Davies (*Lectures on the Diseases of the Lungs and Heart*, p. 497. Lond. 1835.) tried this plan, and with good effect.

There are several modes of using magnets. For toothach, a *simple straight* or *bar magnet*, sometimes called *a magnetic staff*, is used. It is first made warm, and its north pole applied to the tooth: if the pain be not relieved, the south pole should then be substituted. Or the poles are applied to, or passed over, the gums or cheeks. In neuralgic pains, *a compound magnet*, called *a magnetic battery*, is commonly employed. This consists of several curved (horse-shoe, lyre-shaped, or U-shaped) magnets, placed one over the other, with all their poles similarly disposed, and fastened firmly together. Dr. Schmidt (*Lancet* for 1835–36, vol. i. p. 338.) employed a battery of five magnets of unequal length, the centre one being the longest and thickest. This kind of battery is usually called by workmen *a magnetic magazine*. *Magnetic collars*, *girdles*, *bracelets*, &c., are made of several artificial magnets, with their opposite poles in contact, enclosed in linen or silk. *Magnetized steel plates*, (*magnetic plates*) of various forms, are fitted to any part of the body. They are applied to the naked skin, and worn by the aid of a bandage.[1]

To attempt to explain the *methodus medendi* of an agent whose therapeutical influence is not generally admitted, appears to me somewhat premature. I may remark, however, that should the existence of *electro-vital* or *neuro-electric* currents in the animal body, as announced by Prof. Zantedeschi and Dr. Favio,[2] be hereafter fully established, we shall have a ready explanation of the medicinal power of magnetism in the well-known influence of a magnet over a voltaic current.[3]

## II. AGENTIA HYGIENICA.—HYGIENIC AGENTS.

(Non-Naturals.)

Under the absurd name of the *Non-Naturals*, (*Non-Naturalia*) the ancients included six things necessary to health, but which, by accident or abuse, often became the cause of disease;—viz: *Air*, *Aliment*, *Exercise*, *Excretions*, *Sleep*, and *Affections of the Mind*.[4] These are now denominated *Hygienic Agents*.[5]

I propose very briefly to consider, as therapeutic agents, *Food*, *Climate*, and *Exercise*. *Affections of the Mind* have been already noticed. (See p. 41.)

### 1. Cibus.—Food.

The substances employed as Food (*Cibus*) may be conveniently arranged in three groups, respectively denominated Aliments, (*Alimenta*) Drinks, (*Potulenta*) and Condiments (*Condimenta*.)

#### *a.* Alimenta.—Aliments.

It will be convenient to consider aliments under the two heads of *Alimentary Principles* and *Compound Aliments*.[6]

##### 1. Alimentary Principles.

Dr. Prout[7] has divided the alimentary principles into three great classes or

[1] Figures of the different forms of magnetic instruments here referred to, are given by MM. Andry and Thouret, in their very elaborate and able article on Medical Magnetism, in the *Mémoires de la Société Royale de Médecine*, Année 1779. p. 531.

[2] *Report on the Memoir on Electric Currents in Warm blooded Animals*, by Prof. Zantedeschi and Dr. Favio, presented to the Royal Academy of Sciences of Brussels on the 4th April, 1840. By M. Cantraine. In *Lond. Edinb. and Dubl. Mag.* for April, 1841.

[3] For farther information respecting Magnetism as a therapeutical agent, I must refer to Andry and Thouret's Memoir before quoted: as also to Dr. Becker's *Der mineralische Magnetismus und seine Anwendung in der Heilkunst*, Mühlhausen, 1829; Dr. Bulmerincq's *Beiträge zur ärztlichen Behandlung mittelst des mineralischen Magnetismus*, Berlin, 1835; and Dr. Schnitzer's *Ueber die rationelle Anwendung des mineralischen Magnetismus*, Berlin, 1837.—Also, Most's *Encyklopädie der gesammten medicinischen und chirurgischen Praxis*; art. *Magnetismus mineralis*, 2er Band. S. 394. Leipzig, 1837.

[4] For an account of the Non-Naturals, consult Sutherland's *Attempts to revive Ancient Medical Doctrines*, vol. ii. p. 113. Lond. 1763.—Also, Willich's *Lectures on Diet and Regimen*. 3rd edit. Lond. 1800.

[5] Rostan (*Dict. de Médecine*, art. *Hygiène*) terms them *Matière de l'Hygiène*.—On Hygiène, consult Dunglison, *On the Influence of Atmosphere and Locality; Change of Air and Climate; Seasons; Food; Clothing; Bathing; Exercise; Sleep; Corporeal and Intellectual Pursuits, &c. &c. on Human Health; constituting Elements of Hygiene*. Philadelphia, 1835.

[6] See Tiedemann's *Untersuchungen ueber das Nahrungs-Bedürfniss, den Nahrungs-Trieb, und die Nahrungs-Mittel des Menschen*. Darmstadt, 1836.

[7] *Phil. Trans.* for 1827, p. 355. Also, *On the Nature and Treatment of Stomach and Urinary Diseases*, 3d edit. Lond. 1840. In the latter work he admits a fourth alimentary principle, which he calls *aqueous*.

groups—the *saccharine*, the *oleaginous*, and the *albuminous*. He was led to this division by observing that milk, the only article actually furnished and intended by nature as food, always contains a saccharine principle, a butyraceous or oily principle, and a caseous, or, more correctly speaking, an albuminous principle. This arrangement of alimentary principles appears to me to be superior to any hitherto devised; and I shall, therefore, adopt it.

Class 1. Saccharine Principles.

The principles contained in this class are Sugar, Gum, Vegetable Jelly, Starch, and Lignin. These agree in being of vegetable origin, and in consisting of carbon, hydrogen, and oxygen. With the exception of pectin or vegetable jelly, they contain oxygen and hydrogen in the ratio to form water; and might, therefore, be termed *hydrates of carbon*. The following table is principally drawn up from Dr. Prout's paper in the Philosophical Transactions before referred to:—

| | *Carbon.* | *Water.* |
|---|---|---|
| Sugar, | | |
| Pure Sugar Candy.. | 42·85 | 57·15 |
| Impure ditto ..... | 41·5 to 42·5 | 58·5 to 57·5 |
| East India ditto.... | 41·9 | 58·1 |
| English refined .... | 41·5 to 42·5 | 58·5 to 57·5 |
| East India refined.. | 42·2 | 57·8 |
| Maple ..... | 42·1 | 57·9 |
| Beet-root ..... | 42·1 | 57·9 |
| East India moist... | 40·88 | 59·12 |
| Diabetic ..... | 36 to 40? | 64 to 60? |
| Of Narbonne Honey | 36·36 | 63·63 |
| Of Starch..... | 36·2 | 63·8 |
| Of Milk..... | 40·0 | 60·0 |
| Gum, | | |
| Arabic..... | 36·3 | 63·7 |
| Ditto, dried at 212°. | 41·4 | 58·6 |

| | *Carbon* | *Water.* | |
|---|---|---|---|
| Starch, | | | |
| Fine Wheaten..... | 37·5 | 62·5 | |
| Ditto, dried at 212°..... | 42·8 | 57·2 | |
| Ditto, highly dried at 350°. | 44·0 | 56·0 | |
| Arrow-root..... | 36·4 | 63·6 | |
| Ditto, dried at 212°..... | 42·8 | 57·2 | |
| Ditto, highly dried at 212°. | 44·4 | 55·6 | |
| Lignin, | | | |
| From Box ..... | 42·7 | 57·3 | |
| Ditto, dried ..... | 50·0 | 50·0 | |
| From Willow ..... | 42·6 | 57·4 | |
| Ditto, dried ..... | 49·8 | 50·2 | |
| Pectin or Vegetable Jelly, | | *Hydr.* | *Oxyg.* |
| From sweet apples (Mulder[1]) ..... | 45·198 | 5·352 | 49·450 |
| Ditto, sour ditto (ditto).... | 45·853 | 5·479 | 48·668 |
| In pectinate of lead (ditto) | 45·608 | 5·370 | 49·022 |
| In pectinate of lead (Fremy[2]) ..... | 43·5 | 5·2 | 51·4 |

Those varieties of each principle which contain the smallest quantity of water, Dr. Prout terms *strong* or *high;* while those containing the largest proportion of water, he denominates *weak* or *low*. Thus, sugar-candy is a high or strong sugar,—sugar of starch, a weak or low one.

Sugar is the only one of the above five principles capable of crystallizing; and is, therefore, the farthest removed from organization and life. Gum, though incapable of crystallizing, is not organized: it may be denominated an organizable substance. Starch and lignin are organized substances.

In *Diabetes*, abstinence from all the alimentary principles of this class is attended with a considerable diminution of the saccharine secretion. Farinaceous matter, though less objectionable than common sugar, is readily convertible into sugar.

1. Saccharina. *Saccharine Substances.*—Under this head are placed several sweet organic principles, capable, for the most part, of undergoing vinous fermentation when mixed with yeast and a due proportion of water.

*a.* Sugars susceptible of Vinous Fermentation.

1. *Crystallizable.* This division includes *common sugars*, (viz. *cane*, *maple*, and *beet-root sugars*) *granular sugars*, (viz. *grape*, *honey*, *starch*, and *diabetic sugars*) and *sugar of milk*.
2. *Uncrystallizable.* Called *liquid* or *mucous sugars*, as *treacle*.

*b.* Sugars unsusceptible of Vinous Fermentation.[3]

1. *Crystallizable. Mannite.*
2. *Uncrystallizable. Glycyrrhizin*, *Glycerin*, and *Sarcocollin*.

[1] *Pharm. Central-Blatt für* 1838. p. 338. [2] *Journ. de Pharm.* xxvi. 373.

[3] Liebig (Turner's *Elements of Chemistry*, 7th ed. p. 914, Lond. 1840) regards those substances only as saccharine which are susceptible of the vinous fermentation.

Sugar is a highly nutritious substance, and by the healthy stomach is readily digested. It does not agree, however, with some dyspeptics. Flatulency and preternatural acidity of stomach are frequently ascribed to it; but, in many cases, these conditions are referrible rather to the substances taken with the sugar, than to the saccharine matter itself. In diabetes the power of assimilating sugar is in a great measure lost, and the dietetical use of saccharine matter must be rigorously prohibited.

Sugar appears to contribute directly to the nutrition of plants: for the saccharine juices of the sugar-cane, of the maple, of the beet root, &c., must be regarded as nutritive. Yet, it is somewhat remarkable, and apparently inconsistent with this statement, that saccharine matter is found in the excretions of plants; as those formed by the nectariferous glands. Sugar appears to be especially adapted for the food of young plants; hence we find it generated in many seeds (as peas, barley, &c.) during germination.

It is nutritive to animals. Thus it is an important constituent of milk;—a liquid intended for the nourishment of mammals during the first period of their existence. Many insects (especially the *Lepidoptera*, *Hymenoptera*, and *Diptera*) feed on sugar or saccharine liquids. Its asserted poisonous action on some *Annelida*, birds, and frogs, is improbable, and wants confirmation. (Vide Murray, *App. Med.* vol. v. p. 411. Goett. 1790.) That a diet of sugar only is incapable of supporting the life of mammals and birds, has been fully proved by the experiments of Magendie (*Ann. de Chim.* iii. 66. 1816.) and of Tiedemann and Gmelin. (Müller's *Elem. of Phys.* by Baly, p. 482.) Dogs and geese die, when confined and fed solely on sugar and water, with all the symptoms of starvation. Change or alteration of diet, with the use of a certain portion of nitrogenous food, seems, therefore, to be essential to the vitality of these animals.

Sugar is employed by man on account of its agreeable taste, rather than as a direct source of nourishment; yet, of its nutritive qualities, few entertain any doubt. During the sugar season of the West India Islands, "every negro on the plantations, and every animal, even the dogs, grow fat." (Wright, *Med. Plants of Jamaica.*) The injurious effects, which have been ascribed to sugar, are more imaginary than real. Some individuals have consumed large quantities of it, for a long series of years, without suffering any ill consequences. (Slare, *Vindication of Sugars*, Lond. 1715.) Stark's experiments (Stark's *Work*, ed. by J. C. Smith, pp. 160 and 115. Lond. 1788.) hardly admit of any legitimate conclusions being drawn therefrom, as to the action of sugar. The fondness of children for sugar may be regarded as a natural instinct; since nature, by placing it in milk, evidently intended it to form a part of their nourishment during the first period of their life. The popular notion of its having a tendency to injure the teeth seems most absurd, as Dr. Slare (*Op. cit.*) has shown. "It has been alleged, that the eating of sugar spoils the colour of and corrupts the teeth: this, however, proves to be a mistake, for no people on the earth have finer teeth than the negroes in Jamaica." (Wright, *op. cit.*)

The principal use of sugar, considered *dietetically*, is for sweetening various articles of food, whose nutritive qualities also it promotes. In diabetes, and the oxalate of lime diathesis, sugar and sweet foods should be rigorously excluded. In dyspepsia, its effects are to be carefully examined; and, if found to be injurious, its use ought to be prohibited. The copious use of unrefined sugar is likely to prove injurious in some nephritic disorders, as the phosphatic diathesis, on account of the lime contained in it.

2. Mucilaginosa. *Gummata.*—The gummy principles, called Arabin, Tragacanthin or Adraganthin, Cerasin or Prunin, Cydonin, and Bassorin, belong to this group. They possess nutritive properties; but are somewhat difficult of digestion, and apt to disagree with dyspeptics.

Magendie (*Ann. de Chim. et Phys.* t. iii. p. 66.) has shown that dogs, fed on gum alone, languish and die in two or three weeks; and Tiedemann and Gmelin (Müller's *Physiology*, by Baly, vol. i. p. 482.) found that a goose, fed with gum, died on the sixteenth day. These, as well as other experiments, merely show, however, that animals require more than one kind of aliment.

The nutritive property of gum is shown by several facts. In the first place it constitutes a portion of several well-known articles of food; secondly, it sometimes forms the principal or only food of man. Hasselquist (*Voyages and Travels in the Levant*, p. 298. Lond. 1766.) tells us, that a caravan, of more than a thousand persons, travelling from Abyssinia to Cairo, and whose provisions were exhausted, supported themselves for two months on the gum they were carrying as merchandize. The Moors and the Negroes near the Niger, employ it as a common kind of food. The Hottentots also each are well aware of its nutritive properties. (Murray, *App. Medicam.* vol. ii. p. 535. Ed. alt. Goett. 1794.) Six or eight ounces daily for an adult are said to be sufficient to sustain life.

3. VEGETO-GELATINOSA. *Vegetable Jelly.*—To this head are referred Pectin or Grossulin, and Carrageenin. These are nutritive and digestible. Whether the tendency of some fruits to disorder the *primæ viæ* is fairly ascribable to the vegetable jelly, or to some other principle associated with it, has not been clearly made out.

Pectin, under the influence of an alkali, is readily converted into pectic acid. The latter has been recommended for the formation of jellies, gelatinous conserves, &c. (Dumas, *Traité de Chimie*, t. v. p. 404. Paris, 1835.)

4. FARINOSA. *Amylaceous, farinaceous, or starchy substances.*—Under this division are included Wheat-starch, Sago, Tapioca, Arrow-root, (West Indian, East Indian, South Sea, and Portland,) Potato-starch, Tous les Mois, Salop, &c. Amylaceous matter is found in various parts of plants. The albumen of the seeds of grasses abound in it, and from this organ wheaten and rice-starch are obtained. The fleshy cotyledons of the leguminous seeds—as peas and beans—likewise contain it. In the roots, subterranean stems, and tubers of many plants, it is also found; and from these sources are procured Tapioca, Arrow-root, (West Indian, East Indian, and Portland,) Salop, Potato-starch, and Tous les Mois. The interior of some monocotyledonous stems abound in farinaceous matter; and from this source Sago is obtained. Farthermore, a feculoid substance, called *lichenin*, is found in some Lichens—as in Cetraria islandica.

The amylaceous substances are organized. Examined by a microscope they are seen to consist of small grains, which are usually rounded, or elliptical, or mullar-shaped, or polyhedral. The polyhedral form probably arises from the mutual compression of numerous grains in the same or neighbouring cells. On some part of the surface of each grain is a round spot, called the hilum: very rarely, two or even three of these spots are observed on the same grain. The grains of most, if not of all, feculas, have a laminated texture. To the concentric layers is owing the appearance of concentric rings on the surface of most feculas.[1] The organic principle (*amidon,*) of which these layers consist, seems to be uniform in its composition and properties, excepting in some slight differences of cohesion.[2]

When cooked, amylaceous matter is a nutritious and easily digestible substance. Directly or indirectly, observes Dr. Prout, (*On the Nature and Treatment of Stomach and Urinary Diseases*, p. x. Lond. 1840.) "it forms a constituent of the food of most of the higher animals, as well as of man. It differs, therefore, from sugar, in being a *necessary* article of food, without which animals could not exist; while sugar is not. Hence a much larger quantity of amylaceous matter than of sugar, can be taken; and what is a still more decisive fact, the use of this larger quantity of amylaceous matter may be persisted in for an unlimited period, which, it appears, is not the case with a large proportion of sugar."

Farinaceous food is, perhaps, the least irritating of all kinds of aliments. It is, therefore, well adapted for the use of persons affected with morbidly sensible conditions of the primæ viæ. It will sometimes remain on the stomach when every other kind of nutriment is immediately rejected. Being totally devoid of all stimulating properties, it is a useful and valuable article of food in febrile and inflammatory diseases. In diabetes it is the only kind of vegetable aliment admissible.

To render amylaceous matter digestible, it requires to be cooked in order to break or split the grains; for, of the different laminæ of which each grain consists, the outer ones are the most cohesive, and present the greatest resistance to the digestive power of the stomach, while the internal ones are the least so. Hence farinaceous substances are boiled in milk or water,—or they are panified with gluten, by which the grains are completely broken up,[3]—or they are made into puddings and tarts.

5. LIGNIN. *Woody Fibre.*—The substance, called lignin, constitutes the basis

[1] Figures of the different starchy bodies, drawn to the same scale, will be given in subsequent parts of this work (see *Index.*)

[2] For an elaborate account of the structure and chemical properties of starchy substances, see Payen's *Mémoire sur l'Amidon*, in the *Annales des Sciences Naturelles*. 2nde Série, t. x; Botanique. Paris, 1838.

[3] Good bread gives not the slightest trace of entire grains of starch.

of woody fibre, vessels, ducts, and cellular tissues of plants. Its composition is probably similar in all plants.[1] It "forms the appropriate food of numerous insects and of some of the lower animals, but of few of the higher classes of animals. The reason of this is probably to be sought for, in their not being furnished with organs proper for comminuting and reducing it; for when lignin is comminuted and reduced by artificial processes, it is said to form a substance analogous to the amylaceous principle, and to be highly nutritious." (Prout, *op. ante cit.* p. xii.)

The Laplanders, according to Linnæus, (*Flora Lapponica.*) eat bark-bread (*barkbröd*) during a great part of the winter, and sometimes even during the whole year. It is prepared from the inner bark of the *Pinus sylvestris.* (See Von Buch in *The Scots Magazine*, vol. lxxx. p. 315. Edinb. 1817.)

Professor Autenrieth, (*Phil. Trans.* 1827, p. 355.—Also, *The Scots Mag.* vol. lxxx. p. 313.) of Tubingen, states, that when wood is deprived of every thing soluble, reduced to powder, repeatedly subjected to the heat of an oven, and then ground in the manner of corn, it yields, boiled with water, a flour, which forms a jelly, like that of wheat-starch, and, when fermented with leaven, makes a perfectly uniform and spongy bread.

### Class 2.—Oleaginous Alimentary Principles.

This class comprehends the substances denominated Fats, Fixed Oils, and Butters.

Dr. Prout (*Op. supra cit.* p. xiv.) includes also the volatile oils. But, though volatile oil is a constituent of several substances employed as aliments or condiments, yet I am unacquainted with any evidence of its being alimentary. When received into the stomach, it is absorbed, and taken into the system; but is subsequently thrown out again, without having undergone much, if any, change. Alcohol, which Dr. Prout ranks with the volatile oils, is neither oleaginous nor alimentary.

The ultimate constituents or the elementary principles of the oleaginous substances are Carbon, Hydrogen, and Oxygen. The proportions are as follow:—

| | *Carbon.* | *Hydrogen.* | *Oxygen.* | *Loss.* |
|---|---|---|---|---|
| Almond Oil (Saussure[2]) . . . . . | 77·403 | 11·481 | 10.828 | 0·288 |
| Olive Oil { Elaine (Saussure) . . | 76 034 | 11·545 | 12·068 | 0·353 |
| Olive Oil { Margarine (Saussure) | 82·170 | 11·232 | 6·302 | 0·296 |
| Butter (Bérard[3]) . . . . . | 65·6 | 17·6 | 16·8 | — |
| Hog's Lard (Chevreul[4]) . . . . . | 79·098 | 11·146 | 9·756 | — |
| Mutton Suet (Chevreul) . . . . . | 78·996 | 11.700 | 9·304 | — |

The fats and fixed oils, as presented to us by nature are separable into two or three or more fatty principles; of which stearine, margarine, elaine, and butyrin, are the most important. By subjecting solid or congealed fats to pressure, Braconnot[5] separated several of them into two parts,—the one liquid (elaine,) the other solid (stearine and margarine.)

| | *Stearine.* | *Elaine.* |
|---|---|---|
| Butter . . . . . | 40 . . . . . | 60 |
| Hog's Lard . . . . | 38 . . . . . | 62 |
| Beef Marrow . . | 76 . . . . . | 24 |
| Mutton Marrow . | 26 . . . . . | 74 |
| Goose Fat . . . . | 32 . . . . . | 68 |
| Duck Fat . . . . . | 28 . . . . . | 72 |
| Turkey Fat . . . | 26 . . . . . | 74 |

| | *Margarine.* | *Elaine.* |
|---|---|---|
| Olive Oil . . . . . | 28 . . . . . | 72 |
| Almond Oil . . . . . | 24 . . . . . | 76 |
| Oil of Colza[6] . . . . | 46 . . . . . | 54 |

[1] According to the Rev. J. B. Reade (*Lond. and Edin. Phil. Mag.* vol. xi. p. 421) a very remarkable difference exists between the chemical composition of cellular membrane and of spiral vessels in the same plant. But his "results are in many respects so remarkably at variance with all that we are as yet acquainted with respecting similar subjects, that we must at the outset doubt their correctness." (Meyen's *Report on the Progress of Vegetable Physiology, during the year* 1837. Translated by William Francis. Lond. 1839.)

[2] *Ann. de Chim. et Phys* t. xiii. p. 351. [3] Gmelin, *Hand. d. Chemie*, Bd. ii. S. 439. [4] Ibid.

[5] *Ann. de Chim.* xciii. 225. Braconnot terms all the solid fats, stearine; but Lecanu (*Ann. de Chim. et Phys.* lv. 192) has shown that the solid fat of the vegetable oils is margarine

[6] The Colza is the *Brassica campestris*, which is closely allied to *Brassica Napus*, the seeds of which yield Rape Oil.

Stearine, Margarine, Elaine, and Butyrine, yield, by saponification, fatty acids, a sweet basic principle called glycerine (or the oxide of glycerule,) and water. They are probably, therefore, hydrated salts of glycerine. The acids (stearic, margaric, and oleic) obtained respectively from stearine, margarine, and elaine, are fixed; while those (butyric, capric, and caproic acids) procured from butyrin, are volatile and odorous.

Oleaginous aliments are highly nutritious, but exceedingly difficult and slow of digestion. The last-mentioned circumstance is familiar to every dyspeptic, and has been confirmed by the experiments of Dr. Beaumont,[1] made on a Canadian, who had, two inches below the left nipple, a permanent artificial opening into his stomach, produced by a gun-shot wound. Dr. Beaumont remarks, that the bile is not ordinarily found in the stomach; but that, after the use of oily food, it is often observed there: and, he concludes, that it assists the digestion of the fatty substances. The operation of heat on the fatty bodies is injurious to their digestibility, especially in the case of butter. This appears to be owing to the development of acrid fatty acids, and empyreumatic oil matters. Hence buttered toast, melted butter, substances cooked by frying in oil or butter, and pastry, are highly injurious to dyspeptics.

Oleaginous foods often agree so remarkably well with diabetic patients, "that some have gone so far as to propose them as remedies. When freely taken, they usually cause a flow of saliva, and thus diminish the urgent thirst. When they agree, also, they give a sensation of satisfaction and support to the stomach, which other alimentary substances do not. Perhaps butter is the most agreeable form in which they can be taken, and this, under proper circumstances, may be taken freely. When oleaginous matters disagree, as is sometimes the case, they should be carefully shunned." (Prout, *op. supra cit.* p. 43.)

Sir John Ross (*Narrative of a Second Voyage in search of a North-West Passage*, p. 201. Lond. 1835.) considers, and his opinion is probably correct, that the natives of cold countries seem to require a more fatty diet than the inhabitants of tropical regions, in order to promote the production of animal heat.

### Class 3.—Nitrogenous or Azotized Alimentary Principles.

(Albuminous Aliments, *Prout.*)

The most important alimentary principles, containing nitrogen or azote, are Fibrines, Albumen, Caseum, Gelatine, and Gluten. The animal extract, called Osmazome, is also a nitrogenous principle. With one exception (Gluten,) these principles are obtained from the animal kingdom, and they have in consequence, been frequently denominated *animal* aliments. They are composed of carbon, hydrogen, nitrogen, and oxygen, in the following proportions:—

| | Carbon. | Hydrog. | Nitrogen. | Oxygen. |
|---|---|---|---|---|
| Fibrine of a Cow's Arterial Blood (Mulder[2]) | 53·019 | 6·828 | 15·462 | 24·691 |
| of ditto Venous Blood (Mulder) | 53·476 | 6·952 | 15·291 | 24·281 |
| of Muscle of the Ox (Sass & Pfaff[3]) | 48·30 | 10.64 | 15·92 | 17·64 & fixed salts 7·50 |
| Albumen of Eggs, (Mulder) | 53·960 | 7·052 | 15·696 | 23·292 |
| of Arterial Blood (Michaelis[4]) | 53·009 | 6·993 | 15·562 | 24·436 |
| of Venous Blood (Michaelis) | 52·650 | 7.359 | 15·505 | 24·484 |
| Caseum (Jul. Vogel[5]) | 52·53 | 7·82 | 16·20 | 23·45 |
| Gelatine of Hartshorn (Mulder) | 50·048 | 6·477 | 18·350 | 25·125 |
| of Isinglass (Mulder) | 50·757 | 6·44 | 18·313 | 24·286 |
| Gluten (Boussingault[6]) | 54·0 | 7·50 | 14·60 | 23.90 |

[1] *Experiments and Observations on the Gastric Juice and the Physiology of Digestion.* By Wm. Beaumont, M. D. Reprinted from the Plattsburg edition, with notes by Dr. Combe. Edinb. 1838.

[2] *Pharmaceutisches Central-Blatt für* 1837. S. 325.

[3] Müller's *Elements of Physiology*, by Baly, vol. i. p. 369. I strongly suspect some error in this anslysis.

[4] Berzelius, *Traité de Chimie*, t. vii. p. 75.

[5] *Pharm. Central-Blatt für* 1839, S. 491.

[6] *Ann. de Chim. et Phys.* lxiii. 229.

In *Diabetes*, the diet should be principally of nitrogenous principles. Dr. Rollo[1] advocated the exclusive use of animal substances in this malady, and, of its power to check the secretion of sugar, no doubt seems to be entertained. But the craving for vegetable food which some patients experience is so great, that considerable difficulty is experienced in inducing them to submit to a diet exclusively animal. Moreover, violent fever has been ascribed to it.[2] Hence the recommendation of Dr. Prout, to allow a certain quantity of farinaceous food, has been very generally assented to and followed. More recently, however, Dr. Christison (*Edinb. Monthly Journal of Medical Science* for April, 1841.) has published some cases, showing that a mixed diet of animal and vegetable food is sometimes inadmissible; and "that if a sensible amelioration is to be looked for with any confidence, the injunctions of Rollo and his imitators, to enforce a rigorous animal diet, must often be faithfully followed."

In the *Oxalic Acid Diathesis*, the plan of diet is the same as for Diabetes.

1. Fibrine.—In the liquid form, or in the state of suspension, it exists in the blood. In the solid state it is the principal constituent of the muscles or fleshy parts of animals. It is eminently nutritious, and easy of digestion.

2. Albumen.—This principle constitutes the most important part of animal foods. In the liquid state it exists in eggs (*ovalbumen*) and the serum of the blood (*seralbumen*.) In the solid or coagulated state it is a constituent of the flesh, glands, and viscera of animals. The chemical properties of coagulated albumen are almost identical with those of fibrine. Albumen is highly nutritious, and when either raw or lightly boiled is easy of digestion; but when boiled hard, or especially when fried, its capability of being digested is considerably impaired. (See *Eggs*, p. 86.)

3. Caseum. *Lactalbumen*, or *Curd*.—This is the coagulable matter of milk, and is closely allied to albumen, of which it may be regarded as a modification. Coagulated, dried, somewhat changed in its nature, and more or less mixed with butter, it constitutes *cheese*. It is nutritious, and moderately easy of digestion.

4. Gelatine. *Animal Jelly*.—Gelatine is obtained by boiling certain animal tissues in water: the concentrated decoction forms, on cooling, a tremulous mass, called *jelly*. The bones, antlers, skin, tendons, and aponeuroses of mammals, and the swimming bladder of fishes, are the especial sources of it. It is an exceedingly nutritive principle, though probably somewhat less so than fibrine and albumen. As far as my own observations extend it is readily digestible; but it is said not be suited to the digestive powers of many dyspeptics.

"Gelatine may be considered as the least perfect kind of albuminous matter existing in animal bodies; intermediate, as it were, between the saccharine principles of plants, and thoroughly developed albumen. Indeed, gelatine in animals may be said to be the counterpart of the saccharine principles of plants; it being distinguished from all other animal substances, by its ready convertibility into a sort of sugar, by a process similar to that by which starch may be so converted." (Prout, *On the Nat. and Treatm. of Stomach and Urinary Diseases*, p. xiii.)

*Gelatine from Bones* is employed in Paris for the preparation of a nutritious soup for hospitals and other pauper habitations.[3]

*Hartshorn Jelly* is principally used by invalids.

*Patent Gelatine* is procured from the skins of animals. (See *The Mechanic and Chemist* of July 4th, 1840. Lond.)

*Confectioner's Jelly* is made from isinglass, calves' feet, and patent gelatine.

*Soups* and *Broths* owe their nutritive properties principally to gelatine.

*Young meats* yield more gelatine than old ones.

The *Sounds* of fish and *Isinglass* are gelatinous substances.

5. Osmazome. *Alcoholic Extract of Meat*.—This is an alcoholic extract obtained from the flesh, brain, and other parts of animals. It has a reddish brown colour, and the smell and taste of soup. It is generally mixed with lactic acid, the lactates, and common salt. To this principle broths and soups owe their flavour, smell, and part of their nutritive qualities.

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[1] *An Account of two Cases of Diabetes Mellitus*, Lond. 1797.—*Cases of the Diabetes Mellitus*, Lond. 1798. 2d ed. with large additions, 1800.

[2] See the statements of Dr. Marsh, in the *Dublin Hospital Reports*, vol. iii. Dubl. 1822; and of Dr. Prout, in his *Inquiry into the Nature and Treatment of Diabetes, Calculus and other Affections of the Urinary Organs*, p. 79. Lond. 1825.

[3] D'Arcet *Recherches sur les Substances nutritives que renferment les Os*. Paris, 1829.—Edwards and Balzac, in the *Annals des Sciences Nat.* Juillet 1832, p. 318.—Also, Edwards' *Recherches Statistiques sur l'Emploi de la Gélatine*. Paris, 1835.

6. Gluten.—This substance is found in corn; especially in wheat. By washing wheaten dough with a stream of water, the gum and the sugar are dissolved, the starch is washed away, while the gluten is left in the form of a ductile, tenacious, elastic, gray mass, which, by the action of alcohol, is resolved into *albumen*, *mucin*, and *glutin*.

*a. Albumen* is insoluble in alcohol, but soluble in water.
*b. Mucin* is soluble in boiling alcohol, but deposites as the liquid cools.
*c. Glutin* is soluble in alcohol, but is almost insoluble in water.

Gluten is believed to be highly nutritious, and to confer on wheat flour its well known superior alimentary qualities.

"It is the presence of gluten in wheaten flour that renders it pre-eminently nutritious, and its viscidity or tenacity confers upon that species of flour its peculiar excellence for the manufacture of *macaroni*, *vermicelli*, and similar pastes, which are made by a kind of wire-drawing, and for which the wheat of the south of Europe, (more abundant in gluten than our own) is particularly adapted. The superiority of wheaten over other bread depends upon the greater tenacity of its *dough*, which, in *panary fermentation*, is puffed up by the evolved carbonic acid, and retained in its vesicular texture, so as to form a very light loaf." (Brande's *Manual of Chemistry*, p. 1091, 5th ed. 1841.)

## 2. Compound Aliments.

These we subdivide into animal and vegetable.

### *a.* Animal Aliments.

We may conveniently arrange these in six classes;—viz.

| | | |
|---|---|---|
| 1. Mammals. | 3. Reptiles. | 5. Crustaceous animals. |
| 2. Birds. | 4. Fishes. | 6. Mollusks. |

#### Class 1. Mammalia.—Mammals.

In this country, the mammals employed by man, as food, are the Ox, the Sheep, the Hog, the Deer, the Rabbit, and the Hare.

Herbivorous are generally preferred to carnivorous animals for food; as the flesh of the latter has a somewhat disagreeable odour.

Mammals furnish their flesh, their viscera, their blood, and their milk, as articles of food.

1. Flesh.—This consists principally and essentially of muscle, intermixed, however, with tendons, aponeuroses, nerves, vessels, cellular tissue, blood, serum, and fat. Its chemical constituents are fibrine (principally,) albumen, gelatine, hæmatosin or the colouring matter of the blood, osmazome, fatty matter (stearine and elaine,) creatine,[1] a peculiar nervous matter, and salts. The following are the proportions of the first three principles in the muscles of some kinds of flesh:—(Brande, *op. supra cit.*)

| 100 *Parts of Muscle of* | *Water.* | *Albumen or Fibrine.* | *Gelatine.* | *Total of Nutritive Matter.* |
|---|---|---|---|---|
| Beef | 74 | 20 | 6 | 26 |
| Veal | 75 | 19 | 6 | 25 |
| Mutton | 71 | 22 | 7 | 29 |
| Pork | 76 | 19 | 5 | 24 |

The flesh of young animals is more tender than that of old ones. That of castrated males is not only more delicate and finer grained, but has a more agreeable odour and flavour than that of the uncastrated animal. Spaying is said to improve the flavour of the flesh of the female. With regard to digestibility, Dr. Beaumont found that digestion is facilitated by minuteness of division and tenderness of fibre; and retarded by opposite qualities. Venison he ascertained to be one of the most digestible substances; a circumstance which he refers to its

[1] Creatine (from κρεας, *flesh*) is a nitrogenous, crystallizable substance, insoluble in alcohol. It was discovered by Chevreul (*Journ. de Chim. Méd* t. viii. p. 548.)

being easily divisible into shreds or small particles. Beef and mutton are also easy of digestion.

The following table shows the mean time of digestion of several kinds of flesh, according to Dr. Beaumont's experiments:—

| | *Hours.* | *Minutes.* |
|---|---|---|
| Venison steak, broiled | 1 | 35 |
| Sucking pig, roasted | 2 | 30 |
| Lamb, fresh, broiled | 2 | 30 |
| Beef steak, broiled | 3 | 0 |
| Mutton, fresh, broiled | 3 | 0 |
| Pork steak, broiled | 3 | 15 |
| Veal, fresh, broiled | 4 | 0 |
| Beef, old, hard, salted, boiled | 4 | 15 |

By boiling flesh in water, the fibrine is corrugated, the albumen coagulated (though, by a prolonged action of heat and water, it yields a soluble nitrogenous matter;) the hæmatosine is also coagulated; the cellular tissue, the tendons, and the aponeuroses, yield gelatine; the fatty matters melt; while the osmazome and the creatine are dissolved.[1]

2. Viscera.—The brain, the liver, the spleen, the kidneys, the thymus,[2] the lungs, and the alimentary canal of mammals,[3] are employed as food. They abound principally in albumen.

*Composition of the Liver of the Ox.*[4]

| | |
|---|---|
| Vascular & Cutaneous Tissues | 18·94 |
| Parenchyma (*i. e.* soluble parts) | 81·05 |
| Liver | 100.00 |
| Brown oil, containing phosphorus | 3·89 |
| White fatty flocculi | ? |
| Nitrogenous matter | 6·07 |
| Albumen | 20·19 |
| Blood | ? |
| Salts | 1·21 |
| Water | 68.64 |
| Parenchyma of the liver | 100.00 |

*Composition of the Thymus of the Calf.*[5]

| | |
|---|---|
| Albumen | 14·00 |
| Osmazome | 1·65 |
| Gelatine | 6·00 |
| Peculiar animal matter | 0·30 |
| Margaric acid | 0.05 |
| Fibrine | 8·00 |
| Water | 70·00 |
| Thymus | 100·00 |

The following are the mean times of digestion of several viscera, according to Dr. Beaumont:—

| | *Hour.* | *Minutes.* |
|---|---|---|
| Tripe, soused, boiled | 1 | 0 |
| Brains, animal, boiled | 1 | 45 |
| Liver of the ox, fresh, broiled | 2 | 0 |

Sausages made of the flesh, viscera, or blood of animals, and cured by smoking, have sometimes acquired, by keeping, highly deleterious qualities, which Buchner ascribes to the presence of a peculiar fatty acid, which has been termed *botulinic acid* (Wûrst-fett-saûre.) (See Christison's *Treatise on Poisons*, p. 585, 3d ed. Edinb. 1835.)

Bacon also sometimes becomes poisonous. (Ibid. p. 592.)

3. Blood.—Among civilized nations, the pig is the only animal whose blood furnishes a distinct article of food. Mixed with fat and aromatics, and enclosed in the prepared intestines, the blood of this animal constitutes the substance sold in the shops under the name of *black pudding* (*apexabo.*)

The deleterious qualities, which blood puddings sometimes acquire, have been above referred to.

4. Milk.—Properly speaking, milk should be considered among Drinks; but,

[1] See some interesting observations on the effects of heat and water on meat, in Soubeiran's *Nouv. Traité de Pharm.* t. i. p 130. 2nde ed. Paris, 1840.

[2] The thymus of the calf is commonly termed *sweetbread.*

[3] The stomachs of ruminants, when prepared as food, constitute *tripe.*

[4] Braconnot, *Ann. de Chim. et Phys.*, x. 189.

[5] Morin, *Journ. de Chim. Méd.* t. iii. p. 450.

as it contains a large quantity of alimentary matter, and, farthermore, as it yields some solid foods (butter and cheese,) it will be most convenient to consider it here. The composition of several kinds of milk is thus stated by MM. O. Henry and Chevallier. (*Journ. de Pharm.* t. xxv. p. 340.)

| *Constituents.* | *Milk of the* | | | | |
|---|---|---|---|---|---|
| | *Cow.* | *Ass.* | *Woman.* | *Goat.* | *Ewe.* |
| Caseum | 4·48 | 1·82 | 1·52 | 4·02 | 4·50 |
| Butter | 3·13 | 0.11 | 3.55 | 3·32 | 4·20 |
| Sugar of Milk | 4·77 | 6·08 | 6·50 | 5·28 | 5·00 |
| Various Salts | 0·60 | 0·34 | 0·45 | 0·58 | 0·68 |
| Water | 87·02 | 91·65 | 87·98 | 86.80 | 85·62 |
| Total | 100·00 | 100·00 | 100·00 | 100·00 | 100·00 |
| Solid substances | 12.98 | 8·35 | 13·00 | 13·20 | 14·38 |

The nutritive principles of milk are (excluding water,)—caseum, butter, and sugar of milk. Perhaps the phosphate of lime, found in milk, ought to be considered as an aliment for young animals; inasmuch as it is necessary to the development of their osseous system. For the most part, milk is readily digestible; but, with adults, this is by no means universally the case. With some dyspeptics, it proves heavy and difficult of digestion. I find that those, with whom it disagrees, are obnoxious to the use of butter; whence I infer, that the injurious qualities of milk are ascribable to the oily constituent; and, with such patients, ass's milk (which contains but little butter) usually agrees.

The quantity of nutritive matter, contained in milk, varies not only with the species, but with the individual,—nay, with the same individual under different circumstances. The quality of the milk is affected by constitution, age, food, period after parturition, mental emotion, disease, the use of medicines, &c.

Dr. Young (Quoted by Cullen, *Mat. Med.*) found, that a bitch, fed on vegetable aliment, yielded an acescent and spontaneously coagulable milk; but, when animal food was substituted, the milk became alkaline, and did not spontaneously coagulate.

Dr. Cullen says, "I allege it to be a matter of experience, that, supposing the quantity of liquid to be the same, nurses living entirely, or for the greater part, upon vegetable aliment, afford a greater quantity of milk, and of a more proper quality, than nurses living upon much animal food. This I venture to assert—from the observations of fifty years."

The influence which many medicines, taken by the mother, have over the sucking infant, is a circumstance known to every nurse, though Cullen denies it. We can modify the *colour* of the milk by mixing saffron or madder with the food; the *odour* may be affected by various cruciferous and alliaceous plants; the *taste* may be altered by the use of bitters, as wormwood; and lastly, the *medicinal effect* may be also influenced. Children may be salivated by sucking nurses under the influence of mercury, or purged by the exhibition of drastics, or narcotized by the administration of opiates to the nurse. These facts are so familiar to every one, that farther evidence of them is scarcely requisite. It is curious, however, that Simon (*Journ. de Pharm.* xxv. 354.) failed to recognise in the milk various salts, which were taken by the mouth, and were found in abundance in the urine. Mental emotions also affect the quality of the milk. I have frequently seen the bowels of the child disordered in consequence of some sudden emotion on the part of the mother. It is also not improbable that diseased conditions of the parent may render the milk unhealthy. Labillardière (*Dict. Mat. Méd.* iv. 23.) states that the milk of a cow, affected with a kind of tuberculous phthisis (*pommelière*,) contained seven times more phosphate of lime than usual. Dupuy[1] also speaks of the large quantity of calcareous matter in the milk of cows, in whose lungs abundant deposites of the same substance were found. Other morbid changes in the milk have been observed by Donné, Robiquet, and Lassaigne. The facts now mentioned, are of the greatest moment, not only in reference to the frequency of disease in cows, and, therefore, to the possible morbific character of their milk, but they are of considerable importance in reference to the milk of the human subject. I think, with this statement before us, it is highly improper to allow a female, with any trace or suspicion of tuberculous disease, to suckle. Not that a few grains, more or less, of phosphate of lime in the milk, can probably do any injury to the child; but the fact once established, that the milk may be thus altered by disease, leads to the suspicion that some other substances not yet recognised by their physical or chemical characters, may be in the milk of diseased nurses, and which may have an injurious influence on the child; and the sus-

[1] Quoted by Andrel, *Treat. on Pathol. Anat.*; by Townshend and West, vol. i. p. 675.

picion does not confine itself to those affected with tuberculous diseases: other hereditary or constitutional affections may also be attended with altered conditions of the milk. This suspicion is strengthened by the common observation, that the milk of nurses will not equally suit different children. A child, quite healthy, and in good condition, will sometimes, without any evident disease, fall off, and get into what is commonly called a bad condition, apparently from a change of the nurse. I am aware that we cannot always refer this to any positively hurtful matter in the milk. The quantity of nutritive matter in the same quantity of milk of two nurses may be very different: according to Payen, (*Journ. de Chim. Méd.* t. iv. p. 118.) milk with too much nutritive matter in it may disagree with the child. Another point worthy of attention is the quantity of milk yielded in a given time. Payen says it varies in different women as much as from one to ten and a half in the same time.

*a.* **Butter.**—Butter is employed rather as a condiment than as a direct alimentary matter. Its properties have been already noticed (See p. 81.) When rendered rancid by keeping,—or empyreumatic by heat, it is exceedingly injurious to the dyspeptic.

*Cream* consists principally of butter, but mixed with a certain portion of caseum or whey.

*b.* **Cheese.**—The basis of this is caseum or curd coagulated, somewhat altered in its nature, and mixed with more or less butter. Its richness is in proportion to the quantity of butter present. *Stilton cheese* is prepared from milk to which cream is added. *Chesire*, and the best *Gloucester cheeses*, are made from unskimmed milk. *Suffolk*, and *Parmesan cheeses*, are prepared from skim-milk. Cheese is nutritious, but difficult of digestion. When old and strong, it is taken as a condiment, to promote the secretion of saliva and gastric juice, and thereby to assist digestion. Toasted cheese is bad for dyspeptics.

Cheese, like sausages and bacon, sometimes acquires poisonous properties by keeping. (Christison, *op. supra cit.*)

### Class 2. Aves.—Birds.

The eggs and flesh of these animals are used for food.

1. Eggs.—Both the white or glaire and the yelk are employed as food. The former owes its nutritive property to albumen,—the latter to both albumen and oil.

| | | | |
|---|---|---|---|
| Albumen | 12·0 | Albumen | 17·47 |
| Mucus | 2·7 | Yellow oil and fat | 28·75 |
| Salts | 0·3 | Water | 53·78 |
| Water | 85·0 | | |
| White of Egg | 100 0[1] | Yelk of Egg | 100·00[2] |

Eggs are highly nutritive, and, under some circumstances, are readily digested. When beaten up, in tea, or slightly boiled, they are usually easy of digestion, though with some persons they are very apt to disagree. When boiled hard, and especially when fried in butter or oil, they are exceedingly difficult of digestion, and prove highly injurious to the dyspeptic. The following are the mean times of digestion of eggs, as observed by Dr. Beaumont:—

| | *Hour.* | *Minutes.* |
|---|---|---|
| Eggs whipped, raw | 1 | 30 |
| Eggs fresh, raw | 2 | 0 |
| Eggs fresh, roasted | 2 | 15 |
| Eggs fresh, soft boiled | 3 | 0 |
| Eggs fresh, hard boiled | 3 | 30 |
| Eggs fresh, fried | 3 | 30 |

The oil of the yelk renders this part of the egg scarcely so easy of digestion as the white or glaire.

2. Flesh.—The flesh of the common dunghill fowl is white, contains but little osmazome, and, when young, is exceedingly tender. The quantity of nutritive matter, in chicken flesh, is thus stated by Mr. Brande:—

[1] Bostock, quoted by Gmelin.

[2] Prout, *Phil. Trans.* 1822, p. 388.

| 100 *Parts of Muscle of* | *Water.* | *Albumen or Fibrine.* | *Gelatine.* | *Total of Nutritive Matter.* |
|---|---|---|---|---|
| Chicken. . . . | 73 . . . . | 20 . . . . . | 7 . . . . | 27 |

Chicken flesh is easily digested and nutritious. It is the least irritating or stimulating, perhaps, of all animal foods; and is often retained on the stomachs of invalids when other meats would be immediately rejected. Chicken broth is well adapted for irritable stomachs.

The flesh of wild gallinaceous birds, as the pheasant and the partridge, is darker coloured, firmer, richer in osmazome, somewhat less digestible, and more stimulating than that of chicken.

The flesh of water-fowl, as the goose and duck, is mostly firm, penetrated with fat, and often difficult of digestion. It is scarcely adapted for the invalid.[1]

The employment of the enlarged liver of the goose, in the preparation of the *pâtés de foies gras*, has been already referred to. (See p. 48.) These livers were highly esteemed in the time of Pliny. (*Nat. Hist.* lib. x. cap. 27, ed. Valp.) They contain a quantity of phosphoric oil, which renders them difficult of digestion. Dr. Prout (*Op. sapra cit.* p. 244.) suggests, that indolent and dyspeptic individuals, who partake of these diseased productions, "run considerable risk in inoculating and converting their own livers, or other organs, into a similar mass of disease."

### Class 3. Reptilia.—Reptiles.

The Green or Edible Turtle (*Chelonia esculenta*, or *C. midas*) is the only reptile used in this country as food. It is highly nutritive, and, probably, when plainly cooked, is easy of digestion; but when taken in the form of the highly esteemed "turtle soup," is very apt to disagree with dyspeptics.

### Class 4. Pisces.—Fishes.

The quantity of fibrine, albumen, and gelatine, found in some kinds of fish have been ascertained by Mr. Brande, who states them to be as follows:—

| 100 *Parts of Muscle of* | *Water.* | *Albumen or Fibrine.* | *Gelatine.* | *Total of Nutritive Matter.* |
|---|---|---|---|---|
| Cod . . . . | 79 . . . . | 14 . . . . | 7 . . . . | 21 |
| Haddock . . . | 82 . . . . | 13 . . . . | 5 . . . . | 18 |
| Sole . . . . | 79 . . . . | 15 . . . . | 6 . . . . | 21 |

Morin (*Journ. de Pharm.* t. viii. p. 61.) analyzed the flesh of the Smelt, and found it to consist of yellow, phosphoric oily matter, osmazome, gelatine, mucus, albumen, fibrine, sal ammoniac, phosphates of potash, lime, iron, and magnesia, chloride of potassium, and carbonate of lime.

Fish are less satisfying to the appetite than either mammals or birds. They are also less nourishing. Those fish (as salmon and eels,) which abound in oily matter, are more nutritive than other kinds, but are proportionably less digestible. The thirst and uneasy feeling at the stomach, frequently experienced after the use of the richer kinds of fish, have led to the use of spirit as a condiment for this kind of food. Hence the vulgar proverb, that "*brandy is Latin for fish.*" (See Dr. George Cheyne's *Essay of Health and Long Life*, p. 41.) Skin diseases are said to be more prevalent among those who live much on fish. (Troil's *Letters on Iceland*, p. 319. Lond. 1780.) By the continued use of fish, the seminal secretion is said to be promoted, and the sexual feelings raised. This effect is ascribed to the phosphoric oil which these animals contain.[2]

The following are the mean times of digestion of several fish, according to Dr. Beaumont's experiments:—

[1] For farther details respecting the properties of the flesh of birds, I must refer the reader to Cullin's *Treatise of the Materia Medica*, vol. i. p. 376, Edin. 1789; and Pienck's *Bromatologia*. Viennæ, 1783.

[2] Foster (*Observations made during a Voyage Round the World*, p. 315, Lond. 1778) has endeavoured to prove "that feeding on fish by no means contributes to the increase of numbers in a nation."

| | Hours. | Minutes. |
|---|---|---|
| Trout (Salmon,) fresh, boiled | 1 | 30 |
| ——————— fried | 1 | 30 |
| Cod-fish, cured dry, boiled | 2 | 0 |
| Flounder, fresh, fried | 3 | 30 |
| Salmon, salted, boiled | 4 | 0 |

The white fish, as whiting, haddock, sole, flounder, the cod, and turbot, are the most easily digestible of the fishes in common use, in consequence of containing less oil. They are also less stimulating to the system, and, therefore, are the best adapted for the use of invalids. The whiting and the haddock are the most delicate and tender; the turbot and the cod the least so. It must be remembered, however, that the sauces (melted butter, &c.,) usually taken with these fish, are exceedingly obnoxious to the stomach, and, therefore, must be excluded from the table of the invalid. Salmon, eels, herrings, and sprats, abound in oil; and, in consequence, are difficult of digestion, very apt to disturb the stomach, and are exceedingly injurious to the dyspeptic. By drying, salting, and smoking, the digestibility of fish is diminished.

Some species of fish, especially in tropical climates, possess poisonous properties, either at all times, or at certain seasons. Certain individuals are more susceptible of fish-poison than others. (On the subject of Fish-poison, the reader is referred to Dr. Christison's *Treatise on Poisons*.)

Some of the viscera of fish are prepared and used separately as articles of food. Thus, the swimming-bladder constitutes the well-known *sound* and *isinglass*,—substances of a gelatinous nature, and already noticed. (See p. 82.) The roe or ovary (commonly called the *hard roe*, to distinguish it from the milt or testicle, called the *soft roe*) of most fishes is eaten.) It contains a phosphoric oil. The substance, called *caviare*, is the prepared roe of the sturgeon.

The following is the composition of isinglass and caviare. (Gmelin, *Handb. d. Chem.* ii. 1468 and 1469.)

| Isinglass | | Fresh unpressed Caviare | |
|---|---|---|---|
| Gelatine | 70·0 | Yellow odorous fatty oil | 4·3 |
| Ozmazome [?] | 16·0 | Soluble albumen | 6·2 |
| Membrane, insoluble in boiling water | 2·5 | Insoluble albumen | 24·8 |
| Free acid and salts | 4·0 | Chloride of sodium and sulphate of soda | 6·7 |
| Water | 7·5 | Gelatine, with some salts | 0·5 |
| | | Water | 57·5 |
| | 100·0 | | 100·0 |

"The flesh of any fish is always in the highest perfection, or *in season*, as it is called, during the period of the ripening of the milt and the roe. After the fish has deposited the spawn, the flesh becomes soft, and loses a great deal of its peculiar flavour. This is owing to the disappearance of the oil or fat from the flesh, it having been expended in the function of reproduction." (Fleming's *Philosophy of Zoology*, vol. ii. p. 373.)

### Class 5. Crustacea.—Crustaceous Animals.

To this class belong Lobsters, Crabs, Cray-fish, Prawns, and Shrimps.—"They have a white, firm flesh, which contains much gelatine. In the membrane, which encloses the calcareous shell, is found a resinous substance, which, in the living animals, is of a brownish-green colour, but becomes red by boiling. From this matter proceeds the peculiar odour and taste of the broth of these animals. The flesh is difficult of digestion; the broth is stimulant. In febrile and inflammatory complaints their use is injurious." (Tiedemann, *op supra cit.* p. 136.) A cutaneous eruption, and even colic, sometimes follow their ingestion. Several of the crustacea are poisonous.

### Class 6. Mollusca.—Mollusks.

The Oyster, the Muscle, the Periwinkle, the Cockle, the Whelk, and the

Limpet, belong to this class.[1] The flesh of the Oyster was analyzed by Pasquier, (Gmelin, *Handb. d. Chem.* ii. 1478.) who found it consists of water, 87·4; and of osmazome, mucus, albumen, fibrine, and gelatine, together, 12·6. It furnishes a delicious article of food; and is more digestible in the raw state than when cooked (by roasting, scolloping, or stewing;) for the heat employed coagulates and hardens the albumen, and corrugates the fibrine, which are then less easily soluble in the gastric juice; and the heated butter, generally used as an accompaniment, adds still more to the indigestibility of the oyster. The following are the mean times of digestion of oysters, according to the experiments of Dr. Beaumont:—

| | *Hours.* | *Minutes.* |
|---|---|---|
| Oysters, fresh, raw - - - | 2 - | 55 |
| Oysters, fresh, roasted - - - | 3 - | 15 |
| Oysters, fresh, stewed - - - | 3 - | 30 |
| Oyster soup, boiled - - - | 3 - | 30 |

As far as my own personal observation extends, the finest raw oysters of the London market, usually called *natives*, rarely disagree even with dyspeptics; and Dr. Cullen declares oysters to be easy of digestion. Very opposite, however, is the experience of some other writers.[2] Poisonous effects even have been ascribed to oysters. (See Christison's *Treatise on Poisons.*) Considering the enormous consumption of these animals, their supposed ill effects must be of extremely rare occurrence. The accuracy of the statement of Dr. Clarke, (*Trans. of the London College of Physicians*, vol. v. p. 109.) that oysters, taken immediately after delivery, are apt to occasion apoplexies or convulsions, appears to me to be improbable. An aphrodisiac property is usually ascribed to oysters. These mollusks have been recommended in phthisis, and in some abdominal affections. The Muscle has on many occasions operated as a poison. (Christison, *op. supra cit.*) The Great or Vineyard Snail (*Helix pomatia*) is a popular remedy for emaciation, with hectic fever and phthisis, on account of its supposed nourishing qualities.

### β. *Vegetable Aliments.*

These may be arranged in eight classes:—

1. Seeds.
2. Fleshy Fruits.
3. Roots, Subterranean Stems, and Tubers.
4. Buds and Young Shoots.
5. Leaves and Leafstalks.
6. Receptacles and Bracts.
7. Stems.
8. Cryptogamia, or Flowerless Plants.

#### Class 1. Semina.—Seeds.

The seeds used as food are of two kinds, farinaceous and oleaginous.

1. Mealy or Farinaceous Seeds.—The most important of these are the Cereal Grains and the Leguminous Seeds. The Chestnut also belongs to this kind of seeds.

The nutritive principles of the *Cereal grains* are Starch, Gluten, Gum, and Sugar. Of these grains none equal *Wheat* in nutritive qualities, which it owes to the large quantity of gluten which it contains. It yields the finest, whitest,

[1] The mollusks just mentioned, and the crustaceous animals used as food, constitute the *Shell Fish* of the shops. Of course, strictly speaking, they are not fish at all.

[2] Pearson, *Pract. Synopsis of the Materia Alimentaria*, Lond. 1808; Paris's *Treatise on Diet*, 5th ed. Lond. 1837.

and most digestible kind of bread. *Oats* are nutritive, but less so than wheat. Oatmeal "is especially the food of the people of Scotland, and was formerly that of the northern parts of England; countries which have always produced as healthy and as vigorous a race of men as any other in Europe." (Cullen's *Materia Medica*, vol. i. p. 278.) Unfermented oat-bread, in those unaccustomed to it, is apt to occasion dyspepsia, with heartburn, and was formerly thought to have a tendency to cause skin diseases, but without just grounds. Gruel is a mild, nutritious, and easily-digested article of food, in fevers and inflammatory affections. It is well adapted for irritable conditions of the stomach. *Barley*, when deprived of the husk (which is slightly acrid and laxative,) is highly nutritious. Count Rumford (*Essay on Feeding the Poor.*) regards barley-meal, when used for soup, as three or four times as nutritious as wheat-flour. Barley-bread is said to be more difficult of digestion than wheaten bread. Barley-water is a mild, easily digestible liquid. *Rye* is nutritive, but less so than wheat. In those unaccustomed to it, rye-bread is apt to occasion diarrhœa, which Cullen ascribes to its readily becoming acescent. *Rice* is the ordinary sustenance of many oriental nations. Being less laxative than the other cereal grains, it is frequently prescribed, by medical men, as a light, digestible, uninjurious article of food, in diarrhœa and dysentery; and, in consequence, it is, with the public, a reputed drying and astringent agent. Various ill effects, such as disordered vision, &c. have been ascribed to its use;[1] but without any just grounds. Neither does there appear to be any real foundation for the assertion of Dr. Tytler, (*Lancet*, 1833–4, vol. i.) that malignant cholera (which he calls *morbus oryzeus!*) is induced by it. *Maize*, or *Indian Corn*, is nutritive; but, being deficient in gluten, is not adapted for manufacture into bread. It is apt to occasion diarrhœa in those unaccustomed to it. (Dunglison, *Elements of Hygiene*, p. 289. Philad. 1835.) In America, Asia, and some parts of Europe, it is used largely for human sustenance.[2] *Millet*, both common and Italian, is cultivated in Italy as an article of food. *Sorghum*, *Durra*, or *Guinea Corn*, is another of the cerealia employed, in some parts of Africa, as an article of food.

Various foods are prepared from the meal or flour of the cerealia. The most important of these is Bread.

1. Bread.—There are two principal kinds of bread,—the one fermented or leavened, the other unfermented or unleavened.

*a. Fermented or leavened bread.*—The best is that made from wheat, as I have before stated. *Fine bread*, prepared from flour only, is the most nutritive and digestible. That which contains the bran is laxative, and is used by persons troubled with habitual constipation. *Rolls*, and other kinds of *fancy bread*, are less digestible than the common loaf bread. All kinds, when eaten new, are injurious to dyspeptics.

*b. Unfermented or unleavened bread.*—Biscuit is the best kind of unleavened bread, and sometimes suits the stomach of the dyspeptic when leavened bread disagrees. That which is free from butter is to be preferred.

2. Pastry. (*Baked paste.*)—The action of heat on the butter or lard used in the manufacture of pastry, renders this compound highly injurious to the dyspeptic. "All pastry is an abomination:" justly observes Dr. Paris. "I verily believe," he adds, "that one half, at least, of the cases of indigestion which occur, after dinner-parties, may be traced to this cause."

3. Puddings, Pancakes, &c.—"The most digestible pudding is that made with bread, or biscuit and boiled flour: *batter* pudding is not so easily digested; and *suet* pudding is to be considered as the most mischievous to invalids in the whole catalogue. *Pancake* is objectionable, on account of the process of frying imparting a greasiness, to which the dyspeptic stomach is not often reconciled. (Paris's *Treatise on Diet*, p. 233, 5th ed. 1837.)

Of the *Leguminous Seeds*, peas and beans are the best known. Their composition, as determined by Einhof, is as follows:—

[1] Bontius, *Account of the Diseases, Natural History, &c. of the East Indies.* Translated into English, p. 129. 1769.—Bricheteau, in Tortuelle's *Elém. d'Hygiène*, 4me éd.

[2] For farther particulars respecting Maize, consult Cobbett's *Treatise on Cobbett's Corn; Quart. Journ. Agricult.* i.; *Mém. de l'Acad. Roy. de Méd.* t. ii. p. 206, Paris, 1833.

| | *Peas* (*Pisum sativum.*) | *Garden Bean* (*Vicia Faba.*) | *Kidney Bean* (*Phaseolus vulgaris.*) |
|---|---|---|---|
| Starch | 32·45 | 34·17 | 35·94 |
| Amylaceous fibre | 21·88 | 15·89 | 11·07 |
| Legumin | 14·56 | 10.86 | 20.81 |
| Gum | 6.37 | 4·61 | 19.37 |
| Albumen | 1·72 | 0·81 | 1·35 |
| Extractive matter | 2·11 | 3·54 | 3·41 |
| Membrane | — | 10·05 | 7·50 |
| Water | 14·06 | 15·63 | (dried) |
| Salts | 6·56 | 3.46 | 0·55 |
| Loss | 0·29 | 0·98 | — |
| | 100·00 | 100·00 | 100·00 |

Peas and beans are nutritious; but they are apt to disturb the digestive organs, and to occasion flatulence and colic. Their difficult digestibility increases with their age. When young, they are less nourishing, but more digestible. They are usually regarded as being somewhat stimulating and heating, and, therefore, not adapted for febrile and inflammatory affections. Their stimulant influence on horses is well known to veterinarians.

The *Chestnut* possesses considerable nutritive power, and in Lombardy is used as food by the lower classes. Its sweetness, especially when roasted, indicates the presence of sugar. No oil can be obtained from it by pressure. In the raw state, it is very difficult of digestion: it requires to be cooked (roasted) to split the starch grains which it contains, and thereby to render them readily digestible. Dyspetics should carefully avoid chestnuts, even in the cooked state.

2. Oily Seeds.—To this division belong the Almond,[1] the Walnut, the Hazle-nut, the Cashew-nut, the Pistachio-nut, the Stone-Pine-nut, (Pignoli-Pine,) and the Cocoa-nut. These contain a quantity of fixed oil, which, while it confers on them great nutritive qualities, renders them very difficult of digestion. Their use should be carefully avoided by all dyspepties.

### Class 2. Fleshy Fruits.

A considerable number of the esculent fleshy fruits will be described in a subsequent part of this work: hence, a brief notice of them will be sufficient here.

1. Stone Fruits. *Drupes.*—The Peach, the Apricot, the Nectarine, the Plum, and the Cherry, are the principal stone-fruits used in this country. They are usually regarded as difficult of digestion; and the popular opinion is probably the correct one, for Dr. Beaumont found that from six to ten hours were required for the artificial digestion of peaches. They are apt to disorder the digestive organs, and to occasion griping and relaxation.

2. Pomaceous Fruits. *Apples.*—The Apple, the Pear, and the Quince, are difficult of digestion; the Pear being the least so.

3. Baccate Fruits. *Berries.*—The Grape, the Gooseberry, and the Currant, are berries. Their skins (epicarps) and seeds are indigestible. The pulp is apt to relax the bowels. The Grape, if taken without the skin and seeds, is the safest of these fruits.

4. Aurantiaceous Fruits. *Hesperidium* or *Aurantium.*—The Orange, the Lemon, the Citron, the Lime, and the Shaddock, belong to this group. The Orange, when unripe, is apt to cause griping; but when quite ripe, is rarely inadmissible: the seeds and white tissue of the rind should, however, be rejected.

[1] The properties of this seed, which may be taken as the type of the oily seeds, will be fully described in a subsequent part of this work.

5. Cucurbitaceous Fruits. *Pepones.*—To this head belong the Melon, the Pumpkin, the Vegetable Marrow, and the Cucumber. They yield but little nutritive matter, and readily disagree with the dyspeptic.

6. Leguminous Fruits. *Legumes.*—The Tamarind contains but little nutriment. The legume of the Phaseolus vulgaris, or kidney-bean, is brought to the table when boiled.

7. Syconus.—Figs are nutritive, but are apt to occasion flatulence, griping, and relaxation of bowels, especially in children.

8. Sorosis.—The Mulberry yields but little nutritive matter, and readily disorders the bowels. The Pine-apple belongs to this division of fruits.

9. Etærio.—The fleshy receptacle of the Strawberry is not, for the most part, injurious; especially when the achenia (commonly termed seeds) are removed.

Class 3. Roots, Subterranean Stems, and Tubers.

The most important of these is the Potato; which, when in good condition and boiled, furnishes a highly nutritious and easily digested article of food. Potatoes are more palatable and nutritive when boiled so as to make them moderately soft, though not to injure their shape; but they are more digestible when boiled so as to be easily mashed. Waxy and new potatoes are less digestible than old mealy ones. Potatoes, which have germinated, have sometimes proved noxious to cattle, and which is said to arise from the large quantity of *solanina* contained in the buds. The process of cooking potatoes is probably useful in two ways: it splits the starch grains, and thereby renders them readily digestible; and secondly, it destroys or extracts some noxious matter. The latter circumstance seems proved by the fact, that the water in which potatoes have been boiled, has, on some occasions, been found to possess poisonous properties.

Of the *Cruciferous* or *Siliquose* roots used as food, the Turnip contains the most nourishment, and is readily digested, though occasionally it creates flatulence.

The *Umbelliferous* roots, in common use, are the Carrot and the Parsnip. These are saccharine, and slightly nutritive; but the volatile oil, which they contain, renders their flavour unpleasant to many persons, and causes them to be apt to disagree with dyspeptics.

Class 4. Buds and Young Shoots.

Onions, Leeks, Garlic, and the Shallot, are usually ranked among roots. They are, however, subterranean buds, with thick and fleshy scales. When deprived, by boiling, of their acrid volatile oil, they are slightly nutritive.

The young shoots of Asparagus are nourishing. When eaten, they communicate a peculiar odour to the urine. The melted butter eaten with them is injurious to the dyspeptic.

Class 5. Leaves and Leaf Stalks.

The herbaceous part of the Water-Cress, the leaves of Lettuce and of Endive, and the seed-leaves of White Mustard and Common Cress, are eaten raw under the name of salads (*Acetaria,*) with the addition of vinegar, oil, salt, and pepper. They yield very little nourishment.

The Cabbage, the Cauliflower, Broccoli, the Savoy, Spinach, &c., are employed only when boiled. They are apt to disagree with dyspeptics. Spinach usually relaxes the bowels.

The stalks of Rhubarb leaves are used for tarts and puddings. Their use is objectionable when there is a tendency to oxalate of lime calculi. "I have seen," observes Dr. Prout, (*Op. supra cit.* p. 65.) "well-marked instances in which an oxalate of lime nephritic attack has followed the free use of rhubarb, (in the shape of tarts, &c.,) particularly when the patient has been in the habit, at the same time, of drinking *hard water.*"

Class 6. Receptacles and Bracts.

The fleshy receptacle and bracts of the Artichoke are used as food.

Class 7. Stems.

From the stems of several Cycadaceæ, as well as of some Palms, is obtained a farinaceous substance, which is employed, in the countries where it is procured, as an article of food. Sago is procured from this source.

Class 8. Cryptogamia.—Flowerless Plants.

No important articles of food are obtained from this class.

1. Ferns.—From the rhizomes of ferns is obtained, in some of the Polynesian Islands, as well as in some other parts of the world, a farinaceous or ligneous matter, which is employed by the natives as a nutritive substance. (Tiedemann, *op. supra cit.* p. 203.)

2. Lichens.—Several species of *Gyrophora* (as *G. proboscidea* and *cylindrica*) are employed by the hunters of the Arctic regions of America as articles of food, under the name of *tripe de roche*. They supported Capt. Sir John Franklin and his companions, in 1821, for many days. The bitter principle of these plants, however, proved noxious to several of the party. (*Narrative of a Journey to the Shores of the Polar Sea.* Lond. 1823.) Iceland moss also yields nutritive matter; but, to be available as food, the bitter matter of the lichen must be separated.

3. Algæ. *Sea Weeds.*—Several species of the inarticulated Algæ are occasionally employed, in some parts of the British islands, as articles of food, or as condimentary substances. (See Greville's *Algæ Britannicæ.* Edin. 1830.) *Laver* is sometimes met with in the London shops.

4. Fungi. *Mushrooms.*—Though a considerable number of species of fungi are edible—in fact, several form delicious articles of food—a small number only is in common use in this country. This has arisen, in great measure, from the difficulty experienced by the public in discriminating wholesome from poisonous species. Nay, it would appear that the same species is under some circumstances edible, under others deleterious. This, if true, is a very proper ground for distrust. "So strongly did the late Professor L. C. Richard feel the prudence of this, that although no one was better acquainted with the distinctions of fungi, he would never eat any; except such as had been raised in gardens in mushroom beds." (Lindley, *Nat. Syst. of Bot.* 2d edit. p. 442.) The edible species in most common use in this country are, 1st. *Agaricus campestris*, (*common field* or *cultivated mushroom*,) which, in the adult state, is employed in the preparation of ketchup, and is eaten fresh, either stewed or broiled: the young or button mushroom is pickled. 2dly. *Morchella esculenta*, (*common morel*,) employed to flavour gravies, ragouts, &c. 3dly. *Tuber cibarium*, (*common truffle*,) a subterraneous fungus, used for seasoning. No less than thirty-three species of fungi are eaten in Russia. (Dr. Lefrere, *Lond. Med. Gaz.* xxiii. p. 414.)

## *b.* Potulenta.—Drinks.

The liquids, taken by the mouth to quench thirst, are denominated drinks. Of these, a very brief notice is all that can be given here. Several of them will be more fully noticed in subsequent parts of this work.

1. Aqua. *Water.*—This is probably the natural drink of all adults. It is a vital stimulus, and is more essential to our existence than aliment. It serves at least three important purposes in the animal economy: firstly, it repairs the loss of the aqueous part of the blood, caused by the action of the secreting and exhaling organs; secondly, it is a solvent of various alimentary substances, and, therefore, assists the stomach in the act of digestion, though, if taken in very large quantities, it may have an opposite effect, by diluting the gastric juice; thirdly, it is probably a nutritive agent,—that is, it assists in the formation of the solid parts of the body. From the latter opinion, which I hold with Count Rumford, (*Essays*, vol. i. p. 194, 5th ed. 1800.) many, however, will be disposed to dissent.

*Soft water* is to be preferred as a drink to hard water, because it is a better solvent of vegetable and animal matters; and farthermore, because the continued ingestion of the saline constituents of hard waters may slowly prove injurious in some diseases. *The presence of decomposing organic matter* renders water highly noxious. Dr. Lambe[1] considered it to be the cause of various constitutional diseases, and hence he advocated the use of distilled water; but of the accuracy of his opinion we have not sufficient evidence. The obvious effect which results from the use of water containing putrescent matter, is dysentery.[2] It is a curious, but well established fact, that *pure* water more readily acquires a metallic impregnation from leaden cisterns or pipes, than *hard* water. Distilled water, aided by atmospheric air, readily corrodes lead: but if a neutral salt, as chloride of sodium or sulphate of soda, be added to the water, the corrosive action is impaired. Hence, rain-water is more apt than well-water to become impregnated with lead.

2. Toast-Water.—Water is rendered much more palatable and agreeable when impregnated with toasted bread or biscuit. The toast communicates to it a little gum, and an empyreumatic matter. From the latter the water acquires colour and flavour.

3. Tea.—Notwithstanding the extensive employment of tea in this country, it is no easy matter to ascertain its precise effects on the system. Its astringency is fully proved by its chemical properties. Its peculiar influence over the nervous system, and which is especially manifested after the use of green tea, is another well-established effect. This influence is, in some respects, somewhat allied to that exercised by fox-glove: for both tea and fox-glove diminish the tendency to sleep, and act as sedatives to the vascular system. Hence, tea is employed as a drink by those who are accustomed to nocturnal study. Strong green tea, taken in large quantities, is capable, in some constitutions, of producing most distressing feelings; (Dr. E. Percival, *Dubl. Hosp. Reports*, vol. i. p. 219.) and of operating as a narcotic. Part of the effects sometimes ascribed to it are referrible to the water, the temperature at which it is swallowed, or to the substances (milk and sugar) added to it. Weak tea rarely disagrees with the invalid, and is admissible and refreshing in a variety of maladies. It is well adapted for febrile and inflammatory complaints; and is particularly valuable when we are desirous of diminishing a tendency to sleep.

4. Coffee is a tonic and stimulating drink. It occasions thirst, and not unfrequently disorders the bowels. It is usually described as having constipating effects; but I know two individuals on whom it has a relaxing effect. It possesses anti-soporific powers, and is used, therefore, by those who desire nocturnal study.

5. Chicory, or Succory, yields a wholesome beverage, but which wants the fine aromatic flavour for which coffee is so celebrated. I am informed, however, that the flavour of coffee mixed with chicory is preferred by some persons to that of unmixed coffee.

6. Chocolate is a very nourishing beverage, devoid of some of the ill qualities ascribed to tea and coffee; but, on account of the oil which enters into its composition, it is difficult of digestion, and is apt to disagree with dyspeptics.

7. Coco is less oily, and being somewhat astringent, is adapted for persons with relaxed bowels.

8. Beer. *Malt Liquor*.—Under this head are included Ale, Stout, Porter, and the weaker kinds of beer, commonly known as Table or Small Beer. All

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[1] *A Medical and Experimental Inquiry into the Origin, Symptoms, and Cure of Constitutional Diseases.* Lond. 1805.

[2] Dr. Cheyne, in the *Dublin Hospital Reports*, vol. iii. p. 11.—Dr. Copland's *Dict. of Pract. Med.* art. *Dysentery*, p. 698–99.—At the Nottingham Assizes, in 1830, it was proved at a trial, on which I was a witness, that dysentery, in an aggravated form, was caused in cattle by the use of water contaminated with putrescent vegetable matter, produced by the refuse of a starch manufactory. (See a brief report of the trial in the *Veterinarian* for 1830, p. 457.)

these are fermented decoctions of malt and hops. Their specific gravity is as follows:—

| | *Sp. gr.* | | *Sp. gr.* |
|---|---|---|---|
| Ale, Burton, 1st sort . . | 1·111 to 1·120 | Porter, common sort . . | 1·050 |
| " " 2d sort . . | 1·097 to 1·111 | " double . . . . . | 1·055 |
| " " 3d sort . . | 1·077 to 1·092 | Brown Stout . . . . . | 1·064 |
| " Common . . . . . | 1·070 to 1·073 | " " ditto best | 1·072 |
| " Ditto . . . . . | 1·058 | Beer, common small . . | 1·014 |
| | | " good table . . . . | 1·033 to 1·039 |

Beer consists of *water*, *alcohol*, *lupulite*, (the bitter principle of hops,) *volatile oil of hops*, *gum*, *sugar*, *gluten*, *brown extractive*, *a small portion of tannic acid*, *carbonic acid*, and *the phosphates of lime and magnesia* held in solution by *phosphoric* and *acetic acids*. The quantity of alcohol in beer is as follows:—

| | *Proportion of spirit (sp. gr. 0·825) per cent. by Measure.* | *Ditto, per cent. by Weight.* |
|---|---|---|
| Ale, Burton . . . . | 8·88 | 7·326 |
| " average . . . . | 6·87 | 5·667 |
| Brown Stout . . . . | 6·80 | 5·610 |
| London Porter (average) . . | 4·20 | 3·465 |
| " Small Beer . . . | 1·28 | 1·056 |

By distillation the alcohol may be readily separated. On evaporation, beer furnishes a brown extractiform residue.

Beer differs from wine in several important particulars. Thus it contains a much larger quantity of nutritive matter, and a considerably less proportion of alcohol; but it has, in addition, a peculiar bitter and narcotic substance. That its inebriating quality does not wholly depend on the alcohol which it contains, is shown by comparing the quantity of spirit obtained by Mr. Brande from brandy, wine, and porter. From his experiments, it appears that the same quantity of spirit is contained in the following quantities of wine, brandy, and beer:—

| | |
|---|---|
| Port Wine . . . . . | 1·00 |
| Claret . . . . . | 1·52 |
| Champagne . . . . . | 1·82 |
| Brandy . . . . . | 0·43 |
| Burton Ale . . . . . | 2·58 |
| London Porter . . . . . | 5·46 |
| Small Beer . . . . . | 18·16 |

Now if the intoxicating quality of beer depended on the spirit merely, the effect of five and a half pints of London porter, or two and a half pints of Burton ale, should be equal only to that of a pint of port wine; whereas its actual inebriating power greatly exceeds this.

That beer is nutritive, and, when used in moderation, salubrious, can scarcely be doubted. It proves a refreshing drink, and an agreeable and valuable stimulus and support, to those who have to undergo much bodily fatigue. The poor labourer who has repeatedly experienced its invigorating property, will by no means admit the truth of Dr. Franklin's assertion, (*Select Works*, by W. T. Franklin, vol. i. p. 36. Lond. 1818.) that a penny loaf and a pint of water yield more nourishment than a pint of beer. The hop operates as a tonic, and assists digestion. With dyspeptics, beer as well as other fermented liquors, are very apt to disagree. By them, therefore, its use should be carefully avoided. Farthermore, it is objectionable for those liable to lithic acid deposites, and for plethoric persons who have a tendency to apoplexy.

The difference between *ale* and *porter* deserves a slight notice. The first is pale-coloured and sweetish; being prepared from pale or amber-coloured malt,

which contains a large quantity of saccharine matter. Porter, on the other hand, is deep-coloured and devoid of any sweet taste. It is prepared from high dried or rather charred malt, which has had its saccharine matter destroyed by heat. Hence, ale is more objectionable for diabetic and dyspeptic patients than porter. From this statement we ought perhaps to except the ales prepared for the India market, which are free from saccharine matter, and contain double the usual proportion of hops. (See Prout, *op. supra cit.* p. 44.)

9. Wines.—It cannot be denied, that the most perfect health is compatible with total abstinence from wine; and that from the use of this liquid various diseases have been produced, kept up, or aggravated. I am by no means, however, disposed to deny the accuracy of the statement of Dr. Paris, (*Treatise on Diet*, p. 268, 5th ed.) that "there exists no evidence to prove that a temperate use of good wine, when taken at seasonable hours, has ever proved injurious to healthy adults;" since he has so qualified this sentence, that in any cases where ill effects appear to result from the use of wine by adults, they may safely be ascribed to the non-fulfilment of some of the conditions here mentioned,—(viz. the *temperate* use of wine,—the *goodness* of the liquor,—the *seasonable* time of taking it,—or the *health* of the individual.)

It must be admitted, that the most perfect health is compatible with the moderate enjoyment of wine, and that many individuals who attain a good old age, have, during a considerable period of their life, been in the habit of using wine daily. Moreover, persons who have been accustomed to the temperate use of wine, are likely to suffer if deprived of their accustomed stimulus. In a subsequent part of this work, some remarks will be offered on the different qualities of different wines, and their medicinal uses. I shall merely remark here, that in forming an opinion as to the kind of wine best adapted for the dietetical use of our patients, we should consider its colour, its alcoholic strength and intoxicating property, its sweetness, the nature and quantity of acid which it contains, and its age. The *red* wines contain more extractive and colouring matters, (derived from the husk of the grape,) which are apt to disagree with some dyspeptics. With regard to its *alcoholic strength* and *intoxicating quality*, it deserves to be especially remembered that the inebriating property of wine is not proportional to the quantity of contained alcohol,—since champagne is more intoxicating, though less alcoholic, than port wine. (See p. 95.) Its *sweetness* requires especial consideration in dyspeptic and urinary diseases; in some of which, (as in diabetes,) the employment of saccharine matter is highly objectionable. Without adopting the prejudices of Sir A. Carlisle, (*Essay on the Disorders of Old Age.*) against the use of *acids*, it cannot be doubted that the employment of acid wines (as claret and hock) is calculated to prove, on many occasions, injurious; and in such cases sherry is used in preference to other wines. In phosphatic urinary deposites, however, they prove serviceable. By keeping, wine deposites bitartrate of potash, and colouring and extractive matters, which are very apt to disagree with some patients. Hence *old* wines are to be preferred to *new* ones.

10. Ardent Spirits.—Brandy, Rum, Gin, and Whisky, are the ardent spirits most frequently used in this country. Various compounded spirits (those imported are termed *Liqueurs*) are also employed as cordials. The injurious effects of spirit will be pointed out in a subsequent part of this work. I shall here confine my attention to its dietetical use. Brandy is frequently used at the table, as a gastric stimulant, to promote the digestion of substances difficult of solution in the juices of the stomach, as the oily fish. That various uneasy sensations, referred to the scrobiculus cordis, are often relieved by it, cannot be denied; but of the existence of any other benefit we may fairly doubt; while the ill consequences of frequently resorting to spirit are undoubted. Dr. Paris states that in some cases of dyspepsia, wine and beer equally disagree with the stomach, producing acidity and other distressing symptoms; and in such, he observes, "very weak spirit may, perhaps, be taken with advantage." In confirmation of the accuracy

of the observation I can bear testimony; having repeatedly found the substitution of a very weak spirit preferrible to fermented liquors.

11. Carbonic Acid Waters.—To this head belong Soda Water, Ginger Beer, and Effervescing Lemonade. These are refreshing, grateful beverages; though by distending the stomach with gaseous air, they must prove injurious to the process of digestion.

12. Acidulated Waters.—Lemonade and Imperial are pleasant, refreshing drinks, which, however, are apt to disagree with dyspeptics.

13. Saccharine and mucilaginous Drinks.—Sugar-water and Gum-water are also liable to disturb the stomach of the dyspeptic.

14. Infusions or Decoctions of Animal Substances.—Under this head are included Beef Tea, Mutton, Veal, and Chicken Broths, and Soups. *Beef Tea* is a light, pleasant, and slightly nutritive article of diet, adapted for invalids. Spices are sometimes advantageously added to it. *Mutton Broth* is apt to disagree with persons having delicate stomachs, especially if the fat be not skimmed from it. It is frequently given to promote the operation of purgative medicine. *Chicken Broth* is the least disposed to disturb the stomach of all the animal decoctions. It is especially adapted for invalids with great irritability of stomach. *Veal Broth* is less frequently used. *Soups* are not adapted for invalids. Their basis is gelatine, whose nutritive qualities have been already described. (See p. 83.)

15. Gruel and Barley Water.—*Gruel* is prepared from groats or oatmeal. It is a bland, nutritious, easily digestible, emollient liquid, well adapted for the use of invalids, and rarely disturbing the stomach. Sugar, lemon juice, aromatics, or butter, are frequently added, but they (especially butter) are by no means generally admissible. *Barley Water* is a thinner, less viscid liquid. It is used as a mild, demulcent, slightly nutritive drink, for invalids, in febrile and inflammatory disorders.

16. Milk.—Milk is the natural drink of man during the first period of his infancy. Its nutritive qualities have been already noticed. (See p. 85.) On account of the butter which it contains, it is apt to disagree with some adults: in common language, it sometimes lies heavy at the stomach. *Cream* is still more injurious. *Whey* is an agreeable beverage.

### c. Condimenta.—Condiments.

These are substances which are taken with the food to improve its flavour, to promote its digestion, or to correct any injurious quality which it may possess. Some of them are also nutritive.

1. Saline Condiments.—Common salt, or the chloride of sodium, is the only saline condiment essential to health. It is taken by man, as well as by many animals, on account of its agreeable flavour; but the existence of a greater or less appetite for it, in all individuals, appears to me to show that this substance must serve some more important uses in the animal economy than that of merely gratifying the palate. In considering these, we observe, in the first place, that it is an essential constituent of the blood, which fluid probably owes some of its essential properties to its saline matter. Now as the blood is constantly losing part of its saline particles by the secretions (the tears, bile, &c.,) the daily loss is repaired by the employment of chloride of sodium as a condiment. In the second place, the free hydrochloric acid found in the stomach, and which forms an essential constituent of the gastric juice, is obviously derived from the salt taken with our food. Thirdly, the soda of the blood, and of some of the secretions, is doubtless obtained from the decomposition, in the system, of common salt. These are some (probably only a portion) of the uses which chloride of sodium serves in the animal economy. It deserves especial notice, that while salt is thus essen-

tial to health, the continued use of salted provisions is injurious. But their noxious quality is probably to be referred rather to the meat, whose physical and chemical qualities are altered, than to the presence of the salt; though we can readily conceive that an excessive use of salt, or of any other article of food, will be followed by injurious consequences. However relishing salted fish (as anchovies, herrings, cod, &c.) may be, they are difficult of digestion.

2. Acidulous Condiments.—Vinegar is a grateful condiment, and is used either alone, or with pickles. When taken in small quantities, it is quite wholesome. It allays thirst, and operates as a refrigerant. It probably promotes digestion, not merely by the stimulus which it communicates to the stomach, but by its power of dissolving several alimentary principles,—as fibrine, albumen, and gelatine. The frequent use of it is supposed to diminish obesity. It checks the secretion of milk, and at the same time injures the quality of this liquid. Lemon juice, or a solution of citric acid, is an acidulous condiment.

3. Aromatic and Pungent Condiments.—This division includes the spices (as Pepper, Nutmegs, &c.,) the savoury herbs of the family Labiatæ as (Thyme, Sage, &c.,) some Umbelliferous fruits (as Caraway,) several products of the family Cruciferæ (as Mustard, Horse-radish, &c.,) and the alliaceous substances (as Onions, Garlic, &c.) They are employed as condiments, partly for their flavour, and partly to promote the digestion of some kinds of food which experience has shown, are not by themselves easily or readily digested. Moreover, the cruciferous and alliaceous condiments are esteemed anti-scorbutics.

By the inhabitants of the torrid zone they are extensively used to counteract the debilitating influence of heat, as already mentioned. (See p. 47.) In temperate climates their employment is not so important; on the contrary, their copious use is injurious.

4. Oily Condiments.—Butter and oil are used at the table as condiments. Their general effects, as nutritive substances, have been already noticed. (See p. 81.) They become more difficult of digestion and more noxious to the dyspeptic, in proportion to the heat to which they are subjected in the process of cooking.

5. Saccharine Condiments.—Sugar, honey, and treacle, are employed as condiments. The nutritive properties of saccharine substances have been before noticed. (See p. 78.) When taken in small quantities, and largely diluted, as in tea, coffee, &c. sugar is said to be very apt to disagree, and give rise to flatulency and gastric uneasiness. Used in the form of preserves, it is also apt to disorder the stomach of dyspeptics.

Under the name of *Sauces*, are used at the table mixtures of various condiments. Ketchup (made from either Mushrooms or Walnuts,) Soy, and Essence of Anchovies, are those which are most frequently employed. Salt and spices are essential ingredients of them. Vinegar is also a constituent of some.

## Dietetical Regimen.

In the treatment of many diseases, attention to diet is a point of considerable importance. In none is it more necessary than in non-febrile disorders of the digestive and urinary organs. In acute maladies, in which abstinence or low diet is requisite, there is usually no disposition to take food: on the contrary, solids of all kinds are generally loathed. In such cases, therefore, there is less chance of any error of diet being committed. Dietetical regimen is more important in chronic diseases of the assimilating organs, in which the appetite is unimpaired, or even increased,—since in such the patient is more apt to overstep the bounds of prudence, by the employment of a diet, improper either from the quantity or quality of the food used. In chronic local diseases, when the constitution is unimpaired and the appetite for food remains natural, I would by no means advocate the adoption of a spare or low diet; since I believe that in such cases the

indulgence of a moderate appetite for plain food, is attended with beneficial results. From this statement, however, maladies affecting the organs of assimilation must be excepted.

Several diets or kinds of dietetical regimen are employed in the treatment of diseases. The most important of these are the following:—

1. Animal Diet.—This term is applied to a diet composed of animal food, either exclusively or principally. The only disease, in which a diet exclusively of animal food is recommended, is diabetes. In this malady, strict abstinence from vegetable substances is attended with the diminution or cessation of the saccharine condition of the urine, and a reduction in the quantity of this fluid passed. It deserves especial notice that the quantity, as well as the quality, of the food taken in this disease, requires to be carefully attended to, as the craving for food is apt to induce the patient to indulge to an injurious extent. As an example of a dietary of animal food for a diabetic patient, I select the following, adopted by Dr. Christison, (*Edinb. Monthly Journal*, April 1841, p. 236,) for a patient in the Edinburgh Infirmary:—

| | Ounces. | Ounces of dry nutritive principles contained therein.[1] |
|---|---|---|
| Fresh Meat | 40 | 10·8 |
| Cheese | 2 | 2·0 |
| Two Eggs | — | 1·0 |
| New Milk | 48 | 8·0 |
| Beef Tea | 16 | 0·25 |
| Total | | 22·05 |

In a second case only 20 oz. of meat were allowed.

In private practice, it will be convenient to allow other kinds of animal food in addition to the foregoing: as butter, chicken, sausages, fish, shell-fish, brawn, and poultry. For common drink, water, or beef-tea, or mutton-broth, may be sparingly allowed.[2]

The beneficial effects of a diet of animal substances exclusively in diabetes is, in most cases, temporary only; while its rigorous adoption is apt to be attended with febrile or inflammatory affections.[3] Moreover, a difficulty in its employment is often found in the inordinate craving for vegetable substances, and the loathing of animal food, experienced by the patient. Hence most practitioners have permitted the use of a limited quantity of farinaceous food, in the form of biscuit or bread. Rice may be occasionally admitted. Arrow-root, potatoes, and other low kinds of farinaceous substances, are less proper. Dr. Prout recommends sound porter in preference to wine or spirits.

In several other maladies the use of animal substances chiefly has been advised; as in the oxalate of lime diathesis, and in scrofula. Farthermore, it is admissible in other cases, where we are desirous of employing a highly nutritious and stimulating diet.

2. Vegetable Diet.—The exclusive employment of vegetable foods has been very rarely adopted. It has been eloquently advocated by Dr. Lambe,[4] who recommends it, in conjunction with the use of distilled water, as a remedy for cancer, scrofula, consumption, asthma, and other chronic diseases; but he has, I suspect, gained few, if any, proselytes to his opinions and practice.

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[1] The quantities stated in this column appear to me too high. They are taken from Dr. Christison's statement at p. 240, *op supra cit.*

[2] For some further remarks on the use of animal diet in diabetes, see p. 81 and 82.

[3] Dr. Marsh, in the *Dublin Hospital Reports*, vol. iii p 453, 1822.

[4] *Reports of the Effects of a Peculiar Regimen on Scirrhous Tumours and Cancerous Ulcers.* Lond. 1809.—*Additional Reports on the Effects of a Peculiar Regimen in cases of Cancer, Scrofula, Consumption, Asthma, and other Chronic Diseases.* Lond. 1815.

The term *spare* or *abstemious diet* is sometimes used to indicate the employment of vegetable substances principally (not exclusively.) It generally includes the use of the white fish, sometimes alternating with a limited quantity of poultry or butcher's meat. In plethoric habits, where the appetite is unimpaired, this diet is ordered in cases of threatened apoplexy, gout, &c. By its adoption we diminish the quantity of nutritive matter supplied to the system, while we keep the digestive organs actively employed.

3. Milk Diet.—Besides cow's milk, which constitutes the principal article of food, this diet includes the use of farinaceous substances (such as arrow-root, sago, and tapioca,) bread, and light puddings (of rice, bread, or batter.) Milk diet is ordered when we are desirous of affording support to the system with the least possible stimulus or excitement. It is well adapted for inflammatory diseases of the chest (phthisis especially,) of the alimentary canal, and of the bladder, when it is considered expedient to employ a nutritious but not stimulating diet. After hemorrhages, when the powers of the system have been greatly exhausted, a milk diet is frequently beneficial. It has also been considered one of the best means of preventing and of curing the gout. It is a good diet also for many of the diseases of children, especially those of a strumous or scrofulous nature. In some of the above-mentioned maladies, where the stomach is weak and irritable, cow's milk is apt to occasion vomiting and other unpleasant effects, in consequence of the butter which it contains. In such cases, skim-milk or ass's milk may be advantageously substituted.

4. Low Diet.—In acute inflammation, in fever, and after serious accidents, surgical operations, and parturition, patients are directed to adopt a low diet, consisting principally of the use of *slops* (as tea, toast-water, barley-water, and weak broth.) Small quantities of milk and farinaceous matters (in the form of bread, arrow-root, or tapioca, gruel, and light pudding) are sometimes permitted. The terms *thin diet*, *spoon diet*, *fever diet*, *simple diet*, and *broth diet*, are applied to particular modifications of low diet.

5. Full or Common Diet.—On many occasions where it is desirable to restore or support the powers of the system, patients are permitted to satisfy their appetite for plain vegetable and animal food. In many indolent diseases, in scrofula, in some affections of the nervous system (as chorea and epilepsy,) and in the stage of convalescence after acute diseases, &c. this kind of diet is frequently directed. In these cases beer is usually permitted. Wine, and even ardent spirit, are sometimes required. In some diseases of, and in accidents occurring in, confirmed drunkards, it is frequently found injurious to withhold the stimulus to which the patient's system has been long accustomed; and thus, wine, brandy, rum, or gin, is ordered, according to circumstances.

In concluding these remarks on the subject of dietical regimen, I have thought it advisable to give a tabular view of the Diets employed at the different hospitals of this metropolis.[1]

[1] The Diet-tables of the County, Scotch, and Irish hospitals, will be found in Dunglison's New *Dictionary of Medical Science*, art. Diet, p. 233. Philadelphia, 1842.

# DIET-TABLES OF THE LONDON HOSPITALS.

*** In addition to the substances specified in the following Tables, other articles (as chops, steaks, fish, wine, spirit, porter, &c.) are permitted, when specially ordered by the medical officers. These are denominated *extras*.

## LONDON HOSPITAL.

| | *Common Diet.* | *Middle Diet.* | *Low Diet.* | *Milk Diet.* |
|---|---|---|---|---|
| *Per Day* | 12 oz. Bread.<br>1½ pts. Beer, *Men.*<br>1 pint, *Women.* | | 8 oz. Bread. | 12 oz. Bread. |
| *Breakfast* | Gruel. | | Gruel. | Gruel. |
| *Dinner* | 8 oz. Beef, with Potatoes, thrice a week.<br>8 oz. Mutton, with Potatoes, twice a week.<br>8 oz. Potatoes & Soup with Vegetables, twice a week. | The same, except that 4 oz. of Meat shall be given, instead of 8 oz. | Broth. | 1 pint Milk. |
| *Supper* | 1 pint of Broth. | | Gruel or Broth. | 1 pint Milk. |

## ST. BARTHOLOMEW'S HOSPITAL.

| | *Meat Diet.* | *Broth Diet.* | *Thin or Fever Diet.* | *Milk Diet.* |
|---|---|---|---|---|
| *Daily* | Milk Porridge.<br>12 oz. Bread.<br>6oz. Mutn or Beef<br>1 pt. Broth [with Peas or Potatoes, 4 times a week.]<br>2 pts. Beer, *Men.*<br>1 pint, *Women.*<br>1 oz. Butter, twice a week. | Milk Porridge.<br>12 oz. Bread.<br>2 pints Broth.<br>1 pint Beer.<br>1 oz. Butter. | Milk Porridge.<br>12 oz Bread.<br>1 pint of Milk, with Tapioca, Arrow-root, Sago, or Rice, as may be prescribed.<br>Barley-water. | Milk Porridge.<br>12 oz. Bread.<br>2 pts. Milk, with Tapioca, Arrow-root, Sago, or Rice, as may be prescribed.<br>Barley-water.<br>1 oz. Butter.<br>Bread Pudding, 3 times a week, when ordered. |

## GUY'S HOSPITAL.

| | *Full Diet.* | *Middle Diet.* | *Low Diet.* | *Milk Diet.* | *Fever Diet.* |
|---|---|---|---|---|---|
| *Daily* | 14 oz. Bread.<br>1½ oz. Butter.<br>1 quart Table Beer.<br>4 oz. Meat, when dressed. | 12 oz. Bread.<br>1½ oz. Butter.<br>1 pt. Table Beer.<br>4 oz. Meat, when dressed, and<br>¼ pint Broth. | 12 oz. Bread.<br>1 oz. Butter.<br>Tea & Sugar. | 12 oz. Bread.<br>1 oz. Butter.<br>2 pts. Milk. | 6 oz. Bread.<br>1 oz. Butter.<br>Tea & Sugar. |
| | Half a pound of Beef (for Beef-tea,) or Arrow-Root or Sago, when ordered. | | | | |
| | For each diet, Gruel or Barley-Water, as required. | | | | |

## NORTH LONDON HOSPITAL.

| | *Full Diet.* | *Middle Diet.* | *Low Diet.* | *Milk Diet.* |
|---|---|---|---|---|
| *Daily* | 16 Bread.<br>½ pint Milk.<br>½ lb. Meat and ½ lb. Potatoes four days.<br>1 pint soup or Rice three days. | 16 oz. Bread.<br>½ pint Milk.<br>1 pint Soup or Rice. | 8 oz. Bread.<br>½ pint Milk.<br>Oatmeal for Gruel. | 16 oz. Bread.<br>2 pints Milk. |

## ST. THOMAS'S HOSPITAL.

| | *Full Diet.* | *Milk Diet.* | *Dry Diet.* | *Fever Diet.* |
|---|---|---|---|---|
| *Daily* | 2 pints of Beer. 14 oz. of Bread. | 12 oz. of Bread. | 14 oz. of Bread, 2 pints of Beer. | 12 oz. of Bread, 2 pints of Beer. |
| *Breakfast* | Water Gruel. | 1 pint of Milk. | Water Gruel. | Water Gruel. |
| *Dinner* | ½ lb of Beef, when dressed twice a week; 4 oz. of Butter, or 6 oz of Cheese, thrice a week; ½ lb. of Mutton, when boiled, thrice a week. | 1 pint of Milk four times a week. Rice Pudding thrice a week. | 4 oz. of Butter, four times a week; Rice pudding and four oz. of Butter, three times a week. | ¾ of a lb. of Beef for tea. |
| *Supper* | 1 pint Broth, four times a week. | 1 pint of Milk. | | |

## ST. GEORGE'S HOSPITAL.

| | *Extra Diet.* | *Ordinary Diet.* | *Fish Diet.* | *Fever Diet.* | *Broth Diet.* | *Milk Diet.* |
|---|---|---|---|---|---|---|
| *Daily* | 12 oz. Bread. *Men.* 2 pints Beer. *Women.* 1½ pints Beer. | 12 oz. Bread. 1 pint Beer. | 12 oz. Bread. | 12 oz. Bread. Barley Water *ad libitum.* | 12 oz. Bread. | 12 oz. Bread. |
| *Breakfast* | 1 pint Tea. ½ pint Milk. | 1 pint Tea. ½ pint Milk. | 1 pint Tea. ½ pint Milk. | 1 pint Tea. ½ pint Milk. | 1 pint Tea. ½ pint Milk. | 1 pint Tea. ½ pint Milk |
| *Dinner* | 12 oz. Meat, roasted (weighed with the bone before it is dressed) four days. —boiled three days. ½ lb. Potatoes | One half the meat allowed for extra diet. ½ lb. Potatoes. | 4 oz. of plain boiled white fish (as Whiting, Plaice, Flounders, or Haddock.) | Arrow-root, &c. must be especially ordered. | 1 pint Broth, 6 oz. light Pudding. | 1½ pints Rice Milk four days. ½ lb. Bread or Rice Pudding three days. |
| *Supper* | 1 pint Gruel. ½ pint Milk. | 1 pint Gruel. ½ pint Milk. | 1 pint Gruel. ½ pint Milk. | 1 pint Tea. ½ pint Milk. | 1 pint Gruel. ½ pint Milk. | ½ pint Milk. |

## WESTMINSTER HOSPITAL.

| | *Full Diet.* | *Middle Diet.* | *Low Diet.* | | *Spoon, or Fever Diet.* | *Incurable's Diet.* |
|---|---|---|---|---|---|---|
| | | | *Fixed.* | *Casual.* | | |
| *Daily* | 14 oz. Bread. | 10 oz. Bread. | ½ lb. Bread. | — | ¼ lb. Bread. | ½ lb. Bread. ½ lb. Meat. ½ lb. potatoes ½ pint Milk. 1 pint Porter |
| *Breakfast* | 1 pint Milk Porridge, or Rice Gruel | 1 pint Milk Porridge, or thin Gruel. | 1 pint Tea, with Sugar and Milk. | — | 1 pint Tea with Sugar and Milk. | |
| *Dinner* | ½ lb. Meat roasted boiled, or chops. ½ lb. Potatoes. | ¼ lb. Meat roasted, boiled, or chops. ½ lb. Potatoes. | No fixed diet for Dinner. | 1 pint of broth, or ½ lb. of Bread, or Rice Pudding, or 1 pint Beef Tea, or a Chop, or Fish. | Barley Water. | |
| *Supper* | 1 pint Milk Porridge, or Rice Gruel. | 1 pint Milk Porridge, or thin Gruel. | 1 pint Tea with Sugar and Milk. | — | 1 pint Tea with Sugar and Milk. | |

## MIDDLESEX HOSPITAL.

| | *Diæta Carnis, or Meat Diet.* | *Diæta Jusculi or Soup Diet.* | *Diæta Lactis, or Milk Diet.* | *Diæta Simplex or Simple Diet.* | *Cancer Diet.* |
|---|---|---|---|---|---|
| *Daily* | 12 oz. Bread. | 12 oz. Bread. | 12 oz. Bread. | 6 oz. Bread. | 12 oz. Bread.<br>½ lb. Meat.<br>½ lb. Potatoes.<br>1 pint Milk. |
| *Breakfast* | 1 pint Milk. | 1 pint Milk. | 1 pint Milk. | 1 pint Barley Water. | |
| *Dinner* | *Physicians' Patients.*<br>½ lb. Potatoes, 4 oz. dressed meat (beef or mutton,) roast and boiled alternately, 4 days.<br>4 oz. Meat in Soup, 3 days.<br>*Surgeons' Patients.*<br>½ lb. Potatoes, 4 oz. dressed Meat (Beef or Mutton,) roast and boiled alternately. | 1 pint Soup, made with 4 oz. Beef, alternately with 1 pint of Broth with Barley. | ½ pint Milk, with Rice Pudding, 4 days, and with Batter Pudding 3 days. | 1 pint Gruel. | |
| *Supper* | 1 pint Gruel alternately, with 1 pint of Barley Water. | 1 pint Gruel. | ½ pint Milk, or 1 pint Gruel. | 1 pint of Gruel or Barley Water. | |

## KING'S COLLEGE HOSPITAL.

| | *Full Diet.* | *Middle Diet.* | *Milk Diet.* | *Low Diet.* | *Fever Diet.* |
|---|---|---|---|---|---|
| *Daily* | 1 pint Beer, or ½ pint Porter.<br>14 oz. Bread. | 14 oz. Bread. | 1 lb. Bread. | 8 oz. Bread. | — |
| *Breakfast* | 1 pint Milk Porridge. | 1 pint Milk Porridge. | 1 pint Milk. | 1 pint Gruel. | 1 pint Gruel. |
| *Dinner* | ½ lb. Meat.<br>½ lb. Potatoes. | ½ lb. Meat.<br>½ lb Potatoes. | 1 pint Milk. | 1 pint Broth. | 2 pints Barley Water. |
| *Supper* | 1 pint Milk Porridge. | 1 pint Milk Porridge. | 1 pint Gruel. | 1 pint Milk Porridge. | 1 pint Milk Porridge. |

## 2. Exercitatio.—Exercise.

(Gymnastics.)

Exercise is an important hygienic agent. Its proper consideration, however, requires far more space than can be devoted to it in this work. I must, therefore, content myself with a few remarks on its general effects, and refer the reader to some treatises in which it is more fully considered.

Though the word exercise, in its most extensive signification, has reference to the action of all the organs of the animal economy, yet it is usually limited to those of locomotion; and in this sense I employ it.

The exercise of the muscular system is followed by several marked effects:—of these, the first to be noticed are *mechanical*. Whenever the muscles are called into activity, they exert a local influence, of a mechanical kind, on the blood-ves-

sels in their immediate vicinity, and accelerate the circulation of the blood. This is followed by an augmentation of the animal heat; and, if the exercise be of a kind to call into activity a considerable number of muscles, the general circulation soon participates in the effects; the pulse is quickened, and the respiration and secretion are augmented. Another effect, which, in its origin, is probably of a mechanical nature, is the absorption of the fat between the muscles and their fasciculi. It seems to arise from the pressure exerted by the contracted muscle on the soft tissues immediately around it.

A second class of effects caused by muscular action may be denominated *organic* or *vital*. I refer now to the augmentation of volume, firmness, and elasticity, and increase of strength or power, which a muscle acquires from frequent but moderate use. Blacksmiths, fencers, and prize-fighters, furnish excellent illustrative examples of these effects.

But the action of the muscles can only be effected through the medium of the nervous centres and nerves. So that the latter are called into activity, and through them the whole system becomes influenced, when a number of muscles is exercised. These effects may be denominated *nervous*.

The fourth and last class of effects to be referred to, may be called *psychical* or *mental*. (See p. 41.) To this belong the different mental effects produced by agreeable and disagreeable,—by voluntary and compulsory,—exercises. Employed moderately, agreeable exercise acts as a salutary excitant to the intellectual faculties and sensations. I agree with Dr. James Johnson, (*Change of Air, or the Pursuit of Health and Recreation*, 4th ed. 1838.) "that travelling exercise, while it so much improves all the bodily functions, unhinges and unfits the mind, *pro tempore*, for the vigorous exercise of its higher faculties." But the first excitant being over, "the memory of scenes and circumstances, together with the reflections and recollections attendant thereon, furnish an ardent mind with rich materials and trains of thought, that may, by gifted individuals, be converted into language; and thus conveyed to thousands."

Thus, then, it appears that exercise, employed moderately, has a tonic and stimulating influence on the system, and is calculated to be beneficial in a great variety of complaints. Used immoderately, it exhausts both the mental and bodily powers, and produces great debility. In fever, in vascular excitement or inflammation of the brain, in inflammatory affections of the lungs, in maladies of the circulating organs (especially dilatation of the cavities of the heart, diseased valves, and aneurism,) in violent hemorrhages, gastro-enteritic inflammation, acute rheumatism, &c., muscular exertion is manifestly injurious; repose and inaction being indicated. In sprains and lacerations of the muscles, in fractures and dislocations, &c., it is obviously improper. In hernia, or a tendency thereto, great muscular exertion must be carefully avoided.

Exercises may be divided into the *active*, the *passive*, and the *mixed*. To the first belong walking, running, leaping, dancing, fencing, wrestling, &c.; to the second are referred, carriage exercise and sailing; while horse-exercise belongs to the third or last division.[1]

## 3. Climate.

Under the word Climate are included those topographical, atmospheric, and other conditions of a region or country, which have a beneficial or injurious influence on the health and lives of the inhabitants.

It is probable that we are yet ignorant of many circumstances which contribute to give the climatic character to a place; and, of those that are known, it is often not easy to define the separate influence of each.

[1] For farther information on the subject of Exercise, the reader is referred to Celsus, lib. i. cap. 2, and lib. ii. cap. 15; Sir J. Sinclair's *Code of Health and Activity*, Edinb 1806; Dunglison's *Elements of Hygiène*, Philadelphia, 1835; *Dict. de Médecine*, art. *Gymnastique; Dict. de Médecine et de Chirurgie pratiques*, art. *Gymnastique; Manuel d'Education physique, gymnastique et morale*, par le Colonel Amoros. Paris, 1830.

The most obvious circumstances which affect the climate of a region or country, are *temperature*, *humidity*, *purity of the atmosphere*, *wind*, *atmospheric pressure*, *intensity of light*, and *atmospheric equability* or *vicissitudes*.

1. Temperature.—In considering the temperature of a place, we must regard, not merely its annual mean, but its extremes. Inland tracts of country experience greater extremes than the coasts. This arises from land being more rapidly heated and cooled than water. Hence it attains a higher temperature in summer,—and a lower one in the winter. It also deserves notice that the western coasts of the extra-tropical continents have a much higher mean temperature than the eastern coasts. This is explained by the heat evolved in the condensation of vapour, swept from the surface of the ocean by the eastern winds. (Daniell's *Metereological Essays*, p. 105, 2d ed. Lond. 1827.) The effects of heat and cold on the human body have been already considered. (See pp. 46 and 57.) *Warm climates* are adapted for pulmonary invalids (especially consumptive patients,) the rheumatic, the scrofulous, and the paralytic. *Cold*, or rather *moderately cool*, climates are bracing, and are fitted for relaxed constitutions.

2. Humidity. *Hygrometric State of the Atmosphere.*—Evaporation from the cutaneous and pulmonary surfaces is augmented by a dry state of the atmosphere, and checked by a damp or moist state. But the transudation which depends on vital action is augmented by a warm moist atmosphere. (Edwards, *De l'Influence des Agens Physiques*, p. 338. Paris, 1824.) "Of all the physical qualities of the air," observes Sir James Clark, (*The Sanative Influence of Climate*, 3d ed. Lond. 1841.) "humidity is the most injurious to human life." A *moist*, or rather a *soft*, climate promotes vital transudation, and, therefore, is adapted for chronic bronchitis of a dry irritable kind, frequently denominated dry catarrh, and for some other maladies attended with a harsh, dry, parched skin. A *dry* climate, on the other hand, checks vital transudation, and, therefore, is better fitted for relaxed, languid constitutions, with profuse secretion and exhalation; as humid asthma, and those forms of chronic catarrh accompanied with copious expectoration.

3. Purity of the Atmosphere.—A pure condition of the atmosphere is an essential element of all healthy climates. The greater mortality of cities than of the country is principally referrible to the respiration of air vitiated by the congregation of a large number of persons in a comparatively limited space. Emanations from the soil, and from decomposing organic matter, also contribute to the contamination of atmosphere.[1] The injurious effect of fogs on pulmonary invalids is well known to every one. Curiously enough, however, some patients affected with spasmodic asthma breathe better in a smoky atmosphere (as that of London) than in pure air.

4. Wind.—Wind greatly modifies the effect of temperature on the body. Thus two successive days, whose temperature, as indicated by the thermometer, may be the same, shall produce in us—the one a sensation of warmth, in consequence of the calm, still, condition of the air,—while the other creates a feeling of cold, from the presence of a violent wind. So that, as Sir James Clark (*Op. supra cit.* p. 156.) has justly observed, "the influence of temperature on the living body is indicated much more accurately by our sensation than by the thermometer." Moreover, the humidity and the purity of the atmosphere are greatly modified by the motion or calmness of the air. The precise effects produced on climates by wind, must of course depend on its direction, violence, &c.

5. Atmospheric Pressure.—Diminished atmospheric pressure promotes evaporation. Elevated regions, therefore, are colder, drier, more bracing, and, *cæteris paribus*, better adapted for relaxed individuals, with profuse secretion and exhalation, than the opposite localities: but, on the other hand, they are injurious in bronchial or tracheal irritation, with diminished secretion.

In extra-tropical climates, a fall in the barometer, without a change or rise of wind, is usually followed by rain. Now a humid condition of the atmosphere checks evaporation, while the reduced barometrical pressure augments it. Hence, we have two opposing influences in operation. This condition of the air induces a feeling of languor and fatigue, and gives rise to sweating on the slightest exertion.

6. Intensity of Light.—The influence of light has been already considered. (See p. 44.)

[1] The production of Ague, by the exhalations from stagnant water and marshy soils, is well known to every one. My friend, Professor Daniell (*Lond. Edinb. and Dubl. Phil. Mag.* July, 1841,) has shown that the waters upon the Western coast of Africa, to an extent of 40,000 square miles, are impregnated with sulphuretted hydrogen, to an amount, in some places, exceeding that of some of the most celebrated sulphur springs of the world; and he suggests that the existence of this deleterious gas in the atmosphere, which must necessarily accompany its solution in the waters, may be connected with the awful miasma, which has hitherto proved fatal to the explorers and settlers of the deadly shores of Africa; as well as of other places.

The origin of sulphuretted hydrogen in sea, and some other waters, has been ascribed, by Dr. Marcet (*Phil. Trans.* 1819, p. 195,) Mr. Malcomson (*Trans. of the Geological Society*, 2d Ser. vol. v. p. 564, Lond. 1840,) Dr. A. Fontan (*Ann. de Chem. et de Phys.* July, 1840,) and Professor Daniell (*op. supra cit.*,) to the decomposition of sulphates of the waters, by putrefying vegetable matter.

7. Atmospheric Equability or Vicissitudes.—Rapid atmospheric changes are always injurious to health. Invalids, and those with delicate constitutions, often appreciate the slightest alterations in the condition of the atmosphere, and which are not observable by the healthy and the robust.

These are some only of the circumstances which affect the quality or character of a climate. Others doubtless exist; but their precise nature and influence have scarcely been ascertained. For example, we have yet to learn the influence of Electricity and Magnetism on the climate of a place.

I propose, now, to glance at the characters of those climates most commonly resorted to by invalids for therapeutical purposes. In doing so, I beg to acknowledge the great assistance I have received from the valuable work of Sir James Clark, to which I must refer the reader for farther details.

Climates may be conveniently arranged as follows:—

1. Climates of England.
2. Climates of France.
3. Climates of Spain and Portugal.
4. Climates of Italy, and the Mediterranean.
5. Climates of the Atlantic.

## 1. Climates of England.

"The British Islands are situated in such a manner as to be subject to all the circumstances which can possibly be supposed to render a climate irregular and variable. Placed nearly in the centre of the temperate zone, where the range of temperature is very great, their atmosphere is subject, on one side, to the impressions of the largest continent of the world; and, on the other, to those of the vast Atlantic Ocean. Upon their coasts the great stream of aqueous vapour, perpetually rising from the western waters, first receives the influence of the land, whence emanate those condensations and expansions which deflect and reverse the grand system of equipoised currents. They are also within the reach of the frigorific effects of the immense barriers and fields of ice, which, when the shifting position of the sun advances the tropical climate towards the northern pole, counteract its energy, and present a condensing surface of immense extent to the increasing elasticity of the aqueous atmosphere." (Daniell's *Meteorological Essays*, p. 114. 2nd ed. 1827.)

Sir James Clark thus arranges the climates of England:—

1. London.
2. The South Coast.
3. South-west Coast.
4. Cornwall, Land's End.
5. West of England.

1. London.—The mean annual temperature of London somewhat exceeds that of the suburban parts. "The excess of the temperature of the city varies through the year, being least in spring, and greatest in winter; and it belongs, in strictness, to the nights, which average 3·7° warmer than in the country; while the heat of the day, owing, without doubt, to the interception of a portion of the solar rays by a constant veil of smoke, falls, on a mean of years, about a third of a degree short of that in the open plain." (See Luke Howard's *Climate of London*, 1818–20. 2nd ed. 1833.) Hence in the winter, delicate invalids sometimes experience benefit in coming to London from the country. But the impure state of the atmosphere generally counterbalances these good qualities.[1] In some cases of spasmodic asthma, however, respiration is easier in London than in the country.

2. South Coast.—This comprehends the tract of coast between Hastings and Portland Island. Its mean annual temperature is about that of London, but the

[1] For farther details respecting the Climate of London, consult Professor Daniell's *Essay* on this subject. Also, Dr. Bateman's *Reports of the Diseases of London*. Lond. 1819.

summers are somewhat cooler, and the winters somewhat warmer, than the corresponding seasons of the metropolis.[1]

The principal places of resort for invalids, on this line of coast, are the following :—

*a.* Hastings.—A mild winter residence; placed low and well protected from the northerly winds. Sir James Clark (*Op. supra cit.* p. 177.) regards its climate "as somewhat intermediate between that of Devonshire and Clifton; less warm, but also less relaxing than the former. It is about the same temperature; but less dry and bracing than the latter, and it is inferior to it as a spring climate." It is well adapted for pulmonary invalids during the months of December, January, and February. The distinguished author above quoted declares, that it "is unfavourable in nervous complaints, more especially in nervous headachs connected with, or entirely dependent upon, an irritated condition of the digestive organs, and also in cases where a disposition to apoplexy or epilepsy has been manifested."

*St. Leonards* is about a mile from Hastings, and possesses a similar climate.

*b.* Brighton.—The air is dry and bracing. The climate is most beneficial during autumn and the early part of winter, when it is milder and more steady than that of Hastings. It is adapted for relaxed individuals, with copious secretion and exhalation. It usually agrees well with children (especially those of a scrofulous habit) and convalescents.

*c.* Isle of Wight.—*Undercliff* presents an agreeable, mild, sheltered, dry, bracing climate, well adapted for the residence of many pulmonary and other delicate invalids throughout the year. It differs from the climate of Torquay (which is soft, humid, and relaxing) by its dry and bracing qualities. Hence it is suited for relaxed constitutions, with copious secretion. *Cowes and Ryde* are delightful summer residences.

*d.* Southampton.—This part of the coast is objectionable, on account of its temperature being equally variable with that of the environs of London.

3. South-West Coast.—This comprehends the tract of coast extending from Portland Island to Cornwall. Its general qualities are those of a mild, soft, humid climate, soothing but somewhat relaxing. It is adapted to pulmonary affections, especially those which are dry and unaccompanied with much expectoration. In dyspepsia, with symptoms of irritation or inflammation, constituting the gastritic dyspepsia of Sir James Clark, it is also beneficial. But in all forms of chronic diseases, with copious secretion and exhalation, and a languid and relaxed state of the constitution, it is injurious.

The following are the principal places of resort for invalids along the South-West Coast:—

*a.* Salcombe.—The Montpelier of Huxham. The warmest spot of this coast.

*b.* Torquay.—This is drier than the other parts of this coast, though its general character is soft and humid.

*c.* Dawlish.—Next in dryness to Torquay.

*d.* Exmouth.—The higher parts of the town exposed to winds; the lower parts liable to occasional damp. Sir J. Clark declares that it is not adapted for persons with delicate chests.

*e.* Salterton.—Preferable to Exmouth. It is well protected from winds, especially the northerly ones.

*f.* Sidmouth.—Damp.

4. South Coast of Cornwall. *Land's End.*—In its general characters this climate resembles that of the south coast of Devon. From the latter, however, it differs, in its greater humidity, and in being more exposed to winds. It is, consequently, more relaxing. The class of cases in which it is calculated to be beneficial or injurious, are much the same as those for the south coast of Devon.[2]

The following are the chief places of residence for invalids along this coast:—

*a.* Penzance.—Exposed to the north-east winds during the spring months.

*b.* Falmouth.—The winter temperature is a trifle lower than that of Penzance.

5. West of England.—Under this head are grouped the places along the borders of the British Channel and the æstuary of the Severn. The mean temperature of this group is, during the winter, rather lower, but in March and April rather higher, than that of the south coast.

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[1] For the character of this part of England consult Dr. Harwoods *Curative Influence of the Southern Coast of England, especially that of Hastings, with Observations on Diseases, to which a Residence on the Coast is most beneficial.* Lond. 1828.

[2] On the climate of this part of England, consult Dr. Forbe's *Observations on the Climate of Penzance and the District of the Land's End.* Penzance, 1820.—Also his *Medical Topography of the Land's End*, in the *Provincial Medical Transactions*, vol. ii.

Clifton.—This is the mildest and driest climate in the West of England. It is bracing, and well adapted for scrofulous and relaxed constitutions, with copious secretion and exhalation.

### 2. Climates of France.

The southern climates of France resorted to by invalids, may be divided into those of the South-West, and those of the South-East of that country.

1. South-West of France.—According to Sir James Clark the climate of this part of France is soft, relaxing, and rather humid; resembling in its general qualities that of the south-west of England. It is favourable to phthisical invalids, for those labouring under bronchial affections, with little expectoration, and for other chronic cases attended with a dry skin.

*a.* Pau.—Dr. Playfair (Sir J. Clark's *Sanative Influence of Climate*, p. 192.) thus sums up the qualities of this climate. "Calmness, moderate cold, bright sunshine of considerable power, a dry state of atmosphere and of the soil, and rains of short duration. Against these must be placed,—changeableness, the fine weather being as short-lived as the bad; rapid variations of the atmosphere within moderate limits. In autumn and spring there are heavy rains."

*b.* Bagneres de Bigorre, in the department of the High Pyrenees, has a mean temperature, during the months of June, July, August, and September, of 66° F. Dr. Wm. Farr (*A Medical Guide to Nice.* Lond. 1841.) declares the climate to be anti-irritating and moist, and to be favourable to the consumptive. Its season is from June to September.

2. South-East of France.—Sir J. Clark says the general character of the climate is dry, hot, and irritating. It is adapted for torpid, relaxed habits, but is decidedly improper for the consumptive and those labouring under irritation and inflammation of the air-tubes.

*a.* Montpelier.—Long but undeservedly celebrated as a residence for phthisical invalids.
*b.* Marseilles.—Exposed to cold winds. Soil dry and arid.
*c.* Hyeres.—Sir J. Clark declares it to be the least exceptionable residence in Provence for the pulmonary invalid.

### 3. Climates of Portugal and Spain.

Precise information respecting the climates of these countries, to which pulmonary invalids occasionally resort, is much to be desired.

1. Portugal.—Dr. Bullar (*A Winter in the Azores.* Lond. 1841.) states that the mean annual temperature of *Lisbon* is 12° F. higher than that of London; and that the mean temperature of its winter is 16° F. higher than that of London. But notwithstanding its mildness, it is objectionable for persons affected with phthisis, on account of the inequality of its temperature.

2. Spain.—*Biscay* is subject to sudden and extraordinary changes in temperature; the mercury having been known to rise and fall from 3° to 4° F. within a few minutes. (Inglis, *Spain in* 1830, vol. i. p. 39. Lond. 1831.) This must, of course, make it an unfit residence for pulmonary invalids. *Madrid* is elevated more than 300 fathoms above the level of the sea. Its annual mean temperature is 59° F. (Humboldt, in De Laborde's *View of Spain*, vol. i. p. clxiii. Lond. 1809.) *Cadiz*, being nearly surrounded by the sea, has a comparatively temperate climate.

### 4. Climates of Italy and the Mediterranean.

The climates included under this head are exceedingly diversified, so that it is difficult to lay down any general character of them.

*a.* Nice.—The climate of this place is somewhat similar to that of the South-East of France. It is mild, equable, and dry; being adapted for torpid, relaxed individuals, with abundant secretion from the mucous membranes. Dr. William Farr (*A Medical Guide to Nice*, p. 10. Lond. 1841.) says, the great objection to it is its dryness, and the exciting and irritating

nature of its atmosphere. It is beneficial in chronic bronchitis, with copious expectoration,—in chronic rheumatism,—scrofula,—gout, and atonic dyspepsia.

*b.* Genoa.—Climate dry and healthy, with a sharp exciting air. It is adapted for relaxed constitutions, but is unfit for phthisical invalids.

*c.* Florence.—Not favourable for invalids.

*d.* Pisa.—According to Sir James Clark, the climate "is genial, but rather oppressive and damp. It is softer than that of Nice, but not so warm; less soft, but less oppressive, than that of Rome." Pisa is frequented by consumptive invalids.

*e.* Rome.—The climate of this city is one of the best in Italy. Sir James Clark characterizes it as being mild, soft but not damp, rather relaxing and oppressive, and remarkable for the stillness of its atmosphere. It is well adapted for phthisis, bronchial affections of a dry irritating kind, and chronic rheumatism.

*f.* Naples.—The climate of Naples is warm, variable, and dry. Sir James Clark compares it to that of Nice, but states that it is more changeable, and, if softer in the winter, is more humid. Dr. Cox, (*Hints for Invalids about to visit Naples*, p. 17. Lond. 1841.) however, declares that the mean diurnal variation is far less than is generally supposed. It is an unsuitable residence for most pulmonary invalids, especially those affected with tubercular phthisis. In bronchial cases, with profuse secretion, benefit is sometimes obtained from it. In general debility and deranged health, it is also serviceable. Dr. Cox says it is beneficial in dyspepsia, rheumatic neuralgia, and scrofula.

*g.* Malta.—The climate of Malta is mild, dry, bracing, and pretty equable. It is serviceable in chronic bronchitis, [with profuse secretion,] scrofula, dyspepsia, and hypochondriasis.

## 5. Atlantic Climates.

The climates of the Atlantic islands, resorted to by invalids, may be arranged in two groups,—the one eastern, the other western.

1. Eastern Atlantic.—This group includes Madeira, the Canaries, and the Azores.

*a.* Madeira.—The climate of Madeira is mild, humid, equable, and steady. Sir James Clark regards it as the finest in the northern hemisphere. It is superior to all other climates for incipient phthisis. This superiority consists in the mildness of the winter, the coolness of the summer, and the remarkable equality of the temperature during the night and day, as well as throughout the year. Experience, moreover, seems to have fully demonstrated the advantage which patients, with incipient symptoms of consumption, derive from a residence in this island.[1]

*b.* The Canaries.—*Teneriffe* is the only island of this group possessing accommodation for invalids. Though its mean annual temperature is higher than that of Madeira, its equability is less.

*c.* The Azores or Western Islands.—Dr. Bullar declares these to be "rather colder than Madeira, and somewhat more equable, and perhaps more humid; but they have not at present those accommodations for strangers which the latter island possesses, nor have they communications by steam with England." (*A Winter in the Azores.* Lond. 1841.) *St. Michaels*, the largest of the Azores, has a mild, humid, equable climate.

2. Western Atlantic.—This group includes the Bermudas, the Bahamas, and the West Indies. It is more subject to rapid changes of temperature than the Eastern Atlantic group.

*a.* The Bermudas.—The climate is warm, variable, and dry. The mean annual temperature is considerably higher than that of Madeira; but the climate is variable and windy during the winter, and hot and oppressive in the summer (Sir J. Clark.)

*b.* The Bahamas.—The climate is warm, but is subject to rapid changes of temperature. Dry cold winds prevail. Hence the Bahamas are unsuited to consumptive invalids.

*c.* The West Indies.—The temperature of these islands is too high, and its variations too great, to admit of their being a desirable residence for patients affected with pulmonary consumption; but as a prophylactic for those predisposed to this disease, it is highly spoken of. In scrofula, the climate proves beneficial. Calculous complaints and ossific deposites are rare. The most healthy islands of the group are *Jamaica*, *Barbadoes*, *St. Vincent's Antigua*, and *St. Kitt's*.

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[1] For farther information respecting the medical qualities of the island of Madeira, the reader may refer with great advantage to Sir James Clark's work, before cited; Dr. Gourlay's *Observations on the Natural History, Climate, and Diseases of Madeira*, 1811; Dr. Renton, in the *Edinburgh Medical and Surgical Journal*, vol. xxvii. 1817; and Dr. Heineken's paper in the *Medical Repository*, vol. xxii. 1824.

The diseases for which change of climate is most frequently resorted to are—

1st. *Pulmonary Complaints*, especially Phthisis, Chronic Bronchitis resembling Phthisis, Asthma, Hemoptysis, and diseases of the Larynx and Trachea.
2. *Dyspeptic and Hypochondriacal Complaints.*
3. *Chronic Rheumatism.*
4. *Scrofula.*
5. *Urinary Diseases.*
6. *Liver Complaints.*
7. *In the Convalescence from Fever, and other acute maladies.*

1. **Pulmonary Complaints.**—These maladies are benefited by removal from a colder to a warmer climate. Equability, purity, and calmness of the atmosphere, are other desirable qualities in a climate for pulmonary invalids. The nature of the malady and constitution of the patient, however, render all climates possessed of these qualities not equally suited for every case.

*a.* Phthisis.—"For such consumptive patients," observes Sir James Clark, "as are likely to derive benefit from climate, I consider that of *Madeira* altogether the best. *Teneriffe* and the *Azores* approach most nearly in the character of their climate to Madeira." Of the climates of the South of France and Italy the same experienced writer says, when "there exists much sensibility to harsh and keen winds, and more especially, if immediate vicinity to the sea-coast is known to disagree, *Rome* or *Pisa* is the best situation for a winter residence. When, on the contrary, the patient labours under a languid feeble circulation, with a relaxed habit, and a disposition to congestion or to hemorrhage, rather than to inflammation; and, more especially, when the sea air is known by experience to agree, *Nice* deserves the preference." Late experience has shown, that *Montpelier*, *Marseilles*, and other places in the south-east of France, once celebrated as affording a good winter climate for consumptive patients, are decidedly improper for phthisical invalids. Of English climates, those of *Undercliff*, *Torquay*, and *Hastings*, are best adapted for this disease. *Torquay* and *Penzance* disagree with persons of a relaxed habit. *Clifton*, during the spring months, often agrees well.

*b.* Chronic Bronchitis.—In relaxed constitutions, with copious expectoration, the climates of *Undercliff*, *Clifton*, *Brighton* and *Nice*, are those which agree best. But on the other hand, for dry, bronchial, and trachial irritation, *Torquay*, *Madeira*, *Rome*, and *Pisa*, are to be preferred.

2. **Dyspepsia and Hypochondriasis.**—In selecting a climate for these complaints, we must attend to the character of the malady and the constitution of the invalid. Thus, in the atonic dyspepsia of relaxed and sluggish individuals, with copious secretions, we select a dry and bracing climate; and in such, *Brighton*, *Clifton*, *Nice*, or *Naples*, would probably prove beneficial. But when the dyspepsia assumes an inflammatory form, with dry tongue and a febrile condition of system, the soft and humid climates are to be preferred,—such as *Torquay*, *Pau*, *Rome*, and *Pisa*.

3. **Chronic Rheumatism.**—In this malady, mild climates generally have been found beneficial. According to Sir James Clark's experience, *Rome* and *Nice* are the best climates on the continent. In relaxed and cachectic individuals, the latter place is to be preferred.

4. **Scrofula.**—In this malady the *West Indies* prove highly serviceable. *Nice* and *Rome*, on the continent, have appeared to be favourable. In this country *Clifton* is perhaps the climate best adapted for scrofula.

5. **Urinary Diseases.**—Warm climates relieve most affections of the urinary organs, especially calculous complaints, diabetes, and vesical irritation. The benefit probably arises from the excitement of the skin and the abundant cutaneous secretion, and is to be explained on the principle of antagonism already alluded to. (See p. 47.) In the *West Indies* calculous complaints are very rare.

6. **Liver Complaints.**—Various hepatic derangements are induced by a residence in tropical climates; (See p. 48.) and in such cases benefit is obtained by a return to the more temperate climates of Europe.

7. In the **Convalescence** after fevers and inflammatory diseases, change of climate is often found highly beneficial.