ADVICE

Medical & Economical

ON

ALIMENTARY DRINKS.

VIZETELLY, BRANSTON AND CO. PRINTERS, FLEET STREET.

ADVICE

MEDICAL, AND ECONOMICAL,

RELATIVE TO

THE PURCHASE AND CONSUMPTION

OF

TEA, COFFEE, & CHOCOLATE;

WINES, AND MALT LIQUORS:

INCLUDING

TESTS TO DETECT ADULTERATION.

ALSO

REMARKS ON WATER,

WITH DIRECTIONS

TO PURIFY IT FOR DOMESTIC USE.

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LONDON:

PRINTED FOR F. C. WESTLEY, 165, STRAND.

1830.

PRINTED BY C. SMITH, WHITE-LION COURT, WYCH STREET, STRAND.

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INTRODUCTION.

A SHORT descriptive history of the nutritive and medicinal properties, as well as of the adulterations to which they are subjected, of what are termed Alimentary Drinks—that is, of such fluid preparations, whether used as direct means of sustenance, or as excitants of pleasurable sensations in the mind, cannot fail, it is presumed, at the present day, to be well received by every sober and reflecting man, who has any value for his own health and life, or those of his family, his friends, or society in general. It is as often, not only to the improper or intemperate use of liquid stimulants, as to the poisonous ingredients with which these are adulterated, in defiance of all laws and penalties to the contrary, that the general health, and, subsequently, the constitution becomes undermined and ruined beyond the power of art or time to re-establish. The question then may fairly be asked, Would people, with their eyes open, "run a-muck," and swallow all they meet, if they were persuaded

that a snake, a viper, a toad, or a basilisk, lay concealed in the cup, ready to pop down their throats the moment they opened their mouths ?

Liquid food is of the utmost importance to the human body; and, indeed, in point of weight, far exceeds that of the solid kind: the former is necessary to digestion, to perfect the assimilating process, to the formation of the various secretions and excretions, as well as to refresh and stimulate the languid or exhausted powers of the circulation. How much the more salutary then ought these fluids to be, since they all pass through channels so important to life, and support functions so indispensable to our health and existence.

A proper attention to the selection, and a temperate and consistent use of powerful liquors, will always produce proportionate effects. In the following pages we have particularly enlarged upon the use as well as the abuse of tea; which, by some, (especially the viridis or green tea,) is supposed to be of an intoxicating nature, and is used by all civilized nations for its exhilarating qualities—qualities which, if taken very strong, it certainly possesses; and if swallowed in excessive quan-

tities, produces horror of mind, an almost insuperable terror of death, and not unfrequently suspends animation. Coffee, also, when properly prepared, is an exceedingly powerful exhilarant; and is in use amongst all nations. The Turks add opium to it to heighten its effects; and which, in a great measure, disguises its bitterness. In this, and other ways, it may also be abused.

Our next subject is Wine, a generous liquid, the juice of the grape, and also of general use in Europe, equally admired for the exhilarating effects it produces when moderately taken, as repugnant and pernicious from its intoxicating and over-heating qualities, when used in excess. It is a most valuable cordial, and truly, as termed, "the milk of old age," though, it is worthy of remark, in the consumption of wine, it does not supply an increase of the *vis vitæ*, or powers of life, or any ability to produce labour permanently; it simply stimulates and excites the action of the bodily powers, without furnishing for the expenditure of the principle which produces those powers. It is a valuable tonic and stomachic used in moderation, and when pure and unadulterated with poisonous ingredients.

From wine, proceed we next to the consideration of Malt Liquors, Ale and Beer, produced from an infusion of malt, the former only differing from the latter in having a smaller proportion of hops. This liquor, the natural substitute of wine, in countries that could not produce the grape, was originally made in Egypt, the first planted kingdom, on the dispersion from the East, which was supposed unable to produce the grape. And as the Noachian colonies penetrated farther into the west, they found, or thought they found, the same defect, and supplied it in the same manner. Thus the natives of Spain, the inhabitants of France, and the aborigines of Britain, all used an infusion of barley for their ordinary liquor; and it was called by various names, all literally importing only the *strong water*.

The ale of the ancient Britons and other Celtic nations was sometimes made from wheat; and it was the favourite liquor of the Anglo Saxons and Danes. British beer (*barley broth*) as Shakspeare terms it) has ever been held, superior, when unsophisticated, to that of any other country in the world; and the attachment of our ancestors to this nutritive and

pleasant beverage is often noticed by the poets. How much have people to regret its pristine purity! for the brewers of this generation, far superior in worldly wisdom to our forefathers, can, as regards external appearance, accomplish that by art in a few days or weeks, which, formerly, was the result of time, in as many months or years. Let us, however, hope that the day is not now far distant, when we shall again see British ales, and other malt liquors, circulating in all their primitive purity and flavour, without the aid of a poisonous art to qualify them. This, we apprehend, ought to be the result of a fair and free competition, and an open trade in beer; otherwise, a woful disappointment will be felt, should the contrary prove to be the case.

Water is reported by many eminent physicians to be the safest and most satisfactory beverage for man, and the best solvent and diluent of his food; and those who almost exclusively use it are often remarked to be freer from disease, and to retain the vigour of life, and its various functions to a more advanced age. It is no less an agent of considerable importance in the relief and cure of various inflammatory disorders. Of the different kinds

of water, each has been respectively noticed, and many general remarks on the purity and impurity of this fluid will be met with under that particular head.

Milk, which holds a very conspicuous place among the articles of alimentary liquids, we have omitted, from its properties being so generally known; and its adulteration not being attended with any particular noxious effects upon the constitution. This article, nevertheless, should always be procured in a perfectly natural state, or those properties which are attributed to it are considerably, if not totally, impaired; and its wholesome, nourishing, and digestible qualities, which so much recommend it as an article of diet both for children and adults, are either lost or perverted. Milk ought to constitute the chief part of the food of consumptive persons, as it tends much to invigorate the body without increasing the febrile irritation. Asses milk is the best they can use, but of what kind soever, it ought invariably to be fresh and warm from the animal: and butter-milk is well calculated to quench the thirst, and allay the occasional heat and feverishness of consumptive patients.

Animal broths, soups, gruels, and other fluid

preparations, had we been treating convalescently on their utility to the sick and infirm, to whom many variations of them are well adapted, would here also have had a place; and to those in health, who are fond of such liquid aliment in perfection, we cannot do better than refer them to some of the many excellent cookery books with which the "old book stalls," as they are termed, in different parts of the town, are latterly known to abound: the principal objects of this little book being to prevent people from being poisoned, and enable them to judge and distinguish for themselves in such articles of common use and consumption, to which they may either be drawn by their wants or their wishes; that they may be protected against the fraudulent dealer and vender, in all that regards their health and domestic comforts; and that they may secure to themselves those blessings and enjoyments (as far as they extend to these articles) which their means may afford them, without subjecting either their health or their pockets to the merciless sophisticators of some of the principal necessaries as well as luxuries of life.

With these views, every unfounded prejudice

has been excluded; and things duly considered as they are, and not as they are said to be. Observation and experiment have led us to the principal conclusions we have made; and thus far we vouch for the accuracy of our statements.

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No. 14, Heath Place, Cambridge Heath,
Hackney. April, 1830.

CHAPTER I.

ALIMENTARY DRINKS.

On the Dietetic and Medicinal properties of Tea.

There are few subjects on which so much declamation has been poured forth on both sides, for and against, than that which has been elicited at various periods concerning tea imported into this country by the Companies trading from the maritime nations of Europe, to China and India. Foreign teas, indeed, have long been censured as the immediate cause of the many disorders which are a consequence of the derangement or debility of the Nervous System; some observations, therefore, on the nature, preparation, and effects, of this much esteemed and popular herb, drawn from the remarks of some of the least prejudiced writers, may not be unacceptable to its numerous votaries.

As regards the botanical character of this genus of plants (Thea), it may be just necessary to observe, that it belongs to the class Trigynia. Of this genus, Linnæus enumerates two species—viz. the Bohea tea, having flowers with six petals; and the green, having flowers with nine petals. But Dr. Lettsom, in his botanical description of the tea-plant, thinks it most probable that there is only one species, and that the difference between the green and Bohea teas, depend on the nature of the soil, culture, age, and the manner of drying the leaves. He adds, that it has even been observed, that a green tea-tree, planted in the Bohea country, will produce Bohea, and the contrary; and that, on his examining several hundred flowers, brought both from the Bohea and green tea countries, their botanical characters have always appeared uniform.

Tea has already been known in Europe above 200 years; for the Dutch East India Company, who first imported it, and raised its reputation in Europe, was founded in 1602, upon a contribution, at its first settlement, of 6,459,840 florins. The English East India Company was formed towards the end of the reign of Queen Elizabeth, their charter bear-

ing date 1599; and their first fleet sailed in 1606: still, however, they made but little figure before the time of James I., who took them under his protection. The French East India Company was established in 1664.

In their second voyage to China, the Dutch carried thither a great quantity of dried sage, and exchanged it with the Chinese for tea; receiving three or four pounds of the latter, for one of the former: which was cried up as a wonderful European herb, possessed of as many virtues as the Indians could possibly ascribe to their shrub leaf. But as they did not export such a large quantity of sage as was equivalent to the importation of tea, they purchased a great deal at the rate of ten-pence per pound in China, which they afterwards retailed at Paris after the rate of thirty livres a pound, and this not of the best quality; for that which was brought from Japan, where the best is reported to be had, was often sold for a hundred livres per pound; though, about that time, the Chinese sold their tea at three, and never more than nine-pence, per pound: and they frequently mixed it with other herbs to increase its quantity.

Though it appears that tea was first brought

to England in the reign of James the First, yet it was little noticed before the usurpation, when it was imported in such large quantities that it came under the coguizance of government; for we find, in 1660, that a duty of eight-pence per gallon was laid on the liquor made and sold in all coffee-houses*, which was no small prejudice to its use, as well as inconvenience to the drinker; for it was the duty of the excise officer to survey it before any was allowed to be sold; and he was, moreover, not obliged to attend above once or twice a-day. Ever since that time the duty upon tea has continued to be one of the hereditary customs of the crown; though parliament at various times, by different acts, fixed sundry duties upon it; one of which directed it to be sold at four shillings per pound, payable by the sellers of the leaf, exempted from the duty or inspection of the liquor or its makers.

Japan, China and Siam, are the principal places which afford tea; and that from the place, as above observed, is the most valued,

* Whether this was the first import, or whether it was only renewed, as the duty on malt liquor was, upon parliament annulling all Cromwell's acts and laws, we cannot take upon us to say.

being usually of a finer clear green, and more delicious odour and taste than that from the other places; in consequence of which it sold in France for 200 livres per pound, till such time as coffee and chocolate became in more general use, which reduced both its price and reputation.

Tavernier says, the king and nobles of Tunquin prefer the flower of the tea as most wholesome and pleasant, which makes it dearer and more valuable; "for," says he, "as much of this liquor as will fill one of our ordinary beer glasses is there worth a French crown." But we are assured by Conorius, who lived many years in Japan, that the flowers are of no value, the main property being lodged in the leaf. And what led Tavernier and others into this mistake was, that the small leaves, which are first plucked when they are not above forty-eight or fifty hours old, are called the flower or prince of tea, being much more valued, and sold at an extravagant rate, *viz.* from 45 to 140 crowns per pound.

Bohea and Green Tea.

All the various kinds of tea imported at the present day into this country, come under the denomination of *Bohea* and *Green;* and even

these are supposed to be the produce of the same species and plant; though, by Linnæus, they are described as specifically different, the distinction being founded on the number of the petals: others have observed a difference in the leaves. Still it is uncertain whether these be not mere accidental differences, occasioned by diversity of soil, situation and culture.

While the present narrow and jealous policy of the Chinese continues, many interesting particulars respecting the natural history of this popular plant must remain unknown to Europeans.

Both the Bohea or black tea, and viridis or Green tea, are natives of China or Japan, where they attain the height of five or six feet. Great pains are taken in collecting the leaves singly, at three different times of the year, *viz.* about the middle of February, the beginning of March, and in April. Although asserted by some writers that the leaves are first exposed to the steam of boiling water, and then dried on copper plates, it is now well understood that they are simply dried on iron plates, suspended over a fire, till they become dry and shrivelled; and when cooled they are packed in chests lined with sheet lead to exclude the air, in which condition they are sent to Europe.

CHAPTER II.

Division of Teas in Britain.

In Britain, teas are divided into three kinds of Green, and five of Bohea.

The *Green* includes—

1. *Imperial* or *bloom tea*, having a large leaf, a faint but not disagreeable smell, and of a light-green colour. It is green to the eye, and crisp to the mouth. Its specific gravity is the least of all; its principles sit loosest, and therefore two waters will draw off its strength.

2. *Hyson*, so called from the name of a rich East-India Merchant, who was the first importer of it. It has a smaller, harder, and more curled leaf than the common green; is of a more blue colour, tastes crisp in the mouth when chewed, and afterwards looks green upon the hand: it scarcely tinctures the water (with a pale greenness) when strongest, and yet it is of a most delicious taste. All or most of the leaves should be of a clear bluish green; for if they seem decayed, or look brown or blackish,

the tea is old and has lost its flavour. Or, if you pour out a cupful of the infusion and let it stand all night, if its colour remains in the morning, it may be pronounced good; but if the colour has faded, its virtues have evaporated with it; and more especially so, if its delicate smell and bitterish-sweet taste be impaired. This tea will bear four or five waters, and does not require so much tea to the same quantity of water as the other. It is seldom used alone, but is usually mixed with the common green, one part to three of the last.

3. Common Green (*Singlo*, from the place where it is cultivated), of the better sort, has not so large a leaf as the Imperial Green, is of a darker green colour, rougher and more astringent to the taste: it will bear three or four waters.

There are some inferior varieties, as the *ordinary* Green tea, which is still darker; or, if very coarse, of a light whitish-green colour, neither so pleasant to the taste nor smell; and is soon drawn off. Dutch bloom is a very fine green tea, and bears a proportionable rate, and is probably one of the Japan teas. There grows, also, in the northern provinces of Xensi, a very rough, coarse, unpleasant green tea,

which the hardy cannibal Tartars, the present masters of China, use, whose delicate dish is raw horse-flesh; and which, when their dinner sits uneasy upon their stomach, they drink, and find it rarely fail in restoring their appetite and digestion.

The *Boheas* comprehend—

1. *Souchong*, which, on infusion, imparts a yellowish-green colour.

2. *Camho*, a fine tea, emitting a fragrant violet smell, and yielding a pale shade: it receives the name from the province where it is reared.

3. *Pekoe* tea is known by the small white flowers that are mixed with it.

4. *Congo* has a larger leaf than the preceding variety, and yields a deeper tint to water.

5. *Common Bohea*, the leaves of which are of an uniform green colour.

Besides these there are other kinds of tea sold under the names of Gunpowder tea, &c. which differ from the preceding only in the minuteness of their leaves, and being dried with additional care.

Sophistication of Tea by the Chinese.

The crafty Chinese have several ways of

adulterating tea, both in the preparation and packing, a knowledge of these circumstances will be not less advantageous to the merchant than the consumer.

1. It was their practice formerly to mix a good many leaves of their shrubs with the genuine tea, though it would scarcely be supposed the profit was equivalent to the labour. This fraud, if not visible to the eye, may be discovered as follows:—

Make a pot of genuine tea, and another of the supposed adulterated leaves, pour out a dish of each, and put a grain and a half of blue vitriol or copperas into each cup; this last turns the green tea, if genuine and in a good light, of a fine light blue, and Bohea of a deep blue next to black: if this be done by candle light both will appear black; if they be adulterated they will have a mixture of other colours in them, as green, yellow, black, greyish, &c.

2. In the packing, they used to put a coarse tea at the bottom and middle of their zotenage, and a fine tea at top; or put a fine tea both at top and bottom, and a coarser in the middle, till the buyer detected that also.

3. They then began to dye the tea with Japan earth, which gives the leaf the colour,

and the infusion the tincture of Bohea. The following marks will plainly detect this fraud:

a. A like quantity of this kind of tea tinges the same proportion of water of a deeper colour than it should be.

b. It tinges it, not of a dark, but more reddish brown.

c. After the leaves have been sometime infused in the water, and the tincture is washed off, they look greener than they should do if the tea were good; or, if they are damaged for open sale, as is sometimes the case, they are black or brown; or if they were laid in a heap, and heated before roasting; or if they have been burnt in roasting; or got wet after they were roasted.

d. The leaves are also much larger, being too old before they were plucked for Bohea tea: such, therefore, as would avoid this cheat should buy the smallest leaf.

e. The liquor itself, which should have a delicate flavour, and a smooth balsamic taste, is rougher and harsher to the palate.

f. When milk is poured into it, it rises reddish, and not of a dark or blackish brown.

g. A little copperas put into this tea turns it into a light blue, but should make it, if good, of a deep blue inclining to black.

h. Spirit of salt, or sulphur, put to the last mixture, does not clarify it; whereas it ought even to take off the colour of the tea itself, and make it clear.

i. Spirit of hartshorn makes the tea of a deep-brownish colour after it has stood a little, like newly-drawn tincture of saffron; which here it does not.

Taken altogether, these adulterations are by far less noxious than those practised at home by the retail vender, to which we shall hereafter allude. Indeed there is little harm in the practices above noticed, except with such as have too elastic solids, and then the daily use of such teas must tend to constringe the animal fibre by contracting the vessels more; or to those whose lungs are obstructed, or loaded with too much phlegm, in which case the existence of the individual may almost be said to depend on a free expectoration: in these cases it may do much harm, first by crisping up the obstructed vessels, which ought rather to be in a relaxed state; and, secondly, by stopping the spitting, consequently loading the air cells of the lungs. Indeed the chief use of Bohea tea seems to be for such people, in consequence of green being two astringent for them.

But as the natives are dexterous in making

an artificial Bohea, they can send us a counterfeit green, by dying the former with green vitriol, a practice that is frequently attempted on the consumer at home, the trick may be detected in the following manner.

1. By putting a little bit of galls into the liquor; and if there be any vitriol in the tea, it presently turns it of a deep-black colour, which it ought not to do were the article genuine, as galls would not tincture it, except copperas were present.

2. The liquor itself looks of a pale green, inclining to a bluish dye.

3. Spirit of hartshorn dropt into it gives it somewhat of a slight purple colour, and causes a small precipitation; whereas this spirit should turn it a greenish yellow, after it has stood a few minutes. This sophisticating process is more dangerous than any of the former.

The best time for dying of tea, is when they put the first gathered leaves into water before they are roasted; for then they need only throw in their powder of Japan earth, or green vitriol, with the water, and wash their tea in it; as the roasting it after fastens those colours as the moisture of the plants is exhaled.

Chinese, Japanese, and Tartar Method of Preparing Tea for Domestic Use.

The Chinese, Japanese, and Tartars, prepare their teas after different ways.

The Tartars boil it in milk, which is not the best way—

1. Because milk either blunts or sheaths up the active, minute, saline particles of the tea; and, therefore, corpulent, cachectic, or hypochondriac persons should neither boil it in milk, nor put cream to it; consequently the stimulus of the liquor is destroyed, instead of which it softens and lubricates still more, and generates new and greater obstructions and relaxations of the vessels.

2. Boiling of the milk exhales and loses its aqueous and minute particles, which are fittest for dilution and attenuation; hence the grosser, earthy, and caseous parts are increased, all which have a direct tendency still more to load and stuff obstructed vessels.

3. The thinner parts of the milk being lost, the vehicle is unfit to insinuate itself into the leaves, and to dissolve their delicate salt, oil and earth; hence much of these continue embodied with the more mixed parts, and are lost.

The Japanese powder their leaves, and pour boiling water on them, and so sip up both together. By this means we are not only deprived of a clear liquor, but the substance of the leaf, being an astringent, may act more forcibly on our bodies than is consistent with an equal balance between relaxation and contraction. This also makes the tea of a more rough, earthy, and disagreeable taste; and, if astringent, thickens the blood, as well as dries up the fibres: this kind of tea must either be exceedingly weak, or its use will soon destroy the necessary equilibrium of nature.

The Chinese, after having infused their tea in boiling water, as we do, and poured the water from the leaves, they prepare them for an evening sallad, with sugar, oil and vinegar.

Medicinal Properties attributed to Tea.

Much has been said and written on the medicinal properties of tea. In its natural state it is a narcotic plant, on which account the Chinese refrain from using it till it has been divested of this property, by keeping it at least for twelve months. If, however, good tea be taken in moderate quantities, with sufficient milk and sugar, it invigorates the system, and produces

a temporary exhilaration; but when taken too copiously, it is apt to occasion weakness, tremor, palsies, and various other symptoms, arising from the copious and continued use of narcotic plants, while it continues to aggravate hysterical and hypochondrical complaints.

Tea has also been supposed to possess considerable diuretic and sudorific virtues, which, however, depend more on the quantity of warm water employed as a vehicle than the quantity of the tea itself.

Lastly, an infusion of these leaves are the safest refreshment after undergoing great bodily and mental exertion; they afford an agreeable beverage to those who are exposed to cold weather; at the same time it tends to promote perspiration, which is otherwise liable to be impeded.

A certain writer, who, we think, goes somewhat too far in his invectives against tea, observes, that "It had been well for the inhabitants of great Britain if the tea leaf had never found its way into this country; they would not then have been tormented, as thousands of them now are, with an incurable train of nervous symptoms, with stomachic and bowel complaints, and with headach. To the abuse of

tea may be ascribed, in a great measure, the increased frequency of consumptions, and many of the disorders of children; especially water in the head, rickets, &c. may be traced to the same source."

"The tea leaf," observes the same authority, "when first from the tree, is evidently poisonous. It is true that it loses some of its acrimony by drying; but even in the state in which it is sent to this country, it retains much of its narcotic nature. What serious mischief, then, are they bringing upon themselves, who, as is the case with too many of the lower classes of society, make it a principal part of their daily subsistence! The money that should go to purchase wholesome and substantial food, is squandered away in procuring what, of itself, affords no nourishment; for whatever nourishment is derived from the infusion of tea, is owing to the sugar and milk which are added to it; and were it not for these additions, its deleterious effects would be much sooner and much more powerfully felt. The time, it is hoped, is not far distant when the poor shall be enlightened on this important subject. The next generation will hardly believe that their predecessors took such extra-

ordinary delight in defrauding their bodies of their proper and natural aliment, and in bringing upon themselves infirmity and disease. Let the rich and intemperate indulge, if they choose, in the narcotic draught; to their heated and oppressed stomachs it may do no harm; it may even afford momentary relief; but let the poor abstain from it, they have no feverish thirst—no feverish heat to allay, after their noontide repast. To them it is totally unnecessary as a help to digestion, and as an article of sustenance it is worthless and improper. They would therefore be better, infinitely better, without it.

"Besides the narcotic quality, there is another property of the tea leaf which renders its continued use injurious to the constitution—we mean its astringency. Add to these the warm water, and we have, in this unnatural beverage, three different powers concurring to disorder the first organs of digestion, and, ultimately, the whole system.

"If it be asked, what are they who have been long accustomed to tea, to substitute in its place? We answer, milk, milk-porridge, gruel, broth, cocoa, or the like for breakfast; and in the afternoon, milk and water, orgeat,

or lemonade in the summer, and coffee in the winter."

Our author concludes, so far, with the following observations: "It should be understood, that the preceding remarks apply to the general abuse of tea as an article of sustenance; for its occasional employment in a dietetical and medicinal way, in some kinds of sickness, is often of use. Thus the simple infusion, without sugar or milk, is a good diluent and sedative in ardent fevers; and, as it promotes perspiration and urine, it is frequently drank with advantage in colds, catarrhs, rheumatism, headach, &c. It is also serviceable in cases of surfeit and indigestion."

Pechlin says, we may receive as much benefit from several of our own vegetables as from tea; and he is very lavish in praise of Veronica and Paul's Betony. He nevertheless gives it a great character; but, after all, seems at a loss whether to ascribe the good effects to the water or the tea, and is rather inclined to the former, because it is so great a diluter and expeller of the animal salts; in consequence of which, he concludes that many of our own vegetables are possessed of equal virtues with tea, that is, none of them have any or

more virtues than what they receive from water.

Kempfer denies that either veronica or any other domestic substitute vegetable deserves to come in competition with this excellent exotic; nor, says he, is there any plant yet known in the world, whose infusion or decoction taken so plentifully as that of tea, sits so easy upon the stomach, or passes quicker through the body, or so gently refreshes the drooping animal spirits, and recreates the mind. But, as true again, we know no vegetable in the world whose infusion is drank so plentifully, and therefore cannot certainly say what their effects would or would not be.

Andrew Cleyerus was positive that we had the tea shrub in Europe, till he went to Japan, when he gave up his opinion, and tells us quite another story.

Bountiful nature has provided us very liberally with domestic vegetables, serviceable in a great variety of cases, by which means we are left to make a judicious choice and application of them to their proper and particular intentions. Hence some eminent authors have strenuously agreed that we may reap as much advantage from several plants of our own

growth, as from this exotic leaf. But the question does not rest, whether we may not have as good or better specifics, in many cases, as tea; for all must acknowledge that camomile flowers are a better febrifuge and carminative; the fibres of black hellebore root is a better attenuator of the blood in plethoric habits; pennyroyal and horehound more efficacious inciding pectorals. But the question is—

1. Whether we have any one domestic plant whose general and dietetic use is equally beneficial with that of tea?

2. Or, whether we have any domestic, or other European plant, whose principles are in similar proportion, or combined and modified after the same manner, and, consequently, capable of producing the same effects? which will be difficult for those to prove who make this assertion.

The Principles of Tea, and Reputed Effects.

Tea, as imported to us, contains some little phlegm (but more volatile salts), which it either retains in the roasting, or imbibes afterwards from the air. All kinds of Bohea have

naturally more of this than the green, because it is plucked while this principle exceeds its due proportion, *viz.* before the salt, oil and earth have been sufficiently dissolved and rarified by the subterranean and ærial heat, and prepared to rise up into the plant, in due quantity with the phlegm. As the leaf grows its watery principles lessen, and its oily ones increase; for the first juice (this plant draws in plentifully from the earth) is a gross, acid, saline matter, of which Bohea tea exudes more in roasting than green.

The infusion of all sorts of teas are astringent, and their greater or less degree of astringency is in proportion to the weakness or strength of the liquor drank, and the elasticity or laxness of the drinker's fibres. But though all these infusions act astringently, yet some do so more than others. All kinds of Bohea astringe in a lesser degree than those of green; and common green more than the Hyson. And the different principles of tea act after a different manner on our fluids, when separated from the rest; for its salt dissolves the blood, its earth neither attenuates nor coagulates it, its oil thickens it a little, but its gum very

much, whether extracted by an aqueous or spirituous vehicle; and its oil and earth astringe the animal fibre very much.

"Another thing," says Dr. Short*, "which mightily ingratiates the use of this liquor to men of a sprightly genius, who court the continuance of their lively and distinct ideas, is, its remarkable force against drowsiness and dulness, damps and clouds on the brain and intellectual faculties; for it keeps the eye watchful and clear, animates the intellectual powers, maintains, or, rather, raises lively and brisk ideas, excites and sharpens the thoughts, gives new vigour and force to the invention, awakens the senses, and strengthens and clears the understanding; because by its clearing the blood through the medium of its salts, it enters into, cleanses and clears the glands of the brain, increases the secretion and distribution of animal juices, which compensate for the preceding loss of spirits, whether spent on the intellectual or bodily organs, it re-invigorates the fibres and vessels, takes off that laxness and sluggishness which cause the necessity of sleep; the necessary evacuation by

* See his *Dissertation on Tea*, &c. p. 46.—1730.

the skin and kidneys are duly and regularly carried on at the same time, so that the body is not loaded with superfluous juices, which make it dull and indisposed. On which property Waller has descanted thus—

> " The Muses friend, TEA, does our fancy aid,
> Repress those vapours which the head invade,
> And keep that palace of the soul serene,
> Fit for her birth-day to salute a queen.

" And as pains of the head and megrim owe their rise either to a stuffing of the vessels with a gross sizy blood, or a distention with an inflammatory fluid, so that which thins and attenuates the first, and promotes the digestion and secretion of both, must be serviceable in this case; and the drinking four or five dishes of *green tea* once or twice a-day will have this effect, if not too strong, for then its stimulation is too great. But, to prevent frightful dreams, it is best to take three or four dishes in the afternoon, but not too strong, lest it cause watchfulness, and to forbear a supper of animal food after it: the same time and quantity is best to prevent drowsiness*." Though

* Kucher (lib. iv.), in his *China Illustrata*, takes notice of tea for clearing the head and opening the urinary passages, which it certainly does.

Alex.

this savours much of the humoral pathology, it is not without some reason and much judicious remark.

Green tea has also been recommended, not only in pains of the head, but in diseases of the eyes, as weakness, dimness of sight, involuntary tears (Epiphora), &c. from relaxation of the glands, distentions of the vessels, and transudation of the humours, plethora; but in relaxations of the drum of the ear, from cold or other recent *afflux of pituitous juices* on the vessels of its delicate membranes*; in rheums and catarrhs, whether of the nose, throat, or

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Alex. de Rhodes, in his *Voyages et Mission Apostolique*, says, he always cured himself of a periodical pain in his head by tea; and having often occasion to sit up whole nights in China, to take the confessions of dying people, he found such benefit from tea in these great watchings, that he was always as vigorous and fresh next day as though he had rested all night in bed; nay, by the assistance of tea, he sat up, he says, six nights together. See Chamberlain's *Treatise of Coffee, Tea, and Chocolate*, 12mo. p. 46—1685.

* Dr. Jo. Ludov., *Apinus. Obs.* 70. *Decur.* 3. *Miscel. Curios.*, gives an instance of a learned man who had been long deaf, and used issues, sal ammoniac, purges, &c. without effect, who was speedily and perfectly cured by drinking tea; he had frequently before a sounding in his ears, followed with a crack, after which he heard better for some days.

breast, if drank strong, four or five dishes in bed in the morning. For these latter diseases, being a defluxion of sharp *serum* from the glands about the head and throat, are often the effects of diminished or checked perspiration, commonly called a cold; for then what should be separated and discharged by the skin, falls upon the glands of the head, and, irritating them, causes a sneezing, running of the nose, or a cough, or sometimes a dulness of hearing, &c.

Those employed in the Dutch embassy to China, observed that the Chinese spit very little, and are rarely afflicted with gout or stone, which their physicians impute to the liberal use of tea*.

" Bohea tea is serviceable where perspiration is too great, the force and fibres of the vessels too strong, the circulation too rapid; it lessens the immoderate expense of the fluids by the skin; the solids do not act with so great celerity and force, the blood's circuit, therefore, is not so rapid, nor its parts so quickly attenuated or expelled, and hence the body is better nourished. In spitting of blood, whether

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* Tom. iii. *Philosoph. Trans.* No. 14.

it be from the delicacy and tenderness of the pulmonary vessels, or the force, velocity, and acrimony of the humours, good Bohea is said to be of singular service, from its healing and balsamic properties. In this case it is recommended to be drank pretty strong with very coarse sugar, to the extent of five or six dishes in a morning, and three or four in the afternoon, with two tea-spoonfuls of thick cream, blended with the yolk of an egg in every dish.

To make the Egg Cream.

Take the yolk of an egg, with a dessert-spoonful of cream, and, if convenience will allow, two drops of oil of cinnamon added; this will be a good mixture, sufficient to serve two or three people to mix with their tea, for cream being chiefly the oil of the milk, and the yolk the most nutritive part of the egg, they are both lubricating and nourishing: the oil of cinnamon is both cordial and strengthening.

This is also recommended in ulcers and abscesses of the lungs, with difficulty of breathing; a dry and frequent cough, especially after eating or motion; after returning fits of a hectic fever; great anxiety towards the evening, and night sweats.

In obstructions of the lungs, of the abdominal viscera, want of appetite and indigestion, surfeits, free use of spirituous and malt liquors, green tea, used dietetically, is of the greatest service. Indeed were we to follow up the encomia bestowed on tea by various writers, there is not a disease which the flesh is heir to that may not be cured or alleviated by its use*.

As regards its use in indigestion, we have it from unquestionable authority that the Tartars who, as previously observed, feed much on raw flesh, are here very sensible of its effect; for whenever their diet oppresses the stomach they resort immediately to tea, in which they find relief, as it removes the faintness with which they are attacked, and strengthens them. And we are told by Le Compte, that the infusion of tea will soften flesh, and make hard meat tender, which, if true, is clear that it promotes digestion and the dissolution of the food, as well by restoring the natural fluidity of our

* Riedlin's *Lin. Medic. Ann.* 4to.—1698, furnishes us with the history of a man aged forty years, of a very thin and phthisical habit of body, the son of a consumptive father, who, by plentifully drinking of tea, was restored to a more healthy and bulky habit.

juices, as gently astringing the tone of our bowels and vessels by its fine saline particles. And since many chronic diseases arise from a diminution of digestion in the first, second, and third digestive powers, from how many diseases, it is added, may we not expect to be exempted, by a moderate and discreet use of this liquor.

Tea, if moderately used, is generally of more service to the fair sex than to men. As to the seasons of the year, these are very little regarded in respect to diet, when it can conveniently be obtained; but during the hot weather in summer, the foggy, cloudy, and moist weather of winter, and after the autumnal equinox, these being times when our fluids are more liable to lentor or slowness of circulation, and our bodies to an abundance of humours, from a relaxed state of the solids, the use of green tea is not ill adapted to such circumstances, to attenuate our juices, and brace up our fibres, that the circulation, digestion, secretions, and excretions may be regularly and duly performed. As to the stages of life, manhood being the noonday of our age, accretion being then finished, our bodies and vessels having attained their full growth, and in their

greatest vigour and force, and when the digestions and secretions are best performed, seem to want diluters and stimulators least; therefore childhood, youth, and the decline of life require such things most; because in the two first cases we are the most exposed to plethora, from the provision nature makes for our growth, nourishment and evacuations; in the last, circulation and digestion are weaker, the secretions grosser, the evacuation beginning to diminish, all of which expose the body to more gross and phlegmatic humour; but old age requires some warmer and more generous cordial than tea to revive and gladden the heart, as a glass of good port or claret.

The constitutions to which tea seems more particularly adapted, are the phlegmatic and melancholy. As to the strength and quantity to be used, this ought to be adapted to various constitutions. The phlegmatic, corpulent, cachectic, dropsical people, and those of lax stamina, whether hereditary or acquired, should drink it in small quantities, not above two or three cups at most, and very strong; that is, about two tea-spoonfuls of tea, for three cups of the infusion. Sanguine and plethoric people should use it weaker, but not in too large

quantities, since they are liable to corpulency, which exposes them to inflammatory diseases, though they are in less danger from the use of tea than any other fluid they drink. Those of a melancholy turn of mind may use it of a moderate strength, and with more freedom, *viz.* to the extent of four or five cups. Bilious people are, above all others, to expect the least benefit from tea; and when they do use it, they should use milk or cream, of the best quality, with a sufficient quantity of bread and butter.

For healthy and temperate people, tea-drinking once a-day is sufficient, *viz.* in the morning; but those whose quality, business, or company often calls them to a generous glass, or a luxurious diet, should take tea in the afternoon, in order as well to assist digestion, and to dilute the chyle, as to strengthen the bowels.

Bad Effects of Tea-Drinking

Thus far the good effects of tea, from which, at first sight, one would be apt to imagine it could do no mischief. Daily observation, however, points out the contrary. Such as have sensible and elastic nerves, after having taken

several dishes of green, but particularly of Bohea tea, are affected with tremors or shaking, which is a state of undulatory motion of the nerves between their tone and laxity, being now contracted and then relaxed.

In serous distillations from the windpipe or lungs, causing frequent, laborious tickling coughs, or in convulsive coughs, the use of green tea is injurious.

In all coughs, asthmas, and obstructions of the lungs, the use of Bohea is not recommended; though these cases may call for detergents, attenuators, and stimulants, which are the properties of green tea.

In cachectic, dropsical, and phlegmatic habits, Bohea may aggravate the case, without any advantage to the drinkers, who require something more invigorating.

In obstructions of the liver, spleen, pancreas, or other viscera, Bohea, for reasons already stated, is not to be allowed.

On recovering from long and continued fevers, the use of green tea is no less unadvisable; also in weak, sensitive, and delicate stomachs, in cases of cholic in some delicate constitutions, in the dry gripes, in meagre hectic bodies, to inactive and idle people,

female debilities and exhaustion from excessive discharges, tea in large quantities is injurious.

Laborious people require something better adapted to their avocations than tea.

Antonius de Herde, a Dutchman, observed, that the excessive use of tea had occasioned a very intense cold in the stomach and whole abdomen of several, so as to cause a shivering. To all these might be added the common and pernicious practice of mixing a spirituous stimuli in tea, which may lead to a system of inebriety.

Cruger says that tea-drinkers, that is, such as are slavishly attached to the abuse of it, are early recognized by their emaciated countenances and pale-coloured appearance. The practice of some is still more ridiculous and surprising; that is, where tea is drank to wash and sooth the stomach, promote digestion and attenuate the blood, wine, spirituous and malt liquors are afterwards used to *raise* their spirits, and counteract the effects of tea.

"Amongst the favourite beverages of the learned," observes Tissot, "is the infusion of that famous leaf, so well known by the name of Indian tea, which to our great detriment, has every year for these two centuries past,

been constantly imported from China and Japan. This most pernicious gift first destroys the strength of the stomach, and if it be not soon laid aside, equally destroys that of the viscera, the blood, the nerves, and of the whole body; so that malignant and all chronical disorders will appear to increase, especially nervous disorders, in proportion as the use of Indian tea becomes common; and you may easily form a judgment from the diseases that prevail in every country, whether the inhabitants are lovers of tea or the contrary. How happy would it be for Europe, if, by unanimous consent, the importation of this infamous leaf were prohibited, which is endued only with a corrosive force, derived from the acrimony of a gum with which it is pregnant."

Having thus far considered the good and bad properties of tea, we shall take leave of the subject with every deference to the opinion of our reader, with the following sentiments confirmed by some experience. It is our firm opinion, that tea used in moderate quantities and at stated times, proportionately qualified with milk or cream, and sweetened with sugar, is an excellent corrector of the stomach from excess either in eating or drinking

—and where astringent fluids may be required, its effects are mild and certain. It possesses exhilarating and sedative properties, scarcely sensible unless taken immoderately strong, which ought never to be the case when used dietetically. Notwithstanding all this, we conceive it to be inferior to many other fluids, of which we are about to speak, as an alimentary preparation.

Directions for making Tea.

"The Jesuits who came from China, A.D. 1664, told Mr. Waller, that to a drachm of tea, they put a pint of water, and frequently take the yolk of two new-laid eggs, and beat them up with as much fine sugar as is sufficient for the tea, and stir all well together. He also informed him, that we let the hot water remain too long soaking upon the tea, which makes it extract into itself the earthy parts of the herb; the water must remain upon it no longer than while you can say the 'Miserere' psalm very leisurely; you have then only the spiritual part of the tea, the proportion of which to the water must be about a drachm to a pint *.

* Sir Kenelm Digby's Cookery, 1669, p. 176.

For family or party use, the method of making tea should be as follows:—

The tea-pot should be of a size proportioned to the number of persons at table, and the size of the cups. If six persons are to drink tea, the pot should hold as much as will fill nine cups; and one tea-spoonful, of the ordinary size, of tea, will be sufficient for each person to have three cups, which is usually the quantity taken by one individual.

Six tea-spoonfuls of tea is about half an ounce—there being thirteen in one ounce. These should be put into the pot, and boiling water poured on, till the pot is one-third full *. It should thus stand ten minutes, which will draw a good tincture. In the mean time boiling water should be poured into the cups, to warm them; for, unless tea be served hot, it is little better than *slops*. When the tea is thus sufficiently drawn, the tea-cups should be emptied; the pot filled up with boiling water, (not water that *has boiled*) and each cup instantly

* It is the practice in the North, to fill the tea-pot about one-third full, when the kettle sings, and is just on the point of boiling; and to fill it up as soon as boiling takes place—this is called *masking* the tea. Let it then stand a few minutes and pour it out—though never lower than one hird before filled up again.

filled. The tincture of tea in the pot will make the whole sufficiently strong; and the boiling water added, will make the whole hot enough.

After filling the six cups, the pot will remain one-third full as before, and will still draw the tea, and add fresh strength to it. When the cups are returned, if the kettle, as it ought to be, is at hand, the cups should be washed with clean boiling water, and emptied into the basin into which the slop has been thrown. After, fill up the pot a second time, and pour it off immediately, and the second round of cups will be equally strong and hot, as the first. The tea then left in the pot will be also one third of its contents, which is to continue so, till the cups require to be filled a third time.

The cups being a second time returned and washed, pour more boiling water into the tea-pot, so as to fill it two-thirds, and then after filling the cups a third time, the pot will be quite empty, and the strength of the tea exhausted.

By pouring too much water on the leaves at first, the last round of tea is very weak, which leaves two or three good cups to be thrown away. But by the above mode of making tea,

it will be all uniformly strong, and all served up hot. Should any of the company choose to take a fourth or fifth cup, another tea-spoonful of tea may be added to the pot, a little boiling water poured over it, and time allowed it to draw, and the whole should be managed as before. Some prefer sending the sugar and cream round with each cup, that each person may suit his own taste. This mode, however, seems to be tedious and unnecessary, where there is a judicious *sprunny* maker, who will soon learn the peculiar palate of her guests after the first round.

Dubuisson's Mode.*

"Put the tea into a kettle with *cold* water; cover it close, set it on the fire, and make it all but boil; when you see a sort of white scum on the surface, take it from the fire; when the leaves sink it is ready."

Another.

"The night before you wish to have tea ready for drinking, pour on it as much cold water as you wish to make tea; next morning, pour off the clear liquor, and when you wish to drink it, make it warm.—*Ibid.*"

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* See "*L' Art du Lemonadier,*" de DUBUISSON, Paris, pp. 267, 268.

Again.*

"*A great saving* may be made by making a tincture of tea thus:—Pour boiling water upon it, and let it stand twenty minutes, putting into each cup no more than is necessary to fill it about one-third full. Fill each cup with hot water from an urn or kettle, thus the tea will be always hot and equally strong to the end—and one tea-spoonful will be found enough for three cups for each person; according to the present mode of making it, three times the quantity is often used."

Quincey commends tea as an elegant and wholesome beverage; Cheyne condemns it as prejudicial to the nervous system. Bishop Burnet for many years drank fifteen large cups of it every morning, and never complained that it did him the least injury. Dr. Johnson was a lover of tea to an excess hardly credible. He described himself as a hardened and shameless tea-drinker, who, for many years diluted his meals with only the infusion of this fascinating plant; whose kettle had scarcely time to cool; who with tea amused the evening;

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* See Dr. TRUSLER's *Way to be Rich and Respectable.* 8vo, 1796, p. 27.

with tea solaced the midnight; and with tea welcomed in the morning.

If this beverage were generally pernicious, its effects would certainly be evident in China, where all ranks of people freely partake of it; yet so far from being thought hurtful in that country, it is there in high estimation; and the unfrequency of inflammatory disease, is ascribed solely to the liberal use of tea.

It has been justly remarked that tea is an antidote against intemperance, and that he who relishes the one seldom runs into the other. Some even maintain, that tea has contributed more to the sobriety of this nation than the severest laws, the most eloquent harangues of Christian orators, or the best treatises of morality. That it may be hurtful to some constitutions, in particular circumstances, its advocates admit; but they contend, that the nervous disorders so often attributed to tea, are rather owing to hereditary disease, want of exercise, and irregularity in food or sleep, than to this pleasant liquid. In a word, weak tea when drank too hot may enervate; and when very strong may be equally pernicious, by affecting the head or stomach. But when it is taken, we repeat, in moderation, and not too warm,

with a large addition of milk, it will seldom prove hurtful, but, on the contrary, salutary. After study or fatigue, it is a most refreshing and grateful repast; it quenches thirst and cheers the spirits; without heating the blood, it renovates and enlivens without the fear of intoxication. In the enumeration of its excellent qualities we must not forget the delightful society in which we often partake of it, forming no inconsiderable addition to its value; for whatever affords rational pleasures to the mind, will always contribute to bodily health.

The general demand for tea is indeed now so great that the Chinese it is said adulterate it with a kind of moss. But there is good reason to believe, that the deterioration of tea is not confined to China. It is practised, and often with too much success, at home. Mr. Twining, the great tea-dealer, published some years ago a pamphlet, in which he exposed this infamous traffic. The smouch for mixing with black teas, is made of the leaves of the ash tree, prepared by different processes for this purpose. The leaves found to be manufactured at one village and its vicinity was supposed to have been about twenty ton a-year. One man acknowledged to have made six hundred weight

in every week for six months together. The fine sort was sold at four guineas per cwt, and the coarse at two guineas. Elder buds and hawthorn leaves are manufactured in some places to represent fine teas. For the honour of human nature, it is hoped such nefarious practices are not now very common; and those detected in it deserve the most exemplary punishment. The only way to escape adulterated tea is to deal with people of known principle and integrity, and never to purchase it from those who offer it for sale at prices lower than genuine teas can be afforded. There are a variety of ways by which tea may be adulterated; as the mixing of a bad article with a good one; but it is hoped the directions and tests laid down in this article will instruct those who are not sufficiently acquainted with teas to make their market to the best advantage.

Dr. Lettsom's Opinion on Tea.

From the manifest astringency of teas, they have been supposed to strengthen and brace up the solids, though experience does not countenance this effect; as it is in disorder, and in constitution, whereon corroborants or tonics are most serviceable, that the immode-

rate use of tea is peculiarly hurtful; in cold, indolent habits, cachexies, green-sickness, dropsies, and debilities of the nervous system.

Dr. Lettsom has particularly enquired into the medicinal qualities of tea; and from his having observed that infusions of Bohea and Green tea contribute to preserve sweet some small pieces of beef immersed in them, he infers that they possess an antiseptic power, when applied to the dead animal fibre, and from their striking a purple colour with salt of iron, he deduced their astringent quality. He concludes, also, from other experiments, that the activity of tea chiefly resides in its fragrant and volatile parts; and that if the use of it be beneficial, or injurious to any particular constitution, it becomes so principally by means of this odorous, fragrant principle. He apprehends that it is the safest course to use the infusion of the more ordinary kind of this plant, which abounds less with this fragrant principle. Or the tea may be boiled a few minutes in order to dissipate this volatile part, which stands charged as the cause of those nervous affections, that are said to be produced or aggravated, by the use of this liquor. By the process of boiling, may likewise be extracted

more copiously the more fixed, bitter, and stomachic parts of this vegetable.

Dr. Lettsom, who seemed to be thoroughly persuaded of the occasionally noxious effects of this volatile principle in the finer teas, especially recommends this last mentioned mode of making tea, or the substitution of the extract instead of the leaves; by the use of which the nervous relaxing effects, which follow the drinking of tea in the usual manner, would be in a great measure avoided, this extract has been imported hither from China, in the form of small cakes, not exceeding a quarter of an ounce each in weight, ten grains of which might suffice one person for breakfast; but might easily be made at home by simple decoction and evaporation, by those who experience the noxious qualities or the volatile principles of this plant.

It may be further observed, that the effect of drinking large quantities of any aqueous liquor would be to enter speedily into the course of circulation, and pass off as speedily by urine or perspiration, or the increase of some of the secretions. Its effects on the soft parts of the constitution would be relaxing, and thereby enfeebling. If this warm aqueous fluid were

taken in considerable quantities its effects would be proportionable, and still greater if it were substituted instead of nutriment. The infusion of tea, however, has these two peculiarities. It is not only possessed of a sedative quality, but also of a considerable astringency by which the relaxing power, ascribed to a more aqueous fluid, is in some measure corrected on this account. It is, perhaps, less injurious than many other infusions of herbs, which, besides its very slight aromatic flavour, have very little, if any, stypticity to prevent their relaxing, debilitating effects.

So far, therefore, we may again justly conclude that tea, if not drank too hot, nor in too great quantities, is, perhaps, preferable to any other known vegetable infusion. And if we take into consideration, likewise, its known enlivening energy, our attachment to it will appear to be owing to its superiority, in taste and effect, to most other vegetables. Tea may be considered as a very powerful aphrodisiac; and Dr. Percival imputes the amazing population of China, among other causes, to the general use of it.

The Chinese know nothing of imperial tea, flower of tea, and many other names which in

Europe serve to distinguish the goodness and the price of this fashionable commodity; but besides the common tea, they distinguish two other kinds; namely, the *Voui* and *Soumlo*, which are reserved for people of the first quality, and those who are sick. The two principal kinds of tea in Europe—namely, the green tea, which is the common tea of the Chinese, which is gathered from the plant in April. It is held very digestive and a little astringent; it gives a palish green tincture to water, and its leaves are much twisted. The second is Bohea tea, which is the *voui* tea, or bou teta of the Chinese. Father Le Compte makes this only differ from the green tea by its being gathered a month before it—namely, in March, while in the bud; and hence the smallness of the leaves, as well as the depth of the tincture it gives to water. Others take it for the tea of some particular province; the soil being found to make an alteration in the properties of the tea, as much as the season of gathering it. It is all bought at Nankin, and thence brought into Europe, where it is now much in vogue.

As to the differences in colour and flavour of these two kinds, and their varieties, Dr. Lettsom thinks there is reason to suspect that

they are, in some measure, adventitious or produced by art. He was informed by intelligent persons, who resided for some time at Canton, that the tea about that city affords very little smell while growing. The same is observed of the tea plants now in England, and also of the dried specimens from China. We are not, however, as he observes, to conclude from hence, that art alone conveys to teas, when cured, the smell peculiar to each kind; for our vegetable grasses, for instance, have little or no smell till they are dried and made into hay.

As to the opinion that the Green tea owes its verdure to an efflorescence acquired from the plates of copper, on which it is supposed to be cured or dried, he shews that there is no foundation for this suspicion. The infusions of the finest imperial and bloom teas, undergo no change on the effusion of a volatile alkali, which would detect the minutest portion contained in them, by turning the liquors blue. The fine colours of these teas, with as little reason, has been attributed to green copperas; as this metallic salt would, on its being dissolved in water, immediately act on the astringent matter of the leaves, and convert the infusion into ink, as happens when a chalybeate

water has been employed in the making of tea.

On the whole, Dr. Lettsom thinks it not improbable, that some green dye, procured from vegetable substances, is employed in the colouring of the leaves of the green teas. And Neumann suspects, that the brown colour and flavour of the Bohea sorts, are introduced by art. Both the Green and Bohea teas have an agreeable smell, and a lightly bitter sub-astringent taste, which, with a solution of chalybeate vitriol, strike an inky blackness. They give out their smell and taste both to watery and spirituous menstrua. To water the green sorts communicate their own green tincture, and the Bohea the brown; but to a rectified spirit they both impart a fine deep green. The extracts, obtained by gently drawing off the menstrua from the filtered tinctures, are very considerably astringent, and not a little ungrateful; but the spirituous most so.

Savary also speaks of a sort of red tea, or Tartar tea, called honan teha, which tinges the water of a pale red, and which is said to be extremely digestive; by means hereof the Tartars are said to be able to feed on raw flesh. Its taste is earthy, and much the least

agreeable of them all; but this is scarce known in England.

In the choice of tea, that which possesses the briskest smell is to be preferred, and as whole as possible; and the greatest care is to be taken that it have not been exposed to the air to pall and evaporate.

The present consumption of tea is immense. Dr. Lettsom says he was creditably informed, that at least three millions of pounds are allowed for the annual home consumption, not including the incredible quantity smuggled into the kingdom; and that the East India Company have generally in their warehouses a supply for three years. By 13 Geo. III, cap. 44. no license shall be granted to the East India Company to export tea, unless there remain in the warehouses a quantity not less than ten millions of pounds weight.

With all the excellent qualities attributed to tea, the good people of England are little aware of the extravagant price they pay, compared with other countries which have free commercial access to India, for their favourite luxury. The following extract, however, from a late number of the Edinburgh Review, will

enable them to do this, and which we here submit without further comment.

The first table shows the price at which teas are sold by the India Company, and the second table, the prices of the same sort of teas in America and Germany, where the tea trade is not monopolized. Of course the prices are independent of the duty paid to the crown.

Sale of Teas by the East-India Company in March 1823.

Description of Tea.	Putting up Price per lb.	Average Sale Price per lb.	Quantities sold.—lbs.
Bohea.....	1s. 6d.	2s. 5d. 2-10ths	451,118
Congou.....	2s. 2d.	2s. 6d. 3-10ths	1,675,872
Ditto.....	2s. 4d.	2s. 7d. 8-10ths	3,330,673
Campoi.....	2s. 9d.	3s. 5d. 3-10ths	166,207
Souchong.....	3s. 0d.	4s. 4d. 7-10ths	31,940
Twankay.....	2s. 5d.	3s. 4d. 6-10ths	1,139,522
Hyson-skin....	2s. 6d.	3s. 3d. 9-10ths	60,216
Hyson.....	3s. & 4s.	4s. 5d. 4-10ths	221,935

Quantities of Company's Tea sold....	7,077,483
Ditto, of private trade	606
Total quantities sold....	7,078,089

	New York Prices in 1823.		Hamburgh Prices in 1823.	
Bohea.....	0s. 8½d. per lb.	9d. 5-16ths	to 10d. 3-16ths	p. lb
Congou....	0s. 7½d.	....1s. —	to 1s. 2d.	
Campoi....	—	....10d. 7-8th	to 1s. ½d.	
Souchong...	1s. 3¾d.	....1s. —	to 1s. 4d.	
Twankay...	—	....1s. 5d.	to 1s. 7d.	
Hyson-skin	1s. 5½d.	....1s. 5¾d.	to 1s. 7d.	
Hyson	2s. 6d.	....2s. 2d.	to 2s. 4d.	

Which prices being compared with the Company's prices, give—

	Excess of E.I.Company's Prices over those of New York.	Excess of E.I.Company's Prices over those of Hamburgh.
Bohea.....	1s. 8½d. per lb.	.....1s. 7½d. per lb.
Congou.....	1s. 11½d.	.....1s. 6d.
Campoi.....	—	.....2s. 5½d.
Souchong....	3s. 1d.	.....3s. 2½d.
Twankay.....	—	.....1s. 10½d.
Hyson-skin...	1s. 10½d.	.....1s. 9½d.
Hyson	1s. 11½d.	.....2s. 2½d.

Now it is evident that, by multiplying the quantities of the various descriptions of tea disposed of annually at the Company's sales by the *excess of price* at which they are sold over the price of similar teas at New York or Hamburgh, we shall get the nett sum which the people of this country are compelled to pay for the teas used by them, over and above what would purchase an equal supply were the trade thrown open. The Company have furnished the means of making this computation; for it appears, from the statements in their annual accounts, that the sales of Bohea, in 1822, amounted to 2,419,045 lbs., which, being sold at an advance of 1*s.* 8*d.* per lb. (throwing away the fraction) over the price of Bohea at New York, cost £206,587 more than it would have done, but for the monopoly. A similar

computation being made with the other description of tea, the account will stand as under:—

Quantities of Tea sold at Company's sales in 1822.		Ex. of Company's price per lb. over N. Y. or H.	Total ex. of price received by the Com.
Bohea.....	lb 2,419,045	1s. 8d. N. Y.	£206,587
Congou.....	18,569,472	1s. 6d. H.	1,392,710
Campoi.....	196,729	2s. 5d. H.	23,871
Souchong...	115,738	3s. 0d. N. Y.	17,860
Twankay...	4,036,445	1s. 10d. H.	368,907
Hyson-skin..	130,420	1s. 9d. H.	11,411
Hyson.....	396,697	2s. 0d. N.Y.&H.	39,469
Total	25,874,546		£2,058,815

This quantity is, however, exclusive of 2,019,019 lbs. sold at the same sales on account of the captains and other officers of the Company's ships. The sorts of tea belonging to the officers are not specified; but, supposing them to have been mixed up in the same proportions as those belonging to the Company, the excess of price on them will be about £160,000; making, in all, an excess of £2,218,000.

These results are of the utmost importance. They are deduced from documents whose accuracy cannot be disputed. And it appears, from them, that the monopolists of Leadenhall-street *obtained* £2,218,000 *more for the teas*

sold by them in Britain, in 1822, *than would have sufficed to purchase an equal supply had the trade been free!* Inasmuch, too, as very little variation has taken place during the last three years in the prices of tea at Hamburgh and New York; and as neither the prices nor the quantity of the teas sold at the Company's sales in 1822 perceptibly differ from the price and quantities of those sold in 1821 and 1823, it clearly follows, that the monopoly of the tea trade, enjoyed by the East India Company, costs the people of this country, on an average, not less than £2,200,000 a-year!

Thus, it will appear, that for every pound of tea they drink, they pay about 1*s.* 9*d.* to the East India Company more than the sum for which the tea could be brought to market, and which would pay the tax levied on it by the government. This is not the whole amount of the sum paid by the people on this account. The dealers pay the higher price in the first instance, and they must receive on the capital they employ for this purpose proportionate interest. Taking this at only five per cent., that adds another penny to each pound, so that the people pay on account of the monopoly of the East India Company, at least 1*s.* 10*d.* more

than necessary for every pound of tea drank. At a time when this herb is so largely consumed, this sum is a subject worthy of serious consideration. Let us hope, therefore, that in England we shall soon see the day when John Bull will be able to drink his cup of Bohea, Congou, or what not, with as much ease and freedom as either Brother Jonathan or Mynheer.

CHAPTER III.

2.—ON COFFEE.

On the Dietetical and Medicinal Properties of Coffee.

The Coffee tree is cultivated in Arabia, Persia, the East Indies, the Isle of Bourbon, and several parts of America.

Good Turkey coffee is reputed to be by far the most wholesome of all liquors drank at meal time. It possesses nervine and astringent qualities, and may be taken advantageously at

all times, except when there is bile on the stomach. It is said to be a good antidote against an over-dose of opium; and that it affords relief in obstinate spasmodic asthmas. For the latter purpose, the coffee ought to be of the best Mocha, newly burnt, and made very strong, immediately after grinding. In the pure spasmodic kind of asthma, if made so strong as an ounce to the cup, without milk or sugar, and repeated, if necessary, at the distance of a quarter of an hour, the fit has been entirely removed; and this practice has been continued by patients labouring under the disease for years, affording certain relief*; notwithstanding some practitioners have disapproved of its use.

If coffee be drank warm within an hour after dinner, without milk, and sweetened with

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* From several experiments and observations made by Dr. Percival, to ascertain the effects of coffee on the human body, he infers, that it is slightly astringent and antiseptic; that it moderates alimentary fermentation, and is powerfully sedative. It assists digestion, and has been prescribed with great success in asthma. In delicate habits the too frequent use of coffee has, however, been suspected of producing palsies. Sir John Floyer, who had been afflicted with asthma for upwards of three score years, in all his elaborate researches, found no relief but in coffee.

sugar-candy, or fine sugar, it is of singular use to those who are troubled with headach from debility of the stomach, contracted by sedentary habits, close attention, or accidental intoxications. It is also beneficial when digestion is impaired; and persons afflicted with sick headach are much relieved by its use, though this effect is by no means uniform.

Coffee is also raised in botanic gardens in several parts of Europe. Prince Eugene's garden at Vienna produced more coffee than was sufficient for his own consumption. The coffee tree, being an ever-green, makes a fine appearance at all times of the year; but especially when in flower, and when the berries are red, which is generally in the winter; so that they continue a long time in that state.

The coffee produced in Arabia is found so greatly superior to that raised in the West Indies and elsewhere, that the cultivation of the tree is not so much practised in the British colonies. Coffee berries are very apt to imbibe moisture, or the flavour of every thing placed near them. They have been rendered very disagreeable, or utterly spoiled, by being placed in a closet near rum, spirits of wine, or pepper.

The beverage prepared from the berries of coffee has been familiar in Europe for upwards of a century; and among the Turks for 180, some say 250, years. The origin of coffee is not well known: some ascribe it to the prior of a monastery, who, being informed by a goat-herd that his cattle, sometimes browzing on the tree, would wake and caper all night, became curious to prove its virtues. Accordingly he first tried it on his monks, to prevent their sleeping at matins. Others refer the invention of coffee to the Persians. It seems, however, to have been first brought into vogue at Aden, a city near the mouth of the Red Sea. Hence it passed to Mecca. From Arabia Felix it was conveyed to Grand Cairo. From Egypt it passed to Syria and Constantinople. Thevenot, the traveller, was the first who carried it into France; and a Greek servant, called Pasqua, brought to England by Mr. Edwards, a Turkey merchant, in 1652, to make his coffee, first set up the trade of a coffee man, and introduced the drinking of it into this Island.

Dr. Mosely observes, that "the extraordinary influence which coffee, judiciously prepared, imparts to the stomach, from its tonic and invigorating qualities, is strongly exempli-

fied by the immediate effect produced on taking it when the stomach is overloaded with food, or nauseated with surfeit, or debilitated by intemperance. To constitutionally weak stomachs, it affords a pleasing sensation; it accelerates the process of digestion, corrects crudities, and removes colic and flatulencies. Besides its effect in keeping up the harmony of the gastric powers, it diffuses a genial warmth that cherishes the animal spirits, and takes away the listlessness and languor which so greatly imbitter the hours of nervous people, after any deviation to excess, fatigue, or irregularity.

" From the warmth and efficacy of coffee in attenuating the viscid fluids, and increasing the vigour of the circulation, it has been used with great success, in the debilitating disorders of women, dropsy, and in worm complaints; and such other diseases that arise from unwholesome food, want of exercise, weak fibres and obstructed perspiration. There are few people who are not informed of its utility for the headach; the steam is sometimes very useful to mitigate the pains of the head. In the West Indies, where the most violent species of headach are more frequent and severe than in

Europe, coffee is the only medicine that affords relief. Opiates are sometimes used, but coffee has an advantage that opium does not possess; it may be taken in all conditions of the stomach; and at all times by women, who are most subject to these complaints, as it dissipates those congestions that are frequently the cause of the disease, and which opium is known to increase, when its temporary relief is past.

"Coffee having the admirable property of promoting perspiration, it allays thirst and checks preternatural heat."

The great use of coffee in France is supposed to have abated the prevalency of the gravel. In the French colonies, where coffee is more used, with the English, as well as in Turkey, where it is the principal beverage, not only the gravel but the gout, those inveterate tormentors of the human race, it has been said, are scarcely known. It is found useful in quieting the tickling vexatious cough that often accompanies the small-pox, and other eruptive fevers.

Prepared clear and strong, and diluted with a large proportion of boiled milk, it becomes a highly nutritious, light, and balsamic diet, particularly in this manner, for breakfast; and

also proper in hectic pulmonic, and all complaints where a milk diet is useful; and is a great restorative to constitutions emaciated and worn down by gout and other chronic disorders.

Long watching and intense study are wonderfully supported by it, and without the ill consequences that succeed the suspension of rest and sleep, when the nervous influence has nothing to sustain.

Bacon says, "Coffee comforts the head and heart, and helps digestion."

Dr. Willis says, "Being daily drank, it wonderfully clears and enlightens each part of the soul, and disperses all the clouds of every function!"

The celebrated Dr. Harvey, the discoverer of the circulation of the blood, used it often; Voltaire almost lived upon it; as well as Fontenelle, Montaigne and others, who all attained a good old age; and the learned and sedentary of every country have recourse to it to refresh the brain, oppressed by study and contemplation.

Opinion of the Persians, &c.

Sir Thomas Herbert, who was several years

in the East, tells us that the Persians have quite a different opinion of coffee; they say that " coffee comforts the brain, expels melancholy and sleep, purges choler, lightens the spirits, and begets an excellent concoction; and, by custom, becomes delicious." But all these virtues do not conciliate their liking to it, so much as the romantic notion that it was first invented and brewed by the Angel Gabriel, to restore Mahomed's decayed moisture, which it did effectually.

Objections against Coffee.

Objections have been taken against the use of coffee as extravagantly as encomiums have been lavish in its praise. Nor is it to be expected that it should be without its opponents any more than its advocates. Its most furious opponent was Simon Paulli*; but he founded his objections against coffee, as he had his prejudices against tea, chocolate and sugar, not on

* According to this Danish physician, coffee enervates men, and renders them incapable of generation, which injurious tendency is certainly attributed to it by the Turks. From its immoderate use they account for the decrease of population in their provinces, that were so numerously peopled before this berry was introduced among them.

experience, but on anecdotes picked up by hasty travellers, which had no other foundation than vague and absurd report and conjecture: by these tales this learned man confesses he supports a notion that coffee, like tea to the Chinese, acted like a great drier to the Persians, and abated aphrodisiacal worth. This opinion has been received and propagated from him, in the same manner as he received and propagated it from its fabulous origin. These suppositions have been refuted by Du Fours, and many travellers.

"Coffee," says Dr. Carr, in his *Med. Epist.* p. 35, "in bilious habits is very hurtful:" also, "I cannot advise it to those of hardness of breath."

Mr. Boyle mentions an instance of a person to whom coffee always proved an emetic. He also says that he has known great drinking of coffee produce the palsy.

"A substance like coffee, possessed of active principles and evident operations, must necessarily be capable of misapplication and abuse; and there must be particular habits where those operations disturb. Stare says he used it in too *great excess*, and it affected his nerves; but Dr. Fothergill, who was a sensible

man, and did not use it excessively, though he was of a very delicate habit, and could not use tea, drank coffee almost constantly, many years, without receiving any inconveniency from it. But the history of particular cases sometimes serves only to prove that mankind are not all alike organised; and that the sympathy of one, and the antipathy of another, ought by no means to render useless that infinite variety which pervades all nature, and with which the earth is so abundantly blessed in the vegetable creation. Were it so, physic would acquire but little aid from the toils of philosophy, when philosophy had no other incitement to labour than barren speculation*."

Qualifications to Coffee.

It has long been a custom with many people to add mustard to their coffee. Aromatics may, it is known, be added in flatulent, languid, and scorbutic constitutions; and particularly by invalids, and in such cases where warmth or stimulus are requisite. The Orientals add either cloves, cinnamon, cardamoms, cummin

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* *Practical Treatise on Diet and Regimen*, 2d Edit. p. 278, by J. S. Forsyth, Surgeon.

seed, or essence of amber, &c. but neither milk nor sugar.

Milk and sugar, without any aromatics, are generally used with it in Europe, America, and the West-India islands, except when taken after dinner; then the method of the French is commonly followed, and the milk in the afternoon is omitted. A cup or two thus taken after dinner, without cream or milk, promotes digestion, and has been found very serviceable to those who are habitually costive. If a draught of water be taken before coffee, according to the Eastern custom, it gives a tendency to act as an aperient.

If a knowledge of the principles of coffee, founded on examination and various experiments, added to observations made on the extensive and indiscriminate use of it, cannot authorise us to attribute to it any particular circumstance unfriendly to the human frame; if the unerring test of experience has confirmed its utility, in many countries not exclusively productive of those inconveniences, habits, and diseases for which its peculiar properties seem most applicable, let those properties be duly considered, and let us reflect on the state of our atmosphere; the foods,

modes of life of the inhabitants, so injurious to youth and beauty, filling the large towns and cities with chronical infirmities, and I think, (says Dr. Mosely, before quoted) it will be evident what advantages will result from the general use of coffee in England, as an article of diet, from the comforts of which the poor are not excluded; and to which purpose it may often be employed, as a safe and powerful medicine.

Coffee is often imitated by roasting rye with a few almonds. Roasted grain, when properly prepared, is neither unnutritious nor unwholesome, and bears the best analogy with coffee, to any other vegetable.

Directions for Making Coffee.

Coffee, as used on the continent, serves the double purpose of an agreeable tonic, and an exhilarating beverage without the unpleasant effects of wine. As drank usually in England by those who are unacquainted with the proper method used in France and Italy, where it is made strong from the best coffee, and poured out hot and transparent, it debilitates the stomach and produces a slight nausea.

"To make coffee fit for use, you must em-

ploy the German filter, and take at least an ounce for every two breakfast cups.

" No coffee will bear drinking with what is called milk in London.

" London people should either take their coffee pure, or put a couple of tea-spoonfuls of cream to each cup."—(*Cooks' Oracle*, p. 417.)

We are not aware where the author of *The Cooks' Oracle* picked up this confounded nonsense, or can we conceive the motive that gave publicity to such absurdities as those contained in the two last paragraphs; that " no coffee will bear drinking with what is called milk in London." *Café au lait*, or milk and coffee, is one of the best dietetical forms in which coffee can possibly be used; and, assuredly, the London milk is as good as that of Paris, where, it does appear, the author of *The Cooks' Oracle* never was in his life, or he would not have trusted to any " intelligent traveller," so badly informed on this subject.

Café au lait is made in the following manner :—

The coffee is placed in a suspended bag in the coffee-pot which contains the proportion of water; as soon as it boils, an equal quantity of milk is passed through the bag containing the

coffee; these are suffered to boil a little longer; the apparatus containing the coffee grounds is now withdrawn, and the contents of the coffee-pot, which are *groundless,* are poured into a casserole, placed near the fire to keep warm, and from which the coffee-dishes are supplied, and afterwards sweetened "*chacun à son gôut.*"

Café à la Française. (after dinner.)

Take the best Mocha coffee, four ounces to a quart of water, boiling; set it by the edge of the fire, not so close as to boil, but to simmer; stop the nozzle of the spout, if it be a common coffee-pot in which it is made, to prevent as much as possible the aroma of the coffee from flying off; let it simmer perceptibly for twenty minutes; then withdraw it, and dash a tea-cupful of cold spring water into it to throw down the sediment; in a few seconds it will clear transparently and odoriferously. Or it may be simmered in the bag apparatus, when the grounds will not come in contact with the water.

The sweetening used for this is usually sugar-candy, or the finest sugar:—neither milk nor cream, *viz.* after dinner.

*** We protest against the idea of suffering coffee to boil, unless it be for *café au lait*.

Fine cream should always be served up with coffee for those who like it, and either the finest Lisbon sugar, or pounded sugar-candy.

In England this drink is usually made from bad coffee, and drowned in a deluge of water; and not unfrequently deserving the title given to it in "the petitions against coffee," *viz.* "a base, black, thick, nasty, bitter, stinking puddle water."

Soufflée of Coffee. (à la Ude.*)*

Boil a pint of cream with a pint of milk, to which add a little sugar, and a very little salt. Take a clean *omelette* pan, or a coffee roaster, and roast in it a quarter of a pound of coffee on a slow fire. When it is equally roasted, throw it into the boiling cream, that it may acquire a proper taste of the coffee. Throw into it the soft part of two or three rolls to soak; adding butter, sugar, salt, and the beaten whites of eggs; then serve up.—Ude.

Café à l'Anglaise.

Put two ounces of fresh ground coffee, of the best quality, into a coffee-pot, and pour eight

coffee cups of boiling water upon it*; let it boil six minutes; then pour out a cupful, two or three times, and return it again: then put two or three isinglass chips to it, and pour one large spoonful of boiling water on it; boil it five minutes longer, and set the pot by the fire to keep hot for ten minutes, and you will have coffee of a beautiful clearness.

CHAPTER IV.

3.—On Chocolate.

This is well known as an article of diet, prepared from the cacao nut, highly nourishing, particularly when boiled with eggs and milk. It is frequently recommended as a restorative in cases of emaciation and consumption. It is more nourishing and less heating than coffee. It is commonly made too thick, but when of a proper degree of strength, it is a palateable and

* We direct the coffee to be added to the water, not the water to the coffee.

wholesome beverage; though, owing to its oily properties, it frequently proves oppressive and clogging to the stomach of weakly persons.

Dr. Saunders* says "Chocolate is too gross for many weak stomachs;" and Dr. Smith †, that it "overloads the stomach, and renders the juices too slow in their circulation.

Cacao is, in fact, only a weak chocolate, which, being less pure than the former, weak chocolate might be substituted for it.

4.—Cacao.

The cacao, or chocolate nut tree, is a native of America; and abounds plentifully in the northern provinces of South America, where it grows spontaneously; but it is cultivated in many of the West-India islands. It resembles a cherry tree. The fruit is enclosed in a kind of pod, the size and figure of a cucumber. Of this fruit, which consists of seeds, usually about thirty in number, with the addition of vanilla and some other ingredients, the Spaniards, and, after their example, the rest of Europe,

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* See Saunders' *Natural and Artificial Directions for Health.*

† Smith *on the Nerves.*

prepare a kind of conserve or cake, which, diluted in hot water, makes the delicious wholesome drink called chocolate. It is likewise made into a sweetmeat; and there is an oil extracted from it which is an extraordinary remedy in the cure of burns and scalds. The cacao-nuts are esteemed by the Mexicans as anodyne, and used, eaten raw, to assuage pains of the bowels.

This statement refers to the cacao, or tree bearing the small pods; what follows relates to the cacao tree which bears the large nuts. This tree, it has been remarked, supplies the Indians with almost whatever they stand in need of. The bark of the nut is made into cordage, sails and cloths; and the shell into drinking bowls, cups, &c. The kernel affords a wholesome food; and the milk contained in the shell a cooling liquor:

> "At noon, reclin'd in yonder glade,
> Panting beneath the tamarind's shade;
> Or where the palm-tree's nodding head
> Guards from the sun my verdant bed,
> I quaff, to slake my thirsty soul,
> The coco's full nectareous bowl."

The leaves are used for thatching houses, and wrought into baskets; and the body of the

tree is converted into masts for ships, and employed for various other purposes. Indeed it is asserted, in *Lobo's Voyage,* and by other authors*, that a ship may be built, fitted out with masts, sails and cordage, and victualled with bread, water, wine, sugar, vinegar, and oil from the cacao tree.

It is, probably, to this tree that the author of the *Seasons* alludes in the following lines:—

"Wide oe'r his isles the branching Oronoque*
Rolls a brown deluge, and the native drives
To dwell aloft on life-sufficing trees,
At once his dome, his robe, his food, and arms."

CHAPTER V.

On Wine, and the Wines of Different Countries.

Wine is defined a brisk, agreeable, spirituous, and cordial liquor, extracted from vege-

* See Ray's *Wisdom of God in the Creation.* p. 207.
+ A majestic river of Terra Firma, in South America.

table bodies, and fermented. All sorts of vegetables, fruits, seeds, roots, &c. may be made to yield it; such, for instance, as grapes, pulse, pease, turnips, carrots, parsnips, radishes, and even grass. The word wine is, however, appropriated to express the fermented juice of the grape. Of this various sorts are made in France, Spain, Italy, and Germany.

As regards the acquaintance of our ancestors with this generous beverage, it has been conjectured, that the Phœnicians might possibly have introduced a small quantity of it. But this liquor was very little known in our island before it was conquered by the Romans.

A temperate use of wine is conducive to health; and is of extensive utility, not only as a beverage, but as a medicine; and it is recommended by several eminent physicians as an excellent cordial, when unsophisticated by poisonous drugs, peculiarly salutary in fevers. The functions of the body and mind are roused by it. It has a powerful effect upon the organs of digestion, the circulation and the nervous system, by promoting digestion, strengthening the action of the heart and arteries, and raising the spirits. Such are its beneficial operations when taken sparingly. In

excessive quantities it produces opposite effects, destroying the stomach, inducing emaciation and debility, and occasioning inflammation and obstruction in the liver and lungs, &c.; whence gout, palsy, consumption, &c.

In a dietetical point of view, wines are considered as they are either acid, sweet, soft, or austere.

The acid wines, of which the hock and Rhenish are the most noted, are the least heating and the most diuretic. The sweet, as the Frontignac, Malaga, Tent, Cape, &c. are heating and sudorific. The soft or acido-dulcescent wines, as Champagne, Claret, Burgundy, Madeira, &c. are less stimulating than the sweet, and more cordial than the acid wines.

Of the austere and astringent kind, that which is most used in this country is the red Port, which, when it has not been mixed with too large a proportion of brandy, is a generous and stomachic wine, well suited to the generality of British constitutions. This wine receives its name from being made in the districts adjacent to Oporto, or Porto, a rich, handsome, and considerable town of Portugal; and on this account all red wines that come from Spain or Portugal, are called Port wines.

When old and genuine, Portuguese wines are esteemed to be very friendly to the human constitution, and safe to drink; but it is generally supposed that not half the quantity that is consumed under the name of Port wine, in the British dominions only, come from Oporto.

German Wines.

There are excellent wines made in the Emperor of Germany's dominions; particularly on the banks of the Rhine and the Moselle. These wines differ from those of other countries by their peculiar lightness and delusive quality; and are said to be more sovereign in some diseases than even medicine. The Rhenish, made at Hockheim or Hockham, an inconsiderable village not far distant from Mentz, on the Rhine, has been styled the Prince of German wines; old, strong, Rhenish wine is called *hock* or *hockamore*.

The German nobility display their magnificence in their wines; and in many houses, as lady Wortley Montague remarks, the list of them, printed, is put under every plate at their entertainments. Mr. Wraxall has given a copy of one of these papers, which contained thirteen different sorts.—*Memoirs*, vol. ii, p. 257.

The city of Bremen, says Mr. Wraxall, in Lower Saxony, is noted for its old hock, which is brought from the banks of the Rhine, and deposited in the public cellars, which are wonderfully capacious, but not comparable in magnificence to some in Portugal, or to those of Constantia, at the Cape of Good Hope. There is one particular room, called the Rose, where they keep wine, which they state to be 170 years old, and for which they ask 1*l.* 5*s.* a bottle.

At Heidelberg, on the river Neckar, there was a tun or wine vessel constructed, which contained twenty-one pipes. Another was made, or the one now mentioned rebuilt, in 1664, which held 600 hogsheads, English measure. It was emptied and knocked to pieces by the French in 1688. But a new and larger one was afterwards fabricated, which held 800 hogsheads. It was formerly kept full of the best Rhenish wine, and the electors have given many entertainments on its platforms; but this convivial monument of ancient hospitality is now but a melancholy, unsocial, solitary instance of the extinction of hospitality—it moulders in a damp vault, quite empty. It is nine yards long, seven in diameter, and holds 67,000 gallons; a measure

greatly inferior to many of the London porter vats.

The celebrated tun of Koenigstein is said to be the most capacious cask in the world; holding 1,869,336 pints. The top is railed in, affords room for twenty people to regale themselves with ease. There are also several kinds of welcome cups, which are offered to strangers, who are invited, by a Latin inscription, to drink to the prosperity of the whole universe. This enormous tun was built in 1725, by Frederick Augustus, King of Poland, and Elector of Saxony, who, in the inscription above mentioned, is styled the "father of his country, the Titus of his age, and the delight of mankind."

French Wines.

The wines of France are peculiarly excellent; and though they differ very sensibly in their taste and properties, there are few constitutions, be they ever so valetudinary, to which some of them is not adapted. Thomson, in his Autumn, has thus characterized some of these delicious wines:

> "——— The Claret, smooth and red,
> The mellow tasted Burgundy, and, quick
> As is the wit it gives, the gay Champagne."

At Clairvaux, a small town in the department of Aube, in France, there are several enormous casks which will contain from one hundred to four hundred tuns of wine; and the famous tun of St. Bernard, (the first abbot of Clairvaux) will hold no less than 1,612,800 pints of this liquid. In these capacious vessels, wines are sometimes kept for ten years.

Madeira Wine.

This is the produce of Madeira, a beautiful and fertile island, situated in the Atlantic ocean. These wines are greatly improved by the heat of the sun, and therefore acquire a considerable augmentation of price by being conveyed across the equator to their arrival in England. This island, which belongs to the Portuguese, produces 28,000 pipes of wine, annually, 8000 of which are drank there, and the rest exported, principally to the West Indies.

Spanish Wines.

The principal wines of Spain, are Sherry, Pacaretta, Mountain and Tent. Sherry is a sort of *sec* or dry wine, prepared about Xeres, in the diocese of Seville, Andalusia; and hence called, according to our orthography, sherris or sherry.

The wines most remarkable in Cadiz, are Sherry and Pacaretta, both from Xeres, and its vicinity.

In the district of Malaga, there are 14,000 wine presses, chiefly employed in making the rich wines, which, if white, from the nature of the country, is called *Mountain;* if red from the colour, *Vino tinto*, known to us by the name of tent.

The wine of La Mancha appeared to Mr. Townsend to be the best in Spain; it had, he says, the flavour of the richest Burgundy, with the strength and body of the most generous Port.—See his *Journey*, vol. ii, p. 263-390, vol. iii, p. 29.

Malmsey Wine.

This wine was formerly the produce of Cemelia, the islands of the Archipelago, and the Morea, in Greece; but is now chiefly brought from Madeira, and some from Spain. It is a sweet wine, of a golden, or brownish-yellow colour; and to this is applied an Italian proverb, signifying *manna to the mouth and balsam to the brain.*

Malmsey is supposed to have received its name from Malvasia, a small island east of the

Morea, a peninsula, in Turkey in Europe. The French call this wine Malvoisac. It was in a butt of this wine the Duke of Clarence, brother to Edward IV, is said to have been drowned in the Tower.

Sack.

This is a kind of sweet wine, now brought chiefly from the Madeira Islands, and Palma, one of the Canaries. The first is called Madeira *sec*, the latter, which is the richer and better of the two, canary, or palm *sec*.

The name sac is a corruption of *sec*, which signifies dry; but wine merchants of the present day use the word *soft* to denote the same quality. The sack of Shakspeare is believed to have been what is now called sherry.—See Malone's *Shakspeare*, 1st Part Henry IV.

Falernian Wine.

The Falernian wine, so much celebrated by the ancient Roman poets, particularly Virgil and Horace, was the produce of Falernus, a fertile mountain and plain of Campana, a district of Italy, in which Rome is situated. Among the Romans the age of wines was in a manner the criterion of their goodness: and

Horace, in his odes, boasts of his drinking Falernian wine, born as it were with him, or which reckoned its age from the same consuls.

> "Perhaps to-morrow he may change his wine,
> And drink old sparkling Alban*, or Setine,
> Whose title, and whose age, with mould o'ergrown,
> The good old cask for ever keeps unknown."
>
> JUVENAL, BY BOWLES.

What was called Opimiam wine is said to have been kept for 200 years; but the moderns keep no wine to any such age; for in Italy and Germany, where they are longer preserved, scarcely any, it is said, are found above fifteen years old; and in France the best keeping wines are reckoned superannuated in five or six years.

The wines of Italy are still deemed excel-

Albo, says Addison, who travelled in Italy in 1701-2, still retains its reputation for wine. If Martial the celebrated Latin epigrammatist may be credited, wine, in Italy, might formerly be obtained with more facility than water:

> "Lodged at Ravenna, water sells so dear,
> A cistern to a vineyard I prefer.
>
> . . . . . .
>
> By a Ravenna vintner once betrayed,
> So much for wine and water mix'd I paid;
> But when I thought the puschas'd liquor mine,
> The rascal fobb'd me off with only wine."

lent, particularly those of Savoy, Piedmont, Lombardy, the Pope's territories, Naples and Tuscany. Florence the capital of the last mentioned district, is delightfully situated in "Arno's fertile vale," between mountains covered with olive trees and vines.

> "There grapes in thickest clusters hang,
> Among the sweets of Arno's vale."

Greek, or Turkey Wines.

The wines thus denominated come from Candia, Chios, Lesbos, Tenedos, and other islands of the Archipelago, which anciently belonged to the Greeks, but now chiefly to the Turks, and about to be restored to their former possessors. The ancient poets were lavish in praise of this wine. That of Lesbos is mentioned in Virgil's Georgics:—

> "Nor our Italian wines produce the shape,
> Or taste, or flavour of the Lesbian grape."

And Horace inviting his mistress to his country seat, promises to entertain her with a glass of Lesbian, which he calls *innocent* or *harmless*. (*Lib.* 1. *Od.* 17.) The same poet also makes frequent mention of the wine of Chios, and Virgil takes notice of it in one of his eclogues:—

"Two goblets will I crown with sparkling wine,
The gen'rous vintage of the cheering vine;
These will I pour to thee, and make the nectar thine."
DRYDEN.

"The ritual feast shall overflow with wine,
And Chio's richest nectar shall be thine."
WARTON.

Chio, now Scio, is one of the most beautiful and pleasant islands in the Archipelago; it is situated south of Mytilene, the ancient Lesbos. Its vineyards still constitute the principal riches of the island, and the wines maintain their reputation, and, having been immortalized by the "Mantuan Bard," yet "taste sweet in song."

CLARET.

CLARET, or clairet, pale-red, is a name given by the French to such of their red wines as are not of a deep or high colour. The word is a diminutive of *clair*, bright, transparent. Lord Chesterfield in his celebrated letters to his son informs him that claret comes from Bourdeaux, a testimony confirmed by the authors of the Encyclopædia Britannica, who affirm, that the country adjacent to this city not only produces the finest clarets, but, at the season of the vintage, forms one of the most delicious landscapes in the world.

Mr. Townsend says that a generous wine,

produced near Alcala, in Spain, is much used for enriching the poorer wines in the neighbourhood of Bourdeaux, for the purpose of making claret.—*Journey*, vol. iii, p. 302.

Schiraz Wine.

Schiraz is the second city of Persia; Ispahan being considered as the capital; though Colonel Capper, who was in that country in 1778, assures us that the seat of government was transferred the same year from the latter to the former city; and Zehoran, near the Caspian Sea, is now said to be the capital. The wine of Schiraz *, is not only the best in Persia, but, as some think, in the whole world. It is so potent as to admit two-thirds of water without spoiling the flavour.

> The pamper'd here refine their taste,
> Rich wines of Schiraz crown their feast.
>
> Hoppner's *Oriental Tales*.

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* This immense city was destroyed by Alexander the Great, who, in a fit of intemperance, was induced by the depraved courtezan, Thais, to set it on fire. This profligate monarch soon after terminated his ambitious career by intoxication at Babylon, in the thirty-third year of his age. At his final drunken carousal, although already in a state of inebriation, he had the presumption to empty the cup of Hercules, which, according to Rollin, held six bottles, at a single draught.

Tokay.

The same kind of grape proves very different in taste and flavour, according to the climate, and its exposure to the sun. Tokay is an exquisite Hungarian wine; and one particular sort is the produce of a hill which directly fronts the south, and is called, from the peculiar sweetness of its grapes, the sugar hill. This, says Neumann, affords the most delicious wine, and is appropriated to the sole use of the imperial family; hence, perhaps, come the epithet "Imperial Tokay". Tokay or Tockay, is a strong but inconsiderable town in Upper Hungary, only noted for its wine.

CHAPTER VI.

English Wine.

It is supposed that formerly there were vineyards of considerable extent in England. And about a century after the accession of William the Conqueror, there was a vineyard near Pembroke in Wales. It has been thought probable that the cultivation of the vine was re-

linquished in this country in consequence of our increased intercourse with France. Notwithstanding the climate of great Britain has of late years been unfavourable to the production of wines*, yet our good housewives continue to make a pleasant vinous beverage from no less than thirty-seven sorts of fruits.

Domestic Wines.

Our domestic wines, commonly called *sweets*, or *made wines*, are chiefly made from raisins or dried grapes, from Spain or Portugal. Francis Chamberlayne first made the attempt in 1635, and obtained a patent for fourteen years, in which it is alleged that his wines would keep good during several years, and even in a voyage under the line.—Rymer.

The art was very successfully revived some years ago, by Mr. Beaufoy, and the foreign wines most admirably mimicked. Such is the prodigality and luxury of the age, that the demand for many sorts exceeds, in a great degree, the produce of the native vineyards.

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* Mr. Miller asserts that he has made wine from English grapes, as good as any of the best and purest French wines drank either in Paris or Champagne. See Rees' *Encyclopedia*, Art. Wine.

We have skilful fabricators who kindly supply our wants.

It has been estimated that half the port, and five-sixths of the white wines consumed in the metropolis, have been the produce of our *home wine-pressers*. The product of the duty to the state was estimated in one year, from one house alone, at no less than £7363. The genial banks of the Thames yield almost every species of white wine; and, by a wondrous magic, the late Mr. Beaufoy, as others continue to do, poured forth the materials for the rich Frontignac, to the more elegant tables of the civic gourmand, or noble epicure; as well as the Maderia, the Calcavella, and the Lisbon, into every part of the kingdom.

Mr. Pennant, in his "London," speaking of Mr. Beaufoy, whose premises were in the vicinity of Lambeth and Westminster Bridge, observes, that there was a magnificence of business that could not fail to excite the greatest admiration, whether we consider the number or the size of the vessels. At his vinegar manufactory there was one vessel which contained 36,793 gallons of vinegar, besides a number of others which held from 32,000 to 16,900 gallons each.

CHAPTER VII.

ECONOMY OF WINE.

On the Treatment and Management of Different Wines*.

To Rack Wine.

By *racking* of wine is to be understood the drawing it off into another cask, defecating it, and depositing the lees, which are left behind, and which generally consist of ferment, altered by the fermentation of the *must*, some ferment unaltered by the operation, mucilage, tartar, and colouring matter. The lees, however, are not always the same from every kind of wine; the quantity of tartar varies, as also that of the colouring matter, according as the wine is more or less spirituous. In different wines there is

* For the principal part of this article, we have availed ourselves of the report read at a sitting of the Imperial Institute of France, "On the mode of treating and managing different wines." By Dr. Duportal.

more or less of the ferment, and this has undergone more alteration in some wines than in others. Thus sweet Spanish wine does not contain any unchanged ferment, because the sugar in it is more than sufficient to decompose the whole of this substance: by adding more ferment to this wine you will diminish its sweetness, and increase the alcohol. On the contrary, a meagre Burgundy wine will yield a great quantity of unaltered ferment, because the deficiency of sugar did not permit the whole of it to be decomposed. By the addition of sugar to this wine the fermentation would be renewed, and more alcohol is produced.

The operation of racking wines is necessary to their preservation; and should, in general, be renewed whenever there is a considerable sediment at the bottom of the cask. Some wines, however, may be kept upon their lees, such as those of St. Thierry in Champagne, which will continue to improve, if kept upon their lees four years, provided they are contained in casks of a very large size. If we consider the different nature of various wines, and of their lees, it will be easily seen that racking is not equally necessary for all of them. If, for instance, it be a very weak wine, it cannot be

racked off too soon, for the small quantity of alcohol contained in it will not be able to prevent the acetic ferment taking place, from the action of the ferment in the lees. But if it be a very generous wine, early racking is not necessary, because the great proportion of alcohol renders the ferment of no effect. Moreover a sweet and syrupy wine will become improved by keeping on the lees, because the sugar contained in it will be acted upon by the fermentescible principle of the lees. Even a very tart wine, when kept upon its sediment, will grow better when its tartness is owing to a too slow and incomplete fermentation, in which the sugar has not been entirely converted into alcohol. M. Chaptal, in the following passage, clearly establishes the truth of this assertion: "We ought only to draw off those wines which have been well made: if a wine be very tart or very sweet, we must suffer it to undergo a second fermentation upon its lees, and mix them well together, that a new fermentation may be excited, which will ameliorate the wine."

Rules for Racking of Wine.—This operation ought never to be attempted in frosty seasons, nor when a moist wind blows; a dry, cool

wind is preferable; and it is most advantageously done previous to the shooting of the vine, its coming into blossom, and the turn of the grape; for it is at these periods the wine ferments most. In every wine country, experience has demonstrated the proper time for this operation.

Whatever care may be taken in the racking of wines they will again ferment, unless they undergo the operation of brimstoning; that is to say, if they are not impregnated with sulphureous gas, by means of burning sulphur matches in the casks, either when completely empty, or when containing only a few pails of wine, to which more wine is added every time the burning is renewed. At Marseilles, in Languedoc, *must* is used for the purpose of brimstoning, which has been so strongly charged with sulphureous gas as never to have fermented; two or three bottles of this *must*, mixed with each cask of wine, will also preserve it from fermentation. The brimstoning by burning matches, has one disadvantage, that of depriving the must of the flavour of the fruit, and communicating to it an unpleasant taste. On this account other anti-fermentescible substances are sometimes employed.

Thus, M. Perpere recommends sulphuric acid; M. Astier employs mercury; and M. Parmentier has proposed the oxide of manganese, which is less hazardous.

The chemical action produced upon the must and upon the wine, by the operation of brimstoning, is, that it tends evidently to preserve these fluids from fermentation, and, as this cannot take place without the pressure of a ferment, we have reason to conclude that this agent is changed in its nature, and rendered insoluble, perhaps because it abstracts from the oxides and acids employed a portion of their oxygen. It must, however, be acknowledged that the supposed abstraction of this principle is not essentially necessary, since this fermentation may be prevented by adding some boiling-hot wine to the liquor, as is practised in Paris, which shews that the ferment undergoes an alteration by the action of caloric. Nevertheless it is certain, that this substance undergoes a change in its nature by the brimstoning, and is rendered, in part, insoluble, for by this operation the wine becomes turbid: it also sensibly loses its colour; but this is temporary, for in a few days it regains its former appearance. M. Chaptal thinks it advantageous to

the keeping wines, to preserve them from the atmospheric air, whose contact is necessary to induce the acid degeneration.

Fining of Wine.

The operations of racking and brimstoning wines are not always sufficient to impart to the wine that fine limpidity which is so agreeable to the organs of taste and smell, and which so much enhances its value. There still remain in these liquors certain heterogeneous substances which disturb the transparency of them, and which do not fall down by simple rest. In this case we have recourse to a third operation, called *fining*, which is generally performed by fish glue, previously softened to a viscid fluid by maceration in a little of the wine. By this the substance which rendered the wine turbid is carried to the bottom; for we find the wine becomes more limpid, and a sediment is formed, which renders a fresh racking necessary some time after this substance has been poured into the wine, and well mixed with it. The same effect is produced in the turbid wine by means of ox-blood and the white of eggs. These latter, therefore, may be used to clarify wines, especially the last;

which does not so easily undergo a septic change, and is, therefore, preferable in hot climates, and in the summer season. Chaptal affirms that gum-arabic may be substituted for these gelatinous and albuminous substances. He even adds that wine, rendered turbid by the lees, may be cleared by a multitude of substances, such as coarse salt; flints calcined and bruised; starch, rice, milk, &c.; likewise by beech chips, first baked, then boiled in water, and dried in the sun or in an oven. He attributes the effects of beech chips, upon turbid wine, to a slight fermentation which they induce in the liquor: the action of rice, starch, and milk may be referred to the same circumstance; whilst the action of the greatest part of other substances is purely mechanical.

But how is the action of the fish glue, the ox-blood, and the white of egg, to be explained? So little attention has hitherto been paid to what takes place in this case, that we know of no theory formed on the subject; though it appears very easy, from the following facts, to invent a very plausible one.

1. Fish glue is a gelatinous matter; the white of egg and ox-blood are of an albuminous nature.

2. Both of these animal compounds are very soluble in water, and not at all soluble in alcohol.

3. Alcohol exists already formed in wine, since it is easy to separate it by congelation.

These being incontestable facts, what must happen when these gelatinous fluids are poured into the wine? The alcohol of the wine, by its great affinity to water, will attract the fluid, holding the animal matter in solution; consequently this matter, thus deprived of its solvent, must give way to the molecular attraction, which tends to bring its particles together, whence results a kind of net-work swimming in the liquor; this net-work contracts more closely, entangles in itself the foreign substances in the wine, and carries them down to the bottom of the cask, leaving the mass of liquor clear, pure, and transparent.

The last method of preserving and ameliorating wines consists in the art of mixing them together, so as to render them less alterable, and to impart to them the most agreeable flavour. This art, though perfectly well known to the manager of a cellar, is not yet known by the chemist, and will never be known by him, unless the wine merchant will inform him what

mixtures succeed the best. The experience of this latter would be rendered more advantageous if assisted by the reasonings of the former. A wine mixed with some other wine can acquire more strength, more colour, more aroma, or more flavour, only by its principles undergoing some re-action, more or less sensible; and who but the chemist can best dispose the circumstances most favourable to this re-action? If, for instance, it be required to correct a very acid wine, the chemist, finding in this wine a great deal of tartar, will propose the addition of sugar, because this substance, by increasing the proportion of alcohol, will precipitate the tartar, and by this means he will avoid having recourse to the sweet and syrupy for that purpose, which are not to be found in all countries, and whose price is always everywhere so very high.

Wine-Cellar.

After wines have undergone the operations above described, it becomes an important consideration in what vessels they are to be kept. According to Chaptal, a cellar should be dug several feet below the surface of the earth; the openings into which should be towards the

north; it should be at a considerable distance from any street, highway, workshop, sewer, privy, &c.; and it should be covered with an arched roof.

The ancients preserved their wine in earthen vessels, varnished, such as the amphora and the cadus. The porosity of these vessels has occasioned their being laid aside, and for them have been substituted those made of the wood of oak or mulberry tree, or sometimes glass vessels. The last have the advantage of not containing any principle soluble in the wine, and of preserving the liquor completely from the contact of air and moisture, when carefully stopped; but their brittleness and diminutive size limits the use of them to a very small extent, and it becomes necessary to have recourse to vessels made of dry and well-seasoned wood; for if the wood be green it imparts an extractive matter to the wine, which injures its flavour, and acts upon it in a manner similar to the lees.

It is justly observed by Chaptal, that very large and well-closed vessels are the best for keeping wines, since it is found that wine is always better the larger the cask; the reason of which, no doubt, is, that the constituent

principles are more intimately mixed, and do not so easily escape into the atmosphere. This last circumstance is well known to wine merchants, who find that twenty hogsheads of wine, contained in one large vessel, do not lose more by volatilization in a given time, than two hogsheads do when distributed into four casks.

The greatest care bestowed upon wines will not always prevent their suffering some alteration; they will generally undergo some change if the principles which compose them are not in suitable proportions. This has been demonstrated by Chaptal in his investigation of the deterioration to which wines are subject, a deterioration which, for the most part, he ascribes to an excess of ferment in them. Of this alteration we shall make the following observations:—

1. Ropiness only takes place in very weak wines, and those which have been badly fermented; it is known by a ropy, milky, whitish sediment, and the wine then presents a kind of oily appearance. No particular management is requisite to cure this; it is generally sufficient to leave the wine to itself during a season or two, when, for the most part, the wine recovers. Exposure in a warm place, or

the addition of some sugary substance, will hasten the cure; the same thing will happen if the ropy wine is mixed with some good wine newly made.

The fermentescible principle appears to be the source of this degeneration; from its not having been completely decomposed during the fermentation, a great deal of it is dissolved in the vinous liquor, after the entire decomposition of the sugar. And as this principle may be afterwards separated from the liquor by a variety of causes, Chaptal imagines it to be this separation which gives that oily appearance to the wine which we have been describing.

2. Spontaneous ascescency takes place most frequently in very weak wines, especially at three particular periods of the year, when these liquors are in the greatest state of fermentation, *viz.* when the wine is budding; at the time of its blossoming, and at the vintage time. It is, therefore, to the presence of the ferment this deterioration is owing, especially when its action is assisted by air and heat. It has already been said that this action sometimes proceeds so far as to induce the acetous fermentation. The prevention of this fermentation demands the most particular at-

tention, and therefore all the causes which give rise to it are to be carefully avoided. Unfortunately our efforts are not always successful, and we can only arrest the fermentation, or neutralize the acid. For the former purpose Chaptal recommends must, honey, or liquorice to be dissolved in the tart wine. These not only correct the sour taste by replacing it with sweetness, but also reproduce the spirituous fermentation, by supplying the saccharine principle for the remaining ferment to act upon. The wine merchants possess a multitude of receipts for neutralizing the acid in wines; they are chiefly composed of salefiable bases, such as potass, lime, and even litharge. These methods, however, but imperfectly answer the purpose, and some of them are attended with no little danger.

3. Fusty Wines.—A fusty taste in wines arises from two causes: the first is, when the wine is kept in a cask made of decayed or worm-eaten wood: the other when the lees of wine have remained in the cask, although they are emptied out at the time of tunning. It has been proposed to destroy or correct this taste by means of lime, carbonic acid gas, and oxy-muriatic gas. Others advise the wine to be

fined and racked off with care, and then to be infused two or three days upon toasted grains of wheat. In Burgundy they pour the fusty wine upon the lees of well-tasted wine, and afterwards fine it.

Some wines, especially those of Burgundy, acquire, by age, a taste of bitterness. This is owing to the total precipitation of the ferment, and the complete decomposition of the sugar, which set at liberty the acerb or astringent principle contained in these liquors. Chaptal recommends these wines to be poured upon the lees, and that there should be added to them a solution of sugar, or what is still better, a pint of musted wine to every cask.

In addition to these alterations already pointed out, wines are susceptible of several others, such as a mouldy taste, loss of colour, rancidity, &c. The rancid taste in wines is owing to the precipitation of the tartar, and the formation of a small quantity of acetic ether, at the expense of the alcohol and acetic acid contained in the wine.

CHAPTER VIII.

Malt Liquors.

Whether from barley or other grain, provided they be not too strong, malt liquors are wholesome, refreshing, and strengthening drinks. As these liquors are very nutritious, they are chiefly suited to persons who lead a busy and active life. With sedentary and bilious persons they do not agree so well; and they are improper for the corpulent and asthmatic, and those who are liable to giddiness and other complaints of the head. They are better when of a middling age than when kept very long. Beer made from the infusion of malted groats, or malted rye, is lighter and more diuretic than the common barley beer.

Spruce beer is a powerful diuretic and antiscorbutic; it is, however, too cold for some constitutions. Bottled beer is, on account of the fixed air it contains, more refreshing than the barrelled. It is frequently prescribed as an antiseptic and restorative in low fevers

and convalescencies; but care must be taken, during its use, that it do not operate too freely by stool.

London porter, with the properties common to malt liquor, possesses such stomachic and diuretic qualities as gives it a preference over common beer and ale in many cases. Being strongly impregnated with bitters of a narcotic kind, it is apt to induce drowsiness, and, consequently is improper wherever there is a tendency to headach, apoplexy, or other affections of the head. It differs from ale and pale beer, in its being made with high dried malt.

Dr. Ash * says that it obtained the name of Porter from being much drank by porters in the city of London. This happened about the year 1730, from the following circumstance: The malt liquors in general use, prior to that period, were *ale*, *beer*, and *two-penny*, and it was customary to call for a pint or tankard of *half-and-half*, *viz.* half of ale and half of beer; half of ale, and half of two-penny; or half beer and half two-penny. In the course of time it also became the practice to ask for a

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* Author of a once popular *Introduction to English Grammar*, or *English Dictionary*.

pint or tankard of *three-thirds*, meaning a third of ale, beer, and two-penny; and thus the publican was obliged to go to three casks for a single pint of liquor. To avoid this trouble and waste, a brewer of the name of Harwood* conceived the idea of making a liquor which should partake of the united flavours of *ale, beer*, and *two-penny*. He did so, and succeeded, calling it entire, or entire butt-beer, meaning that it was drawn entirely from one cask or butt; and being a hearty, nourishing liquor, it was very suitable for porters, and other working people; hence it obtained the name of porter.

Mr. Pennant, speaking of porter (genuine porter it may be presumed,) calls it a whole-

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* Mr. Harwood was one of the proprietors of a respectable brewery, known by the name of the "Bell Brew house," Shoreditch. A contemporary bard of the neighbourhood, whose muse had been often invigorated by "Potations pottle deep" of Mr. H.'s newly discovered beverage, chaunted forth its praise in a ballad which was long popular, and is still preserved in Ellis's *History of Shoreditch*.

Entire butt beer was first retailed at the "Blue Last," Curtain Road; and the intercourse between that public house and Bell Brewhouse has continued ever since. The proprietors of this brewhouse, in 1805, were Messrs. Pryor.

some liquor, which, he says, enables the London porter-drinkers to undergo tasks that ten gin-drinkers would sink under.

Malt liquors have had many advocates both in prose and verse; and Bloomfield, in his admired poem, *The Farmer's Boy*, calls it a sovereign cordial; and the modern Scotch bard, as well as in his famous song of *John Barleycorn*, thus apostrophises it:—

> "Thou clears the head o' doited lear;
> Thou cheers the heart o' drooping care;
> And strings the nerves o' labor fair,
> At 's weary toil;
> Thou even brightens dark despair,
> Wi' gloomy smile."
>
> BURNS.

It is, however, a mistaken notion, as Mr. Colquhoun* observes, that a large quantity of malt liquor is necessary to support labour of any description. After a certain moderate portion is taken, it not only enervates the body but stupifies the senses. A coal-heaver who drinks from twelve to sixteen pots a-day, would derive more real nourishment, and perform his labour with more ease and a greater portion of

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* *Treatise on the Police.*

athletic strength, if only one-third of the quantity were consumed. He would also enjoy much better health, and be fitter for his labour the following day.

Mum.

This is a wholesome kind of malt liquor, brewed chiefly from malt made from wheat instead of barley. It is not thought to be fit for use till it has been full two years in the cask.

Mum is much used in Germany; and Brunswick, a large and strong town of Lower Saxony, is the place of most note for making it; hence it is frequently called Brunswick Mum. It is sometimes imported into this country, and our own brewers also make small quantities of this bulk-increasing liquor.

"———sedulous and stout
With bowls of fat'ning mum."

Phillips.

"The clam'rous crowd is hush'd with mugs of mum.
Till all, tun'd equal, send a general hum."

Pope.

Brown Stout.

This is a cant phrase for strong beer.

" Should but the muse descending drop
A slice of bread and mutton chop,
Or kindly when his credit's out,
Surprise him with a pint of *stout;*
Exalted in his mighty mind,
He flies and leaves his stars * behind."

SWIFT.

NUT-BROWN.

THIS term, when applied to malt liquor, denoted, in former times, ale or beer that, in consequence of its age, had become brown, like a nut long kept; but the brewers of this generation, being considerably wiser than their predecessors, can, as far as relates to external appearance, accomplish that by art in a few days, which heretofore was performed by time in as many years. The attachment of our ancestors to this nutritive and pleasant beverage is often noticed by the poets; and Dr. King, in his *Art of Cookery*, alludes to it in the following lines:—

" King Hardicanute, 'midst Danes and Saxons stout,
Carous'd on *nut-brown ale*, and din'd on grout †."

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* 'Sublimi feriam sidera vertice'—my lofty head shall strike the stars—is a flight of Horace, that has been long employed as a common-place pleasantry.

† Grout, a coarse part of meal, pollard, oats husked, or coarsely ground. In Scotland they are called *groats*, and

" Young and old come forth to play,
Till the live long day-light fail,
Then to the spicy, *nut-brown ale.*"

MILTON.

" Full oft I drain'd the spicy *nut-brown* bowl."

POPE.

Dr. Warton says, that nut-brown ale was a composition of ale, nutmeg, sugar, toast, and roasted apples. It was commonly called *lambs' wool;* by Fletcher, *the spiced wassail bowl;* and by Shakspear, *the gossip's bowl*.*

ALE.

ALE is made by infusing malt in hot water, and then fermenting the liquor by the addition of barm or yeast. Hops are also an essential ingredient.

There are various sorts of ale known in Britain, particularly *pale* and *brown;* the former is brewed from malt slightly dried, and is

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use it occasionally instead of barley to make broth, but in general, as with us, to feed poultry, or make gruel. It is what we term *grits.* The monarch's dish of grout was probably an admixture of ingredients. Hardicanute died at Lambeth, in 1042, in the midst of the jollity of a wedding dinner.

* See *Chron. and Biog. Exer.* 4th Edit. Art. Wassail.

esteemed more viscid than the latter, which is made from malt more highly dried.

Many places in England are famed for the excellency of their ale, particularly Dorchester, in Dorsetshire; and Burton, in Staffordshire. The ale of this last county is, by some, deemed incomparable, and great quantities of it are sent down the Trent to Hull, and exported to other parts of the kingdom.

The ancient Britons, and other Celtic nations, sometimes made their ale of wheat, oats and millet. This was the favourite liquor of the Anglo-Saxons and Danes, as it had been of their ancestors, the ancient Germans. Before their conversion to christianity, they believed that drinking large and frequent draughts of ale was one of the chief felicities which those heroes enjoyed who were admitted into the hall of Odin. To heighten the enjoyment, they were, moreover, assured that their favourite beverage should be drank out of the skulls of their enemies.

Ale continues to be the favourite beverage of the peasantry in most of the English counties: the poor man's—

"Sweet oblivion of his daily care."

Goldsmith, in his beautiful poem, *The De-*

serted Village, laments the decay of a village ale-house in the following pathetically descriptive lines:—

" Low lies that house where *nut-brown* draughts inspir'd,
Where grey-beard mirth and smiling toil retir'd;
Where village statesmen talk'd with looks profound,
And news, much older than the ale, went round.
Obscure it sinks, nor shall it more impart
An hour's importance to a poor man's heart *."

Ale is of so great antiquity in the kingdom, that in the year 1492, we meet with a licence from Henry VII to John Merchant, a Fleming, to export fifty tuns of this liquor.

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* In former times it was customary to present to malefactors, in their way to the gallows, a great bowl of ale, as the last refreshment they were to receive in this life. Such a custom prevailed at York, which gave rise to the saying, that the " saddler of Bawtry was hanged for *leaving his liquor*." Had he stopped, as usual, his reprieve, which was actually on the road, would have arrived time enough to have saved him. PENNANT's *London*, p. 179.—1793.

Intoxicating draughts used anciently to be given to malefactors just before their execution, to stupify them, and render them insensible to their pain. The compassionate ladies of Jerusalem generally provided this potion, which consisted of frankincense and wine, at their own cost. The foundation of this humane custom was the command of Solomon. See *Prov.* xxxi. 6.

Beer.

Beer, like ale, as before observed, is a liquor made of malt and hops. It is, however, distinguished from ale, either by being older, stronger, or smaller. The following phrases denote, it is presumed, beer of a superior potency.

> "Here is a pot of good *double beer*, neighbour; Drink." Shakspeare.
>
> "Strong, lusty, London beer." Fletcher.

Barley Broth is also a cant word often used by the vulgar for strong beer, and is so employed by Shakspeare:

> "Can sodden water—their barley broth—
> Decoct their cold blood to such valiant heat?"

Old or strong beer is sometimes designated by the apellation of *stingo*, as well as by that of *October;* because that month is held to be peculiarly propitious to the brewing of this grateful beverage.

> "Nor wanting is the brown October, drawn
> Mature and perfect from this dark retreat
> Of *thirty years;* and now his honest front
> Flames in the light refulgent, not afraid
> Even with the best vineyards' best produce to vie.
> Thomson.

British beer is universally held to be superior to that of all other countries.

Fermented liquors, we repeat, taken in moderate quantities, are both proper and necessary for those who perform laborious work; but the healthy proportion is apt, when the opportunity offers, to be exceeded by people whose gratifications are few in number, and of rare occurrence. They are much less injurious to the constitution than ardent spirits, however diluted.

CHAPTER IX.

On the Strength and Age of Malt Liquors.

Whether they be ales or strong beers, it is certain that the middling sort is allowed by physicians to be the most agreeable of any, especially to those who lead sedentary lives, or are not otherwise occupied in such callings as promote perspiration enough to throw out and break the viscidities of the stronger sorts; on which account the laborious man has the ad-

vantage, whose diet being poor, and body robust, the strength of such liquors gives a supply, and better digests into nourishment. But, for inactive men, a hogshead of ale that is made from six bushels of malt is sufficient for a dilution of their food, and will better assist their constitution than the stronger sort; that quantity, therefore, of ale, and ten bushels for a hogshead of strong beer that should not be tapped under nine months, is the most healthful. Such an amber liquor as this, brewed from good malt, will permit a copious libation over night without producing any unpleasant effect the next morning. This, indeed, is the true nostrum of brewing, which ought to be the constant study and endeavour of all who brew to produce; and then it will supply the place of more chargeable and pernicious drinks. So likewise, for small, beer, especially in a farmer's family, where it is not of sufficient body, the drinkers will be feeble in hot weather, and not be able to perform their work, and will also bring on distempers, besides the loss of time, and a great waste of such beer that is generally much thrown away; because drink is certainly a nourisher of the body, as well as meats, and, the more substantial they both are,

the better will the labourer go through his work, especially in harvest time; and in large families the doctor's bills have proved the evil of this bad economy, and far surpassed the charge of that malt which would have kept the servants in good health, and preserved the beer from such waste as the smaller sort is liable to. This is the reason some prudent farmers will brew their ale and small beer in March, allowing five or six bushels of malt, and two pounds of hops to the hogshead of ale; and a quarter of malt, and three pounds of hops, to five barrels of small beer.

The age of malt liquors make them more or less wholesome, and seem to have the same effects as hops; for those liquors that are longest kept, are certainly the least viscid. Age, by degrees, breaks the viscid parts, renders them smaller, and makes them finer for secretion; but this is always to be determined by their strength, because in proportion to this they will sooner or latter come to their full perfection, and likewise their decay, until the finer spirits quite escape, and the remainder becomes vapid and sour. The older, therefore, drinks are, the more healthful they will be, so they be kept up to the standard, but not

to go beyond it. The advantage of private brewing will be felt by all who put it in practice. Independent of being free from adulteration, they will have their ale and beer fine and old, at their discretion.

Observations on some Country Drinks.

In Suffolk and Norfolk, they run very much upon a light brown or deep amber-coloured butt beer, which, in the latter place, is called *Nogg*, commonly sold for about six-pence per quart, and in some parts is a light, good drink: but then, like their cheese, where they make mostly butter, their common ale is hardly fit to drink; in consequence of being made, for the most part, from the earthy goods of the strong beer and its hops. About Rochester, in Kent, they brew a most potent, deep, brown, stout beer, at five-pence per quart, and which, indeed, best agrees with their brackish water and bad air.

In Somersetshire and other parts of the west, they affect a pale butt beer; and at Bristol, besides their state drink, a mild, cool-worked common ale is much in request for being of a deep amber or light brown colour, and so clear that they often bring it in decan-

ters—a condition in which it would be desirable to see the hot, worked, London common brown ale always in, that both it, and the pale yeast water also may be exempt from that censure, which strangers but too justly, are apt to cast upon them. At Bedminster, an eminent quaker, who made an ample fortune by the distillery, used to say that he would rather brew in a kettle, than drink the town brewed malt liquors—a reflection for which there would be no room were the excellent New River water, sound malt, an airy brew-house, and a true art employed in brewing them.

The Pleasure and Profit of Good Ale and Beer.

As a clear, wholesome, pleasant malt drink is justly esteemed the best universal liquor this island affords, and, where it may be the best brewed of any place in the world, it is of the utmost importance to make it answer this great end; because by this health is preserved, both master and servant kept at home or near it, business more diligently and expeditiously carried on, the great expense of high priced wines and unwholesome spirits lessened, the publican enriched, and the revenue increased. On the

contrary, where there is no other drink to be had than thick, grouty, sickly, fulsome ale; harsh, stale, or ill-tasted beer, then home and its neighbourhood become irksome and forsaken by master and servant, who think their time well spent in roving, perhaps, a mile or two, in search of some better beverage; and then if it pleases them they so indulge this rare opportunity, by indulging to excess, and thus subject themselves to many inconveniences; which a vessel of "good nappy" at home, or some adjoining public house, would, in a great measure prevent, by having an opportunity of enjoying it in an easier and cheaper manner.

BEER—PORTER—ALE:—ADULTERATIONS OF.

BEER, commonly called porter, the universal cordial of the populace, gin excepted, is also, in the hands of the brewer and the publican, as liable to adulteration as bread in those of the baker. Some years ago, a Winchester quart of old sound porter would yield near six ounces of good proof spirits, by a careful distillation; but the beer of the present day will not yield four ounces of the same spirit. Whether this deficiency be attributable to the avarice of the brewer, the roguery of the publican, or the

quality of the malt, is not very pertinent to the subject; but the reduction of its strength ought to be balanced by its genuineness.

Beer divested of its quintessence by any means, speedily becomes too forward and sickly (as it is termed); and it requires, in this state, more circumspection and management than good sound beer. The loss of its spirituous body disposes it to turn flat, so that when *thrown down*, as it is called, or clarified with isinglass, and afterwards drawn into proper drinking vessels, it will not retain its flowery head or froth, the pride both of the victualler and the drinker. The brewer's coopers employed to rectify the usual disorders of beer, have invented various methods to remedy this defect, and have at length hit upon one which answers the business excellently, but which, at the same time, proves of the most pernicious consequence to the constitution; green vitriol (commonly called copperas) or salt of iron is the general panacea for such beer. A quantity of this nauseous styptic, from one to six ounces, is previously dissolved in milk or beer, then mixed up with a solution of isinglass, and thus added to one butt of beer. When by this means it is rendered fine, and drawn, the head

or froth will rise three or four inches above the pot, and will remain so for a length of time. The populace here fall into the same error as in the choice of their bread—for they prefer none that is not white, nor drink any beer, but what, when drawn, carries a head-like a cauliflower, and there are few *licensed* victuallers who do not understand this method of obliging their customers.

Salt of steel differs very little from purified green vitriol, although it is a chemical preparation of the shops. As alum consists of a chalky earth united to the acid of vitriol, so copperas or green vitriol, consists of a martial earth united with the same acid, and thus only differ in their bases as regards the composition; but the last is infinitely more nauseous, and deleterious, especially when drank in beer: for in this case it is not decomposed, like alum in bread, before it is taken internally, but every particle of beer is united to a particle of vitriol, and is thus taken into the stomach dissolved in its pure state.

It is admitted that salt of steel when prudently given, proves an excellent medicine, but when it is daily drank in beer, and continued a few days, it is not difficult to conceive by what

means it may produce very acute and dangerous diseases. It certainly does not affect all constitutions alike, for where there is a predominant acid in the stomach, it is increased by it, and thus, not unfrequently, in a surprising manner, it induces a most excruciating pain in the stomach, accompanied with heartburn; followed sometimes by severe griping, which at length is succeeded by an obstinate diarrhœa. Boerhaave observes, that this salt of iron on meeting with alkalescent and putrid matters in the body, and thus having its acid solvent drank up thereby, is turned into an astringent, ponderous, sluggish, metallic calx, that occasions inveterate obstructions; and that, at other times, it changes the excrements black, and forms them to a matter like clay.

There is still a worse mischief attends this abuse, when salt of iron is thus consumed in beer, it remarkably increases the momentum of the blood, especially if exercise be used after it; and this increased velocity of the blood heats the body, which induces thirst, which the toper in vain attempts to remove, by drinking more beer, and thus he is inadvertently coaxed into a debauch, attended with a most intolerable headache. The next day a sickness at the sto-

mach and universal languor prevail so much, that he becomes unfit for his accustomed exercise; and though he innocently accuses himself of the imprudent excess, he remains perfectly ignorant of the immediate cause.

Experiment I.

To prove when Beer is Adulterated with Salt of Steel, or Green Vitriol.

Take one ounce of the best blue coloured gall, such as the dyers use, powder them grossly, and boil them a quarter of an hour in half a pint of water. Strain the decoction and keep it in a phial for use.

When beer is suspected to contain green copperas or salt of steel, take two wine-glasses, fill them with the suspected beer, place them in a good light, and add a few drops of the decoction of galls to one glass; let it be well stirred and compared with the colour of the beer in the other glass; and if the one into which the solution of galls was poured, be changed the least degree blacker, it may with certainty be concluded, that such beer is impregnated with some chalybeate particles, which will appear more evidently, if the two glasses be examined after they have remained

undisturbed twenty-four hours; in which case a blackish sediment is deposited to the bottom of the glass admixed with the decoction.

Experiment II.

But for a more convincing proof, as the quantities of salt are sometimes very minute, take a gallon of beer and boil it gently till it be consumed to a pint, or less, to which add some decoction of galls, as before, and the effects will be more obvious. If no additional blackness supervene, it is evident that such beer is unadulterated with salt of steel. At other times beer is so profusely contaminated with it, that a styptic inky taste is very perceptible after drinking it.

These salts are not the only impurities with which beer is debased. The strong acid of vitriol is preferred for different purposes. Beer sometimes is so peculiarly stubborn as to resist purification with common finings. This defect is remedied by a previous addition of the acid of vitriol; four ounces of which is the general proportion to a butt. And another secret advantage results from this practice; for a butt of mild beer is thus rendered sufficiently acid for the victualler to gratify the state palate of

his customer, or to resemble what they call entire butt beer.

In other beer, the natural prevalent acidity is destroyed by the addition of fixed alkaline salts, soap lees, and calcareous earths. The first produce an immediate effervescence, called by the victuallers fomentation, and when the conflict is over, the gross particles are more easily precipitated with the finings. The first, in one sense, is a venial crime, for the essence of pure alkaline salts with the natural vegetable acid of beer, produces a *diuretic salt*, which is not generally pernicious, as it deterges the urinary passages and runs off quickly: however, like alum in bread, it has no business there.

It sometimes, though seldom, happens that lime and oil of vitriol are alternately added to beer, with a view to rectify what is termed *cloudy beer*. This mixture produces a *selenite* salt, which hitherto has been adjudged indissoluble. If this salt did not gravitate to the bottom of the cask, in its needle-like shoals, the consequences might be dreaded.

Hence, likewise, we can estimate the mischief arising from these artful sophistications. Miserable is the person afflicted with a preva-

lent acidity in the stomach, who drinks beer adulterated with the acid of vitriol; but he who indulges his bilious constitution with alkaline diluents, adds oil to flame. Health is an inestimable blessing; yet how ignorantly and wilfully is it sported with! To enumerate the variety of diseases which may arise from this infected fountain, would exceed the bounds which we have prescribed: they are obvious enough to every reflecting mind.

Milk, with a proportion of alum, is sometimes added to beer, with a view to fine it when cloudy. At the same time, a necessary quantity of colouring matter is added to give it the proper colour. This colouring matter is variously prepared: some prefer the juice of elder berries; others the decoction of log-wood, or brown burnt sugar dissolved, in the same manner as cooks colour their gravy; whilst others, for cheapness, substitute what is called wash by the distillers, which is the residuum of molasses after it has been fermented and distilled. The same method is practised by some small-beer brewers, to procure a commendable colour to their pale beer, after the colouring tincture of malt has been previously extracted by the ale or first worts: all which

customs, however innoxious, ought not to be countenanced, but excite the indignation of every customer. There are certain methods to detect these artificial combinations, which would be too tedious here to detail; we shall therefore prefer what is evidently more material.

Experiment III.

To prove when Oil of Vitriol is mixed with Beer.

Take one gallon of suspected beer, and boil it down to a pint, as before directed; and add to it, gradually, a clear solution of any fixed alkaline salt, till the acidity is perfectly saturated; which may be known by its effect on syrup of violets; for if the acid predominates it will change the syrup reddish; if the alkali, green: stir the beer thus saturated, and dilute it with a pint of water; filter and evaporate to a small quantity; place it in a cellar in a flat-bottomed china vessel, and in a few hours there will be procured small particles of a neutral salt adhering to the sides and bottom of the vessel, called *tartar of vitriol*, which will not appear if the beer be free from the acid of vitriol. For the natural acidity of old

beer is of the acetous kind, which thus would constitute a saline, soapy magma, resembling the diuretic salt of the shops, except in colour, and which will not chrystallise like the former.

The sophistication of beer by brewers, by the use of coculus indicus, a poisonous narcotic herb, being a vegetable, is not to be detected but through the effects it produces. Receipts for fining, feeding, preserving, relishing or flavouring, and colouring malt drinks; curing ropy, musty beer and ale, victuallers are too well acquainted with to need any instructions here; we only wish they would use such as are harmless, they would thereby merit the good wishes of their customers, and secure their own reputation as honest men.

The following easy method is recommended to test malt liquors that are suspected of being adulterated. Put the small end of a clean tobacco pipe into a very clear brisk fire; and when it is red-hot, put it into the tankard or pot of beer, till it cools. If it comes out white, the malt liquor is clean and wholesome; but if, on the contrary, it comes out black or cloudy, then it may be concluded that poisonous and stupifying drugs have been introduced into it either by the brewer or the publican; in order

to give it an artificial and diabolical strength, that causes the headach, and puts the whole frame and body out of condition.

CHAPTER X.

Perry and Cyder.

These hold a middle place between wine and malt liquors. They are less nutritious than the latter, and less cordial than the former.

Cider is drank so abundantly during the warm season, which is a sufficient inducement to its adulteration. The want of a larger proportion of the natural inflammable spirit in cider disposes it to turn of a crabbed sour. When judiciously made, cider is an excellent drink and far exceeds the low wines made in France to answer the intention of beer.

Cider, well made, will keep in proper cellars for years; but what is generally drank in town and the environs is such abominable stuff that

is is with difficulty preserved for a year. The fine powder of alabaster, and marble dust, which is what the stone-masons rub off in polishing marble, are frequently added to cider; the acid of the cider dissolves these substances, and in proportion to such solution, the remainder becomes milder through the loss of the acid, for the acid and earth act reciprocally on each other. The absorbent earths are used indiscriminately for the same intention. And though the liquors by this means are rendered milder, they are afterwards disposed to generate fresh acidity; or if the alkaline quality of the earth predominates, the liquors turn vapid or flat, and never regain the essential spirit which they lost; and whoever drinks such spirits, let them remember at the same time, they are drinking a solution of stones and absorbent earths, as chalk, oyster-shells, crab's eyes, calcined bones, &c. which continue dissolved no longer in the body than while their solvent retains its properties as such; for when such liquors meet with any thing putrid or alkalescent in the body, which generally happens in bilious habits, the acid solvent will probably be destroyed thereby; consequently

the earth will be set free, and thus lay the permanent foundation for chronic diseases, particularly the stone and gravel, if not the gout.

Dealers observe that cider, when treated in the manner already mentioned, is divested of a peculiar roughness, and turns flat; alum is added to restore the former, and treacle, which communicates a new fermentation and considerable sweetness with a brown face, is the general remedy for the latter. This addition is commonly made a few days before it is sold to the retailer, lest it contract a new acidity after the fermentation is finished; for acids, united with absorbents, never return to acids again. If this cider be speedily bottled, it presently becomes brisk, sparkling, and attenuated, and attended with that mantling flatulent appearance, which wins the approbation of the consumer.

Leaden vessels are sometimes employed in the making of cider and remedying its defects. The acid of the cider here dissolves a portion of the lead, which is converted into a certain destructive slow poison. A few drops of the tincture of orpiment dropped into this cider changes it black, which is an infallible method to detect it.

Cider is an excellent drink made of the juice of apples*, especially of the more curious table kinds:—

" The pippin, burnish'd o'er with gold, the moyle,
Of sweetest honey's taste, the fair pearmain,
Temper'd like comliest nymph, with red and white."
See PHILLIPS's *Cider*, line 460.

Herefordshire and Devonshire are famous for cider; but much of that made in the latter county is of a harsh, sour, and watery nature, to which qualities is commonly imputed a severe kind of colic, to which we shall, as we proceed with this article, briefly allude, prevalent among the lower order of the people.

The Herefordshire cider is so exquisite, that when the Earl of Manchester was ambassador in France, he is frequently said to have passed

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* The blossoms of apples perfume and purify the circumambient air, a circumstance which, by medical writers is imagined, conduces greatly to the health and longevity for which the natives of Herefordshire have long been famous. As a proof of their title to this character, the following instance has been adduced. When King James I. made a progress into this county, a dance, called the " Morris dance," was evoluted in the presence of his majesty, by ten men and women, whose united ages amounted to upwards of a thousand years. Vide *Chron. and Biog.*

this beverage on their nobility for a delicious wine:—

"Some ciders have, by art or age unlearn'd
Their genuine relish, and of sundry vines
Assum'd the flavour: one sort counterfeits
The Spanish product; this to Gauls have seem'd
The sparkling nectar of Champagne; with that
A German oft has swill'd his throat, and sworn,
Deluded, that imperial Rhine bestow'd
The gen'rous rummer; whilst the owner, pleas'd
Laughs inly at his guests, thus entertain'd
With foreign vintage from his cider cask."

PHILLIPS.

There is a spirituous liquor drawn from cider by distillation, called cider spirit, to which the dealers in spirits can give the flavour of some other kind, and sell it under the assumed names; or mix it in large proportion with foreign brandy, rum, or arrack, in the sale, without any danger of the fraud being detected. The best cider is said to be made from the red-streak apple, grafted upon the Jennet Moyle stock.—

"Let ev'ry tree in ev'ry garden own
The red-streak as supreme, where pulpous fruit
With gold irradiate, and vermillion shines;
Hail Herefordian plant! that dost disdain
All other fields."

PHILLIPS.

Other ciders have various degrees of potency, and a great variety of flavour.

"———From Silurian * vats, high sparkling wines
Foam in transparent floods; some strong, to cheer
The wint'ry revels of the labouring kind,
And tasteful some to cool the summer hours."

THOMSON.

Devonshire Colic.

From the disease occurring frequently in Devonshire and other cider counties, it has generally been supposed to arise from an impregnation of lead received into the stomach; and it seems now to be perfectly understood, that the malic acid of the apple takes up in solution a portion of the lead of the vats employed in manufacturing the cider, which soon acts in the stomach of those who drink this liquor abundantly, and produces the disease in question. It is true, however, that the effects of some metals in destroying or preventing the acidity of cider or wine, often induces dealers in these articles to employ some of the preparations of lead for this purpose. The method most in use for discovering the injurious mix-

* Herefordshire formed a considerable part of the ancient Siluria.

ture of litharge with wine, is by pouring into it some sulphuric acid, which causes a white precipitate to fall to the bottom of the vessel. This, however, is not so accurate a test of lead as water charged with sulphuretted hydrogen, which is prepared as follows:—

Put into a phial a paste of sulphur and iron filings, pour on it a little sulphuric acid, and pass the gas produced into a flask of water by a bent tube. This water, poured on wine mixed with litharge, renders it black and flaky, and produces an abundant precipitate, which soon falls to the bottom of the vessel.

Perry is a pleasant beverage made from pears.

To fine a Hogshead of Cider.

Take half a gallon of skimmed milk, and four ounces of isinglass; put them in a stew-pan, and let them simmer over a slow fire, till the isinglass is melted; and when almost cold, put it into the cask, and keep stirring it with your fining stick from near the bottom, for a quarter of an hour; then clean the top of the cask; and an hour afterwards bung it tight down.

Cider and perry, for home consumption,

must stand in the bottles six or eight hours before they are corked; and afterwards wired down, and packed in a high bin.

Neither wine, beer, cider, or other fermentable liquor ought to be bottled but in a clear fine day: the bottles ought to be first well inspected; and no corks used but the velvet ones; as inferior or low-priced corks will cause all liquors to taste of them.

CHAPTER XI.

Ardent Spirits.

In small quantities, ardent spirits are a powerful cordial and corroborant, raising the pulse, strengthening the stomach, promoting digestion, and preventing flatulence. Taken sparingly and diluted with water, they supply the place of wine; and, with some constitutions, agree better, as they are not, like wine, disposed to acidity. The abuse of them is productive of the same pernicious effects as those

which arise from an excessive indulgence in wine, but in a greater degree.

French brandy is the most bracing and stomachic. It is a spirituous and inflammable liquor, extracted from wine and other liquids, by distillation*.

Gin and rum are the most diuretic and sudorific.

Rum is a species of vinous spirit, drawn by distillation from sugar canes, or rather from molasses, which are the dregs of sugar. The word *rum* is the name it bears among the native Americans. Dr. Johnson acknowledges his ignorance of its derivation. The island of Jamaica alone is said to produce annually four millions of gallons of this liquor. The abominable manner in which it is adulterated by the retailer calls loudly for the rigid interference of the excise laws. The evils resulting from the

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* Mr. Consett, in his *Swedish Tour*, says, they make the lowest priced brandy from rye and a species of ants, a large black insect very plentiful there, and which the natives think highly palatable and pleasant to eat.

In Virginia and Maryland, peaches and apples afford brandy. That made from the former Mr. Cooper deems to be as fine a liquor as he ever tasted.—*Information respecting America*, p. 120.

present excessive use of spirituous liquors, and low gins, in particular, are the consequences of the little attention paid to the sophistication of them by the unprincipled vender. The deleterious ingredients made use of, in what is termed *doctoring* the common beverage of the people, is the cause of the evil more than the low price at which they are consequently sold. The vigilance of the excise would remedy this crying evil; as the health of the community would be less affected, and their morals less contaminated even by the excessive use of good spirits, than by a constant indulgence in bad. The revenue would be equally benefited; and there would, unquestionably, be less to complain of in all quarters. Until something be done to check the practice of adulteration which now generally prevails, there is, in fact, no possibility of striking at the root of the evil. The farmer and the distiller would be equally protected; and the necessity either of a prohibition, under certain restrictions, an increased duty, or other vexatious proceedings, to enhance the value, would appear nugatory and uncalled for, were the regulations of the excise duly enforced, and the penalties inflicted on the delinquents immediately on detection.

Bad liquors, like bad provisions, are destructive to health; and it requires more of each to satiate, than of those of a better quality, which produce more salutary effects, by being attended with less danger in the consumption. The spirituous liquors in the metropolis, wine, brandy, rum, gin, and porter, not excepting even small beer, are so abominably adulterated, and with the most deleterious ingredients, that a criminal action might be brought against the retail venders every day in the year for an attempt to poison. Independent of the sophisticating ingredients, one spirit is adulterated with another. Cyder and domestic wines are added to the foreign—rum is added to brandy, gin to rum, water to gin, small beer to porter and ale; and treacle and water with, occasionally, a slight infusion of hops, is added to small beer, to give bulk. These, however, are comparatively harmless to those which come under the appellation of *doctorings*. The large brewers themselves are not above the practice of putting intoxicating and narcotic ingredients into the malt liquors; in short, a system of slow poisoning exists throughout the whole nation, which can never cease to fill our gaols and mad-houses, or keep people honest, till a

vigilant and imperative excise neutralize, nay paralyze, the dishonest and destructive agency which has so long undermined the health and morals of the people, particularly the lower classes, who are always the best and safest gudgeons for rascality to practise upon.

Vinegar.

Having discussed nearly every alimentary fluid of any importance used in families, we should leave a chasm in our pages were we to omit vinegar, an article of such extensive consumption.

The best vinegar for common use made about London is excessively bad, when compared with that made from good wine; which last ought to be carefully distinguished from that made from sour wine, cider or beer, and which, notwithstanding the austere taste of the vinegar produced by the last, must not be accounted perfect.

When English vinegar, or rather sour ale, through any injudicious treatment, does not turn out sufficiently acrid, oil of vitriol is frequently made the compensative substitute. The pernicious effects resulting from the vitriolic acid thus consumed at our meals, has been

already alluded to when speaking of porter and the adulteration to which it is subjected; but as vinegar is of such extensive use, in sauces, pickles, sallads, the public are innocently entrapped into a large consumption of the former article, under the name of vinegar; hence those violent pains in the stomach, gripes, and colic, after eating sallads with vinegar, notwithstanding the interposition of oil, which complaints seldom arise from the liberal use of pure vinegar.

Good vinegar has ever been accounted salubrious when used with discretion, especially in bilious constitutions; and in epidemic diseases, it is an experienced preservative. The learned Boerhaave judiciously extols its efficacy in putrid fevers, small-pox, and the bites of venomous insects; and expressly affirms that in mortifications and gangrenes it has no equal. He also adds, that good vinegar has such an antipathy to inebriety, that a person almost dead drunk from the abuse of spirituous liquors, may be recovered by the use of good vinegar; but these excellent salutary qualities are not to be expected, from the use of the common sophisticated trash which is imposed

upon the people under the plausible appellation of white wine vinegar.

How inestimable then is that science which not only directs us in the choice of whiat aliments we eat or drink, but reveals the iniquitous artifice of those entrusted to prepare them:—

"———————— As if they labour'd
To bring manslaughter into form."

SHAKSPEARE.

Experiment to prove when Vinegar is adulterated with Vitriolic Acid.

Take two quarts of vinegar, and boil it, in an earthenware vessel, down to about a quarter of a pint; then dissolve half an ounce of salt of tartar in four ounces (equal to a quarter of a pint) of hot water, which is to be added to the vinegar, and filtered through blotting paper, and put into a flat bottomed earthen dish or glass, and placed in dry sand, previously put into a small iron pot, over a gentle fire, that it may evaporate to about one ounce; then take the vessel out of the sand, and put it in a cool place for an hour, and if there be any oil of vitriol in the vinegar, it will be united with

the salt of tartar, and thus constitute vitriolated tartar, which will be found striking in small crystals to the bottom of the vessel, and which may easily be detected by their form and taste; for pure vinegar and alkaline salt, form a diuretic salt, which appears quite in a different manner.

Since English vinegar seldom escapes adulteration, the ill consequences of which are so often experienced, an easy process for making a wholesome article of this description for family purposes, may not improperly be inserted here, in which case, we would recommend the following as a general rule—viz. that the very best fermented liquors make the best vinegar. They know little of the matter who attempt to prepare good vinegar from stale, acidulated subjects, divested in a great measure of their inflammable spirit; for all their natural parts are absolutely necessary to preserve the essence of vinegar. The older chemical writers, as Glauber, Stahl, Boerhaave, abound in processes for making vinegar. The following method has, our decided preference:—*Take*

A five gallon cask, with a pretty large bung hole at one end, season it two or three days with common vinegar; then pour it out, and put into it four pounds of raisin stalks, and four ounces of bruised ginger; then take four gallons of

good, sound wine or ale, which just fetch upon the boil with a very quick fire, and then immediately add the ingredients to it. Let the cask, slightly corked, be placed in the sun, or near a fire, shaking it every day, and in a short time it will be converted into excellent vinegar.

N.B.—The ginger and raisin stalks are only added to promote the acetous fermentation.

There are several methods in use for meliorating the acid of vinegar. Weak vinegar exposed to the frost, defended from the snow, is very simple and practicable, as thus, by rejecting the ice, the remainder is rendered sufficiently acid; but as this practice is attended with very great waste, the chemists have invented a process whereby vinegar can be strengthened at pleasure with its own natural concentrated acid, by which means the addition of a mineral acid, becomes as unnecessary as it is unwholesome.

To conclude, instances of unregarded abuses are innumerable; whoever, therefore, observes the hint, pursues the business, and elucidates the subject, ought, at least, to merit the grateful approbation of all who are compassionately inclined to prevent and relieve the unhappy afflictions of their fellow creatures.

ON LITHARGE, AS A POISONOUS SUBSTANCE.

THIS is a compound of lead which has occasionally proved poisonous, in consequence of dif-

ferent articles of food or drink becoming contaminated with it*. If the *food* contain any free vegetable acids, or saline preparations, it will attack utensils made of lead, and oxidate, and indeed in some cases dissolve them. This circumstance seems to have been known to the ancients. Their tin was all adulterated with lead; and Galen, assigning this as a reason, cautions against the use of tinned vessels, and recommends the preservation of medicines in glass ones.

Earthen vessels glazed with lead, are also very apt to be acted on by vegetable acids. Vinegar corrodes them, and if there be any article of food within, the oxide or acetate that is produced will mix with it, so also weaker acids. A case occurred some years ago, at Northampton (Massachusets) where a family, consisting of eight individuals, were all seized

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* Sir George Baker states, 'that twelve infants died successively in convulsions at Dartmouth,' in consequence of an ointment, which had litharge in its composition, being applied to the nipples of their nurses. Instances are also frequently given by medical writers, where the external use of preparations of lead, when applied to abraded surfaces, has proved deleterious. See *Med. Commentaries*, vol. ii, p. 189. *Orfila*, p. 472. *Percival*, &c.

with cholic pains, strong convulsive spasms of the intestines, frequent vomitings, and obstinate costiveness, in consequence of eating stewed apples, which had been kept for some months in a large earthen vessel. On examination, the glazing was found corroded, and a solution from the stewed apples exhibited the chemical proofs indicative of the metal*. Dr. Eberle also states, that he saw four cases in 1815, arising from apple butter being in these vessels. On examining one of them, a thick crust of acetate of lead was seen covering its internal surface.

Milk has also acted on vessels of this description†. "I wish," says Mr. Hayes, "to establish the possibility of the fact, that milk may corrode or dissolve particles of the vessels above mentioned, and therefore liable to communicate pernicious qualities to the butter." The reasons whence these conclusions are

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* See "An Account of the Poisonous Effects of the use of Glazed Earthen Vessels. By W. Meade, Esq."—*New England Journal*, vol. ii, p. 258.

† *American Recorder*, vol. i, p. 504. See also a paper on the Danger of using Vessels of Lead, Copper, or Brass, in Dairies, by Mr. Thomas Hayes, Surgeon, Hampstead, in the *Repertory of the Arts*, 1st Series, vol. 7, p 116.

drawn are as follow: "Whoever has been much in great dairies, must have observed a peculiarly sour, frowsy smell in them, although they be ever so well attended to in respect to cleanliness, &c. In some, where the managers are not very cleanly, it is extremely disagreeable, owing mostly to the corrupted milk. In some, too, from the utensils being scalded in the dairy; and, in others, from a bad construction of the building itself, the want of a free circulation of air, water, &c.; but in all a great deal of the lighter, or more volatile parts of the milk fly off from the surface of the pans, and furnish a great quantity of acid effluvia to the surrounding air and ceiling, and which is again deposited on every thing beneath it, and of course often on the vessels after they have been put by clean, in the intervals of their being out of use. This may be observed to give a dull sort of appearance to brass and copper, as if you had breathed upon them; and if you rub your fingers lightly over the vessels, you will have both the taste and smell of the metal.

"It also happens sometimes, that after the vessels are washed, they are not carefully rinsed, nor perfectly dried by the fire; so that some of the milk, &c. is left on the surface of

them, which may dissolve the metals, either by its animal, oily, or ascescent qualities.

"This is not the only way, nor the worst, by which the butter may become impregnated with mischief. The greater the quantity of cream that is thrown up by the milk, the larger profits accrue to the dairyman; therefore he keeps it in the vessels as long as he can, and it is frequently kept till it is very sour, and capable of acting upon them; if they are of lead, a calx or sugar of lead will be produced; if of brass or copper, verdigrise.

"It is true, the quantity cannot be very great; but this will depend upon the degree of sourness, and length of time which the milk stands: but independent of the acid, the animal oil in the cream will dissolve brass and copper.

"That an acid floats in the atmosphere of a dairy; may be proved by placing a bason of syrup of violets for a little time, and it will be found to turn red.

"May not then," observes our authority, "a casual, nay obstinate complaint originate from the same source, in consequence of the unwholesomeness of the butter, which the physician may have in vain laboured to account for.

Butter is found very frequently to derange weakly, delicate, and irritable stomachs; yet these stomachs will bear olive oil:—this cannot, therefore, be accounted for from the oleose parts but from the metallic impregnation."

The adulteration of wines by lead appears to be an old device; and it has been much used, since it destroys their austerity, gives them a sweet taste, and renders them saleable. Litharge has been extensively used for this purpose.

Beckmann supposes that the ancients were acquainted with the fact, that lead rendered harsh wines milder; for Pliny remarks that when the Greek and Roman wine-merchants wished to try whether their wine was spoilt they immersed in it a plate of lead, which could only be to observe whether by corrosion the colour of the lead was changed.

It was not until the fifteenth century, that the use of lead became notorious, as to call for prohibitions on the part of government in Germany, and the adulteration of this article appears to have been a subject of deliberation at the diet of Rokenburg, in 1487, and the diet of Worms in 1495. In France, this species of villany was carried to great excess. The

Duke of Wirtemberg, by a decree, dated March 10th, 1690, declared it capital to mix litharge in wine, or even to sell litharge in the shops. And individuals were punished with death for the infraction of this decree. At the present we have no reason to disbelieve that the sugar of lead is frequently and extensively employed by unprincipled dealers every where. It is of much importance to those who consume great quantities of this spirit to know by what means they may guard against, not only imposition as respects the proper and intrinsic value of the commodity, but their health and lives; for assuredly to the villanous use of lead in the adulteration of the juice of the grape, may be attributed many of the paralytic strokes that occur among the higher orders of society in England, and these cases are by no means few among us.

In no instance, perhaps, has adulteration been more extensively practised throughout England, or with consequences more prejudicial to health than in that of wine. The juice of the grape, when expressed, is subject to two distinct degrees of fermentation, the vinous and the acetous; by the first it becomes wine; but the progress from that to the second,

by which it loses its spirit and becomes combined with acid, is almost imperceptible; and, when the liquor is weak, is frequently rapid.

When the progress of the vinous fermentation has commenced, it is impossible to restore the wine to the original state. Ingenuity, however, has been variously exerted to render the acid, in wine thus spoiled, imperceptible; so that those who do not possess an accurate judgment in such matters, not unfrequently purchase sweetened vinegar instead of wine. Were this the only consequence of the fraud, it would not form a subject for serious alarm; but as mere saccharine juices cannot be used in sufficient quantity to conceal the acidity, without betraying themselves, the dealers have had recourse to another expedient, more certain in its operation, and more injurious to the customer. The substance thus employed is sugar of lead, which, when dissolved in the acid that spoils wine, gives to the liquor a saccharine taste that is not unpleasant, without affecting either the colour or smell, while it effectually stops the fermentation; but it communicates at the same time, the noxious quality of occasioning, according to the quantity used and the constitution of the customer, vio-

lent cholics, obstructions, and other diseases, which sometimes end in death; so that, as Beckmann observes, it may be justly doubted whether Mars, Venus, or Saturn, be most destructive to the human race. It is, however, some consolation to reflect, that the strength of the wine usually imported into this country, secures it in a great measure from acidity, and, consequently, renders this practice less frequent than on the continent; where it is very generally employed to correct, as it is termed, the small wine in most common use, and no where more extensively than at Paris.

The following anecdote will give our wine-drinking gourmands some idea of the opinion foreigners, for the most part, entertain of the manufacture of what goes by the name of wine in this country.

A Frenchman, making the tour of London, writes to his friends in Paris to the following effect: After describing Windsor and its environs, he reaches Putney, where he goes on shore, "in order," says he, "to regale ourselves in one of their houses of entertainment; but in reality there is no *entertainment*. Here were neither tarts nor cheese-cakes, nor any sort of food but an English dish called *bread*

and *cheese*, and some raw flesh. But if it be difficult to find any thing to allay hunger, it is still more so to quench your thirst. There is a liquor sold in this country which they call *wine* (most of the inhabitants call it *wind*); of what ingredients it is composed I cannot tell; but you are not to conceive, as the word seems to import, that this is the translation of our French word *vin*, a liquor made of the juice of the grape; for I am well assured there is not a drop of any such juice in it. There must be many ingredients in this liquor, from the many different tastes; some of which are sweet, others sour, and others bitter; but though it appeared so nauseous to me and my friend, that we could not swallow it, the English relish it very well; nay, they will often drink a gallon of it at a sitting; sometimes in their *cups*, for it intoxicates, they will *wantonly give it the names of all our best wines.*

"However," continues Monsieur, "though we found nothing to eat or to drink, we found something to pay. I herewith send you a copy of the charges on this occasion, as long as my arm, which you will no doubt think a great curiosity."

It would appear that the ancients were aware

that lead both ameliorated harsh wine, preserved it from acidity, and that the acid of wine had the power of dissolving it; for when the Greek and Roman wine merchants wanted to know whether their wine was spoiled, they immersed in it, as before observed, a plate of lead, which could only be to observe whether the colour of the lead was changed. They were also acquainted with the mode of clarifying and improving wine, by boiling it with lime or gypsum—a method supposed to be still practised in some parts of Spain, and in the island of Zante: but it is considered no further prejudicial than as it tends, if used in too large a quantity, to deprive the liquor of its spirituous parts. That the custom is of very ancient date in the former country, is proved by a decree of the States of Arragon, in 1348.

The practice of adulterating and fabricating wine is, indeed, almost as old as the liquor itself; and so invariably has it been continued, that, at the present day, we can drink a bottle of sparkling Champagne for five-and sixpence, and six dozen of port for five pounds. Every age, of which we possess the records, furnishes some edicts against the continuance of such baleful practices. Some of these enumerate

many of the articles used for that purpose; among which we find vitriol, quicksilver, lapis calaminaris, and sulphur; the latter, however, is certainly innoxious, and is supposed to be much used in the preparation of some quantities of white wine, at Bourdeaux. The mode in which it is employed is that of fumigation, by kindling linen rags, dipped in brimstone, and allowing the vapour to enter the cask; and its effects are, to confine the fixed air contained in the wine, and to stop its fermentation. Some wine merchants, however, sprinkle these rags with bismuth, which, should it fall into the liquor, may have a very prejudicial effect on the health. It was indeed at one time supposed to have been attended with such noxious consequences, that its use and that of litharge, had nearly ruined the wine trade of Wurtemberg; and in 1697, this species of adulteration was forbidden throughout the kingdom on pain of death. The nefarious practice, however, had been too long continued to be easily abandoned by the merchants, nor was it until one extensive dealer had been beheaded, and others severely fined, that the practice was checked; and although it has since been concealed with more caution, it unquestionably is

every thing but annihilated; for even in this country, in the present century, a treatise has been published on the art of making wine, in which the use of litharge is openly recommended, as being entirely free from danger!

Detection of Metals in Wine.

The presence of metals may be detected in wine by the application of arsenical liver of sulphur; but its use is not decisive of the particular kind employed, as it precipitates all metals black, without any distinction; and if gypsum should have been added, the colour of the precipitate will be altered by that of the earth.

Wine Test.

Take Quick lime.... one ounce,
Orpiment..... half an ounce,
Distilled water, eight ounces;
Dissolve, and filter, through blotting paper.

Take oyster shells, calcined, and sulphur, equal parts, keep them red-hot for a quarter of an hour; when cold, add an equal quantity of cream of tartar—water, a pint; boil for an hour; decant into one ounce phials, and add to each twenty drops of the spirit of salt.

A few drops of this liquor added to any kind of wine, precipitates any metal that may be contained in it, except iron, which is prevented by the addition of the spirit of salt.

Among the innocent articles with which wine has been mixed, we find mustard and mugwort mentioned, in the year 1484; and in the following century, milk was included in an imperial ordinance against adulteration. The effects of the latter, however, are only to clarify the liquor, and to render the tint more pale, and are otherwise wholly imperceptible: it was known to the ancient Greeks; and is still used in small quantities, and for white wine alone. But the most extraordinary addition of all was employed by that people, not to adulterate but to ameliorate their wine; for which purpose we are assured by many old authors, they sometimes mixed it with sea-water.

Brazil wood, and the husks of elder berries and bilberries are employed by our London *fabriquants* to impart a rich purple tint to red port of a pale faint colour. Gypsum is used to render cloudy wine transparent. An additional astringency is imparted to immature red wines by means of oak-wood, saw-dust, and the

husks of filberts; by which, and similar other means a mixture of foreign spoiled and home-made wines, is converted into the wretched compound, frequently sold as genuine port.

Wine Flavour.

Various expedients are resorted to for the purpose of communicating flavours to insipid wines. For instance, a nutty flavour is produced by bitter almonds; and the ingredient employed to form the *banquet* of high-flavoured wines, are *sweet briars*, *orris root*, *clary*, *cherry laurel water* (rankest poison, and deleterious in its smallest proportions), and elder flowers.

"There is always in London," says an excellent practical chemist, "a certain fraternity of operators who work under ground in holes, caverns, and dark retirements, to conceal their mysteries from the eyes and observation of mankind. These subterraneous philosophers are daily employed in the transmutation of liquors, and by the power of magical drugs and incantations, raising, under the streets of London, the choicest products of the hills and vallies of France. They can squeeze Claret out of the sloe, and draw Champagne from an apple (or a gooseberry), an act which Virgil

seems to have had in view in that remarkable prophecy, where he observes—

" Incultisque rubeus pendebit sentibus uva."
Ecl. iv. v. 29.

Which Dryden has as felicitously translated in the following words:—

" The ripening grape shall hang on every thorn."

Every veritable gourmand ought to be a good culinary chemist; the necessity is obvious, he preserves his health for many happy returns of a sumptuous banquet, and defends the life of his convives by laying in no stock, or suffering anything to be served up to them that may militate either with their present or future appetites.

Dr. Hahneman's test for the detection of lead in wine, which has been much recommended, is prepared as follows: *viz.* by putting together into a small phial sixteen grains of the sulphuret of lime, prepared in the dry way, and twenty grains of cream of tartar. The phial is to be filled with water, well corked, and occasionally shaken for the space of ten minutes. When the powder has subsided, decant the clear liquor, and preserve it in a well-stopped bottle for use. This liquor,

when first prepared, discovers lead by a dark-coloured precepitate*.

a. Sulphate of soda throws down a white precipitate.

b. Muriatic acid and the muriates, a white precipitate.

c. Infusion of galls, a yellowish-white precipitate.

d. Gallic acid in a pure state, a white precipitate.

e. Ammonia, a white precipitate, which, when washed and dried, acquires a yellowish tinge.

f. If the precipitates be dried, or the suspected substance be in powder, they may each of them be united with potash and charcoal, and exposed to heat in a crucible. If lead be actually present, it will be found, after this process, in a metallic state.

Cider adulterated with lead has also frequently proved injurious.

Rum is also another liquor which may act on lead. Dr. John Hunter mentions, that a violent cholic prevailed extensively among the soldiers in Jamaica, in 1781-2. They were in the

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* Henry's *Chemistry*, vol. ii. p. 275. Orfila gives minute directions for the detection of lead in wines.

habit of drinking rum, and suspecting its purity, he was led to examine it. The result of his experiments induced him to believe that it was contaminated with lead*. Dr. Franklin also communicated a curious fact to Sir George Baker on this point. About forty years previous (Sir George's paper was read in 1767), leaden worms were used in Boston for the distillation of rum. The consequence was so violent to the drinkers, and the illness so common that government forbade their use, and ordered worms to be constructed of block tin. The dry bellyache was much less heard of afterwards.—*Trans. Coll. Phys. London*, vol. i. p. 346.

Even syrups have been clarified by the acetate of lead, and thus contain a notable portion of the metal.—*Orfila*, vol. i. p. 454.

Cholic is among the earliest symptoms, produced by the gradual introduction of small

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* When the new rum in the West Indies, thus impregnated, has been kept in a cask for twelve months, it loses its deleterious properties. This fact is mentioned by Mr. Sylvester, and by him applied to the discovery of a new test—the Gallic acid. See *Eclectic Repository*, vol. iv. p. 454.

quantities of lead into the system, and from this circumstance the complaint has been styled *colica pictonum*. It is not acute at first, nor of long duration, but frequently returns, and at last becomes intolerably severe. The mouth is dry; there is generally an absence of fever; sickness of the stomach is present, and sometimes vomiting, which will last for several days. The abdomen is drawn in towards the navel, and this sinking in is the more observable as the pain becomes more intense. Costiveness is very common, and the stools are painful and difficult: the urine presents no particular character. Paralysis of the fingers, hands, and wrist are also common symptoms, occurring most severely in those who are in the constant practice of handling preparations of lead.—*See also Wine.*

CHAPTER XII.

On Water.

Water is the chief ingredient in all animal fluids and solids: even bones, dead and dried twenty-five years, have, by distillation, yielded half their weight in water. This admirable fluid is, in fact, the grand support of the material nature; that which enables her to bring forth all her vegetable offspring, and to rear all her animated inhabitants. Water, in short, is to the terraqueous globe what the vital fluid is to the human body; or, in the words of the poet*—

> "————the crystal element,
> The chief ingredient in heaven's various works,
> Whose flexile genius sparkles in the gem,
> Grows firm in oak, and fugitive in wine;
> The vehicle—the source of nutriment
> And life, to all that vegetate or live."

It is asserted, in consequence of experiments

* Dr. Armstrong's *Poem on Health.*

made by an eminent philosopher, that an acre of ground, even after being parched by the heat of the sun in summer, dispersed into the air about 1600 gallons of water in the course of twelve of the hottest hours of the day*. From the plenteous stock of water which all bodies afford, Arbuthnot infers that it is the proper drink for every animal. As an aliment, it is, indeed, one of the most useful drinks in the world; and, if we may credit many of our latest and most judicious physicians, one of the best too, on account of its potent digestive qualities. As a beverage, that which is purest, lightest, most transparent, colourless, void of taste and smell, is deemed the best. It has, in many instances, been proved that water alone is capable of sustaining human life a long time. As a medicine it is found, internally, a powerful febrifuge, and excellent against colds, coughs, scurvy, &c. Moreover it may be added—

1. Water of all other liquids quenches thirst the best.

2. Of all other liquids, water is the best for making up the loss we sustain continually of

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* Watson's *Chemical Essays*, vol. iii. p. 52—56.

the moist and watery parts of our blood and juices.

3. It promotes a true, nutritious, and healthy digestion best.

4. The due use of water in the youth and manhood of healthy bodies, is the best way to attain a long and comfortable life.

Division of Waters.

The simple waters are 1. *Distilled water;* 2. *Rain water;* 3. *Ice* and *snow water;* 4. *Spring water;* River water; Stagnated waters. Their individual distinctions are as follow:—

I. Distilled Water.—This is the lightest of all waters, holding neither solid nor gaseous substances in solution; is perfectly void of taste and smell, colourless, and beautifully transparent; has a soft feel, and wets the finger more readily than any other. It mixes uniformly with soap into an opaline mixture; but may be added to a solution of soap in spirit of wine without injuring its transparency. The clearness of distilled water is not impaired by the most delicate re-agents, such as lime-water, a solution of barytes in any acid, nitrated silver, or acid of sugar. When evaporated in a silver vessel, it leaves no residuum;

if preserved from access to foreign matter floating in the air, it may be kept for ages unaltered, in the vessels upon which it has no action, as it does not possess within itself the power of decomposition. As it freezes directly at thirty-two of Fahrenheit, and boils at 212° under the atmospherical pressure of 29.8 inches, these points are made use of as the standard ones for thermometrical division; and its specific weight being always the same under the mean pressure of temperature, it is employed for the comparative standard of specific gravity.

Distilled water is seldom employed to any extent in the preparation of food, or in manufactures, on account of the trouble in procuring it in large quantities; but for preparing a great number of medicines, and in almost every one of their chemical properties that are carried on in the liquid way, this water is an essential requisite.

II. Rain Water.—This is the next in purity to distilled water, in consequence of having undergone a natural distillation from the earth, and is condensed in the form of rain. In fact, rain water approaches so closely to absolute purity as probably to be equal to distilled water

for every purpose, except in the nicer chemical experiments. The contents of rain water appear to vary according to the state of the air through which it falls. The heterogeneous atmosphere of a smoky town will give some impregnation to rain as it passes through, and this, though it may not at once be perceptible on chemical examination, will nevertheless render it liable to spontaneous change; and hence rain water, if long kept, especially in hot climates, acquires a strong smell; becomes full of animalculæ, and is in some degree putrid. The specific gravity of rain water is so nearly the same with that of distilled water, that it requires the most delicate instruments to detect the difference. Rain that falls in towns acquires a small quantity of sulphate of lime and calcareous matter from the mortar and plaster of the houses.

III. Ice and Snow Water.—These are equal in purity to rain water, and, when fresh melted, contain air, which is expelled during freezing.

In cold climates and in high latitudes, thawed snow forms the constant drink of the inhabitants during winter; and the vast masses of ice which float on the polar seas, afford an

abundant supply to the mariner. It is well known that in a weak brine, exposed to a moderate freezing cold, it is only the watery part that congeals, leaving the unfrozen liquor proportionately stronger of the salt. The same happens with a dilute solution of vegetable acids, with fermented liquors and the like; and advantage is taken of this property to reduce the saline part to a more concentrated form.

IV. Spring Water.—Under this comprehensive class are included all waters that spring from some depth beneath the soil, and are used at the fountain head, or at least before they have run any considerable distance exposed to the air. It is obvious that spring water will be as various in its contents as the substances which compose the soil through which it flows. When the ingredients are not such as to give any peculiar medical or sensible properties, and the water is used for common purposes, it is distinguished as a hard or soft spring, sweet or brackish, clear or turbid. Ordinary springs insensibly pass into mineral springs, as their foreign contents become more notable or uncommon; though sometimes wa-

ters have acquired great medical reputation from mere purity.

By far the greater number of springs are cold at some depth from the surface; and below the influence of the external atmosphere their temperature is, generally, tolerably uniform during every vicissitude of season, and always several degrees higher than the freezing point. Others again arise constantly hot, or with a temperature always exceeding the summer heat; and the warmth possessed by the water is entirely independent of that of the atmosphere, and varies little winter or summer.

One of the principal inconveniences of almost every spring water, is its hardness, owing to the presence of earthy salts, which, in by far the greater number of cases, are only the insipid substances, chalk and selenite, which do not impair the taste of the water; whilst the air which it contains, and its grateful coolness, render it a most agreeable, and generally a perfectly innocent drink; though sometimes, in weak stomachs, it is apt to occasion an uneasy sense of weight in that organ, followed by a degree of dyspepsy.

The quantity of earthy salts, contained in spring water, varies considerably; but, in ge-

neral, it appears that the proportion of five grains of these in the pint will constitute a hard water, unfit for washing with soap, and for many other purposes of household use and manufactures.

The water of deep wells is always, *cæteris paribus*, much harder than that of springs which overflow their channel; for much agitation and exposure to air produce a gradual deposition of the calcareous earth; and hence spring water often incrusts to a considerable thickness, the inside of any kind of tube through which it flows, as it arises from the earth. The specific gravity of these waters is also, for the most part, greater than that of any other kind of water, that of the sea excepted. Springs that overflow their channel, and form to themselves a limited well, pass insensibly into the state of stream or river water, and thereby become altered in their chemical qualities.

V. River Water. — This, in general, is much softer, and more free from earthy salts than the last, but contains less air of any kind; for, by the agitation of a long current, and, in most cases, by a great increase of temperature, it loses common air and carbonic acid, and with this last, most of the lime which is held

in solution. The specific gravity thereby becomes less, the taste not so harsh, but less fresh and agreeable; and out of a hard spring is often made a stream of sufficient purity for most of the purposes where a soft water is required. Some streams, however, that arise from a clear siliceous rock, and flow in a sandy or stony bed, are from the outset remarkably pure. Such are the mountain lakes and rivulets in the rocky districts of Wales, the source of the beautiful waters of the Dee; and numberless other rivers that flow through the hollow of every valley. Some river waters, however, do not take their rise from a rocky soil; and are indeed at first considerably changed with foreign matter, during a long course, even over a rich cultivated plain, become remarkably pure as to saline contents, but often fouled with mud, and vegetable or animal exuviæ, which are rather suspended than held in true solution. Such, for instance, as that of the Thames, which, taken up at London at low water, is a very soft and good water, and, after rest and filtration, it holds but a very small portion of any thing that could prove noxious, or impede any manufacture. It is also excellently adapted for sea voyages; though on

these occasions it undergoes a remarkable spontaneous change. No water carried to sea becomes sooner putrid than that of the Thames. When a cask is opened after being kept a month or two, a quantity of inflammable air escapes, and the water is so black and offensive as scarcely to be borne. Upon racking it off, however, into large earthern vessels, (oil jars are commonly used for the purpose) and exposing it to the air, it gradually deposits a quantity of black, slimy mud, becomes clear as crystal, and remarkably sweet and palatable.

The Seine has a high reputation in France, and appears from accurate experiments to be a river of great purity.

It might be expected that a river which has passed through a large town, and received al- its impurities, and been used by numerous dyers and tanners, hatters and others, who crowd to its banks for the convenience of plenty of water, should thereby acquire such a foulness, as to become very perceptible to chemical examination for a considerable distance below the town; but it appears, from the most accurate examination, that where the stream is at all considerable, these kinds of impurities have but little influence in permanently alter-

ing the quality of the water, especially as they are for the most part only suspended, and not truly dissolved; and therefore, mere rest, and especially filtration, will restore the water to its original purity. Probably, therefore, the most accurate chemist would find some difficulty to distinguish water taken up at London, from that procured at Hampton Court, after each has been purified by simple filtration.

VI. Stagnated Waters.—The waters that present the greatest impurities to the senses, are those of stagnant pools, and low marshy countries. They are filled with the remains of animal and vegetable matter undergoing decomposition, and, during that process, becoming in part soluble in water, thereby affording a rich nutriment to the succession of living plants and insects which is supplying the place of those that perish.

From the want of sufficient agitation in stagnant waters, vegetation goes on undisturbed and the surface becomes covered with a kind of moss (conferva) and other aquatic plants; and as these standing waters are in general shallow, they receive the full influence of the sun, which further promotes all changes that are going on within them. The taste is gene-

rally vapid, and destitute of that freshness and agreeable coolness which characterise spring water. It should, however, be remarked, that stagnant waters are generally soft, and many of the impurities are only suspended, consequently separable by filtration; and perhaps the unpalatableness of the drink has caused it to be in worse credit than it deserves, on the score of salubrity. The decidedly noxious effects produced by the air of marshes and stagnant pools, have often been supposed to extend to the internal use of these waters; and often, especially in hot climates, a residence near these places has been as much condemned on one account as the other, and, in like manner, an improvement in health has been as much attributed to a change of water as of air.

On the Purification of Corrupted Waters.

Water is known to become putrid, and consequently to contract qualities which render its use unwholesome. This circumstance is the more particularly embarrassing during sea voyages; and it deserves no less consideration in those districts where the inhabitants are often obliged to make use of stagnant water, or of

such as, from its hepatic taste and smell, is very disagreeable.

It has been found by repeated experiments on the purifying powers of charcoal, that, among other properties, it possesses that of almost instantly depriving the most putrid water of its bad smell; from this circumstance it was suggested, that the same substance might have a very powerful effect in preventing water from becoming putrid, which it was actually found to do.

Pure water, properly so called, when deprived of all heterogeneous parts, is not subject to become putrid; but it is very difficult to keep it long in a pure state, on account of its dissolving powers. To preserve water for any length of time in that state, it would be necessary to keep it in a vessel of glass, or of earthenware; but the brittleness of these vessels renders it impossible to make use of large ones, and we are obliged to have recourse to wooden vessels, which, though they are not subject to be broken, like the others, have the great disadvantage of imparting to the water a great quantity of mucilaginous and extractive particles, which harden its putrefaction.

It is well known that these particles, in a state

of division, furnish an innumerable quantity of living creatures, the almost perpetual destruction and generation of which communicate to water that degree of corruption and putrefaction, which renders its use so dangerous; it is not, therefore, from the water itself, but from the continual decomposition of the substances dissolved in it, that its disposition to putrefaction arises. Hence it evidently appears that the first means of preserving from putrefaction water which we are obliged to keep in wooden vessels, or casks, consists in having these reservoirs perfectly clean. The smallest quantity of matter already corrupted being left in them, acts as a real ferment; acid very quickly disposes the fresh water, with which these vessels are filled, to become putrid in the same manner. For this reason it is advised that the casks or other vessels be well washed with hot water and sand, or with any other substance capable of removing the mucilaginous particles; and afterwards, that a certain quantity of powdered charcoal be employed, which will entirely deprive such casks, or other vessels, of the musty or putrid smell they may have contracted.

When water is preserved, by having cer-

tain substances mixed with it, these substances act, either by their anti-putrescent powers, or by mechanically absorbing the putrified particles. Vitriolic acid possesses the first of these properties; and powdered charcoal fills the second intention, in a very striking manner; and the effect of the latter is much more speedy by using it in conjunction with the former. Powdered charcoal prevents the water from acquiring that yellow colour which it usually contracts by time; and the acid particularly contributes to clarify the water, which the charcoal when employed alone renders turbid. If we wish to use the water thus preserved, it should be first tried by passing a small quantity of it through a strainer in the form of a jelly bag, filled with powder of charcoal; such a strainer or bag should always be in readiness.

Directions to Purify any quantity of Corrupted Water.

To the quantity of water intended to be purified, add as much powdered charcoal as may be necessary to entirely deprive it of its bad smell; and, in order to ascertain that the quantity is sufficient to clarify the said water, a small

quantity of it may be passed through a linen bag, two or three inches long; if the water, thus filtered, has a turbid appearance, a fresh quantity of powdered charcoal must be added, until it becomes perfectly clear: the whole of the water may be thus passed through a filtering bag, the size of which should be proportioned to the quantity of water. If vitriolic or any other acid can be procured, a small quantity of it should be added to the water, before the charcoal powder is used; the quantity of acid being regulated in proportion to the state of putridity in which the water is actually found; and which should be added in quantity sufficient to communicate to the water a degree of acidity just perceptible to the taste.

If the water be merely intended for dressing meat and vegetables for the ship's company, instead of acid, such a quantity of sea salt as would have been proper for seasoning the above articles, may be employed. Saline substances, like acid, hasten the effects of the charcoal powder; by making use of acids, as already observed, a much less quantity of powdered charcoal is necessary; and, so easy is the process to any one accustomed to operations of this kind, that four or five minutes only

are required to render several gallons of putrid water fit to drink.

In the same manner to improve the taste of those springs which naturally have an hepatic flavour, and are, therefore, unpleasant to use, nothing more is necessary than to filter them through a bag half filled with powdered charcoal; if such waters are not very much loaded with mucilaginous particles, the addition of an acid is not necessary.

Four ounces and a half of powdered charcoal, a quantity sufficient to purify three pints and a half of water, when no acid is made use of, take up as much space as sixteen ounces of water, but if this powder be strongly compressed, it will take up only the space of nine ounces of water, consequently it would require two casks of powdered charcoal to purify eleven casks of water. In order to save the charcoal on board of ships, as it is an article not easily procured at sea, the powder that has been used should not be thrown away; for if it be afterwards well dried, and again beaten to powder, it will, by that means, acquire new surfaces, and serve a second time, to purify a quantity of water almost as great as that, for which, in the first place, it was used—and, in-

deed, it may even be applied to the same purposes after it has been frequently used, in the same manner; as, by making it red hot in a close vessel, it will thereby resume its purifying properties.

It is proper here to observe, that charcoal takes from the water a part of the acid which has been made use of; if two drops of sulphuric acid are put into four ounces of water, the water will become sensibly acid; but this acidity will immediately disappear, if a small quantity of powdered charcoal be added to the water.

Sea Water.

This contains common salt and Epsom salt in large quantity—is purgative, and at sea is used as a common clyster.

Many attempts have been made to obtain fresh from sea-water*; distillation is the only method known: and when this topic is broach-

* In Heyne's India, a person of the name of Beaumont, at Calcutta, is said to have offered, for 25,000*l*, to disclose the secret of converting salt into fresh water in a large quantity without heat, and with a very little expense. The process, he says, is so simple, that he can scarce speak of it without betraying the secret.

ed, sea-captains say that they may as well carry water with them as fuel to distil it.

Various methods have been proposed and adopted to render sea-water portable; and although such has been partially effected, it does not appear to have been realized to any very considerable extent, at least, so far as to supersede the necessity of taking an equivalent stock of fresh water to sea for the uses of life. The following account, purporting to be the extract of a letter, was published some years ago.

The method here alluded to consists in first making a precipitate with oil of tartar, which, as the author says, may be done at a very little expense: the sea-water is afterwards distilled. "The stove he uses takes up little room, and is so constructed, that with a small quantity of wood or charcoal, twelve gallons of water may be distilled in a day. To cool this water, he makes the spiral tube of the alembic pass out of the ship, by a hole made on purpose through the ship, and brings it in again by another like hole; so that the tube is kept dipt in the sea-water, which serves for a refrigerant; by this means he saves the room a refrigerant must occupy, and the trouble of changing the

water which the tube would have made hot. Finally, he joins filtration to the two preceding operations, in order to correct the bad qualities of the water. This filtration is performed by means of a certain earth, which he mixes and stirs up in the distilled water, and which in some time falls to the bottom in form of a sediment.

The author affirms, that sea-water distilled in this manner is very wholesome; that he has made men and animals drink of it without the least ill effect; and he pretends that the earth he mixes therewith, for filtrating it, blunts the spicula and edge of the salt, besides absorbing its volatile spirits; and thus deprives them of their force and activity.

It were to be wished the author of the above process had been more explicit; but it seems he has made a secret of some essentials connected with it, which, however, we are of opinion, chemistry might supply.

The following experiment for obtaining the same effect; is suggested, in consequence of the former, by another hand: "sea water becomes fresh by making it pass through marine plants I took a small glass vessel of an oblong form, and, having filled it partly with sea

water, I put therein a proper quantity of the alva marina (sea weed); the roots of some of which were naked and quite clear of any foreign body: but to the rest were still adhering the pebbles that served to support them in the sea. The vessel being then full, I fitted to it a glass head, with its beak, to which I joined a receiver, without luting the joints. There distilled daily from these plants a small quantity of water, very fresh, very potable, and quite free from the ill taste which waters distilled by fire usually retain. I insist upon this experiment, as it shews the easiest, surest, and most natural method of making sea water fresh, a matter of such singular utility to navigators.

"I doubt not but we may find other plants, among those growing either in the sea or on its shores, which may be more effectual for this experiment, and which yield fresh water in greater quantity, as rock samphire, the brassica marina, or alkali rind, or kali kind, the sea-lentil, and others. Some of these plants may be tried, by examining their growth either in sea water, or earth sprinkled with it: and hence, in some measure, the conjecture may be very probable, that the real primitive water which might have existed before animals and

plants, is sea water; and that fresh water is for the most part indebted for its origin to the vapours of plants, the respiration of animals, and the exhalation of the earth, attracted by the heat of the sun.

Remarks on the Waters of different Places and Counties.

The advocates for vegetable diet say, that a small portion of fish or meat taken daily will maintain irritation; and vegetable diet, without quitting the use of common water, whether drank alone or in tea, coffee, beer, will by no means insure health.

Neither the holy well, nor the spring at Malvern, nor even the golden water of Persia, could serve as a substitute for that which has undergone distillation. Without this, or some equally efficacious precaution, vegetable eaters will not be exempted from violent disorders, brought on by the use of common water or spirits. There is indeed no truth of greater evidence than that this liquid contains the most mischievous qualities, not unknown to some of the rudest tribes; and if we first look at home, our own Thames water has so much animal oil in it, that a cask at sea, while under sponta-

neous purification, has been seen to catch fire, on the application of a lighted candle to its surface.

Brackish water has a tendency to inflame, and always increases thirst; in some parts of Africa the inhabitants dare not drink it for fear of worse consequences. The natives, accustomed to attribute some of their disorders to the offensive quality of bad water, are generally of opinion that the Guinea worm proceeds from that source.

According to Prosper Alpinus, "as the river Caleg overflows its banks every year, it pours into those cavities of the city its copious waters, which is almost evaporated during the following summer; and the little that remains being foul and muddy, is corrupted, and becomes poisonous. Wherefore it is my opinion, in which I am not unsupported by other writers, that the use of the stale water in the food and drink is the real cause of those fevers; and that wherever it remains unmixed with the water which has recently flowed in, and which the people then begin to make use of in their articles of sustenance, the old water, neither settling properly nor being purified by the new, must always be suspected as the occasion

of those dreadful complaints." Hence it may be inferred that, at proper times, water casks, butts, and cisterns, ought to be cleaned out thoroughly, so that no old water or other crudities going into decomposition may accumulate.

During the winter there runs through Mancona, a village in Spanish America, on the road between Quito and Truxillo, a small rivulet of fresh water, to the great relief of the mules. But in summer, the little remaining is so brackish that nothing but absolute necessity can render it tolerable.

In Curtis's Diseases of India (p. 35) he observes, "no water was found here except a little on the sea-shore, (at Moubar on the coast of Arabia-Felix) the inhabitants of a fishing village, from which the bay derives its name, bring all they use from wells several miles inland on the backs of camels.

"In many places of both hundreds, (in Essex)* they suffer much from want of water, especially in the islands called Wallis, Fontness, and Convey; having no other means of preserving it (and that rain water) than by

* Letter from Dr. Kirkland to Sir John Sinclair. Vide *Code of Health*, vol. ii, p. 215.

digging pits; which they line with chalk rubbish, forming a sort of cement; and in this way they are often obliged to keep it for months, especially in summer; which, by corrupting, becomes a grievous unhealthy circumstance. To remedy in some measure this inconvenience, for several years before I left Essex I recommended them to filter the water through stones made for the purpose, which appeared to improve it, at least rendered it more agreeable to the eye. In many other places of late they have been fortunate enough to procure that valuable article by means of sinking wells to a great depth, no less than 500 feet; which, with the improvements before mentioned, has contributed much to benefit the health of the people; as will appear from the following fact. An ingenious apothecary residing at Walden, informed me, that in consequence of a well having been sunk to nearly the depth I mentioned, and of good water, in the parish of Steeple, Dengy Hundred, where he has practised many years, the inhabitants are so much improved in health, that, in place of receiving from many farmers in that parish sums of twenty, thirty, or forty pounds yearly, he does not now take so many shillings."

By the above letter, it would appear that this Essex water was so bad as to have immediate ill effects upon those who used it. But even after the purification which it underwent, there was undoubtedly still enough of a pernicious quality in the water to produce very mischievous consequences in the course of years. Upon this account it is recommended either to cease to drink at all, which one is less inclined to do on vegetable than on animal diet; or to purify the water which we use in the only way that is effectual, viz. by distillation. In a still of five and twenty, or thirty gallons, the first three gallons distilled each time, should be thrown away; because water, and our experience refers principally to London water, is charged with so much septic matter, that the fluid which first runs off in distilling, will not keep many days, though what comes off later is almost imputrescible. Three or four gallons must likewise be left at the bottom of the still, on account of the residuary filth which they contain.

The following is a test of the purity of water, familiar to every chemist. Drop into a glass of water a few drops of nitrate of lead; if the water is properly distilled, it will remain

clear; if not, it will be clouded. And to prove the existence of putrid animal matter in water, add to a sufficient quantity of water a solution of the acetate of lead. If the precipitate be collected and heated with its own weight of a fixed alkali, a portion of lead will be found reduced. Hence the precipitate itself must have furnished the inflammable matter necessary to the reduction of the lead.

Vitruvius informs us that the ancients inspected the livers of animals in order to judge of the nature of the water of a country, and the salubrity of its nutritive productions. From this source they derived instruction respecting the choice of the most advantageous situations for building cities. The size and condition of the liver is, in fact, a pretty sure indication of the unhealthiness of pasture grounds, and of the deleterious quality of the water, which, especially when it is stagnant, produces in cows, and particularly in sheep, fatal diseases that have often their seat in the liver, as, for instance, the rot, which frequently destroys whole flocks in marshy countries. The spleen is also a viscus very apt to be affected by those qualities *.

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* *Code of Health.* vol. iii.

Dry summers are followed by unhealthy springs.

"The air of Buckminster is very sharp, and the place is accounted, by those who know it, one of the healthiest towns in these parts. Yet it has been observed after a dry summer, (as in the years 1719, 1723, 1727) that in the springs following, the buryings in that parish have surprisingly increased; whether by stagnation of the air, or by the scarcity and badness of the water, (it being generally bad when scarce) or by surfeits got after the preceding autumn, I pretend not to determine *."

Great droughts, it is well known, have always been found highly noxious in their ultimate, if not in their immediate, effects. It has been stated that in the East Indies, the servants decline going to particular situations, on account of the injurious quality of the water. In Batavia, it is productive of fevers, and in the parent state, Holland, it is so bad, that it is universally abandoned for beer. Hard water affects even the productions of the soil, for gardeners let the waters stand to soften before they throw it on the plants. In Lord Anson's voyage, it is asserted that the island of Luco-

* Op. Citat.

nia is r markab y healthy, and that the water found upon it is the best in the world. Lucas informs us, in his first volume, that Borrechus observed the residuum of water to be inflammable, that it melted with bubbles, swelled, took fire, and burned with a clear bright flame. Hippocrates, and Arbuthnot after him, both prescribe, in obstinate diseases, a regimen of whey and bread, of vegetables and milk. Lind tells us that "the water of the river St. Lawrence occasioned fluxes in Sir Charles Saunders's fleet. In Canada it is bad; at Senegal and through the whole extent of Guinea, it is very unwholesome. In the island of Antigua, there is no water but such as is preserved in tanks from the rains, which corrupts in dry seasons, and swarms with vermin. Hence the Spaniards named it Antigua, old, dry, parched. Van Swieten writes, that the scurvy which he treated in Holland was usually much abated in spring and autumn, by making use of whey for common drink, and thereby avoiding the stagnating unwholesome water so general in that country. Lind further says, "I always observed it increased (the sea scurvy) in frequency and violence upon the ship's

small beer being exhausted, and having water served in lieu of it." And that the scurvy is to be seen chiefly among the poorer sort who inhabit the low, damp part of the provinces, and continue to live upon salted, smoked, or often rancid pork, coarse bread, and who are obliged to drink unwholesome stagnating water.

"As for those who are obliged to live in low moist places, it was hardly possible to cure them of the scurvy by the most powerful medicines. The disease was usually, indeed, much abated in spring and autumn, by making use of whey for common drink." Water is with difficulty preserved sweet at sea; and sometimes cannot even be preserved wholesome at places where ships may touch. There are two sorts of bad water: the first is putrid and stinking; the other, a hard, heavy water, that is not putrid, but which will not incorporate with soap, or break peas when boiled in it. Both are unwholesome.

Besides putrid water, sailors are obliged to use, for want of better, a hard water, as it is called, replete with saline and earthy particles, which is found to be very unwholesome, though fresh and sweet. Bad water is, indeed, next to

bad air, a frequent cause of sickness, especially of the flux, and most of the diseases in tropical climates may be traced to this cause.

To remedy many of the inconveniences from bad water, many ingenious methods have been adopted. Its purification may be effected by means of filtering machines; but nothing would be better to effect the purposes than distillation, or converting it into small beer, which might easily be done in long voyages, when once the stock was found to be tainted, or that procured fresh, when not of a healthy quality.

Some toasted biscuits put into the water of the river St. Lawrence, was found serviceable in preventing the bad effects of it in occasioning fluxes in Sir Charles Saunders's fleet. At Senegal, where the water is extremely unwholesome, unslacked lime has been used to purify it. On foreign stations the distillation of sea water must prove of essential relief; by preventing many formidable diseases, and otherwise preserving the crews of ships in good health. In fine, no subject at home requires more the attention of medical police than preserving the common supplies from every species of impurity with which, particularly in large

manufacturing districts, this element is known to be impregnated.

The health and the comfort of every family are so immediately bound up with the supply of pure and wholesome water to their habitations, that (in the words of Dr. Ure) "it cannot but be an interesting object to ascertain the qualities of that which is daily consumed by the inhabitants of large cities; seeing that *a very minute* portion of unwholesome matter, daily taken, may constitute the principal cause of the differences in salubrity which are observable in different places."

Important as this fact is, it is not the less true, that the public attention was never fully roused, until the appearance, about fifteen months ago, of a publication, called "The Dolphin;" the object of which was to prove, that an article, designated by the illustrious Dr. Mead as "*the vehicle of all our nourishment*," was actually supplied to them in a polluted and unwholesome condition. The writer was threatened with prosecution, and his statements declared to be false: a public meeting of the inhabitants of the western part of the town nevertheless took place; petitions were presented to parliament; and the result was,

the appointment of a Royal Commission to inquire into the State of the Supply of Water to the Metropolis.

The long and anxiously looked-for Report of the Commissioners at length made its appearance; and *a document of greater importance* has scarcely ever been laid before the public. Upon the concurring testimony of many eminent chemists and physicians, facts of the most fearful nature are therein established, beyond the possibility of contradiction; *viz.* that the water drawn by the Companies from the river Thames, is sent into our cisterns in a condition *impure and offensive in the extreme—that it is loaded with decayed animal and vegetable matters, the proceeds of* 145 *common sewers*—that it is strongly impregnated with the deleterious refuse of gas, lead, and soap works, drug mills, and manufactories of every description—and that, in consequence of *this mass of pollution constantly mixing with it*, it has become not only disgusting to the senses, but unfit to be employed in the preparation of food, or for any domestic purpose.

The Commissioners (Dr. Roget, Professor Brande, and Mr. Telford, the eminent engineer) commenced their labours by requesting

Mr. Wright, the individual who directed the public attention to the existing evil, to furnish them with a statement of the alleged grievances, and to point out the best mode of obtaining information as to the truth of the allegations contained in the petition of the inhabitants of the western part of the metropolis to parliament. In consequence of this request, Mr. Wright addressed to them a Memoir, which is annexed to their Report. This Memoir, together with the evidence taken before the Commissioners, contains a series of testimonials to the gross impurity of the Thames water, of which we shall here give a brief outline; all of which will be read with interest.

Evidence of the Impurity and Insalubrity of the Thames Water supplied by the Companies.

Sir Henry Halford pronounces the water sent into his house to be a filthy fluid, with which he is disgusted. Mr. Thomas (surgeon) tells us it is saturated with decayed vegetable matters, and other substances prejudicial to health. Dr. Hooper is convinced that such matters in the stomach greatly contribute to the production of that state of faulty digestion and impurity of blood, of which the inhabitants of the

metropolis are constantly complaining. Mr. Keate (surgeon) avows it to be his opinion, that it is so filthy and impure, as to be unfit for the breakfast table and for culinary purposes, and that it adds so much to the other unwholesome constituents of bread, as to render every meal injurious to the health of thousands. Dr. Turner asserts, that the water sent into his cisterns during the hot weather frequently became quite putrid; and Dr. J. R. Hume has no doubt that the continued use of it without filtering is capable of producing deleterious effects.

Dr. Yeates says, that the Thames water is *extremely bad, foul, dirty,* and *unwholesome,* from the great quantity of filthy matters continually pouring into it from *numerous sewers.* He instances a disease which prevailed to a very serious extent, which he had himself traced to the impurities of the water for domestic use.

Dr. Somerville, physician to Chelsea Hospital, states the water to be very impure. "The tide," he says, "stirs up the MASS OF IMPURITY produced by all that is corruptible in the animal and vegetable world, together with the noxious filth of gas and other manufactories,

that constantly flow into the Thames from Battersea down to Gravesend." Alluding to the water supplied to his late residence in Hanover Square, he adds, that "it was not only frequently, but generally, *extremely impure, fœtid, and offensive;* that it deposited much mud, and often enough to render its colour blackish."

The last professional gentleman to whose evidence we shall refer, is Dr. Paris. He pronounces the water to be *impure and offensive*, and says that it stinks shortly after it has come in. Large quantities of matter are mechanically suspended in it. The Company send in mud with the water, and then complain that the cisterns are not kept clean. He states, that a family whom he attended last autumn were all ill, and he believes it arose from drinking this water. "As a physician," he says, "I cannot find terms sufficiently expressive of *the awful effects it may be likely to produce upon the health, and even lives*, of the inhabitants of the Metropolis." And in the last edition of his work he goes still further, and asserts, that if a remedy be not applied to the evil, "*the ravages of some epidemic may be fairly anticipated.*" Such is the picture—the

faithful and frightful picture—of the condition of the water of the Thames, as supplied by the Companies to their customers.

That the Commissioners, with these facts before them, should terminate their labours without taking into consideration the best mode of removing so crying an evil, was next to impossible. Prevented, however, by the limits assigned to their inquiry, from looking abroad for a purer source, they naturally turned their attention to the improvement of the supply at home; and the result of their labours is the recommendation of a general system of filtration—a system, not limited to the 53,000 families daily drinking the filthy fluid of which we have been speaking, but extending itself to the 176,000 tenants of the New River and other Companies, consuming the 29,000,000 of gallons daily supplied to the metropolis. "Although," say they, "the New River water is not open to the same objectionable impregnations as that of the Thames, it receives the drainage of a large extent of country, is occasionally very muddy, and is susceptible of much improvement by filtration."

In justice to the inventor and proprietor of every thing calculated to benefit society, we

add our own testimony, from ocular demonstration, in corroboration to what has already been said of Mr. George Robins's "Royal Filter," by which we conceive a most important and salutary advantage is derived to all who possess such a valuable household article. We subjoin the following extracts from the prospectus put into our hands, on visiting the admirable properties of the "Royal Filter:"

"Progressive Science at length has perfected a machine which, until now, had remained but partially known, other than by the name of a Dripping Mill, or Stone. The advantages, however derivable from it, even in an imperfect condition, especially in places abounding in contaminated water, were found so important, that the discovery was hailed as an invention perfectly unique in its kind, although it possessed neither the portability or qualities requisite to render it of general utility. To supersede the original, and surpass it in point of excellence, were a task of some difficulty; but it was speedily overcome, and The Royal Filter—now considered indispensable—owns supremacy, by being placed in the houses of many thousand families.

"By means of this filtering machine turbid

water is rendered bright and chrystal-like; when approximating the coast, and consequently brackish, it is rendered so soft and agreeable to the taste, that if two vessels, one containing the element unfiltered, the other having undergone the process, were presented, they would be pronounced two distinct fluids.

"Mr. Hume, of Long Acre, who has been so long and successfully employed by government in analysing waters, had two bottles sent him to analyse; the one full of all sorts of animal and vegetable matters in a state of decomposition, and strongly impregnated with gas; the other, a bottle which had contained the same foul ingredients, but had been purified by the Royal Filter.

"In the unfiltered sample, estimating at per gallon imperial measure, he found, he says, forty-six grains and a half of solid matter, of which thirty grains consisted of impurities, and the remaining sixteen grains were the original ingredients peculiar to the water, and dissolved in it: "for," he observes, "there is no water, however pure and wholesome, whether from deep wells, superficial springs, or any other source, that is free from saline and other soluble salts, not at all injurious to health."

" In the filtered sample, estimating as above, he found only sixteen grains of substances, which, on examination, proved to be the same materials peculiar to, and soluble in, the water in its primitive state, and perfectly free from the impurities and contingent foulness of the water, occasioned principally by decayed vegetable matters, a slight impregnation by animal substances, some carbureted hydrogen or coal gas, and carbonic acid gas. Mr. Hume concludes with bearing the following high testimony to the merits of this discovery: " After a very careful analysis, I cannot hesitate to pronounce the method which has been adopted to filter this specimen of water to be most effectual, and highly deserving of public encouragement." The same gentleman, at a subsequent period, analysed two other bottles, and says, " the opinion I had formed of this new process for filtering is fully confirmed."

" Mr. Brodie, the surgeon, corroborates every thing that has been said in its favour. He states, that having procured some of the foulest water his house afforded, and mixed with it a quantity of water impregnated with gas from coals, he poured it into the Royal Filter; that it passed through it very rapidly, and was

drawn off in a state of such purity, and so entirely free from the odour and taste of the gas, as to be quite fit for being placed in a decanter on the table, to be drank during dinner.

"Mr. Thomas, the surgeon, has had a Royal Filter placed in his cistern, and ever since the employment of it, has had the satisfaction to find his house regularly and abundantly supplied with clear and wholesome water.

"Mr. Keat, the surgeon, considers it to be admirably adapted to the important purpose of purifying and clarifying water on a large scale, and that it would be a valuable appendage to every cistern. 'It possesses,' he says, 'the very great advantage of filtering all that is served into the cistern, so that no unfiltered water can be used for domestic purposes; and the water thus filtered is beautifully clear.'"

A discovery so highly conducive to the cleanliness, health, and comfort of the inhabitants of the British metropolis, we trust, will meet that encouragement it so well deserves.

Pure water is the fittest drink for all ages and temperaments; and of all the productions of nature or art, comes the nearest to that universal remedy, so much sought after by man-

kind, but never hitherto discovered.—HOFFMAN.

Sir William Temple, and many other men of eminence, has supported the same opinion. Pure soft running water, in point of superiority, is proved by many striking facts. Horses, for instance, always prefer soft water; and when by necessity or inattention, they are confined to the latter, their coats become rough, and ill-conditioned: they are also, in consequence, frequently troubled with the gripes. Hard water is known to produce a tendency to disease in the spleen, especially of sheep; and it is refused by pigeons, when they procure that which is soft.

Toast and water is not only a nutritious, but a wholesome diluent. The bread, toasted brown on both sides, renders the water exceedingly soft and palatable, and very much tends to correct any existing bad quality in it. Soda water, made as wanted, with the powders, and toast and water used for this purpose, is much superior to that made with water in its ordinary state.

The most eligible mode of making toast and water is, to take a slice of good stale bread and toast it brown, but not burnt, on both sides.

Let the bread in this state be put into an earthenware jug, and pour over it from the tea-kettle as much boiling water as you intend for drink. Cover the jug with something, such as as a plate or saucer; and let it stand till it be quite cold; it will now be fit for use Though in the absence of boiling water, the toasted bread put into cold will make the drink much better than common water.

As regard the criteria of judging of good water from external appearances, the following may be taken into consideration: the vigorous and florid appearance of the inhabitants of a district; and the healthy condition of the animals about the place. The lighter the water the better; it being a sign of its being most exempt from other ingredients. Waters which most freely dissolve soap are the best. Springs which freeze with difficulty, and undergo little or no variation in their temperature at different seasons of the year, are considered good. It is esteemed a good sign of the quality of river water, to produce water cresses and water marigolds; and where fresh verdure is observed along its banks. But the best way to deprive water of its earthy salts, is first to boil it, and after it has cooled, to drop into it

a little carbonate of soda; and lastly, to filter it.

It was not, indeed, until very lately, that people would believe that porter could be brewed at any other place than London, owing, as was stated, to the Thames water; when, in fine, the first brewhouse in the kingdom, (we mean Whitbread's) uses no other than New River water; and it is now well known that excellent porter is brewed in most of the principal towns and villages of England, Ireland, and America. Rain water is equally good, if not better than any other, to brew with; and unless lake water produce a free lather with soap, it is too hard to brew with. The water of rivers and ponds, if it could be procured from the middle of the stream or bed, is preferable to that taken up at the edge, where dead fish, putrid animal matter, and other filth are always found. Rain water is said by people of experience, to be best adapted for brewing, as it not only extracts the tincture of malt better than any other, but it contains more fermentable parts, by which the process is quickened, and the spirituous product increased.

THE END.

C. SMITH, PRINTER, WYCH-STREET, STRAND.

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