643—Fraud in mixing charlock seed with mustard; this cannot be detected, 1643. 1645, 1646—Rye is mixed with chicory to the extent of from 25 to 75 per cent., 1644.

Instance of large adulteration with water in the case of Egyptian beans sent to a grist mill to be split, 1646, 1647—Sale of English rhubarb chiefly as Turkey rhubarb, 1650, 1651. 1695-1697—The loss of weight in the process of grinding drugs is borne by the owner; instance, however, of the weight being made up with satinwood sawdust, 1652-1655. 1679—Witness was engaged for thirty years as a spice and drug grinder for wholesale druggists, during which time he rarely ground genuine articles unmixed, 1655-1657. 1659. 1667-1687—Instances of adulterations being now practised which some years ago were not known, 1658. 1688-1692.

Witness has had as much practical experience in regard to adulteration as any one, and has done all in his power to expose and check it, 1659—Use of corrosive sublimate, as well as of sulphuric acid and oil of vitriol, in vinegar, 1662-1666—Witness has ground large quantities of cocculus indicus, which he believes ultimately went into beer, 1669-1672—The check of the Excise sometimes prevents adulteration, 1693—Reference to pepper dust as a well-known adulterating article; how manufactured, 1693, 1694.

Mustard, vinegar, and pepper are adulterated as much as any other articles, 1695—Adulteration and colouring matters employed in the case of certain articles of confectionery, 1698-1700—Extensive adulteration of milk with a decoction of white carrots, 1700-1705—Fraud is committed in selling any article under a name which the seller knows to be wrong, 1703. 1706. 1710-1712.

Belief that seven out of every ten articles are adulterated, 1707—There is probably much adulteration before importation, 1708, 1709—Adulteration of Russian isinglass with Brazilian isinglass, which is less than half the price, 1710—Parties often adulterate in order to reduce their price for the sake of custom, 1713, 1714—There is at present no protection to the public against adulteration, 1715.

*Gelopaga.* Use of a compound termed gelopaga in the manufacture of London port wine, *Taylor* 71-76.

*General Board of Health.* Machinery suggested in connexion with the General Board of Health, for the detection and punishment of adulterations, *Wakley* 2213. 2227. 2258, *Rep.* p. viii, ix.

See also *Central Board.* *Local Boards.*

*Gentian Powder.* Immense adulteration in the case of compound gentian powder, *Bastick* 863, 864—Rare instances in which compound gentian powder is likely to be sold; witness never sells it, *Baiss* 997-1006. 1011. 1015-1018—Reference to powdered gentian as chiefly or entirely used for horses and cattle, *Bell* 2335.

*German Yeast.* Purity of German yeast as analysed by witness, *Taylor* 50.

*Germany.* Efficacious measures adopted in Germany for preventing adulteration in drugs, &c., *Bastick* 882, 883. 886; *Richter* 3777-3782. 3806-3830. 3843-3854.

See also *Drugs*, 5.

*Gin.* Witness has not analysed gin, but believes it to be largely adulterated, *Taylor* 80, 81—Authority of others for witness's statement, in 1855, that gin was adulterated with sulphuric acid, *Hassall* 4610.

*Ginger.* The best ginger may be adulterated with inferior ginger, but it is not at all likely to be adulterated with turmeric, *Drew* 2993-3001—Witness never heard of ginger being adulterated with potato flour, Cayenne pepper, or mustard husks, *ib.* 3002.

*Glasgow.* General belief in Glasgow that adulteration is practised wherever it is possible, *Mackenzie* 3978-3980. 3991-4041, 4042. 4046-4049. 4078-4091—Extent to which witness of his own knowledge can speak to the practice of adulteration, *ib.* 4001 *et seq.*—Instance of adulteration in drugs supplied to the Town's Hospital *ib.* 4002-4006—Statement in proof of the adulteration of tea, *ib.* 4048. 4059-4075—General feeling

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of the people of Glasgow that legislative interference is necessary, *Machenzie* 4049, 4050, 4078-4088—Witness constantly receives complaints from correspondents as to the practice of adulteration, *ib.* 4089-4091.

*Goodman, Samuel Robert.* (Analysis of his Evidence.)—Has been legal adviser for thirteen years to the justices of the City of London, 3902, 3903—During that period the justices have never been called upon to exercise their jurisdiction with respect to the adulteration of food, 3904-3906—State of the law at the present time as regards those who adulterate food, 3907, *et seq.*—Power under the Apothecaries' Act to punish apothecaries for the sale of adulterated drugs, 3917.

As a general principle, the adulteration of food, as affecting an individual and not a public body, is not an indictable offence, 3919-3924—Inability and indisposition of the poorer classes to institute actions at law in cases of adulteration, 3925-3928, 3938, 3941, 3942, 3958-3969—Instances of conviction against parties for selling goods under false pretences, that is, for substituting one article for another, 3929-3933—Probability of steps being taken by the London public, under the Act 3 Geo. 4, c. 106, (relative to bread) if the provisions of such Act were generally known, 3936-3940.

Expediency of a right of search as a means towards checking adulteration, 3943—As regards drugs, if certified by competent analysis to be adulterated, the onus of proving their genuineness should rest with the vendors, 3943, 3944—The local magistrates should have power to refer articles to a central body in London, 3945, 3946, 3953, 3957—There should be a general Act, upon the principle of the Metropolitan Bread Act, power being given to inspectors to prosecute, 3947, 3952—Expediency of local Boards throughout the country in order to carry out the proceedings, 3953-3956.

*Goole.* Circumstance of a miller at Goole having been recently prosecuted for an admixture of China clay with flour; fine in this case of about 50 *l.*; *Jackson* 3681-3687, 3693-3708, 3743-3751, 3768—Doubt as to the miller having been really guilty in the matter, *ib.* 3701-3708, 3743-3751.

*Gray's Supplement to the Pharmacopœia.* Reference to a book of recipes for imitations of drugs termed "Gray's Supplement to the Pharmacopœia," which is easily obtainable, *Bastick* 925-931.

## H.

*Hair Dyes.* Danger to health from the use of oxide of lead in hair dyes; instance thereof, *Taylor* 28.

*Hamburg.* Adulterations of food are the subject of police regulations involving fine and imprisonment, *Rep. p. vi.*

*Hassall, Arthur Hill, M.D.* (Analysis of his Evidence.)—Explanation relative to certain diagrams prepared for the purpose of illustrating the successful application of the microscope to the discovery of adulteration, 4388, 4389—Frequent mixture of rice flour or bean flour with wheat flour in order to whiten it, 4389, 4534—Authority of Baron Liebig adverted to as showing the injurious property of alum in bread, 4389—Liebig recommended lime-water in lieu of alum as a means of improving the colour of bread; disapproval thereof, 4389, 4390, 4651, 4652—Objections to alum in bread, independently of the question of its being injurious, 4390.

Reference to former evidence before the Committee in regard to the use of chicory on the Continent, 4390—Circumstance of chicory being used in France and Germany as an aperient in the case of children, 4390, 4653—Samples of adulterated tea produced and explained, 4390, 4653—Purchase within the last few days of some tea containing a proportion of lie tea, 4390, 4391, 4644—Explanation as to the very extensive adulteration of annatto, 4391—Considerable and injurious adulteration of sugar confectionery, though much less than was the case a few years ago, 4391.

Evidence, in continuation of evidence of last Session, in regard to the adulteration of drugs, 4391-4398—Nature of the adulteration detected by witness in liquorice, tumeric, powdered rhubarb, colocynth, compound scammony powder, and aromatic confection, 4391-4398—The adulteration of drugs introduces into the practice of medicine the greatest uncertainty and confusion, and often defeats the best-directed efforts of the physician, 4398—Adulteration takes place previously to importation, by the drug-grinder, and by the wholesale and retail chemists, 4399, 4400.

Correction of the evidence of Mr. Phillips in 1855 (Q. 2483) as to witness having examined beer by means of acetate of lead, 4400—Explanatory statement relative to the evidence of Mr. Clapperton, 4400-4413—Witness could, of himself, easily make 100 microscopical examinations in a week, 4414, 4415—With proper assistance he could make from 200 to 300 examinations weekly, 4416-4419—Concurrence in the statement

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ment of Mr. Rodgers that cocculus indicus in beer may be detected, though the test is a laborious one, 4420-4423, 4560.

Definition of adulteration as the intentional addition to an article, for purposes of gain or deception, of any substance or substances, and the presence of which addition is not acknowledged in the name under which the article is sold, 4424, 4434-4436, 4661-4669—Expediency of a specification distinguishing between pernicious and fraudulent adulterations, 4425-4431—All adulterations of drugs are indirectly pernicious, 4432, 4433—Facility of a specification in regard to the mixture of chicory and coffee as well as of all compound articles, 4434-4436.

Suggestion that parties convicted of adulteration should be obliged to placard the judgment against them in their windows for different periods, 4438—Importance in the first instance of a central authority to issue regulations, 4439, 4440—Advantage in the local inspectors being locally appointed, 4439, 4440—Probable facility in obtaining competent local officers to carry out preventive measures, 4441-4443—The Board of Inland Revenue might be adapted to the functions requisite in a central Board, 4444-4446.

Main importance of publicity as a means of checking adulteration, 4447-4452—Inadequacy of fines to prevent adulteration, 4452, 4621-4625—There is not one-twentieth part of the adulteration now prevailing that did prevail some four or five years ago, 4452—Doubt as to the advantage of appointing a learned commission to inquire into the effect of alum in bread, and of other admixtures, 4453, 4454—Apathy of the public in regard to undertaking prosecutions under the Bread Act, 4455, 4456.

In his microscopical and chemical examination witness frequently made numerous analyses of one article, and tested altogether between 2,000 and 3,000 samples, over a period of four or five years, 4457-4462—Separate analyses were not required, when using the microscope, in order to discover the presence of separate bodies in any article, 4463-4466, 4504-4506—Grounds upon which witness has stated that anchovies are mixed with Dutch, French, and Sicilian fish, 4467, 4468.

In 99 cases out of 100, witness testified in his former evidence to the existence of adulteration through his own personal knowledge and not on the statements of others; examination hereon, 4469-4475, 4603, 4607-4620—Statement as to bread being sometimes adulterated with sulphate of copper in this country as well as in France and Germany, 4470-4474—An excess of water in butter one-third of the article for instance, should certainly be considered an adulteration, 4476-4481, 4487, 4488—Various quantities of water found by witness in butter, 4482-4486—Question as to the expediency of preventing the importation of butter containing an excess of water; a system of drawback would be a better plan, 4489-4497.

Statement as to cassia in the stick being sometimes sold for cinnamon in the stick, 4498-4503—Quantitative as well as qualitative analysis by means of the microscope, 4504-4506, 4508, 4509, 4647, 4648—Objection to the mixture of sugar with cocoa, even though an improvement, unless it be sold as a specified mixture, 4507, 4510-4513, 4601—No mixed articles should be sold unless as mixtures, the proportion of each ingredient being moreover made known to the purchaser, 4510, 4522, 4523, 4655-4663, 4669—Relative prices of sugar and cocoa adverted to, 4514-4517, 4524-4526—Protection afforded by buying the cocoa nib, 4518—Genuine flake cocoa obtainable at Ridgway's, 4518-4521.

Injurious quantity of red lead detected by witness in curry powder and Cayenne pepper, 4527-4533—Fraudulent, though not injurious, dilution of rum and gin with water, 4535-4538—Injurious quantity of Cayenne pepper found by witness in gin and rum, 4539-4543.

Grounds for the statement that stout, as sold by publicans, is considerably adulterated with water, 4544-4555—Adulteration also of porter adverted to, 4544-4548—Inability of the poor man to enter into the question of adulteration of beer, or to avoid being defrauded by the practice, 4556-4559—Witness has not detected cocculus indicus in beer, 4560-4563.

Data for the conclusion that exhausted tea leaves and British and foreign leaves, other than those of the tea plant, are mixed with tea leaves, and sold to the public as genuine tea, 4564-4596—Size and structure of the tea leaf adverted to, 4568-4575, 4638, 4639—Stoppage within the last two years of some tea manufacture in this country by the Excise, 4582-4591—Discovery by witness of sulphate of iron in tea, 4597-4601.

Numerous injurious substances for adulteration detected by witness besides red lead, 4602, 4603—Varying extent of the adulteration in those cases where the amount was not specified, 4604-4606—Grounds for witness's evidence last Session that flour is adulterated with "mineral white, or hydrated sulphate of lime," 4707-4609—Authority of others for the statement that gin is adulterated with sulphuric acid, 4610—Also for the statement that lard is adulterated with mutton suet, alum, and potash, 4611-4614.

*Hassall, Arthur Hill, M. D.* (Analysis of his Evidence)—continued.

Authority of others for the statement that porter and ale are adulterated with grains of paradise, capsicum, and wormwood, 4615-4619—Presence of insects, called acari, in all brown sugars adverted to as showing the desirableness of using refined or crystallised sugars, 4626-4634—Belief as to the colouring matters used in green tea being prejudicial to health, 4635-4637—Further statement as to the use of lie tea within recent periods, 4640-4646.

Less perfect admixture of adulterating agents in the case of solid substances than of powders, 4647—A small quantity of sulphuric acid in vinegar is a large adulteration, 4649—Grape sugar is present naturally in cane sugar; it has also been introduced intentionally, 4650—Diuretic as well as aperient properties of chicory, 4653, 4654—Though the substitution of one article for another may not be adulteration, it equally requires legislative interference, 4655-4661—Difficulty of determining the amount of dilution which should constitute adulteration in the case of wine, 4661-4667.

Course advisable in the event of goods adulterated by the wholesale dealer being sold unknowingly by the retailer, 4670-4672. 4679—The legislative check upon uttering base coin is a fair analogy in regard to a check upon adulteration, 4673-4677—More stringent measures desirable in the case of adulterations injurious to health than of those which are merely fraudulent, 4678.

*Hassall, Dr.* See "Lancet," *The*.

*Health.* The public health is no doubt much prejudiced by the adulteration of food, &c.; the evil, however, has been much exaggerated, *Taylor* 227—Belief that the great mass of the food of the country is not so adulterated as to cause disease, *Thompson* 608, 609—More stringent measures desirable in the case of adulterations injurious to health than of those which are merely fraudulent, *Thompson* 650; *Hassall* 4678—Distinction drawn by the Leeds magistrates between deleterious and harmless adulterations, *Emerson* 1176-1182.

Whatever system be adopted, the Legislature should protect the public from all adulterations injurious to health, *Challice* 1563-1567—Injury to health by the adulteration of pickles, bread, and confectionery, *Wakley* 2285, 2299-2301—Testimony to the injurious effect of certain adulterating substances upon the public health, *Carpenter* 2419 *et seq*; *Hassall* 4602, 4603—Doubt as to the advantage of appointing a learned commission to inquire into the effect of alum in bread, and of other admixtures, the injurious properties of the same being already determined, *Hassall* 4453, 4454.

Comment by the Committee upon the injurious effect of adulterations, generally and specifically, upon the public health, *Rep. p. iii, et seq.*

See also *Almonds, Essential Oil of. Beer. Bread, I. 3. II. Coffee.*  
*Colouring Substances. Confectionery. Copper. Drugs, 1. 2. Flavouring*  
*Substances. Flour, 1. France. Meat. Milk. Pickles. Preventive*  
*Measures. Tea, IV. Vinegar.*

*Holland.* Severe punishment, by imprisonment or fine, in the case of the sale of adulterated articles injurious to health, *Rep. p. vi.*

*Honey.* Frequent adulteration of honey with flour and sugar, or sugar and water, *Bastick* 863.

*Horse Powders.* Practice in regard to the preparation of compound horse powders by wholesale druggists; decrease in the number made, *Atkinson* 2869, 2873-2875—Doubt as to the materials employed in horse medicines being used in medicines for the public, *ib.* 2870-2872.

*Hydro-Chloric Acid.* A sample of hydro-chloric acid, sent to St. Mary's Hospital, Paddington, contained four or five grains of arsenic acid, *Blyth* 700.

## I.

*Imports.* There is probably much adulteration generally before importation, *Gay* 1708, 1709.—See also *Ad Valorem Duties. Drugs, 2. 3. 7. Duty on Imports. Tea.*

*Impurities.* Necessity of a careful chemical examination, in order to distinguish between adulterations and accidental impurities, *Taylor* 207, 208—The sale of naturally inferior qualities of goods should not be prohibited or punished, *Wakley* 2282, 2283—Impurity in drugs, when the same arises from unskilful preparation, should not be punishable, *Bell* 2327, 2328—Great variation naturally in the qualities of several important drugs *Atkinson* 2876, 2878, 2894-2900.

Insufficient allowance made for the fact of the decomposition or deterioration of drugs through being improperly cared for, *Drew* 2967, 2983, 2984—Necessary importation of some articles known to be impure, *ib.* 3044-3047—Opium and scammony, two most important

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important drugs, are both liable to accidental impurity before importation, *Drew* 3047, 3050, 3066.

See also *Drugs, 1. 2. 7.*

*Indigo.* Reference to the analysis by witness of a cargo of indigo, which was found to contain a large proportion of Prussian blue, *Taylor* 200, 201.

*Injurious Adulterations.* See *Health.*

*Inland Revenue Department.* Instances of proceedings wrongfully taken by the Excise in the case of tobacco and beer, to the great injury of the parties concerned, *Thompson* 614-617, 645, 651-656—Witness has often been employed against the Excise, *ib.* 618, 619—The check of the Excise sometimes prevents adulteration, *Gay* 1693—Inadequacy of the proceedings of the Excise for the prevention of adulteration, which they treat merely as a question of revenue, *Wakley* 2210-2213, 2234.

Economy in employing the machinery of the Inland Revenue Department, *Carpenter* 2479—If the Excise were to put into practice their power of inspection of publicans' cellars, the prevalence of adulteration of beer would be greatly checked, *Wickham* 3428-3431—Advantage if the officers of Excise in Scotland had power to inspect mills, *Mackenzie* 3990, 4033—Inexpediency of the present limit to the power of the Excise in regard to prosecutions for adulteration, *ib.* 4052—The Board of Inland Revenue might be adapted to the functions requisite in a central Board, *Hassall* 4444-4446.

Return, dated Inland Revenue Office, 1 May 1856, of the number of excise licenses issued within the Bills of Mortality, in the year 1855, classed in trades, *Moffatt* 4387.

System of detection and analysis adopted by the department, *Rep. p. viii*—The system of inspection by the Board and also the mere power of inspection have had a very good effect, *ib.*

Objection to an extension of the system of the Board as a means of preventing adulterations of food, *Rep. p. viii.*

*Inspection.* Evidence in favour of the appointment of public inspectors for the detection and punishment of adulteration generally, *Bastick* 881-886, 912-916, 918, 938-940; *Emerson* 1138-1147, 1161-1165, 1168-1172; *Farrant* 1320-1331, 1395; *Challice* 1543-1565; *Carpenter* 2444, 2445, 2452, 2453, 2474 *et seq.*; *Rodgers* 3272-3274—The mere appointment of public inspectors would prevent much adulteration, *Challice* 1546; *Postgate* 4346—The fees paid for private analyses, and the fines for adulteration, might go towards the inspectors' salaries, *Postgate* 4303, 4309, 4310—The inspectors should have fixed salaries of about 500 l. a year, *ib.* 4307, 4308—Advantage of the local inspectors being locally appointed, *Hassall* 4439, 4440.

See also *Analysts. Board of Health. Central Board. Drugs, 8. Flour, 2. Inland Revenue Department. Local Boards. Nuisances Removal Act. Preventive Measures. Tea, VI.*

*Iodide of Potassium.* Witness has found therein an admixture of carbonate of potash, *Bingley* 4096.

*Ipecacuanha.* Impossibility of the alleged adulteration of ipecacuanha with chalk, *Drew* 2966.

*Ireland.* See *Drugs, 6. Dublin.*

*Isinglass.* Evidence on the subject of adulteration in isinglass, to the effect that the gelatine in patent refined isinglass made in this country is superior to the imported isinglass, *Taylor* 146-169—Inferior quality of Brazilian isinglass as compared with Russian, for which it is often sold in this country, *ib.* 146, 160—Means for detecting adulteration in isinglass or gelatine, *ib.* 147, 152, 162, 163—How the patent isinglass is made, *ib.* 148—Inferior quality of the gelatine or isinglass imported from France, *ib.* 154-158, 161, 162.

Adulteration of Russian isinglass with Brazilian isinglass, which is less than half the price, *Gay* 1710—Doubt as to the so-called isinglass made in this country being equal to the isinglass imported, *Wakley* 2280, 2281.

## J.

*Jackson, John.* (Analysis of his Evidence)—Miller, near Wakefield, 3668—Has recently been prosecuted on a charge of adulterating flour, which charge was disproved on the trial; sundry ingredients said to have been used, 3669-3672, 3709, 3710, 3714, 3761—Summary manner in which the Nuisances Removal Act was enforced on the occasion by the local inspector, 3673-3676, 3711-3713, 3724, 3772, 3773—The power under the Nuisances Removal Act, in regard to the seizure of flour, may be so exercised as to be  
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*Jackson, John.* (Analysis of his Evidence)—continued.

most unjust and oppressive, 3673-3678. 3724. 3772, 3773—Process under the Act of William the Fourth in regard to prosecutions for adulterated flour, 3679-3682. 3705.

Circumstance of a miller at Gole having been recently prosecuted for an admixture of China clay with flour; a fine of about 50*l.* was inflicted, 3681-3687. 2693-3708—Witness produces a sample of China clay, and explains its properties, and the facility for mixing it with flour, 3686-3692. 3699—China clay comes from Cornwall, and costs in its ground state about 18*s.* a ton, 3688. 3696-3698—Doubt as to the miller fined for using China clay having been really guilty in the matter, 3701-3708. 3743-3751.

Unsatisfactory state of the law in regard to the adulteration of flour by reason of the inspection of mills devolving on persons totally incompetent to judge of the quality of flour, 3715. 3718. 3724. 3730-3739. 3742—Suggested inspection of mills by persons well conversant with flour; they might inspect all flour in mills, and wheat within certain districts, and should not inspect anything else, 3716-3718. 3729. 3733-3737. 3741. 3742—Alum is or has been extensively used by millers, it being less discoverable when ground with the wheat than when mixed with the flour, 3719-3724.

Effect of the power to seize impure flour in deterring adulteration, 3724-3728—Inexpediency of the system under the Nuisances Removal Act, whereby one person inspects meat, flour, drainage, &c., with all of which things he cannot be conversant, 3730-3740—Instance of a conviction for adulteration with alum, near Wakefield, 3735. 3743-3747—Statement to the effect that the prohibition against mixing peas or beans with flour is not desirable, and that such mixture should, under certain conditions, be allowable, 3752-3761. 3765.

Inexpediency of the prohibition against mixing barley flour with wheat flour, 3761, 3762—The use of alum by millers should certainly be interdicted, 3764-3767—References to a conviction before the borough magistrates at Pontefract in the case of flour adulterated by a miller, 3769-3771—Instead of large quantities of flour being liable to be seized under the Nuisances Removal Act, smaller quantities should first be taken and tested before proceedings are taken, 3772, 3773.

*Jalap.* Facility of detecting the adulteration of jalap with powdered wood, *Drew* 2966—Witness has never heard of flour being mixed with jalap, *ib.* 2979, 2980—Probability of jalap being often decomposed instead of adulterated, *ib.* 2981-2984—Reference to the importation and sale of jalap stalks as jalap, as showing that the same might to a certain extent be checked by a tax on the spurious article, *ib.* 3139-3157.

## L.

*Lancashire.* See *Poor Law Unions.*

"*Lancet*," *The.* Grocers and others have sought witness's opinion relative to statements in the "*Lancet*," which statements he has confirmed as to the articles in question being adulterated, *Quekett* 409. 417-419. 432, 433—Instances of inaccuracy in the analysis conducted by Dr. Hassall for the "*Lancet*," *Thompson* 604, 605; *Carpenter* 2479. 2485-2491—Good effect, for a time, of the "*Lancet*" investigations, *Bastick* 881.

Witness has paid considerable attention to the question of adulteration, and in 1851 devoted a portion of the "*Lancet*" to the exposure of the practice, with a view to its prevention by the Legislature, *Wahley* 2202-2204—Large number of names published in the "*Lancet*" as connected with the sale of adulterated articles; enemies made thereby by witness, though there was no prosecution against him, *ib.* 2220-2225—Accuracy and fidelity with which the sanitary commission of the "*Lancet*" was conducted by Dr. Hassall, *ib.* 2226-2268—Number of trades inquired into by the commission, *ib.* 2245, 2246—Course adopted in the purchase of samples for analysis, *ib.* 2251.

Inadequacy of one person to make the number of analyses published weekly by Dr. Hassall, *Carpenter* 2479-2484—Probability that several persons would have brought actions against the "*Lancet*" but for the expense, *ib.* 2488-2491—Inaccuracy imputed to Dr. Hassall in regard to the result of his examinations as to the existence of alum in bread, *Callard* 3593-3601.

In his microscopical and chemical examination witness frequently made numerous analyses of one article, and tested altogether between 2,000 and 3,000 samples, over a period of four or five years, *Hassall* 4457-4462.

See also *Bread*, I. 6. *Fry, Messrs.* *Vinegar.*

*Lard.* Authority of others for witness's statement that lard is adulterated with mutton suet, alum, and potash, *Hassall* 4611-4614.

*Leeds.* Before the People's Flour Mill at Leeds was established in 1847, it was generally understood that the bread was dear in price and bad in quality, *Emerson* 1044-1046—Case of a person being fined, or rather imprisoned, for putting plaster of Paris into flour, *Emerson*

*Leeds*—continued.

*Emerson* 1045. 1097-1099—Admixture generally of inferior flour in order that low prices may be taken, *ib.* 1062-1065—Instances of adulteration at Leeds of coffee, vinegar, mustard, &c., *Postgate* 4222.

*Leeds (People's Flour Mill).* The society in connexion with the People's Flour Mill comprises 3,100 members, chiefly of the working classes, *Emerson* 1047, 1048. 1071. 1113, 1114—Amount of business done by the society, *ib.* 1049, 1050. 1068-1070. 1117-1122—The flour made in the people's mill is of the best quality and is never adulterated, *ib.* 1051, 1052. 1058-1061. 1104, 1105. 1198, 1199—The bread made from it is not so white as the baker's bread, *ib.* 1062—The flour of the society is not cheaper, but is doubtless much better than that of the dealers generally, *ib.* 1054-1065. 1096—The society was first under the Friendly Societies Act, but is now under the Provident Societies Act, *ib.* 1072. 1075-1077.

The society sells flour to others than members, and does all the business it can, *Emerson* 1078-1080. 1118-1121—Checks upon the flour being impure or adulterated before it reaches the hands of the consumer, *ib.* 1083-1095. 1100, 1101. 1106, 1107—Duties of the directors of the society; they are unpaid, *ib.* 1108-1112—The shares in the society were one guinea each, and no one could hold more than one share, *ib.* 1111. 1115—Profitable character of the undertaking; the shares are now worth 2*l.* 10*s.* each, *ib.* 1116. 1123-1126. 1148-1150—About one-third of the customers are not shareholders, *ib.* 1117.

The society takes no direct steps to check adulteration in flour generally, *Emerson* 1127-1132—The liability of the shareholders in case of failure is not limited, *ib.* 1134-1137—Opposition at first to the establishment of the mill, *ib.* 1151-1153—Benefits, as regards price and quality, resulting from the mill, *ib.* 1154-1160—Liability of witness, as manager of the society, in the event of adulteration of the flour, *ib.* 1173-1175.

*Legislative Interference.* See *Preventive Measures.*

*Lewis, Waller, M.B.* (Analysis of his Evidence.)—Medical officer under the Post-office, 341—Was deputed by the Secretary of State for the Home Department to make inquiries in Paris relative to the French law upon matters affecting the public health, 342, 343—When in Paris was in constant communication with M. Trebuchet, the Chef de Salubrité Publique, 343, 344—Drew up a report on the French laws in question, 343—Concludes that many of the sanitary measures in France might be imitated with advantage in this country, 343. 368.

Particulars relative to the constitution and mode of operation of the Conseil de Salubrité Publique and the Conseil de Santé Publique, the two Boards in Paris for regulating all matters relative to the public health, 345 *et seq.* 376—Penalties, simple and cumulative, inflicted in cases of adulteration, 350. 386—Advantage of the assize of bread in France, 358-361. 367—The Conseil de Santé Publique is proposed to be extended to the French provinces, where confectionery, &c. is much worse than in the capital, 363. 382-385.

Less adulteration of food in Paris than in London, 367—Suggested formation of a central department in this country to be attached to the General Board of Health, and to have powers similar in the main to those of the Conseil de Santé Publique, 368-376—There might be a local machinery, through means of Local Boards of Health, 371. 381—Approval of the infliction of penalties by the Central Board, rather than of its being left to the public to proceed on evidence supplied by the Board, 377-380—An adulteration which is a commercial fraud, though not injurious to health, should also be punishable, 386-391.

*Licensed Traders.* Advantage of requiring every trade to be licensed, *Challice* 1550—The expenses of carrying out public inspection might be defrayed by making tradesmen pay a small licence fee yearly, *Rodgers* 3274.

Witness delivers in a return, dated Inland Revenue Office, 1 May 1856, of the number of Excise licences issued within the Bills of Mortality in the year 1855, classed in trades, *Moffatt* 4387.

See also *Chemists and Druggists.*

*Lie Tea.* See *Tea*, II. VI.

*Lime Juice.* Considerable adulteration in the case of four samples of lime-juice examined by witness, *Blyth* 671-674—Instances of extensive and injurious adulteration of lime-juice as sold at Liverpool, *Bingley* 4114-4125. 4131-4136—Small demand for lime-juice in Sheffield; it is probably adulterated there also, *ib.* 4126-4130.

*Lincoln.* Cases in this town of adulteration of flour, meal, coffee, vinegar, mustard, and other articles, *Postgate*, 4215-4217—Feeling of the people of Lincoln in favour of legislative interference, *ib.* 4217.



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*Linseed Dust.* Extensive adulteration detected therein by witness, *Bingley* 4094.

*Liquorice Powder.* Occasional sale of compound liquorice powder to country retail dealers for rolling horse medicines in, *Baiss* 1006-1010. 1013.

Details relative to extensive adulteration in the case of liquorice or liquorice powder; ingredients employed, *Hassall* 4391-4397.

*Local Boards.* Local machinery suggested in connexion with Local Boards of Health for the prevention of adulteration, *Lewis* 371. 381; *Wakley* 2227-2230. 2242. 2289-2292—Expediency of Local Boards throughout the country, in order to carry out the proceedings, *Goodman* 3953-3956—Municipal or other local or district authorities should appoint officers or inspectors who should procure samples for analysis, *Rep. p. viii.*

See also *Analysts. Central Board. Inspection.*

*Locock, Richard.* (Analysis of his Evidence.)—Wholesale tea-dealer; does business chiefly with country buyers, 2009-2012—Fully concurs in the statements of Mr. Ripley and Mr. Weston, that tea is now imported in a pure state, 2013. 2018-2020—Has never sold spurious tea, and does not believe that wholesale dealers generally do so, 2014-2017. 2051-2059—Considers that retail dealers sell the tea in the same pure state in which it is for the most part sold to them; experience in support of this statement, 2021. 2036-2050—The taste of the public is an ample protection against adulterated or inferior tea, 2022. 2033. 2043. 2066. 2071.

If lie tea were sold as tea it would be a fraud, and steps should be taken to punish the seller, 2034. 3035. 3072-2075—There is now no demand for lie tea, and it is not imported, 2057-2059. 2070—Lie tea pays duty as tea; impropriety thereof, 2060-2062. 2067, 2068—The wholesale dealer, the retailer, and the consumer, can protect themselves against lie tea, and do not require legislative interference, 2064-2075.

*London.* Calculation that adulteration may be put down in London at an expense of 10,000 *l.* a year; *employés* suggested for the purpose, who should act on the principle of the "Lancet" commission, *Wakley* 2242-2244. 2253-2272—Three or four examiners and half a dozen purchasers would be sufficient, *ib.* 2253-2257.

During the last thirteen years the justices of the City of London have never been called upon to exercise their jurisdiction with respect to the adulteration of food, *Goodman* 3904-3906.

*Lubeck.* Adulterations of food are treated as frauds and are dealt with by police authority, *Rep. p. vi.*

## M.

*Mackenzie, Peter.* (Analysis of his Evidence.)—Editor of the "Reformers' Gazette," a Glasgow paper, 3970, 3971—Particulars relative to the adulteration, in 1847, of a large quantity of oatmeal provided to meet destitution in the Highlands; part taken by witness in the matter, which led to the imprisonment of the offender, 3972-3977. 3994-4000. 4026-4029. 4035-4040—It was stated on the trial in this case that it was a common practice to adulterate oatmeal, 3976. 4087—The indictment for the adulteration of the oatmeal was of necessity laid at common law, 3977. 3994-3997.

General belief in Glasgow that adulteration is practised wherever it is possible, 3978-3980. 3991. 4041, 4042. 4046-4049. 4078-4091—Expediency of special legislation in order to check a practice so prevalent and so injurious, 3981-3996. 4041-4045. 4048-4050—Inability of the poorer classes to protect themselves, 3984. 4048. 4076, 4077—Advantage if the officers of Excise in Scotland had power to inspect mills, 3990. 4033.

Extent to which witness of his own knowledge can speak to the practice of adulteration, 4001 *et seq.*—Instance of adulteration in drugs supplied to the Town's Hospital, Glasgow, 4002-4006—Grounds for the belief that oatmeal is extensively adulterated, 4009-4014—Adulteration of butter with foreign ingredients, 4015-4023—How the question of adulteration of oatmeal might be defined, 4030-4034—Effect of competition in trade in leading to adulteration, 4046.

Statement in proof of the adulteration of tea in Glasgow, 4048. 4059-4075—General feeling of the people of Glasgow that legislative interference is necessary, 4049, 4050. 4078-4088—Instance of conviction by the Excise for adulteration of tobacco, 4050, 4051—Inexpediency of the present limit to the power of Excise in regard to prosecutions for adulteration, 4052—Summary power of the Excise in regard to tobacco, 4053-4055—Belief nevertheless that tobacco is extensively adulterated, 4056-4058—Witness constantly receives complaints from correspondents as to the practice of adulteration, 4089-4091.

*Magistrates.* The local magistrates should have power to refer articles to a central body in London, *Goodman* 3945, 3946. 3953-3957—Magistrates should have summary jurisdiction to fine and imprison if adulteration be proved, *Postgate* 4238; *Rep. p. vii, viii.*—If

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*Magistrates*—continued.

—If thought proper, evidence besides that of the public analyst or inspector should be required by the magistrate, *Postgate* 4238-4256. 4300.

*Manchester.* Extensive deterioration of wheat flour in Manchester by an admixture of rice or maize, *Calvert* 2081—Extensive adulteration in the case of samples of drugs procured by witness from twelve shops, *ib.* 2134-2138.

See also *Newton Heath, Manchester.*

*Mary's, St., Hospital, Paddington.* Supply at first to the hospital of samples of drugs, many of which were inferior in quality, *Blyth* 664-666—Sundry instances of adulteration in the samples supplied, *ib.* 667 *et seq.*—The vendors, in sending impure samples of drugs, were not aware that they would undergo examination, *ib.* 689—Great improvement in the drugs supplied to the hospital when it became known that there was a chemical analysis; some of the vendors sending adulterated samples no longer competed for the supply, *ib.* 708-711.

*Meat.* Evidence as to the constant sale of diseased and unhealthy meat to the poorer classes in London, *Challice* 1446-1466—Inadequacy of the present law for preventing the sale of bad meat, *Challice* 1460-1464; *Richardson* 2182. 2190-2191—Diseases produced by the consumption of bad meat, *ib.* 2174. 2191, 2192. 2196—There should be power to search for and seize diseased meat wherever it can be found, as well as in slaughter-houses, *ib.* 2184-2186—The power of dealing with diseased meat should be so extended as not to be dependent merely upon local Acts, *ib.* 2187, 2188.

See also *Newton Heath, Manchester.*

*Medicines.* See *Drugs.*

*Metropolis Local Management Bill.* Opportunity under this Bill to empower vestries, through means of their inspectors of nuisances and sanitary officers, to detect adulteration, *Challice* 1505, 1506. 1511-1513.

*Microscope, The.* Ascertainment of the structure of articles by means of the microscope, *Quekett* 393-395. 409, 410. 424. 429—Fallacy of relying upon the microscope as a means of judging of adulteration, *Drew* 2967.

Explanation relative to certain diagrams prepared for the purpose of illustrating the successful application of the microscope to the discovery of adulteration, *Hassall* 4388, 4389—Almost all vegetable substances, even when reduced to powder, can be distinguished by means of the microscope, *ib.* 4388, 4389—Witness could, of himself, easily make 100 microscopical examinations in a week, *ib.* 4414, 4415—With proper assistance, he could make from 200 to 300 examinations weekly, *ib.* 4416-4419.

Separate analyses were not required by witness, when using the microscope, in order to discover the presence of separate bodies in any article, *Hassall* 4463-4466. 4504-4506—Quantitative as well as qualitative analysis by means of the microscope, *ib.* 4504-4506. 4508, 4509. 4647, 4648.

Facility for detection through means of the microscope, adverted to by the Committee, *Rep. p. viii.*

*Milk.* Witness has not found any adulteration, except that of water, in milk, *Taylor* 82, 83—Witness examined milk five or six years ago, when he found in it an admixture of calves' brains; in recent examinations the only extraneous matter found has been water, *Quekett* 395-403. 429-431—Dilution of samples of milk with water; one sample only, as examined by witness, contained chalk, *Blyth* 712-714—Different prices and qualities of milk, the difference being the result of using chalk and water for adulteration; instance of this in the case of milk supplied by contract to the Bermondsey Board of Guardians, in which there was a great sediment, most probably chalk, *Challice* 1482-1497.

Extensive adulteration of milk with a decoction of white carrots, *Gay* 1700-1705—Adulteration of milk with water, but not with chalk, &c.; test of the lactometer adverted to hereon, *Neligan* 1854-1858—Injury to health in the nutritive property of milk being lowered by water, *ib.* 1862-1866—Parties mixing water with milk should be fined, *ib.* 1864, 1866.

*Milk of Sulphur.* Considerable adulteration therein twenty years ago, but not at the present time, *Bell* 2319, 2320—Circumstance of milk of sulphur (so called) being retailed at 28s. per cwt., whereas pure milk of sulphur is worth 75s. per cwt., *Postgate* 4228. 4238.

*Mixed Articles.* No mixed articles should be sold unless as mixtures, the proportion of each ingredient being moreover made known to the purchaser by means of a label or otherwise, *Taylor* 88. 91. 190. 209; *Hassall* 4510. 4522, 4523. 4655-4663. 4669—The mixture of good and bad tea, or of different qualities of the same article, should be treated as a fraud, *Postgate* 4319-4323—Facility of a specification in regard to the mixture of chicory and coffee, as well as of all compound articles, *Hassall* 4434-4436.

See also *Coffee.*

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*Moffatt, George* (Member of the Committee). (Analysis of his Evidence.)—Delivers in a return, dated Inland Revenue Office, 1 May 1856, of the number of excise licences issued within the bills of mortality, in the year 1855, classed in trades, 4387.

*Moffatt, Mr.* Draft Report proposed by Mr. Moffatt, *Rep. p. xix xxv*—The same, negatived by the Committee, *ib. p. xxv*.

*Morality.* Lax morality in trade produced by the practice of adulteration, *Carpenter* 2472, 2473; *Woodin* 2759; *Rep. p. iii*.

*Musk.* Musk is adulterated both at home and abroad; at home with mahogany dust, *Bastich* 855-857.

*Mustard.* General and extensive adulteration of mustard with flour and turmeric, so that as a medical appliance it is constantly quite ineffective, *Chalice* 1470-1472—Advantage of the mustard husks for medical purposes, *ib. 1472*.

Witness is superintendent of the Government mustard manufactory at Deptford, which was erected about eighteen months ago, in consequence of the great difficulty of obtaining pure mustard, *Gay* 1598, 1599, 1601-1603, 1622—The difficulty of procuring pure mustard arises from the fact of its turning black after it has been some hours mixed, *ib. 1604, 1605, 1660, 1661*—The adulteration is practised more on account of the price than for the sake of improving the colour, *ib. 1605*—Use invariably of turmeric for colouring mustard, the other main adulteration being wheat flour; other substances used, *ib. 1607-1613*.

Character and extent of the adulteration practised by witness when in trade formerly as a mustard manufacturer, *Gay* 1610-1612—Large quantity of gypsum and other ingredients found by witness in mustard supplied to Government, *ib. 1613-1621, 1629-1631*—Purity of the mustard now supplied to the royal navy, *ib. 1624, 1625*—Facility for detecting turmeric in mustard by means of ammonia; illustration of this, *ib. 1625-1628, 1631*.

Wholesomeness of good mustard, *Gay* 1633—Circumstance of there being as much essential oil in the refuse of the mustard as in the mustard flour, *ib. 1633-1638*—Fraud in mixing charlock seed with mustard; this cannot be detected, *ib. 1643, 1645, 1646*—Mustard, vinegar, and pepper are adulterated as much as any other articles, *ib. 1695*.

## N.

*Names of Articles.* Propriety of its being compulsory to sell all articles by their proper names, *Taylor* 211, 212; *Wakley* 2278-2281; *Postgate* 4238-4242.

*Neligan, John Moore, M. D.* (Analysis of his Evidence.)—Physician in Dublin, 1716, 1717—Has written a work on the subject of medicines and adulterations, 1718—Greater purity of drugs in Ireland than in England on account of the power of inspection in the Dublin College of Physicians, 1719-1721—Practice of the College of Physicians in carrying out the inspection, 1721-1724, 1727-1733—It is contemplated to publish the result of the inspection, 1721, 1776, 1777—System of classification of shops under the inspection, 1724-1726—Hitherto there has not been any penalty for adulteration, not even publicity; power to burn adulterated drugs adverted to, 1728-1733, 1774-1777.

Some of the impure drugs in Dublin are imported impure from England, 1733, 1734—Difference between the pharmacopœias of the two countries, 1734-1739—Considerable adulteration of scammony, both before and after importation, 1740-1746—Inducement to adulteration in the practice of workhouses and dispensaries to contract for drugs at very low prices, 1746-1749—Beneficial operation of the Dublin Apothecaries' Hall, where medicines are always sold in a pure state, 1749-1752, 1760-1764.

Advantage of the examination and licence necessary before any one can open an apothecary's shop in Ireland, 1753-1757—Distinction in Ireland between apothecaries and chemists, 1758, 1759—System of licensing in France adverted to, 1765-1767—Advantage if chemists in England were obliged to be licensed, 1768, 1769—A system of licence and inspection might be desirable in the case of drug-grinders and wholesale druggists, 1769-1773.

Slight security to the consumer by an examination of drugs in bond, 1778, 1788, 1807, 1808—Facility with which wholesale druggists can guard against impure drugs, 1779, 1791, 1792—Inexpediency of prohibiting the importation of impure opium, &c., 1779-1787, 1814, 1815—Reason for the check in America upon the importation of drugs; inadequacy of the check, 1789, 1790, 1808-1813—Insufficiency of the means and powers of the Dublin College of Physicians for detecting and checking adulterations throughout Ireland generally, 1793-1796, 1818, 1819—Instance of death at Newry occasioned through the ignorance of an apothecary's apprentice, 1794, 1803.

Suggestions recently made by witness, and about to be enforced in Ireland, for distinguishing dangerous from harmless medicines, and external from internal applications, by keeping them in differently shaped bottles, 1797-1801—Preventive measures and penalties

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*Neligan, John Moore, M. D.* (Analysis of his Evidence)—continued.

penalties recommended in order to check the sale of adulterated articles by the retail druggists throughout the country, as well as in the metropolis, 1804, 1805, 1816-1828, 1872—Words of the Act by which the Dublin College of Physicians are empowered to inspect and examine, 1805, 1806.

Belief that there is not in Dublin any general adulteration of food prejudicial to health, 1829, 1848, 1849, 1859-1861—Facility for obtaining good bread in Dublin, though adulteration is sometimes resorted to, 1829-1839—Crystals of alum could not exist in bread on account of the heat in the process of baking, 1832-1834—Weekly inspection of meat in the Dublin markets by the corporation under local Act, 1841-1847.

Witness has found copper in pickles, but not to an extent at all injurious to health, 1848, 1851-1853—Belief that in Dublin drugs are more adulterated than anything else, 1850—Adulteration of milk with water, but never with chalk, &c.; test of the lactometer adverted to hereon; 1854-1858—Injury to health in the nutritive property of milk being lowered by water, 1862-1866—Parties mixing water with milk should be fined, 1864-1866.

Less use of quack medicines in Ireland than in England, 1868—Check in Paris upon the sale of what are termed secret medicines, 1869—Advantage if quack medicines in this country were prohibited altogether, 1870, 1877, 1878—Medical men in Dublin are frequently disappointed in the effect produced by their prescriptions, through the inferiority of the medicines, 1871, 1875—Patients are sometimes recommended by their physicians to have their prescriptions made up at particular shops; reason why such recommendation is not the general practice, 1873-1876.

*Newry, Ireland.* Instance of a death at Newry occasioned through the ignorance of an apothecary's apprentice in vending medicines, *Neligan* 1794, 1803.

*Newton Heath, Manchester.* Considerable extent to which the practice of slaughtering diseased animals is carried by some butchers at Newton Heath; the meat, which is most unwholesome, is sold to the public in various forms; *Richardson* 2153-2166, 2172-2174—There used to be seven slaughterhouses for diseased meat, but now there are only three, *ib. 2154, 2166*—Witness has two sub-inspectors, practical butchers, to accompany him in his visits of inspection to the slaughterhouses, on whose opinion he relies in seizing and condemning bad meat, *ib. 2157, 2158, 2163, 2170, 2171*—There are at present about twelve diseased cows and twenty-four diseased calves killed weekly, *ib. 2159*.

Heavy penalties inflicted under the Local Act in the event of convictions for selling bad meat, *Richardson* 2176, 2193-2195—The lower classes still buy diseased meat, notwithstanding the convictions, their poverty probably compelling them to do so, *ib. 2177-2181*.

*New York, State of.* Articles specially prohibited from adulteration, the penalty being by fine or imprisonment, *Rep. p. vi, vii*.

*Nitrate of Soda.* Extensive adulteration detected therein by witness, *Bingley* 4094.

*Nitre, Sweet Spirits of.* Extensive and injurious adulteration in the case of three out of five samples of sweet spirits of nitre tested by witness for the Paddington Hospital, *Blyth* 680-684—Adulteration of sweet spirits of nitre with alcohol and water; it may easily be detected, *Bastich* 857-859.

*Nomenclature of Medicines.* Advantage of simplifying the nomenclature in regard to medicines, and of labelling all goods in English instead of in Latin, *Drew* 3184-3189—Adoption in Germany of a Latin nomenclature of drugs, except as regards the physician's directions accompanying the prescription, which directions are in German, *Richter* 3839-3841—Question as to the propriety of an English nomenclature, *ib. 3841, 3842*.

*Normandy, Dr.* Particulars as to witness having sent two loaves of bread to Dr. Normandy for analysis, one of which contained alum, and one was free from it, and as to Dr. Normandy having reported as the result of his examination, that both loaves were without alum, *Robertson* 3605-3624—Improbability of the miller having already mixed alum with the flour of which these loaves were made, *ib. 3621-3623*.

Extract from a letter from Dr. Normandy to the chairman of the Committee, containing certain explanations with respect to the foregoing statement, (Q. 4579).

*Nuisances Removal Act.* The power under the Nuisances Removal Act in regard to the seizure of flour may be so exercised as to be most unjust and oppressive, *Jackson* 3673-3678, 3724, 3742, 3772, 3773—Inexpediency of the system under the Nuisances Removal Act, whereby one person inspects meat flour, drainage, &c., with all of which things he cannot be conversant, *ib. 3730-3740; Bingley* 4205-4208.

*Nutmegs.* Inaccuracy of evidence before the Committee in 1855 as to the sale invariably of wild nutmegs for cultivated nutmegs, *Abbias* 301-304.

## O.

**Oatmeal.** Frequent adulteration at Leeds of oatmeal, with the "sharps" taken out of flour, *Emerson* 1066, 1067—Oatmeal as supplied to poor law unions, and generally, has been invariably found to consist of a large proportion of rice and maize, whereby its nutritive quality is much reduced, *Calvert* 2108-2110.

Particulars relative to the adulteration in 1847 of a large quantity of oatmeal, provided to meet the destitution in the Highlands; part taken by witness in the matter, which led to the imprisonment of the offender, *Mackenzie* 3972-3977. 3994-4000. 4026-4029. 4035-4040—The convicted party, by name Bannatyne, was adjudged to be imprisoned for three months, and to pay a fine of 300 l.; *ib.* 3973—Nature of the adulteration, *ib.* 3974-3976. 4035-4038.

It was stated on the trial in this case, that it was a common practice to adulterate oatmeal, *Mackenzie* 3976. 4087—Through some means Bannatyne was liberated before the expiration of his sentence, and the fine was not exacted; ill effects thereof, *ib.* 3998-4000. 4026-4029—The indictment for the adulteration was of necessity laid at common law, *ib.* 3977. 3994-3997.

Grounds for the belief that oatmeal generally is extensively adulterated, *Mackenzie* 4009-4014—How the question of adulteration of oatmeal might be defined, *ib.* 4030-4034.

**Objects of Adulteration.** Enumeration of the objects for which adulterating agents are used, *Postgate* 4215.

**Opium.** Naturally inferior quality of the great mass of opium samples sent to St. Mary's Hospital, Paddington; the adulteration generally takes place abroad, *Blyth* 700-707—Exceptional instances of opium being purposely adulterated in this country, *Bastick* 845, 846—Facility for procuring genuine opium by paying properly for it, *Bell* 2332—Skill required to judge of the purity of opium, *ib.*

Statement to the effect that opium is imported in a much purer state than has been alleged, *Drew* 3047-3050. 3054-3056. 3067-3070—Inferior character lately of Egyptian opium, *ib.* 3051—East India opium is very pure, but it is not imported into England, *ib.* 3052, 3053.

See also *Drugs. Impurities.*

**Order in Council.** An order in council prohibiting injurious and fraudulent adulterations should at once be passed, *Postgate* 4238.

**Origin of Inquiry.** Circumstances which led witness to attend certain public meeting throughout the country; he is well known as having paid much attention to the question of adulteration, and may be said to have originated the present inquiry, *Postgate* 4224-4227.

**Oxide of Lead.** See *Colouring Substances. Hair-dyes.*

**Oxide of Zinc.** Considerable adulteration in this substance in former years, *Bell* 2319.

## P.

**Paris.** Less adulteration of food in Paris than in London, *Lewis* 367—Check in Paris upon the sale of what are termed secret medicines, *Neligan* 1869—Objection to the system in Paris for preventing adulterations, *Wahley* 2302, 2303.

**Patent Medicines.** Consideration of means for checking the large sale of patent medicines; suggestion that the stamp duty be doubled, *Drew* 3169-3179. 3191-3196.

Injurious effect of these medicines upon the public health, *Rep. p. ix*—The stamp duty should if possible be abandoned, as it only encourages the sale, *ib.*

**Penalties.** Difficulty in a system of penalties on account of the conflicting opinions of chemists as to the properties of the substances, *Taylor* 206, 207. 223—System of penalties under the French law, *Lewis* 350—Approval of the infliction of penalties by the central Board, rather than of its being left to the public to proceed on evidence supplied by the Board, *ib.* 377-380—Objection to the infliction of heavy penalties, *Wahley* 2218, 2219. 2304, 2305—Disapproval of fine and imprisonment for the adulteration of drugs, *Atkinson* 2889—System of punishment recommended by the Committee, *Rep. p. vii-ix.*

See also *Central Board. Drugs, 8. Fines. France. Preventive Measures.*

**Pepper.** Adulteration detected by witness in pepper, *Thompson* 622-626; *Bingley* 4106, 4107—Use of late years of bone or ivory dust for adulterating white pepper, *Gay* 1689.

**Pepper Dust.** Reference to pepper dust as a well-known adulterating article; how manufactured, *Gay* 1693, 1694.

*Pharmaceutical*

**Pharmaceutical Society.** Improvement in the drug trade through the operations of the society, *Bastick* 932, 933; *Wahley* 2308-2310; *Bell* 2317-2321; *Richter* 3784, 3785 *Rep. p. ix*—The society was established in 1841 for the better education of chemists as a check upon adulteration, and other abuses, *Bell* 2315, 2316. 2318—Remarks made by witness at a meeting of the society in December 1841, relative to the existence of adulteration in drugs, and the means of remedying the same, *ib.* 2316, 2317—The society will gladly assist in the promotion of the objects for which the present Committee has been appointed, *ib.* 2406, 2407.

The establishment of the Pharmaceutical Society has given rise to a salutary spirit of inquiry in regard to drugs, but has not tended to prevent adulteration, *Drew* 2967-2970. 2974-2978.

**Pharmacopœias.** Difference between the pharmacopœias of England and Ireland, *Neligan* 1734-1739—Suggestion that in lieu of the three pharmacopœias of London, Dublin, and Edinburgh, there should be but one pharmacopœia applicable to the three countries, *Richter* 3795-3801—Different pharmacopœias on the Continent adverted to, *ib.* 3802, 3803. 3807.

The Committee refer to the evident evils of different pharmacopœias, and recommend the matter to the immediate consideration of the medical authorities of England, Ireland, and Scotland, *Rep. p. ix, x.*

**Phillips, the late Richard.** Improvement in the quality of retailed drugs through the publication in the "Pharmaceutical Journal," in 1842 and 1843, of articles written by the late Mr. Richard Phillips, *Bell* 2319, 2320.

**Pickles.** Simple means of testing the composition of pickles, *Thompson* 607—Witness has found copper in pickles, but never to an extent injurious to health, *Neligan* 1848. 1851-1853—In pickles, as in other things, the adulteration is frequently practised in ignorance of its being injurious, *Carpenter* 2420.—See also *Copper.*

**Poisons.** See *Sale of Poisons. Secret Poisonings.*

**Pontefract.** Reference to a conviction before the borough magistrates at Pontefract, in the case of flour adulterated by a miller, *Jackson* 3769-3771.

**Poor Law Medical Officers.** Objection to poor law medical officers as local analysts for detecting adulterations, *Taylor* 226.

**Poor Law Unions.** Nature of the adulteration of wheat flour supplied to six of the poor law unions in Lancashire; it went from a pure article up to seventy-four per cent. of adulteration, *Calvert* 2078, 2079. 2084, 2085. 2094—Instances of the supply of unsound flour to unions, to the great injury of health, *ib.* 2079. 2084, 2085—Impossibility of workhouse authorities detecting the presence of adulteration from the appearance; an officer is wanted for the purpose, *ib.* 2084. 2115-2119—Undue amount of water in bread supplied to the Lancashire Unions, *ib.* 2094, 2095—The milk supplied to five or six unions in Lancashire contained from ten to fifteen per cent. of water; there was no other adulteration in it, *ib.* 2107, 2108.

Expediency of correcting the present supplies to workhouses, the lowest tender being generally accepted, without any proper inquiry into the proper quality of the articles; suggestions hereon, *Calvert* 2112-2119. 2127-2133—Undue proportion of salt and water in the butter supplied to Lancashire workhouses, *ib.* 2119-2122—Out of 289 analyses made by witness for workhouses, there were 138 instances of adulteration or bad quality, *ib.* 2124—In some instances the workhouse contracts were accepted at prices which did not admit of a genuine supply, *ib.* 2125-2128—Calculation showing a loss of 2,271 l. to a union on a supply of 14,629 l., *ib.* 2128-2133.

Statement relative to some drugs supplied at extremely low prices to the Sheffield Poor Law Union, which drugs were found to be extensively adulterated, *Bingley* 4172-4193. 4214—Poor-law medical officers have no interest in regard to the supply of drugs to the union, 4192, 4193.

**Poorer Classes.** Perceptive faculties of the lower classes adverted to, as showing that, in the case of bread, beer, &c., taste is a great protection against adulteration, *Thompson* 533-539—Difficulties in the way of operatives proceeding against shopkeepers or manufacturers for adulteration, *Emerson* 1184-1197; *Farrant* 1325-1331—Liability especially, of the poorer classes to the evil of adulteration, *Challice* 1468, 1469. 1547, 1548; *Carpenter* 2519; *Atkinson* 2895, *Rep. p. iv*—Reluctance or inability of the poor to take steps against shopkeepers for adulteration, *Challice* 1507-1510; *Wahley* 2236-2238; *Bell* 2410-2416; *Mackenzie* 3894. 4048. 4076, 4077, *Rep. p. iv*—The poorer classes should have increased facilities for bringing offenders to justice, *Carpenter* 2510-2512—High prices paid by the poor as compared with the quality of the articles, *Postgate* 4262-4264, 4320—Inability of the poor man to enter into the question of adulteration of beer, or to avoid being defrauded by the practice, *Hassall* 4556-4559.

**Porter.** See *Beer.*

*Postgate, John.* (Analysis of his Evidence.)—Enumeration of the objects for which agents are used to adulterate, 4215—Instances of adulteration in sundry towns in which witness has attended meetings for the purpose of inquiring into the practice; about two-thirds of the articles were found to be adulterated, 4215-4223. 4228-4237—Statement showing that witness may be said to have originated the present inquiry, 4224-4227.

Circumstance of milk of sulphur, so called, being retailed at 28s. per cwt., whereas pure milk of sulphur is worth 75s. per cwt., 4228. 4328—Witness recently found 13 grains of alum in half a pound of bread, 4228—Alum in bread is exceedingly injurious; proof of this, 4228-4231—Adulteration of butter, as imported from Ostend, with flour and water, 4231-4237.

Suggestions in detail for the adoption of remedial measures, 4238 *et seq.*—An Order in Council prohibiting injurious and fraudulent adulterations should at once be passed, 4238—A special Act should subsequently be passed, declaring pernicious adulterations illegal, and holding the sellers responsible, 4238. 4258—The Board of Health or some other central body should issue instructions from time to time as to what constitutes adulteration, 4238. 4248-4252. 4266. 4274. 4331-4342. 4386—Analysts should be appointed by Boards of Guardians or other local authorities, subject to the approval of the central Board, 4238. 4265-4275. 4348. 4349.

Special qualifications essential in the local analysts, 4238. 4252. 4253. 4275. 4276—Duties which should devolve on the analyst, 4238—In some cases analysis might be made for private parties on the payment of a fee; traders might avail themselves of this arrangement, 4238. 4255. 4258. 4269. 4303. 4311-4314. 4386—Suggestion that a portion of each sample be intrusted to the care of the town clerk, so as to be produced in case of dispute, 4238. 4300—Proposition for dealing with fraudulent adulterations, not only in food and drugs, but in all other matters, through means of a public prosecutor, who should proceed on evidence supplied by the local analyst or inspector, 4238. 4255-4261.

The magistrates should have summary jurisdiction to fine and imprison, 4238—If thought proper, evidence besides that of the analyst should be required by the magistrate, 4238. 4256. 4300—Suggested system of registration of tradesmen in connexion with a system of publication of names, so that the public might distinguish between honest and dishonest traders, 4238. 4243-4247. 4291—Pernicious adulteration should be declared a criminal offence, 4238.

All articles should be sold by their proper names, 4238. 4242—Amendment desirable in regard to the permission to sell a mixture of chicory and coffee, 4238-4241—Definition of fraudulent adulterations, 4248. 4318-4343—Probable number of inspectors necessary, 4254. 4303-4306. 4347—High prices paid by the poor as compared with the quality of the articles, 4262-4264. 4320.

Facility with which adulterations generally might be detected by a competent analyst, 4278-4289. 4301. 4302—The analyst should report the result of his analysis to the magistrate, and should initiate the legal proceedings, 4290-4294—Lists of those who adulterate should only be published after conviction, 4291. 4298—The principle of the Bread Act should be adopted generally, inspectors being appointed to enforce it, 4294-4297. 4343-4346—Inoperativeness of the law relative to adulterated bread on account of its being nobody's business to prosecute, 4295-4297. 4344. 4345.

The fees paid for private analyses, and the fines for adulteration, might go towards the inspectors' salaries, 4303. 4309. 4310—The inspectors should have fixed salaries of about 500*l.* a year, 4307. 4308—Propriety of concluding that the retailer should be conversant generally with the quality of the articles obtained by him from the wholesale dealer, 4311-4317—Extensive adulteration of cream of tartar adverted to, 4323-4328.

Responsibility desirable in the retailer of drugs, 4350-4353. 4381-4386—There might be an inspection of drugs as imported, though it would not be expedient to reject all which were not pure, 4350. 4355-4357. 4368-4380—Advantage if the quality and strength of drugs and chemicals as sold to the public were fixed by regulation as in America, 4350. 4373-4386—Improvement if all chemists were licensed, 4351—There should be a public inspection of drugs as of food, 4352-4354—Advantage if a small duty were levied on certain imported articles, such as scammony, chicory, &c., 4356-4370.

*Powdered Medicines.* Extensive adulteration practised in the case of compound powders, *Bastick* 863-869—The adulteration is conventional as regards the manufacturer and the retailer, but is a fraud upon the public, and destroys the efficacy of medical prescriptions, *ib.* 865, 866. 870-874.

It is not the practice of witness's firm to keep or to manufacture what are termed compound powders, and he believes the sale of such powders by wholesale druggists is of rare occurrence, *Bais* 997-1018—Desuetude long since of the practice of some druggists to mix *lignum vitæ* with some powders, *Drew* 2987-2992—Compound powders have never been made by witness's firm, *Allen* 3874.

Less

*Powdered Medicines*—continued.

Less perfect admixture of adulterating agents in the case of solid substances than of powders, *Hassall* 4647.

See also *Gentian Powder.* *Horse Powders.*

*Prescriptions.* Patients are sometimes recommended by their physicians to have their prescriptions made up at particular shops; reason why such recommendation is not the general practice, *Neligan* 1873-1876—As regards the mode of making up prescriptions, medical men are doubtless generally in the hands of the chemists, *Drew* 3097.

See also *Drugs.*

*Preserved Fruits.* Danger in keeping preserved fruits in pewter-stopped bottles, *Taylor* 28.

*Press, The.* Beneficial operation of the press as a means of exposing the impurity of drugs, &c., *Richter* 3785, 3786.—See also "*Lancet.*" *The.*

*Prevalence of Adulteration.* Witness demurs to the evidence given before the Committee in 1855, as to the extent of adulteration of tea, sugar, &c., *Abbiss* 250—Concurrence in the evidence of Dr. Hassall and Dr. Normanby as regards the extent of adulteration, *Bastick* 913-916—Prevalence of adulteration over the whole of the metropolis, *Challice* 1513-1516—Instances of adulterations being now practised which some years ago were not known, *Gay* 1688-1692—Belief that seven out of every ten articles are adulterated, *ib.* 1707.

Adulteration has of late years immensely increased, and will further increase, upon the termination of the labours of the Committee, unless they take active steps for its suppression, *Wakley* 2204-2206—The practice has existed for a very long period, *ib.* 2204—Some of the statements made to the Committee have been exaggerated; and have unduly frightened the public mind, *Bell* 2411—Instances of adulteration in sundry towns in which witness has attended meetings, for the purpose of inquiring into the practice; about two-thirds of the articles were found to be adulterated, *Postgate* 4215-4223. 4228-4237.

There is not one-twentieth part of the adulteration now prevailing that did prevail some four or five years ago, *Hassall* 4452—In ninety-nine cases out of one hundred, witness testified in his evidence in 1855 as to the existence of adulteration, through his own personal knowledge, and not on the statements of others; examination hereon, *ib.* 4469-4475. 4603. 4607-4620—Varying extent of the adulteration in those cases mentioned by witness where the amount was not specified, *ib.* 4604-4606.

The Committee cannot avoid the conclusion that adulteration widely prevails, though under circumstances of very various character, *Rep.* p. iii, iv.

*Preventive Measures.* Suggestion that there be a power to visit shops, &c., and take samples of articles for analysis; that there be a right of seizure of all noxious articles, and a fine if improperly used, *Taylor* 188. 209. 235. 236—Approval of legislative interference for the prevention of injurious adulterations; it must, however, be exercised with the greatest caution, and any tradesman prosecuted wrongfully should recover his expenses in the matter, *Thompson* 609-614. 638-658.

Expediency of legislative interference generally further insisted on, *Blyth* 801. 810. 811; *Bastick* 881. 918; *Bell* 2410-2416; *Carpenter* 2501-2509; *Mackenzie* 3986-3991. 4041-4045. 4048-4050—There is at present no protection to the public against adulteration, *Gay* 1715—Inoperativeness of certain laws now in force for checking adulteration, *ib.* 2233-2239—The purchaser rather than the seller should be protected by the law, *ib.* 2297, 2298—Expediency of dealing with adulteration in the germ, and of checking the power and the inducement to defraud, *Richter* 3783. 3789. 3831-3833—Corrective measures should be fully carried out, *ib.* 3789. 3794.

Metropolitan Act and general Act, at the present time, for punishing adulteration of flour and bread, *Goodman* 3909-3913. 3925-3940. 3950-3952—Penalties in the case of adulteration of ale, beer, porter, cyder, and perry, *ib.* 3914-3917—There should be a general Act upon the principle of the Metropolitan Bread Act, power being given to inspectors to prosecute, *Goodman* 3947-3952; *Postgate* 4294-4297. 4343-4346—Suggestion in detail for the adoption of remedial measures, *Postgate* 4238 *et seq.*—A special Act should forthwith be passed, declaring pernicious adulterations illegal, and holding the sellers responsible, *ib.* 4238. 4258—Probable facility in obtaining competent local officers to carry out preventive measures, *Hassall* 4441-4443.

Conclusions of the Committee as to the necessity of preventive measures, *Rep.* p. iv, v—Legislation in foreign countries considered, *ib.* p. v-vii—Suggestions in detail as to the measures expedient for this country, *ib.* p. vii-x—Extent to which the law now affords redress, *ib.* vii.

See also Act 6 & 7 Will. 4, c. 37. *Ad Valorem Duties.* *Analysts.* *Bread,* III.  
*Central Board.* *Coffee,* 5. *Drugs,* 7, 8. *Fines.* *Flour,* 2. *France.*  
*Inland Revenue Department.* *Licensed Traders.* *Local Boards.* *London.*  
*Magistrates.* *Metropolis Local Management Bill.* *Order in Council.* *Penal-*  
*ties.* *Publicity.* *Registration of Tradesmen.* *Retail Traders.* *Spain.*  
*Stamp Duty.* *Tea,* VI.

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Prices.

Report, 1856—continued.

**Prices.** Cessation of adulteration in any drug, if the demand cease for the impure article, *Bell* 2321, 2326—The demand for cheap medicines is a primary cause of adulteration, *ib.* 2396, 2397—Where the adulteration produces a corresponding reduction in price and is not injurious to health, the law should not interfere, *Rep. p. iv.*

See also *Competition.*

**Private Analyses.** In some cases analyses might be made for private parties by the proposed public analysts, on the payment of a fee; traders might avail themselves of this arrangement, *Postgate* 4238, 4255, 4258, 4269, 4303, 4311-4314, 4386; *Rep. p. ix.*

*Proceedings of the Committee, Rep. p. xi et seq.*

**Prosecutions.** In the case of local prosecutions, the funds should be provided locally, *Wakley* 2296—Apathy of the public in regard to undertaking prosecutions under the Bread Act, *Carpenter* 2442-2446; *Rodgers* 3268-3271, 3275, 3276; *Postgate* 4295-4297, 4344, 4345; *Hassall* 4455, 4456—As a general principle, the adulteration of food, as affecting an individual, and not a public body, is not an indictable offence, *Goodman* 3925-3928, 3938, 3941, 3942, 3958-3969—The rich, as well as the poor, are unwilling to prosecute, *ib.* 3965-3968—The proposed analyst or inspector should report the result of his analyses to the magistrate, and should initiate the legal proceedings, *Postgate* 4290-4294—See also *Central Board.*

**Prussia.** All persons selling articles of food or drink which they know to possess properties injurious to health are subject to fine or bodily punishment, *Rep. p. vi.*—Drugs can only be dispensed by apothecaries legally appointed, *ib.*

**Public, The.** See *Health. Poorer Classes. Preventive Measures.*

**Publicity.** Less adulteration in consequence of the present inquiry, previously to which the practice was on the increase, *Taylor* 228, 231—Main importance of publicity as a check upon adulteration; suggestions hereon, *Taylor* 229; *Wakley* 2209-2216, 2218, 2219, 2257; *Bell* 2385, 2386; *Postgate* 4291, 4298; *Hassall* 4447-4452; *Rep. p. viii.*—Publicity desirable when articles are found to be free from adulteration, *Wakley* 2214—Doubt as to any good result being produced by the publicity of the Committee, *Bell* 2408, 2409.

Instance of the successful effect of the principle of publicity, *Carpenter* 2454-2456—Increase of adulteration of late years, through the publicity given by publications on the subject several years ago, *ib.* 2517, 2518—In cases of conviction, a notice of the conviction should be placed in the shop-window of the offending party, *Rodgers* 3274; *Hassall* 4438—There should be power to publish the names of the offenders, *Rep. p. viii.*

See also "*Lancet,*" *The. Press, The. Registration of Tradesmen.*

**Pyroligneous Acid.** Doubt as to the advantage of substituting pyroligneous acid for vinegar, *Taylor* 177, 178.

## Q.

**Quack Medicines.** Great demand for secret or quack medicines; they do an immense deal of mischief, and should be rendered illegal, *Taylor* 182-187; *Neligan* 1870, 1877, 1878; *Bell* 2396-2404—Less use of quack medicines in Ireland than in England, *Neligan* 1868—Disapproval of the tax now levied on quack medicines, as tending to encourage their sale, *Bell* 2400-2402—Injurious effect of patent or quack medicines upon the public health, *Drew* 3166-3168, 3180-3183, 3191.

**Quassia.** See *Beer, 1.*

**Quckett, Professor John Thomas.** (Analysis of his Evidence.)—Professor in the Royal College of Surgeons, 392—Has examined several articles microscopically, more particularly with a view to their structure, 393-395, 409, 410, 424, 429—Examined milk five or six years ago, when he found in it an admixture of calves' brains; in recent examinations the only extraneous matter has been water, 395-403, 429-431—Has found chicory and beans in coffee; until lately indeed chicory was almost always to be found in cheap coffee, 404-409.

Grocers and others have sought witness's opinion relative to statements in the "*Lancet,*" which statements he has confirmed, as to the articles in question being adulterated, 409, 417-419, 432, 433—By microscopic examination, witness has found potato starch and bean starch in bread, but cannot detect alum by such examination, 411-416—Belief as to porter being sometimes adulterated with a mineral substance, 420-424—Cream, like milk, is not adulterated save with water, 425, 426.

**Quinine.** Witness has found chalk and starch in quinine, *Bingley* 4096.

Report, 1856—continued.

## R.

**Red Lead.** Injurious quantity of red lead detected by witness in curry powder and cayenne pepper, *Hassall* 4527-4533.

**Red Precipitate.** Extensive and injurious adulteration of this article, *Bastick* 859-862.

**Registration of Tradesmen.** Suggested system of registration in connexion with a system of publication of names, so that the public might distinguish between honest and dishonest traders, *Postgate* 4238, 4243-4247, 4291.

**Retail Traders.** Sale by many chemists of adulterated articles unwittingly, *Bastick* 877-880—If the retail dealer selling adulterated drugs gave up the name of the wholesale dealer who supplied him, he should be exonerated, *Wakley* 2294, 2295—The retail seller of drugs, &c. is mainly to be checked, *Richter* 3792, 3794; *Postgate* 4350, 4353, 4381-4386—Propriety of concluding that the retailer should be conversant generally with the quality of the articles obtained by him from the wholesale dealer, *Postgate* 4311-4317—Course advisable in the event of goods adulterated by the wholesale dealer being sold unknowingly to the retailer, *Hassall* 4670-4672, 4679.

## RHUBARB:

1. *Cultivation of Medicinal Rhubarb in England.*
2. *Quality and Price respectively of the Home and Foreign Article.*
3. *Sale of English Rhubarb as such, or in substitution for Foreign Rhubarb.*
4. *Adulteration of Powdered Rhubarb.*

1. *Cultivation of Medical Rhubarb in England:*

Large cultivation of rhubarb in this country, on the recommendation, probably, of Dr. Pereira that it might be substituted for Turkey rhubarb, *Blyth* 720-728.

Witness is a grower of English rhubarb at Boddicott, near Banbury, *Usher* 1568, 1569—English rhubarb was first grown in 1789, when it was introduced by Mr. Hayward of Banbury, *ib.* 1570—It has been extensively used as a medicine since 1811, when the plants were bought by witness's father, *ib.* 1571, 1572—The culture is rather expensive, *ib.* 1573—It is a different article from the ordinary garden rhubarb, *ib.* 1574-1576.

There is but one other grower, also near Banbury, besides witness, *Usher* 1594—The soil near Banbury is particularly well suited for the cultivation, *ib.* 1595—The plants are similar to those originally introduced in 1789, *ib.* 1596.

2. *Quality and Price respectively of the Home and Foreign Article:*

In proof that English rhubarb is a valuable medicament, and that it is not much inferior to foreign rhubarb, witness adduces the testimony of the late Dr. Pereira, of Mr. Tustin, dispenser at the London Hospital, of Professor Redwood, and of Dr. Thompson, as contained in his "London Dispensatory" of 1837, *Usher* 1577-1580, 1587-1590—Exclusive and successful use of English rhubarb in the London Hospital for the last thirteen years, *ib.* 1577, 1578, 1591, 1592—Relative prices of English and foreign rhubarb; inaccuracy of statements hereon by Mr. Warrington and Mr. Herring, *ib.* 1581-1584—Importation of inferior foreign rhubarb in 1846, adverted to, *ib.* 1584-1586.

High price of Russia rhubarb as compared with English rhubarb, *Bell* 2336-2339; *Drew* 3006, 3007—Different qualities and different prices of rhubarb; there is no need of adulteration, *Atkinson* 2894-2899—English rhubarb by no means possesses the good properties attributed to it by Dr. Pereira, and the other authorities at the London Hospital, *Drew* 3014, 3015, 3017, 3024, 3025.

3. *Sale of English Rhubarb as such, or in substitution for Foreign Rhubarb:*

The consumption of English rhubarb is gradually increasing, *Usher* 1593—Doubts as to English rhubarb being sold as foreign rhubarb, *ib.* 1597—Sale of English rhubarb chiefly as Turkey rhubarb, *Gay* 1650, 1651, 1695-1697—Exaggerated character of the evidence given relative to the adulteration of foreign rhubarb, and the use of English rhubarb, *Drew* 3002-3006, 3009, 3019-3030; *Allen* 3877-3879—Large quantities of English rhubarb used as such by Irish poor law unions, *Drew* 3005, 3910-3913.

4. *Adulteration of Powdered Rhubarb:*

In the case of powdered rhubarb, witness has detected an adulteration of turmeric and wheat flour, *Hassall* 4398.

**Richardson, Reginald John.** (Analysis of his Evidence.)—Officer of the Local Board of Health at Newton Heath, Manchester, 2151, 2152, 2167-2169—Considerable extent to which the practice of slaughtering diseased animals is carried on by some butchers at Newton Heath; the meat, which is most unwholesome, is sold to the public in various forms, 2153-2166, 2172-2174—Witness has two sub-inspectors, practical butchers, to accompany

*Richardson, Reginald John.* (Analysis of his Evidence)—continued.

accompany him in his visits of inspection to the slaughter-houses, on whose opinion he relies in seizing and condemning bad meat, 2157, 2158, 2163, 2170, 2171.

Diseases produced by the consumption of diseased meat, 2174, 2191, 2192, 2196—Heavy penalties inflicted under the local Act in the event of convictions for selling bad meat, 2176, 2193-2195—The lower classes still buy diseased meat, notwithstanding the convictions, their poverty probably compelling them to do so, 2177-2181.

Vague and unsatisfactory state of the present law for preventing the sale of bad meat, 2182, 2190, 2191—There should be a central Board in London with provincial Boards in large towns, to whom meat might be sent for chemical analysis, 2182-2184, 2196—There should be power to search for and seize diseased meat, wherever it can be found, as well as in slaughter-houses, 2184-2186—The power of dealing with diseased meat should be so extended as not to be dependent merely upon local Acts, 2187, 2188.

There are five knackers' yards at Newton Heath, and it is a constant practice to sell the best parts of the horse to mix with potted meat, and sausages, 2197-2200.

*Richter, Emil.* (Analysis of his Evidence.)—Doctor of philosophy under a German diploma, 3774, 3775—Is analytical and managing chemist to Messrs. Savory & Moore, 3776—Outline of the system pursued in Germany whereby chemists are well educated and drugs are sold in a pure state, and at a fixed price, 3777-3782, 3806-3830, 3843-3854—Importance of a much higher state of education of chemists and druggists in this country, 3783-3787—Expediency of dealing with adulteration in the germ, and of checking the power and the inducement to defraud, 3783-3789, 3831-3833—Beneficial operation of the Pharmaceutical Society adverted to, 3784, 3785—Also of the press, as a means of exposing impure drugs, 3785, 3786.

Recommended system of inspection of chemists' and druggists' shops, 3787, 3789-3794—Suggestions for the adoption of a system of licensing, whereby not only would there be a check against unqualified chemists, but funds would be raised towards defraying the expense of inspection, 3787-3790—Corrective measures should be gradually carried out, 3789-3794—Inexpediency of prohibiting the importation of impure drugs, 3791-3793, 3834-3838—The retail seller of the article is mainly to be checked, 3792-3794.

Suggestion that, in lieu of the three Pharmacopœias of London, Dublin, and Edinburgh, there should be but one Pharmacopœia applicable to the three countries, 3795-3801—Different Pharmacopœias on the Continent adverted to, 3802, 3803, 3807—With reference to poisons, witness recommends the adoption generally of a peculiarly constructed bottle for containing poison, such plan having been successfully adopted by Messrs. Savory & Moore, 3803-3805—Adoption, in Germany, of a Latin nomenclature of drugs, except as regards the physician's directions accompanying the prescription, which directions are in German, 3839-3841—Question as to the propriety of a Latin nomenclature, 3841, 3842.

*Right of Search.* Expediency of a right of entry to houses without a warrant from a magistrate, *Wakley* 2216-2218; *Goodman* 3943.*Ripley, Philip.* (Analysis of his Evidence.)—Tea-broker; has been 10 years in China, 1879-1882—Belief that at the present time tea, both in China and this country, is free from adulteration, 1883, 1884, 1911, 1931-1933—Adulteration previously to the discontinuance of the manufacture of lie tea, which, when witness left China in 1854, was no longer made, 1884, 1888, 1902, 1909, 1910—Substances from which lie tea was made; these were not deleterious, 1884, 1887, 1888—Large importation of lie tea from China during the years 1847 to 1851; 1884, 1885, 1897-1901—Stop to the importation of lie tea on its spurious character becoming generally known; specimens of it were sent by witness to the exhibition of 1851; 1885-1911.

Explanation relative to the facing or colouring of green teas, to the effect that the same is not at all injurious to health, and cannot be considered an adulteration, 1911-1930—Mode of manufacture of green tea; belief that it comes from the same plant as black tea, 1917-1925—Check upon the importation, but not upon the exportation of adulterated tea, 1934, 1935—Variation in the price of tea at Canton and in England, adverted to in connection with the quantity produced, 1936-1942—As broker for the sale of tea to any party, witness would not consider himself answerable in the event of adulteration, 1943-1949.

*Robertson, Alexander.* (Analysis of his Evidence.)—Particulars as to witness having sent two loaves of bread to Dr. Normandy for analysis, one of which contained alum and one was free from it; and as to Dr. Normandy having reported as the result of his examination that both loaves were without alum, 3605-3624—Great improbability of the miller having already mixed alum with the flour of which these loaves were made, 3621-3633.

ROCHDALE :

## ROCHDALE :

1. Co-operative Society for the Supply of Flour.
2. Co-operative Society for the Supply of Provisions.

## 1. Co-operative Society for the Supply of Flour :

Witness is bookkeeper and traveller to a corn-mill society at Rochdale, *Farrant* 1200-1202, 1239, 1248—The society was established in order to meet the demand of the public for a pure article, *ib.* 1203-1208—Loss of 450 *l.* by the society during the first nine months of its existence, on account of the dissatisfaction felt with the dark colour of the bread, through the absence of alum in the flour, and some defect in the grinding, *ib.* 1209-1211, 1244-1260, 1263-1268—The price of the flour made by the society was about the same as that of the trade, *ib.* 1212, 1213.

Particulars as to the society having at the end of nine months resorted to the use of alum in order the better to sell their flour, and to prevent further loss; complete success of this experiment, which was continued in practice for three years, *Farrant* 1214-1218, 1261, 1262, 1269-1272, 1287, 1288, 1296, 1297, 1302-1315—Disuse of alum by the society chiefly in consequence of convictions against some persons in other places for using it, *ib.* 1219-1222, 1298-1300, 1319—After three years' use of alum the society returned to the sale of pure flour, the prejudice against the colour having, to a great extent, been removed; further increase of business under this arrangement, *ib.* 1221-1229, 1272-1279, 1292, 1293, 1298-1300—Rice is now put into the flour, but witness does not consider this an adulteration, *ib.* 1221, 1280-1282, 1286, 1316, 1317, 1332-1343.

Constitution and general operation of the society, which numbers about 300 members, *Farrant* 1230-1239, 1344-1347—The mill was established in 1851, *ib.* 1240—Legal check only upon adulteration by the society, *ib.* 1283—The flour of the society is used chiefly by shareholders; how distributed, *ib.* 1289-1291, 1294—About 10,000 persons use the flour, *ib.* 1295—Witness has never heard that the alum when used was unhealthy, *ib.* 1303-1306—Partial disuse of alum by the bakers when the society left it off, *ib.* 1311, 1312.

## 2. Co-operative Society for the Supply of Provisions :

Particulars relative to a co-operative society in Rochdale with which witness is connected, established in 1844, for the purpose of supplying the members, who are all working men, with pure provisions, and for retaining the profits among themselves; beneficial and successful operation of this society, the annual returns of which are about 70,000 *l.*, *Farrant* 1347-1397.

Use for a time, by the society, of chicory, in the coffee sold to the members; stop put to the practice by the members on its becoming known to them, *Farrant* 1356-1366—Articles are sold as near the trade price as possible, *ib.* 1368—The society pays, in the first instance, a dividend of 5 *l.* per cent., and generally a further dividend of about 1 *s.* in the pound, *ib.* 1382—No member can take less than five shares, or more than 100; the shares are 1 *l.* each, 1283—The capital is from 7,000 *l.* to 8,000 *l.*, *ib.* 1384.

*Rodgers, Julian.* (Analysis of his Evidence.)—Analytical chemist and surgeon, residing in St. George's-road, Pimlico, 3255—Has paid considerable attention to the question of adulteration, more especially of bread and beer, 3256 *et seq.*—As regards bread, has recently examined a considerable number of samples, comprising the description used in workhouses up to that used at Buckingham Palace, and has in every case detected alum, 3257, 3279, 3280—Precautions necessary in the detection of alum, 3257—Impression that the quantity of alum used varies from eight ounces to two pounds in a batch of 116 loaves, 3257, 3294-3296.

Evidence showing that alum in bread, though used in very small quantities, is decidedly injurious to health, 3258-3264, 3273, 3286, 3289, 3309—The main objects in using alum are to enable bakers to use very inferior kinds of flour, and to cause loaves when baked in batch to separate nicely, 3264, 3265, 3301-3306, 3315—Rice is largely used in bread, in order to add to the weight by the absorption of water, 3266, 3267.

Inoperative character of the present law relative to the adulteration of bread in the metropolis, 3268-3271, 3275, 3276—Expediency of a system of public inspection; nature of the system suggested, 3272-3274—In cases of conviction, a notice of the conviction should be placed in the shop window of the offending party, 3274—The expenses of carrying out public inspection, might be defrayed, by making tradesmen pay a small license fee yearly, 3274.

The cheaper the bread the larger the amount of alum, 3277—Whatever the price of wheat, there is the same use of alum, 3281—The only advantage of alum is that it prevents bread from turning mouldy, 3285-3288—The means for detecting alum are not so simple that the public can adopt them; such means explained, 3290-3293, 3297-3300, 3316, 3317—Willingness of respectable bakers to submit to a system of inspection, 3310—The heat in baking would not prevent powdered alum from appearing in a crystalline form, 3311, 3312—The practice of adulterating with alum is prevalent with millers, 3313.

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Report, 1856—continued.

*Rodgers, Julian.* (Analysis of his Evidence)—continued.

As regards beer, witness has recently undertaken some analyses, and feels certain that he will be able to detect cocculus indicus, 3318-3324. 3338, 3339—Large importation of cocculus indicus for no use so far as witness is aware, except admixture with beer; its importation should be prohibited, 3325-3329. 3347-3351. 3357, 3358—Facility for obtaining cocculus indicus; it is specially prepared by some druggists for publicans and small brewers, and is sold under the name of "multum" and "hard mixture," 3330-3337. 3352-3356—Instance of a publican on entering business being offered a receipt for making three barrels of beer out of two, 3337—Nature of the test employed by witness for detecting cocculus indicus, 3338-3341.

Restrictive measures necessary in respect to the sale of poisons, 3359-3368—It should be indispensable that the purchaser be always accompanied by some one known to the vendor, or that he be furnished with an order from his medical man, 3359. 3364-3366—Belief that secret poisonings are more numerous than is generally supposed, 3361-3363—Defective regulations with regard to the investigation of poisons in cases of coroners' inquests, 3363.

*Rum.* Fraudulent though not injurious dilution of rum and gin with water, *Hassall* 4535-4538—Injurious quantity of cayenne pepper found by witness in gin and rum, *ib.* 4539-4543.

## S.

*Saffron.* Adulteration of saffron with saff-flower, *Bastick* 862.

*Sale of Poisons.* Care taken generally by chemists to prevent danger in the sale of poisonous substances, *Taylor* 24—Suggestions recently made by witness, and about to be enforced in Ireland, for distinguishing dangerous from harmless medicines, and external from internal applications by keeping them in differently shaped bottles, *Neligan* 1797-1801.

Witness differs from Dr. Neligan's suggestions as to differently shaped bottles, &c., and considers that the best safeguard is that of marking the word "poison" upon everything which is poisonous, *Bell* 2349-2357.

Restrictive measures recommended by witness in respect to the sale of poisons, *Rodgers* 3359-3368—It should be indispensable that the purchaser be always accompanied by some one known to the vendor, or that he be furnished with an order from a medical man, *ib.* 3359. 3364-3366.

Witness recommends the adoption generally of a peculiarly constructed bottle for containing poison, such plan having been successfully adopted by Messrs. Savory & Moore, *Richter* 3803-3805.

Urgent importance of restriction upon the sale of poisons, some of the most violent poisons being now readily obtainable, *Rep. p. ix*—Nature of the restriction suggested, *ib.*

*Samples for Analysis.* Means for guarding against abuse in the purchase of samples for analysis, *Carpenter* 2513-2516—Samples should be procured by persons under the local Boards of Health, *Rodgers* 3274—Expediency of providing that fraud is not practised by the person selecting the samples for analysis, *Bingley* 4194-4197—Advantage of a plan of sealed samples, *ib.* 4195-4197—Suggestion that a portion of each sample be entrusted to the care of the town clerk, so as to be produced in case of dispute, *Postgate* 4238. 4300.

*Sarsaparilla.* Fraud in the importation from America of an article under the name of sarsaparilla which is not sarsaparilla, *Drew* 3196, 3197.

*Sausages.* There are five knackers' yards at Newton Heath near Manchester, and it is a constant practice to sell the best parts of the horse to mix with potted meats and sausages, *Richardson* 2197-2200.

*Scammony.* General adulteration of scammony with chalk and flour, *Bastick* 843, 844—There is great difficulty in getting pure scammony, *Challice* 1537—Considerable adulteration both before and after importation, *Neligan* 1740-1746—Scammony was never pure twenty years ago, *Bell* 2321—Extent of the adulteration at the present time, *ib.* 2321-2325.

Great difference in the price and quality of scammony, *Bell* 2322; *Drew* 3106-3109. 3115-3121—Exaggerated character of the evidence as to the adulteration, *Drew* 3110-3114—Doubt as to the mode of disposal of the really worthless scammony, *ib.* 3122-3128—Witness has found an admixture of chalk, *Bingley* 4096—Considerable adulteration detected by witness in compound scammony powder, *Hassall* 4398.

See also *Drugs. Impurities.*

*Scarborough.* Injurious adulteration of bread in this town, *Postgate* 4221, 4222.

Scheele's

Report, 1856—continued.

*Scheele's Green.* Extensive and injurious use of the substance termed Scheele's green in colouring confectionery, and for other purposes; poisonous property of this mineral, *Taylor* 4-8—Less use of Scheele's green since the date of the present inquiry, *ib.* 4, 5—Propriety of checking the use of this substance, *ib.* 7, 8.

*Scholefield, Mr.* Report proposed by the Chairman of the Committee, *Rep. p. xiv-xix*—The same adopted, with some amendments, *ib. p. xxvi, xxvii.*

*Scoffern's Sugar-refining Process.* Discontinuance in this country and in two of the colonies of Scoffern's process of sugar-refining on account of its involving the use of acetate of lead which was pronounced by witness and others to be injurious to health, *Carpenter* 2454-2458.

*Secret Medicines.* See *Patent Medicines. Quack Medicines.*

*Secret Poisonings.* Belief that secret poisonings are more numerous than is generally supposed, *Rodgers* 3361-3363—Defective regulations with regard to the investigation of poisons in cases of coroners' inquests, *ib.* 3363.

*Senna.* Cessation of adulteration of senna, through measures adopted by the Pharmaceutical Society, *Bell* 2326—Almost all senna used to be adulterated with cyan-chum, *ib.*

*Sheffield.* Impression that there is not any large amount of injurious adulteration at Sheffield, *Bingley* 4160-4164. 4170-4172.

*Sherry Wine.* Belief as to the manufacture of sherry out of brandy and water, *Challice* 1502-1504.

*Snuff.* Adulteration of snuff with various chromates, red lead, lime, and powdered glass, *Rep. p. iv.*

*Soap.* Large adulteration in soap as supplied to poor-law unions, *Calvert* 2122, 2123.

*Spain.* Witness lays before the Committee a summary of the regulations adopted by the Spanish government in December last, in order to prevent the importation of adulterated drugs sent from this country, *Wise* 3432-3434—Regulations in Spain with regard to the dispensing of medicines, *ib.* 3432—All prescriptions must be written in the native language, *ib.*—Regulations with regard to patent or secret medicines, *ib.*—Reference by the Committee to the Spanish law, *Rep. p. vi.*

*Spices.* Belief that spices are not adulterated, as alleged by Dr. Hassall in 1855, *Drew* 2963-2965.

*Stamp Duty.* Persons professing to sell genuine articles should pay a stamp duty, *Drew* 3196-3198.

*Strychnia.* See *Beer, 1. 4.*

*Substituted Articles.* Difficulty of dealing with cases in which articles of food not necessarily unwholesome or inferior are sold as substitutes, such as Tahti arrowroot for Bermuda arrowroot, &c., *Taylor* 190-200. 209-212—Instances of conviction against parties for selling goods under false pretences, that is, for substituting one article for another, *Goodman* 3929-3933—Though the substitution of one article for another may not be adulteration, it equally requires legislative interference, *Hassall* 4655-4661.

*Sugar.* Denial of the accuracy of evidence as to the extent of adulteration in sugar; witness has never detected any adulteration, *Abbiss* 291-300—Witness has generally found the moist sugar supplied to poor-law unions to be pure, *Calvert* 2123—Sugar is rarely adulterated, *Woodin* 2759-2769—Presence of insects, called acari, in all brown sugars adverted to as showing the desirableness of using refined or crystallised sugars, *Hassall* 4626-4634—Grape sugar is present naturally in cane sugar; it has also been introduced intentionally, *ib.* 4650.

*Sugar Confectionery.* See *Colouring Substances. Confectionery.*

*Sulphate of Copper.* Extensive adulteration of sulphate of copper with sulphate of iron, *Bastick* 850-854.—See also *Bread, II.*

*Sulphate of Lime.* Nature of the adulteration detected by witness therein, *Bingley* 4096.

*Sulphuric Acid.* Existence generally of arsenic in sulphuric acid as made from iron pyrites, *Taylor* 181.—See also *Vinegar.*

## T.

*Tartaric Acid.* Instance of substitution by the retail dealer of bisulphate of soda for tartaric acid, *Bastick* 875, 876.

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Taylor,

*Taylor, Professor Alfred Swaine.* (Analysis of his Evidence.)—Professor of medical jurisprudence and chemistry in Guy's Hospital for the last twenty-four years, 1, 2—As regards adulterations, has more particularly attended to the admixture of colours in confectionery, 3, 4—Extensive and injurious use of the substance termed Scheele's green in colouring confectionery, and for other purposes; poisonous property of this mineral, 4-8—Less use of Scheele's green since the date of the present inquiry, 4, 5—Propriety of checking the use of this substance, 7, 8.

Prussian blue and ultramarine (as used in confectionery) are not poisonous, 8—Noxious character of vermilion and red lead used in confectionery, *ib.*—Also of the yellow colouring matters of oxide of lead, chromate of lead, and sulphuret of arsenic, *ib.* Suggested substitution by law of harmless colouring matters for those now employed, 8, 9—Legislative interference in France for the prevention of injurious adulterations; substances prohibited; 10-13 229, 230, 235.

Extensive use by cooks and confectioners of essential oil of almonds, and of a compound termed almond flavour; these substances contain from six to twelve per cent. of prussic acid, and often lead to fatal results, 14-24—Incautious and improper manner in which these substances are sold, 14, 15, 22-24—The sale should be prohibited, or else the prussic acid should be extracted in the manufacture, 16-21.

Poisonous properties of compounds sold to imitate the flavour of Jargonelle pear, Ribstone pippin, &c., 25-28—Danger to health from the use of oxide of lead in hair dyes; instance thereof, 28—Danger in keeping preserved fruits in pewter-stoppered bottles, *ib.*—Frequent use, till lately, of sulphate of copper in pickles and preserved fruits, *ib.*—Also, till lately, of large quantities of oxide of iron for imparting a red colour to anchovies, 28-34.

As regards bread, witness has not, save in one instance, found alum therein; he has, however, found phosphate and carbonate of lime; nature of his experience on this point, 35, 36, 42-44—Injurious property of alum when introduced day by day into the human system, 37—Purity generally of flour as analysed by witness, 37, 43, 44—The baking powders, as used in what is called digestive bread, are not generally injurious to health, 38-40—Injurious property of the muriatic acid used in unfermented bread, 40, 41—Opportunity for largely adulterating bread by the use of bean flour, pea flour, and lentil flour, 45, 46, 49—Doubt as to any one having found in bread alum "in crystals the size of a large pea," 47, 48—Purity of ordinary and German yeast as analysed by witness, 50.

Considerable extent to which London ale and porter are adulterated by the retail dealers, the substances used being quassia, gentian, cocculus indicus, &c., 50-57—Intoxicating effects produced by cocculus indicus, 51—Greater purity of bottled beer than of draught beer, 55, 56—Belief that strychnia is not put into beer, 57, 58—Large quantity of cocculus indicus imported into this country and not used for legitimate purposes, 63-70.

Statement showing that damaged wines, such as bad claret and bad Italian red wines, are manufactured into London Port; the ingredients used are not actually injurious to health, 71-80—Witness has not analysed gin, but believes it to be largely adulterated, 80, 81—He has not found any adulteration in milk except water, 82, 83—Flour and annatto are mixed with cream, but these are not injurious, 83.

Dr. Carpenter and witness were consulted by Government in 1853 relative to the mixture of chicory and coffee, 84, 85—They came to the conclusion that there was nothing in chicory to affect health, 85—Also that in certain proportions the mixture was preferred by the public to genuine coffee, 85, 87-92—Also that it might be mixed with coffee up to a certain proportion without materially affecting the quality of the latter, 85—Properties and component parts of chicory; it is less nutritious than coffee, 85, 132-134—Preference given by witness to unmixed coffee, 87, 93-96.

The maximum admixture of coffee and chicory suggested by Dr. Carpenter and witness was ten ounces of coffee to six of chicory, 87-89, 103—Questions laid by Government before Dr. Carpenter and witness, and answers made by them thereto, 87, 145—If the vendor sell a mixed article, he should be obliged to state that it is a mixture, 88, 91—Practice in France in regard to the admixture of chicory with coffee, 98-102—Witness never detected more than fifty per cent. of chicory, 104-106.

How far more desirable to compel a separate sale of chicory and coffee than to adopt the maximum admixture suggested by Dr. Carpenter and witness; difficulty in properly securing the public from fraud under the former proposition, as compared with the inconvenience to them under the latter plan, 107-128, 135-145—Facilities for detecting chicory in coffee by means of the microscope existed long previously to 1851; 129-131.

Evidence on the subject of adulteration in isinglass to the effect that the gelatine, or patent refined isinglass made in this country is superior to the imported isinglass, 146-169—Inferior quality of Brazilian isinglass, as compared with Russian, for which it is often sold in this country, 146, 160—Means of detecting adulteration in isinglass or gelatine,

*Taylor, Professor Alfred Swaine.* (Analysis of his Evidence)—continued.

gelatine, 147, 152, 162, 163—How the patent isinglass is made, 148—Inferior quality of the gelatine, or isinglass, imported from France, 154-158, 161, 162.

Witness has found vinegar largely adulterated with sulphuric acid, 170-174—Doubt as to oil of vitriol having been found in vinegar in enormous quantities, 171, 174—Injurious effect in course of time of sulphuric acid as used in vinegar; means of detecting it, 173-176, 179-181—Doubt as to the advantage of substituting pyroligneous acid for vinegar, 177, 178—Expediency of a check upon the sale or manufacture of quack medicines, some pills largely sold being exceedingly injurious to health, 182-187.

Suggestion that there be a power to visit shops, &c., and take samples of articles for analysis, that there be a right of seizure of all noxious articles, and a fine if improperly used, 188, 209, 235, 236—System in France in regard to the infliction of fines; there is a cumulative penalty for a second offence, 188-190, 247—Suggestion that in cases of harmless adulterations, a ticket or label be placed on the article as sold to the public, explaining the admixture, 190, 209—Difficulty of dealing with cases in which articles of food not necessarily unwholesome or inferior, are sold as substitutes, such as Tahiti arrowroot for Bermuda arrowroot, &c., 190-200, 209-212—Reference to the analysis by witness of a cargo of indigo which was found to contain a large proportion of Prussian blue, 200, 201.

Difficulty in a system of penalties on account of the conflicting opinions of chemists as to the properties of substances, 206, 207, 223—Necessity of a careful chemical examination in order to distinguish between adulterations and accidental impurities, 207, 208—Propriety of all articles being sold under their genuine names, 211, 212—A central Board of five or more persons to decide upon adulterations generally is far preferable to a system of local analysts, one analyst, moreover, being inadequate to the task, 213-226, 234, 238-240.

The public health is no doubt much prejudiced by the adulteration of food, &c.; the evil, however, has been much exaggerated, 227—Less adulteration in consequence of the present inquiry, previously to which the practice was on the increase, 228, 231—Advantage of publishing the names of parties convicted of adulteration, 229—Adulteration results in a great measure from competition in price, 232, 233—The members of the proposed Board should have a fixed salary, 237—Possibility of the public placing too much reliance on the certificates of the Board as to the purity of any article sold by a particular tradesman, 241-246.

## TEA:

- I. *As to Adulteration generally in Black and Green Teas:*
  1. Evidence to the effect that there is no Adulteration.
  2. Evidence to a contrary Purport.
- II. *As to "Lie" Tea:*
  1. Denial that it is now Imported.
  2. Statement in proof of Importation.
- III. *Manufacture of Tea in this Country.*
- IV. *Colouring of Green Tea; how far injurious.*
- V. *Cause of Variation in Price.*
- VI. *Remedial Measures considered with a view to purity of Supply.*

I. *As to Adulteration generally in Black and Green Teas:*

1. Evidence to the effect that there is no Adulteration:

Statement that tea is generally sold in this country in a pure state; experience on which this statement is grounded, *Abbiss* 250-252, 256-269, 276-290; *Weston* 1953 *et seq.*; *Locock* 2014 *et seq.*—Witness tests the genuineness of his tea by the taste alone, *Abbiss* 265-269, 276, 285—Use by the Chinese of Prussian blue, &c., for facing green tea; this cannot be considered an adulteration; *ib.* 253-255, 274, 275; *Ripley* 1911-1930—Tea, generally speaking, is pretty good, *Challice* 1518.

Believe that at the present time tea, both in China and this country, is free from adulteration, *Ripley* 1833, 1834, 1911, 1931-1933—Concurrence in the statement that tea is now imported in a pure state, *Weston* 1953, 1954; *Locock* 2013, 2018-2020—There is scarcely any adulteration practised in this country, and tea, as it reaches the consumer, is purer than any other article, *Weston* 1956, *et seq.*

2. Evidence to a contrary Purport:

Supply through the Co-operative Central Agency (conducted by witness) of a chest of pure green tea to one of the country stores in connexion with it; dissatisfaction given thereby, it being erroneously considered inferior to some green tea previously in use, which was however nothing but coloured black tea, *Woodin* 2527, 2528—Feeling throughout the manufacturing districts in favour of spurious tea, as compared with the genuine tea sought to be sold through the Central Agency, *ib.* 2528, 2610, 1611—Difficulty of the Central Agency in selling genuine tea in 1851, *ib.* 2534.



TEA—continued.

## I. As to Adulteration generally in Black and Green Teas—continued.

## 2. Evidence to a contrary Purport—continued.

Compilation and publication by witness in 1851, of facts bearing upon the adulteration of tea, &c., in order to undeceive consumers in the manufacturing districts, *Woodin* 2528, 2529—Extract from this book, relative to the adulteration of tea in this country and in China, *ib.* 2530-2532—False names under which bohea and twankay are now generally imported, *ib.* 2532-2536—Statement by witness in 1851, that 2,876,388 lbs. of spurious tea are consumed in this country, *ib.* 2532—Improvement since 1851 in regard to the quality of tea sold to the public, *ib.* 2533.

Importation and sale of woping and bohea under the title of a better grade of tea, *Woodin* 2536-2568—Composition of Canton bohea out of congou and woping, *ib.* 2546-2549, 2561-2565—How far there is any difference between woping and bohea, *ib.* 2540-2549, 2560-2565—Sample of naturally green tea produced, *ib.* 2642, 2643—Low opinion entertained of the English by the Chinese for drinking painted and spurious teas, *ib.* 2674, 2731—Very small extent to which frauds are practised in this country with regard to the adulteration of tea, *ib.* 2715-2717, 2724, 2725—Difficulty of procuring genuine green teas from China, *ib.* 2747-2750.

The adulteration or mixture of inferior with good teas is chiefly practised by small dealers, *Divett* 3211—Witness has found catechu in tea, *Postgate* 4280—Samples of adulterated tea produced and explained, *Hassall* 4390, 4653—Size and structure of the tea leaf adverted to, *ib.* 4568-4575, 4638, 4639—Discovery by witness of sulphate of iron in tea, *ib.* 4597-4601.

## II. As to "Lie" Tea :

## 1. Denial that it is now Imported :

Belief that lie tea is not now imported, *Abbiss* 270-273—Adulteration in China previously to the discontinuance of the manufacture of lie tea, which, when witness left the country in 1854, was no longer made, *Ripley* 1884, 1888, 1902, 1909, 1910—Substances from which lie tea was made; these were not deleterious, *ib.* 1884, 1887, 1888—Large importation of lie tea from China during the years 1847-1851, *ib.* 1884, 1885, 1897-1901—Stop to the importation of lie tea on its spurious character becoming generally known; specimens of it were sent by witness to the exhibition in 1851, *ib.* 1885-1911.

Witness has not met with lie tea since 1852, when some which cost the importer 1 s. a pound was sold at 6 d. a pound, *Weston* 1954, 1955—Discontinuance of the importation of lie tea and junk tea as unprofitable, adverted to, as showing the power of the public to prevent adulteration, *ib.* 1968, 1974-1990, 2008—The junk tea not being saleable, save in a small proportion, was mainly exported to Holland, *ib.* 1977-1985—There is now no demand for lie tea, and it is not imported, *Locock* 2057-2059, 2070—Lie tea pays duties as tea; impropriety thereof, *ib.* 2060-2062, 2067, 2068.

## 2. Statement in proof of Importation :

Evidence showing that lie tea is still, or has been till very recently largely imported from China, *Woodin* 2570-2611, 2628-2636, 2732-2746—Facility for procuring lie tea at the trade auctions in Mincing-lane, *ib.* 2574-2576, 2732-2735—There are two kinds of lie tea imported; component parts of each, *ib.* 2577—Check upon the importation and sale of lie tea through the exposures in the "Lancet," and before the Committee, *ib.* 2584, 2606-2608, 2612, 2613, 2620, 2628-2636, 2640, 2740-2746, 2751, 2752—Price at which, and name under which lie tea has been sold in the poorer districts, *ib.* 2624—There are no means of ascertaining the actual quantity imported, *ib.* 2637-2641, 2736, 2737—Lie tea cannot be made worse by the retailer, *ib.* 2668.

Witness attends before the Committee, in consequence of information received from a respectable London tea dealer, in order to controvert the allegation that lie tea is not now imported, nor to be had in the market, *Divett* 3203-3206—Unwillingness of witness's informant to give evidence in person, *ib.* 3205, 3214, 3237—Particulars as to the information received from this person in proof of the recent importation and sale of different kinds of spurious or lie tea; samples of such tea (given by him to witness) laid before the Committee, *ib.* 3206, 3212-3253—Witness has no direct experience in regard to adulterated or lie tea, *ib.* 3210.

Use up to a recent period of lie tea, as proved by the purchase within the last few days of some tea containing a proportion of lie tea, *Hassall* 4390, 4391, 4640-4646.

## III. Manufacture of Tea in this Country :

Spurious tea has not been manufactured in England for some years, *Abbiss* 257, 258. Instances of ingenious adulteration of tea in this country, by turning what is called scented caper into pearl-leaf gunpowder, *Divett* 3206-3209—Data for the conclusion that exhausted tea leaves, and British and foreign leaves, other than those of the tea plant are mixed with tea leaves and sold as genuine tea, *Hassall* 4564-4596—Instances of seizures of exhausted tea-leaves by the Excise, *ib.* 4564, 4565—Stoppage within the last two years of some tea manufacture in this country by the Excise, *ib.* 4582-4591.

TEA—continued.

## IV. Colouring of Green Tea; how far injurious :

Mode of manufacture and colouring of green tea; belief that it comes from the same plant as black tea, *Ripley* 1917-1925—The colouring is not injurious to health, *Ripley* 1923-1929; *Weston* 2001—Different colouring matters, such as Prussian blue, &c. used in China for imparting the artificial green colour, *Ripley* 1930; *Woodin* 2645.

All genuine teas in China are of the same colour, *Woodin*, 2648-2653—Difference in the colour of black and green tea, adverted to as the effect of the manipulation, *ib.* 2651-2656—Small proportion of green tea imported without being previously artificially coloured, *ib.* 2671-2673, 2747-2750—Belief as to the artificial colouring of some of the green teas being injurious to health, *Woodin* 2674, 2710-2714, 2719-2723, 2726, 2727; *Hassall* 4635-4627—The practice of painting is not necessary in any case, and is only done to order by the Chinese, *Woodin* 2674-2676.

## V. Cause of Variation in Price :

Variation in the price of tea at Canton, and in England, adverted to as the result of variation in the quantity produced and imported, *Ripley* 1936-1942.

## VI. Remedial Measures considered with a view to purity of Supply :

Check at present upon the importation, but not upon the exportation of adulterated tea, *Ripley* 1934, 1935—As broker for the sale of tea to any party, witness would not consider himself answerable in the event of adulteration, *ib.* 1943-1949—Protection against the adulteration of tea in the taste of the public, *Weston* 1998-2008; *Locock* 2022-2033, 2043, 2066, 2076—If lie tea were sold as genuine tea, it would be a fraud, and means should be adopted to punish the seller, *Locock* 2034, 2035, 2072-2075—The wholesale dealer, the retailer, and the consumer can protect themselves against lie tea, and do not require legislative interference, *ib.* 2064-2075.

Suggested adoption of a system of *ad valorem* duties, *Woodin* 2567, 2568, 2662, 2690-2697—The importation of all painted or artificially coloured tea should be stopped altogether, *ib.* 2569, 2570, 2642 *et seq.* 2694-2697, 2708—Artificially coloured tea might be easily detected at the Custom-house, *ib.* 2647—Facility for distinguishing between different kinds and qualities of tea, *ib.* 2657-2661—The painting of teas in this country should be a punishable offence, *ib.* 2664-2666, 2709—It is not desirable nor possible to prevent the sale of mixed black teas of different qualities, *ib.* 2698-2706, 2718—The prohibition of painted teas would apply to lie tea, *ib.* 2728-2730.

See also *Ad Valorem Duties. Tysam Tea.*

*Thompson, Lewis.* (Analysis of his Evidence.)—Analytical chemist; is also a member of the College of Surgeons and a licentiate of the Apothecaries' Company, 434-437—Within the last eight months has examined samples of bread procured chiefly by working people at seventy-eight different shops, 438-440, 478—The constituents of alum were found in all these samples, but alum, as such, did not exist, 440-455—Erroneous impression produced by witnesses who have assumed that alum remains in bread after the process of baking; error of Liebig hereon, 447-455, 470-477, 491—Belief that the constituent parts of alum, as found in bread, are not injurious to health, 456-458, 491, 516, 522-524, 528.

Respects in which the admixture of alum is advantageous, 459-462, 500, 502-504, 525-527—The use of alum expressly for the purpose of improving the appearance of inferior flour, so that it may be sold as good flour, is not considered unjustifiable by witness, 462-464, 499-501, 506-510—The maceration of bread in water does not leave any taste of alum in the water, 465, 466, 469—Fallacious evidence given by Mr. Postgate before the Committee in 1855 (Q. 2123), as to means for detecting alum in bread; illustration in proof of this statement, 466-468—Erroneous evidence also of Dr. Normandy (Q. 568), as to the detection of alum, 468, 470-477.

Greater price per lb. of flour than of bread; explanation that 3½ lbs. of flour will make more than 4 lbs. of bread on account of the absorption of water, 478-484—Doubt as to bread with alum in it absorbing more water than bread without alum, 485-490—The use of alum in bread, unless much more largely than at present, does not call for legislative interference, 492-510, 529-538—Belief that it is quite notorious to the public that alum is always used in bread, and that notice by bakers of the fact would not diminish their trade, 511-521—Similar constituents of alum found by witness in bread lately bought by him in Paris, as in London bread, 516, 517, 522-524—Perceptive faculties of the lower classes adverted to, as showing that in the case of bread, beer, &c., taste is a great protection against adulteration, 533-539.

As regards beer, witness considers that adulteration is not practised by the brewer, 540—Belief that the only adulteration by the publican is the addition of some coarse sugar for the purpose of fermentation, 540-543—Profit derived through the fermentation produced by the sugar, 543, 593, 594—Witness has examined a great many samples of beer, and has never detected cocculus indicus, quassia, or gentian; these, however, 0.23.

*Thompson, Lewis.* (Analysis of his Evidence)—continued.

ever, cannot be detected chemically, 544-547. 549. 566-590—Belief that ales are adulterated with some bitter substance, though the same cannot be proved by chemical means, 545-548, 549. 570. 572.

Circumstance of cocculus indicus being largely imported into this country, for what purposes witness cannot say, 550-552. 600, 601—Rapid and stupifying effect of cocculus indicus contrasted with the stimulating effect of alcohol; inference that there can be no motive for putting it into beer, 552-565—Witness never found strychnia or morphia in bitter ales, 574, 575—The practice of adulteration would not, in the end, be beneficial to the publican, 581, 582. 591. 602, 603—Equally good and wholesome character of the retail as of the wholesale beer, 583—Probable use of sugar in the manufacture of beer adverted to as some explanation of the less use of malt and hops, 584-588—Ample profit of the publican without resorting to adulteration, 591-599.

In the case of vinegar, witness considers the adulteration has been greatly exaggerated, 604—Erroneous statement published by the "Lancet" in regard to the adulteration of vinegar manufactured by Messrs. Hall & Evans, of Worcester; tardy and meagre apology by the "Lancet" after the manufacturers had been put to considerable expense, 604, 605—Explanation of the test adopted by witness in order to ascertain the presence of sulphuric acid in vinegar, 605, 606—Simple means for testing the composition of pickles, 607—Belief that the great mass of the food of the country is not so adulterated as to cause disease, 608, 609.

Approval of legislative interference for the prevention of injurious adulteration; it must, however, be exercised with the greatest caution, and any tradesman prosecuted wrongfully should recover his expenses in the matter, 609-614. 638-658—Instances of proceedings wrongfully taken by the Excise in the case of tobacco and beer, to the great injury of the parties concerned, 614-617. 645. 651-656—Witness has often been employed against the Excise, 618, 619.

Adulterating ingredients sometimes found by witness in tobacco; how far injurious, 619-621. 626-635—Nature of the adulteration detected by witness in pepper, 622-626—Adulterations injurious to health should be more severely punished than those which are merely fraudulent, 650.

*Tobacco.* Adulterating ingredients sometimes found by witness in tobacco; how far injurious, *Thompson* 619-621. 626-635—Instance of conviction by the Excise for adulteration of tobacco, *Mackenzie* 4050, 4051—Summary power of the Excise in regard to tobacco, *ib.* 4053-4055—Belief nevertheless that tobacco is extensively adulterated, *ib.* 4056-4058.

*Tradesmen.* Great interest taken in the proceedings of the Committee by tradesmen, the great body of whom are anxious for legislative interference, *Wakley* 2205-2208. 2217, 2218.

*Turmeric.* Immense adulteration in the case of compound powder of turmeric, *Bastick* 868, 869—Belief that turmeric, as used in mustard, is not prejudicial to health, *Gay* 1613—Instance of adulteration of turmeric with a composition of chrome yellow, *ib.* 1621, 1622—Considerable adulteration of turmeric with yellow ochre and alkali, *Hassall* 4397, 4398.—See also *Annatto. Mustard.*

*Tysam Tea.* Manufacture at Canton, or somewhere up the country, of teas called Tysam, in imitation of the Assam teas, and sold as such in this country, *Woodin* 2676-2689.

## U.

*Unfermented Bread.* Injurious property of the muriatic acid as used in unfermented bread, *Taylor* 40, 41.

Doubt as to the expediency of interdicting unfermented bread, which is by some looked upon as an improvement upon the ordinary bread, *Callard* 3573-3575.

*United States of America.* See *Drugs*, 3. *New York, State of.*

*Unjust Convictions.* Nature of the protection or remedy which tradesmen should have against unjust or mistaken convictions by a public Sanitary Commission, *Wakley* 2259-2272.

*Usher, Rufus.* (Analysis of his Evidence.)—A grower of English rhubarb at Boddicott, near Banbury, 1568, 1569—English rhubarb was first grown in 1789, when it was introduced by Mr. Hayward, of Banbury, 1570—It has been extensively used as a medicine since 1811, when the plants were bought by witness's father, 1571, 1572—The culture is rather expensive, 1573—It is a different article from the ordinary garden rhubarb, 1574-1576.

In proof that English rhubarb is a valuable medicament, and that it is not much inferior to foreign rhubarb, witness adduces the testimony of the late Dr. Pereira, of Mr.

*Usher, Rufus.* (Analysis of his Evidence)—continued.

Mr. Tustin, dispenser at the London Hospital, of Professor Redwood, and of Dr. Thompson, as contained in his "London Dispensatory" of 1837; 1577-1580. 1587-1590—Exclusive and successful use of English rhubarb in the London Hospital for the last thirteen years, 1577, 1578. 1591, 1592—Relative prices of English and foreign rhubarb; inaccuracy of statements hereon by Mr. Warington and Mr. Herring, 1581-1584—Importation of inferior foreign rhubarb in 1846 adverted to, 1584-1586.

The consumption of English rhubarb is gradually increasing, 1593—There is but one other grower, also near Banbury, besides witness, 1594—The soil near Banbury is particularly well suited for the cultivation, 1595—The plants are similar to those originally introduced in 1789; 1596—Doubt as to English rhubarb being sold as foreign rhubarb, 1597.

*Uttoxeter.* Instances of rice flour sold as wheat flour at Uttoxeter; penalties inflicted on the millers, *Calvert* 2088. 2090, 2091.

## V.

*Verdigris.* Instances of adulteration of verdigris in Somersetshire forty-five years ago, *Wakley* 2204.

*Vinegar.* Witness has found vinegar much adulterated with sulphuric acid, *Taylor* 170-174—Doubt as to oil of vitriol (so called) being found in vinegar in enormous quantities, *ib.* 171. 174—Injurious effect in course of time of sulphuric acid as used in vinegar; means of detecting it; *ib.* 173-176. 179, 180—Use of corrosive sublimate as well as of sulphuric acid and oil of vitriol in vinegar, *Gay* 1662-1666—Adulteration of vinegar as imported from abroad, *ib.* 1709—A small quantity of sulphuric acid in vinegar is a serious adulteration, *Hassall* 4649.

Witness considers that the adulteration has been greatly exaggerated, *Thompson* 604—Erroneous statements published by the "Lancet" in regard to the adulteration of vinegar manufactured by Messrs. Hall & Evans, of Worcester; tardy and meagre apology by the "Lancet," after the manufacturers had been put to considerable expense, *ib.* 604, 605—Explanation of the test adopted by witness in order to ascertain the presence of sulphuric acid, *ib.* 605, 606.

See also *Pyroligneous Acid.*

## W.

*Wakefield.* Conviction of a miller near Wakefield for adulteration of flour with alum, *Jackson* 3735. 3743-3747.

*Wakley, Thomas.* (Analysis of his Evidence.)—Coroner for Middlesex, and editor of the "Lancet," 2201—Has paid considerable attention to the question of adulteration, and, in 1851, devoted a portion of the "Lancet" to the exposure of the practice, with a view to its prevention by the Legislature, 2202-2204—The practice has existed for a very long period, 2204—Extensive and dangerous adulteration practised about the year 1811, at a druggist's in Somersetshire, to whom at the time witness was articled as pupil; the articles adulterated were always sent to London, 2204, 2205. 2311.

Adulteration has of late years immensely increased, and will further increase upon the termination of the labours of the Committee, unless they take active steps for its suppression, 2204-2206—Great interest taken in the proceedings of the Committee by tradesmen, the great body of whom are anxious for legislative interference, 2205-2208. 2217. 2278—Main importance of publicity as a check on adulteration; suggestions hereon, 2209-2216. 2218, 2219. 2257—Inadequacy of the proceedings of the Excise for the prevention of adulteration, which they treat merely as a question of revenue, 2210-2213. 2234.

Machinery suggested in connexion with the General Board of Health for the detection and punishment of adulteration, 2213. 2227. 2258—Expediency of a right of entry to houses without a warrant from a magistrate, 2216-2218—Objection to the infliction of heavy penalties, 2218, 2219. 2304, 2305—Large number of names published in the "Lancet" as connected with the sale of adulterated articles; enemies made thereby by witness, though there was no prosecution against him, 2220-2225—Accuracy and fidelity with which the Sanitary Commission of the "Lancet" was conducted by Dr. Hassall, 2226. 2268.

Machinery suggested in connexion with local Boards of Health for the prevention of adulteration, 2227-2230. 2240-2242. 2289-2292—Inoperativeness of certain laws now in force for checking adulteration, 2233-2239—Uselessness of leaving it to the poor to detect and prosecute, 2236-2238—Necessity of educated persons for detecting adulteration; these might soon be found, 2239. 2291.

*Wakley, Thomas.* (Analysis of his Evidence)—continued.

Calculation that adulteration may be put down in London at an expense of 10,000 *l.* a year; *employés* suggested for the purpose, who should act on the principle of the "Lancet" Commission, 2242-2244. 2253-2272—Number of trades inquired into by the Commission, 2245, 2246—Course adopted in the purchase of samples for analysis, 2251—Nature of the protection or remedy which tradesmen should have against unjust or mistaken convictions by a public Sanitary Commission, 2259-2272.

In cases of difficulty, articles might be sent from the country to the central Board in London, 2275-2277. 2292.—Propriety of its being compulsory to sell all articles by their proper names, 2278-2281—Doubt as to the so-called isinglass made in this country being equal to the imported isinglass, 2280, 2281—The sale of naturally inferior qualities of goods should not be prohibited or punished, 2282, 2283—Injury to health by the adulteration of pickles, bread, and confectionery, 2285. 2299-2301—There is a great deal of adulteration in opium, scammony, and other drugs, 2286, 2287.

If the retail dealer selling adulterated drugs gave up the name of the wholesale dealer who supplied them, he should be exonerated, 2294, 2295—In the case of local prosecutions, the funds should be provided locally, 2296—The purchaser, rather than the seller, should be protected by the law, 2297, 2298—Objection to the system in Paris for preventing adulterations, 2302, 2303—Great advantage if chemists and druggists were licensed; they would not object to it, 2306-2308—Improvement in the drug trade through the operation of the Pharmaceutical Society, 2308-2310.

*Wax.* Constant adulteration of wax with spermaceti, or with some cheaper kind of fat, *Bastick*, 862.

*Weston, William.* (Analysis of his Evidence.)—Tea broker; has been in China, and has a large experience of the trade, 1950-1952—Concurs with Mr. Ripley, that adulterated tea is not now imported into this country, 1953, 1954—Has not met with lie tea since 1852, when some which cost the importer 1 *s.* a pound was sold at 6 *d.* a pound, 1954, 1955—Considers that there is scarcely any adulteration practised in this country, and that tea as it reaches the consumer is purer than any other article; experience on which this statement is grounded, 1956 *et seq.*—Discontinuance of the importation of lie tea and junk tea as unprofitable, adverted to as showing the power of the public to prevent adulteration, 1968. 1974-1990. 2008—Protection against the adulteration of tea in the taste of the public, 1998-2008—The colouring of green tea is not injurious to health, 2001.

*Wheat.* Better character of foreign than of English wheat, on account of the land producing a less quantity per acre, or being virgin soil, *Brown* 3437-3477-3496. 3507.

*White Precipitate.* Large and injurious adulteration in the case of white precipitate, *Bastick* 859. 862—Facility for detecting adulteration, *Baiss* 1026, 1027.

*Wichham, Edward.* (Analysis of his Evidence.)—Has been engaged in the brewing business in London and in the country, 3369-3373. 3392. 3397—Adulteration of beer mainly takes place in the cellar of the publican, 3372-3375—It is not practised by any large brewers in London, though it may be resorted to by some small brewers, 3372-3375. 3393. 3394—Publicans who do not adulterate form exceptions to the rule, 3376—Description of the usual adulteration by publicans, 3377-3382. 3391—Reference to adulteration as forming the main profit of the publican, 3383-3388. 3423, 3424.

Grounds for the belief that cocculus indicus is not used either by brewers or publicans in London, 3389-3406. 3413-3420—Use of cocculus indicus by small brewers in Derbyshire, 3407. 3421, 3422—Use of quassia and gentian for the sake of imparting a bitter flavour, 3408-3412—Use of copperas and roach alum in order to raise a froth, 3425-3428—If the Excise were to put in practice their power of inspection of publicans' cellars, the prevalence of adulteration would be greatly checked, 3428-3431.

*Wine.* Statement showing that damaged wines, such as bad claret and bad Italian red wines, are manufactured into London port; the ingredients used are not actually injurious to health, *Taylor* 71-80—Purity of port and sherry wines as examined by witness, *Blyth* 787-789—Printed recipe produced for making imitation of good port wine; explanation thereon; *Bastick* 895-904—Quality and price of the article sold as port wine, though only an imitation, *ib.* 924-946—Compound mixture sold to the poor as port wine; injurious properties thereof; *Challice* 1498-1501. 1505—Facility for detecting adulteration in port wine, *ib.* 1517—Difficulty of determining the amount of dilution which should constitute adulteration in the case of wine, *Hassall* 4661-4667.

See also *Sherry Wine.*

*Wise, John Aysford* (Member of the Committee). (Analysis of his Evidence.)—Lays before the Committee a summary of the regulations adopted by the Spanish Government in December last in order to prevent the importation of adulterated drugs sent from this country, 3432-3434—Regulations in Spain with regard to the dispensing of medicines, 3432—All prescriptions must be written in the native language, *ib.*—Regulations with regard to patent or secret medicines, *ib.*

*Wolverhampton.*

*Wolverhampton.* Extensive adulteration of articles sold in this town, *Postgate* 4223.

*Woodin, Joseph.* (Analysis of his Evidence.)—Grocer and tea-dealer for twenty-five years, 2521, 2522—For the last five years has been conducting the Co-operative Central Agency, established for the purpose of supplying unadulterated goods to the consumers, 2522-2525—Supply through the Central Agency of a chest of pure green tea to one of the country stores in connexion with it; dissatisfaction given thereby, it being erroneously considered to be inferior to some green tea previously in use, which was, however, nothing but coloured black tea, 2527, 2528.

Feeling throughout the manufacturing districts in favour of spurious tea as compared with the genuine tea sought to be sold through the Central Agency, 2528. 2610, 2611—Compilation and publication by witness, in 1851, of facts bearing upon the adulteration of tea, &c., in order to undeceive the consumers in the manufacturing districts, 2528, 2529—Extract from this book, relative to the adulteration of tea in this country and in China, 2530. 2532—Witness has never been in China, 2531—False names under which bohea and Twankay are now generally imported, 2532. 2536—Statement by witness in 1851, that 2,876,388 lbs. of spurious tea are consumed in this country, 2532.

Improvement since 1851 in regard to the quality of tea sold to the public, 2533—Difficulty of the Central Agency in selling genuine tea in 1851; 2534—Importation and sale of woping and bohea under the title of a better grade of tea, 2536-2568—How far there is any difference between woping and bohea, 2540-2549. 2560-2565—Composition of Canton bohea out of congou and woping, 2546-2549. 2561-2565—If there were an *ad valorem* duty on bohea the consumer could purchase it for 1 *s.* or 1 *s.* 4 *d.* a pound, 2567—Injustice to the poor man in spurious and inferior teas being palmed off upon him, such teas being subject to the same duty of 1 *s.* 9 *d.* a pound as the best teas, 2568. 2662. 2690-2693—The importation of all painted or artificially coloured tea should be stopped altogether, 2569, 2570. 2642 *et seq.* 2694-2697. 2708.

Evidence showing that lie tea is still, or has been till very recently, largely imported from China, 2570-2611. 2628-2636. 2732-2746—Facility for procuring lie tea at the trade auctions in Mincing-lane, 2574-2576. 2732-2735—There are two kinds of lie tea imported; component parts of each, 2577—Check upon the importation and sale of lie tea through the exposures in the "Lancet" and before the Committee, 2584. 2606-2608. 2612, 2613. 2620. 2628-2636. 2640. 2740-2746—Price at which, and name under which, lie tea has been sold in the poorer districts, 2597. 2608-2610. 2621-2624—There are no means of ascertaining the actual quantity of lie tea imported, 2637-2641. 2736, 2737.

Sample of naturally green tea produced, 2642, 2643—Colouring matters used in China for imparting the artificial green colour, 2645—Artificially coloured tea might be easily detected at the Custom-house, 2647—All genuine teas in China are of the same colour, 2648-2653—Difference in the colour of black and green tea adverted to as the effect of the manipulation, 2651-2656—Facility for distinguishing between different kinds and qualities of tea, 2657-2661—The painting of teas in this country should be a punishable offence, 2664-2666. 2709—The lie tea cannot be made worse by the retailer, 2668.

Small proportion of green tea imported without being previously artificially coloured, 2671-2673. 2747-2750—The practice of painting is not necessary in any case, and is only done to order by the Chinese; it is injurious to health, 2674-2676. 2710-2714. 2719-2723. 2726, 2727—Low opinion entertained of the English by the Chinese for drinking painted and spurious teas, 2674. 2731—Manufacture at Canton, or somewhere up the country, of teas called Tysam in imitation of the Assam teas, and sold as such in this country, 2676-2689—An *ad valorem* duty is not necessary if all painted teas be prohibited, 2696, 2697—It is not desirable, nor possible, to prevent the sale of mixed black teas of different qualities, 2698-2706. 2718.

Very small extent to which frauds are practised in this country with regard to the adulteration of tea, 2715-2717. 2724, 2725—The prohibition of painted teas would apply to lie tea, 2728-2730—Difficulty of procuring genuine green teas from China, 2747-2750—Effect of the exposures in the "Lancet," &c., in correcting the public taste in regard to tea, 2751, 2752.

With reference to coffee, it is contended that the admixture of chicory is prejudicial to the fair trader, the consumer, and the revenue, and should therefore be prohibited, 2753-2759. 2807—Coffee sold at 1 *s.* a pound generally consists of half chicory; fraud on the consumer thereby, 2755-2757—Lax morality in trade produced by the power of using chicory to any extent, 2759—Reference to sugar, to the effect that it is rarely adulterated, 2759-2769.

Belief that coffee is not adulterated with any other article than chicory, 2770. 2805—The annual consumption of chicory is about 12,000 tons, and of coffee about 18,000 tons, 2770—In the case of the society or agency to which witness belongs, it is found that

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Report, 1856—*continued.*

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*Woodin, Joseph—(Analysis of his Evidence)—continued.*

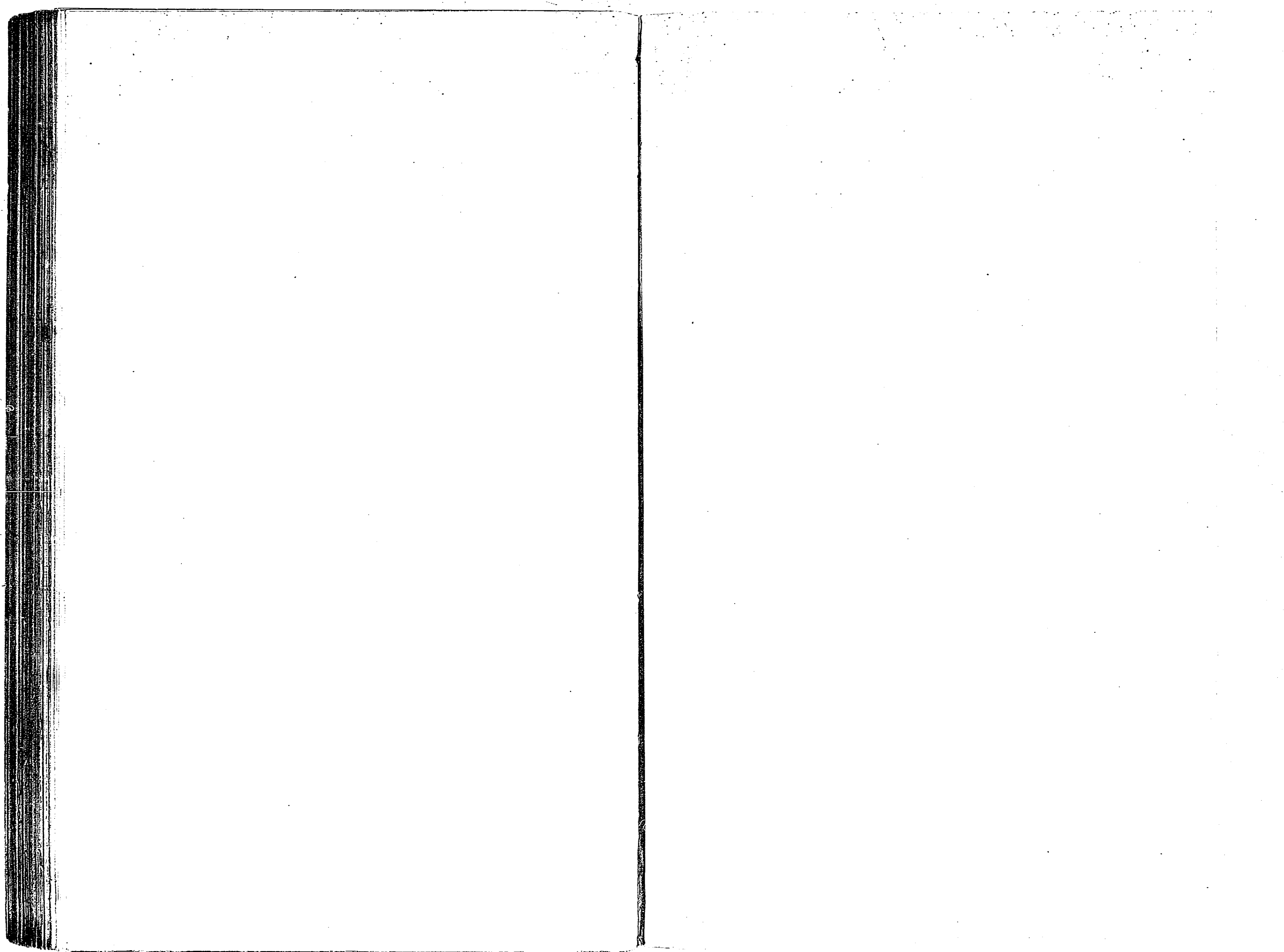
that the public buy 1 lb. of chicory to 9 lb. of coffee; inference therefrom as to the undue consumption of chicory under the present deceptive system, 2770. 2775, 2776—  
Consideration of the data on which witness states that 12,000 tons of chicory are annually used in this country, 2770-2801—Chicory chiefly comes from Holland and Belgium, and is not much grown in England, 2802. 2806—It is mixed with the coffee sometimes by the coffee-roasters, but generally by the grocers themselves, 2802-2804.

*Workhouses. See Poor Law Unions.*

Y

*Yeast. Purity of ordinary yeast as analysed by witness, Taylor 50.*

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R E P O R T.

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**ADULTERATION OF FOOD, &c.**

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