

Lectures on diet and regimen : being a systematic inquiry into the most rational means of preserving health and prolonging life : together with physiological and chemical explanations, calculated chiefly for the use of families, in order to banish the prevailing abuses and prejudices in medicine / by A.F.M. Willich, M.D.

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Publication/Creation

New-York : Printed by T. and J. Swords ..., 1801.

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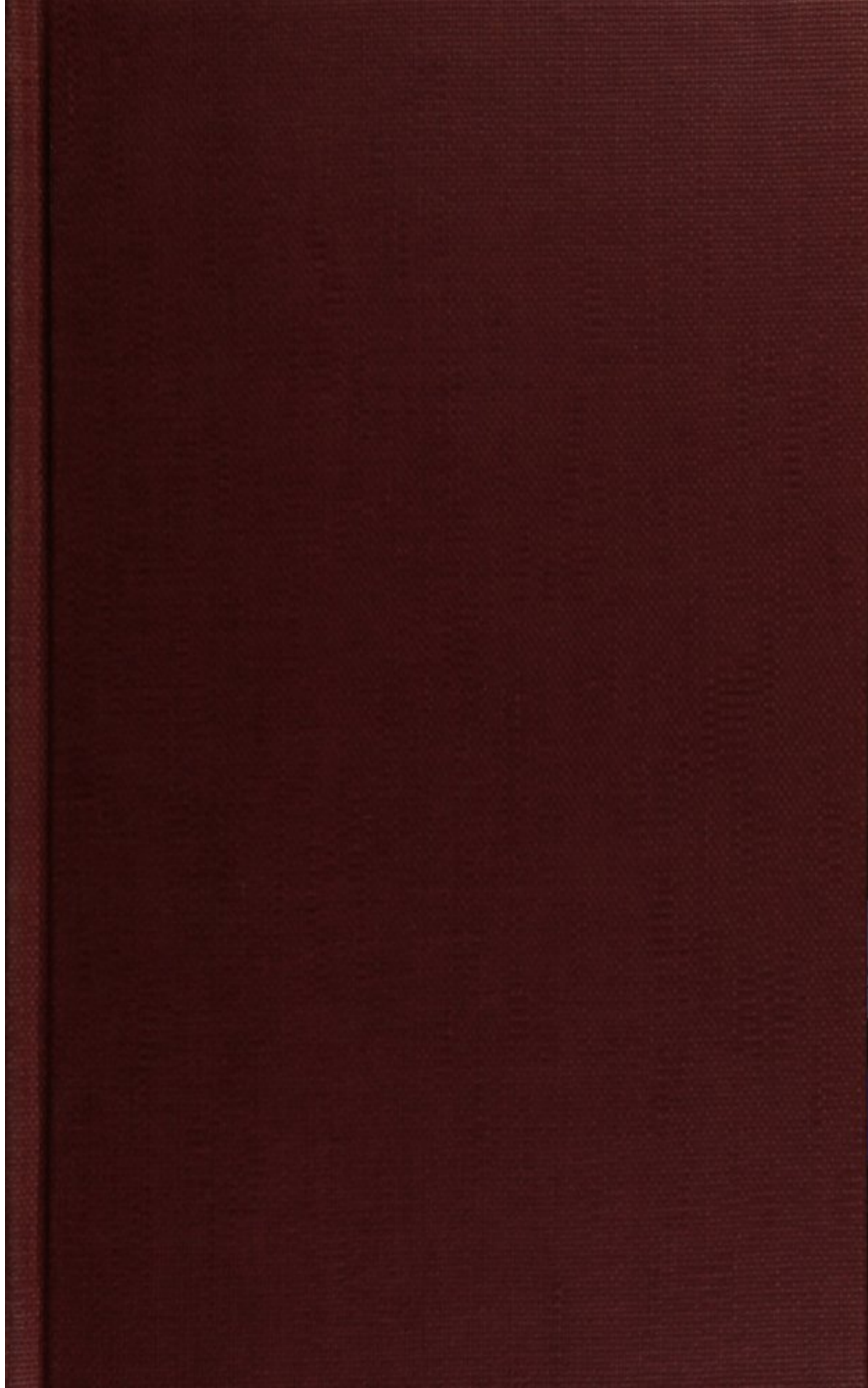
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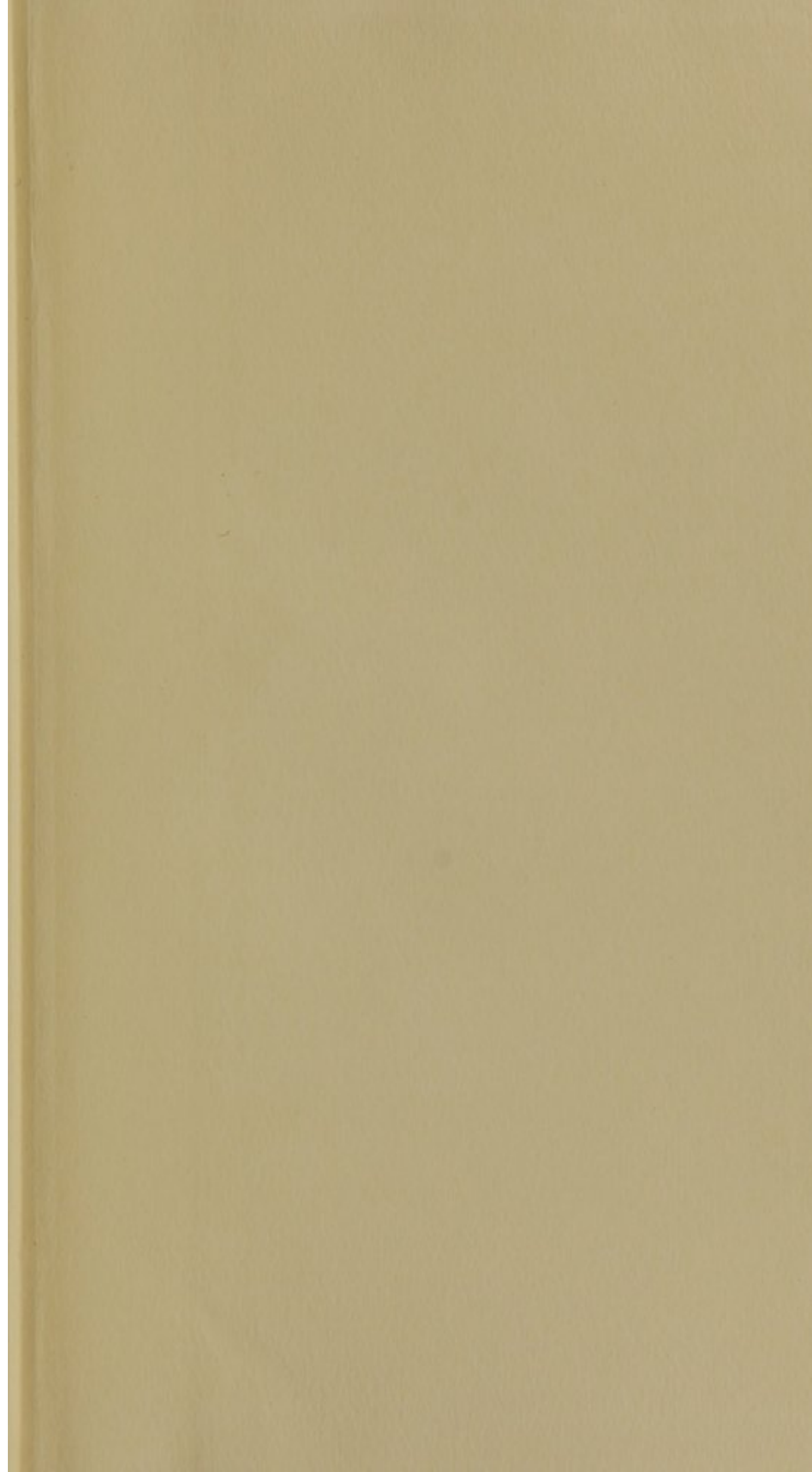


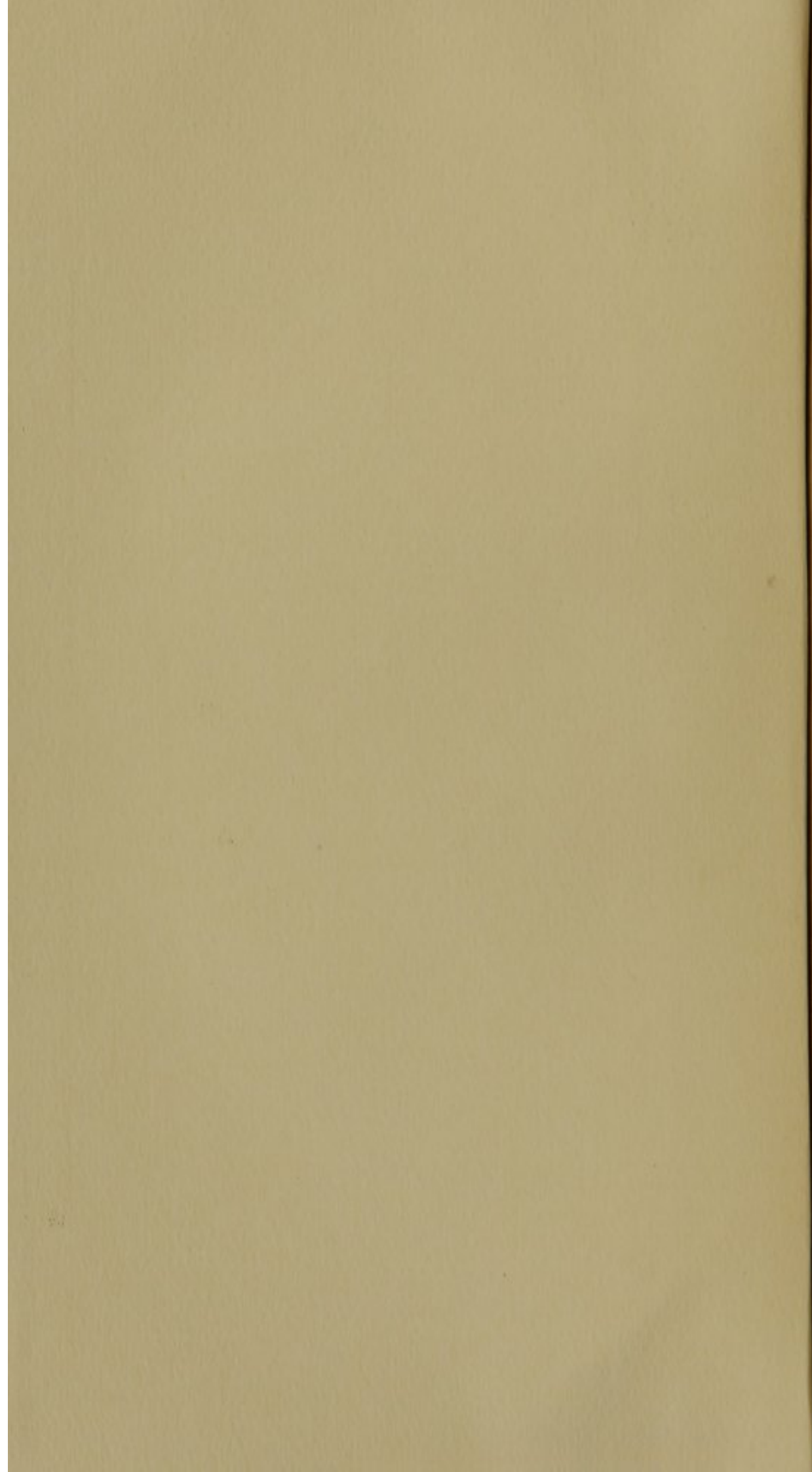
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LECTURES
ON
DIET AND REGIMEN:

BEING
A SYSTEMATIC INQUIRY
INTO THE MOST RATIONAL MEANS OF PRESERVING HEALTH
AND PROLONGING LIFE:

TOGETHER WITH
PHYSIOLOGICAL AND CHEMICAL EXPLANATIONS,
CALCULATED CHIEFLY
FOR THE USE OF FAMILIES,
IN ORDER TO BANISH THE PREVAILING ABUSES AND PREJUDICES IN MEDICINE.

By A. F. M. WILlich, M. D.

Qui stomachum regem totius corporis esse
Contendant, vera niti ratione videntur;
Hujus enim tenor validus firmat omnia membra;
At contrà ejusdem franguntur cuncta dolore.
SERENI SAMMONICI, *de Medicina Præcepta saluberrima,*

THE FIRST NEW-YORK, FROM THE THIRD LONDON, EDITION.

NEW-YORK:

Printed by T. and J. Swords, Printers to the Faculty of Physic
of Columbia College, No. 99 Pearl-street.

1801.

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ANNEX
Food

TO
*THOSE MOTHERS AND GUARDIANS
OF FAMILIES*
WHOSE
GREATEST PRIDE AND HAPPINESS IT IS
TO REAR
HEALTHY AND VIRTUOUS CHILDREN;
AND
*TO THOSE FRIENDS OF SOCIETY AND
THEMSELVES*
WHO ARE SOLICITOUS
TO PRESERVE THEIR HEALTH,
AND TO ADOPT
THE PARENTAL HINTS OF NATURE,
RATHER THAN SUBMIT TO
THE PRECARIOUS RELIEF OF ART.

TO
THOSE WHOSE AND COMMANDING
OF THE
WHICH
GREATNESS AND WISDOM IS
TO BE
INTELLECT AND VIRTUOUS CHILDREN
AND
TO THOSE FRIENDS OF SOCIETY AND
THE
WHO ARE SOLICITED
TO PRESERVE THEIR HEALTH
AND TO AVOID
THE NECESSARY HINDERS
IN THEIR JOURNALS TO
THE FAVORABLE BELIEF OF ALL

ADVERTISEMENT
TO THE
FIRST LONDON EDITION.

THESE Lectures, with the exception of the Eighth and Ninth Chapters, were delivered last winter,* at Bath, and in the spring at Bristol, to numerous and respectable audiences. The Author had no intention, at that time, to publish them; but as he found no work, in the English language, comprehending such a systematic view of the various and important objects which came more immediately under his consideration, and conceived that the dissemination of the rules selected by him might be generally useful, he was induced to alter his resolution, and submit them to the candour of the public.

To many English and German writers he must acknowledge his obligations, in the composition of his work. Among the former, he has occasionally availed himself of the excellent writings of PRIESTLEY, on the subject of *'Air and Weather;'* of FOTHERGILL and VAUGHAN, on *'Dress;'* and of ARMSTRONG, CULLEN, and FALCONER, on *'Food and Drink.'* To Dr. FOTHERGILL also, on the subject of *'Sleeping and Waking,'* he is much indebted, as well as to Mr. ADAMS' useful Treatise on the *'Treatment and Preservation of the Eyes.'*

Beside the valuable observations drawn from all these sources, he has been greatly assisted by the opinions of several German writers, viz. INGENHOUSZ, HAHNEMANN, HUFELAND, MARCARD, SCHEMMERING, UNZER, ZIMMERMANN, and others; having derived con-

* In the months of January and February, 1798.

siderable advantage from the general result of their respective inquiries on the subject of Diet and Regimen.

Although it can scarcely be expected that a work of this nature should be perfect, or free from inaccuracy, the Author has spared no pains to render it deserving of the public favour, and trusts it will be found a domestic guide both to families and individuals.

Should the rules and cautions, interspersed throughout, tend, in the smallest degree, to increase the knowledge of the inquisitive, dissuade the unwary from injurious habits, or rescue the sensualist from the brink of destruction, the exertions of the Author will be amply compensated.

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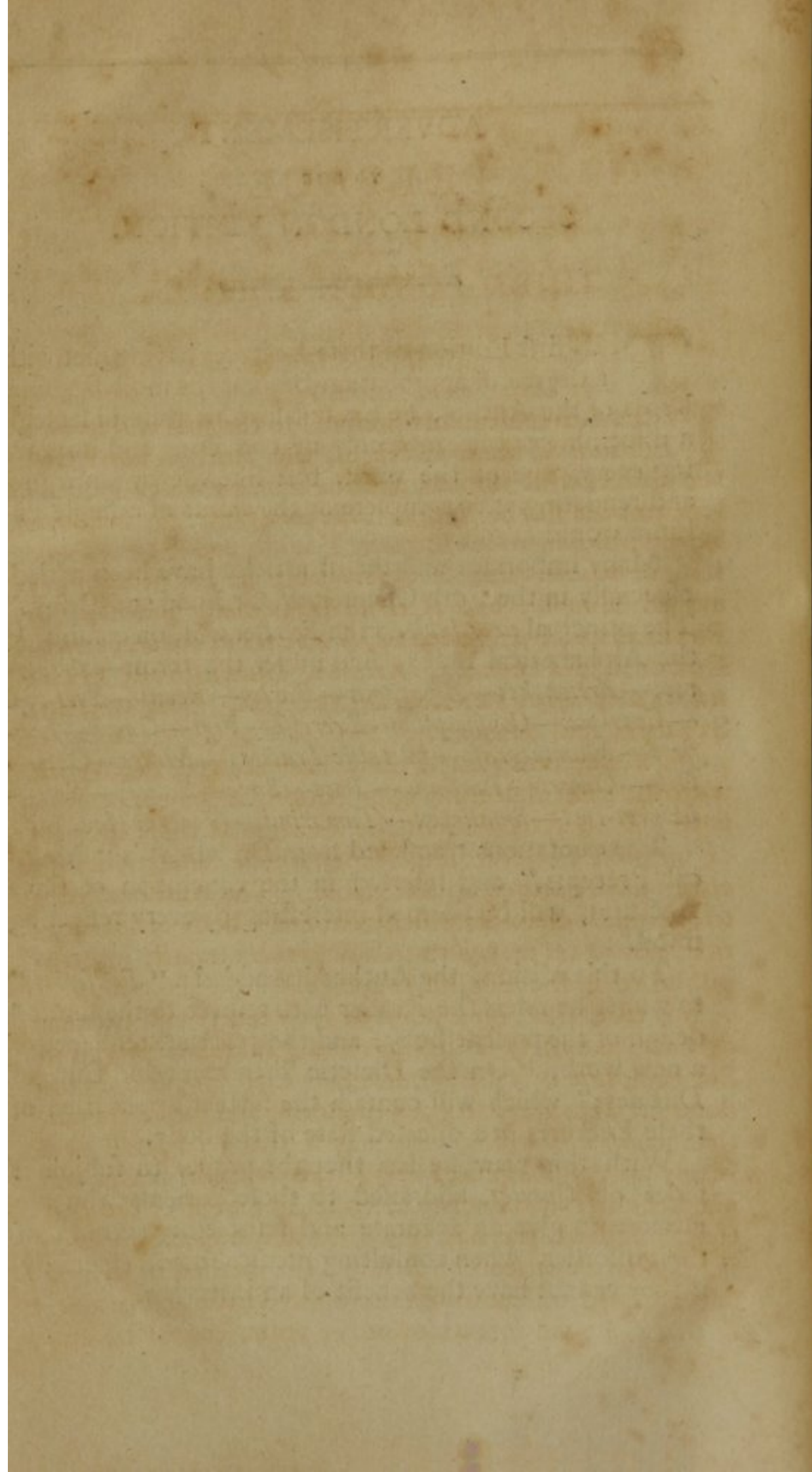
THE first Edition of these Lectures having met with a degree of approbation beyond the most sanguine hopes of the Author, he has testified his grateful sense to a discerning public, not only by correcting and improving every page of the work, but likewise by enlarging and rendering it as complete as the limits of a single volume would admit.

Many important and useful articles have been added, especially in the Fifth Chapter, "Of Food and Drink." The principal *new subjects* the Reader will, on consulting the Alphabetical Index, find under the terms—*Arrow-root—Artichokes—Asparagus—Barley—Beans—Beet-root—Cow-pox—Consumption—Exercise—Figs—Game—Lobsters—Manna-grass—Metallic Tractors—Millet—Oats—Oil—Olives—Parsnips—Rice—Sago—Salsafy—Salt—Skirret-root—Small-pox—Tamarinds—Vinegar, &c. &c.*

The quotations translated from Dr. MEAD's "Medical Precepts," and inserted in the conclusion of these Lectures, will be deemed interesting by every reflecting mind.

To this edition, the Author has added a "*Postscript*," to which he refers the Reader with respect to the limited design of the present book, and the practical tendency of a new work, "On the Dietetic Treatment and Cure of Diseases;" which will contain the farther application of these Lectures in a diseased state of the body.

With this view he has thought proper to subjoin a series of *Queries*, addressed to those patients who are anxious to give an accurate and satisfactory account of their disorder, when consulting medical men, especially if they cannot have the benefit of an interview.



PREFACE

TO THE

THIRD LONDON EDITION.

IN the Advertisements prefixed to the first and second Editions of these Lectures, the Author has stated the object of his labours, and the motives which induced him to publish the Work. He has gratefully acknowledged his obligations to many English and German writers, of whose valuable observations he has occasionally availed himself; and is more particularly indebted to PRIESTLEY, FOTHERGILL, VAUGHAN, ARMSTRONG, CULLEN, FALCONER, ADAMS, INGENHOUS, HAHNEMANN, HUFELAND, MARCARD, SÖMMERING, STRUVE, and UNZER.

As a discriminating Public has received this Work with the most flattering approbation, it may appear superfluous to apologize for the insertion of those subjects of inquiry, however important, which some fastidious critics have deemed objectionable. The Author alludes to the ninth chapter, which contains a body of information, not to be met with in any *popular* treatise hitherto published in the English language.

It is true, that, on a point of such nicety and peculiar delicacy, a variety of feelings and sentiments prevail in Society: but if it be admitted, “that *false delicacy* has done greater injury to good manners, and sound morals, than *undisguised truth*, especially if this be related in a manly and philosophical style,” the judicious reader will not hesitate to pronounce a verdict in favour of the Author. Indeed, this has, in a great measure, already been verified by experience. Besides, the method of writing here adopted will be found uniformly chaste and serious; so that the good intentions of the writer cannot be mis-

taken, particularly as the Work is not immediately addressed to the young and inexperienced, but to *Mothers and Guardians of Families*. It is therefore to be hoped, that, in a country where good sense and sound principles have long been domesticated, the public mind will not be influenced, either by the anonymous calumny of the hypocritic, or the illiberal aspersions of the partisan.

Since the second edition of the present Lectures was published, many applications have been made to the Author, as well as to the different Booksellers in the Metropolis, respecting the New Work announced in the *Postscript*, entitled, “*On the Dietetic Treatment and Cure of Diseases.*” *—As the mature digestion of the materials, and an arrangement of the numerous facts connected with this inquiry, require a much greater portion of time and labour than the Author at first conceived to be necessary, he craves the indulgence of the Public for delaying its publication till next year. In that Work he proposes to point out a more simple and rational method of treating *chronic disorders*, and, at the same time, to show that medicines *alone* are often unavailing, and in such complaints generally misapplied. It must, therefore, contain the practical application of the rules and cautions laid down throughout the present volume, in a diseased state of the body. And, as the Author has, on a former occasion, observed, that, in this respect, there appears to him a remarkable chasm to be filled up in the philosophy of medicine, he will not venture to appear before the public tribunal with an imperfect or defective work.—This promise, however, he requests the candid and liberal reader to interpret in that limited sense, which is applicable to every novel and arduous undertaking.

There is another circumstance which ought to be explained. The new treatise before alluded to is not intended to preclude the necessity of applying for medical

* As soon as this work comes to hand, T. and J. SWORDS propose to put it to press, and print it uniformly with this volume.

advice, in all diseases whatever, but to enable the reader to discriminate between danger and safety, and to warn him against that implicit reliance on the operation of medicines taken by the stomach; a practice which must be frequently the bane of health, while it undermines the soundest constitution. Hence the Author will be induced to substitute various means of introducing medicinal substances into the human system, and such as are less dangerous to the digestive organs; because these are designed by Nature for a very different purpose.

The *Queries* addressed to patients, at the conclusion of the Postscript, have been reprinted in this edition; for the Author has found, by experience, that they were of service to such persons as had not an opportunity of consulting professional men, in any other manner than by correspondence: this, I flatter myself, has been the case more especially with those individuals who were afflicted with painful and chronic disorders, where it is an essential point to give an accurate and satisfactory account of their complaints, before the physician can venture to return any advice, with safety or advantage.

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INTRODUCTION.

On the present State of Medicine as a Science.

WE apparently live in an age, when every branch of human knowledge is reduced to a popular system; when the most important sciences lay aside the garb of pedantry and mysticism; when, in short, the sources of information are open to both sexes, and persons of every rank. An improvement, which is so conspicuous, must ultimately be attended with the most desirable and extensive effects.

Among other beneficial pursuits, which render the comforts of life more numerous and permanent, we have occasion to observe, that Natural Philosophy and Chemistry are at present much cultivated, while they contribute a principal share in spreading useful knowledge among all classes of society.

Since Medicine, considered as a science, which rests upon practical rules of experience, is, in a great measure, founded upon Natural Philosophy and Chemistry, it will be allowed, that with the daily progress of the latter, Medicine also must necessarily partake of their improvements, and continually receive accessions conducive to its further perfection.

With the progressive increase of refinement and luxury, a certain weakness and indisposition, whether real or imaginary, has infested society in the character of a gentle epidemic. It cannot properly be called a disease, but rather an approximation to an infirm state, which almost involuntarily compels man to reflect upon the relative situation of his physical nature, to acquire correct ideas of health, disease, and the means of prevention or relief, and thus imperceptibly to become his own guide.

Every individual of the least penetration now claims the privilege of being his own physician:—it is not un-

fashionable to form a *certain* system concerning the state of our own health, and to consider it as the criterion, by which we may judge of ourselves and others, of patients and their physician.

Formerly people were not accustomed to think of the physical state of their body, until it began to be afflicted with pain or debility: in which case they intrusted it to the practitioner in Physic, as we deliver a time-piece to a watch-maker, who repairs it according to the best of his knowledge, without apprehending that its owner will be at the trouble of thinking or reasoning upon the method which he judged to be the most proper.

In our times, we frequently undertake the charge of prescribing medicines for ourselves; and the natural consequence is, that we seldom are able to tell whether we are healthy or diseased; that we trust as much, if not more, to ourselves than to the physician, who is only sent for occasionally; and that we cannot conceive him to be perfectly free from the systems of the schools, from self-interest, or professional motives. Thus, by an acquaintance with medical subjects, which, of itself, is laudable, not only the skill of the physician is frequently thwarted, but the recovery of the patient unhappily retarded, or, at least, rendered more difficult.

No disease is now cured without demonstration; and he who can neither discover nor comply with the peculiar system of health adopted by his patient, may, indeed, act from motives dictated by reason and humanity; but his success as a *practical physician*, in the common acceptance of that phrase, must ever remain problematical. Yet this general propensity to investigate medical subjects, if it were properly directed, might be attended with very happy effects. For the medical art ought not to be subject to an imperious and fascinating demon, whose labours are chiefly carried on in the dark recesses of mystery, whom we know only from his baneful influence, as he spares no objects of prey, and holds his votaries in a perpetual state of dependence!

“The veil of mystery,” says a popular modern writer, “which still hangs over Medicine, renders it not only a conjectural, but even a suspicious art. This has been long ago removed from the other sciences, which induces many to believe that Medicine is a mere trick, and that it will not bear a fair and candid examination. Medicine, however, needs only to be *better* known, in order to secure the general esteem of mankind. Its precepts are such as every wise man would choose to observe, and it forbids nothing but what is incompatible with true happiness.”

Observations on the general Laws of Nature.

If we reflect upon the admirable uniformity which prevails throughout the works of Nature, both in the production and dissolution of matter, we find that she invariably moves in a circle; that in the perpetual construction, as well as in the subsequent demolition of bodies, she is always equally new and equally perfect; that the smallest particle, though invisible to our eyes, is usefully employed by her restless activity; and that death itself, or the destruction of forms and figures, is no more than a careful decomposition, and a designed regeneration of individual parts, in order to produce new substances, in a manner no less skilful than surprising. We further observe, that in the immense variety of things, in the inconceivable waste of elementary particles, there nevertheless prevails the strictest economy; that nothing is produced in vain, nothing consumed without a cause. We clearly perceive that all Nature is united by indissoluble ties; that every individual thing exists for the sake of another, and that no one can subsist without its concomitant. Hence we justly conclude, that man himself is not an insulated being, but that he is a necessary link in the great chain which connects the universe.

Nature is our safest guide, and she will be so with greater certainty, as we become better acquainted with

her operations, especially with respect to those particulars which more nearly concern our physical existence. Thus, a source of many and extensive advantages will be opened; thus we shall approach to our original destination—namely, that of living long and healthy.

On the contrary, while we continue to move in a limited sphere of knowledge; as long as we are unconcerned with respect to the causes which produce health or disease, we are in danger either of being anxiously parsimonious, or prodigally wasteful, of those powers by which life is supported. Both extremes are contrary to the purpose of Nature. She teaches us the rule of just economy;—being a small part of her great system, we must follow her example, and expend neither too much nor too little of her treasures.

Although it be true that our knowledge of Nature is still very imperfect, yet this circumstance ought not to deter us from investigating the means which may lead to its improvement.

We are assisted by the experience of so many industrious inquirers, of so many sound philosophers, that we may flatter ourselves with the hopes of discovering some of her hidden secrets, and of penetrating still farther into her wonderful recesses. This, however, cannot be accomplished without much patience and perseverance in the student.

All men, it is true, have not sufficient time and opportunities to acquire an extensive and accurate knowledge of Nature; but those are inexcusable who remain entire strangers to her ordinary operations, and especially if they neglect to cultivate a proper acquaintance with the constitution of their own frame. If, indeed, we were fixed to the earth, as the trees are by their roots, or if, from mere animal instinct, we were induced to search into the causes of our physical life, we then should vegetate like plants, or live like irrational animals. But, in the character of creatures, who ought to choose and reject agreeably to the dictates of reason, a more assiduous and minute study of Nature, as well as of our own

frame, is indispensable; because the physical constitution of man cannot subsist, unless he second her intentions, and co-operate with her beneficent efforts.

Difference of Opinion on Medical Subjects.

It has not unfrequently been remarked, that Medicine is an uncertain, fluctuating, and precarious art. One medical school, for instance, considers the mass of the fluids as the primary cause of all diseases; another ascribes them to the irregular action of the solids, and particularly the nerves; some again consider that as the cause of the disorder which many are inclined to represent as the effect. Thus, different schools propagate different tenets relative to the origin of diseases; though, ultimately, with respect to matters of fact, they all must necessarily agree. Nor is this diversity of opinions in the least degree detrimental to the practical department of Medicine, provided that we do not regulate the mode of treatment altogether by hypothetical notions. Of what consequence is it to the patient whether his physician imagines the nerves to be fine tubes, filled with a subtle fluid, or not? whether he believes that catarrhs arise from noxious particles floating in the air, or from catching cold? or whether he is prejudiced in favour of this or that particular theory of fevers?—It is a sufficient security to the patient, if his physician be thoroughly acquainted with the symptoms of the disease, and able to distinguish them from those of any other malady. In this respect, the medical art is truly excellent, and stands unrivalled; for the nature of diseases remains invariably the same. The accurate observations made by HIPPOCRATES, two thousand years ago, on the symptoms and progress of diseases, recur to the medical practitioner of the present day, in a manner sufficiently regular and uniform. And, in fact, how should it be otherwise, when Nature always pursues the same path, whether in a healthy or diseased state of the body?

Here again it will be asked, whence does it happen that two physicians seldom agree in opinion, with regard

to the case of the same patient? This question may be briefly answered, by claiming the same right for the medical profession, which is assumed by theologians in contested points of divinity; by lawyers, when arguing on any part of their code which is not perfectly clear; and by philosophers, who maintain different opinions on the same subject in metaphysics; for instance, that of *space* and *time*. But there are more forcible reasons which enable us, in some measure, to account for this diversity of opinion in Medicine. One of the physicians, perhaps, is in the habit of visiting fifty patients in a forenoon; so that he has not sufficient time to investigate minutely the nature and origin of the disease: while another, of less extensive practice, is enabled to do more justice to his patients, by attending to their complaints with deliberation and accuracy. One of them shall distinguish some of the leading symptoms, and, without hesitation, pronounce that he has discovered the true source of the malady; but, as many diseases of a different nature are attended with similar and common symptoms, there is no small danger of confounding them. Another shall enter the patient's room, with a preconceived opinion on the subject of some prevailing epidemic, or in deep reflection upon the case which occupied his attention in the last visit. With these impediments, how difficult will it be to proceed in a cool and unbiassed inquiry? If, again, both should happen to be called in at different stages of the disease, each of them would prescribe a different method of cure; and the judgment of him who was last consulted, would, in all probability, be the most correct. Or, lastly, a physician may be sent for, who, having commenced his studies about half a century since, has not (from want of time or inclination) sufficiently attended to the more recent discoveries of this inquisitive age: how then can it be expected, that he should agree in opinion with those whose knowledge has been improved by the numberless new facts and observations lately made in Physics, particularly in Chemistry?

Origin and Causes of Disease.

Man is subject to the same destructive agents from without, by which the lower animals are affected; and, for many reasons, he is more frequently exposed to diseases and pain than these. *First*, the inferior creatures are unquestionably provided with a more active instinct, by which Nature teaches them, from their very birth, to avoid every thing that may prove hurtful, and to choose whatever may have a salutary influence on their existence.

Nature to these, without profusion kind,
The proper organs, proper powers assign'd;
Each seeming want compensated of course,
Here with degrees of swiftness, there with force.

Pope.

Few traces of this beneficial instinct can be discovered in the human race. Our own experience, or the instructions of others, which are likewise founded upon experience, must gradually teach us the wholesome or pernicious qualities of the objects of the material world. Reason, indeed, that peculiar faculty of man, compensates, in a great measure, the want of this instinct; as it directs his choice in pursuing what is useful, and in avoiding what is injurious. Yet, at the same time, the want of instinct in man is the source of many sufferings in the earlier years of his life. He is born, without covering, to withstand the effects of climate; without the means of defending himself in his helpless state; and without instinct, if we except that of sucking. He remains much longer incapable of providing for his own preservation, and stands in need of the assistance of his parents for a much greater number of years than any other animal with which we are acquainted. Although his parents, in general, acquit themselves of this charge with much greater solicitude and tenderness than the lower animals, yet our imperfect instinct is productive of much mischief to children, from ignorance and ill-directed tenderness in parents and nurses. Children are frequently supplied

with articles of food and dress, which, at a more advanced age, produce the seeds of disease and dissolution. Thus, many infants are indebted for their obstructions in the mesentery, and the consumptive habit attending them, to their uninformed and over-anxious parents or friends, who commit daily errors with regard to the quantity and quality of the aliment, which they, in many instances, too liberally administer to the objects of their care; even though it be of an indigestible nature.

In the *second* place, it is a fact universally admitted, that mankind, especially in large and populous towns, have much degenerated in bodily strength, energy of mind, and in their capacity of resisting the noxious agency of powers which affect them from without.

The progressive cultivation of the mind, together with the daily refinements of habits and manners, are ever accompanied with a proportionate increase of luxury. But as this change, from a robust to a more relaxed state of life, has produced no difference in the *causes* generating disease, to which we are even more subject than formerly, we must necessarily suffer by the concomitant *effects*. For though luxury has assisted us in preventing the temporary effects of external agents, such as cold, heat, rain, &c. and we can occasionally guard ourselves against their severity, yet we are, upon the next return of them, attacked with much greater violence than if we had been more habituated to their influence. And this state of things has imperceptibly introduced the use of many articles, both of dress and aliment, which, in their consequences, often prove detrimental to health. Hence we find, that, in proportion as the refinements of luxury increase in a nation, the number and variety of diseases also increase. On the contrary, the more uncivilized a people continue, and the more their habits and customs approximate to a state of Nature, they are proportionately the less affected by the causes of disease.

In the *third* place, we observe among the human race a greater number of prevailing passions; and man is more violently, and, for the time of their duration, more

obstinately governed by them than any other living creature. These emotions variously affect the human body: but the most noxious and oppressive of all the passions are *terror* and *grief*; the former of which is sometimes so violent as to threaten immediate dissolution. Controuled by their powerful influence, and hurried away by the impulse of the moment, the mind is rendered incapable of judging, and of properly selecting the means of repressing those passions. Hence the remedies to which we have recourse during the prevalence of passion, and which then appear to us the most proper, frequently lay the foundation of innumerable disorders, both of body and mind.

A *fourth* source of diseases among mankind, are various specific contagions; and, perhaps, the greater number of these originate in the surrounding atmosphere. This is highly probable, at least with respect to marshy exhalations, and the effluvia of places rendered unwholesome by different manufacturing processes. Another class of contagious miasmata consists of those which cannot be traced to any certain origin. Indeed, we daily observe their migrations; and we perceive them moving from one individual to another, without fixing any stationary residence: yet they have hitherto frustrated every attempt made towards their extirpation. Of this unsettled nature are the small-pox, the measles, hooping-cough, the influenza, and many other epidemics. The small-pox has of late been very successfully treated; and it is well known, that some of the most ingenious practitioners in Italy and Germany are, at this moment, employed in a serious attempt wholly to extirpate this contagion from the continent of Europe; as has formerly been accomplished in the cases of the plague and leprosy.*

* The means employed by our ancestors to subdue the virulence of these malignant disorders, consisted chiefly in separating every infected person from the healthy, and preventing all intercourse between them. For this purpose, many thousand houses of reception were then established and supported at the public expense, in every country of Europe; the diseased were instantly and carefully removed to those houses, and not permitted to leave them till perfectly cured.

On the Doctrine of Temperaments.

Since it is established by numberless facts, that the temperaments, as well as the diseases, of whole nations, are, in a great measure, influenced by their ordinary food, it will no longer be doubted that the most important consequences result from our daily aliment, whether it consist of food or drink.

As the *doctrine of temperaments* is in itself highly curious and interesting, I think this a proper place to introduce some practical remarks illustrative of that subject, and to present a concise view of it, chiefly derived from the learned annotations of the celebrated Professor SÖMMERING, of Mayence.

“The doctrine of temperaments,” says he, “in the general acceptation of that term, must be allowed to have greatly misled the ancient physicians, and particularly those who lived before the time of GALEN. We are not, however, to infer from this, that the doctrine itself is without foundation. They erred not by admitting the existence of temperaments, for that seems now to be fully established; but by too great a fondness for *generalization*; by limiting the number of them to

A measure somewhat similar to this has lately been proposed, and laid before the Plenipotentiaries of the Continental Powers assembled at Rastadt, by Professor Junker, Dr. Faust, and other German Physicians. This proposal, however, differs essentially from the former method of extirpating contagious disorders: as, according to the modern plan, we understand, every individual, whether willing or not, must submit to be inoculated for the small-pox.

To deprive this loathsome disease of its destructive power, another method, perhaps more plausible and less compulsory, has been lately attempted in this country, and strongly recommended by Drs. JENNER, PEARSON, WOODVILLE, and other practitioners. I allude to the inoculation for the *cow-pox*. It is sincerely to be wished, that their humane efforts may be crowned with success; and if it be true, that persons inoculated with cow-pox matter are *for ever* exempt from the infection of the *small-pox*, and that this artificial transmission of morbid matter from the brute to the human subject is not attended with danger, it is of little consequence whether the cow-pox originate from any cutaneous disease of the milker, or from the grease of horses.—I am, however, not very sanguine in my expectations, which have often been disappointed on similar occasions; and, till I can persuade myself of the perfect analogy subsisting between the two diseases—nay, of their homogeneous nature—I shall patiently wait for a greater number of facts tending to confirm the truth of the hypothesis. Meanwhile I am of opinion, that this subject can be decided only when the *small-pox* shall again appear as the *prevailing epidemic*.

four, and fixing their attention, in this division, simply on the nature and composition of the blood, instead of regarding the whole animal economy. Thus, for instance, they knew many parts of the human body scarcely by their names; and were little, if at all, acquainted with the great influence of the nerves; while our modern physicians pay an almost extravagant homage to these fashionable co-operators in diseases, and frequently forget, in their attention to their favourites, the more important, or, at least, more obvious, parts of the fluids.

“ There is a certain line observable in all the more perfect animals, by which Nature is regulated in performing the functions of the body and mind; in preserving or impairing the health, and in exerting all those energies of life on which the happiness of the creature depends. This line is various in different individuals, and the variety cannot be completely explained on the principle of the ancients, by a difference in the qualities of the blood alone, though a human body of moderate size contains not less than thirty pounds weight of that fluid. Other terms must, therefore, be substituted for their *sanguine*, *choleric*, *phlegmatic*, and *melancholy* temperaments; but, before we attempt them, it will be necessary to take a more extensive view of the economy of man.

“ The causes of the difference of temperaments are various: *First*, a diversity in the nervous system, with respect to the number of the constituent fibres, their strength, and sensibility. A large brain, coarse and strong nerves, and great sensibility, in general, have always been found to be the marks of a *choleric* or *cholericosanguine* disposition. Hence proceed the quickness of perception and capacity of knowledge in persons of this class, accompanied with great acuteness and strength of judgment, from the multitude of their ideas of comparison. These qualities are, however, in some measure, counterbalanced by a violent propensity to anger, and impatience under slight sufferings of body or mind. Medicines ought, therefore, to be cautiously administered

to them, and in small quantities only. A diminutive brain, and very delicate nerves, have generally been observed to be connected with dull senses and a phlegmatic languor—sometimes with a taint of melancholy. To affect the organs of such persons, the impression of external objects must be strong and permanent. Their judgments are often childish from the want of ideas; and, hence, they are seldom able to make progress in science. They are, however, more fit to endure labour and the injuries of climate; consequently, their medicines should be strong, and administered in large quantities.

“ *Secondly* : Difference of irritability is another cause of difference of temperament. When the fibres are excited by the slightest stimulus to quick and permanent contraction, we may justly infer the existence of a choleric disposition; while a phlegmatic temper displays itself by opposite symptoms, the muscles being slowly contracted, and excited with difficulty by the most powerful stimulus.

“ *Thirdly* : The fibres and membranes of a phlegmatic person are remarkably soft to the touch; those of a melancholic person hard and dry, with greater tone and facility of contraction.

“ *Fourthly* : There appears to be sufficient reason for the opinion, that an *electric* principle is dispersed through the atmosphere, which is communicated to the body, in different degrees, by respiration; which supplies the fibres with their natural tone, stimulates the vessels to a more vigorous action, and increases the serenity of mind. This principle does not exist in the atmosphere of all countries in equal quantities; nor even in the same country at different seasons or hours of the day. Thus, during the influence of the *Sirocco* in *Sicily*, all the fibres are oppressed by languor; but when the air becomes more serene and elastic, the natural energy of body and mind returns. All men do not inhale this electric matter in equal quantities, and thus a remarkable difference of temperament is produced.

“ *Fifthly* : To these causes must be added the differ-

ence in the nature and quantity of the blood. Thus, when the blood is highly stimulant, the heart is excited to more violent action; an increased secretion of bile promotes the vermicular motion, and a superfluity of mucus disposes to catarrh, &c. From these considerations it is evident, that there are causes sufficiently powerful to produce a predisposition to a particular temperament, at a very early period of life. That a complete change is ever effected from a choleric habit, for instance, to a phlegmatic, cannot be consistently admitted, at least while the laws of Nature remain unalterable. I will, however, admit, that the temperaments, though not completely changed, may be modified; that the vehemence of some, and the languor of others, may, to a certain degree, be lessened; but this must be done by remedies suited to the class of the causes productive of a particular temperament. Of these the principal are:

“1. A different regimen. Thus animal food imparts the highest degree of strength to the organs, enlivens the senses, and often occasions a degree of ferocity; as is evident in cannibals, in carnivorous animals in general, in butchers and their dogs, and in hunters, especially when aided by the frequent use of spices, wines, and stimulating medicines. Vegetable diet, on the contrary, diminishes the irritability and sensibility of the system; in a word, renders it phlegmatic.—Some authors, indeed, have considered potatoes as the means of contributing to that end; but I am not inclined to subscribe to this doctrine, since I have had occasion to observe the lively temperament of the common people of Ireland.—Yet attention to diet is highly necessary in those who have the charge of children; as, by the use of animal food, additional energy may be given to the fibres; and, when their irritability is too great, it may be diminished by an opposite regimen.

“2. Education, both physical and moral, is another cause of alteration in the temperament of man. Its power is almost unbounded, especially in the more early

periods of life; and, hence, it often happens that whole nations seem to possess one common temperament.

“ 3. Climate, in its most extensive sense, comprehending atmosphere and soil, is a third cause of alteration. The activity and acuteness of a choleric habit are seldom to be found in a region of perpetual fog; as, for instance, in Holland. They are the natural produce of a warm climate, and require a gentle elevation of surface, with a moderately moist soil, and a serene, equal atmosphere.

“ 4. I have often observed an astonishing degree of activity communicated to the whole system, by an ardent desire of learning; so that the temperament seemed to receive new life from every accession of knowledge.

“ 5. The want of the necessaries of life on the one hand, or possession of the means of luxury on the other, variously modify the disposition; and the liveliness of the temperament is also observed to rise or fall, according to the degree of political freedom.

“ 6. Age, company, and professional duties greatly affect the temperament. Hence, we seldom find any one who, at fifty-six years of age, retains the activity of that choleric or sanguine habit which he possessed at thirty-six.

“ Those who follow Nature, and not a plausible hypothesis, will be sensible how difficult it is to classify and fix the characteristic marks of the different temperaments; and it is rather a matter of doubt, whether the following sketch will be more successful than the attempts of others.

“ All the modifications of temperaments appear to be varieties of the *sanguine* and *phlegmatic*.

“ 1. The sanguine is variable. It is marked by a lively complexion; the vessels are full of blood; and persons of this habit are seldom able to bear great warmth: they are predisposed to inflammations, and possess a high degree of irritability and sensibility. All is voluptuous in this temperament. They are fickle in every thing they

undertake; are affable, and soon become acquainted; but as soon forget their friends, and are suspicious of every body. Whatever requires industry they abhor; and, hence, make little progress in science till they advance in age.

“ 2. The sanguineo-choleric enjoys all the health and serenity of the sanguine, with all the perseverance of the choleric.

“ 3. In the choleric the body is soft and flexible, without being dry and meagre as in the melancholic; the skin has a tint of yellow; the hair is red; the eyes dark and moderately large, with a penetrating expression, and frequently a degree of wildness; the pulse full and quick; the muscular contractions in walking, speaking, &c. are rapid; the bile is copious and acrid; and, hence, the vermicular motion is active, and the body not liable to costiveness. Persons of this class are particularly fond of animal food. They possess great magnanimity, are fitted for laborious undertakings, and seem born to command.

“ 4. He whose temperament is hypochondriacal is a burthen to himself and others. Persons of this class are subject to diseases of the liver; and, hence, have a fallow complexion. They are never contented with their situation, and are a prey to envy and suspicion.

“ 5. The melancholic temperament is marked by a gloomy countenance; small, hollow, blinking eyes; black hair; a rigid or tough skin; dry and meagre fibres. The pulse is weak and languid; the bile black; the vermicular motion slow. The perceptions of persons of this disposition are acute: they are fond of contemplation; and are slow in the execution of labour, which they patiently undertake. They bear with resolution the troubles of life; and, though not easily provoked, are nevertheless vindictive.

“ 6. The *Bæotic*, or rustic temperament, has many of the qualities of the sanguine, in common with those of the phlegmatic. The body is brawny, the muscles have but little irritability, the nerves are dull, the manners rude, and the powers of apprehension feeble.

“ 7. The gentle temperament is a combination of the sanguine, choleric, and phlegmatic. Universal benevolence is the distinguishing character in this class. Their manners are soft and unruffled. They hate talkativeness; and if they apply to science, their progress is great, as they are persevering and contemplative. Lastly,

“ 8. The phlegmatic class is marked by a soft white skin, prominent eyes, a weak pulse, and languid gait. They speak slowly, are little hurt by the injuries of the weather, submit to oppression, and seem born to obey. From their little irritability they are not easily provoked, and soon return to their natural state of indifference and apathy.”

On Patent or Quack Medicines.

Although there is but one state of perfect health, yet the deviations from it, and the genera and species of diseases are almost infinite. It will hence, without difficulty, be understood, that in the classes of medical remedies there must likewise be a great variety, and that some of them are even of opposite tendencies. Such are both the warm and cold bath, considered as medical remedies. Though opposite to each other in their sensible effects, each of them manifests its medical virtue, yet only in such a state of the body as will admit of using it with advantage.

It is evident, from these premises, that an universal remedy, or one that possesses healing powers for the cure of *all* diseases, is, in fact, a non-entity, the existence of which is physically impossible, as the mere idea of it involves a direct contradiction. How, for instance, can it be conceived, that the same remedy should be capable of restoring the tone of the fibres when they are relaxed, and also have the power of relaxing them when they are too rigid; that it should coagulate the fluids when in a state of resolution, and again attenuate them when they are too viscid; that it should moderate the nerves in a state of preternatural sensibility, and likewise restore them

to their proper degree of irritability when they are in a contrary state.

Indeed, the belief in an universal remedy appears to lose ground every day, even among the vulgar; and has been long exploded in those classes of society, which are not influenced by prejudice, or tinctured with fanaticism. It is, however, sincerely to be regretted, that we are still inundated with a flood of advertisements in almost every newspaper; and that the lower and less enlightened classes of the community are still imposed upon by a set of privileged impostors, who frequently puzzle the intelligent reader to decide, whether the impudence or the industry, with which they endeavour to establish the reputation of their respective poisons, be the most prominent feature in their character.*—It was justly observed by the sagacious and comprehensive BACON, “that a reflecting physician is not directed by the opinion which the multitude entertain of a favourite remedy, but that he must be guided by a sound judgment; and, consequently, he is led to make very important distinctions

* To illustrate this proposition farther, I shall quote the sensible remarks of a late writer, Mr. JAMES PARKINSON, who expresses himself, in his “*Medical Admonitions*,” when treating on the subject of Catarrh, in the following pertinent words:

“Most of the *Nostrums* advertised as *cough drops*, &c. are preparations of opium, similar to the paregoric elixir of the shops, but disguised and rendered more deleterious, by the addition of aromatic and heating gums. The injury which may be occasioned by the indiscriminate employment of such medicines, in this disease, may be very considerable; as is well known by every person possessing even the smallest share of medical knowledge.

“It would undoubtedly be rendering a great benefit to society, if some medical man were to convince the ignorant of the pernicious consequences of their reliance on advertised *Nostrums*: but, unfortunately, the situation in which medical men stand is such, that their best intentioned and most disinterested exertions for this purpose would not only be but little regarded, but frequently would be even imputed to base and invidious motives. Those to whom they have to address their admonitions, are unhappily those on whom reason has least influence. “*Prithee, Doctor*,” said an old acquaintance to a celebrated empiric, who was standing at his door, “how is it that you, whose origin I so well know, should have been able to obtain more patients than almost all the regular-bred physicians?” “*Pray*,” says the Quack, “how many persons may have passed us whilst you put your question?”—“About twenty.”—“And pray, how many of those do you suppose possessed a competent share of common sense?”—“Perhaps one out of twenty.”—“Just so,” says the Doctor; “and that one applies to the regular physician, whilst I and my brethren pick up the other nineteen.”—P. 327 and 328.

between those things which only by their name pass for medical remedies, and others which in reality possess healing powers."

I am induced to avail myself of this quotation, as it indirectly censures the conduct of *certain* medical practitioners, who do not scruple to recommend what are vulgarly called Patent and other Quack medicines, *the composition of which is carefully concealed from the public*. Having acquired their unmerited reputation by mere chance, and being supported by the most refined artifices, in order to delude the unwary, we are unable to come at the evidence of perhaps nine-tenths of those who have experienced their fatal effects, and who are now no longer in a situation to complain.

The transition from *Panaceas*, or universal remedies, to *Nostrums* or *Specifics*, such, for instance, as pretend to cure the *same* disease in *every* patient, is easy and natural. With the latter also impositions of a dangerous tendency are often practised. It will probably be asked here, how far they are practically admissible, and in what cases they are wholly unavailing? It is not very difficult to answer this question. In those diseases, which, in every instance, depend upon the same cause, as in agues, the small-pox, measles, and many other contagious distempers, the possibility of specifics, in a limited sense, may be rationally, though *hypothetically*, admitted. But in other maladies, the causes of which depend upon a variety of concurrent circumstances, and the cure of which, in different individuals, frequently requires very opposite remedies, as in the Dropsy, the various species of Colic, the almost infinite variety of Consumptions, &c. &c. a specific remedy is an imposition upon the common sense of mankind. Those who are but imperfectly acquainted with the various causes from which the same disorder originates in different individuals, can never entertain such a vulgar and dangerous notion. They will easily perceive how much depends upon ascertaining, with precision, the seat and cause of the complaint, before any medicine can be prescribed with safety

or advantage: even life and death, I am concerned to say, are too often decided by the *first steps* of him who intrudes his advice upon a suffering friend.

The following instances will show the danger attending the precipitate application of the same medicine in similar disorders.—A person violently troubled with the colic took a glass of juniper spirits, commonly called Hollands, from which he received almost instantaneous relief, as the indisposition proceeded from flatulency. Another person, who found himself attacked with similar pains, was induced, by the example of his friend, to try the same expedient; he took it without hesitation, and died in a few hours. Nor is it surprising that the effects of the cordial were fatal in this case, as the colic was owing to an inflammation in the intestines.—A third person was afflicted with a colic, arising from poisonous mushrooms which he had inadvertently swallowed; the immediate administration of an emetic, and after it some diluted vegetable acid, restored him to health.—A fourth person had an attack of this malady from an *encysted hernia*, or inward rupture. The emetic, which relieved the former patient, necessarily proved fatal to the latter; for it burst the bag of enclosed matter, poured the contents into the cavities of the abdomen, and thus speedily terminated his existence.—Again, another had, by mistake, made use of arsenic, which occasioned violent pains, not unlike those of a common colic. A large quantity of sweet oil, taken internally, was the means of his preservation; whereas the remedies employed in the other cases would have been totally ineffectual.—Here I willingly close a narrative, the recital of which cannot but excite the most painful sensations. To lengthen the illustration would lead me too far beyond my prescribed limits: for cases of this nature happen so frequently, that it would be easy to extend the account of them by a long catalogue of affecting and fatal accidents.

What is more natural than to place confidence in a remedy which we have known to afford relief to others

in the same kind of indisposition? The patient anxiously inquires after a person who has been afflicted with the same malady; he is eager to know the remedy that has been used with success; his friend or neighbour imparts to him the wished-for intelligence; he is determined to give the medicine a fair trial, and takes it with confidence. From what has been stated, it will not be difficult to conceive, that, if his case does not exactly correspond with that of his friend, any *chance remedy* may be extremely dangerous, and even fatal.

The physician is obliged to employ all his sagacity, supported by his own experience, as well as by that of his predecessors; and, nevertheless, is often under the temporary necessity of discovering, from the progress of the disease, what he could not derive from the minutest researches. How then can it be expected, that a novice in the art of healing should be more successful, when the whole of his method of cure is either the impulse of the moment, or the effect of his own credulity? It may be therefore truly said, that life and death are frequently intrusted to chance.*

From what has been premised, it may be confidently asserted, that a *Nostrum*, or an universal remedy, is as great a *desideratum* as the philosopher's stone. The absurd idea of an universal medicine can only obtain credit with the weak, the credulous, or the ignorant.

One of the most unfortunate circumstances in the history of such medicines, is the insinuating and dangerous method by which they are *puffed* into notice. And as we hear little of the baneful effects which they daily must produce, by being promiscuously applied,

* The late Dr. HUXHAM, a physician of great celebrity, when speaking of *Asclepiades*, the Roman empiric, says: "This man, from a *declaimer*, turned *physician*, and set himself up to oppose all the physicians of his time; and the novelty of the thing bore him out, as it frequently doth the *Quacks* of the present time; and ever will, *whilst the majority of the world are fools.*"

In another place, Dr. HUXHAM thus curiously contrasts the too timid practice of some regular physicians, with the hazardous treatment, which is the leading feature of *Quacks*: "The timid, low, insipid practice of some is almost as dangerous as the bold, unwarranted empiricism of others; time and opportunity, never to be regained, are often lost by the former; whilst the latter, by a *bold push*, sends you off the *stage* in a moment.

people attend only to the extraordinary instances, perhaps not one in fifty, where they have afforded a temporary or apparent relief. It is well known, that the more powerful a remedy is, the more permanent and dangerous must be its effects on the constitution; especially if it be introduced, like many Patent Medicines, by an almost indefinite increase of the doses.

There is another consideration, not apt to strike those who are unacquainted with the laws of animal economy. When we intend to bring about any remarkable change in the system of an organized body, we are obliged to employ such means as may contribute to produce that change, without affecting too violently the *living powers*; or without extending their action to an improper length. Indeed, the patient may be gradually habituated to almost any stimulus, but at the expense of palsied organs and a broken constitution.* Such are the melancholy effects of imposture and credulity! Were it possible to collect all the cases of sacrifices to this mysterious infatuation, it is probable that their number would exceed the enormous havock made by gunpowder or the sword.

A popular writer makes the following just remark on the subject in question: "As matters stand at present," says he, "it is easier to cheat a man out of his life, than of a shilling, and almost impossible either to detect or punish the offender. Notwithstanding this, people still shut their eyes, and take every thing upon trust, that is administered by any pretender to Medicine, without daring to ask him a reason for any part of his conduct. Implicit faith, every where else the object of ridicule, is still sacred here.

Analysis of Fashionable Complaints.

If these abuses of medicine be of consequence, how much more so are certain manners, habits, and customs,

* An Italian Count, uncommonly fond of swallowing medicines, found at length that he could take no more. Previous to his death, he ordered the following inscription to be placed on his tomb:

"*I was once healthy; I wished to be better; I took medicine, and died.*"

which the united efforts of the Faculty will never effectually remove or suppress, unless assisted by the female guardians of helpless infancy? That I may not be misunderstood with respect to the real intention of this address to the fair sex, I beg leave previously to observe, that the following remarks apply chiefly to certain classes of the community, among whom a due degree of attention is but seldom paid to the skin of their offspring.

The greater number of our fashionable complaints and affections are nearly related to each other. The gout, formerly a regular but uncommon disease, which attacked only the external parts of persons advanced in years, has now become a constitutional indisposition, a juvenile complaint, torturing the patient in a thousand different forms. The famous *Podagra* and *Chiragra* of our ancestors are now nearly obsolete, and, instead of the gout in the *feet* or *hands*, we hear every day of the nervous gout, the gout in the *head*, and even the fatal gout in the *stomach*. No rank, age, or mode of life seems to be exempt from this fashionable enemy.—The next and still more general malady of the times, is *an extreme sensibility to every change of the atmosphere; or rather a constantly sensible relation to its influence*. We are not only more subject to be affected with every current of air, every change of heat and cold, but the feelings of some are so exquisitely delicate, that in a close apartment, nay even in bed, they can determine with accuracy the state of the weather, as well as the direction of the wind. By consulting their sensations, these *living barometers* announce, more correctly than the artificial ones, not only the present, but even the future changes of the weather. I could never have believed, that this additional sense, which is only of modern origin, could have been so much improved, had I not frequently witnessed the sensations of certain patients when a cloud is floating over their heads;—a talent so peculiar to our age would, undoubtedly, excite the surprise, but not the envy, of our less refined forefathers. In a climate where the weather changes every day, and almost every hour, it may be

easily imagined how dependent, frail, and transitory must be the health of the wretched possessors of this *new* sense; and that beings so organized cannot warrant, for a single hour, their state of health, their good humour, or their physical existence. Is it not then very probable, that many strange and inconsistent events of the times may have their secret foundation in this dependence on the weather?—In judging of man and his actions, we ought first to observe the state of the barometer; as our more superstitious ancestors made the celestial constellations the criterion in their prognostics.

Not less characteristic of the present generation, but more painful, are the fashionable nervous and hypochondriacal diseases. These are formidable, insidious tormentors, which not only destroy our physical well-being, but also discompose our tranquillity and contentment, and cloud our fairest prospects of happiness. Without depriving us of life, they render it an insupportable burthen; without inducing death, they make him a welcome visitor.

It is unnecessary to detail the diversified shapes in which these maladies present themselves. Let it suffice to observe, that however intimately the mind appears to be connected with these phenomena, we can, nevertheless, account for them from physical causes. They have rapidly increased with the propagation of the gout; and experience shows, that they frequently alternate with it in the same patient. It is highly probable, therefore, that they are of a similar nature with the gout; and that they originate from the same source, which is peculiar to our age. Closely connected with the gout, and likewise with the hypochondriasis, how frequently do we observe the hæmorrhoids, formerly a disease of the aged, but now the companion of youth, and almost a general complaint.

The last class of our fashionable diseases includes all those affections of the skin, which are known by the name of *eruptions, discolourations, efflorescences, scorbutic taints, &c.* Of late these have alarmingly increased,

and appear daily to spread every where like noxious weeds. Even in the higher ranks, where neither a poor diet nor want of attention to cleanliness can be assigned as causes, we frequently observe persons whose skin announces bad health, and on whom medicine can have little or no effect. Physicians of different countries complain of new and unheard-of cutaneous disorders, of an extremely malignant tendency; and, if their progress be not checked in time, Europe will perhaps once more be visited with that malignant and filthy disease, the Leprosy.

It is, however, not sufficient to give a bare catalogue of these singular diseases. I shall, therefore, attempt to trace them to their source; to show that they can be easily prevented; and to point out the most likely means by which so desirable an event may be accomplished.—It is to you, guardians of a future, and, I hope, a hardier race, that I now appeal—it is your aid I solicit in so important a measure of national and domestic policy.

On the Nature and Functions of the Skin.

Much as we hear and speak of *bathing*, and of the great attention at present paid to cleanliness, I am bold to affirm, that the greater number, if not the whole, of our fashionable complaints originate from the want of care and proper management of the *skin*. Through unpardonable neglect in the earlier part of life, especially at the age of adolescence, the surface of the body becomes so much enervated, by constant relaxation, that it oppresses, and, as it were, confines our mental and bodily faculties; promotes the general disposition towards the complaints above mentioned; and, if not counteracted in time, must produce consequences still more alarming and deplorable.

We often hear people complain, that *their skin is uneasy*; a complaint which, I fear, is but too prevalent among those who give themselves little trouble to inquire into its origin.—But how is it possible, I hear many

persons ask, that the skin, which is a mere covering to the body, to shelter it from rain and sunshine, can have such an influence over the whole frame? I shall venture to explain this problem, and hope to impress such as are inclined to be sceptical with more respect for that important part of the human body.

The skin unites in itself three very essential functions. It is the organ of the most extensive and useful sense, that of *touch*; it is the channel of *perspiration*, the principal means which Nature employs to purify our fluids; and, through the most admirable organization, it is enabled to *absorb* certain salutary particles of the surrounding atmosphere, and to guard us against the influence of others of an injurious tendency. For this purpose, innumerable nerves and vessels are dispersed throughout the skin, which are in the continual act of feeling, and, at the same time, of secreting and volatilizing noxious particles, and absorbing those which contain vital principles. It has been proved, by accurate calculations, that the most healthy individual daily and insensibly perspires upwards of three pounds weight of superfluous and impure humours. It may, therefore, be confidently asserted, that no part of the body is provided with so many important organs, by which it is connected with almost every operation performed in animal life, as the skin. By this organization we are placed in immediate connection with the surrounding atmosphere, which particularly affects us through the skin, and exerts its influence on our health. We further feel, directly through that medium, the qualities of the air, heat, cold, pressure, rarefaction, &c. and, hence, we experience, at least in their influence, other much more subtle and less known qualities, of which I shall only mention the electric and magnetic fluids. From the spirituous and highly penetrating nature of these fluids, we may easily conjecture how considerable a share they must have in the principle of vitality, and of what essential use the organ is through which they affect us.

Important as the skin is to external life, it is no less so

to the internal economy of the body, where it appears to be peculiarly designed to preserve the grand equilibrium of the different systems, by which the human frame is supported in its vital, animal, and sexual functions.—If any stagnation, accumulation, or irregularity arise in the fluids, the skin is the great and ever-ready conductor through which the superfluous particles are separated, the noxious volatilized, and the fluids, stagnating in their course, effectually attenuated; a canal being, at the same time, opened for the removal of those humours, which, if they should get access to the vital parts, such as the heart and the brain, would cause inevitable destruction. By the proper exercise of this organ many diseases may be suppressed in their early stages, and those which have already taken place may be most effectually removed. No disease whatever can be healed without the co-operation of the skin. The nature and constitution of this organ most certainly determine either our hope or apprehension for the safety of the patient. In the most dangerous inflammatory fevers, when the prospect of recovery is but gloomy, a beneficial change of the skin is the only effort by which Nature, almost overcome, relieves herself, and ejects the poison in a surprising manner, frequently in the course of one night. The greatest art of a physician, indeed, consists in the proper management of this extensive organ, and in regulating its activity where occasion requires. To mention only one circumstance: it is well known to those who have experienced the beneficial effects of a simple blister, that its stimulus, like a charm, has frequently relieved the most excruciating pains and spasms in the internal parts.

Cleanliness, flexibility, and activity of the skin, are, according to the observations premised, the principal requisites to the health of individuals, as well as of whole nations. But, instead of contributing to its improvement, we generally pay very little attention to it, except to the skin of the face and hands, which are too often made the *fallacious* index of health. I am convinced, however, that most of the patients and valetudinarians,

who take so much pains to refresh and fortify the *internal* parts of the body by invigorating potations,* seldom, if ever, pay any regard to their *external* surface; an object of equal importance, and, perhaps, standing in much greater need of corroborants than the former. Hence it happens, that the skin of convalescents is observed to be particularly relaxed and obstructed; that they are liable to continual colds upon the least change of temperature; and that every day of their recovery renders them more subject to relapses.

In this country the children of people in the middling and lower ranks are, perhaps, better managed than in most of the countries upon the Continent; because frequent and daily bathing is, to my positive knowledge, no where so generally practised as in England. As soon, however, as children attain a certain age, this practice is again as generally neglected; and, after the tenth or twelfth year of age, the surface of the body is very little attended to. Thus a foundation is laid for numberless evils, and particularly for that scorbutic taint which now almost universally prevails, and is more or less connected with other more fashionable complaints.—As we advance in years this disposition of the skin increases still more, especially from the mode of life pursued in the higher ranks. We then begin to accustom ourselves to sedentary habits, to think, and to partake of the pleasures of society. The lady, the man of fortune, and the ill-fated man of letters, all require *more active* exercise than they actually take, which alone can promote a free perspiration, and enliven the surface of the body; but, by their indolent habits, the whole machine is in a languid state, and the skin becomes contracted and debilitated.

The husbandman, indeed, labours diligently; and though, by perspiration, his skin preserves more life and activity, it is neither kept sufficiently clean, nor prevented from being obstructed by perspirable matter.

* O madness, to think use of strongest wines,
And strongest drinks, our chief support of health.

The artist and manufacturer carry on their pursuits in a sedentary manner, and in a confined impure air: the latter, in the duties of his occupation, generally employs unwholesome substances, so that, at length, in some parts of the body, he loses the use of this organ entirely. The voluptuary and the glutton do not suffer less than the former, as they impair the energy of the skin by excesses of every kind, and take no precautions to preserve its elastic texture.—Our usual articles of dress, flannel excepted, are not calculated to promote a free perspiration;—our coal-fires, and still more the free use of *warm* liquors, contribute greatly to relax the skin. If we add to this list of predisposing causes our inconstant climate, which at one hour of the day braces, at another relaxes, the surface of the body; alternately heats and cools it, and, consequently, disturbs its uniform action; it will be easily understood, that the skin must, for these reasons, be almost generally vitiated; and that it really is a leading source of many of our fashionable indispositions.

When the sensibility of the surface is impaired; when the myriads of orifices, that are designed for the continual purification and renovation of our fluids, are obstructed, if not closed; when the subtle nervous texture is nearly deprived of its energy, so that it becomes an *impenetrable coat of mail*, is there any reason to wonder, that we are so often harassed by a sense of constraint and anxiety; and, that this uneasiness, in many cases, terminates in a desponding gloom, and, at length, in complete melancholy?—Ask the hypochondriac, whether a certain degree of cold, paleness, and a spasmodic sensation in the skin, do not always precede his most violent fits of imbecility? and, whether his feelings are not most comfortable when the surface of his body is vigorous, warm, and perspires freely? In short, the degrees of insensible perspiration are to him the surest barometer of his state of mind. If our skin be disorganized, the free inlets and outlets of the electric, magnetic, and other matters, which affect us at the change

of the weather, are inactive. Thus, the origin of extreme sensibility towards the various atmospheric revolutions is no longer a mystery; for, in a healthy surface of the body, no inconvenience will follow from such changes.—If we farther advert to those acrimonious fluids, which, in consequence of an imperfect state of perspiration, are retained in the body, and which affect the most sensible nerves and membranes, we shall the better comprehend how cramps and spasms, the torturing pains of the Gout and Rheumatism, and the great variety of cutaneous diseases, have of late become so obstinate and general.

The just proportion of the fluids, and the circulation of the blood, are also determined, in no small degree, by the skin; so that if these fluids become thick and languid, the whole momentum of the blood is repelled towards the interior parts. Thus a continual plethora, or fulness of the blood, is occasioned; the head and breast are greatly oppressed; and the external parts, especially the lower extremities, feel chilly and languid.

In warm climates, in Italy for instance, the hæmorrhoids, a very distressing complaint, are but rarely met with, notwithstanding the luxurious and sensual mode of life of the inhabitants, because their perspiration is always free and unchecked; while among us there are persons who devote the whole of their attention to the cure of that troublesome disorder.

May we not infer, from what I have thus advanced, that the use of baths is too much neglected, and ought to be universally introduced? It is not sufficient, for the great purposes here alluded to, that a few of the more wealthy families repair every season to watering-places, or that they even make use of other modes of bathing, either for their health or amusement. A very different method must be pursued, if we seriously wish to restore the vigour of a degenerated race. I mean here to inculcate the indispensable necessity of *domestic baths*, so well known among the ancients, and so universally established all over Europe a few centuries ago. These were eminently calculated to check the farther

progress of the leprosy; a disease which, though slower in its effects, is not less distressing than the plague itself.

Much has been said and written upon the various methods, and the universal medicines, proposed in different ages, by different adventurers, professedly to diminish the inherent disposition to disease, and to give a new and renovating principle to the human frame. At one time they expected to find it in the philosophic and *astralian salts*, at another in Magnetism and Electricity; some fanatics pretended to have discovered it in the light of the moon, others in celestial beds; but, if I may venture to deliver my opinion, we may search for it most safely and successfully in every clear fountain—in the bosom of ever young, ever animating Nature.

Bathing may be also considered as an excellent specific for alleviating both mental and bodily affections. It is not merely a cleanser of the skin, enlivening and rendering it more fit for performing its offices; but it also refreshes the mind, and spreads over the whole system a sensation of ease, activity, and pleasantness. It likewise removes stagnation in the larger, as well as in the capillary vessels; gives an uniform, free circulation to the blood; and preserves that wonderful harmony in our interior organs, on the disposition of which our health and comfort so much depend. A person fatigued, or distressed in body and mind, will derive more refreshment from the luxury of a lukewarm bath, and may drown his disquietude in it more effectually, than by indulging in copious libations to Bacchus.—The bath may be equally recommended as an admirable retiring place, to evade, for a time, the influence of the atmosphere; and persons, that have the misfortune to be too susceptible of external impressions, would find no small benefit were they to repair, in thick and sultry weather, to the bath, where they may breathe in an element less loaded with noxious particles.

The wish to enjoy perpetual youth is one of the most predominant and pardonable. Though it cannot be rationally asserted, that bathing will confer continual

youth ; yet I will hazard an opinion, that it has a very uncommon and superior tendency to prolong that happy state : it preserves all the solid parts soft and pliable, and renders the joints flexible. Hence, it powerfully counteracts what I presume to call an insidious disease, viz. *age*, which operates by gradually exhausting the humours, and depriving the constituent parts of the human frame of their elasticity. It is no less certain, that bathing is one of the best preservatives of beauty ; and, that those nations, among whom it is a prevailing practice, are usually the most distinguished for elegance of form and freshness of complexion.

A moderate desire to improve and beautify the surface of the body is far from being a frivolous pursuit. It excites as much interest, and is productive of as beneficial consequences, as the exertions of many a pseudo-philosopher, who devotes the toil of years to arrange his notions in a certain systematic form, and who yet is not fortunate enough to attain the great object of his wish. I have had frequent opportunities to observe, that the desire of beauty, when not inordinate, may prove the source of many virtuous and laudable pursuits, and that it may be greatly instrumental to the preservation of health. I am also persuaded, that this desire is often pursued by methods not the most proper ; and that, from not having a just knowledge of beauty, females make many valuable sacrifices, not only of things essential to health, but sometimes of life itself. Instances are not uncommon of young persons attempting to bleach their skins, and beautify their persons, by avoiding the open air, using a mild and weakening diet, or even abstinence from food, sleeping too long, warming their beds, &c. &c. But, alas ! the event does not answer their expectation ; they lose both health and bloom !—Eating chalk, drinking vinegar, wearing camphorated charms, and similar destructive means, have been resorted to by other more daring adventurers, but with no better success. Those I have last enumerated may be called the *minor cosmetics* : others of a more formidable nature I almost

hesitate to mention, as they are, unquestionably, the most deleterious substances with which we are acquainted. *Mercury* and *lead*, manufactured in various forms, are, unhappily, ingredients too common in many of our *modern* cosmetics, whether they consist of lotions, creams, powders, paints, or ointments. That these substances can be communicated to the circulating fluids through the skin, as well as by the stomach, requires, I should suppose, no further proof after the doctrines already advanced on this subject. *Lead*, if once introduced into the system, though in the smallest proportions, cannot be removed by art; and never fails to produce the most deplorable effects, such as palsy, contraction and convulsion of the limbs, total lameness, weakness, and the most excruciating colics. Besides these more obvious effects, the frequent external use of lead and mercury, in cosmetics, occasions cramps in every part of the body, faintings, nervous weakness, catarrhs, tubercles in the lungs and intestines, which occur either separately or together, according to the different circumstances, till, at length, a consumption, either pulmonary or hectic, closes the dreadful scene.

The secret venom, circling in her veins,
Works through her skin, and bursts in bloating stains;
Her cheeks their freshness lose, and wonted grace,
And an unusual paleness spreads her face.

GRANVILLE.

Beauty of complexion, the subject under consideration at present, is but another term for a sound and healthy skin:—a pure mirror of the harmony of the internal parts with their surface; or, if I may be allowed the expression, “*it is visible health.*”

There subsists so intimate a relation between our interior and exterior vessels, that almost every error or irregularity in the organs within, shows itself first on the surface of the body, particularly on the face.—How often are we struck with the countenance of a person, who thinks himself in perfect health, but whose illness, the result of some morbid cause concealed in the body,

justifies, in a few days, the serious apprehensions we entertained at our last interview. Nature has wisely ordained, that the first appearance of internal irregularities should be indicated by the countenance; but to what use do we generally apply this index? We refuse to avail ourselves of her beneficent intimation; and the continued use of pernicious substances, instead of promoting the object we have in view, ultimately tarnishes and impairs that beauty which we meant to adorn and preserve. We imagine it in our power to improve the skin without attending to the purity of the fluids, though it is indebted to them for its very existence; and yet we should smile at a person, who attempted to cleanse an impure tongue by constantly scraping it, when a disordered stomach was the real cause of that impurity.

From the tenor of the preceding observations, I hope for indulgence when I venture to pronounce every cosmetic, the composition of which is kept a secret from the public, to be false and fraudulent ware. The three great, and really effectual, SUBSTITUTES FOR COSMETICS,* which I would recommend, are the following: *First*, due attention to *insensible perspiration*; an important process, by which Nature, if duly assisted, will not fail to expel all acrimonious or useless particles. By this, too, the surface of the body will be kept in a constant atmosphere of softening exhalations; a species of volatile vapour-bath, which is the most efficacious mean of preserving it soft and pliant, and of animating it with

* To such readers, whether male or female, as are *determined* to make use of *cosmetics*, instead of attending to the more effectual means to preserve the bloom of the skin, it may be of service to point out one or two *external applications*, in order to prevent them from using the dangerous and destructive preparations of *Quacks*.—According to the late Dr. WITHERING, an infusion of horseradish in milk makes one of the safest and best cosmetics. Another preparation for clearing the skin of pimples and *recent eruptions*, if assisted by gentle aperient medicines, is the fresh expressed juice of house-leek mixed with an equal quantity of sweet milk or cream.—Yet all contrivances whatever, to answer this purpose, are absurd and nugatory, if the *inward* state of the body be neglected, or if they be looked upon as *specifics of themselves*. Such things do *not* exist in nature; and we might as well try to bleach the face of a Negro, as to remove any scorbutic or other eruptions from the face, without bestowing proper attention on the whole state of the body, and particularly the fluids, whence these irregularities derive their origin.

the colour of life.—The next circumstance to be attended to is the *purity of the fluids*; this depends equally on a free *perspiration* and a vigorous state of *digestion*.—The third requisite to a fair, healthful complexion is an *uniform* distribution of the fluids; or, in other words, a *free and unrestrained circulation of the blood*; as the very purest fluids, when profusely propelled to the face, are productive of disagreeable consequences, such as unnatural redness, flushings, tumid appearances, &c. of which ladies who lead a sedentary life are so apt to complain.

To these three general observations I think it may be useful to subjoin a few particular injunctions relative to the refinement of the skin, as connected with a state of good health.—Carefully avoid all *immoderate and violent dancing*; as the sudden alternations of heat and cold not only impair the general state of the skin, but are likewise very detrimental to beauty.—Abstain from the too frequent and too copious use of heating liquors of every kind, particularly punch and strong wines. There is scarcely any thing which is, in my opinion, more destructive to the bloom of youth and manhood than this *liquid fire*, which fills the blood with inflammable particles, propels it towards the face, parches the skin, renders it spotted, and lays the foundation of that incurable disease, which is sometimes figuratively called *copper in the face*. Neither sugar nor any additional ingredient, to gratify the palate, can deprive these liquors of their noxious qualities, insomuch, that even the most agreeable of these seductive drinks is attended with considerable danger.

Avoid, likewise, the excessive use of *hot* drinks, such as coffee, chocolate, and tea, particularly the last, in which the inhabitants of this country indulge more than in any other beverage. I scarcely dare venture to impeach this favourite *solace* of our morning and evening hours; but, with all due deference to the happiness of the domestic circle, I consider it as my duty to denounce the too liberal use of this liquor, as not a little prejudicial to the fairness and purity of the skin. Tea,

taken hot, and in immoderate quantities, not only has a tendency to weaken the organs of digestion, but causes fluctuations and congestions in the humours of the face, and frequently brings on a degree of debilitating perspiration. Let us conceive the stomach inundated with a quantity of warm water just at the time of digestion; its concoctive powers are literally drowned at the very instant when their assistance is most required; and, instead of a pure balsamic *chyle*, or alimentary fluid, it prepares crude and acrimonious humours, which can only generate an impure mass of blood. Here I cannot impress upon the attentive reader, in terms sufficiently strong, the following truth: *that a healthy stomach only can produce healthy and uncontaminated fluids*; and that two-thirds of what we call acrimony, or sharpness of humours in the system, proceed from a languid stomach and irregular digestion. If, therefore, the tea be made too weak, it will operate merely as warm water, and, as such, relax the coat and membranes of the stomach;—if made too strong, it will give an unnatural heat to the body, prove a dangerous stimulus to the nerves, occasion palpitations of the heart, a general tremor, cramps, and a number of other complaints, which it is needless to enumerate. That these effects do not take place, during the first months or years of indulging ourselves in the intemperate use of hot and strong tea, is no argument to controvert this position; they will, either sooner or later, unavoidably follow.

I shall but slightly touch, here, on another subject, scarcely of less importance than the former; namely, the various compositions prepared by the pastry-cook and confectioner. These dainties would be less objectionable, if any method could be devised to bake them without the pernicious ingredients of yeast and fat, substances which load the stomach with a glutinous slime and rancid matter, which obstruct the glands of the abdomen, particularly those of the mesentery, and have a strong tendency to produce the cutaneous diseases before mentioned.

On the Physical Education of Children.

The physical education* of infants unquestionably forms an object of the first importance. The great disproportion subsisting between healthy and diseased children, together with the deplorable mortality which occurs among the latter, too plainly evince, that their *bodily* welfare is not sufficiently attended to.

There is little room to doubt, that by more rational management, during the first years of infancy, many subsequent diseases may either be wholly prevented, or, at least, greatly mitigated. Nothing, perhaps, would contribute more to meliorate education in general, than what has been long and much wanted, a serious and minute attention of the Faculty to this particular branch of medical study, which, at present, I am concerned to say, is almost totally neglected.

The few books extant on this subject are neither written on scientific principles, nor calculated, by their manner and style, to afford plain and familiar instruction. It is not enough for professional men to plan systems of education in their studies; let them also demonstrate in practice, that they are familiarly acquainted with the *true* method of educating children; a method, which, in my opinion, implies somewhat more than merely prescribing and administering medicines.

So long as the nursing of children remains exclusively in the hands of common midwives and nurses, it is rather a matter of surprise that so many infants should survive the age of childhood. We ought, therefore, above all things, to inquire into the monstrous prejudices prevailing in this essential part of domestic management, and thus make the first step towards their eradication.

How great would be my satisfaction if, by the following strictures, I should be able to prevail upon some

* To some readers it may be necessary to explain, that by *physical education* is meant the bodily treatment of children; the term *physical* being applied in opposition to *moral*.

intelligent mothers, who possess sufficient fortitude, to throw off the bondage of old customs or modern fashions, and to return to the path of simple nature!—In a system of practical education it is a judicious precept, which cannot be too much inculcated, *to omit rather than to undertake, or be too officious in, the physical treatment of infants.*

From the difficulty of discovering the true cause and seat of the complaints of children, especially if accompanied with any particular symptoms in the excretory vessels, it is very usual to administer a *gentle laxative* or *emetic* upon the slightest occasion.—It would lead me too far to examine, in detail, the many bad consequences resulting from so absurd and detrimental a practice. I cannot, however, forbear to remark, that, by dealing constantly in aperient medicines (a strange infatuation among the vulgar), the future diseases of the child assume a particular character of the *gastric* kind; for the juice of the stomach, which serves to concoct the food, is thus vitiated. As the operation of laxatives is in a manner mechanical, by impelling the fluids, and particularly those of the mucous kind, towards the stomach and bowels, and causing them to accumulate in a greater degree than usual, it will be easily understood, that, by the frequent repetition of this stimulus, the gastric juice will be rendered unfit to effect the proper solution of food in the stomach. For the same reason, persons subject to frequent costiveness soon begin to complain of indigestion when they once habituate themselves to take ANDERSON'S or any other aperient pills; for by them the stomach is converted, as it were, into a field of battle, where all the irregularities that take place in the system are left to fight their way; where the limits of disease and health, nay, the alternative of life and death, are to be finally determined. That this, however, is not the most proper place for such a conflict requires no demonstration. The stomach is appointed by Nature for very different purposes; it is the only organ of nourishment and digestion, the source of restoration and

health. But how can it effectually answer this end, if it serves, at the same time, as the constant laboratory of diseases? When it is in a state of impurity, it cannot act with uniform energy and a sufficient degree of elasticity, so as to prevent frequent irregularities in digestion. Hence arise bad humours, hypochondriac affections, and nervous debility; all of which, I have reason to fear, are, more or less, the consequences of tampering with medicines, especially in the period of infancy. I am further induced to think, though it may to some appear rather a bold idea, that more children are destroyed by the absurd practice of loading their tender stomachs with every sort of trash, and afterwards relieving them by repeated doses of physic, than by any *natural* process. This likewise accounts for the great number of children who die *in towns*, at an early age, before they become inured to such severe attacks on their digestive organs.

In order to check, and, if possible, to prevent, this general tendency to disease; to meliorate the constitution of children, by producing a regular circulation of the fluids; and to direct the exuding morbid matter more universally and uniformly through the pores of the skin, a more effectual remedy cannot be suggested than that of *frequent bathing*, and a very limited use of aperient medicines.

These observations are not conjectural, but founded on experience; and it gives me pleasure to add, that they are confirmed by many physicians of eminent abilities and extensive practice.

Frequent bathing, in infancy, is a powerful means of counteracting and suppressing the disposition to stomatic and bilious complaints, which, at present, are uncommonly prevalent among children and adults, and are frequently accompanied with diversified nervous symptoms. By a proper use of the bath many infantile diseases may be safely prevented; catarrhs suppressed, or greatly mitigated; teething rendered easy; and the whole physical condition of the child considerably im-

proved, from the efforts of Nature, to throw off malignant humours by the pores.

It becomes here a question, which is the most proper degree of heat in the bath for children. I shall venture to pronounce, upon the authority of the best modern authors, confirmed by my own experience and observation, that the *lukewarm bath*, between 84 and 96° of Fahrenheit's thermometer, rather warmer than new milk, is, upon an average, the most suitable temperature. An erroneous notion too much prevails, that the good effects of bathing are principally to be ascribed to the *cold bath*. The use of any bath, indeed, whether cold or warm, that is, the stimulating impression excited by the water, is, of itself, an excellent tonic, serving to brace and invigorate the whole system. Not to mention the comfortable sensations that must necessarily attend the cleansing and opening so many millions of pores, with which the skin is provided, it is farther remarkable, that water, formerly considered as a *simple* element, is now pretty generally understood to be a *compound* body, consisting of *oxygen* and *hydrogen*, or vital and inflammable air; the former of which it is well known promotes the process of *respiration*, and literally nourishes the vital principle in the human body. Although this assertion rests chiefly on an hypothetical foundation, so much is certain, that a lukewarm bath, used for the legs alone, is found, by experience, to communicate new spirits to the weary traveller, almost instantly to remove the sense of languor, and to re-animate all his faculties. BRUCE, the Abyssinian traveller, remarks, that in the intense heat of that country, a lukewarm bath afforded him more refreshment and vigour than a cold one. We ought farther to consider, that infants are accustomed scarcely to any other than a *warm* temperature. The cold bath belongs to the class of *heroic remedies*, and in its sudden and powerful effects nearly resembles electricity. It is, moreover, an axiom in medicine, that the means of stimulating and corroborating the system, should be in proportion to the degree of vital power in the individual;

that a faint spark may be extinguished rather than kindled by too violent a concussion of air; and that a degree of stimulus and invigoration, which agrees with a firm and robust body, may prove destructive to one that is weak and delicate. It might, therefore, be extremely hazardous to employ a remedy in the delicate frame of infants which even adults should not resort to, without the greatest precaution. I presume to go a step farther, and do not hesitate to say that the use of the cold bath, as far as relates to the treatment of children, is even DANGEROUS. Its principal mode of operation is by contracting the whole surface of the body, and causing a general repulsion of the fluids towards the internal parts. Hence, in a young and delicate body, which has very little internal *re-action*, the necessary consequence of cold bathing will be an unequal distribution of the fluids, a partial or local stagnation of them; and, what is worst of all, an accumulation of humours in the head, by which infants are frequently injured before it is in their power to complain. The lukewarm bath, on the contrary, produces an uniform revolution and salutary purification of all the fluids. For these reasons I consider the tepid bath as in every respect preferable, since it may be used somewhat cooler for thriving children, or warmer for those of a weakly constitution, and the requisite degrees of heat be regulated according to the increasing age and strength of the child. In summer, the water of the bath ought to be exposed the whole day to the rays of the sun, which will impart to it an agreeable and congenial warmth. Rain or river water is the most proper for this purpose; but if it be necessary to use spring or well water, it should be previously softened with a small quantity of boiled water, in which a quarter of an ounce of soap has been dissolved, with the addition of a little bran or oatmeal; or if milk can be obtained, it will be a still more useful ingredient. I would particularly recommend not to boil the *whole* quantity of the water to be used for bathing, as it would in that case be deprived of its aërial constituents, which are not without their

importance in the bath.—During the first weeks and months the child should not be suffered to remain in the bath longer than five minutes, and the time may be gradually increased to a quarter of an hour. During the whole process of bathing, the body should not remain inactive, but be gently rubbed with the hand, and afterwards with a soft sponge. It is of consequence to attend to the point of time when the child is taken out of the bath; for, in almost every instance, where warm bathing disagrees with the child, it will be found to arise from neglect in not wiping and drying the body, with sufficient expedition, at this particular period. Hence, it is highly necessary to keep warm clothes in readiness, in which the child should be wrapped up, and dried, the very moment it is taken out of the bath. Every one in the habit of bathing must have observed, that the evaporation of water on the skin excites penetrating and uncomfortable sensations of cold; and there is an astonishing difference of temperature between actually being in the water, and having water on the skin after quitting the bath. If, therefore, a child, from want of due precaution, be kept for several minutes with a naked, wet body, it will be liable to contract a cold, the more dangerous in its consequences, as it immediately succeeds a state in which the body has been warm and the pores open.

It should be farther observed, that bathing, immediately after a meal, or with a full stomach, is highly improper, if not dangerous, both in children and adults; nor is it advisable, in rough weather, to carry a child into the open air too soon after bathing. The most proper time for using the bath is the evening, when the child can be removed to bed as soon as it is completely dried.

There is another species of bath equally indispensable, which I will call the *Air-bath*, or the daily enjoyment of fresh air. This is usually considered as a promenade, or walk of pleasure; and, as children cannot judge of its great utility, and the weather is not always favourable for excursions, parents are sometimes guilty

of unpardonable neglect, in confining infants for whole days and weeks together within their rooms. But if air be essentially requisite to animate the most subtle powers of man, it follows, that it is as necessary to the organs of life as food and drink; and that its salutary influence on the constitution does not so much depend on the state of it, with respect to pleasantness and serenity, as on its freshness and constant renewal. Hence, I would impress it on the reader, as a rule not to be violated, *to let no day elapse without affording the child an opportunity of imbibing the salubrious qualities of fresh air.*—In the first months great precaution is necessary; and children born in spring or summer have, in this respect, no small advantage, as there is less danger in exposing them to the open air during the warm months than there is in autumn and winter. In the milder seasons, too, violent winds and moist weather cannot be too carefully avoided. After the two first months of its existence, if the child has been duly habituated to fresh air, it may be safely carried out in *any* state of the weather; this ought to be regularly done every day, if it be only for half an hour, as it is one of the most nourishing cordials that can be given. I shall just notice here, in a cursory way, the great benefit which the eyes of children derive from this practice, and which, especially at a time when complaints of weak and sore eyes are heard in almost every family, is of the utmost importance. It is an unquestionable fact, that shortness of sight, and weakness of the eyes, so prevalent among the inhabitants of towns, is chiefly owing to the injudicious custom of confining children, during the first years of their lives, almost constantly within four walls; so that the eye, being accustomed to *near* objects only, becomes organized for a narrow view, and, at length, is rendered incapable of forming the proper focus for *distant* objects. On the other hand, it is equally certain, that by an early and daily exertion of the organs of sight, in beholding remote objects in the open air, the circle of vision is en-

larged, the power of sight increased, and, consequently, a solid foundation is laid for acquiring a clear and comprehensive discernment of objects.

From the preceding observations it will be readily admitted, that the proper and daily airing of the nursery, *in winter as well as in summer*, is of no small importance to the health of children.—It has been proved, by many fatal instances, that a confined and impure air is, of itself, capable of exciting the most violent convulsive symptoms, and, consequently, is one of the principal causes that so many infants die of convulsions soon after their birth. Would it not be more eligible to select the most airy apartment in the house for a nursery, instead of confined garrets, as is too frequently the case in large families? The room in which children breathe should, at least, be capacious and lofty, and exposed to the cheering rays of the sun, which not only influence the temper and spirits of children, but serve to purify the vitiated air in their apartments.

Persons unaccustomed to reflect on this subject, can scarcely conceive what salutary effects the simple means here recommended, namely, the early habit of washing, bathing, and daily airing, produce on the constitution and physical formation of the child. The habit of body, growth, and appearance of children, properly educated in this respect, will be totally different from those who are reared, like foreign plants, in a hot-house. To point out still more forcibly the peculiar advantages attending the regimen here recommended, I shall exhibit a picture of such children, not taken from fancy but authorized by facts, and agreeable to the experience of many modern observers, as well as my own, and that of a respectable physician in Germany, Professor HUFELAND, of Jena, to whom I am greatly indebted for the following observations:

1. A child, whose physical education is properly attended to, becomes more hardy and less affected by the vicissitudes of climate and weather.

2. Its body is straight and robust; its limbs are uniformly muscular, and well proportioned.

3. The stages of evolution, in its different organs, take place in regular succession—no power, no capacity, outstrips another; its teeth do not appear too soon, nor at irregular periods; the child does not begin to walk too early nor too late; and the same order is observable with regard to its speaking. Even the mental faculties expand themselves more regularly; that is, not too rapidly, but after the most important bodily changes have been effected. Every period of its progress to maturity comes on in a natural and gradual manner, so that the child, in a physical sense, longer remains a child; he does not mature into manhood before he has completed the proper term of youth; and thus every stage, as well as the whole career of his existence, is considerably prolonged.

4. By this treatment the circulation of the fluids, and all internal motions, particularly of the lungs and intestines, together with the usual evacuations, are beneficially promoted. Of no less advantage is the bath to those children who are subject to habitual costiveness; a distemper which cannot be too much guarded against, not only during the age of childhood, but also throughout life:—while infants accustomed to the bath and fresh air are scarcely ever known to suffer from this complaint.

5. The texture of their muscular flesh becomes solid, the colour blooming, and the body neither appears tumid and spongy nor parched and meagre. The complexion is lively and fresh; the head and lower belly are in just proportion to the rest of the body; and the disposition to rickets, so common in children, is in them imperceptible.

6. Neither are such children as enjoy the benefit of the bath affected by that excessive sensibility and diseased irritation of the nervous system, which, in many instances, so fatally degenerates into spasms, fits, and

convulsions. These irregularities, in early life, are chiefly instrumental in bringing on that pitiable state, in which some unhappy persons, through the whole of their lives, are little better than *loco-motive, nervous machines*, or passive beings, that exist apparently for the sake of *feeling only, not for acting*.

7. Diseases of the skin, eruptions, catarrhs, coughs, obstructions of the first passages, &c. seldom attack a child when properly treated; and if they do, their duration will be short, and the *crises* easy and natural.

8. Those diseases in children which are commonly called dangerous, as the small-pox, measles, scarlet fever, &c. and which are ultimately diseases of the skin, are greatly alleviated in their symptoms, and more easily overcome, when the skin is in full health and vigour; but, as the usual management of children deprives the skin of those properties, we need not be at all surprised at the danger and subsequent mortality of children in the above mentioned diseases.

9. The early practice of washing and bathing may be also recommended, as tending to strengthen that habit of cleanliness, which is so praise-worthy and useful in itself, and which is not sufficiently cultivated among those nations where the bath is in disuse.*

If the means above stated are expected to produce their full effect, it should not be forgotten, that the *whole* management of the child ought to correspond and keep pace with the preceding practice. Without due attention to this circumstance, constant washing and bathing may not only prove of little service, but may, in some instances, be productive of mischief. Hence,

* The Russians, notwithstanding their ignorance and rusticity of manners, excel the more refined French and Germans, both in a delicate sensibility of cleanliness and in the practical use of the bath. I lately read of a foreign gentleman, who, during his travels in Russia, had hired one of the natives as his groom or postillion. After having travelled for several days in very sultry weather, the semi-barbarian, upon his knees, requested his employer to grant him leave of absence for two or three hours, to refresh himself with the luxury of a bath, which to him was indispensable, and the want of which he had long felt. The *peasants* in that country possess a refinement of sense, with respect to the surface of the body, with which the most elegant *ladies* in other countries seem totally unacquainted.

it is absolutely necessary to prohibit the use of feather-beds, burthensome dresses, &c. and to avoid the suffocating air of close rooms, whether occasioned by too great heat or a vitiated atmosphere.

There is no practice more detrimental to the powers and energy of man, in the first period of his evolution, than that of immediately sinking the tender infant in a soft feather-bed. In this situation all the organs become extremely relaxed, and we lay the foundation of a very serious malady, a *sweating skin*; the source of constant colds, tooth-aches, head-aches, catarrhs, and innumerable other complaints.

For these and similar reasons, I would advise parents to lay their children, from the very hour of their birth, on soft and cooling matresses, under thin blankets or cotton quilts, which do not incommode the body, leave the hands and arms at liberty, and are not liable to excite too great a degree of heat. In the intense cold of winter an additional blanket may be used, which, however, should be removed when the weather becomes milder and the child grows stronger. But the greatest mischief arises from bolsters or pillows filled with feathers, which must, after a certain time, produce uncleanness and a disagreeable smell. Such a pillow is calculated to collect and retain mephitic vapours; and, for this obvious reason, it cannot but be unsafe to sleep for a whole twelve-month with one's head reposed on such a mass of acrid exhalations. This inconvenience may be easily avoided, by furnishing children with cushions filled with horse-hair, or with the softest bran, previously well beaten; the best for this purpose is the bran of oats. The great advantage of these pillows is, that they admit moisture to pass through them, consequently they will always remain dry, and may from time to time be renewed, while they preserve a moderate and regular degree of warmth.

Cleanliness, in domestic life, is one of the cardinal virtues, and an essential requisite to the proper physical education of children. Indeed, I cannot help remarking, that this is, perhaps, the *only* province of parental

care, in which we *never* can do *too much*. For this end, we ought not to neglect the article of linen, as the frequent change of it is of more consequence than many parents may suppose. A child is much more liable to perspire than an adult; the natural effect of which is, that its linen is more readily soiled and rendered unfit for wearing. I would, therefore, advise all parents, who can afford it, to give their children clean, dry linen *every day*. An undoubted proof of the utility of this practice is, that instances have occurred of children being cured of the rickets, when, from the first appearance of that complaint, they have been daily furnished with clean linen, well dried, and occasionally smoked with juniper-berries, frankincense, or other fragrant substances, in order to expel the moisture which is absorbed by linen. But, if a clean change cannot be conveniently procured every day, the night-shirt, as well as that of the day, ought to be regularly dried and perfumed if necessary.

Lastly, let the dress of children be light; the head and breast, during the first months, may be covered, though very slightly; but, as soon as the hair is sufficiently strong to afford protection, there is no particular necessity for hats or caps, unless in rainy or cold weather. The breast and neck acquire more firmness, and are rendered hardier, by keeping them uncovered; as our frequent colds and sore throats chiefly originate from the absurd habit of wearing bosom-friends and stiffened cravats.

I shall conclude these observations with an historical account from HERODOTUS, which clearly illustrates the advantage attending the cool regimen of the head. This judicious and learned writer informs us, that after the battle between the *Persians*, under CAMBYSES, and the *Egyptians*, the slain of both nations were separated; and, upon examining the heads of the Persians, their skulls were found to be so thin that a small stone would easily perforate them; while, on the other hand, the heads of the Egyptians were so firm that they could scarcely be fractured by the largest stones. The cause

of this remarkable difference HERODOTUS ascribes to a custom the Egyptians had of shaving their heads from the earliest infancy, and going uncovered in all states of the weather; whereas the Persians always kept their heads warm, by wearing heavy turbans.

I sincerely wish, that the rules and observations here submitted to the candid reader were more generally understood and practised, so far, at least, as they are found to accord with reason and experience. I am not, however, disposed to imagine, that plans of *sudden* improvement are the most likely to succeed; and I am well aware of the difficulties we must expect to encounter, when we attack old and rooted prejudices, with the hope of vanquishing them *all at once*. For though I should be fortunate enough to substitute sounder opinions, and better practices, in lieu of those already established; yet, unless the mind be prepared for such changes, by a proper philosophic culture, nothing is more probable than that a speedy relapse into former errors will be the necessary consequence. The history of our own time has, in some recent instances, evidently confirmed the truth of this observation. We find even the mandates of arbitrary power insufficient to produce a thorough reform in the manners and customs of a superstitious people. The philanthropic but weak Emperor, Joseph II. was obliged to yield to the torrent of popular prejudice; and, in spite of his better reason, frequently to repeal measures dictated by the enlightened genius of philosophy. His obstinate and infatuated subjects were not yet ripe for such salutary innovations. Our age is scarcely docile enough to pursue those improvements, which a rapid and constant progress in the sciences daily suggests. Upon this ground alone we can explain the frequent and obvious contrast between the prevailing theories and practices, both in the higher and lower walks of life. A great majority of the common people, from their habitual indifference to literature, and their aversion to serious reflection, still manifest their ancient prejudices to every thing which comes under the description of novelty

or improvement. More than one generation will probably elapse, before even a part of the useful hints can be realised, which lie dispersed in the modern writings on subjects of health and domestic economy.—Whatever benefits can be attained by popular instruction, both with regard to the treatment of children and adults, must be introduced in a gradual manner. The ancient treatment of children, being consecrated by time, must not be rudely and precipitately rejected; but old customs may be changed by prudent and moderate management; and thus we may proceed, from one step to another, in extending the boundaries of truth and reason. A gradual transition from a faulty to a better state of things is commonly the most permanent. Let us combat, at first, the most dangerous notions and prejudices: the conquest over a *single* prejudice, if completely effected, is a triumph of no little moment; inasmuch as it will shake the foundation of many others more or less connected with it.

In my earnest endeavours to caution the reader against inveterate prejudices, I do not mean to insinuate, that a perfect and permanent state of health is compatible with the delicate organization and complex functions of the human body. I am well aware, that its most healthy condition closely borders on disease, and that the seeds of distempers are planted in the very fulness or luxuriance of our fluids. Hence, no *absolute* perfection is to be found among mortals, whether we consider them in a physical or moral state. CICERO illustrates this proposition, when speaking of man as a moral agent, with equal truth and energy, in the following words: “He is not,” says this philosophical orator, “the most virtuous man who commits *no* faults; but I consider him as the most virtuous, whose conscience reproaches him with the *fewest*.”

LECTURES, &c.

CHAP. I.

A practical Inquiry into the means and plans adopted among different nations, with a view to prolong human life.—An historical survey of this interesting subject, in different ages; together with the success which has attended the respective efforts made by nations and individuals.—A brief statement of the conditions requisite to the attainment of a long and healthy life.—Observations, rules, and cautions deduced from the experience of ages.—Symptoms of actual dissolution.—Summary account of a dietetic system; explanation of its design, and the vast diversity of objects comprehended under this popular science.

AS the enjoyment of “a sound mind in a sound body” is one of the greatest of terrestrial blessings, it is incumbent on every rational inquirer, to devote some portion of his time and industry to the research of such useful and practical objects, as may contribute to improve and insure so desirable a state.

As long as the various functions of the human body, the voluntary as well as the involuntary motions, are performed with ease, and suffer no interruption, we usually pronounce it in a state of health; in the contrary case we call it diseased. I shall advance a step farther, and assert, that when we do not feel ourselves encumbered with the weight of our own frame, and when we are not disposed to reflect, with uneasiness and solicitude, upon its physical condition, then we have a right to consider our health as being in a perfect state.

Although we are liable to suffer from the attacks of disease, in a variety of shapes, yet we have abundant reason to contemplate, with satisfaction, the vicissitudes of human life: for, even in the present imperfect state of

things, we find comforts more than sufficient to counterbalance our sorrows. Considering the innumerable accidents to which we are daily and hourly exposed, it is a matter of just surprise, that frail, imbecile man should remain in health during the greater part of his life; and still more so, that, upon an average the number of healthy individuals should be found far to exceed those in a contrary state. If we farther advert to the want of thought and circumspection, which marks the conduct of man in general, in the treatment of his body, our astonishment will necessarily increase, that he so often escapes the dangers prepared by his own hands. But parental Nature frequently repairs the injury, though we are unconscious of her salutary efforts. She powerfully co-operates, when art is called in to assist in restoring that harmony and order in the system, which had been imprudently or inadvertently disturbed. To her healing powers we are principally indebted, if the sufferings resulting from ignorance or obstinacy are less severe than the extent of the mischief seemed to portend.

It cannot be expected, that persons unacquainted with the economy of the human frame should be able to discriminate between internal and external causes, and their effects. Where a competent share of this knowledge is wanting, it will be impossible to ascertain, or to counteract, the different causes by which our health is affected; and should a fortunate individual ever fix upon a suitable remedy, he will be indebted to chance alone for the discovery.

This has been the case in all ages, and, alas! it is still the case. Remedies have, from time to time, been devised, not merely to serve as *Nostrums for all diseases*, but also for the pretended purpose of *prolonging human life*. Those of the latter kind have been applied with a view to resist or check many operations of Nature, which insensibly consume the vital heat and other powers of life, such as respiration, muscular irritation, &c. Thus, from the implicit credulity of some, and the exuberant imagination of others, observations and expe-

riments, however incompatible with sound reason and philosophy, have been multiplied, with the avowed design of establishing proofs or refutations of this or that absurd opinion. In this manner have fanaticism and imposture falsified the plainest truths, or forged the most unfounded and ridiculous claims; insomuch that one glaring inconsistency was employed to combat another, and folly succeeded folly, till a fund of materials has been transmitted to posterity, sufficient to form a concise history of this subject.

Men, in all ages, have set a just value on long life; and, in proportion to the means of enjoyment, this computation has been felt in a greater or less degree. If the gratification of the sensual appetite formed the principal object of living, the prolongation of it would be, to the epicure, as desirable as the prospect of a life to be enjoyed beyond the limits of the grave is to the moralist and the believer.

In the Old Testament the promise of a long life is held up as one of the most important sources of consolation; and, conformably to the principles of Christianity, a patient continuance in well-doing, or, in other words, a long life, rich in good works, can best insure the hope of a more happy state in a future world. Hence the wish of a speedy termination of our existence in this world is one of those eccentricities, into which only persons deprived of reason are liable to be drawn, either from extreme anxiety or the want of fortitude. The desire of longevity seems to be inherent in all animated nature, and particularly in the human race: it is intimately cherished by us throughout the whole of our existence, and is frequently supported and strengthened, not only by justifiable means, but also by various species of collusion.

The possibility of prolonging human life was never doubted by the Orientals, even in the earliest ages. One of the most ancient methods on record, is that of placing the aged and decrepit in the vicinity of an atmosphere replete with the exhalations of blooming youth. It is not improbable, that a certain custom which then

prevailed in the East, by alluring the fancy with beautiful images, and by imposing upon the understanding through poetical fictions, first induced man to entertain this singular notion. The bloom of youth, and particularly that of the healthful virgin, was compared, by the Orientals, with roses, lilies, and other elegant flowers; she was introduced, in allegorical description, to represent odoriferous spices, balms, and oils, and was made the subject of pastoral and other poems. How easy, then, the transition from fancy to belief, that the exhalations of vigorous and healthy persons must be highly conducive to the support of exhausted age; that they, like the fragrant balms of the East, were capable of softening the rigidity of the fibres, of exciting the vital spirits, and, in short, of supplying the aged with a fresh stock of health. The history of King DAVID furnishes us with a striking illustration of this renovating process.

In the writings of the ancient physicians we meet with various accounts, from which we learn, that this method has ever been a favourite resource of invalids exhausted by age. Modern physicians also mention the practice, and the celebrated BOERHAAVE informs us, that he advised an old and decrepit Burgomaster, at Amsterdam, to sleep between two young persons; and that his patient, who, before, was sinking under the weight of infirmities, obviously recovered strength and cheerfulness of mind.

The great age of some school-masters has likewise been ascribed to the benefit they derive from breathing, almost constantly, among young and healthy children. It has been farther observed, that young persons, if they sleep with the aged, become lean and enfeebled.—Upon more accurate inquiries, however, it is pretty evident, that most, and, perhaps, the whole of the benefits which the aged derive from this expedient, may be placed to the account of the imagination, and its surprising effects on the body. It is this power which, in my opinion, renews the languishing flame of the aged, and which may

preserve them for some time longer in that renovated state, provided it be supported by a proper attention to diet and other circumstances.—We frequently see a debilitated and peevish old man assume a complacent, smiling aspect, when a sprightly maiden addresses him in the language of courteous pleasantry. The most charming images recur to his excited imagination; and the powers of life are, as it were, again roused, and directed to one object. That such means of re-animating old age may have a favourable effect on health, cannot be disputed.

To imagine, however, that the vigour of health, and the bloom of youth, can be transfused, by insensible perspiration, or exhalation, into the body of the aged, is to labour under a very palpable mistake. I shall prove, in the next chapter, “On Air and Weather,” that every living being necessarily vitiates the air, more or less, by its respiration; and that the atmosphere, thus impregnated, becomes unfit for others to breathe in; because every expiration contains certain particles, which are separated by the lungs, as not only useless, but noxious to the body. How, then, is it possible, that matters or substances should be hurtful to one body, if retained, and useful to another, if communicated? Or was it supposed, that the *watery parts* of insensible exhalation, from the juvenile body, could moisten and refresh the parched fibres of the aged? To accomplish this purpose, we are possessed of remedies much purer and more effectual. Natural warmth or heat is the only means competent to produce such a salutary effect; as that alone is capable of exciting the slumbering energy of life. And, in this respect, I apprehend, we ought to approve of the above described method practised by the ancients.

When young persons live or sleep with old people, and are observed to grow thin and infirm (which, however, is not always the case), that proceeds from another circumstance, namely, that the former absorb or inhale the noxious particles of the latter; but it by no means

follows, that the aged body attracts the vital principle from the younger. Although free *caloric*, or matter of heat, may probably pass from the young body into that of the aged; yet this transfusion, under certain circumstances, would be rather to the advantage than disadvantage of the former; because this deprivation of superfluous caloric is, not unfrequently, found to be serviceable and wholesome.

From the preceding remarks we may conceive, that a school-room, filled with the various exhalations of children, cannot conduce to the prolongation of life; and, consequently, that the great age of certain school-masters must be ascribed to some other cause. An accurate account of the mortality prevailing among that class of men, would satisfactorily demonstrate, that the age of school-masters is in a just proportion to that of other classes of society.

I shall now consider various plans that have been adopted for the prolongation of human life.

The Egyptians, who lived in a country rendered unwholesome by intense heat and frequent inundations, could not long remain ignorant of the comparative longevity of their northern neighbours, the Greeks. After many fruitless attempts to discover the true cause of their short existence, and to provide the means of removing that cause, they, at length became fanatical enough to imagine themselves possessed of the grand secret for prolonging life, in the constant use of sudorifics and emetics. The air of Egypt, being impregnated with aqueous and putrid particles, not only checked the process of perspiration, but also generated various epidemic distempers. In such cases, sudorific medicines were necessary and proper; and even emetics, by exciting a forcible commotion through the whole system, not unfrequently restored the activity of the cutaneous vessels, and thus produced a favourable effect in those maladies. Farther, the heat of the climate inspissated their fluids: this circumstance, connected with their usual mode of life and their crude aliment, necessarily produced an ex-

cess of bile, which overflowed the stomach upon the least occasion, and could not fail, sooner or later, to produce very obstinate diseases. Emetics, therefore, being eminently qualified to evacuate bile, would, of course, obtain general reputation among the Egyptians. These, and sudorifics, were, for a long time, considered as specific remedies, from their tendency to expel the matter so dangerous to health; and because, in those ages, diseases were considered the *only* enemies to longevity: the Egyptian physicians and philosophers not being able to distinguish between cause and effect, the former of which was the pestilential vapours of a hot climate.

A general custom prevailed in Egypt, to take, at least, two emetics every month; to inquire of acquaintances and friends how those medicines had operated, and to wish each other joy upon these occasions. I need not observe, that this singular method of prolonging life is not to be recommended as worthy of imitation; that the periodical custom of taking medicinal remedies renders their frequent repetition necessary, while it destroys their occasional efficacy; and that it, therefore, chiefly belongs to the department of the physician to determine when, and in what degree, such medicines are to be administered.

The Greeks lived in a more romantic and picturesque country; while their conceptions, with regard to the structure and functions of the human frame, were more correct and conformable to nature. Their philosophers and physicians were more enlightened, and less prejudiced, than those of Egypt: they were not, like the latter, under the capricious influence of a wild imagination, too frequently disordered by the effects of BLACK BILE. Nature, displayed in all her charms, in the sublime and beautiful scenery of their country, every where invited them to the enjoyment of free and pure air; the effects of this on their susceptible nerves, combined with an excellent system of bodily exercise, proved the best specific to counteract the operations of time, and prolong their active, healthful lives. For this great and beneficial purpose, particular methods and

rules were contrived, in order to give the body the most varied and effectual, yet gentle, motions:—these athletic exercises were judiciously adapted to the different constitutions, situations, and ages of life, so that the sagacious Greeks arrived at an extraordinary degree of perfection in the *gymnastic art*.

The great advantage of such a course of bodily exercise cannot be disputed, when we consider how many individuals meet with a premature death from want of activity, motion, and nervous energy; though their organization may be in no other respect deficient. Besides, a body inured to frequent and laborious exercise will not be easily affected by external causes of disease; being secured, as it were, by a coat of mail, against the attacks of many acute disorders.

The Greeks attempted to cure diseases in their first stages, or, at least, to stop their farther progress, by the systematic institution of gymnastic exercise. They caused the patient to move in various positions; applied gentle friction to the whole surface of the body; and used a variety of methods to overcome the languor of the muscles, by stimulating the muscular energy.

In relaxed, emaciated individuals, whose organization is deficient in the proper degree of tension or elasticity, this method must be allowed to possess great advantages; but I do not conceive it necessary to prove here, that it cannot be consistently applied to *all* diseases. It is not to be supposed, that the weary traveller can be either strengthened or refreshed by additional exercise.

The modern methods of bracing the human body, such as frequent bathing in cold water, exposing the body to all the vicissitudes of climate and weather, the various modes of supporting bodily fatigue, such as travelling on horseback and on foot, &c. which are so indiscriminately recommended to our aspiring youth, cannot, in every instance, fortify and render the human frame indestructible: on the contrary, *all such violent efforts* have a tendency to bring on the symptoms of age at a much earlier period than it ought to appear; as the

joints and muscles are thereby rendered liable to contract an uncommon degree of stiffness and rigidity.—To load tender youth with burthens disproportionate to their age, and to impose upon them the task of men, can never be the most proper means of hardening and preparing them for a long and active life.

A distinction, however, should be made here between bracing the *fibres*, of which all solid parts of the body consist, and bracing the sense of *touch* or *feeling*. The animal fibres may be solid, but should not be so rigid as to become insensible; a certain degree of irritability is necessary to the proper exercise of their contracting and relaxing power. If, farther, there should exist in the body a disposition towards rigidity and insensibility, any artificial modes of bracing it will be of a dangerous tendency. If, on the contrary, the fibres should be too irritable, the Grecian method may, in that case, be resorted to with safety and advantage. A striking instance of this occurs in the history of Captain Cook. On his arrival in the Friendly Islands he was seized with an acute rheumatism, attended with excruciating pains. He was soon relieved from this torturing situation, by the easy and instinctive process of gentle friction, which the islanders generally resorted to on such occasions. Thus a few untutored persons completely effected what could not have been sooner, nor more easily, accomplished by the systematic art of the learned.

From these considerations we may safely infer, 1. That the cold bath, gymnastic exercises, bodily fatigue of any kind, and all expedients to brace and invigorate the constitution, ought only to be adopted under certain limitations, viz. with a proper regard to particular cases and circumstances: and, 2. That these severe remedies cannot and ought not to be universally nor indiscriminately recommended as means of prolonging life.

Let us not, however, disparage the merits of that ingenious race of men, whom we only know from their inimitable works. For, though the method of the Greeks cannot be safely introduced among us, without

many and great exceptions, we must do them the justice to allow, that, in their operations of hardening the human body, they proceeded in a more cautious, gradual, and judicious manner, than the moderns seem willing to submit to. Sudden changes of any kind produce a sort of revolution in the body, and this is necessarily attended with a waste of strength proportionate to the violence of the shock.

PLUTARCH possessed clear and rational ideas on the subject of preserving and prolonging human life; the truth of which he confirmed by his own experience, during a series of many happy years. He advises to keep the head cool and the feet warm, not to take medicines on every slight indisposition, but rather to let Nature relieve herself, by fasting a day, and, while we attend to the body, not to forget the mind. Much learning is comprised in these golden precepts, which will be valuable as long as human nature remains the same. The attention bestowed upon the mind, however laudable, should not authorise us to neglect the care of the body; the intimate connection subsisting between both requires a due proportion of care and attention to be paid to each. In the same degree as a diseased body sympathetically torments the mind, so does an infirm mind agitate and harass the body; and such tortures and reciprocal effects are unavoidably attended with the consumption of animal life.—What PLUTARCH enjoins, with respect to keeping the head cool and the feet warm, is agreeable to reason and experience; we should not, however, imagine, that the grand secret of prolonging life consists in the sole observance of these maxims. The head and feet are not the only points in which life is concentrated; they may, indeed, have a beneficial or pernicious influence on the whole body, and, in this respect, they demand a share of our attention; but no other part ought, on that account, to escape our notice.

I now enter upon a very unpleasant task, namely, that of reviewing a period of darkness, during the barbarity

of the middle ages, when the progress of true knowledge was obstructed by the most absurd fancies and puerile conceits; when conjectures, caprices, and dreams supplied the place of the most useful sciences, of the most important truths. Chemistry, a science so essentially requisite to explain the phenomena of known and unknown substances, was studied chiefly by jugglers and fanatics;—their systems, replete with metaphysical nonsense, and composed of the most crude, heterogeneous materials, served rather to nourish superstition than to establish facts and illustrate useful truths. Universal remedies, in various forms, met with strenuous advocates and deluded consumers. The path of accurate observation and experiment was forsaken: instead of penetrating into the mysterious recesses of Nature, they bewildered themselves in the labyrinth of fanciful speculation; they overstepped the bounds of good sense, modesty, and truth; and the blind led the blind.

The prolongation of life, too, was no longer sought for in a manner agreeable to the dictates of Nature; even this interesting branch of human pursuits was rendered subservient to Chemistry, or rather to the confused system of Alchemy. *Original matter* was considered as the elementary cause of all beings; by this they expected literally to work miracles, to transmute the base into noble metals, to metamorphose man, in his animal state, by chemical process, to render him more durable, and to secure him against early decline and dissolution. Millions of vessels, retorts, and phials were either exposed to the action of the most violent artificial heat, or to the natural warmth of the sun; or else they were buried in some dunghill, or other foetid mass, for the purpose of attracting this *original matter*, or obtaining it from putrescible substances.

As the metal called Gold always bore the highest value, these crude philosophers concluded, from a ridiculous analogy, that its value, with respect to the preservation of health and the cure of diseases, must likewise surpass that of all other remedies. The nugatory art

of dissolving it, so as to render it potable, and to prevent it from being again converted into metal, employed a multitude of busy idiots, not only in concealed corners, but in the splendid laboratories of the palaces of the great. Sovereigns, magistrates, counsellors, and impostors, struck with the common phrenzy, entered into friendship and alliance, formed private fraternities, and sometimes proceeded to such a pitch of extravagance, as to involve themselves and their posterity in ruinous debts. The real object of many was, doubtless, to gratify their avarice and desire of aggrandisement: although this sinister motive was concealed under the specious pretext of searching for a remedy, that should serve as a tincture of life, both for the healthy and diseased; yet some among these whimsical mortals were actuated by more honourable motives, zealous only for the interests of truth and the well-being of their fellow-creatures. The common people, in some countries, particularly Italy, Germany, and France, often denied themselves the necessaries of life, to save as much as would purchase a few drops of the tincture of gold, which was offered for sale by some superstitious or fraudulent chemist: and so thoroughly persuaded were they of the efficacy of this remedy, that it afforded them, in every instance, the most confident and only hope of recovery. These beneficial effects were positively promised, but were looked for in vain. All-subduing Death would not submit to be bribed with gold, and Disease refused to hold any intercourse with that powerful Deity who presides over the industry and commerce of nations.

As, however, these diversified and almost numberless experiments were frequently productive of useful inventions in the arts and manufactures; and as many chemical remedies of real value were thereby accidentally discovered, the great and general attention to those bold projectors was constantly kept alive and excited. Indeed, we are indebted to their curious operations, or rather, perhaps, to chance, for several valuable medicines, the excellence of which cannot be disputed; but which, ne-

vertheless, require more precaution in their use and application, and more perspicacity and diligence in investigating their nature and properties, than the original preparers of such articles were able or willing to afford.

All their endeavours to prolong life, by artificial means, could not be attended with beneficial effects; and the application of the remedies thus contrived must necessarily, in many cases, have proved detrimental to the health of the patient. In proof of this assertion it will be sufficient to give a slight sketch of the different views and opinions of the Gold-makers, Rosicrucians, manufacturers of Astralian Salts, Drops of Life, and Tinctures of Gold, hunters after the philosopher's stone, &c. &c. Some of these enthusiasts fancied that life resembled a flame, from which the body derived warmth, spirit, and animation. They endeavoured to cherish and increase this flame, and supplied the body with materials to feed it, as we pour oil into a burning lamp.

Others imagined they had discovered something invisible, and incorporeal in the air, that important medium which supports the life of man. They pretended to catch, refine, reduce, and *materialize* this undefinable something, so that it might be swallowed in the form of powders or drops; that by its penetrating powers it might insinuate itself into the whole animal frame, invigorate, and, consequently, qualify it for a longer duration.

Others again were foolish enough to indulge a notion that they could divest themselves of the properties of matter during this life; that, in this manner, they might be defended against the gradual approaches of dissolution, to which every animal body is subject; and that, thus fortified, without quitting their terrestrial tabernacle, they could associate at pleasure with the inhabitants of the spiritual world.

The Sacred Volume itself was interpreted and commented upon by Alchemists, with a view to render it subservient to their interested designs. Indisputable historical facts, recorded in this invaluable book, were

treated by them as hieroglyphical symbols of chemical processes; and the fundamental truths of the Christian Religion were applied, in a wanton and blasphemous manner, to the purposes of making Gold, and distilling the Elixir of Life.

The productions of Alchemy are so far from promoting longevity, that they have rather a contrary tendency. All the remedies which it affords are of a heating and stimulating nature. The person who takes them will feel himself more cheerful for some time, and, on that account, he may fancy himself more vigorous and juvenile; as they certainly give an additional impulse to the sensations of life, like wine, spirits, and all other stimulants. But this increase of the *sensation of life* should by no means be confounded with an increase of the *power of life*. It may even be safely affirmed, that, by the increase of vital sensations, the career of life itself is accelerated, and the principle of it sooner exhausted; consequently, the duration of the body is necessarily shortened.

I should not omit to mention, that these remedies strongly increase the sensitive power of man; they predispose him to sensual pursuits; stimulate him to commit excesses of every kind; incite him to take continual or excessive exercise, as dancing and the like; and thus, by inevitable consequences, hasten the dissolution of the body. That, for instance, which, according to the natural course, ought to be expended or consumed in three days, is dissipated, perhaps, in as many jovial hours. This premature loss is attended with relaxation, irksomeness, and even aversion to life, till a new dose of stimulants reproduces the former artificial vivacity. It fares with the patient here as it does with the drunkard, who, in the morning that succeeds his nightly excess, feels his whole frame relaxed, torpid, and in universal tremor, so that he is obliged to take a fresh dram of his favourite liquor before he can enter on any serious business with pleasure or effect.

These famous essences, balms, tinctures of life, &c.

are farther dangerous, as they contract the small vessels, so necessary to the preservation of life as well as to the reparation of the losses sustained, and thus render them unfit to perform their office. Hence arise rigidity or stiffness, and exsiccation; the body becomes shrivelled, and the symptoms of old age appear at an earlier period than they otherwise would. Man is seldom unprovided with the supplies of vitality;—every breath of air we inhale, and every particle of food we swallow, is a fresh accession to the stock of life. But as soon as the *susceptibility* or *power of receiving* those supplies becomes languid, we may then be considered as unfit to perform the vital functions; and all the medicaments of nature and art will be found insufficient to procure relief. He who searches for the supplies of life in alchemical productions, elixirs, balsamic essences, &c. will, sooner or later, but always prematurely, experience the want of susceptibility. Even that impudent boaster and celebrated *insurer of lives*, THEOPHRASTUS PARACELSUS, although he pretended to have in his possession the stone of immortality, died—in his fiftieth year! His vegetable sulphur was a heating and stimulating remedy, similar to the Anodyne Liquor of HOFFMANN.

The world of spirits also was invaded, and summoned, as it were, to contribute to the prolongation of human life. Spirits were supposed to have the dominion of air, fire, earth, and water; they were divided into distinct classes, and particular services ascribed to each. The malevolent spirits were opposed and counteracted by various means of prevention: the good and tutelary were obliged to submit to a sort of gentle, involuntary servitude. From invisible beings were expected and demanded visible means of assistance—riches—health—friends—and long life. Thus the poor spirits were profanely maltreated, nay, sometimes severely punished, and even miserably flogged in effigy, when they betrayed symptoms of disaffection, or want of implicit loyalty.

As men had thus, in their weakness and folly, forsaken the bounds of this terrestrial sphere, it will easily be be-

lieved, that, with the help of an exuberant imagination, they would make a transition to the higher regions—to the celestial bodies and the stars, to which, indeed, they ascribed no less a power than that of deciding the destinies of men, and which, consequently, must have had a considerable share in shortening or prolonging the duration of human life.—Every nation or kingdom was subjected to the dominion of its particular planet, the time of whose government was determined; and a number of ascendant powers were fictitiously contrived, with a view to reduce, under its influence, every thing which was produced and born during its administration.

The professors of astrology appeared as the confidants of these invisible rulers, and the interpreters of their will; they were well versed in the art of giving a respectable appearance to this usurped dignity. Provided they could but ascertain the hour and minute of a person's birth, they confidently took upon themselves to predict his mental capacities, future vicissitudes of life, diseases, together with the circumstances, the day, and the hour of his death. Not only the common people, but persons of the highest rank and station, nay, even the men most distinguished for learning and abilities, did homage to those "gods of their idolatry," and lived in continual dread of their occult powers. With anxious countenances and attentive ears, they listened to the effusions of those self-appointed oracles, which prognosticated the bright or gloomy days of futurity. Even physicians were solicitous to qualify themselves for an appointment no less lucrative than respectable: they forgot, over the dazzling hoards of Mammon, *that they were peculiarly and professedly the pupils of Nature*.—The curious student, in the Universities, found every where Public Lecturers, who undertook to instruct him in the profound arts of divination, chiromancy, and the famous *cabala*.

Not to mention other instances, I shall relate an anecdote of the noted *Thurneisen*, who, in the last century, was invested at Berlin with the respective offices of Printer to the Court, Bookseller, Almanack-maker, Astrologer,

Chemist, and First Physician. Messengers daily arrived from the most respectable houses in Germany, Poland, Hungary, Denmark, and even from England, for the purpose of consulting him respecting the future fortunes of new-born infants, acquainting him with the hour of their nativity, and soliciting his advice and directions as to their management. Many volumes of this singular correspondence are still preserved in the Royal Library at Berlin. The business of this fortunate adept increased so rapidly, that he found it necessary to employ a number of subaltern assistants, who, together with their Master, realised considerable fortunes. He died in high reputation and favour with his superstitious contemporaries: and Thurneisen's Astrological Almanack is yet published in some of the less enlightened provinces of Germany. But it may be asked, how it happens, that an art which determines the fate of mortals, and ascertains the impassable limits of human life, can, at the same time, produce the means of prolonging it? This I shall now proceed to account for. The teachers of divination maintained, that not only men, but all natural bodies, plants, animals, nay, whole countries, including every place and family, were under the government of some particular planet. As soon as the masters of the OCCULT SCIENCE had discovered, by their tables, under what constellation the misfortune or distemper of any person originated, nothing farther was required than that he should remove to a dwelling ruled by an opposite planet, and confine himself exclusively to such articles of food and drink as were under the influence of a different star. In this artificial manner they contrived to form a system, or peculiar classification of plants, namely, lunar, solar, mercurial, and the like—and hence arose a confused mass of dietetic rules, which, when considered with reference to the purposes of health, cleanliness, exercise, &c. form a remarkable contrast to those of the Greeks.

Neither was this preventive and repulsive method confined merely to persons who suffered under some bo-

dily disorder; even individuals who enjoyed a good state of health, if an unlucky constellation happened to forebode a severe disease, or any other misfortune, were directed to choose a place of residence influenced by a more friendly star; or to make use of such aliment only as, being under the auspices of a propitious star, might counteract the malignant influence of its adversary.

It was also pretty generally believed and maintained, that a sort of intimate relation or sympathy subsisted between metals and plants; hence the names of the latter were given to the former, in order to denote this supposed connection and affinity. The corresponding metals were melted into a common mass, under a certain planet, and were formed into small medals or coins, with the firm persuasion, that he who carried such a piece about his person, might confidently expect the whole favour and protection of the planet thus represented.

The transition from one degree of folly to another is easy; and this may help us to account for the shocking delusions practised in the manufacturing and wearing of metallic amulets of a peculiar mould, to which were attributed, by a sort of magic influence, the power and protection of the respective planet: these charms were thought to possess virtue sufficient to over-rule the bad effects presaged by an unlucky hour of birth, to promote to places of honour and profit, and to be of potent efficacy in matters of commerce and matrimony. The German soldiers, in the dark and superstitious ages, believed, that if the figure of Mars, cast and engraved in the sign of the Scorpion, were worn about the neck as an amulet, it would render them invulnerable, and insure success to their military enterprises: hence, amulets were then found upon every soldier, either killed in battle or taken prisoner.

But let us quit a subject which excites disgust, by exhibiting such glaring deviations from truth and reason. It is much more pleasant to dwell upon examples which afford satisfactory proof, that the human mind has never been *entirely and universally* debased, and that there have

always existed some individuals, though few in number, who would not submit their neck to the yoke of popular prejudice, and whose superior talents and virtues rescued them from the impositions of general folly or depravity. A memorable instance of this rare merit is to be found in the Noble Venetian, LEWIS CORNARO, whose history illustrates this agreeable and instructive truth, that Nature, left to herself, or, in other words, a mode of life and diet properly adapted and regularly persisted in, will atchieve great things; and that a frame, disordered, and even reduced to the brink of the grave, may yet be re-established, and preserve its health and vigour for a great number of years.

CORNARO had been a professed epicure and libertine, till he entered into the fortieth year of his age. His constitution was so far reduced by the colic, rheumatic pains, fevers, &c. that his physicians, at length, assured him that he could not survive much longer than two months; that no medicines whatever could avert this catastrophe, and that the only possible means of preserving his life would be a regular adherence to a frugal diet. He punctually followed this advice, perceived symptoms of convalescence within a few days from the commencement of his plan of reformation, and, after the lapse of twelve months, was not only completely restored, but found himself in a better state of health than he had ever been during any period of his life. He resolved, therefore, to confine himself to a still more parsimonious regimen, and to take nothing but what he judged to be absolutely requisite for his support. Thus, during *sixty* years, he confined himself to exactly twelve ounces of food a day (bread and other nourishment included), with thirteen ounces of beverage. It should be also observed, that, during this long period, he carefully avoided violent heat, cold, passions, and extremes of every kind; and, by rigidly and uniformly adhering to this moderate diet, not only his body but his mind also acquired so determined a tone, that no common incidents could affect them. At a very advanced age he

lost a law-suit, which involved pecuniary concerns of great importance, and on account of which two of his brothers died of broken hearts;—but he still retained his usual health and tranquillity. His carriage was accidentally overturned, and dragged along by the horses; in consequence of which his arms and legs were dislocated. He caused them, however, to be reduced again, and, without taking any medicines, was, in a short time, restored.

The following is a striking instance of the dangerous effects attending the slightest deviation from long custom and habit:—When CORNARO had reached his eightieth year, his friends prevailed upon him to add a small portion to his daily quantum of food, alleging, that his advanced age necessarily called for additional support. Although he was not convinced by this argument, being of opinion, that, with the gradual decrease of strength, our powers of digestion are likewise impaired; and that we ought to diminish rather than to increase our food, in proportion to the decay of Nature; yet he yielded to the solicitations of his friends, and increased his food from twelve to fourteen, and his drink from thirteen to sixteen ounces. “Scarcely,” to quote the words of our dietetic veteran, “had I proceeded in this new mode of living for ten days, before I found my spirits visibly affected; a fretful, peevish temper succeeded to my former cheerfulness and gaiety, so that I became a burthen to myself and others. This change of temper was followed by symptoms still more alarming. On the twelfth day I was attacked with a pain in my side, which continued for twenty-four hours together, and soon after found myself oppressed by a fever that raged, with unabating fury, for thirty-five days, so that my life was, at times, despaired of. By the blessing of God, however, on returning to my former regimen, I recovered from this shock, and now enjoy, in my eighty-third year, perfect health of body and serenity of mind. I can mount my horse without assistance; I can climb steep precipices, and but lately I wrote a comedy abound-

ing with traits of innocent mirth and raillery. When I return home, after being engaged in my private affairs, or from attending the councils of state, I feel inexpressible satisfaction in the company of my grand-children, eleven in number, whose education, amusement, and songs are the comfort of my age. I frequently join them in singing, as my voice is now stronger and clearer than I ever knew it to be in my youth, and as my happiness is not disturbed by the complaints, the moroseness, and melancholy humours, so frequently the lot of intemperate old age."

In this happy frame of body and mind, CORNARO attained to his hundredth year; his virtuous and memorable example, however, has hitherto had but few imitators. He found, by *actual observation* and *experience*, that a strict and uniform regimen, or a regular daily allowance of food and drink ascertained by weight, was the best method *he* could pursue for the purpose of prolonging his life. He did not wish, however, to be understood, nor does it follow in general, that this or any other precise portion of nutriment is to be held out as a proper standard, by which *all persons* are to regulate their diet. His advice, that we should take no more food than what is absolutely necessary to our subsistence, may be thus explained; namely, that the restoration of strength, derived from supplies of nutriment, ought to bear an exact proportion to the losses sustained by the body. He, for instance, who spends little of his time in bed, and much in the open air, takes frequent exercise, is constantly employed in some laborious occupation, makes long journies on foot or horseback, or the like, will feel himself refreshed and strengthened after partaking of a plentiful meal and cheering beverage; and such a repast is even indispensable to him to recruit the sources of his muscular strength and activity.—If, on the other hand, a person who lounges away half of his time in bed, or upon the sofa, were to consume a quantity of food equal to the former, he would, no doubt, feel himself heavy and uncomfortable. Yet here,

too, the consequent loss of strength may vary in degree, in different sedentary persons; and this circumstance will afford me an opportunity, in the sequel, to apply to individual cases the doctrine suggested by the experience of CORNARO.

There was another period, during which *blood-letting* came into general use, and obtained great credit, as one of the most effectual means of prolonging life: while the superfluity and vitiated state of the blood, or what physicians term a *plethoric habit*, was supposed to be a principal cause of early dissolution. Through the veins, thus regularly opened, at certain seasons, the superfluous or vitiated blood was supposed to be emitted, while that of a more salubrious quality was left behind. Considered as a remedy, phlebotomy must certainly be allowed to possess its uses; and it is sometimes a necessary expedient to produce an immediate diminution in the fulness of the blood, particularly when the time is too short, and the danger too pressing, to admit of any other method for effecting that purpose. As there can be no doubt, that blood-letting is an invaluable remedy in many disorders, it is the more peculiarly incumbent on the practical physician to distinguish, with care, those cases, in which imminent danger may be averted, and health restored, by the use of it. I am of opinion, that there are two cases, and only two, in which venesection is likely to be attended with real advantage: 1st, When it is required to prevent the fluids from gaining access to the parts more essential to life; and, 2dly, Where means must be speedily used to counteract a threatened inflammation in the intestines. But, even in these two cases, the intelligent physician is at no loss for other remedies, which may be frequently administered with greater probability of success. In the treatment of every disorder, it is necessary to select that remedy which is found most suitable to the stage of the complaint. And here we have no occasion to start the question, Whether the method and the means, by which the disease is checked and health restored, are, in the end, best

calculated to prolong the life of the patient? Physicians professionally look upon every disease as an evil which cannot be too speedily removed; and it would be to hazard the recovery of their patients, in many cases, were they to waste time in reflecting upon the consequences of the remedy, with respect to its influence on the duration of life. Hence the art of prolonging life, strictly speaking, is not a distinct branch of medicine, but rather forms a separate art, and as such is the common property of all: it should therefore constitute a part of the education and studies of every rational individual, whatever be his other engagements and occupations.—The absurd notion, that blood-letting is useful and necessary to the prolongation of human life, is still pretty generally received among the common people of all countries. Neither the *good* nor the *bad* days, superstitiously marked in the almanacks for amusing the vulgar, can palliate or justify the mischiefs with which this dangerous error is pregnant. Bleeding can be of service only when it is performed at a proper time; and, to express my opinion of it in a few words, *it is always noxious to the healthy.*

The blood contains, and affords to the bones, ligaments, tendons, membranes, muscles, nerves, vessels; in short, to the whole organized body, all the parts which form the bones, ligaments, tendons, &c. Each of these parts is evolved from the blood, and adapted to its proper place, in so artificial a manner, that the human mind is totally at a loss to comprehend how this operation is performed; neither have the researches of the most acute and attentive observer been able to account for it. And as the blood serves to supply the waste, and to make up the losses, which those parts occasionally sustain, it may be considered as the original source of our whole organization. By its stimulating powers it also causes the heart and the arteries to contract; and, by that means, preserves the circulating motion, by which it is propelled through all the parts of the body, for the purposes designed by Nature.

Now it requires little reflection to perceive, that he who wastes this vital fluid, thereby obstructs, and, as it were, cuts off the sources of his support and regeneration. And though it be true, that the blood evacuated by periodical bleedings is soon reproduced by the activity of the vital powers, yet this restoration is not effected without considerable efforts, and at the expense of the whole machine. As this exertion, therefore, is a great pressure upon the vital powers, it must, of course, be attended with a proportionate degree of their consumption. It is too well known, that the corrupted part of the blood cannot be separated from the mass, so that the sound and uncorrupted particles alone may remain behind. If the quality of the blood ever become vitiated and diseased; if it be too thick and viscous, or too acrid, and dissolved, the whole mass participates in the infectious taint; neither is it in the power of art to contrive any method by which the corrupted part may be kept asunder from that which is in a sound state. It would be equally unreasonable to expect that a spoiled cask of wine could be cured of its tartness, by drawing or tapping the acid and impure portion from the top, and leaving the sweet and wholesome part behind.—Lastly, experience has shown, in numberless instances, that persons accustomed to frequent blood-letting are not only rendered more delicate in their constitutions, and thereby more subject to diseases, but also that they die, in general, at an earlier age than others; and though cases have occurred of some persons who, having been bled twice or four times a year, have nevertheless arrived at a considerable age, these instances only prove, that venesection was to them a proper medical remedy, perhaps adapted to their peculiar habit of body; or that the activity of their vital powers, their mode of life, and other favourable circumstances, internal and external, may have been sufficient to counterbalance the dangerous consequences resulting from the frequent loss of this essential fluid.

On the Doctrine of Transfusion.

At a time when the shortness of life was imputed to a distempered state of the blood; when all diseases were ascribed to this cause, without attending to the *whole* of what relates to the moral and physical nature of man, a conclusion was easily formed, that a radical removal of the corrupted blood, and a complete renovation of the entire mass, by substitution, was both practicable and effectual. The speculative mind of man was not at a loss to devise expedients, or rather attempts, to effect this desirable purpose; and this undoubtedly was one of the boldest, most extraordinary, and most ingenious attempts ever made to lengthen the period of human life. I allude here to the famous scheme of *transfusion*, or of *introducing the blood of one animal body into that of another*; a curious discovery, attributed to ANDREAS LIBAVIUS, Professor of Medicine and Chemistry in the University of Halle, who, in the year 1615, publicly recommended experimental essays to ascertain the fact. Libavius was an honest and spirited opposer of the Theosophic System, founded by the bombastic Paracelsus, and supported by a numerous tribe of credulous and frantic followers. Although Libavius was not totally exempt from the fashionable follies of that age, since he believed in the transmutation of metals, and suggested to his pupils the wonderful powers of *potable gold*; yet he distinguished rational Alchemy from the fanatical systems then in repute, and zealously defended the former against the disciples of Galen, as well as those of Paracelsus. He made a number of important discoveries in Chemistry, and was unquestionably the first professor in Germany who read Chemical Lectures upon pure principles of affinity, unconnected with the extravagant notions of the Theosophists.*

* As this remarkable sect was founded upon the doctrines of Paracelsus, during the latter part of the sixteenth and the beginning of the seventeenth centuries; and as the society known by the name of Rosicrucians, or Rosencrucians, has not been without its followers and propagators, in different shapes,

The first experiments, relative to the transfusion of the blood, appear to have been made, and that with great propriety, on the lower animals. The blood of the young, healthy, and vigorous was transfused into the old and infirm, by means of a delicate tube, placed

even to the present time, I shall here present the reader with a concise account of the origin and tenets of that fanatical sect.

We find this order first publicly announced to the world, in a book published in the German language, at Regensburg, in the year 1614, with the following title: "*The Universal and General Reformation of the World, together with an Account of the famous Fraternity of the Rosencrucians.*" In the work is an intimation, that the members of the society had been secretly at work, for a century preceding, and that they had come to the knowledge of many great and important secrets, which, if communicated to the world, would promote the happiness of man. An adventurer of the name of CHRISTIAN ROSENKREUZ is said to have founded this order, in the fourteenth century, after having been previously initiated in the sublime wisdom of the East, during his travels in Egypt and Fez. According to what we can learn from this work, the intention of the founder, and the final aim of the society, appear to have been the accumulation of wealth and treasures, by means of secrets known only to the members; and by a proper distribution of these treasures among Princes and Potentates, to promote the grand scheme of the society, by producing "*a general revolution of all things.*" In their "Confession of Faith there are many bold and singular dogmas; among others, that the end of the world is at hand; that a general reformation of men and manners will speedily take place; that the wicked shall be expelled or subdued, the Jews converted, and the doctrine of Christ propagated over the whole earth. The Rosicrucians not only believed that these events must happen, but they also endeavoured to accelerate them by unremitted exertions. To their faithful votaries and followers they promised abundance of celestial wisdom, unspeakable riches, exemption from disease, an immortal state of ever-blooming youth, and, above all, *the Philosopher's Stone*. Learning and improvement of the mind were, by this order, considered as superfluous, and despised. They found all knowledge in the Bible: this, however, has been supposed rather a pretext to obviate a charge, which was brought against them, of not believing in the Christian Religion. The truth is, they imagined themselves superior to Divine Revelation, and supposed every useful acquisition, every virtue, to be derived from the influence of the Deity on the soul of man. In this, as well as many other respects, they appear to be followers of PARACELSUS, whom they profess to revere as a messenger of the Divinity. Like him, they pretend to cure all diseases, through *Faith* and the power of imagination; to heal the most mortal disorders by a touch, or even by simply looking at the patient. The Universal Remedy was likewise a grand secret of the order, the discovery of which was promised to all its faithful members.

I think it unnecessary to enumerate any more of such impious fancies, if the Founder of this still lurking sect, now partly revived, had not asserted, with astonishing effrontery, that human life was capable of prolongation, like a fire kept up by combustible matter, and that he was in the possession of a secret which could verify his assertion. It is evident, however, from the testimony of the above mentioned LIBAVIUS, a man of unquestionable veracity, that this doughty champion in Medical Chemistry, or rather Alchemy, PARACELSUS, notwithstanding his bold assertions, died at Salzburg, in Germany, in the Hospital of St. Stephen's, in 1541; and that his death was principally brought on by the irregular and dissolute mode of life which he had for a long time pursued,

in a vein opened for that purpose. The effect of this operation was surprising and important : aged and decrepit animals were soon observed to become more lively, and to move with greater ease and rapidity. By the indefatigable exertions of LOWER, in England, of DENNIS, in France, and of MORITZ HOFFMANN, and others, in Germany, this artificial mode of renovating the life and spirits was successfully continued, and even brought to some degree of perfection.—The vein usually opened in the arm of a patient was resorted to for the purpose of transfusion : into this a small tube was placed in a perpendicular direction ; the same vein was then opened in a healthy individual, but more frequently in an animal, into which another tube was forced in a reclining direction ; both the small tubes were then slid into one another ; and, in that position, the delicate act of transfusion was safely performed. When the operation was completed, the vein was tied up in the same manner as in blood-letting.—Sometimes a quantity of blood was drawn from the patient previous to the experiment taking place. As few persons, however, were to be found that would agree to part with their blood to others, recourse was generally had to animals, and most frequently to the calf, the lamb, and the stag. These being laid upon a table, and tied so as to be unable to move, the operation was performed in the manner before described.

In some instances, the good effects of these experiments were evident and promising, while they excited the greatest hopes of the future improvement and progress of this new art. But the increasing abuses practised by bold and inexperienced adventurers, together with the great number of cases wherein it proved unsuccessful, induced the different governments of Europe to put an entire stop to the practice, by the strictest prohibitions. And, indeed, while the constitutions of men differ from each other so materially as they now do, this is, and ever will be, a hazardous, if not a desperate, remedy.—The blood of every individual is *sui generis*, or

of a peculiar nature, and congenial with that body *only* to which it belongs, and in which it is generated. Hence, our hope of prolonging human life, by artificial evacuations and injections, must necessarily be disappointed.

We are not, however, to suppose, that these and similar pursuits, during the ages of which we treat, as well as those which succeeded, were solely or chiefly followed by mere adventurers and fanatics. No; the greatest wits and geniuses of those times, together with the most learned and eminent men, deemed them objects worthy of their sedulous attention! Lord BACON, that sagacious explorer of the arcana of Nature, that luminary of science and talents, represents life as a flame, which is continually wasted by the surrounding atmosphere, and asserts, that *all the fluids* of the body may, from time to time, be renovated, and that such renovation is necessary. The remedies which he prefers and prescribes are conformable to this hypothesis. To prevent the *external* consumption, produced by circumambient air, he recommends the bath, and, after it, friction with oils and salves, with a view to fortify the pores, and exclude the influence of the external air. To counteract the *internal* waste of the body he inculcates the propriety of a cooling, moderate diet, and, above all, extols the narcotic or soporific remedies, as the true balm of life, and best adapted to attain the desired effect.—Tranquillity of mind, and a cooling diet, may, no doubt, be very necessary in some cases, where there is too great an irritability of temperament, and where the circulation of the blood is too rapid. But to a phlegmatic habit they will rather be injurious than serviceable. Narcotic remedies, too, are but ill qualified to cool and moderate the body, since they never fail to act as a certain stimulus, are attended with heat and relaxation, and, therefore, must accelerate the consumption of the vital powers: that sleep, also, which is artificial, and which they have a tendency to induce, cannot, upon the whole, be salutary. It is no less evident, that the vital power supplied by heat or *caloric* (which is principally evolved from the

air,* and introduced into the body by means of respiration), must be much less considerable during sleep than while we are awake.

For improving the fluids of the aged, and renovating the dry and corrupted part of them, Lord BACON thinks nothing can be put in competition with powerful laxatives, and advises the use of a full course of them every two or three years at least. These remedies are, in his opinion, the best qualified to evacuate vitiated humours, and afterwards to produce, in lieu of them, milder and more healthy juices. The exhausted, and, as it were, thirsty vessels may be replenished and strengthened, according to his ideas, by a refreshing and nourishing diet.

However plausible this theory may appear, the execution of it is impracticable, and the basis on which it rests merely conjectural. If it were possible to withdraw the impure part of the fluids from the body, by means of evacuants, and, at the same time, to remove the *causes* which produce the tendency to corruption, then the doctrine laid down by Lord BACON would deserve every praise, and the most minute attention to its merits. But it ought to be observed, that the activity and energy of *the whole* organized system is indispensibly necessary in the process of separating the noxious or useless particles. As, therefore, laxatives remove only the more watery fluids; as they have a bad effect on the stomach and intestines, by rendering them too irritable, and, consequently, less tonic or vigorous; as the bile, a fluid so essential to the concoction of food and assimilation of alimentary matter, is thereby uselessly wasted; as the balance between the solid and fluid parts of the body is, in this manner, destroyed; and as the vital powers must sustain a considerable degree of diminution, in affording supplies to repair what is lost; the precarious nature of *evacuants*, as the means of prolonging human life, appears too evident to require farther illustration.

* We shall have occasion to institute a particular inquiry into the properties of *air*, in the next chapter, from which it will appear, that one species of air is more noxious to the vital power than another, and that there is a greater consumption of it in one than in the other.

It is not, therefore, in such remedies as these, which can only be employed with safety where a judicious attention is paid to the case and circumstances of the patient, that we ought to confide, as the most proper to prolong the period of our existence: we must search for means less dangerous and more effectual.

There is a pretty numerous class of men, who profess to calculate the length of their lives, not so much by the number of years or days they have lived, as by the use they have made of them, or, to speak more plainly, by the quantum of sensual pleasure they have enjoyed. Persons of this cast, though fully sensible of the unavoidable consequences, are not averse to what is called *living fast*. Accustomed to reckon only upon the enjoyments of life, they wish to attain these in a shorter period of time, and in more rapid succession, rather than slowly and by degrees; especially as the duration of our life ever remains uncertain. Men of this sanguine character may be aptly compared to a plant forced in a hot-house, which will, indeed, grow up suddenly, but, if contrasted with a plant of slower growth, or any kind of fruit which gradually ripens to maturity, will be found much degenerated, neither possessing the solidity and strength of stalk, nor the astringent, aromatic, and other properties, in that vigour and perfection, which we find in vegetables raised in the open air. Many similar hot-house plants are discoverable among men, in the different stages of society. In childhood they display the premature acquirements of youth; in youth they show the sense, ambition, and other qualifications of manhood; and, before they have well passed through the prime of virility, they are either snatched away by untimely death, or their faculties become blunted and impaired.

It is the unalterable plan of Nature to proceed gradually in her operations; all outrage and extravagance militate against her established laws. The *true* enjoyment of life does not consist in the hasty pursuit of pleasure, nor in the intemperate indulgence of our sensual

appetites. The epicure is soon disordered by dangerous surfeit, in consequence of his indulgence in a variety of highly-flavoured dishes, and is obliged to spend that time in reluctant confinement, which he proposed to devote to his bottle, to his debauchery, or to some scene of gaiety; he is compelled to lead, as it were, a vegetable life, scarcely pitied by his friends, and, in the fullest sense of the word, to *exist* rather than to *live*.

In one respect we have little occasion to extol our own enlightened age, at the expense of those which are so frequently and justly termed *dark*: I allude to the bold and artful designs of imposture, and particularly *medical imposture*. We daily see illiterate and audacious empirics sport with the lives of a credulous public, that seem obstinately resolved to shut their ears against all the suggestions of reason and experience.

The host of empirics and mountebanks that infest our great cities, and the tinctures, essences, and balms of life so much in vogue even with the polished classes; the celestial beds, the enchanting magnetic powers lately introduced into this country by *Messmer* and his numerous disciples; the prevailing indifference to all dietetic precepts; the singular imposition practised on many females, in persuading them to wear the inert *acroamatic belts* (which shall be further noticed in the ninth chapter); the strange infatuation of the opulent, to pay *five guineas* for a pair of *metallic tractors** not worth a six-

* The Monthly Reviewers, in examining Mr. PERKINS's pamphlet on that subject, after having informed the reader, that a Dr. WILLARD, an American practitioner, the author himself, and four other persons, had *purposely* burnt themselves with a red-hot piece of iron, so that blisters were raised, in order to *experience* the anodyne effects of the tractors, and that all these living witnesses obtained relief in a few minutes, proceed in the following words:

"This zeal for knowledge is truly edifying, especially as the tractors are generously presented to the public at *only* five guineas a pair; and it is clear, that one pair would suffice to cure all the burns and scalds of a large parish. Why are not such luculent experiments repeated here? If Mr. P. or any admirer of the discovery, would submit to have a red-hot poker run into some part of his body not necessary to life (into *that part where honour's lodged*, according to BUTLER, for example), in any public coffee-house within the bills of mortality, and would afterwards heal the wound, in presence of the company, in ten minutes, or in half as many hours, by means of the tractors, the most stony-hearted infi-

pence; the tables for blood-letting, and other absurdities still inserted in popular almanacks, sufficiently evince, that this is far from being the "Age of Reason;" that the Temple of Superstition is yet thronged with numberless votaries; that human reason is still a slave to the most tyrannical prejudices; and that there is no readier way to excite general attention and admiration than to pretend to the mysterious and the marvellous.

The visionary system of JACOB BÖHMEN has lately been revived in some parts of Germany. The ghosts and apparitions, which had disappeared from the times of THOMASius and SWEDENBORG, have again, it seems, left their graves, to the great terror of fanaticism. New prophets announce their Divine mission, and, what is worse, find implicit believers! The inventors of secret medicines are rewarded by patents, and obtain no small celebrity; while some of the more conscientious, but less fortunate, adepts endeavour to amuse the public with *popular systems of medicine!* These, however, are harmless, in comparison with the daring experiments of which I shall briefly sketch the history.

One of the most dazzling and successful inventors in modern times was MESSMER, who began his career of Medical Knight-errantry at Vienna. His house was the

del could not resist such a demonstration. Why trifle with internal inflammations when such an outward and visible sign might be afforded?

"Mr. PERKINS has taken some pains, in the first part of his pamphlet, to show that the operation of his rods is not derived from animal magnetism. In our opinion, this is an unnecessary piece of trouble in England, where there is a constant succession of similar pretensions. The *virgula divinatoria*, and the *baguette* of the juggler, are the genuine prototypes of this mystery. We were, indeed, rejoiced, on Dr. PERKINS's account, to find that the Connecticut Society had only denounced him as a *Mesmerist*; we trembled, lest he should have been put into the inquisitorial hands of the old women as a white witch.

"To trace the relations and dependencies of projects, similar to that of Dr. PERKINS, would now be a work of more labour than utility. The fund of public credulity is an inexhaustible resource for those who can resolve to levy contributions on it. In vain is the spirit of quackery exorcised in one form; it rises again immediately, 'with twenty ghastly murders on its head, to push us from our stools.' We, who have contemplated the progress of real knowledge, during a long course of years, have seen many bubbles like this glitter for a moment, and then disappear for ever. People may talk of *Mesmerism* or *Perkinism*; but we consider all such varieties as belonging to the old and extensive class, *Charlatanism*."—*Monthly Review*, April, 1799, pp. 463 and 464.

mirror of high life; the rendezvous of the gay: the young and opulent were enlivened and entertained with continual concerts, routs, and illuminations. At a great expence he imported into Germany the first *Harmonica* from this country: he established cabinets of natural curiosities, and laboured constantly and secretly in his chemical laboratory; so that he acquired the reputation of being a great Alchemist—a philosopher studiously employed in the most useful and important researches.

In 1766 he first publicly announced the object and nature of his secret labours:—all his discoveries centered in the *magnet*—which, according to his hypothesis, was the best and safest remedy hitherto proposed against all diseases incident to the human body. This declaration of MESSMER excited very general attention; the more so, as about the same time he established an hospital in his own house, into which he admitted a number of patients *gratis*. Such disinterestedness procured, as might be expected, no small addition to his fame. He was, besides, fortunate in gaining over many celebrated physicians to espouse his opinions, who lavished the greatest encomiums on his new art, and were instrumental in communicating to the public a number of successful experiments. This seems to have surpassed the expectations of MESSMER, and induced him to extend his original plan farther than it is likely he first intended. We find him soon after assuming a more dogmatical and mysterious air, when, for the purpose of shining exclusively, he appeared in the character of a *Magician*—his pride and egotism would brook neither equal nor competitor.

The common Loadstone, or Mineral Magnet, which is so well known, did not appear to him sufficiently important and mysterious: he contrived an unusual one, to the effect of which he gave the name of '*Animal Magnetism*.' After this he proceeded to a still bolder assumption, every where giving it out, that the inconceivable powers of this subtle fluid were centered in his own person. Now the Mono-drama began; and MESSMER, at

once the hero and chorus of the piece, performed his part in a masterly manner. He placed the most nervous, hysteric, and hypochondriac patients opposite to him; and, by the sole act of stretching forth his finger, made them feel the most violent shocks. The effects of this wonderful power excited universal astonishment; its activity and penetration being confirmed by unquestionable testimonies, from which it appeared, that blows, similar to those given by a blunt iron, could be imparted by the operator, while he himself was separated by two doors, nay, even by thick walls. The very looks of this Prince of Jugglers had the power to excite painful cramps and twitches in his credulous and prejudiced patients.

This wonderful tide of success instigated his indefatigable genius to bolder attempts, especially as he had no severe criticisms to apprehend from the superstitious multitude. He roundly asserted things of which he never offered the least shadow of proof, and for the truth of which he had no other pledge to offer but his own high reputation. At one time he could communicate his magnetic power to paper, wool, silk, bread, leather, stones, water, &c.—at another he asserted, that certain individuals possessed a greater degree of susceptibility for this power than others.

It must be owned, however, to the honour of his contemporaries, that many of them made it their business to encounter his extravagant pretensions, and refute his dogmatical assertions with the most convincing arguments. Yet he long enjoyed the triumph of being supported by blind followers, and their increasing number completely overpowered the suffrages of reason.

MESSMER perceived, at length, that he should never be able to reach, in his native country, the point which he had fixed upon as the termination of his magnetical career. The Germans began to discredit his pompous claims; but it was only after repeated failures in some important promised cures, that he found himself under the necessity of seeking protection in Paris. There he met with a most flattering reception, being caressed,

and, in a manner, adored by a nation, which has ever been extravagantly fond of every thing new, whimsical, and mysterious. MESSMER well knew how to turn this national propensity to his own advantage. He addressed himself particularly to the weak; to such as wished to be considered men of profound knowledge, but who, when they are compelled to be silent from real ignorance, take refuge behind the impenetrable shield of mystery. The fashionable levity, the irresistible curiosity, and the peculiar turn of the Parisians, ever solicitous to have something interesting for conversation, to keep their active imagination in play, were exactly suited to the genius and talents of the inventor of Animal Magnetism. We need not wonder, therefore, if he availed himself of their moral and physical character, to assure easy entrance to his doctrines, and success to his pretended experiments: in fact, he found friends and admirers wherever he made his appearance.*

What splendid promises! what rich prospects! MESSMER, the greatest of philosophers, the most virtuous of men, the physician of mankind, charitably opens his arms to all his fellow-mortals who stand in need of comfort and

* His first advertisement was couched in the following high-sounding terms: "Behold a discovery which promises unspeakable advantages to the human race, and immortal fame to its author! Behold the dawn of an universal revolution! A new race of men shall arise, shall overspread the earth, to embellish it by their virtues, and render it fertile by their industry. Neither vice nor ignorance shall stop their active career; they will know our calamities only from the records of history. The prolonged duration of their life will enable them to plan and accomplish the most laudable undertakings. The tranquil, the innocent gratifications of that primeval age will be restored, wherein man laboured without toil, lived without sorrow, and expired without a groan! Mothers will no longer be subject to pain and danger during their pregnancy and childbirth; their progeny will be more robust and brave: the now rugged and difficult path of education will be rendered smooth and easy; and hereditary complaints and diseases will be for ever banished from the future auspicious race. Parents will impart to them the activity, energy, graceful limbs and demeanour of the primitive world. Fathers, rejoicing to see their posterity of the fourth and fifth generations, will only drop, like fruit fully ripe, at the extreme point of age! Animals and plants, no less susceptible of the magnetic power than man, will be exempt from the reproach of barrenness and the ravages of distemper. The flocks in the fields, and the plants in the gardens, will be more vigorous and nourishing, and the trees will bear more beautiful and luscious fruits. The human mind, once endowed with this elementary power, will probably rise to still more sublime and astonishing effects of nature:—who, indeed, is able to pronounce, with certainty, how far this salutary influence may extend?"

assistance. No wonder that the cause of magnetism, under such a zealous apostle, rapidly gained ground, and obtained every day large additions to the number of its converts. To the gay, the nervous, and the dissipated, of all ranks and ages, it held out the most flattering promises. Men of the first respectability interested themselves in behalf of this new philosophy; they anticipated, in idea, the more happy and more vigorous race which would proceed, as it were by enchantment, from the wonderful impulsive powers of Animal Magnetism. Nay, even the French Government was so far seduced by these flattering appearances, as to offer the German Adventurer *thirty thousand livres* for the communication of his secret art. He appears, however, to have understood his own interest better than thus to dispose of his hypothetical property, which, upon a more accurate investigation, might be objected to, as consisting of unfair articles of purchase. He, consequently, returned the following answer to the credulous French Ministers:—
“That Dr. M. considered his art of too great importance, and the abuses it might lead to too dangerous, for him, at present, to make it public; that he must, therefore, reserve to himself the time of its publication, and mode of introducing it to general use and observation; that he would first take proper measures to initiate or prepare the minds of men, by exciting in them a susceptibility of this great power; and that he would then undertake to communicate his secret gradually, which he meant to do without hope of reward.”

MESSMER, too politic to part with his secret for so small a premium, had a better prospect in view; and his apparent disinterestedness and hesitation served only to sound an over-curious public, to allure more victims to his delusive practices, and to retain them more firmly in their implicit belief. Soon after this he was easily prevailed upon to institute a private society, into which none were admitted but such as bound themselves by a vow to perpetual secrecy. These pupils he agreed to instruct in his important mysteries, on condition of each

paying him *one hundred louis*. In the course of six months, having had not less than three hundred such pupils, he realized a fortune of *thirty thousand louis*. It appears, however, that his disciples did not long adhere to their engagement: we find them separating gradually from their professor, and establishing schools for the propagation of his system, with a view, no doubt, to reimburse themselves for their expenses in the acquisition of the magnetising art. But few of them having clearly understood the enigmatic terms and mysterious doctrines of their foreign master, every new adept exerted himself to excel his fellow-labourers in additional explanations and inventions; others, who did not possess, or could not spare, the sum of one hundred louis, were industriously employed in attempts to discover the secret by their own ingenuity; and thus arose a great variety of magnetical sects. At length, however, MESSMER's authority became suspected; his pecuniary acquisitions were now notorious, and our *humane* and *disinterested philosopher* was assailed with critical and satirical animadversions from every quarter. The futility of his process for medical purposes, as well as the bad consequences it might produce in a moral point of view, soon became topics of common conversation, and, at length, excited even the apprehensions of Government. One dangerous effect of the magnetic associations was, that young voluptuaries began to employ this art to promote their libidinous and destructive designs.

As soon as matters had taken this serious turn, the French Government, much to its credit, deputed four respectable and unprejudiced men, to whom were afterwards added four others of great learning and abilities, to inquire into and appreciate the merits of the new discovery of animal magnetism. These philosophers, among whom we find the illustrious names of FRANKLIN and LAVOISIER, recognized, indeed, very surprising and unexpected phenomena in the physical state of magnetised individuals; but they gave it as their opinion, that the power of imagination, and not animal

magnetism, had produced these effects. Sensible of the superior influence which the imagination can exert on the human body, when it is effectually wrought upon, they perceived, after a number of experiments and facts frequently repeated, that *Contact*, or *Touch*, *Imagination*, *Imitation*, and *excited Sensibility*, were the real and *sole* causes of these phenomena, which had so much confounded the illiterate, the credulous, and the enthusiastic; that this boasted magnetic element had no real existence in nature; consequently, that MESSMER himself was either an arrant Impostor or a deceived Fanatic.

In the mean time this magnetising business had made no small progress in Germany; a number of periodical and other publications vindicated its claims to public favour and attention; and some literary men, who had rendered themselves justly celebrated by their former writings, now appeared as bold and eager champions in support of this mystical doctrine. The ingenious LAVATER undertook long journeys for the propagation of Magnetism and Somnambulism*—and what manipulations and other absurdities were not practised on hysterical young ladies in the city of Bremen? It is farther worthy of notice, that an eminent physician of that place, in a recent publication, does not scruple to rank magnetism among medical remedies! Yet it must be confessed, that the great body of the learned, throughout Germany, have endeavoured, by strong and impartial criticism, to oppose and refute Animal Magnetism, considered as a medical system. And how should it be otherwise, since it is highly ridiculous to imagine, that violent agitations, spasms, convulsions, &c. which are obviously symptoms of a diseased state, and which must increase rather than diminish the disposition to nervous diseases, can be the means of improving the constitu-

* *Somnambulism* is the art of exciting sleep in persons under the influence of Animal Magnetism, with a view to obtain, or rather extort, during this artificial sleep, their verbal declarations and directions for curing the diseases of body and mind. Such was the rage for propagating this mystical nonsense, that even the pulpit was occasionally resorted to, in order to make—not fair penitents, but fair proselytes to the system.

tion, and ultimately prolonging human life? Every attentive person must have observed, that too frequent intercourse between nervous and hypochondriac patients is infectious; and if this be the case, public assemblies, for exhibiting magnetised persons, can neither be safe nor proper. It is no small proof of the good sense of the people of this country, that the professors of this fanatical art could not long maintain their ground; that they were soon exposed to public ridicule on the stage; and that the few who are still left are banished to the dark alleys and obscure cellars of the metropolis.

Some other plans for the prolongation of life deserve to be mentioned, though scarcely less absurd than the preceding.

The French Count of ST. GERMAIN made large sums by vending an artificial Tea, chiefly composed of Yellow-Saunders, Senna-leaves, and Fennel-seed; puffing it off by the specious name of *Tea for prolonging Life*. It was once swallowed with great avidity all over the Continent; but its celebrity was short-lived, and its promised beneficial effects were never realized.

Another impudent Adventurer, the *Chevalier d'Ailhoud*, presented the world with a Powder, which met with so large and rapid a sale, that he was very soon enabled to purchase a whole *Comté*. Instead, however, of adding to the means of securing health and long life, this famous powder is well known to produce constant indisposition, and, at length, to cause a most miserable death; being compounded of certain drugs which are of a poisonous nature, though slow in their operation. And yet there are on the Continent, even to this day, several respectable families who persist in the use of this deleterious powder, from an ill-judged partiality for its inventor.

COUNT CAGLIOSTRO, that luminary of modern Impostors and Debauchees, prepared a very common stomachic Elixir, which he sold at an enormous price, by the name of "*Balm of Life*;" pretending, with unparalleled assurance, that, by the use of this medicine, he

had attained an age exceeding two hundred years, and that he was thereby rendered invulnerable to all attempts by poison. These bold assertions could not fail to excite very general attention. During his residence at Strasburg, while he was descanting, in a large and respectable company, on the virtues of his antidote, his pride was mortified by a severe check. A Physician who was present, and had taken part in the conversation, quitting the room privately, went to an Apothecary's shop, where, having ordered two pills to be made of an equal size, and agreeable to his directions, he suddenly appeared again before CAGLIOSTRO, and addressed him as follows: "Here, my worthy Count, are two pills; the one contains a mortal poison, the other is perfectly innocent; choose one of these, and swallow it, and I engage to take that which you leave. This will be considered as a decisive proof of your medical skill, and enable the public to ascertain the efficacy of your extolled elixir." CAGLIOSTRO took the alarm, made a number of apologies, but could not be prevailed upon to touch the pills. His opponent swallowed both immediately, and proved, by his Apothecary, that they might be taken with the most perfect safety, being only made of common bread. Notwithstanding the shame of this detection, CAGLIOSTRO still retained numerous advocates and partisans, by circulating unfounded reports, and concealing his real character by a variety of tricks.

The inspired Father GASSNER, of Bavaria, ascribed all diseases, lameness, palsy, &c. to diabolical agency, contending, from the history of Job, Saul, &c. recorded in Sacred Writ, that Satan, as the grand enemy of mankind, has a power to embitter and shorten our lives by diseases. Vast numbers of credulous people flocked to this fanatic, for the purpose of obtaining relief. Multitudes of patients, afflicted with nervous and hypochondriacal complaints, besieged him, as it were, in his quarters every day!—all being stimulated by a wild imagination, all eager to view and acknowledge the works of Satan! Men of literary character, even the Natural

Philosophers of Bavaria, were hurried away by the stream, and completely blinded by this sanctimonious Impostor.

It is no less astonishing than true, that, in the year 1794, a Count THUN, at Leipzig, pretended to perform miraculous cures on gouty, hypochondriac, and hysterical patients, merely by the imposition of his sacred hands. He could not, however, raise many disciples in a place that abounds with Sceptics and Unbelievers.

It would be trespassing too much on the limits I have proposed to myself, were I to enumerate the various remedies advertised in the daily papers, both British and Foreign, under the fictitious and fraudulent pretence of prolonging life. I shall, therefore, only remark, in general, that all these celebrated specifics are obviously composed upon wrong principles; inasmuch as their inventors proceed on the hypothetical idea, that *disease is the only cause of shortening life*; and, being thus mistaken, it is no wonder that they carry the *strengthening or bracing* system to an extravagant degree.

The highest point of bodily vigour and health may, of itself, contribute to shorten life, although no external causes should appear to co-operate in hastening the consumptive process. Nay, the very remedies we use, and the regimen we attend to, for the prevention or cure of diseases, may be of such a nature as to promote that consumption.

On the Absurdity of Specific Remedies.

From the doctrines now laid before the reader, I hope I shall not be thought unreasonable in drawing this conclusion:—That the plans for prolonging human life are generally erroneous and injudicious; that all *artificial* means have rather a tendency to shorten than to prolong it; and that we can never safely expect the accomplishment of this great object, unless we pursue methods more consonant to Nature and more verified by experience.

The truth of this inference will be more evident, when we come to inquire into the *conditions* which are essentially requisite to the attainment of a long life.

The *first* of these is a certain bodily and mental disposition to longevity, not easily defined, yet sufficiently known and understood. In whatever this disposition may consist, it is matter of astonishment, and inexplicable by the laws of animal economy, that many individuals, frequently under the most unfavourable circumstances, and in the most unwholesome climates, have attained to a great and comfortable age. It may, indeed, be confidently affirmed, that, without this principal requisite, all other advantages are often of no avail;—the most salubrious country-air, a district abounding with aged inhabitants, a rigid adherence to the diet of CORNARO, a regular course of exercise and recreations, with the best art of the physician, are not sufficient to insure the felicitous prospect of a long and healthy life.*

Secondly: It is certain that there is, in most cases, a sort of hereditary disposition to longevity; an innate principle or quality, which, like many family diseases, is propagated from one generation to another. Perhaps nine out of ten old persons could make it appear, that their parents and ancestors also lived to a great age; a reason which may be admitted, without having recourse to any material substance, as the cause or effect of this inherent virtue.

The *third* requisite to longevity is a *perfect birth* of the child, and a proper subsequent conduct in the mother; upon which subject it is not my design to expatiate in this place. That acute physiologist, Lord BACON, some-

* If these rational means be unavailing to insure longevity, still more so are those miraculous remedies introduced by superstition. The Ancients conceived the idea of a *principle of life*, which they compared to a radical fluid;—the Alchemists expected to find this *original entity* in *gold*, by the use of which they pretended that the human body might acquire the solidity and durability of that metal. Others traced the germ of life in bodies of considerable duration; in plants and animals; in the wood of the Cedar, and in the flesh of the Stag.—BOERHAAVE has made a facetious remark upon the subject: "This notion," says he, "is just as ridiculous as that of the man who, in order to prepare himself for the business of a running footman, is said to have lived for some time entirely on the flesh of hares, hoping thus to surpass all his fellows in agility."

where remarks, "That children partake more of the nature of the mother the longer time she has nursed them; and that those children which most resemble the mother will be generally found to have a greater claim to longevity."

Fourthly: A gradual, and not too precipitate, culture of the physical and mental faculties may be properly considered as an excellent preliminary step towards prolonging life. The age of man bears a certain proportion to the growth of his various powers; and the longer we can protract the different stages of life, the more extended will be the whole compass of our existence. As it is evidently the design of Nature, that man should live longer than most of the lower animals, he, of course, requires a greater space of time to develop the faculties both of mind and body. Animals which arrive soon at the perfection of their nature and form live but a short time. Man requires upwards of twenty, and, according to some, twenty-five, years before he attains to full maturity; and, if it be a rule of Nature, that animals, in general, live eight times the number of years which is requisite to the attainment of their perfect growth, a strong presumption arises, that the age of man might be extended to nearly two hundred years. In the works of the illustrious BACON, and particularly in his "Historical View of Life and Death," are given many strong arguments to confirm this assertion. Surprising as it may appear to some, there is a possibility, at least, if not a probability, that the term of human life might be still farther extended, if mankind could, by any means, be persuaded to return to that primeval state of nature, from which history and tradition have furnished us with such astonishing, and almost incredible, instances of longevity. It is not my intention here to inquire into the degree of credit which may be due to the accounts of some extraordinary facts of individual longevity recorded by the sacred historian, as the learned vary much in their opinion relative to the mode of computation, and whether the Solar, the Arabic, or the Lunar year, or a still

shorter measure of time, is alluded to. This, at least, seems to be generally admitted, that the antediluvians enjoyed an enviable uninterrupted state of health; that their vegetable aliment and general mode of living were extremely simple, and nowise prejudicial; that the constitution and temperature of the globe itself must have been greatly affected and deteriorated in consequence of the Flood, or other causes of which we are ignorant; and, lastly, that those impetuous and inordinate appetites and passions, which, like flames, may now be said to consume the powers of life, were then either less violent, or exerted their baneful influence at a much later period of life.

Nature resents every outrage committed on her treasures, and seldom fails to punish the transgressors with lingering disease or early dissolution. This observation may be applied to the moral as well as the physical faculties of man. It is commonly said, and not without some degree of truth, that very forward children seldom live to the age of adults; and that too early an exertion of mental powers is, in most cases, destructive. The same remark holds good in what relates to the body. The inhabitants of hot climates, who frequently marry at the age of ten or twelve, or twelve and fourteen, begin to be old at thirty, and rarely survive the sixtieth year. Every expedient which hastens the evolution of the natural powers, every exertion of strength disproportionate to the ability of the individual, should be carefully avoided, as such excesses are of a dangerous tendency. Hence, the great art of education, the great art of living, consists in following the path of Nature.

Fifthly: We should constantly inure ourselves to the habits of supporting and resisting the various impressions of external agency.—Some persons, who have paid a very rigid attention to diet, have, notwithstanding, been unable to reach even a middling age; while others, who have been addicted to the most irregular and extravagant courses, have been observed to attain one very advanced. Hence arise contradictory maxims in die-

tetics, which can only be reconciled by deciding chemically between the two extremes, and ascertaining, as nearly as possible, the absolute and relative salubrity of things. All deviations from the rules of diet are, in a certain degree, hurtful; although these may, in most cases, be attended only with a limited advantage. Many epicures have been known to reach their seventieth and eightieth year, if they have once survived a certain critical period of their lives.* As soon as the body becomes accustomed to the use of certain things, at first disagreeable, and, perhaps, hurtful, the noxious tendency will not only be removed, but we shall find our frame hardened and strengthened by using them. Nature must withstand many a shock, if she would familiarize herself to the vicissitudes of climate and opposite modes of life; but every victory she gains, in these encounters, will be a means of rendering her more vigorous and unconquerable.—How could the sublime mind of FREDERIC THE GREAT have remained so long in its earthly vehicle, if he had not improved, by constant culture and discipline, his original disposition to a long life? Numbers of other men, who have endured as much exercise of body and exertion of mind, in their younger years, have yet not attained to any remarkable age.—Severe and obstinate diseases have also been thought, in many instances, to contribute to the prolongation of life: this is, at best, however, but a doubtful point; although it cannot be denied, that many sick persons have, to all appearance, acquired additional strength and spirits after having recovered from a distressing quartan ague, or some threatening pulmonary disorder.

* Experience shows, that there is a particular term of life, which, if we can pass in the fullness of health and vigour, leaves the greatest probability of living to a considerable age. In the female sex this period generally arrives at or before the fiftieth year; in the male it is about the sixtieth year. GELLIUS, a medical author of credit, asserts, from observations founded on long experience, that the sixty-third year is, to most constitutions, a critical and dangerous one. The Egyptians called this epocha *Androcles*, because man begins, from that time, to experience a rapid decay of strength and energy. Others, rather more superstitiously, maintained, that, about this period, many individuals die, or, at least, are subject to severe attacks of disease.—The Emperor AUGUSTUS received the congratulations of his friends on having survived this trying period.

Sixthly: We may take notice of a certain *steady and uniform progress through life*, as highly conducive to the great object in view, whether it flows in the manner of a gentle stream, or resembles the more active course of a rapid river. The mind, when accustomed to certain situations and pursuits, which almost constantly affect it in an uniform manner, is most likely to preserve its reasoning powers unimpaired and strong. He whom neither violent joy convulses, nor deep melancholy corrodes, and whose career of life is not chequered by too sudden vicissitudes, may, with some probability, expect a long enjoyment of that life to which he has become so habituated.—There are many whose days quickly glide away, like those of a simple rustic, in continual sameness: such persons, it is observed, generally live to a great age.

Seventhly: A very necessary cause of the attainment to an advanced age is a sound state of digestion. In very old persons we generally find the digestive organs in excellent condition; nor is there a surer symptom of approaching dissolution than complaints in the stomach, or frequent returns of indigestion. The Swiss are indebted, it is thought, to the vigorous tone of their digestive organs for the long preservation of their lives, in general, and for the great number of aged persons among them. Milk and vegetable food seem remarkably well adapted to invigorate the stomach. To effect the same purpose Lord BACON advises old people to have recourse to strengthening baths, fomentations, and similar *external* remedies, which operate upon the absorbent system. At the same time a thin but nourishing and moderate diet should be observed, in order to spare the organs of digestion.

Eighthly, and lastly: We may recommend equanimity, or that state of the mind when, from the happy nature of its pursuits, it is not disquieted by too violent exertions. In the literary professions, and particularly among such individuals as are placed in easy circumstances, we discover as many instances of longevity as in the more laborious occupations. It was remarked by the

Ancients, that grammarians and rhetoricians commonly attained to a great age. The mind being engaged in scientific pursuits, and other objects in which it finds pleasure, such as conversation on literary and mixed topics, collecting the productions of Nature, a continual series of mental researches, diversifying the pursuits or amusements, yet gradually and constantly persevering in exertions towards the attainment of some principal object—all supply the vital power, as it were, with materials, like the cruse of oil, which proved a never-failing support to the widow of *Sarepta*. On the other hand, it is a general remark, that deep thinkers, speculative philosophers, and those whose powers are continually absorbed in abstruse inquiry, soon feel the effects of age, from the great exertions of their mental faculties. This must be understood, however, with exceptions, as in the cases of Sir ISAAC NEWTON, HALLER, EULER, and the pride of his nation and age, the profound and venerable KANT, still living at Kœnigsberg.

I venture to say thus much on the various rules and precautions requisite to attain a long and healthful life. Some of the particulars are, no doubt, found united in a certain proportion of the individuals who arrive at a respectable age. It is commonly remarked also, that the inhabitants of mountainous countries, for the most part, live to a greater age than those of low, and, particularly, marshy districts. This is partly true; yet we are not to consider the lofty regions in the Alps and Pyrenees as possessing these salubrious qualities; for it is only upon moderate heights, and in hilly rather than mountainous countries, that we so frequently meet with people of an unusual age. Persons who are constantly travelling, are likewise said to enjoy a long and healthful life; and Lord BACON farther includes in the list of long lives such as are of a melancholy temperament. It is a questionable point, whether the great age of many Turks is to be ascribed to the serenity of their climate, their daily use of the bath, or their uncommon temperance in eating and drinking. For, as to their copious use

of opium, which is considered by them almost as necessary as food, we have already shown the noxious tendency of such practice; for opium generates, in a remarkable degree, a disposition of the fluids in many respects resembling that of hypochondriasis. There is scarcely an instance of any person that has attained to uncommon longevity who has not been particular in his diet and manner of living. But, in this respect, we cannot hope to derive advantage from excessive solicitude:—for, as when in want of sleep, the more we think of it the more it shuns us; so those who are most anxious for longevity are the least likely to attain it. Age is a gift which Heaven frequently and gradually bestows upon mortals when they are scarcely sensible of it!

On the Symptoms of actual Dissolution.

That many unfortunate individuals are consigned to the grave before they are actually dead, is a truth too well attested to require demonstration. If this were not, or never had been, the case, it could not have excited that degree of attention on the Continent, and particularly in Germany, which, of late years, has been bestowed on this important subject. The most respectable Physicians have proved, by incontrovertible facts, that sick persons have often been hastily buried, or, to speak more properly, smothered in their coffins, either from accidental mistake, or from the most detestable motives. But, as many false and scandalous reports are generally circulated, in addition to those founded on truth, we need not wonder, that this business has not been conducted, hitherto, with that degree of calm and patient attention to which it is justly entitled. Houses, for the reception of persons apparently dead, have been, at length, erected in various parts of Germany, in Berlin, Jena, Coburg, &c. This idea, at the first view of it, may, to some, appear whimsical; but those who know the extent of the power of vitality, and the almost infinite modifications of which that power is susceptible,

will not ridicule a proposal which originated in motives of prudence and humanity. Into these houses every inhabitant of the town, or district, has a right to send the body of a deceased person, on paying a trifling sum, per night, towards the expenses of the institution. Here the body is deposited on a couch, lightly covered, and provided with a string fastened to the hand, which pulls a bell on the top of the house. A watchman is appointed to receive and register the bodies brought into the house, and to give the alarm if necessary. This, to say the least of it, is no small convenience to families in a large city, crowded into narrow apartments, with a number of children, who must necessarily suffer from the pestiferous exhalations of dead bodies. But this is not the principal advantage attending such establishments: it is, unquestionably, a great satisfaction to the relatives of the deceased, to be assured, that every means have been used to preserve, from the most dreadful of all deaths, a friend whose memory they revere.

The cases in which death can be clearly ascertained are nearly the following:

1. When putrefaction has actually taken place over the whole animal frame; as instances are common, in which a partial mortification of an arm or a leg is by no means mortal.

2. In the nervous apoplexy of the aged; as such persons generally die in consequence of slowly wasting disorders, various species of palsy, &c.

3. If the patient expires after a long standing consumption, hectic fever, or ulcerations of the breast and lungs, diseases now very common.

4. If any of the larger blood-vessels, or other parts essential to life, have received external injury, by violent blows, bruises, or cuts, attended with great loss of blood, which could not be stopped by artificial means. If we are unable to supply the loss of this vital fluid, and to restore the organization of the parts thus destroyed—particularly if the brain, the lungs, the heart, the stomach, or any of the intestines, have suffered from a

severe wound—a speedy dissolution may be considered as inevitable.

5. After chronic disorders of the intestines, obstructions of the abdominal vessels, and dropsy thence arising—or, if an incurable weakness in the breast has occasioned the organic destruction, or ossification of the pectoral vessels—there is little prospect of the recovery of such a person; as these complaints of asthmatic sufferers, in general, are not in a just proportion to the whole state of the body: for instance, if their appetite and digestion have been unimpaired previous to their disease, or if their muscular strength has not suffered from the like affections.

6. In persons of tender and debilitated nerves, who have been long subject to spasms or epileptic fits, particularly if they die in child-bed, in consequence of violent hæmorrhages, or after repeated and oppressive agitations of mind—in such cases there is no hope left, as it is too late to think of changing or improving the constitution of the nervous system. Lastly,

7. If a person gradually wastes away in a malignant, nervous, or putrid fever, or after long fasting from want of food—in these instances it is not in the power of the medical art to restore the shrivelled vessels to their proper tension and energy; consequently all our attempts to reanimate the body will be unavailing.

There remains now to be stated, also, in what cases and situations the symptoms of apparent death are less certain, so that some hope of recovery is still left to the disconsolate friend and relative. These are principally the following: after faintings, sudden loss of blood from diseased intestines;—in certain cases of repelled morbid matter, for instance, in the small-pox, measles, poisons, and the like, which frequently produce a spurious kind of apoplexy;—after hysteric and hypochondriac spasms and colics of a transitory kind, which have not too often recurred;—after mental anxiety, perturbation, terror, and other oppressive passions, where every thing depends on a speedy removal of the causes. To this list we may

likewise add the cases of drowned, hanged, and otherwise suffocated persons; or those who appear to be dead, in consequence of a fall from high scaffoldings, without any external injury. In such accidents an internal pressure or stoppage of the vital functions, as breathing and the circulation of the blood, often produces a state of apparent death.—Even the suppressed pulse in the arteries, imperceptible respiration, the coldness and rigidity of the limbs, the want of contractibility in the pupil of the eye, the involuntary loss of excrementitious substances,—all these symptoms of approaching dissolution should not discourage us from trying the proper means of recovering the patient's life. In children and young persons, in particular, we must not too hastily decide whether they be absolutely dead or not;—*teething* is frequently attended with diversified convulsive symptoms, and the *tape-worm* is capable of producing the most alarming effects, which the inexperienced by-standers may unwarily ascribe to very different causes. Hence every possible degree of precaution is requisite in managing the bodies of infants apparently dead; and they ought not to be removed from the warm temperature of the sick-room before the last lingering spark of life is extinguished. Indeed, it must strike even superficial observers, that the hasty removal of a body from a warm to a colder temperature is highly improper and dangerous. And here the excellent rules, published by the Royal Humane Society of London, for the recovery of persons apparently dead, cannot be recommended in too strong terms; although some of the more violent methods detailed in their plan, such as inflation of the bowels with the *fumes of tobacco*, *clysters* prepared of that herb, violent *agitation*, and too *early* and *indiscriminate* application of the *electric shock*, might well bear a few modifications and improvements.

Summary of Dietetics.

The knowledge of those objects which relate to the preservation of the human body, in its natural state, may be called the *Doctrine of Health*. Life and Health are, therefore, the proper objects of this doctrine; as the second department of Medicine solely relates to the preternatural states of man, viz. Disease and Death, and forms that branch of professional study which we call '*Pathology*.'

The compass of the former science, or an investigation of the objects included in the doctrine of health, must be very extensive. It furnishes us with rules and cautions as to every thing we ought to do, or to avoid, in order to remain healthy. This useful science is properly denominated DIETETICS, or a *systematic view of all objects relative to health in general, and to food and drink in particular*.

The following chapters will, therefore, be exclusively devoted to Dietetics. My principal object will be to lay a solid foundation for that important science, by investigating and combating the chief prejudices which have, hitherto, retarded the progress of this branch of knowledge. Hence, a *System of Dietetics* should not only contain all those rules which are requisite to guide us in the preservation of health, together with such as relate to the choice of a proper mode of life, but should likewise inform us with regard to the beneficial or hurtful influence which *external objects* produce on the health and life of man, and teach us the just application, or practical use, of these objects.

DIETETICS include the whole of what the Ancients understood by the singular name of the SIX NON-NATURALS; namely, *Air, Aliment, Exercise and Rest, the Passions and Affections of the Mind, Wakefulness and Sleep, and Repletion and Evacuation*. Although these general heads do not comprise, strictly speaking, every thing that relates to the different functions of the human body, yet

they contain all such conditions of life as are absolutely necessary, and the greatest part of those circumstances which are connected with the health and well-being of the individual. In each of these particulars we are liable to commit errors, either by intemperate use, or improper application. I propose, therefore, to lay down a System of Rules, by which we may be assisted to choose, according to particular circumstances, the best and most rational means of insuring health, and of avoiding whatever may have a contrary tendency.

Our mode of life is no longer that natural and simple one which prevailed in the primitive ages of mankind; as, in the present state of society, such habits are scarcely conceivable. Man, in a state of nature, had little occasion to attend to his health; he wanted no rules for its preservation; for, as the seeds of diseases are rarely scattered in such a state, instinct would be to him, in most cases, a sufficient guide. It now seems to be impossible to return to that primeval state, without returning, at the same time, from our present degree of mental improvement to that of pristine barbarity. We have, apparently, purchased our improved state of mental culture, by sacrificing to it a considerable share of our bodily welfare;—happy, however, we may still consider ourselves, if we have really gained in moral and intellectual improvement.

Innumerable are the causes which have conspired to render the *true* knowledge of the means conducive to health difficult in the acquisition, and uncertain in its application. The chief of these are probably the following, which include most of the subordinate particulars:—the present very artificial method of living; the prodigious number of the employments of mankind; the different modes of dwelling and dressing; the endless variety of substances used as food and drink; the great diversity of national customs and manners; and the difference of climate and situation:—all these circumstances have a greater or less influence, conjointly or separately, not only on the passions, inclinations, and

instinctive desires of individuals, but also on the general state of the health and physical welfare of a people. By the present mode of living we are exposed to diseases wholly unknown in the first ages of the world, and we suffer from a variety of complaints, originating either in artificial habits, or the constraint under which we labour in consequence of blindly complying with the caprices of custom or fashion, without, perhaps, apprehending any ill consequences from such pernicious practices.

Many ingenious writers have lately endeavoured to point out the disadvantages arising from causes apparently trivial. Thus the fashion of using paint, hair-powder, and pomatum; of wearing ill shaped shoes, laced stays, &c. have deservedly incurred severe ridicule and pointed censure. The custom of applying lead to earthen vessels has not escaped their attention: the danger, however, resulting from the use of that substance, has been greatly exaggerated. Writers, with the best intention, have, sometimes, from an excess of zeal, descanted on the worst side of the question only, by attributing to certain things many dangerous qualities which, in fact, are owing to a great diversity of circumstances.

This partial method of inquiring into the sources of the evil is, generally speaking, a serious error; as it not only leads to false conclusions, but also draws our attention from other pressing injuries, to which, in a more dispassionate state of mind, our care might be directed.

Perhaps the greater number of dietetic writers have fallen into another error of an equally bad tendency. They judge of every thing, according to the agreeable or disagreeable effect it produces on their own palate and constitution, and, hence, recommend their favourite dishes to others; though what is salutary, in particular cases, may have a pernicious tendency, if prescribed indiscriminately.

The multiplicity of our wants, which all deserve attention in a Dietetic System, has also considerably mul-

tiplied the rules of health. Of all animated beings, indeed, none require such rules more than those who fervilely submit to the arbitrary mandates of luxury and fashion.

Many, indeed, are the open and secret enemies to the health and prosperity of man. Even the most healthy, and those who rigidly adhere to the rules of Diet and Regimen, cannot altogether evade their attacks. Hence we should make it our study to inform ourselves minutely of every thing, so as to be enabled to judge of its good or bad qualities. Whatever we are obliged to have more immediately around us ranks in this class: the arrangement of our dwelling-places, beds, clothes, furniture, &c. in the choice of which we are less accustomed to consult what Nature requires, or to contrive what may be most likely to promote the welfare of the body, than to follow fashion, vanity, or improper habits.

Some of our organs of sensation, and other faculties of the body, must unavoidably suffer from inattention to a proper mode of living in general. From the great exertions to which we often subject them (the eyes, for instance, in reading), they are liable to a variety of accidents, and frequently become debilitated and impaired. It appears, therefore, perfectly consistent with the plan of this work, to treat of the management of the eyes, teeth, and other parts of the body.

In a complete System of Rules for preserving the health of man, attention must be paid to the separate wants of individual constitutions; provided they be not too minute and trivial. Such a System must contain more than what relates to the first and most simple rules of living;—its precepts must not apply to the healthy alone, or those whose life is regulated by the simplicity of Nature,—it should also lay down instructions, how, in all contingent circumstances, we may be secured from danger and bodily injuries. It is not, however, proposed to treat of diseases after they have taken place, if the removal of them requires any thing more than a strict adherence to temperance and the other rules laid down

in these Lectures.—But to prevent any misapplication of those rules, which are established by the accumulated observations of ages, it may not be improper to introduce here some previous *general remarks* relative to the individual use and advantage to be derived from a connected view of *Dietetics*.

It ought to be remembered, as a preliminary observation, that the rules contained in this work are not to be considered as strictly applicable, in every instance, to the particular situation of any individual, or as essentially necessary to the preservation of his health. It is not so much the healthy, as the valetudinary and infirm, who stand in need of minute precepts for their conduct; and even the latter ought not to engage too solicitously in compliance with them, since it is only a very limited number that require such accurate attention.

A vigorous and persevering method of inuring ourselves to the unavoidable difficulties and diversified accidents of life, is of greater importance to the preservation of health than any dietetical precepts whatever. Man is capable of undergoing all the vicissitudes and inconveniences of air, weather, and climate; he can digest any kind of food if his stomach has not been wantonly indulged; and he can sustain the severest bodily exercise and labour, without paying too minute attention to time or regularity, when his employment or duty renders exertion necessary. But he who, from his infancy, has been treated with extreme tenderness, or who, after having been previously accustomed to a hardy mode of life, is seized with the whim of bestowing too much care on his health, will suffer from the most trivial hardships, and catch cold at every change of the air; every heavy or high-seasoned dish will be oppressive, and the smallest deviation from the rules of temperance will indispose him. Yet, by the same rules, every healthy person will learn, that the grand secret of preserving himself in that state consists principally in the art of moderating his desires and enjoyments. We may thus arrive at the knowledge of such things as are *generally*

conducive to the welfare of the body; and more than this ought not to be expected. Rules of health, *universally* applicable to the state of every individual, are not discoverable in nature; nor can they be derived from any experimental knowledge we possess of corporeal objects.—The best general precept is, that every one study himself and his own particular constitution; that he choose and regulate his mode of life accordingly; and that he make his own experience his guide in whatever he finds most suitable and convenient.

CHAP. II.

Of AIR and WEATHER;—their influence on the Human Body;—the means of improving the former, and diminishing the pernicious effects of the latter.

Of Air in general.

AS soon as an infant enters the world the air of the atmosphere penetrates into his lungs, filled up till then with aqueous mucus, and renders them fit for the circulation of the blood, which immediately commences. From that moment the alternate extension and contraction of the breast and lungs, the inspiration and expiration of the air, or, in other words, the function of *respiration*, becomes indispensibly necessary to the preservation of animal life. While the child remained in the womb it required no external air. As soon, however, as it has drawn breath, as soon as the lungs are opened, the act of respiration begins, is incessantly repeated through life, and can never absolutely cease but with death. As, therefore, air is the principal medium by which animal life is supported, it becomes highly important to acquire correct ideas of this invisible substance, that pervades all the parts of animate and inanimate matter, and is so essential to man for the preservation of both his life and health,

Air is that colourless, transparent, compressible, heavy, and elastic fluid which every where surrounds our globe, and which generally receives the name of *Atmosphere*.* This ambient matter, in its common state, is combined with a great variety of foreign ingredients. It contains *water* in a state of solution; by means of water it combines with salts; in many places we find it impregnated with *sulphur*, with putrid exhalations, and the like; nay, frequently we even meet with earthy particles floating in this element.—When all foreign ingredients are separated from it, the subtle aërial body still remains of a compound nature, and is by no means a simple elementary substance, as was formerly believed.

According to the late discoveries in chemistry, the aërial basis of the atmosphere consists of *three* different species of air; namely, of pure, respirable, or dephlogisticated air; of azotic, or phlogisticated air; and of fixed, aërial, or carbonic acid air.—The proportion of the first, namely, pure or vital air, consists, accord-

* "Our bodies are equally pressed upon by the incumbent atmosphere, and the weight they sustain is equal to a cylinder of the *air*, the base of which is equal to the superficies of our bodies.—Every square foot of this superficies sustains a quantity of *air* equal to 2660lb; so that if the superficies of a man's body were to contain 15 square feet, which is pretty near the truth, he would support a weight equal to 39,900lb. The difference of the weight of the air, which our bodies sustain at one time more than at another, is also very great; that between the greatest and the least pressure of air upon our bodies has been proved to be equal to 3902lb. Hence, it is so far from being matter of astonishment, that we sometimes suffer in our health by a change of weather, that it is the greatest miracle we do not always do so. For when we consider, that our bodies are sometimes pressed upon by nearly a ton and a half weight more than at another, and that this variation is often very sudden, it is surprising that every such change should not entirely break the frame of our bodies to pieces. And the vessels of our bodies, being so much strained by an increased pressure, would stagnate the blood up to the very heart, and the circulation would entirely cease, if Nature had not wisely contrived, that, when the resistance to the circulating blood is greatest, the *impetus*, by which the heart contracts, should be so too. For, upon increase of the weight of the air, the lungs will be more forcibly expanded, and, thereby, the blood more intimately broken and divided; so that it becomes fitter for the more fluid secretions, such as that of the (supposed) nervous fluid, by which the heart will be more strongly contracted, and the motion of the blood towards the surface of the body being obstructed, it will pass in greater quantity to the brain, where the pressure of the air is taken off by the *cranium*, upon which account also more spirits will be separated, and thus the heart, too, more enabled to carry on the circulation through all passable canals, while some others towards the surface are obstructed."

Quincy's *New Medic. Dict.*—Article *Air*.

ing to the French Chemists, who have given it the name of *Oxygen*, of 27 or 28 in the hundred parts; the second, viz. the *Azote* of the French, of 72 or 73 in the hundred; and the third, namely, the *Carbonic acid air*, of about one part only in the hundred.*

Oxygen is much better adapted to the respiration of animals than common atmospheric air. If two animals be enclosed in vessels, one of which contains pure oxygen, and the other common atmospheric air, in proportions equal to the size of the animals, the former, in the oxygen, will be found to live six or seven times longer than the latter in common air. It is properly this oxygen which we inspire, and which is the grand support of animal life. Persons apparently dead, or in a state of suffocation, have been instantly restored to life by its influence; and, from the corresponding testimony of several respectable physicians, it appears to have been em-

* The accurate experiments made by the late SCHEELE and BERGMAN, in Sweden, do not much differ from those of the French Chemists with respect to these proportions. For, according to Scheele and Bergman, the common proportion of vital air, or oxygen, in the atmosphere, is about one-fourth; that of azote about five-eighths; and that of carbonic acid nearly one-sixteenth; the last of which, by the French, is computed only at one-hundredth part, that is, five parts in the hundred less than the Swedish philosophers maintain.

The following is a concise history of *Oxygen*:—In August, 1774, Dr. PRIESTLEY, and, much about the same time, Mr. SCHEELE, in Sweden, discovered this respirable part of atmospheric air, or rather they exhibited it, for the first time, in a pure state. This elastic substance was first called *dephlogisticated air*, agreeably to the hypothesis of *phlogiston*;—afterwards it went under different names, as pure air, fire air, vital air, until the late hypothesis of *Oxygen*, or the acidifying principle, has procured it the denomination of *Oxygen gas*.—But still more diversified than these names are the theories which have been proposed on the nature and properties of this species of air during the last twenty years. With *Priestley* it is the purest air, freed of all *phlogiston*; with *Scheele* it is the nitrous acid deprived of its water; according to *Bergman* it is one of the unknown constituents of nitrous acid; with *Fontana* it is the dephlogisticated nitrous acid; *Forster* considers it as air united with fire; Mr. *Watt*, of Birmingham, thinks to find in it elementary fire combined with hydrogen or inflammable gas; *Achard* and *Gren* formerly believed it to be water combined with much caloric, or the principle of heat; but *Gren* latterly maintained, in his System of Chemistry, that it is the unknown basis of vital air combined with caloric;—if we believe *Westrumb* it is elementary air in a state of combination with caloric, but the basis of the former cannot be discovered; according to *Fourcroy* it is an unknown elementary matter united with inflammable air; in the opinion of *Lavoisier* it contains the acidifying principle, *OXYGEN*, and the principle of Heat, *CALORIC*; Mr. *Cavendish* maintains that it is dephlogisticated water; and according to *De la Metherie* it is an unknown substance combined with water and fire, &c. &c.

ployed with advantage in many obstinate diseases. The celebrated INGENHOUSZ, therefore, gave it the name of *vital air*. It promotes combustion in a very high degree. A candle will burn in it from six to seven times longer than in common air, with a much greater degree of heat, and a more brilliant flame. Bodies, in a glowing state, are immediately inflamed when put into oxygen gas; and even metals, which are not very fusible, are melted in it, and converted into oxyds, or calces, with the greatest facility.

Azote, by others called phlogisticated, mephitic, corrupted, or suffocative air, is absolutely irrespirable, and not miscible with water. It arises from the change which atmospherical air undergoes in every process of combustion, putrefaction, and respiration, whether produced by nature or art.

Azote enters into no combination with water, but may be rendered less hurtful by shaken it with that fluid; this accounts, in some measure, for the salubrity of the sea air. It greatly promotes the growth of plants, and readily accumulates in apartments filled with people, or containing articles fresh painted with oil-colours, or in which strongly fragrant flowers are kept, without having any access of fresh air. We should be extremely cautious in entering such places; as diseases of the breast and lungs are too frequently the consequences of neglect, obstinacy, or ignorance.

The *Carbonic acid* of the French is the *fixed air* of Dr. BLACK, and the *Aërial acid* of BERGMAN. This species of air is miscible with water; but, in its pure state, is equally irrespirable as the Azote. It derives its origin partly from the vinous fermentation of vegetables and some animal substances, and partly from the mild alkaline salts and earths combined with acids. Much of this air abounds in mines, where it frequently distresses the workmen by its suffocating effect. It is also observed in most mineral waters, where a stratum of it sometimes swims upon the surface of the well. These waters, as well as fermented liquors, which contain a con-

considerable portion of fixed air, receive from it the well known pungency so agreeable to the palate. Hence, flat and spoiled beer, or wine, may be corrected and restored to its former briskness, by the addition of fixed air evolved from chalk and vitriolic acid, or by mixing it with new beer or wine in a state of fermentation.

This species of air quickly extinguishes fire, and strongly attracts the fumes arising from candles. As it is unfit for respiration animals cannot live in it. The warm-blooded animals die in it much sooner than others; those of an amphibious kind somewhat later; insects are not irrecoverably killed by it; irritability is suddenly destroyed, and the heart of an animal so deprived of life, though still warm, no longer exhibits any signs of motion.

There is another species of mephitic air, which is not miscible with water, which burns with a flame, and, if mixed either with atmospheric air or oxygen gas, instantly catches fire and is exploded: this has received the name of inflammable air,* and deserves to be mentioned here, although it cannot be considered as a constituent part of the atmosphere.

With respect to the *specific gravity* of the different airs before enumerated, it is, in this place, only necessary to observe, that the heaviest is the fixed air, or carbonic acid gas; next to this comes the azote and oxygen, both of which are heavier than the common air of the atmosphere; and, lastly, hydrogen, or inflammable gas,

* This air may be obtained, in a great variety of ways, from all substances liable to inflammation, or containing combustible matter, by means of heat, fermentation, acids, and the like; nay, even from metals, by directing the steam of boiling water through a red-hot metallic tube.—It is the spontaneous production of Nature throughout her *three* kingdoms. In mines, in subterraneous caverns, and particularly in coal-pits, it is known by the name of *choak-damp*. It is copiously generated in the intestines of living animals, and is frequently met with in common sewers, burying-grounds, and places where dead animal bodies are exposed to putrefaction.

The white Dittany (*Dictamnus albus*, LIN.), when in flower, generates so great a quantity of inflammable air, that the atmosphere around it has been observed to catch fire. In swamps, pools, and other stagnant waters, where a number of plants, particularly sage, calamus, and the like, are putrefying, we find a species of inflammable gas, which is known by the name of *marsh-air*, or, more commonly, the *ignis fatuus*, or *Will-o'-the-wisp*.

which is the lightest of all, for it is even lighter than the purest atmospheric air.

When the atmosphere is too much impregnated with any of the mephitic gases, its influence on the human body is extremely noxious. From this cause many of the workmen in lead-mines die, in the prime of life, of an obstinate and incurable colic, which is attended with the most painful obstructions.—Painters, glaziers, potters, and manufacturers of glazed earthen ware, are, from a similar cause, exposed to the same dreadful disease, being obliged to make use of great quantities of lead* in different forms.

It is almost unnecessary to mention the frequent and sudden deaths that have taken place from the explosion of inflammable air in mines, or from the opening of pits, deep wells, and other confined places. Neither is any thing so much calculated to vitiate and empoison the air, to fill it with noxious vapours, and to generate diseases, as the *burying-grounds* established within the walls of populous cities, where human bodies are deposited, as if with an apparent design to produce an atmosphere which is particularly fatal to the tender lungs of children, and, in no small degree, hurtful to adults.

As the mass of atmospheric air is incessantly corrupted by the respiration of men and animals, by the burning of so many natural and artificial fires, by the dissolution and putrefaction of innumerable substances, and by

* Whether this insidious and deleterious metal be communicated by inhaling its vapours through the lungs, or by absorbing them through the pores of the skin, the effects of it are equally dangerous and fatal. The internal use of sulphur, and both the internal and external use of vegetable oils, or animal fats, are the only antidotes hitherto discovered against this virulent bane of the manufacturer and the artist.

Most trades and occupations are subject to peculiar diseases; in some the materials of the manufacture have a pernicious influence on the body; and in others the nature of the employment is hurtful, either from requiring a sedentary life, a reclined, stooping, or standing posture, or from being performed in a confined air, or at a great fire, and the like. Hence, *millers*, *hair-dressers*, and *stone-masons*, frequently die of consumption of the lungs, in consequence of the minute particles of dust which they are continually obliged to inhale. Manufacturers of wool, and particularly hatters, are much troubled with obstinate cutaneous diseases; and all those whose business is attended with grease and dust suffer more or less from the consequences of uncleanness.

various other phlogistic or disoxygenating processes, it would, at length, become altogether incompetent for its original designation, if Nature had not provided effectual means for its improvement and renovation. Among the most powerful of these we may place the growth and vegetation of plants.—For this very important discovery we are indebted to Dr. PRIESTLEY, who was so fortunate as to make it after he had long employed himself in fruitless attempts to improve and restore impure air by artificial means. He found, that air, rendered mortal by the breathing of animals which had expired in it, was again so completely restored by the vegetation of plants, that, after the lapse of some days, an animal could live in it with equal ease, and for the same length of time, as in a similar quantity of common atmospheric air.

These experiments, indeed, did not succeed with some Naturalists, and PRIESTLEY himself, upon repeating them with different plants, found the result rather varying and doubtful; but Dr. INGENHOUSZ removed the greater part of these difficulties, by his book entitled, “Experiments upon Vegetables, 8vo. London, 1779.” This ingenious philosopher remarked, 1st, That most plants have the property of correcting bad air within a few hours, when they are exposed to the *light of the sun*; but that, on the contrary, *during the night*, or in the *shade*, they corrupt the common air of the atmosphere;—2d, That plants, from their own substance, afford a very pure dephlogisticated air, or oxygen, when exposed to the rays of the sun; but a very impure air, or azote, at night, or in the shade;—3d, That not all the parts of plants, but only the green stalks of leaves, particularly through the sides opposite to the soil, produce this beneficial effect;—4th, That the disengagement of pure or vital air does not commence until the sun has been some time above the horizon; that it ceases altogether with the termination of day-light; and that the disadvantage arising from the impure exhalation of plants, during the night, is far exceeded by the great

advantage they afford during the day; insomuch, that the impure air, generated by a plant during the whole night, scarcely amounts to a hundredth part of the pure vital air, or oxygen, exhaled from the same plant in two hours of a serene day.—Thus we discover a most striking phenomenon in the economy of Nature; since the vegetation of plants continually counteracts the noxious effects of respiration, combustion, and putrefaction.* In this manner the atmosphere is constantly preserved in that necessary state of purity and temperature which is the most salutary both to animals and vegetables.

We have learnt the effects produced on the human body by the atmosphere and the changes of the weather, partly from observations made by ourselves and others, and partly from their influence on inanimate matter, by which we can judge, in some measure, of its analogous effects on the human frame; but we should not thence conclude, that our knowledge, in this respect, is either complete or infallible. Observations may frequently deceive us, since the human body is incessantly exposed to the effects of other external agents, as well as the weather, which may easily elude our attention. Farther, the atmosphere surrounding us, besides the properties perceptible by our senses, or discoverable by the assistance of particular instruments, may also be impregnated with substances which have hitherto escaped our researches, and which, nevertheless, may have the power to effect important changes. Lastly, we ought not to consider the arguments deduced from analogy as strictly conclusive; we should remember, that the effects of ex-

* It should be recollected here, that when the growth of plants is interrupted by the cold of winter, so that they no longer generate a beneficial air to purify the atmosphere, Nature has ordained it, that this very cold of the winter itself contains the most effectual virtues to check the progress of putrefaction. We farther find, that in the most unwholesome, and particularly in marshy, countries those very plants appear to be profusely distributed, which most eminently possess the property of purifying the air. And as the pure air, or oxygen, is of greater specific gravity than the common air of the atmosphere, it is perfectly consistent with the operations of Nature, that the oxygen should settle towards the lower side of the leaves of plants.

ternal objects on the living animal fibre are, in many instances, totally different from those which they produce on lifeless or inanimate bodies.

Recommending these general remarks to the consideration of the reader, I proceed to consider those particular and positive effects which the different states of the atmosphere produce on our frame, and in what manner they influence our health.

Warm air relaxes the solid parts of the body, and occasions a quicker circulation of the fluids. *Heat* is chiefly oppressive to the nerves; hence, the tender and infirm suffer severely in hot weather; hence arise hysteric and hypochondriac complaints, convulsions, and diarrhœas. *Cold* renders bodies more compact, particularly the solid parts of the animal structure, such as the muscles, nerves, bones, &c. They become more elastic in winter; the appetite for food is stronger, and digestion easier and quicker. On the contrary, the resistance of the fluid parts becomes so great, that even the increased powers of the solids cannot overcome it if the cold be too violent. In winter the blood is much disposed to inflammations; hence, stitches in the side, inflammatory sore throats, rheumatisms, &c. In persons who take little exercise the fluids are apt to stagnate, and the solids to chill, during the winter;—upon the whole, however, the effects of cold weather may be rendered less hurtful, and even salutary, to the body, if proper exercise be not neglected.

Damp or moist air suddenly relaxes and debilitates; it occasions a slowness in the circulation of the fluids, which gives rise to obstructions, and impedes both the circulation of the blood and the secretion of humours, by checking insensible perspiration. If the moisture of the air increases, we experience an unaccountable torpor and *ennui*; with the loss of energy we lose our gaiety, and the mind is depressed as well as the body. Damp places and districts are always unwholesome, but more particularly so in cold weather. Moisture, by diminishing perspiration, produces disorders of the throat, the breast,

and the abdomen. But the most dangerous and fatal effects on the human body have been observed to arise from moist air accompanied with hot weather; for, when moisture has impaired our energy, heat increases the evil in a great degree, by opening the pores through which the moisture penetrates into the body, and predisposing every part of it to putrefaction and dissolution. This accounts for the great mortality prevalent during the hot season at Batavia, and some of the West-India islands.

Dry and cool air, from possessing a due degree of elasticity, promotes, in an extraordinary manner, the serenity and alertness of mind and body: hence it is found uncommonly salubrious to hypochondriacs. But a dry, and very cold air, generates inflammatory diseases; because it inspissates the blood. Dry and hot air affects us like heat, and enervates the body. But a dry air, which is not too warm, is both agreeable and salubrious.

Great and *sudden changes* from a warm to a cold, or from a light to a heavy air, are highly injurious to valetudinarians, and even to the healthy. Soldiers in camp, and, sometimes, travellers, feel very severely the bad effects of cold and moist night air after long marches and journies. Weakly and infirm persons have frequently ominous sensations previous to any remarkable change of the air.

A moderately heavy and elastic air is the most agreeable and salutary to the human body; hence, Nature has not assigned us our constant residence on the summits of mountains. Yet a light and rarefied air, such as is felt on the highest mountains, is not so unfit for respiration, nor does it manifest so noxious an influence on the human body, as was formerly believed. The latest travellers assure us of the contrary, and speak, in decisive terms, of the salutary effects of the air during a short stay in those elevated regions.

Among the different WINDS—which are only strong commotions of the air—the long continued *North wind* is comparatively the most wholesome, as it purifies the atmosphere of noxious vapours, renders the air serene

and dry, and thus imparts to the human body elasticity, vigour, activity, and a lively colour. It is, however, troublesome to persons of delicate habits, and occasions in them coughs, inflammation of the throat, pains in the side, obstructions, and febrile diseases. The *South wind* weakens and relaxes the body, and is very apt to produce catarrhal affections. The *Morning wind* is very drying; but *Evening winds* are cool and moist, being frequently accompanied with rain and changeable weather. All these winds differ materially in their qualities, from local circumstances, and accordingly as they blow over a Continent, over the Ocean, or over high mountains and icy regions, from which they carry along with them more or less of cold and humid particles. But, upon the whole, too dry weather is always more healthy than that which is too moist.

Of the four SEASONS of the year the *Autumn* is the most unhealthy, because then the particles of perspiration not only remain on the body, but are in a state inclining to putrefaction. This disadvantage, however, may be easily obviated by guarding ourselves with proper dress and choosing a suitable diet. Too light a dress and too thin stockings are not adviseable at this season. The *Spring season* is, in general, the most healthful. Spring, and the beginning of *Summer*, are most salutary to children and young persons; while the Summer and the beginning of *Autumn* agree best with the aged. The latter end of *Autumn*, and the beginning of *Winter*, are commonly the most wholesome seasons to persons of a middle age.

It has been remarked by medical men, that certain diseases appear and disappear according to the different seasons. Thus, putrid and bilious disorders prevail in Summer; inflammatory diseases in Winter; and the catarrhal, mucous, and gastric or stomachic, affections in Spring and Autumn. It has been farther observed, that in Spring the blood circulates more freely; hence, probably, arose the ancient practice of blood-letting, and taking laxatives, at certain regular periods; both of

which I have already pointed out, in the preceding chapter, as dangerous in their tendency, and always hurtful to the healthy.

As the vegetable kingdom is renewed in Spring, and as vegetation, in general, is most lively in that season, there can be little doubt, that the pure vital air is then most copiously evolved by means of the solar light and heat. Hence it follows, that the vernal air is more wholesome than that of Autumn, which is saturated with impure and putrefying particles. The cold of Autumn, however, and the frequent winds then prevalent, prove extremely efficacious in counteracting the baneful effects of corruption and putrefaction.

If the temperature of the air correspond with the natural constitution of the season, we may expect what is called a healthful year, and that the prevalent diseases will be of a mild nature; but if the weather does not agree with the general laws of the season—if, for instance, the Winter prove warm, or, at least, moderate; or the Spring cold and severe, with sudden alternations of heat, we may expect to find the year, pretty generally, marked with alarming and obstinate diseases.

The temperature of the air depends not a little on the natural situation of the country; whether it lie high or low; whether its mountains oppose or give a free passage to the winds; whether it contain flowing or stagnant waters, or morasses; and whether it be open or covered with woods.—Country air is, upon the whole, always purer than that of towns, narrow streets, and crowded buildings.

All *strongly scented bodies* are more or less pernicious; as well those of a disagreeable smell as the greater number of fragrant perfumes. The latter, if too strong, are more particularly dangerous, as a sense of disgust does not naturally incline us to avoid them. Among these may be comprehended all vegetable odours strongly volatile and pungent, and which thereby stimulate and stupify the nerves. Hence, people who carry large nosegays, in the hot days of summer, are apt to feel themselves

variously and strongly affected, particularly with drowfiness. From this apparently innocent cause head-aches, vertigoes, fainting fits, and apoplexies have frequently been produced in persons of a plethoric habit. Such persons, as well as those of a delicate constitution, are liable to indisposition from the fragrance of many balsamic plants, but particularly from the strong scent of lilies, roses, pinks, the blossoms of oranges, hyacinths, and the like.—Many flowers emit a more powerful fragrance in the night than in the day-time, and the exhalations of several trees, and other vegetable bodies, are peculiarly dangerous, and sometimes mortal. Of this nature are the walnut and yew trees, under whose shades persons have actually died who had fallen asleep; and likewise the deadly *Upas* of Surinam, and the no less poisonous *Manchineel* tree of the West-Indies.

Aromatics of every kind taint the air in a similar manner, introducing into the human body particles foreign to its nature, all exciting, in a greater to less degree, an inclination to sleep. Saffron and hops have sometimes proved fatal; the former especially has often produced a sleep, terminating in death, in those incautions individuals who had lain down in the warehouses, or upon the bags, in which it was packed. Ambergris and musk are also, on account of their powerful fragrance, very hurtful to persons of an irritable and nervous temperament.

Dwellings in the vicinity of lakes, fens, and marshes, are exposed to all the noxious effects of a moist atmosphere, namely, to the various species of intermittent fevers or agues;—on the other hand, it has been observed that persons living on the banks of rivers, though at times subject to these, are not very liable to other diseases, and that running water has a tendency to purify the air when it is saturated with inflammable particles.

Too sudden a transition from warm to cold air, or the reverse, is pernicious; but to exchange, however suddenly, an unhealthy atmosphere for a healthier, is, at all times, safe and highly advisable. Numberless instances have proved, that such persons as were constantly

indisposed in the corrupted air of a town very soon recovered their health on removing to the purer atmosphere of the country. Yet the question, *Which air is the most wholesome to live in?* will admit only of a conditional answer. We must attend not only to the particular constitution of the air, but also to the nature and habits of the individual. Neither should we too hastily pronounce every air unwholesome, that does not appear to agree with us. The air of every climate, whether hot, cold, or temperate, may be called salubrious, provided it be pure and clear, and occasionally agitated by wind: but a gross atmosphere, and one loaded with animal or vegetable exhalations, is certainly deleterious. After all, perhaps, the longevity of the inhabitants may be considered as the best evidence of a wholesome district. Thus we find uncommonly long-lived persons in high countries, or such as are visited by frequent winds, and also in small sea-ports; while in villages, and places thinly inhabited, the proportion of aged people is likewise considerably greater than in cities or populous towns. This may be ascribed partly to a purer air, and partly to a more simple mode of life prevailing in such places: for wealth and riches, the concomitant effects of which are greater luxury and extravagance in living, usually keep pace with the increase of population; and if the numerous chimnies of our populous cities did not serve as so many well-contrived machines for rarefying the atmosphere, incalculable mischiefs must inevitably ensue.

Of the Improvement of Air in Dwelling-Houses.

A house built on a rising ground, on a chalky soil, in an open, dry country, and neither exposed to the greatest degree of cold in winter, nor to the highest point of heat in summer, may be said to stand in a wholesome situation. Hence, those apartments are the most healthful, as well as comfortable to the individual, which enjoy a pure and free circulation of air in summer, and the cheering rays of the sun in winter: the heat of

summer being considerably tempered by the former, and the severity of winter much abated by the latter. Farther, a proper size and height are requisite to constitute a healthful apartment; for low rooms are detrimental to health, especially when inhabited by large families, and seldom aired, or rather, which is frequently the case, when all air is carefully excluded by close doors, shutters, curtains, &c. The most proper place of residence in winter is one with a southern aspect, not only as being more dry, but also more cheerful, and, therefore, attended with a favourable influence on the spirits. In summer the situation of a room may be chosen either to the North or to the East, the latter of which is preferable, because it admits the first enlivening rays of the sun.

Although it is not in every person's power to choose his habitation agreeably to the laws of health; yet this choice, of a pure and healthy air, is not sufficiently attended to, and it certainly deserves as much consideration, in purchasing an estate or country-house, as the quality of the soil or other lucrative advantages.

The local constitution of the air depends not merely on the exhalations of the soil itself, but likewise on the different vapours, conducted to and blended with it by the winds, from adjoining places. Thus, in a dry and sandy country, considered of itself as healthy, the air may be rendered extremely unwholesome from the vicinity of marshes or other stagnant waters.

The better to judge of the salubrity of the air in any district, we should examine the properties of the wells and springs; for both *air* and *water* absorb the saline and mineral particles of the soil. We may conclude, with tolerable accuracy, that a country producing good water enjoys likewise a salubrious air; and as the best water is tasteless, so the purest air is free from any smell whatever.

The most certain marks, by which to distinguish whether the air in rooms be damp or not, are the following: the walls or tapestry change their colour; bread, in closets, acquires a mouldy surface; sponges, in the rooms,

retain their moisture; loaf-sugar turns soft; iron rusts; brass and copper acquire a green colour, or verdigris; and wooden furniture moulders and crumbles to pieces.

The sitting-room ought, if possible, to be above the ground floor, or in the second story; it should be so constructed as to admit a free current of air; but if this cannot be done, it should be frequently aired by opening the windows in dry weather, or by fumigating the room, either with vinegar dropped upon warm stones, or evaporated in a basin over a lamp, or with sugar, juniper-berries, and the like.

Every room is filled with *three* different *strata* of air: 1. The lower part of the room contains the heaviest species of air, namely, fixed or carbonic acid gas, especially in apartments situated on the ground floor, or those under ground: 2. The middle part of the room is filled with the lighter atmospheric air: and 3, The uppermost stratum contains the lightest or inflammable air, which is the most impure of the three, in consequence of the processes it has undergone by respiration and combustion. In lofty apartments this contaminated species of air is not inspired by the lungs; because the middle stratum, or the most wholesome of the three, extends to a height above that of a man.

A continual change of the air, by opening the doors, and occasionally the windows, however advisable, is yet not sufficient to preserve a salubrious atmosphere in an apartment. For this important purpose the following improvements may be suggested as useful: 1st, Small apertures in the ceiling of the room, or through the walls close to the ceiling, in an oblique direction, so that the rain and snow cannot penetrate: 2d, Ventilators, that is, small moveable wheels, made of brass or sheet-iron, which are applied to some part of the window-panes, and set in motion by the pressure of the external air. There is an excellent contrivance to introduce fresh atmospheric air into a room, namely, by occasionally opening and shutting the door. The most proper height for placing these ventilators is about seven feet from the floor. 3d,

Air-tubes running in a straight direction from the door to the fire-place, or rather to the wall of the chimney, and concealed under the floor of the room. As such tubes, however, are very expensive, and appear better calculated to convey the smoke up the chimney, after all means have been tried in vain, than to conduct the impure air from the upper part of a room, I shall mention a better and much easier method of effecting this purpose. It is a late discovery of a physician in France, who contrived it with a view to save the great expense of ventilating or airing large wards in hospitals, filled with patients who laboured under putrid distempers, particularly in the height of summer. He caused a number of small holes to be made in the uppermost part of the window-frames; into these holes he placed, from without, an equal number of funnels, presenting an aperture of nine or twelve inches diameter, and terminating, in the inside, almost in a point, or, at least, in an opening not exceeding the size of a small quill. By this simple contrivance the air in the sick-rooms was so effectually renewed, by the great and constant pressure of atmospheric air from without, that any other artificial process, for correcting the putrid air in a large hospital, was judged to be unnecessary.

Above all things, the windows and doors of sitting and bed-rooms, when it can be done conveniently, ought to be left open for a certain space of time every day. This, however, requires to be done at the proper time, neither too early in the morning, nor when it grows dark in the evening, during the vernal and autumnal months; nor at the time when the horizon is overspread with a thick fog. The windows should be opened when the air is pure and serene; or, in general, when there is less danger to be apprehended from the external air than from that within. Sometimes it may be proper to make use of what is called *pumping* the room, or moving the door backward and forward for some minutes together: but in spring and autumn our sitting-rooms,

and, even in winter, bed-rooms, ought to be ventilated every clear day, by currents of fresh air, for a considerable time.

In the hot days of summer the windows may be opened early in the morning and in the evening, in order to cool and refresh the heated air of the room by that from without. It is, however, not safe (and has sometimes proved fatal) to leave the windows of a bed-room open at night during the summer months, as there is no small hazard of checking perspiration by the cool night-air, the susceptibility of the pores being then very much increased by the heat of the day and the warmth of the bed. Rooms which we inhabit in the day-time may be safely left open during the night.—In summer-houses, or such as are surrounded with plants and trees, it will be proper not to open the windows of bed or other rooms till some time after sun-rise, and to shut them at sunset: they require also to be opened and shut sooner in hazy than in serene weather.

The airing of apartments should not be neglected even in winter, as coal-fires alone are not sufficient to carry off the corrupted particles of air, unless they be assisted by ventilators. Here I must oppose and contradict a prevailing, yet mistaken, notion, that fire, in a room where the windows are open, introduces moist air. On the contrary, the most proper time for opening the windows is after lighting up a brisk fire; as the warmer air of the room will then be powerfully attracted by the colder atmospheric air, and the corrupt particles of the air within most speedily dissipated.

In *moist* and *cold* air the dress should be somewhat warmer than usual: flannel may then be worn with double advantage next the skin, and the rooms we inhabit should be fumigated with the berries of Juniper, or similar shrubs.—Fumigation is likewise attended with this advantage, that it contributes to dry, and, in some degree, to warm the air.

In *moist* and *warm* air the explosion of a little gun-

powder will be of use, or vinegar may be evaporated with greater safety, and the floor and walls sprinkled over with this excellent antiseptic.

Hot and *dry* air may be tempered by placing vessels filled with cold water in different parts of a room; or, as is often practised in hot climates, by sprinkling water over the floor.—The greater or less degree of corruption of the air, in an apartment, depends very much on the kind of labour or exercise performed in it: six watch-makers will not render the air nearly so impure as two carpenters would do in the same space and time; hence appears the necessity of appropriating lofty rooms, instead of low garrets, for the workshops of mechanics.

Plants and flowers placed before the windows are both an agreeable and useful ornament, if not of too strong a fragrance. In serene weather it may be expedient to strew fresh plants (not flowers) in a dwelling-room, exposed to the rays of the sun, taking care, however, to remove them as soon as the sun withdraws. This method of exposing plants, or even the branches of trees with green leaves, in apartments, may have a beneficial influence on valetudinarians, and particularly on asthmatic persons, as vital air, or *oxygen*, is thereby generated, and introduced very gradually into the lungs.

Large trees, with thick foliage, should not be suffered near the windows of a house; for, besides that they obstruct the access of day-light and fresh air, and have thus a tendency to make the rooms damp, their exhalations in the evening, and during the night, are by no means wholesome. Trees, planted at the distance of eight or ten yards from the house, do not prevent the free access of air; they present an agreeable object to the eye, and cannot be too much recommended, both for their cooling shades in summer, and the salutary exhalations they emit during the day.

It has been already mentioned, that the flame of candles contaminates the air; for which reason the custom of illuminating assembly or other large rooms with a *superfluous* number of candles must be very detrimental.

This extravagance becomes still more dangerous in places where, beside the crowd of people, great quantities of provisions, dressed with the richest spices of the East and West, contribute to saturate the air with the most heterogeneous particles. And as persons of weak lungs must suffer extremely in such an atmosphere, it would be proper to provide all public rooms with a competent number of conic ventilators, of the description before mentioned.

Strictly speaking we ought not to sit in the room where we dine, or take victuals, till it be aired again: those who can afford this luxury should be careful not to stay for hours together over their bottle in the dining-room; the bad effects of such contaminated air are not perceived by the persons continuing their libations after dinner, but are very sensibly felt by any one coming in from the fresh air.

It is no less unhealthy to sleep in a room where a quantity of *green fruit* is kept; a circumstance not attended to in country places, particularly by those who deal in fruit. From its fragrance a portion of inflammable matter exhales, which soon impregnates the air. Hence, females of delicate habits have been known to faint in approaching places where a few quinces were kept. For the same reason store-rooms and pantries are extremely unwholesome, if provisions of all kinds, animal as well as vegetable, be kept in them; especially oil, candles, fat, flesh meat, whether raw, boiled, or roasted; pastry, and the like.

As foul linen readily imbibes the perspirable matter of the skin, it should never be suffered to remain long in a bed chamber, or sitting room.

If possible, we should not sit through the day in a room in which we have slept; as the bed-clothes, and particularly feather beds, very slowly part with the exhalations they have imbibed during the night: neither is it sufficient for purifying the air of the room, that it has been ever so well aired in the morning.

The vapour of *charcoal* produces, especially in close

apartments, dangerous and frequently fatal effects. It fills the atmosphere with sulphuric particles, which may be inspired, but cannot be expired:—they retard the motion of the blood-vessels, stagnate the blood itself, penetrate into the head, and produce an acute pain, vertigo, and torpor—hence the greatest precaution is necessary, where charcoal is used, as innumerable fatal accidents have happened from this source. Dyers, who employ it for dying their cloth upon frames, seldom fail to experience great injury to their health.

All employments, in which persons work among impure wool, oil, colours, and the like, are, to a certain degree, detrimental to health. Washing, ironing, dressing the hair with greasy curling-irons, burning lamp-oil, frequent painting of the walls, all saturate the air of a room with pernicious, damp, and sulphuric vapours. From the change which oil and candles, in a state of combustion, produce, in the colour of a white wall and white curtains, we may infer, that this fetid steam must also penetrate into the human body, and, if so, must materially affect it.

It farther deserves to be remarked, that all damp vapours are prejudicial, although they should not in themselves have a tendency to contaminate the air. Hence the keeping of wet linen, or even wet clothes, umbrellas, and the like, in dwelling-rooms, should by all means be carefully avoided. Mechanics and others who are obliged to dry wet things in their strongly-heated apartments—joiners, turners, potters, bookbinders, &c. are particularly liable to swellings, and other disagreeable affections in the relaxed vessels of absorption.

Of Heat and Cold.

As observation and experience inform us, that immoderate heat relaxes the body, overheats the blood, and exsiccates or consumes the other fluids; and that the people who live in temperate regions are more hardy and vigorous, and attain to a greater age, than the in-

habitants of warmer climates, it follows from these premises, that we ought not to enervate the human body by keeping it immoderately warm, by covering it with a superfluity of clothes, by plunging it unnecessarily into hot baths, by using strong fires in temperate weather, or by sleeping in warm rooms, and perhaps on feather beds, the most heating of all substances. The temperature of a sitting room should not exceed 60° of Fahrenheit's thermometer; that of a bed-room may be about 50° , as the medium temperature of our climate is between 50 and 55° .

Although man is, no doubt, capable of inuring himself to a very great degree of heat, as well as of cold, yet sudden transitions can be supported only by the few who possess very firm constitutions. The gradual changes of the seasons prepare us, in the safest manner, to sustain the vicissitudes of cold and hot weather. It is, therefore, an error, and of no small consequence, in the modern system of education, that we generally endeavour to habituate our children to the support of cold weather only. Persons who cannot bear the heat of the sun, or strongly-heated rooms, are, from their excessive delicacy, frequently exposed to the most violent, nay, to mortal, accidents. Hence, children ought to be gradually accustomed to these inconveniences, which, indeed, occur frequently, and are more dangerous than those arising from sudden transitions to a colder temperature: for the effects of the latter may, in a great measure, be obviated by exercise and muscular action.

In the sultry days of summer we should be particularly on our guard against violently overheating the body;—in autumn we should not dress too lightly, and in the mornings and evenings always somewhat warmer;—in short, we ought to avoid every thing that appears likely to check and repel perspiration. The baneful custom of accommodating our dress to the almanack and the fashion, rather than to the vicissitudes of the weather, in this inconstant climate, must necessarily be productive of many disagreeable consequences. Above all things,

we ought to change our summer-dress rather early in autumn, and to clothe ourselves gradually warmer, according to the variations of the weather. Yet, after all, perhaps, it would be most advisable to accustom ourselves to one kind of dress only for all seasons. The propriety of this custom I shall more particularly consider in the fourth chapter.

With respect to the proper time for heating rooms in autumn, it has been supposed, that early fires are unwholesome and productive of frequent catarrhs. This assertion is certainly ill founded; for, in warming a room, as well as in clothing the body, we should not so much be regulated by the particular time of the year, as the state of the weather, and the degrees of actual heat and cold; for, in attending to these circumstances, we cannot easily mistake. If, in the temperate days of autumn, the room should feel colder than the external air, it is time to make a moderate fire: in damp and cold weather this is an useful precaution even in summer. Those who, from caprice, parsimony, or prejudice, would rather shiver for some weeks longer, than consult their sensations, often feel the consequence of a violent cold. The Dutch and German stoves certainly afford more uniform heat in a room, though they may not be considered cheerful enough for an English company.

As we can neither breathe nor live without fresh air, we ought not to withdraw our bodies too much from the bracing effects of cold. In this respect, we should act conformably to Nature, that is, in the same degree as the warmer weather changes to a colder state, we should gradually expose ourselves to the various changes of temperature. The cold will then neither feel unpleasant, nor impede the necessary perspiration; especially if we oppose it with vigorous bodily exercise. We ought also to take more solid sustenance in winter than in summer; because, by the longer continued motion or digestive process of the stomach, the circulation of the blood is accelerated, from which the natural heat of

the body is produced. Nature herself dictates a compliance with this precept, as she has provided us with more substantial kinds of food during the former season than the latter.

Lastly, as every sudden change of the weather, from heat to cold, and the reverse, is prejudicial to the body, we ought to guard against every circumstance by which *perspiration* may be suddenly checked. Hence we never should remove from a strongly heated apartment into a fresh and cold air, unless we are provided with a warmer dress;—in hot days, or after violent exercise, we should not frequent vaults, cellars, or ice-houses, undress immediately after over-heating the body, take rest upon a damp soil or upon stones, nor bathe in cold water. Such bold transgressors have often been punished with instant death, or, what is still worse, have brought on a painful and lingering species of consumption, which has hitherto baffled the united efforts of the Faculty, and which annually makes dreadful havock among people of a middle age.* It is devoutly to be wished, that the experiments, now pursued with factitious airs or gases, and with the fox-glove, may afford some remedy

* According to the statement given in the Bills of Mortality, the total number of deaths in London, during the three spring months of 1799, amounted to 5271. Among these no less than 1353, or *upwards of one-fourth*, were carried off by *consumption*!—Although consumption and decline are terms often used to express many other *chronic* diseases, as well as *pulmonary consumption*, so that the above stated number probably includes various species of decline, yet, even with these allowances, the number of victims to *general consumption* is truly terrific. Let the reader reflect, for a moment, on the following melancholy inference:—If the population of this country consist of between nine and ten millions, of whom the 30th or the 33d part, that is about 300,000, die annually, it follows that this merciless disease, CONSUMPTION, cuts off about 80,000 persons every year, in Great-Britain alone, and these generally in the prime of life, when society ought to be benefitted by their mental and bodily exertions!

The following statement will afford a more conspicuous view of this important subject:

It appears from the London Bills of Mortality, that there died of pulmonic disorders

5910 out of 18,238, in the year 1796.

5439 ——— 16,714, ——— 1797.

6210 ——— 17,285, ——— 1799.

Computing the average of the three years, we shall find that this uncontrollable disorder destroys annually 5853 out of 17,412 individuals, or *upwards of ONE-THIRD* of the inhabitants of London.

against this formidable destroyer of the human species, which cuts off incredible numbers in the bloom of life, and spares neither age, rank, nor sex.—And, as there is so much reason to believe, that a great proportion of consumptive cases originate from the sudden transitions above mentioned, no language can be strong enough to deprecate practices, as injudicious as they are destructive.

CHAP. III.

Of CLEANLINESS, and its various Modifications, so far as it is immediately connected with Health;—the Management of the Teeth;—the Use of Baths, &c.

Of Cleanliness in general.

THIS domestic virtue ought to extend its influence to every object connected with the human frame; to the preparation and consumption of food and drink, to dress, habitation, household furniture, and all our physical wants; in a word, cleanliness should not be confined merely to the interior domestic economy; for it claims our attention in every place which we occupy, and wherein we breathe.

Let our clothes, linen, beds, covers, blankets and sheets be clean and dry; as all these substances absorb perspirable matter, and check the process of perspiration. Articles of dress which are soiled, and come into contact with the skin, being placed immediately over the pores, reimbibe the humours already perspired, and return them to the body by the absorbents. Dirty linen will never attract the useless or noxious matter, which is secreted from the blood, and ejected by the body; it remains on the pores of the skin, and is either again absorbed by the vessels, or clogs those emunctories which require always to be kept open. For a similar reason, it is highly improper and dangerous to wear the clothes of sick persons, especially in contagious distempers.

Let the body, and particularly the joints, be frequently washed with pure water, especially in summer, when the perspirable matter, being of an unctuous, clammy nature, obstructs the excretion by the pores.—The face, neck, and hands, being most exposed to the air, dust, and the like, ought to be daily washed, both morning and evening. Attention should also be paid to the ears, by cleaning them occasionally, that the sense of hearing may not be impaired by the accumulation of wax, which, from its acrid nature, may prove unpleasant, as well as injurious. The whole head ought to be frequently washed and cleaned, even though no hair-powder be used; as it perspires very much, and is, besides, exposed to dust and other particles in the atmosphere. Washing opens the pores, while the comb, by its close application to the skin, dissolves the viscid humours, and renders them fluid.

The mouth should be rinsed every morning, after dinner, and at night, with cold water; but in winter the chill should be taken off. The frequent washing of the mouth is otherwise necessary, because the viscid slime, and small particles of food which settle about the interstices of the teeth, are very apt to putrefy, and, if not removed, will infect the breath, and gradually injure the teeth themselves. Besides, this slime settles on the tongue, covers the papillæ, by which food is tasted, and renders the palate less sensible.

It is scarcely necessary to observe, that the nose also should not be overlooked, as by neglecting to remove the secreted moisture in time, the effects may become troublesome and detrimental to the organs of smell. In children, the nose ought to be occasionally washed; it having been found that the unpleasant smell, peculiar to some infants, is owing to the habitual neglect of cleaning that organ.

The tongue should be cleaned every morning, either with a small piece of whalebone, or with a sage leaf. This leaf is likewise useful for polishing the teeth. To clean the throat, we should gargle it with fresh water,

and swallow a mouthful of water every morning—the latter, however, must not be attempted too hastily; but, when we once accustom ourselves to the practice, we shall find it attended with advantage.

It is necessary, especially in hot weather, to wash the feet frequently; as they perspire much, and are more exposed to dust than any other part of the body. The water should be warm, but not too much so, because hot water, thus used, relaxes the fibres, drives the blood upwards, and occasions head-aches. The proper degree of heat for young persons to wash in, is between 96 and 98° of Fahrenheit, and for the aged between 98 and 100°, or somewhat more than milk-warm.

The removing of the beard and nails is no insignificant matter in the care of health. By shaving we promote perspiration. Long nails, especially as they were in fashion some years ago, disfigure the hands, and prevent the feet from expanding freely; but the nails ought not to be cut too close, otherwise the toes will be obstructed in their pressure on the ground, and the fingers in feeling. They may also be easily injured; and wounds under the nails are generally attended with disagreeable consequences, on account of the many nerves running in that direction. When the nails on the toes are suffered to become too long, they are apt to grow into the flesh, to become an obstacle in walking, and sometimes to occasion considerable pain.

In the vessels used for preparing food and drink we ought likewise to pay proper attention to cleanliness. Every particle of filth introduced into the stomach may prove hurtful to it, to the tender intestines, to the blood, and, consequently, to the whole body. For the same reason it is not only indelicate, but also unwholesome, to dine or take any food in places where an offensive smell prevails.

On the Management of the Teeth.

The principal requisite for the preservation of the teeth is, never to retire to rest without having cleaned them: for this prevents the viscid particles of food, collected during the day, from corrupting them in the night. The tooth-ache, now so common, is frequently owing to a hollow state of the teeth, but still more frequently originates in a want of cleanliness. The cleaning of the teeth, however, requires precaution. What is called the Tartar of the Teeth is of a corrosive nature, and should be removed with the greatest care. The manner in which most Dentists treat the teeth, as well as their powders, tinctures, and other dentifrices, however ingeniously puffed off and strongly recommended, are pernicious; because they deprive the teeth of their enamel, make them loose, and spoil the gums. The various dentifrices, whether *Royal* or *Imperial*, advertised in the public papers, are, at least, of doubtful, if not injurious, effect;—it is an astonishing instance of credulity and infatuation, that people will take external and internal *medicines upon trust*, when they would hesitate to take any *food* with which they are unacquainted.

If there be too much tartar, so that it adheres like a cement between two teeth, its being incautiously removed will deprive the teeth of the tartarous cohesion, and, consequently, of their support; thus, from the constant contact of the tongue, lips, and food, they will be shaken and loosened. The same will happen, should the tartar be allowed to eat away the gum from the root of the tooth. If, in this case, the basis of the tooth be injured, it will necessarily be rendered loose; the gums being no longer able to retain a tooth which is deprived of its intermediate cement.

The tartar, therefore, must not be broken suddenly, with iron or glass instruments; but may be gradually scraped away with a blunt or broad cut quill, or some similar substance, from which the enamel of the teeth

can suffer no injury. Most kinds of dissolvent drops, especially those sold as specifics for whitening the teeth, are made up of vitriolic acid, diluted with some distilled waters—They are of no service, but, on the contrary, remove the enamel with the tartar, and thus spoil the teeth for ever. The common tooth-brushes are liable to the same objection.

To prevent the tartar from settling on the teeth, they ought to be kept clean, by washing them every morning and evening. Certain kinds of food and drink should likewise be mentioned, as having a tendency to produce and accumulate the tartar—such are all viscous and saline substances, as salted and smoked meat, cheese, roasted eggs, the flesh of tame and wild animals, kept too long for the sake of making it more tender and palatable, truffles, and all species of mushrooms; beans, peas, chesnuts, vinegar, tart wines, and all kinds of acid fruit.

An expedient equally safe and effectual, for removing the tartar, is, to cover the teeth with a fine powder of *Gum Tragacanth*, or with soft wax, and by that means to extract the tartar at once, together with this adhesive covering.

Although it does not enter into the plan of these Lectures to treat of the various diseases to which the teeth are subject, or to describe the different methods pursued in curing them, yet I judge it necessary to point out some of the most simple and approved remedies in that very painful affection, the tooth-ache. If the complaint proceed from a hollow and carious tooth, some soft extract of the Peruvian Bark may be placed in the cavity; if this should not remove the pain, a few drops of *Cajeput oil*, upon cotton, may be applied to the hollow tooth, or rubbed, externally, upon the painful side of the cheek. THUNBERG, the Swedish Traveller, introduced the use of Cajeput oil into Europe, having often witnessed its powerful and almost instantaneous effects in the East-Indies, where it is the last expedient of gouty and rheumatic sufferers.

Dr. RICHTER, an eminent Physician of Göttingen, informs us that he has frequently relieved the most violent tooth-ache, by applying, externally, the essence of *pimpinelle*, or Burnet-saxifrage, with an equal quantity of laudanum, adding to it a drop or two of the essential oil of cloves. Though external remedies are not likely to effect a radical cure of this malady, yet, in urgent cases, they may be safely resorted to, especially if applied so as not to injure the skin of the face; for they will often produce a temporary relief. If, however, the tooth-ache proceed from *no local* cause; if, for instance, it be owing to an impure stomach, to catarrhal, rheumatic, hysterical, venereal, or other affections, all the specifics ever discovered cannot relieve from pain, until the cause be either in part or entirely removed. In my own practice, I have found the oil of Savin, or Juniper oil, preferable to laudanum in its effects on a hollow tooth; the latter is at best an uncertain remedy.

In scorbutic diseases of the teeth and gums, a vegetable diet, consisting chiefly of ripe fruit, and mucilaginous vegetables, will be found the best corrective. Beside these, a fine powder, made of three parts of double-refined sugar and one part of burnt alum, may be employed with advantage for the purpose of rubbing them. Sugar is an excellent antiseptic; and IMBERT DE LONNES, a French Physician, reports, that a whole ship's company was once cured of an alarming scurvy, by living, for some time, from necessity, upon sugar alone.—We should also consider the connection subsisting between the teeth and the stomach; if the former be unequal to the purposes of mastication, the digestive powers will be gradually impaired, and the soundest stomach vitiated. To neglect the teeth, therefore, is to neglect the stomach; and if the stomach be weakened, the whole mass of the fluids, and particularly the blood, will ultimately be tainted with crude, unassimilated, and acrimonious humours.

To dissolve and wash away the superfluous, slimy, and unctuous particles which produce the tartar, fresh

water is sufficient; or it may be rendered a little more acrid by the admixture of a small quantity of common salt. Acids and alkalies, so frequently employed as dentifrices, are of too corrosive a nature; and alkalies, in particular, injure the gums, perhaps the teeth themselves, while acids deprive them of their enamel, and thus occasion a speedy external corruption, and inevitable gangrene within.

The most simple dentifrice is a crust of bread, hard toasted, and reduced to a fine powder. This is fully calculated to absorb the viscid, oleaginous particles, and to remove the stony or tartarous matter. The bread, however, should not be toasted too black, as in that case it would evolve an acrid, alkaline salt, which might prove hurtful. A still better dentifrice is a moderately fine powder of the Peruvian Bark, particularly of the genuine red species, which strengthens the gums, without inflaming them.

In cleaning the teeth we ought not to make use of brushes or sponges, but of the finger, which being provided with the finest papillary vessels, is a much better and more proper instrument, and precludes the necessity of resorting to artificial means. Besides the finger has the advantage of being soft and pliable, and of feeling any immoderate pressure too sensibly to permit us to do injury to the teeth or gums:—hence, it is an injudicious delicacy alone which can prevent us from making use of it, in preference to even the best tooth-brushes.

For cleaning the interstices between the teeth, we should not employ pins or needles, whether made of gold, silver, or steel; for all metallic substances are apt to canker the teeth. If toothpicks be at all advisable, they should be made of soft wood, or quills cut in a blunt point. In my own opinion none should be used; for, of whatever materials they are made, they open, loosen, and injure the teeth, by making room for the tartar and other substances to prey upon them and the gums. To answer every purpose of toothpicks, a thick and soft cotton cloth should be used, to rub the teeth

over gently after every meal; but if people have once accustomed themselves to regularly picking their teeth, then, indeed, the cotton frictions may, perhaps, come too late.

Lastly, the cleaning and brushing of the teeth, however useful and necessary, is insufficient to prevent the settling of the tartar, and the consequent injury to the teeth; for the source of both evils does not exist in the mouth, but really proceeds from the stomach, and an impure state of the fluids. For this reason, the medical treatment of the teeth requires a particular regimen and diet, according to the individual case of every patient.

Of the Use of Baths.

This important branch of dietetic regimen is of excellent use and efficacy both in the prevention and cure of diseases. Though the ancients could less dispense with the use of the bath, on account of the frequency of their athletic exercises, as well as from the want of linen, which was then much less in use than at present; yet, in our times, it would be of great service if the use of baths were more general and frequent, and this beneficial practice not confined to particular places or seasons, as a mere matter of fashion. Considered as a species of universal domestic remedy, as one which forms the basis of cleanliness, bathing, in its different forms, may be pronounced one of the most extensive and beneficial restorers of health and vigour. I am not so sanguine, however, in my expectations, as to think that the cure of all maladies and diseases may be effected by the bath, as was lately promised by a noted empiric in this country, who most sagaciously impregnated his vapour-baths with the collective produce of the vegetable kingdom. Such a general remedy is just as chimerical as the most famous panaceas, the tincture of gold not excepted.

Bathing, whether in warm or cold water, produces the most salutary effect on the absorbent vessels; which would otherwise reconduct the impurities of the skin

through the pores, to the no small injury of health. To persons in a perfect state of vigour, the frequent use of the bath is less necessary than to the infirm; as the healthy possess a greater power to resist impurities, by means of their unimpaired perspiration, the elasticity of their minute vessels, and the due consistence of their circulating fluids. The case is very different with the infirm, the delicate, and the aged. In these, the slowness of circulation, the viscosity or clamminess of the fluids, the constant efforts of Nature to propel the impurities towards the skin, combine to render the frequent washing of their bodies an essential requisite to their physical existence.

Baths, considered as the means of curing diseases and restoring health, if judiciously applied, are likewise of peculiar advantage; and though, in this respect, they do not properly make part of a regular system of dietetics, yet I shall request the indulgence of the reader while I make a few necessary remarks relative to the proper application of the bath, it being so frequently used as a mere dietetic remedy. Much depends on a clear and accurate knowledge of the properties and effects of the different baths. I shall, therefore, divide them into two principal classes, the *warm* and the *cold* bath.

The *warm*, that is, the tepid or lukewarm bath, being about the temperature of the blood, between 96° and 98° of Fahrenheit, has usually been considered as apt to weaken and relax the body; but this is certainly an ill-founded notion. It is only when its heat exceeds that of the human body (as in the *Hot Bath* and *King's Bath* at BATH, both of which are from 18 to 20° higher than blood-heat), that the warm bath *can* produce a debilitating effect. Indeed, baths of the above immoderate heat ought not to be used in their natural state, that is, without reducing their temperature by cold water, except in particular cases, and under the immediate advice of a physician. On the contrary, the lukewarm or tepid bath, from 85 to 96° , is always safe; and is so far from relaxing the tone of the solids, that it may

justly be considered as one of the most powerful and universal restoratives with which we are acquainted. Instead of heating the body it has a cooling effect; it diminishes the quickness of the pulse, and reduces it in a greater proportion, according as the pulse has been more quick and unnatural, and according to the length of time the bath is continued. Hence, tepid baths are of eminent service, where the body has been overheated, from whatever cause, whether after fatigue from travelling, severe bodily exercise, or after violent exertion and perturbation of mind; as they allay the tempestuous and irregular movements of the body, and, consequently, in the strictest sense, invigorate the system. By their softening and moistening power they greatly contribute to the formation and growth of the body of young persons, and are of singular benefit to those in whom we perceive a tendency to arrive too early at the consistence of a settled age; so that the warm bath is particularly adapted to prolong the state of youth, and retard, for some time, the approach of full manhood. This effect the tepid baths produce, in a manner exactly alike, in the coldest as well as in the hottest climates.

From what has been advanced it will not be difficult to discover in what particular disorders the tepid-bath may be of the greatest service, and the reason why it proves so eminently useful (particularly in a parched and rough state of the skin) in paralytic, spasmodic, bilious, consumptive, hypochondriac, hysteric, and insane cases, as well as in an acrimonious and impure state of the fluids, such as scorbutic and leprous eruptions, lues, &c. One obvious effect of the habitual use of the bath, particularly the tepid, is, that it softens and renews the external integuments of the body. It considerably increases the pressure on the body from without; hence, breathing, particularly on entering the bath, is frequently somewhat difficult, till the muscles have, by practice, become inured to a greater degree of resistance. Yet this effect, which in most instances is of small importance, requires the greatest precaution in some particular cases,

so far as to prevent the use of the bath altogether; for instance, in persons of a full habit, who are in danger of breaking some of the internal blood-vessels, by the precipitate use of the bath, whether warm or cold.

These few hints will be sufficient to determine the cases, in which the lukewarm bath may be resorted to with safety and advantage, as a *dietetical* remedy. Its application in the treatment of diseases is foreign to the object of this chapter, and demands the most minute inquiry into the nature of the cases which indicate the use of it; as it is, of itself, a potent remedy, which, if improperly used, may produce a contrary effect.

Bathing in rivers, as well as in the sea, is effectual for every purpose of cleaning the body; it washes away impurities from the surface, opens the cutaneous vessels for a due perspiration, and increases the circulation of the blood. For these reasons, it cannot be too much recommended, not only to the infirm and debilitated, under certain restrictions, but likewise to the healthy. The apprehension of bad consequences from the coldness of the water, is, in reality, ill-founded; for, besides that it produces a strengthening effect, by its astringent property, the cold sensation is not of itself hurtful.

The same precaution, however, is requisite in the use of the cold as in that of the tepid bath; for, after having overheated the body, especially in the hot days of summer, it may prove instantly fatal, by inducing a state of apoplexy. Hence, the plethoric, the asthmatic, and all those who perceive a great determination of blood to the head, should be very circumspect in its use. For, although the consequence may not prove immediately fatal, yet, from the sudden force and pressure of the water, some of the smaller blood-vessels of the head and breast may easily burst, and thus lay the foundation of an incurable disorder. To such as are of a sound and robust constitution bathing may be rendered an agreeable exercise, by swimming against the stream; for the fibres and vessels being obliged to resist the power of the undulating waves, the nerves are thereby excited into action.

Before I proceed to lay down dietetical rules for the use of the bath, I shall premise a brief historical narrative of this excellent practice, and generally explain its sensible effects.

Among the Greeks, and particularly the Spartans, bathing was not entrusted to the caprice of individuals, but considered as a public institution, which was governed and arranged agreeably to the express laws of the State. —We learn also, from sacred history, that among the Jews, at a much earlier period, persons under certain circumstances were pronounced unclean, and, consequently, unfit to hold any intercourse or communion with others till they had performed the appointed ablutions. The Greeks, according to their own historians, learnt this practice from the Egyptians, and the Romans from the Greeks. With those celebrated nations public and private baths formed an important branch of useful and ornamental architecture: many opulent individuals courted the favour of the people by lavishing their treasures in the establishment and decoration of public baths; and, to this day, we frequently discover the valuable remains of these national edifices. Among the Romans, the baths were, in time, converted into regular and luxurious dwelling-places, in which the sons of the patricians, and of the wealthy, were educated; a circumstance sufficiently ascertained in the history of CHARLES THE GREAT.

The change which the contact of cold water produces on the body, naturally leads us to inquire into the physical nature and properties of the cold bath. The lightest water is at least 800 times heavier than air; from which it has been concluded, that the former presses upon the human body with a force proportionally great. If, therefore, the column of air, which presses upon our body with a force equal to 39,900lb. could be converted into water, the whole weight of that pressure would amount to 31,920,000lb. Yet, as our health is affected by a difference in the pressure of the air, occasionally varying from 3 to 4000lb. we may easily under-

stand, that the human body is not calculated to sustain, for any length of time, the great pressure of water. For this reason, the most experienced negro divers dare not venture beyond a certain depth of the sea; well knowing it would be impossible to rise up against the additional weight of water incumbent upon their bodies.

The sensible *properties* of the *Cold Bath*, in general, consist in its power of contracting the solid parts, and of inspissating the fluids. Any part of the body, which is exposed to the sudden contact of cold water, experiences, at the same instant, a degree of tension and contraction, and becomes narrower and smaller. Not only the blood-vessels, but likewise the small capillary tubes, are liable to this contraction and subsequent relaxation. What is vulgarly called *goose-skin* is an effort of the cutaneous fibres, a contraction of the orifices of the absorbent and exhalant vessels, occasioned by mental perturbation, spasms, or the effect of cold. Hence it happens, that, by the cold bath, all the blood-vessels of the skin, and of the muscles in immediate contact with it, are so constricted and diminished, that, at the time of this violent exertion, they are unable to receive the usual quantity of blood. The smaller vessels of the skin are likewise closed, and press upon the humours contained in them, so as to prevent all perspiration during this pressure. Thus all the fibres of the skin and muscles are brought into close contact; and if the humours contained in these tubes had no other outlets, by which to discharge themselves, they would become thick or inspissated, and lose their natural warmth. Were this inspissation of the fluids really to take place, it would be attended with dangerous stagnations and obstructions. That it does not, however, produce these fatal effects, may be ascribed to the following cause. As soon as the pressure is made against the external vessels, the blood retreats from them, in search of places where it finds less resistance. All the great vessels within the body afford receptacles into which it now flows, till the principal arteries, and the veins of the intestines,

being filled, extended, and enlarged, it rises to the heart. Though the effect consequent on the cold bath may be considered as altogether mechanical; yet this simple operation is frequently productive of the most important and beneficial effects.

All other strengthening remedies operating, in general, only on the fluid parts of the body, require to be previously dissolved by the fluids, blended with the mass of blood, and thereby conducted to the solid parts. The cold bath, on the contrary, acts almost instantaneously on the solid parts themselves, and produces its bracing effect, before a single drop of blood has been commuted. From which remedy, therefore, is it more likely we should derive the desired effect, that which immediately answers the purpose, or that which must pass through so many canals, and undergo so many changes, before it arrives at the place where it is to exert its efficacy?—The sudden changes arising from the application of the cold bath contribute, in various ways, to brace the human body. The relaxed fibres of the skin and the muscles acquire more solidity and compactness from contraction. Their elasticity is increased, and thus a considerable defect removed: the nerves are stimulated and incited to those powerful exertions, on which the ease, vigour, and habitual sprightliness of the body so much depend. From that degree of irritability which the nerves possess, when in a debilitated state, arise all hysteric, spasmodic, and convulsive symptoms and affections. These may be mitigated or removed by the cold bath; because it powerfully affects and alters the state of the nerves; it shakes and animates them, and, by its forcible operation, overcomes their tendency to preternatural rigidity and other disagreeable sensations. Here then we have two causes which illustrate the excellent effects of this remedy;—there remains, however, to be explained a third cause, which is still more important.

The blood, which, by external pressure, is driven into the internal vessels, extends and enlarges them, without diminishing that contractile force or tendency which is

peculiar to every artery. At the moment when the external pressure ceases, all the internal vessels exert their inherent power of contracting more forcibly than usual, as they are more strongly extended, and, consequently, enabled to exercise a greater force. The blood, returned to the cutaneous and muscular vessels, finds its reservoirs contracted and invigorated; it flows through muscles, the fibres of which have acquired greater elasticity and power of resistance. It is accelerated, in its new motion, by these improved fibres and veins, and the result of the collective powers is a fresh impulse and rapidity given to its circulation. Although, at the first immersion, the uniform course of it is somewhat interrupted, this temporary stoppage serves afterwards to re-establish and promote it. The blood can now penetrate, with ease, into the smallest capillary vessels, and also circulate freely through every part of the animal machine, without affecting or relaxing the solids.*

* Such are the advantages which the theory of bathing holds out. I shall, however, quote a respectable authority, which may be of use to remove some erroneous notions, hitherto very prevalent, in the practice of cold bathing.

"In the earlier stages of exercise (says Dr. CURRIE, of *Liverpool*), before profuse perspiration has dissipated the heat, and fatigue debilitated the living power, nothing is more safe, according to my experience, than the cold bath. This is so true, that I have, for some years, constantly directed infirm persons to use such a degree of exercise, before immersion, as may produce some increased action of the vascular system, with some increase of heat, and thus secure a force of reaction under the shock, which, otherwise, might not always take place. The popular opinion, that it is safer to go perfectly cool into the water, is founded on erroneous notions, and sometimes productive of injurious consequences. Thus, persons, heated and beginning to perspire, often think it necessary to wait on the edge of the bath until they are perfectly cooled, and then, plunging into the water, feel a sudden chilliness that is alarming and dangerous. In such cases the injury is generally imputed to going into the water too warm, whereas, in truth, it arises from going in too cold.

"But though it be perfectly safe to go into the cold bath in the earlier stages of exercise, nothing is more dangerous than this practice, after exercise has produced profuse perspiration, and terminated in languor and fatigue; because, in such circumstances, the heat is not only sinking rapidly, but the system parts more easily with the portion that remains.

"In his Essay on Swimming, FRANKLIN makes the following observation:—

* *During the great heats of summer there is no danger in bathing, however warm we may be, in rivers which have been thoroughly warmed by the sun. But to throw ourselves into cold spring water, when the body has been heated by exercise in the sun, is an imprudence which may prove fatal. I once knew an instance of four young men, who, having worked at harvest, in the heat of the day, with a view of refreshing themselves,*

The healthy and the vigorous, who resort to the cold bath, on account of its cleansing and bracing effects, may continue in it, with safety, for a considerable time. But, to strengthen and give elasticity to the solid parts, every thing depends upon the sudden impression of the cold. This primary effect will be weakened or frustrated by remaining in the bath till the water feels warm, so that the pressing or vibrating action on the nerves at length ceases. The most proper time of bathing is, when the stomach is not employed in digestion; as in the morning or forenoon, or from three to four hours after dinner.

The cold bath, between 65 and 32° of Fahrenheit, is not, strictly speaking, a dietetic remedy; nor are its effects so much calculated for the healthy and robust as for the infirm and diseased, under peculiar circumstances. The external use of cold water is of singular benefit, when applied to particular parts of the body, where its use may be much longer continued without danger, and where we may, in a manner, by compulsion and perseverance, accomplish the intended effects.

Of all the parts of the body, the head receives most benefit from the affusion of cold water; this is a simple and effectual remedy against too great an impulse of the blood towards the head, where persons are threatened with apoplexy; in disorders of the brain and cranium,

plunged into a spring of cold water; two died on the spot, a third the next morning, and the fourth recovered with great difficulty. The authority of the American BACON is of great weight in Medicine, as in every branch of science, and particularly in what respects immersion in water; for, doubtless, he spent more time in this element than any philosopher of modern days. It may, however, be easily supposed, that he adopted the commonly-received opinion, that the injury arose from the persons in question going in *when hot*, instead of from going in *when cooling, after having been heated*; to which last circumstance it can hardly be doubted, that the fatal accident he relates was to be imputed."

These remarks are worthy of the learned Dr. CURRIE;—at the same time, instead of advising any person to use the *cold bath* after exercise, I would certainly prefer the *tepid* or *lukewarm bath*, both on account of the greater safety attending the use of it, and because it possesses nearly all the advantages of the cold bath, without being liable to so many strong objections. Besides, the cold bath is altogether improper in a weak state of the lungs, in all complaints of the breast, in dropsies, in plethoric habits, and for very corpulent individuals; in all which cases the lukewarm bath may, if duly modified, produce effects highly beneficial.

as well as in wounds and other complaints to which the head is subject. In these instances, its effects may be still farther improved by frigorific or cooling salts. The affusion of cold water upon the abdomen has likewise been employed, with great advantage, in cases of obstinate costiveness, as it affords almost instantaneous relief, when internal remedies have produced no effect. This should not, however, induce persons to try that remedy indiscriminately, or without proper advice.

On the contrary, in all those cases where the cold bath might repel certain eruptive humours, which Nature determines towards the surface of the body, it cannot be resorted to without danger. Apoplexies have been the frequent consequences of an unwary use of the cold bath; more frequent, indeed, than is generally suspected: and yet the popular opinion, still prevalent, is, that there can be no better practice than to plunge into the cold bath, at all times, and in all states of the body, in order to strengthen the nerves. Children, especially, are indiscriminately accustomed to it from their infancy, to restore them to that degree of bodily vigour for which our ancestors were so famed. That many children, by the daily practice of bathing them in cold water, grow and continue healthy and strong, proves as little as that many infants become vigorous and robust in the most unwholesome climates, and under the most unfavourable management.—Some think to fortify the body, by the use of the cold bath, against the vicissitudes of the weather; but it can be proved, that children, who, from their infancy, have been bathed in cold water, are as much exposed to coughs and catarrhs as those who have not been habituated to this erroneous practice, provided they have not been mismanaged by effeminating indulgence. In general, all artificial plans, of hardening and bracing the bodies of children, are commendable only when the child shows no strong and lasting aversion to them.

It should be considered, that, as the cold bath powerfully contracts the fibres by its frequent use, it imparts,

to the juvenile body, an unnatural degree of solidity and compactness, whereby it too early acquires the properties of an adult. The skin of such children as have been too frequently bathed, is generally much drier and harder than it ought be at their age. It is a remark of GALEN, that the cold bath does not agree with a growing person, and he advises young people not to bathe at all till the body be completely formed. Is it not inconsistent, that, by cold bathing, we expect to bring the body of youth to the vigour of age, and that, afterwards, when age approaches, we should wish to render it softer, and restore its energy, by lukewarm bathing? Hence, the cold bath, for the purpose of strengthening children, must ever be considered as a doubtful remedy.

We now proceed to lay down some rules for the use of the cold bath, in the cases where it may be of service. 1st, Every cold bath applied to the whole body ought to be of short duration; all depends upon the first impression the cold makes on the skin and nerves, it being this impression which hardens us against the effects of rough and cold weather:—2d, The head should be always first wetted, either by immersion, by pouring water upon it, or the application of wet cloths, and then plunging over head into the bath:—3d, The immersion ought always to be sudden, not only because it is less felt than when we enter the bath slowly and timorously, but likewise because the effect of the first impression is uniform all over the body, and the blood, in this manner, is not propelled from the lower to the upper parts. Hence, the Shower Bath possesses great advantages, as it pours the water suddenly upon the whole body, and thus, in the most perfect manner, fulfils the three rules above specified:—4th, The due temperature of the cold bath can be ascertained only in relation to individual cases; as it extends from 33 to 56° of Fahrenheit, except in *partial* bathings, where, as has been already observed, the degree of cold may, and often ought to be, increased by ice, nitre, alum, salt, sal

ammoniac, or other artificial means:—5th, Gentle exercise ought to precede the cold bath, to produce some reaction of the vascular system on entering into it; for neither complete rest nor violent exercise are proper, previous to the use of this remedy:—6th, The morning or forenoon is the most proper time for cold bathing, unless it be in a river,—then the afternoon, or towards the evening, when the water has been warmed by the sun, and the dinner has been digested, are the most eligible periods of the day: a light breakfast will not be detrimental before using the bath:—7th, While in the water we should not remain inactive, but move about, in order to promote the circulation of the blood from the centre of the body to the extremities:—8th, After immersion the whole body ought to be wiped, as quickly as possible, with a dry and somewhat rough cloth. Moderate exercise out of doors, if convenient, is proper, and, indeed, necessary.

To specify the various situations in which the cold bath may be used, with perfect safety and advantage, would lead me too far, and does not belong, strictly speaking, to the subject of this book. I shall, however, briefly enumerate certain cases, in which we must absolutely refrain from the cold bath. 1. In a general plethora, or full habit of body, and in the febrile disposition which attends it; in hæmorrhages or fluxes of blood, and in every kind of inflammation. 2. In constipations, or obstructions of the abdominal intestines. 3. In diseases of the breast, difficult breathing, and short and dry coughs. 4. In an acrimonious state of the fluids, bad colour of the face, difficult healing of the flesh, and the scurvy, properly so called. 5. In gouty and rheumatic paroxysms. 6. In cutaneous diseases. 7. In a state of pregnancy. And, lastly, 8. In a deformed or distorted state of the body, except in some particular cases to be determined by a physician.

The best method of cold bathing is in the sea or a river. Where, from necessity, it is resorted to in the house, I recommend the *Shower Bath*, for which a pro-

per apparatus is to be had at the tin-shops. Where the saving of expense is an object, it may be effectually supplied by the following easy expedient: Fill a common watering-pot with cold water; let the patient sit down, undressed, upon a stool, which may be placed in a large tub; and let the hair, if not cut short, be spread over the shoulders as loosely as possible; then pour the water from the pot over the patient's head, face, neck, shoulders, and all parts of the body, progressively down to the feet, till the whole has been thoroughly bathed. Let him next be rubbed dry, and take gentle exercise, as has been already recommended, till the sensation of cold be succeeded by a gentle glow all over him. When we first resort to this kind of bath, it may be used gently, and with water having some degree of warmth, so as not to make the shock too great; but, as the patient becomes accustomed to it, the degree of cold may be increased, the water may be allowed to fall from a greater height, and the holes in the pan may be made larger, so as to make the shower heavier. A large sponge may, in some measure, be substituted for a watering-pot.

Although the Shower Bath does not cover the surface of the body so universally as the usual cold baths, this circumstance is rather favourable than otherwise: for those parts, which the water has not touched, feel the impression, by sympathy, as much as those in actual contact with it. Every drop of water becomes a partial cold bath in miniature, and thus a stronger impression is excited than by any other mode of bathing. The Shower Bath, for the following reasons, possesses advantages superior to all others. 1. The sudden contact of the water, which, in the common bath, is only momentary, may here be prolonged, repeated, and modified at pleasure. 2. The head and breast, which are exposed to some inconvenience and danger in the common bath, are here effectually secured, by receiving the first shock of the water; the blood is, consequently, impelled to the lower parts of the body; and the patient feels no obstruction in breathing, or undulations of blood to-

wards the head. 3. The heavy pressure on the body, occasioned by the weight of the water, and the free circulation of the blood in the parts touched by it, being, for some time, at least, interrupted, make the usual manner of bathing often more detrimental than useful. The Shower Bath, on the contrary, descends in single drops, which are, at once, more stimulating and pleasant than the immersion into cold water, and it can be more readily procured, and more easily modified and adapted to the circumstances of the patient.

I shall conclude this chapter with some account of what is called the *Aërial* or *Air Bath*. This is a late invention, the effects of which have not yet been sufficiently ascertained. Experience informs us, that, by exposing the naked body, for a short time, to an agreeably cool, or even a cold air, we perceive effects somewhat similar to those produced by the cold bath; particularly that of a pleasant sensation of heat, diffused over the whole body, after having again dressed. There is little danger of catching cold upon this occasion; for, in a place where we already feel a certain degree of cold in our usual dress, the sensation of it will not be much increased if we undress altogether. It may also be remarked, that, with the *whole* body naked, we have much less to apprehend from the effects of cold, than by exposing or keeping one part of it less covered than another.*

This species of bath certainly deserves farther trials. A spacious apartment, with open windows, may serve every purpose of moving in the free air. And here I would recommend to all who are engaged in sedentary and literary pursuits, to walk, with their heads uncovered, in an open, and even in the coldest air, as being

* Lord MONBODDO, the author of "*Ancient Metaphysics*," who died in May, 1799, in his 90th year, till very lately accustomed himself to take violent exercise, when quite undressed, in the open air. He also anointed his body, like the ancients, with aromatic oils, especially in certain states of the atmosphere: in the severest weather he never would enter a carriage, which he looked upon as an unjustifiable effeminacy, but annually rode from Edinburgh to London, and took other long journeys on horseback. And this venerable judge and amiable man found himself, long after the age of seventy, as hale, and, in many respects, as vigorous as he had been at thirty or forty.

a simple and excellent means of strengthening the head, and removing those complaints which arise from intense thought and close mental application.

To rub the body with woollen cloths, or with soft brushes, is very salutary; as it gently stimulates the fibres, increases the circulation of the fluids to the external parts, and promotes a free perspiration, together with all the other evacuations. Persons of a delicate habit, or of a sedentary life, and those who are liable to sudden twitches of the tendons, cramps, and lameness, may effectually relieve, or rather prevent, these complaints, by causing the whole body, particularly the limbs, to be rubbed every morning and evening, for about half an hour, with rough cloths, or soft brushes, till the skin becomes red. This friction is still more beneficial to the aged than to the young; and it may, in a great measure, produce the salutary effects of bodily exercise.

Frequent cutting the hair is of advantage to the eyes, the ears, and, indeed, the whole body. In like manner, the daily washing of the head with cold water is an excellent remedy against periodical head-aches. In coryzas, or defluxions of the humours from the head, and in weak eyes, the shaving of the head often affords immediate relief; while, at the same time, it opens the pores and promotes perspiration. It is altogether a mistaken idea, that there is a danger of catching cold from the practice of washing the head, or leaving it exposed to the free air after having been washed. The more frequently the surface is cleansed of scorbutic and scaly impurities, the more easy and comfortable we feel. The oftener the hair is cut, the more quickly it grows again; and this easy operation supplies the place of a constant blister or artificial issue.*

* All secret compositions or pomatums, for making the hair grow long and thick, are little better than fraud and imposition, and generally consist of noxious ingredients. In the place of them I recommend a simple mixture of olive-oil and spirits of rosemary, to which may be added a few drops of oil of nutmeg. With this mixture let the hair be anointed every night, but sparingly at first.

Friction of the soles of the feet is very advantageous; but, on account of the great number of highly sensible nerves in them, such practice must not be carried to excess. A proper degree of warmth and perspiration in the feet is always a favourable symptom of health. Besides, they should often be bathed in cold, or, which is still better, in lukewarm water, well rubbed; and the nails cautiously cut. There will then be no danger of the nails growing into the flesh, or of corns, or other callosities arising in the feet. All the methods hitherto discovered of extracting corns afford only *temporary* ease; and it is very dangerous to cut them too deep, on account of the many nerves running in every direction of the toes. Easy shoes, frequent bathing the feet in lukewarm water, with a little salt and pot-ashes dissolved in it, and a plaster made of equal parts of Gum Galbanum, Saffron, and Camphor, are the only remedies I can recommend against this troublesome complaint.

CHAP. IV.

Of Dress;—the Advantages and Disadvantages of the usual Mode of Clothing considered, together with Proposals for remedying its Defects.

IN considering the various articles of Dress, attention must be paid both to their *substance* and *form*. Our mode of clothing may occasion inconvenience, disease, and death—1. When we attempt by it to improve some supposed defects of the body, which cannot be done without injury; and, 2. When it consists of improper substances, whether used from necessity, or in compliance with fashion and caprice.

To change the hair to a darker colour, the liquid remedies, sold by the perfumers, are generally dangerous, as they consist of lead, antimony, and other metallic solutions. The only method to be pursued with safety is, to cut the hair pretty close to the head, and comb it, morning and evening, with a leaden comb, which simple process cannot injure or check the perspiration of the head.

To avoid ridicule, we comply with the prevailing fashions of the day; but, if this compliance be prejudicial to health, it shows great weakness to allow ourselves to be carried away with the stream; and though a deviation from the prevailing mode may, for the moment, excite ridicule in the thoughtless, yet those who have the boldness to oppose the Tyrant, when his dictatorial mandates are injurious to health, will, in the end, triumph; and they may themselves have the satisfaction to introduce dresses, at once healthful and elegant. Happily, in this respect, people begin, in some degree, to think for themselves; and that rigid adherence to the mode, which, heretofore, dressed both men and women as much in uniform suits as a regiment of soldiers, does not now disgust us.

The general properties of a good dress are the three following:—1. That it be not so hard and unpliant, as to obstruct the free and easy motion of the joints, and be uncomfortable, either from its weight or tightness. 2. That it preserve the body in that degree of temperature which is most agreeable, as well as most suitable to the different functions and motions in a healthy state;—and, 3. That it produce no detrimental effects, either by increasing perspiration in an unnecessary degree, or too much absorbing the vapours of the atmosphere.

On the Materials used for Dress.

The property of receiving, repelling, and emitting heat and cold, depends not only on the substance from which our dress is made, and its shape or form, but also on the colour. Clothes of a light colour have the least attraction for heat, and, therefore, are the most proper in hot weather. Substances of a very smooth and shining surface strongly reflect the rays of the sun, which cannot penetrate through them; hence, the advantage, in hot climates, of hats covered with oil-skin, particularly of a green or white colour, of smooth and shining

shoes, glazed gowns, and the like. Dazzling colours are offensive, and a person who suffers from weak eyes will injure them still more by wearing crimson or scarlet, or being much in company with others thus dressed. For a similar reason, splendid white dresses, steel buttons, gold and silver lace, and all ornaments of this sort, are detrimental to vision.

Animal Wool produces a moderate warmth, on account of the stimulus and gentle friction it occasions on the skin. By its use, animal electricity is elicited, perspiration promoted, the perspired humours are absorbed, and again easily evaporated, on account of the porous nature of this substance.

Linen Cloth, by diminishing the elasticity of the skin, increases the internal warmth, and, at the same time, from its compactness, too readily retains the perspirable humours, and does not part with them so easily as wool. Soiled shirts, therefore, produce a disagreeable, cooling sensation, and obstruct perspiration, especially if made of thick, strong cloth, and not regularly changed every day.

Silk occasions a gentle stimulus, but does not sufficiently promote perspiration, though it attracts less humidity from the atmosphere than linen.

Oil-skin, or wax-cloth, increases perspiration in an uncommon degree, but does not admit it to evaporate again, and is, therefore, applicable only in certain diseases.

Cotton may be considered as an intermediate substance between animal wool and linen; it increases warmth and perspiration, imbibes and retains the perspired humours, to the injury of the wearer, and, like wool, readily attracts infectious matter.

All kinds of *Fur* are more noxious than useful, both with respect to their structure and constituent parts. They contain many alkaline and oily particles; are generally too compact and unequal on the surface; too much stimulate and increase perspiration, by promoting the access of humours to the skin; do not allow the perspirable matter to escape; soon acquire an intolerable

smell, and, more than any other substance, attract and retain contagious effluvia. Experience informs us, that nations who dress in fur, particularly in hot climates, are frequently exposed to diseases, owing to a want of cleanliness and free perspiration; such are the putrid fevers of Hungary, the plague among the Turks, and the singular disease of the hair in Poland, called *plica polonica*, which curls the whole hair into a number of twists, that have the appearance of so many greasy strings, and present a ghastly spectacle.

We ought, therefore, to choose a dress agreeable to the season and weather, as well as to the constitution of the body. Woollen clothes are the most proper in spring, autumn, and winter; because they moderately warm the body, do not weaken it by the abstraction of too many exhalations, and have the fewest points of contact, or, in short, do not attach so close to the body as any other materials of dress.

In summer most people are accustomed to wear thin clothes, which are scarcely proper in our changeable climate. It is not advisable, in that season, to take much exercise in thin dresses, particularly in the heat of the day. Nor should we venture to wear such clothes early in the morning, when the air is cool, and the pores of the skin have been dilated by the warmth of the bed;—but still less in the evening, when the heat of the day has so much opened them, that perspiration may be easily checked, and health materially injured.

In our variable climate, it would be preferable to adopt a species of dress which is nearly uniform in all seasons; for, as thin clothes are more immediately pervaded by heat, during the least exercise, it certainly would be more prudent and rational to wear a dress that is calculated to withstand the effects both of cold and heat. That there is no danger in adopting a general dress for all seasons; and that, on the contrary, it is the most beneficial plan of managing the body, with regard to the most important function, namely, that of perspiration, I shall endeavour to prove in the next section.

On the immediate Covering of the Skin.

The first and principal rule, with respect to this subject, is, that *the covering of the skin ought to be always the same, and not be changed according to the season and the weather.* The usual consequence of this change is, in the first place, an uneasy and painful sensation. A skin accustomed to fine linen only cannot endure the sensation occasioned by a coarser kind; and cotton is still more disagreeable; but most of all animal wool or flannel. In the next place, to change the dress, according to the weather, requires more expense and time than is convenient to the great mass of the people.

Nevertheless, there are many who, from mistaken maxims of health, accommodate the covering of their skins to the seasons: they dress themselves in winter in flannel, towards spring and autumn they wear cotton, and in summer linen; changes as absurd as they are dangerous. Notwithstanding the difficulties which each of these variations must produce, while we undergo this new experiment on our skin, we expose ourselves, at the same time, in every such change, to all possible dangers arising from cold and repelled perspiration. This custom is the more dangerous, as it is usually practised by the infirm, the tender, and the aged, who regulate themselves, in the periodical modes of dress, less by the temperature of the weather than by the days of the almanack.

The question, then, which is the *most proper covering of the skin*, is easily answered. *Animal wool* seems to recommend itself to us by the very circumstance, that hair is the general covering of those animals which most resemble man in their structure. If men were habituated to go naked in the colder climates, the human body would, no doubt, also be better covered with hair. Animals, in winter as well as in summer, have the same coat, except that in the coldest season their hair is uniformly somewhat thicker and longer, consequently, also

warmer, than in summer, especially in the northern countries.

Not only analogy, but experience also proves, that wool, worn next the skin, has indisputable advantages over all other substances. For, 1. Flannel is but a slow conductor of *external* heat to the body, and it the more easily attracts *internal* heat, and allows it to evaporate the more readily, as it is more porous than any other texture. 2. A sultry atmosphere is extremely troublesome, particularly where great heat is combined with moisture, the humidity checking perspiration, and, at the same time, conducting too many aqueous particles to the absorbent vessels from without. Here, then, flannel is of incomparable service, since it keeps the vessels of the skin constantly open, causes them to perspire freely, and admits but a very small degree of external moisture.

The principal good effect of flannel, however, consists in its gentle and beneficial stimulus, or that friction which it occasions on the skin, and by which it opens the pores. We must not imagine, that flannel, *of itself*, heats more than linen or cotton; for it is not the heat which occasions inconvenience, but the circumstance of the perspirable matter adhering to the skin. In flannel we may perspire without danger, and undertake any exercise of the body without disagreeable sensations; but not so when linen remains wet on the skin. If we take violent exercise in flannel, perspiration is necessarily increased, but the perspired matter is communicated through the flannel to the atmosphere, and the skin remains dry, warm, and comfortable. If we take the same exercise in linen shirts, perspiration is, indeed, also increased, but the perspired matter is not imparted to the atmosphere, but is inspissated in a fluid state, clogs the linen, and remains in contact with the skin.

Another advantage which flannel possesses over linen and cotton is, that people perspiring profusely, in flannel shirts, may safely venture into the open air, and will not easily catch cold, because flannel does not retain the

perspired humours. If we do the same in linen shirts the skin will soon be wetted by perspiration, which will occasion a sensation of chilliness and shivering; in most cases, a violent cold, and, very frequently, an inflammation of the lungs, will be the consequence. This danger arises from the fluid matter settling on the skin; and we may be still more severely injured, if we, at the same time, expose ourselves to the action of the wind, or a current of air.

Numberless writers, both antient and modern, confirm the good effects of flannel next the skin; of these I shall only quote COUNT RUMFORD, who says, in one of his earlier Essays, that he is convinced of the utility of flannel shirts in all seasons; that he has worn them in all climates, in the warmest apartments, and during the most fatiguing exercise, without the least difficulty; that he was relieved, by the use of flannel, from a pain in his breast, which he had been frequently subject to, and never since knew an hour's illness; and that nothing exceeds the agreeable sensation of this dress, when we are once accustomed to it.

Indeed, after the praises bestowed upon flannel, by so many respectable authorities, and by men who, from long experience, have ascertained its beneficial effects, it is surprising that any individual, however great his reputation, should be whimsical, or hardy enough to dispute its *general* salubrity, merely with a view to establish a favourite hypothesis.

It has been objected, that flannel, worn next the skin, is debilitating, because it too much increases perspiration; but this is not founded on truth; since perspiration, *as long as the skin remains dry*, never can be hurtful, nor immoderate. Such mistaken notions have been propagated, from the circumstance, that flannel is frequently ordered by physicians, to increase perspiration in some diseases, where it is necessary to the recovery of the patient: *but the copious perspiration is then the effect of the disease, and not of the flannel.*

The uneasy sensation occasioned by flannel is of very

short duration. That it may make the skin red and inflamed, if it be too much rubbed and scratched, cannot be denied; but it is a palpable error, that it produces cutaneous eruptions. It has quite a contrary effect; as it preserves the pores open, increases perspiration, and thus removes the cause of cutaneous diseases, which arise chiefly from a checked and irregular state of excretion by the pores.

In answer to another objection against the wearing of flannel, it is certain, that a flannel shirt or waistcoat may preserve the body as clean, and much cleaner, than linen, *if as frequently changed*.*

Wool, on account of its rough surface, is more calculated to absorb infectious morbid matter, than a more smooth substance; but we have nothing to apprehend from flannel next the skin. I am rather of opinion, that it is a better preventive against contagion than any other; because, while it encourages perspiration, it, at the same

* This preliminary condition, I presume, sufficiently answers the objection of a learned writer, according to whom a flannel dress requires a more frequent change than linen, *to promote cleanliness*, and, consequently, would produce a contrary effect among the lower classes of people. Yet, in other respects, I fully agree with the celebrated HUFELAND, who lays down the following conditions and limitations in what relates to the use of flannel:—"Upon the whole," says he, "I am of opinion that it would not be advisable, at least to children and young persons, *universally* to adopt a woollen texture for the covering of the skin. It is, however, a *salutary* dress to those who, in all probability, have commenced the second half of their life; to all cold or phlegmatic temperaments; to all who lead a sedentary life; to individuals subject to catarrhs, or frequent colds, gout, diarrhœa, and partial congestions of the blood; to all nervous patients and convalescents from severe chronic disorders; to persons who are too susceptible of the impressions of the atmosphere; and, lastly, in such climates and pursuits of life as are exposed to frequent and sudden changes of air.—It is, on the contrary, *hurtful* to all those, without exception, who are already subject to violent perspiration, or troubled with cutaneous eruptions, and who cannot afford to change their under-dress as often as is consistent with cleanliness."

Professor HUFELAND doubtless meant to say, that the wearing of flannel next to the skin, is *then only hurtful*, if none of the conditions before specified reconcile its use; for, even in cases apparently doubtful, the temporary wearing of flannel is not attended with such danger as might perhaps result from neglecting its application. But though it be obviously conducive to health, the Professor recommends only such a texture of wool, as is sufficiently porous, and neither too rough nor too thick.—Coarse woollen stockings in winter, and thin ones in summer, ought, in his opinion, to be more generally worn. Those persons, lastly, who are in a good state of health, and have no particular reason for wearing flannel, or whose skin is too irritable, may find it, he thinks, beneficial to wear a cloth fabricated of a mixed texture of cotton and linen.

time, removes the inhaled poisonous particles, particularly if, in cases of danger, perspiration be increased by other suitable means. Hence, people wearing flannel on their skin, never suffer from cold. I have been informed, that the manufacturers in the different foundries of Birmingham, as well as at the iron-works of Colebrook-Dale and Kettley, in the most intense heat, wear no other but flannel shirts; and that without these it would be impossible to prevent continual colds, and the most fatal diseases. With this beneficent intention, the British soldiers, upon the continent, some years ago, were furnished with flannel waistcoats, by the liberal subscriptions of individuals, which, I am convinced, saved many brave fellows that must otherwise have fallen victims to the effects of a cold and moist climate.

These advantages strongly recommend the use of flannel to every one anxious to preserve his health, but particularly to those who are exposed to all kinds of weather, as husbandmen, fishermen, mariners, soldiers, and travellers. As flannel is suitable to all seasons; as it requires no great changes in the under-dress; and as it is a tolerable substitute for a deficiency of upper-dress, it deserves every attention among those who provide for orphan and poor-houses, as well as for the indigent of every description. Many desperate diseases in the legs of the common people, many inflammations of the throat, breast, and lungs, might be prevented, and numbers of lives saved, both of children and adults, if flannel were more generally worn.

Those who complain of cold legs and feet are never comfortable nor healthy; but if they could be prevailed upon to wear worsted stockings and flannel drawers, they would acquire a quicker circulation of the blood in the lower extremities, and prevent many troubles and indispositions, from which, without this precaution, they cannot escape. Most valetudinarians and patients pay no attention to this advice, because they imagine that the wearing of flannel is attended with uneasy sensations. This idea, however, ought not to prevent them from

giving it a fair trial; for the uncomfortable sensation continues only a few days, as I have myself experienced; and this trifling sacrifice cannot be compared with the salutary effects, which flannel next the skin almost uniformly produces. By continuing it a sufficient length of time, and changing it frequently, the most obstinate gouty and rheumatic complaints have often been removed, and many other imminent dangers averted. Children afflicted with rickets cannot be better relieved than by a proper diet and flannel shirts, which may be daily fumigated with amber, petroleum, or other fragrant substances; a process which has been frequently productive of the most beneficial effects.

Of Stockings.

Cotton stockings, which are so generally worn at present, are highly objectionable. There is no part of the human frame which perspires so much as the feet. The disagreeable sensation cold feet produce is well known; for the connection between the feet and head, the stomach, the uterus, and many other important parts of the human system, is so intimate, that gout, suppression of the critical evacuations, pain in the excretory organs; nay, cancer, inflammation of the uterus, and abortion, may be the consequence of cold feet and legs, which are the necessary effects of wearing cotton and silk stockings. Cotton and linen, worn next the skin, if once filled with perspirable matter, do not admit any more to pass through them; a glutinous and cooling moisture accumulates, and it is not easy to keep the feet thoroughly clean in this dress. Those who alternately wear cotton and worsted stockings must soon observe the difference in the exhalation and moisture peculiar to each. Cotton, though somewhat better than linen, is still much inferior to wool, which is alone calculated to absorb and exhale the noxious humours emitted by the pores.

The reciprocal effect of the perspiration of the feet,

and of the leather of the shoes, is greater than is commonly believed. Hence, those who wear cotton stockings ought, from respect to cleanliness, as well as health, to change them according as their exercise increases perspiration.

Although the feet are the principal sources or conductors of exhalation from the body, little attention has been paid to them, with the view of promoting this salutary secretion. Instead of profiting by this hint of Nature, mankind have been imprudently and unaccountably studious to stop that canal; imagining this to be the safest way of preserving the feet dry, and free from all disagreeable smell. Dry feet are certainly preferable to moist: but the means of promoting perspiration are also the only means capable of keeping the feet dry, and free from any unpleasant fetor.—It is also improper and unhealthy to wear any other but woollen gloves, which ought to be worn by all females, who wish to improve the skin of their hands and arms; no cosmetics or washes are so certain and so powerful in their effects: on the contrary, all external applications, unless assisted by internal remedies, are attended with the positive ruin of the skin, bloom, and health.

Persons who perspire freely in their feet, and who increase this exudation by much walking or dancing, will, no doubt, be sensible, that cotton, thread, or silk stockings, instead of removing the transpired matter, actually retain it, bring it in contact with the skin, preserve it in a state of heat favourable to putrefaction, and check all farther perspiration.

That the feet are more exposed to the effects of cold, and to stagnations of the fluids, than any other part of the body is unquestionable: 1st, Because they are the most remote parts from the heart, and the quickness of the circulation of the blood decreases in proportion to that distance; and, 2d, The blood, circulating downwards, makes its way to the heart somewhat slower, on account of its relative gravity. By this slowness in the circulation, more watery particles are deposited by the

blood. It is, therefore, necessary to keep the feet somewhat warmer than the rest of the body, in order to encourage the motion of the fluids to the upper parts. Woollen stockings are excellently adapted for this purpose, and they ought to be chosen rather thicker than those flannels used for shirts and drawers. For the same reason, it is proper to prevent all moisture from without, by means of water-proof shoes, provided with thick cork soles, for the winter, or with elastic socks of horse-hair.

The most disagreeable sensation produced by the feet in perspiring is between the toes: this can only be prevented by wearing stockings made with toes, like the fingers of gloves; because these alone can absorb and prevent the viscid and fetid particles from settling there. But, as this proposal is not likely to meet with the approbation of the votaries of fashion, I shall substitute an easier method of remedying the unpleasant effects of violent perspiration in the feet. A powder of burnt alum will overcome this feter, by neutralising the acrid particles, and, at the same time, will not obstruct the necessary perspiration.

Of Dress, as to its Form.

All coverings for the head, of whatever kind, produce more mischief than benefit. The well-known and excellent rule, of keeping the head cool and the feet warm, is too much neglected, especially by the lower classes of the people in many countries, as in Scotland, Holland, and Germany, and likewise among people of a certain age and description in this country. The Scotch peasant wears his heavy bonnet, the Dutchman his cap, and the Turk his turban, without considering that such oppressive loads are stupefying, and that, while no attention is paid to keep their feet warm and dry, their heads are virtually converted into vapour-baths. In all countries, the man who lives at his ease carefully covers his head with a warm night-cap; he spends, perhaps, one-half of the day in this unnatural dress, and prepares

his head for frequent colds, at every sudden change in the atmosphere. Besides weakness of the head, pains, eruptions, local plethora, or fullness of blood, loss of the hair, lethargy, and, at length, stupor or insanity, are often the effects of this imprudence.*

In this temperate climate we may safely accustom our youth to go with the head uncovered, as Nature has already provided it with hair for that purpose. In very cold and hot countries, however, the head must be slightly covered, to shelter it from cold, or from the still more dangerous vertical rays of the sun.

It is an instance of improvement in the education of children in England, that their tender heads are not so much shut up in close caps, and fur bonnets, as those upon the Continent. A practice so injudicious and hurtful deserves no imitation; and yet there are advocates for *warm* night-caps and wigs; they would starve their feet, while the head is enclosed in an artificial stove, which enfeebles their mental faculties, and diminishes their bodily vigour.

New-born children, and those who are very tender, require only an easy and moderately warm covering for the head, and this chiefly during the first weeks, on account of the softness of their cranium, which is then but imperfectly ossified. Yet such a cap should be loosely tied, that it may not press the head, nor cripple the muscles of the ears.

That the ear is naturally capable of some motion is proved by the muscles with which it is provided. Its form, resembling a shell, is admirably adapted to receive and convey sound. In the vain conceit, that a projecting ear, as the Author of Nature has created it, is a deformity, nurses and over-wise matrons endeavour

* A few years since the ladies, instead of those horrid masses of frizzled hair, which used formerly to injure their health and disfigure their faces, happily returned to beautiful and elegant nature; they wore their hair hanging down in graceful ringlets, while the only artificial covering was a simple turban, or an ornamental bandeau. Of late, however, this pleasing style of decoration has been succeeded by unnatural, disgusting, and unhealthful *wigs*; a fashion probably introduced by some ugly and bald woman, to reduce her gay and beautiful imitators to her own standard of deformity.

to press the child's ear, from its first appearance, close to the head. Thus they render the shell of the ear immoveable, and diminish the capacity of hearing. A properly-expanded ear not only strengthens the perception of sound, but likewise preserves this useful sense to a great age, when the muscles of the internal organs of hearing become relaxed.

To go with the head uncovered, in sunshine, is certainly improper, both for children and adults; but our common black hats are ill calculated to avert the mischief, as they do not reflect the heat, but rather concentrate it in the most sensible manner upon the head. Hats of a white, or any other light colour, made of straw or similar light materials, would be far preferable, particularly for people labouring in the fields, soldiers, and travellers. In very hot weather, a piece of white paper may be fastened, with advantage, to the crown of the hat.

As the hat ought likewise to shelter the eyes from too vivid a light, the brim should be broad enough to protect them, and the inner side of a green or blue, but not of a black nor a dazzling colour. From the present mode, however, it appears, that both ladies and gentlemen think a brim almost, if not altogether, unnecessary, even when the power of the sun is most oppressive.

Persons suffering from periodical head-aches, or whose heads are otherwise unhealthy, should have their hair cut short. By this trifling sacrifice, they will promote the necessary perspiration, the head will remain cool, and the cold bathing of it can be practised with more advantage. In this point of view, wigs cannot be *altogether* condemned, as long as hair-dressing, artificial braids, and other ornaments, form an essential part of fashionable dress. Besides, the wearers of wigs are, in a great measure, exempt from many inconveniences and evils attending the use of powder and pomatum. Lastly, if we must choose one of the two maladies of the times, it is more rational to adopt the least noxious to health; and so far I think a *light wig* is justly preferable to a

head enveloped in an artificial paste of powder and pomatum. Those, however, who are once accustomed to wear a wig, should not, upon any account, let their hair grow again, in order to have it dressed, pasted, and powdered anew.

With respect to *Shirts*, the most proper substance having been before investigated, I shall only add, as to their form—that they may be seriously prejudicial to health if too narrow in the collar or in the wristbands. I have seen several instances of people attacked with shortness of breath and difficulty of speech, from this reason only, because the blood cannot circulate freely if the neck and wrists be tied or buttoned up too closely. I was once present where a young man, playing at rackets, was suddenly seized with an apoplectic fit, the cause of which seemed, at first, inexplicable. As soon, however, as his shirt-collar, wristbands, and garters were loosened, he recovered.

Neck-cloths, cravats, and ribbands, necklaces of all sorts, *when they are too tight*, stop the access and retreat of the blood to and from the head, occasion accumulations of the blood and other fluids, head-aches, faintings, stupor, apoplexy, corrosive ulcers of the skin, and innumerable other maladies. All coverings of the neck ought, therefore, to be constantly worn loose. Persons who are liable to sore throats, and diseases of the breast, should gradually accustom themselves, in mild and dry weather, to go with their necks as slightly covered as possible, and, if fashion would permit it, to have no other covering but the collar of the shirt. In cold and moist weather, a thin handkerchief may be added. But the modern cravats, filled with a stiffening of cotton or wool, are extremely injurious to the part which they are intended to protect. For, by occasioning too great heat, they render the neck unnaturally sensible to every change of the atmosphere. It is rather surprising, that, from a due sense of their perniciousness, we have rejected all coverings of the neck in children,

as being troublesome and useless; and yet, in defiance of reason and experience, we continue to encumber our own necks with such bandages.

Necklaces and ribbands, likewise, are generally tied so close, as to press with violence on that supposed deformity of the throat, vulgarly called the *Adam's apple*, which projects less in the female than in the male sex. These ribbands and necklaces, when worn tight, are the more inconvenient and dangerous if they be narrow and edged. Upon taking them off, which is too frequently neglected at night, they leave an impression on the neck, clearly proving the impediment they are to free muscular action, and what stagnations, pain, and dangerous consequences they may occasion. The neck and throat being alternately expanded and contracted, in speaking, chewing, and swallowing, it is the highest degree of imprudence to obstruct its motions, for the sake of appearance, vanity, or fashion.

Equally objectionable are those black stocks that were formerly much in fashion, and are still worn by some old beaux and military men. The latter, indeed, deserve our compassion, from being obliged to wear these uncomfortable collars; but the former ought to consider, that they expose themselves to dangers, increasing as they advance in age, and rendering them every day more liable to apoplexy. I knew a regiment of soldiers on the Continent, whose Colonel was so excessively fond of what he considered a martial appearance, that he caused his officers and men to have every article of their uniform remarkably tight, particularly the stocks, waistbands, and knee-garters. The consequence was, that, in the course of a few months, above the half of his regiment became subject to very obstinate cutaneous diseases, and other obstructions, so that they were unable to perform duty. Other regiments, in the vicinity, also suffered from this destructive custom; but the proportion of their disabled soldiers was like one to ten in the former.—The late Dr. FOTHERGIL asserts, that

these tight stocks are productive of apoplexy, if a person look for some time, with his head turned, without moving his body. By this alone, he believes, people have brought on apoplectic symptoms; for such a turn of the neck, when the body stands fixed, diminishes the diameter of the jugular veins so much, that a proportionate quantity of blood cannot return to them from the vessels of the head and the brain.

Neck-cloths or cravats, loosely tied, and not too thick, are, therefore, the only proper ones for *Men*; but, as to *Women* and *Children*, it cannot be disputed, that they would do better without any.

Laced stays are, among the better ranks of society, at present, out of fashion; since the Grecian form is justly preferred to all artificial shapes. Yet, when we have adopted an useful habit ourselves, it is our duty to recommend it to those also, who are still following a destructive practice. And, with this intention, I cannot but reluctantly observe, that nine-tenths of the community still wear these oppressive *strait jackets*, merely because their mothers and grandmothers have done the same. I shall, therefore, briefly state a few of the consequences arising from this unnatural part of female dress; namely, diseases of the breast, external callosities, and cancer itself; the ribs are compressed; the spine is bent out of its place; the free expansion of the lungs is prevented: hence, shortness of breath, indurations and tubercles of the lungs, cramp of the stomach, defective digestion, nausea, irregularities in the secretory and other organs, and the like: in short, the list of maladies, thus produced, is too long to be here detailed; and both married and unmarried ladies, for the sake of compassion, should exert all their influence, to convince the common people of the injuries occasioned by stiff laced stays. If any such part of dress be at all admissible, it ought to consist of soft and pliable materials, such as fine chamois leather, hatter's felt, or, what is still better, the knitted and more elastic texture used for gloves and stockings.

All that has been said, with regard to laced stays, is also applicable to small waists, and tight coverings of the breast and abdomen.*

Narrow sleeves in gowns and coats, tight wristbands in shirts, and bracelets, occasion a swelling of the veins on the back of the hand, rigidity, weakness of the nerves, and incapacity of bending the arm. If the arms be, in this manner, twisted from infancy, their growth and formation are impeded; and it is probably owing to this cause that we see so many persons with short, thin, and ill-formed arms.

Women suffer much more by this bandage than men, whose arms possess more muscular strength, and have not the interstices of the muscles filled with fat, like the former. In this respect, the modern fashion of tying the sleeves of ladies' gowns close to the elbow deserves particular censure; as the circulation of the blood, together with the motion of the arms, is thus obstructed, and many disagreeable consequences wantonly induced. Farther, the female arm is naturally somewhat fuller from the shoulder downwards, and again becomes smaller towards the joints of the hand; but, in man, it is always more muscular a little below the elbow. From this difference in the structure, it is obvious, that the sleeves in a female dress lie close to the whole arm, while those of a man's coat but partially attach to it.

Many of the remarks already suggested, respecting the form and substance of other parts of dress, are likewise applicable to the article of *breeches*. If these be made of improper materials, or too tight in the waistband, they must occasion both uneasiness and injury to the body. Yet the ingenious observations, lately published, on this subject, by Dr. FAUST, an eminent physician in Germany, are by no means so conclusive, as to induce us to abandon an article of dress, not only ren-

* Fashion delights in extremes. No sooner had the fair sex abandoned the unnatural and unhealthful custom of long, taper waists, than they, in a manner, concealed the waist altogether. Instead of the cincture round the middle of the body, as nature and taste directed, they bound themselves over the breasts; a custom not less preposterous than injurious to health.

dered necessary by the laws of decorum, but which, when properly constructed, is even of considerable service; inasmuch as breeches, by their moderate pressure, tend to strengthen the relaxed parts of the body, particularly at a tender age.

The most proper form of this vestment is, upon the whole, that of *pantaloons*; but they ought to be sufficiently wide, of a thin cooling substance in summer, and of a warm elastic woollen cloth in winter. Tight and contracting leather breeches, purposely contrived to display an elegant shape of the limbs, are extremely inconvenient, occasioning numbness and chilliness all over the hip and thigh, and a painful pressure of the *pudenda*. Leather is also an improper substance for this part of dress; as, on account of its close texture, it is apt to check insensible perspiration. If the waistband be too strait, the free motion of the internal parts of the abdomen will be obstructed, the absorbent vessels of the intestines prevented from performing their offices, and hypochondriacal complaints be easily induced. This inconvenience may be entirely avoided, by the use of *braces*, now almost generally adopted, and which, as they render a tight cincture altogether unnecessary, cannot be too much recommended, both to men and women, for the sake of health as well as comfort.

There are many reasons, which delicacy forbids me to mention, why it would be highly beneficial to the physical and moral condition of females, to wear some kind of drawers, at least after a certain age. This additional piece of dress would effectually prevent several inconveniences to which women are subject. There are other circumstances attending their usual dress, which contribute to bring on a premature sexual impulse, and are apt to induce them to habits equally irregular and injurious to health. This hint cannot be misunderstood by judicious mothers, and, it is humbly presumed, will not be totally disregarded; especially as young females but too readily accustom themselves to sit in an improper posture.

Concerning the dress of the legs, I must, in the first place, censure the use of tight *garters*, particularly in men, to whom they are altogether unnecessary. Whether females can do without them is scarcely fair to question: but if any substitute or contrivance can be adopted in their place, it will amply compensate any little trouble or inconvenience:—the stockings can easily be tied to some tape fastened to the waistband. This apparently trifling improvement is of greater moment than many are inclined to imagine; for garters are undoubtedly the cause of much mischief, whether tied below or above the knee. The part to which they are applied acquires an unnatural hardness; they dispose the thighs and legs to drop, induce great fatigue in walking, and are, very probably, the cause that certain persons so frequently stumble, fall, and dislocate or break the knee-pan. The great difference in walking, with and without garters, I have myself sufficiently experienced. Many years ago, when, in compliance with early habits and prejudices, I was accustomed to the use of garters, I could not walk or ride half a dozen miles without fatigue; which inconvenience I found immediately remedied, on abandoning those improper ligaments.

The advantages of woollen *stockings* have been already pointed out. Upper stockings of silk, cotton, or linen, are not objectionable; and they may be chosen of thicker or thinner quality, according to the weather and season. But the best stockings may become hurtful, if too short in the feet, and may bring on a spasmodic rigidity, and distortion of the toes. If, on the other hand, the feet of the stockings are too wide, so that they make folds in the shoes, they will injure the skin by their friction, and be attended with painful consequences. The stockings of children ought neither to cover the knees, nor be tied in any other manner than by fastening them with strings to the waistband; otherwise they will increase the size of the knees, render them preternaturally thick, and may produce white swellings and other dangerous maladies.

Boots, if too tight, and made of thick leather, are so injurious to health, and so troublesome in walking, that no reasonable being will be inclined to force his feet and legs into them. The consequences of a practice, as hurtful as it is injudicious, are obvious from the preceding observations.

The constant use of boots contracts the size of the legs, particularly the calves, as may be daily observed in military men, and the fashionable loungers of Bond-street and Pall-Mall.

I now proceed to the last, but not the least important, part of our dress, namely, *Shoes*. The celebrated Dutch anatomist, CAMPER, did not consider this subject unworthy of his attention, as he published a particular work, "*On the proper Form and Size of Shoes*," as late as the year 1781. The shoes ought to be of the size of the foot; they should be also accommodated to the degree of motion or exercise, and to the nature of the soil and place in which we wear them; circumstances that are, at present, too little attended to. A shoe that is bigger than the foot prevents a firm step; while one which is too narrow occasions pain and troublesome corns. Many volumes have been written on the Art of Shoeing that noble and useful animal, the Horse;—it is considered as a fundamental rule in Farriery, that the shoe must be neither smaller nor larger than the hoof; and yet mankind can submit to squeeze their feet into a narrower compass than is intended by Nature. How frequently do we smile at the Chinese and Circassians, who, from a tyrannical custom, compress their feet, that they may remain small and crippled! Yet these feeble Orientals proceed more rationally, in this practice, than their European rivals. *They* begin it gradually, and from the earliest infancy. *We* do not think of contracting the feet of our children till they have almost attained the natural size, and thus endeavour to counteract the progress of Nature, when it is too late to do it with impunity. Who, then, are the greater slaves of fashion, the Chinese or their enlight-

ened antipodes?—It is pitiable to see the young and old, of both sexes, advancing into an assembly or ball-room with the most painful sensations. Without consulting Lavater's Physiognomy, it is easy to discover, by their distorted features and compressed lips, what many whimsical persons suffer from too tight, or, what is still worse, from short shoes.—Our knees would be more flexible, and our toes more pliable, more useful, and better adapted to perform the various motions of the feet, if they were not continually pressed and palsied by this improper *case-work*. Nature has designed the toes to be as moveable as the fingers. Those unfortunate beings, who are born without hands, learn to perform, with the toes, the most astonishing tasks, to write and cut pens, to sew, to draw; in short, to supply almost completely the want of their hands.

Our feet, no doubt, would be more comfortable, easy, and useful, if we were not at the greatest pains to deprive them of their elasticity and vigour. The numerous nerves, crossing the feet in every direction, plainly evince, that Nature has endowed them with peculiar powers, of which we can scarcely form an adequate conception. The untutored Indian, or the wild African, excels not only the enlightened European, but likewise the lower animals, in running, leaping, and, in short, in swiftness and agility of every kind, where muscular motion is required. Either of them would heartily laugh at us, that we are obliged to employ professional operators for extracting corns, and to contrive ointments and plasters for the cure of those evils which we have wantonly brought on ourselves.

A judicious writer says, “almost nine-tenths of mankind are troubled with corns; a disease that is seldom or never occasioned but by strait shoes;” and I presume to add, that the remaining tenth part do not envy their fellow-creatures for this modern improvement. Our ancestors, even within my memory, wore their shoes with broad toes, which showed, at once, their good sense and due attention to health and comfort. He who

is regardless of the pain and trouble occasioned by warts, excrescences, and callosities of various forms; he who wishes to convert his feet and toes into so many barometers, to indicate the present state, and to foretel the future changes of the weather, will ever agree with his shoemaker, to save as much leather as possible; but he is scarcely to be pitied for his imprudence. Such a person will not unfrequently be disappointed in his excursions, when his crippled feet require temporary rest; and I am farther persuaded, that such cessations of exercise are extremely detrimental to health in general, and that they may be registered among the predisposing causes of the gout, rheumatism, and dropsy. Many people are thus almost deprived of the use of their legs; and the pain of the more virulent species of corns, as well as of the nails, when grown into the flesh, is excruciating.

For these obvious reasons, the soles of the shoes ought to be sufficiently broad, especially under the toes, but instead of which we are accustomed to see them so pointed, that they appear to be intended for weapons of attack or defence. If, for instance, the greatest breadth of the foot be four inches, the shoe should not be three and a half, but rather four and a half inches broad, since the bulk of the foot, and the seam of the leather, require an allowance of half an inch. The soles also ought not to be bent hollow, as is frequently done in women's shoes; for since the foot is not so constructed as to present a spherical surface, it is improper to deprive it of that firm hold which Nature has given it by a nearly flat form. The foot must necessarily suffer from this ill-contrived shape, which deprives it of its flexibility, occasions difficulty in walking, and renders every step unpleasant and unsafe.

In the same manner as some persons absurdly endeavour to diminish the breadth of the foot, others are equally dissatisfied with its length. Hence we see them make use of an instrument, to force their feet into shoes perhaps an inch shorter than is requisite for easy motion.

This custom is the most destructive of any; and, though not much practised at present, since a long and narrow shoe is the most fashionable, yet the inconvenience and danger still remain. Instead of bending the toes with their nails inwards, as was formerly the case, with short shoes, we now squeeze them together, and often lay them cross-ways over one another, so as to carry them about without motion, like a mere insensible mass of matter. Upon striking the foot against a stone, we feel the punishment due to such folly. Shoes of this kind may be aptly compared to the wooden boxes worn by the Dutch and French peasants, from necessity, in wet seasons, and which admit of quite as much motion as the long and narrow machines, in which our votaries of fashion cramp their feet from choice.

A convenient shoe, therefore, ought to be somewhat round at the toes, sufficiently long, with thick soles, and the upper leather soft and pliable. If it be deficient in any of these requisites, the skin will be rendered callous; the perspiration, indispensable to these parts, will be stopped; warts and corns will be formed in numbers; the nails will grow into the flesh, and various complicated maladies be produced, which not only affect the feet, but the whole body. Beside these more serious consequences, a person walking with narrow shoes will be much sooner, and more sensibly fatigued, than he whose shoes are sufficiently wide and easy.

The poor, as well as country people, who wear shoes sufficiently large, have not only a much safer step, but their feet are less subject to the multiplicity of complaints with which ours are annoyed. Those who, either from inclination or frugality, go barefooted in summer, have not even to plead the reason of the Ancients, who considered it as a token of chastity; and I cannot help remarking, that it is both indecorous and unwholesome, as well as an injudicious species of economy, especially in the northern parts of Britain. The shoe, in our climate and mode of life, is a necessary defence against many accidental injuries to which the foot is liable; and

it is likewise a crime against cleanliness, to expose any part of the human body to dust and mire.

With respect to the *substance* of which shoes should be made, no other general rule can be given, than that it ought to be sufficiently compact to prevent the water from penetrating it; so elastic and soft, as to admit an easy motion of the whole foot; and accommodated to the weather, exercise, and soil in which it is used. To those who have not the means or opportunity of procuring the patent water-proof leather, I shall suggest a method of preparing this species of leather, at a very small expense. One pint of *drying oil*, two ounces of *yellow wax*, two ounces of *spirit of turpentine*, and half an ounce of *Burgundy pitch*, should be carefully melted together over a slow fire. Those to whom the smell of pitch and turpentine is unpleasant, may add a few drachms of some cheap essential oil, as of *lavender*, *thyme*, and the like. With this composition new shoes and boots are rubbed, either in the sun, or at some distance from a fire, with a sponge or soft brush: this operation is to be repeated as often as they become dry, until they become fully saturated.* In this manner, the leather, at length, becomes impervious to wet; the shoes, or boots, made of it last much longer than those made of common leather; acquire such softness and pliability, that they never shrivel nor grow hard and inflexible; and, thus prepared, are the most effectual preservatives against cold and chilblains.

To conclude, I shall only remark, that it is not advisable to change the shoes from one foot to the other. Let us rather tread one of the shoes somewhat crooked, than injure our feet and health by an adherence to a custom, which has nothing but custom to recommend it. If it be our serious wish to avoid corns, and other painful inconveniences, to which the rage of fashion subjects

* It deserves to be remarked, that the shoes or boots, thus prepared, ought not to be worn till they have become perfectly dry and elastic; as, in the contrary case, the leather will be too soft, and wear out much sooner than even the common kind, without this preparation.

the feet of its votaries, we should persuade the shoemaker to provide us with a particular shoe for each foot; and this can be done only by keeping *separate double lasts* for every wearer. Is it not injudicious and absurd, to have both shoes made of the same size and form, when Nature has not formed both feet alike, or, at least, not in the same direction?

It gives me great satisfaction to add, that, since the first edition of these Lectures was published, the rational practice of having separate shoes purposely made for each foot, has already been adopted among the more enlightened classes of society. From a full conviction of its great utility, I sincerely wish that it may soon become universal!

CHAP. V.

Of Food;—its Quantity, Quality, Proportion, relative Salubrity, Time of taking it, &c.

ALTHOUGH it be certain, that animal life could not be supported without food and drink, few individuals give themselves the trouble of reflecting, how the very important function of assimilating our aliment is accomplished. That office of the stomach, by which all living creatures are supported, deserves the attention of every inquisitive mind. Were I not confined in my plan to the relative salubrity of Food and Drink, without entering into physiological disquisitions, how the digestive organs prepare and conduct the food from one stage to another, till it is converted into chyle, and from that into blood, I might amuse my readers with a variety of speculations and theories, none of which are fully established; but such digressions, however entertaining or gratifying to curiosity, would be of little service, either in making the proper choice of aliment, or in ascertaining its wholesome or pernicious qualities.

If, in the early periods of society, when men subsisted upon roots, plants, and animal food, as they were promiscuously found, people did not reflect upon the relative salubrity of things, we have no right to censure them; as they often might have been starved before they could have discovered their qualities. But if we, in our present state of knowledge, neglect such inquiries; if we indiscriminately feed on whatever is presented to our palate; such conduct deserves severe animadversion. For, as man assumes the right of calling himself Lord of the Creation, it is a duty incumbent on him, to make himself acquainted with the nature and properties of those substances which so essentially contribute to animal existence.

Hence, it may be justly asked, what are the constituent parts of aliment? how are they to be distinguished? are they of different kinds, or do they, with all the difference of form and taste, still manifest the same properties, powers, and effects? do they promiscuously supply all the parts of the human body? or are particular kinds of food more or less adapted to supply the wants of different parts of the body? and, lastly, have all substances we make use of as food an equal share in this *nutritive principle*? Such are the questions which must arise in every reflecting mind; and, as the preservation of the body depends so much on the manner in which the continual waste is supplied, it is a matter of the first consequence, to choose the substances which are most congenial to the different states and conditions of the body.

An eastern Dervise was once asked by a wealthy Mahometan, "Of what service to society is an order of men, who employ themselves in speculative notions of divinity and medicine?"—"If you were more cautious and temperate in your meals," answered the Dervise, "if you would learn to govern your passions and desires, by a due attention to abstinence, you all might be sages, and have no occasion for Dervises among you. But your appetite and aliment impair your understanding!"

In the consumption of food we are liable to commit errors, both as to their quantity and quality. The error in the quantity, however, is generally the most detrimental. A small portion of food can be better digested and more easily changed into chyle, or that alimentary fluid from which the blood derives its origin, than a large portion, which injures the coats of the stomach, and prevents them from exerting their force. Hence every satiety, or superfluity, is noxious.

It is in infancy, and early age, that the foundation is laid for the many diseases arising from indigestion, which are now found in almost every family. If children are fed immoderately, and beyond the real wants of Nature, the first passages become too much distended, and their stomach, by degrees, acquires an unnatural craving for food, which must be satisfied, whatever be the consequence. These excessive supplies not only are unnecessary, but produce the most serious and fatal disorders. There is a certain relation subsisting between what is taken in and what is lost by the body: if we eat and drink much, we likewise lose much, without gaining any more by it than we might do by moderate meals. For that which yields the alimentary particles is, as it were, drowned by the current; and muscular energy is not only decreased, but, in a great measure, destroyed. Yet eating too little would be going to the opposite extreme, retard the growth to bodily perfection, and eventually diminish the digestive power of the stomach, by depriving it of its due share of exercise and support.

Nature is easily satisfied, and is always best provided if we do not intrude upon her more than she is accustomed to. If we have, for some time, taken little nourishment, Nature becomes so habituated to it, that we feel indisposed as soon as the usual measure is transgressed; and both the stomach and its digestive powers are thereby impaired.

The hardy countryman digests the crude and solid food, at which the stomach of the luxurious citizen re-

coils. In order to strengthen that organ, we ought not to withhold from it what keeps it in proper exercise. But, for this purpose, we should rather improve the quality than increase the quantity of alimentary substances. It is with this organ as with all other parts of the body: the more exercise we give it, the more strength and vigour it acquires. Hence, it is highly improper to leave off eating food of difficult digestion, as some people are apt to do; for this is not the way of improving the energy of the body.

It would be a fruitless and impracticable attempt, to lay down fixed rules, by which the respective salubrity or perniciousness of every species of aliment might be determined, in its application to the individual. It has been before observed, that such rules do not exist in Nature; and that the relative state and condition of the person, time, and circumstances, must serve as our guide. Hence, it may be considered as a general rule, that all incongruous mixtures and compositions, for instance, milk and vinegar, or other acids, or milk and spirits, are hurtful, by generating an acid and acrid whey in the stomach, and, at the same time, producing an indigestible coagulated mass.

Having premised these introductory remarks, I proceed to treat,

1. *As to its quantity.* A much greater number of diseases originate, upon the whole, from irregularities in eating, than in drinking; and, in the latter respect, we commit more frequent errors with regard to quantity than quality: otherwise the heterogeneous mixture of provisions, with which we load our stomach, would disagree with all.—This, indeed, but too often happens. One who eats slowly, and a little only of a variety of dishes, will less injure his stomach than another, who eats immoderately of one or two favourite articles, and partakes of the others only for the sake of custom, or as a compliment paid, perhaps, to a fair hostess.—The gastric juice, which is generated in the stomach, is capable of dissolving and digesting the most diversified materials,

provided they be not unsuitably mixed; and a perfectly healthy stomach can prepare a chyle, or a milky fluid, of the same nourishing principle, from all esculent substances whatever.

The general rule, then, is, *to eat as much as is necessary to supply the waste suffered by the body*: if we exceed this measure, we produce too much *blood*; a circumstance as detrimental, though not so dangerous to life, as that of having too little. If we were never to trespass the due limits of temperance, our natural appetite would be able accurately to determine how much food we may consume without diminishing our vivacity. But, from the usual physical education of children, this can scarcely be expected in adults. We ought, therefore, to pay strict attention to the state of those intestines which serve to prepare the alimentary fluid; and, when these are in a relaxed or diseased state, we should instantly begin to be more moderate in eating.

There are three kinds of *appetite*: 1st, The *natural* appetite, which is equally stimulated and satisfied with the most simple dish as with the most palatable; 2d, The *artificial* appetite, or that excited by stomachic elixirs, liqueurs, pickles, digestive salts, &c. and which remains only as long as the operation of these stimulants continues; 3d, The *habitual* appetite, or that by which we accustom ourselves to take victuals at certain hours, and frequently without any appetite.—Longing for a particular food is likewise a kind of false appetite.—The *true* and *healthy* appetite alone can ascertain the quantity of aliment proper for the individual: if, in that state, we no longer relish a common dish, it is a certain criterion of its disagreeing with our digestive organs. If after dinner we feel ourselves as cheerful as before it, we may be assured that we have taken a *dietetical* meal: For, if the proper measure be exceeded, torpor and relaxation will be the necessary consequence: our faculty of digestion will be impaired, and a variety of complaints gradually induced.

The stomach being too much distended by frequent

exertions, will not rest satisfied with the former quantity of food: its avidity will increase with indulgence in excess; and temperance alone can reduce it to its natural state, and restore its elasticity. Fulness of blood, and corpulency, are the disagreeable effects of gluttony; which progressively relaxes the stomach, and punishes the offender with head-ache, fever, pain in the bowels, diarrhœa, and other disorders.

The more suddenly this expansion takes place, the more forcibly and dangerously it affects the stomach; and its fibres, being too much extended, are the more sensible of the subsequent relaxation. Slow eating, therefore, preserves the fibres in a due state of elasticity. Hence, *to eat slowly* is the first maxim in Dietetics: the stomach suffering, in this case, a very gradual distention, as the food has sufficient time to be duly prepared by mastication. He who observes this simple rule will feel himself satisfied only after he has received a due proportion of aliment. But he who swallows his food too quickly, and before it is perfectly chewed, will imagine he has eaten enough, when the unmasticated provisions occasion a sense of pressure on the sides of the stomach.—The teeth are designed by Nature to grind our food, and to mix it with the saliva, produced by innumerable glands, and destined to promote its solution.

A healthy appetite is also determined by the season, to the influence of which the stomach is exposed, in common with the other viscera.—Hence, heat, in general, relaxes and exhausts the body, from its tendency to dissipate the fluids, or to diminish their quantity; and, consequently, the stomach cannot digest the same proportion of food in summer which it does in winter. There are persons, however, who have the strongest appetite, and possess the most vigorous digestive powers, in the extreme heat of summer. The bile of such individuals is of a watery consistence, and too sparingly secreted; a defect which is best remedied by heat. Those who take more exercise in winter than in summer, can also digest more food. But as individuals leading a

sedentary life usually suffer in winter from a bad state of digestion, owing to a want of exercise, they ought to take less aliment in that season.

Those substances which restore and supply what has been wasted, are called *nutritive*. They conduct to the body homogeneous or assimilated parts, by means of the intestinal canal, and by changing those parts into muscular substance, or flesh, or into the fluid form of blood. Since some alimentary articles communicate their nutritive property sooner than others, as they contain coarser or more delicate particles, which, according to their nature, are more or less apt to be assimilated with the body, it follows, that they cannot all be equally nourishing.

Too little aliment debilitates the body, which thereby acquires less than it loses by respiration; it hastens the consumption of life; the blood becomes inert and rarefied, or is rendered acrid and liable to putrefaction. After long fasting the breath is foetid, and the body becomes disposed to putrid fevers.—We can more easily digest a heavy meal in four hours of accelerated respiration and muscular action during the day, than in eight hours of sleep. This circumstance has induced mankind to make their principal meal about the middle of the day. A person who sits up five or six hours after supper, will feel himself much more inclined to take a second meal than to go to bed.

Abstinence readily induces putrid diseases; a fasting of twenty four hours is followed with a disgust and aversion to food, which of itself is a symptom of putrescency, and is, at length, succeeded by delirium.—After taking, for some time, too little food, the body is enfeebled; the vessels are not sufficiently supplied; their action on the whole mass of the blood, and of that fluid on the several vessels, is interrupted; its free circulation is checked; and the smaller vessels corrugate, so that the thinnest blood is no longer capable of pervading them, as is the case in old age. When a person has suffered so much from extreme hunger, that his fluids are already

in a putrescent state, much food must not be given him at once; for his contracted stomach cannot digest it. Such a body must be supported with liquid nourishment, in small quantities, and be treated altogether like a patient in a putrid or nervous fever. Hence, no animal food of any kind, but subacid vegetables alone, can be given with propriety.

2. *As to the quality of aliment*, we must here investigate the nature of *Digestion*. This function may be aptly divided into two different processes: *Solution* and *Affimilation*. Solution takes place in the stomach, where the food is changed into a pulp, is dissolved, according to its greater or less solubility, and its nourishing particles are absorbed. Affimilation only begins when the solution has already taken place in the stomach, when the nutritive substance, or the alimentary juice, is inhaled by the absorbent vessels, and conducted to the blood by means of the lacteals. Affimilation, therefore, is that function by which the aliment is, as it were, animalized: and, hence, it has been conjectured, that animal food is easier digested than vegetable, as being more easily converted into animal fluids, and more analogous to our nature.

There are articles of easy and of difficult digestion, in the animal as well as in the vegetable kingdom: and in both we find some substances which are completely indigestible, and which pass through the alimentary canal without affording any nourishment.

The most simple dishes are the most nourishing.—The multiplied combination of substances, though they may please the palate, are not conducive to health. All substances which contain much jelly, whether animal or vegetable, are nourishing; for this alone affords nutriment; and the hard, watery, and saline particles of food cannot be assimilated or converted into chyle. Nourishing substances would, indeed, be more conformable to Nature; but, as our appetite generally incites us to eat more than is necessary, we should acquire too much alimentary matter, and become too full of

blood, if we were to choose only such articles of food as contain a great quantity of jelly.

Dr. BUCHAN very justly observes, that "the great art of preparing food is to blend the nutritive part of the aliment with a sufficient quantity of some light farinaceous substance, in order to fill up the canal without overcharging it with more nutritious particles than are necessary for the support of the animal. This may be done either by bread or other farinaceous substances, of which there is a great variety." Those who are not employed in hard labour or exercise, do not require such nourishing food as those whose nutritive fluids are partly consumed by muscular exertions and violent perspiration. Such as have suffered frequent losses of blood, from whatever cause, will best restore it by strong aliment; which, on the contrary, ought to be avoided by the plethoric. Lastly, those whose frame is weakened and emaciated by irregularities and dissipation should not attempt to eat much at a time, but rather repeat their meals more frequently, at proper and regular intervals.

Whether we ought to make use of articles of easy or difficult digestion cannot be determined by general rules: every person must attend to the effects which substances of different degrees of digestibility produce on his stomach. The chyle, when prepared of substances not easily digestible, is solid and concentrated, and, consequently, affords a substantial muscular fibre; but such substances as the stomach cannot digest ought never to be used as food.

It is an important rule of diet, *to eat, if possible, of one kind of meat only*, or, at all events, *to eat of that dish first which is the most palatable*. The stomach is enabled to prepare the best chyle from simple substances, and will thence produce the most healthy fluids. And, if we follow the second part of this rule, we are in no danger of overloading the stomach. At a table dietetically arranged, we ought to begin with those dishes which are most difficult to be digested, and finish our

meal with the most easy; because the former require stronger digestive powers, and more bile and saliva, all of which become defective towards the end of a meal. The power of digestion in the stomach is undoubtedly most vigorous and active when that organ is not too much distended; and the coarser kinds of substances also require a longer time for being duly assimilated.

To begin meals, as the French, Germans, and Scots generally do, with *soups* or *broths*, is highly improper and noxious. These liquid dishes are ill-calculated to prepare the stomach for the reception of solid food; as they not only weaken and swell it, by their bulk and weight, but also deprive it of the appetite for the succeeding part of the dinner. Every tension is attended with relaxation, so that we imagine ourselves satisfied sooner than we are in reality. Besides, broths and soups require little digestion, weaken the stomach, and are attended with all the pernicious effects of other warm and relaxing drink. They are beneficial to the sick, to the aged, and to those who, from the want of teeth, have lost the power of mastication; but for such persons they ought to be sufficiently diluted, and not too much heated with spices; otherwise they will be digested with some difficulty.

Many individuals are accustomed to pass the whole forenoon without breakfast, and feel no inconvenience from it; while others, of a more delicate stomach, cannot bear such abstinence without unavoidable cravings and debility. The business of digestion is usually accomplished within three or four hours after a meal; hence, the stomach is empty at rising in the morning, and the body often enfeebled by long fasting. Our breakfast should, therefore, consist of more solid and nourishing substances than are now generally used for that meal; especially if our dinner is to be delayed till the late hours which modern fashion prescribes. We should breakfast soon after we get up, dine about mid-day, and not protract the hour of supper till the time which Nature points out for rest.

A principal rule of diet is to take food with an easy and serene mind; hence, it is preferable to dine or sup in company: our food has thus more relish, it agrees better with us, and we eat more slowly and cheerfully. But we ought not to indulge ourselves in sitting too long at table, which is always pernicious to health. For digestion takes place even while we remain there; and, as the stomach, when gradually supplied, craves for additional quantities of food, especially when a variety of palatable dishes stimulate the appetite, we ought to be much on our guard against these seductions. Hence, it is most advisable to make our dinner on one or two dishes; because we can eat more of a plurality of dishes than of one or two only, and do not so easily perceive when the stomach is overloaded. To read, or otherwise exercise the mind, during the time of eating, is likewise improper.

Gentle exercise, before dinner or supper, is very conducive to increase our appetite, by promoting the circulation of the blood. But too violent exercise impairs the appetite, and weakens the powers of the stomach, by means of its sympathy with the other parts of the body. In proof of this, we may frequently observe, that individuals, exhausted with fatigue, are unable to partake of their usual repasts. The exercise, however gentle, ought to be over, at least, half an hour before dinner; because it is hurtful to sit down to table immediately after great exertion.

As to our conduct *after dinner*, it is scarcely possible to give rules that are generally applicable, and much less so to every individual. From the contradictory opinion of the most esteemed authors, they appear not to have discriminated between the various states and conditions of animal life; and, as exercise was found to agree with some constitutions, and to disagree with others, a diversity of opinions necessarily originated among those who were so passionately fond of reducing every thing to general rules. In order, then, to remove these difficulties, I think it necessary to observe,

that though it be apparently consistent with the instinct of Nature, to rest some time after dinner, according to the example of animals; yet this time, as well as other concurrent circumstances, deserves to be more precisely determined.

As soon as the food has entered the stomach, the important office of digestion begins: the vigour of the organs exerted on this occasion ought certainly not to be abridged by violent exercise; but muscular and robust people feel no inconvenience from gentle motion about *one* hour after the heaviest meal. On the contrary, it is highly probable, that the abdominal muscles receive an additional impetus by exertions of a moderate kind. But, as the whole process of digestion is of much longer duration than is generally imagined, the afternoon-hours cannot be employed advantageously to health in any labour requiring strong exertions.

The transition of the alimentary fluid into blood, which takes place in the third or fourth hour after a meal, and in some people of a weak and slow digestion much later, is always attended with some increase of irritability, which, in persons of great sensibility, may degenerate into a painful sensation or illness. At this time, therefore, nervous and hypochondriac persons are frequently troubled with their usual paroxysms; they are seized with anguish, oppression, and an inclination to faint, without any external cause. Persons in this condition of body, as well as all febrile patients, and especially those who are troubled with stomachic complaints, would act extremely wrong and imprudent, to undertake any exercise whatever before their victuals be completely digested; as, during digestion, all the fluids collect towards the stomach. In violent exercise, or an increased state of perspiration, the fluids are propelled to the external parts, and withdrawn from the stomach, where they are indispensable to assist the proper concoction.

As to the propriety of *sleeping after dinner*, we may

learn from those animals which sleep after feeding, that a little indulgence of this kind cannot be hurtful. Yet this again cannot be established as a general rule among men: for the animals which sleep after food are, for the most part, supplied with substances of so very difficult digestion, and so hard in their nature, that great digestive powers are required to convert them into alimentary matter. Hence, this practice can be recommended only to the nervous and debilitated, and to delicate persons in general, who are much employed in mental exercise, and are past the middle age—especially after a heavy meal, in hot weather and warm climates.

Experience, however, teaches us, that, in this respect, a short sleep, of a few minutes only, is sufficient and preferable to one of longer duration; for, in the latter case, we lose more, by an increase of insensible perspiration, than is conducive to digestion.—But the position of the body is far from being a matter of indifference. The best is a reclined, and not a horizontal posture, from which head-ache may easily arise, when the stomach presses upon the subjacent intestines, and the blood is, consequently, impelled to the head. The old practice of standing or walking after dinner is so far improper, as it is hurtful to take exercise, while the stomach is distended by food, the sensation of which lasts, at least, for one hour.

In the primitive ages people subsisted chiefly upon plants and fruits. Even to this day, many sects and whole nations, the Bramins, for instance, abstain from animal food. The ancient Germans also, who were much renowned for their bodily strength, lived upon acorns, wood apples, sour milk, and other productions of their then uncultivated soil. In the present mode of life, here as well as on the Continent, a great proportion of the poorer class of country people subsist chiefly on vegetables; but, although they duly digest their vegetable aliment, and become vigorous, yet it is certain, that animal food would answer these purposes much

better. Hence, in countries where the labouring class of people live principally upon animal food, they far excel in bodily strength and duration of life.

A popular writer observes, that "animal food is less adapted to the sedentary than to the laborious, whose diet ought to consist chiefly of vegetables. Indulging in animal food renders men dull and unfit for the pursuits of science, especially when it is accompanied with the free use of strong liquors." This is partly true, but Dr. BUCHAN ought to have added, that the infirm, and those who labour under complaints of indigestion, will suffer still more from the use of vegetable substances, which, by their peculiar nature, produce too much acid, and require stronger digestive organs, in order to be changed into a good alimentary fluid.

Dr. BUCHAN farther observes, that "consumptions, so common in England, are, in part, owing to the great use of animal food." To this assertion no one will give his assent who is acquainted with the class of men carrying on the business of butchers, among whom it is as rare to hear of a consumptive person as it is to find a sailor troubled with the hypochondriasis. I must quote another observation of this gentleman, to which I cannot implicitly subscribe. Having remarked, that the most common disease in this country is the scurvy; that we find a tincture of it in almost every family, and in some a very deep taint, he says, "that a disease so general must have a *general cause*, and there is *none so obvious* as the great quantity of animal food devoured by the natives. As a proof, that scurvy arises from this cause, we are in possession of no remedy for that disease equal to the free use of fresh vegetables." He likewise remarks, "that the choleric disposition of the English is almost proverbial, and if he were to assign a cause of it, it would be their living so much on animal food;" and, finally, that "there is no doubt but this induces a ferocity of temper unknown to men whose food is chiefly taken from the vegetable kingdom."

There is some truth, mingled with much fallacy, in

these assertions. I will allow, that animal food predisposes people to scorbutic complaints, and that it renders men more bold and sanguinary in their temper; but there are a variety of other causes which produce a similar effect. Nor are the English so choleric a people as the Italians and Turks, both of whom, though sparing in the use of animal food, are uncommonly vindictive. It is farther not to be imputed to the consumption of flesh-meat, or the want of vegetables alone, that the scurvy is so frequent in this country, both on land and at sea. There appears to me to exist a powerful cause, to which people pay very little attention, and from which the scurvy more frequently derives its origin than from any other; the difference of food being, in fact, only a concurrent cause.

If we consider the very sudden and frequent changes of temperature in our climate; if we compare the present mode of living with that of our ancestors, who did not interrupt the digestion of one meal by another, such as our rich luncheons in the forenoon, and our tea and coffee in the afternoon, when the digestive organs are, as it were, drowned in these favourite liquids; if, farther, we reflect upon the irregular manner in which our time of repose is arranged, so that we spend a great part of our life in the unwholesome night air, partly at late suppers, and partly in the modern practice of travelling at night;—if all these circumstances be duly weighed, we cannot be at a loss to discover a more general cause of scorbutic complaints than that of eating too much animal food.

After these reflections, it will not be difficult to comprehend, that the most important of the human functions is materially injured by these habitual irregularities. I allude to *insensible perspiration*, which is so far from being encouraged and supported by such conduct, that the noxious particles, which ought to be evaporated, are daily and hourly repelled, again absorbed by the lacteals, and reconducted to the mass of the circulating fluids. Here they can produce no other effect than that of tainting the humours with acrimonious par-

ticles, and disposing them to a state of putrescency and dissolution, which is the leading symptom of scurvy. After the minutest inquiries among seafaring people, as well as the inhabitants of the country, I have been informed, that those individuals who pay due attention to the state of their skin, by wearing flannel shirts and worsted stockings, and do not expose themselves too often to night-air, or other irregularities, are seldom, if ever, troubled with scurvy.

To return to the subject of animal food and its effects, it deserves to be remarked, that a too frequent and excessive use of it disposes the fluids to putrefaction, and, I believe, in some sanguine temperaments, communicates to the mind a degree of ferocity. Nations subsisting chiefly upon the flesh of animals, like the Tartars, are, in general, more fierce than others; and the same effect is manifest in carnivorous animals: they emit a very disagreeable smell, and both their flesh and milk have an unpleasant and disgusting taste. Even a child will refuse the breast when its nurse has eaten too much animal food. Those who eat great quantities of meat, and little bread or vegetables, must necessarily acquire an offensive breath. It appears, therefore, to be most suitable and conducive to health, to combine animal with vegetable food, in due proportions. This cannot be minutely ascertained, with respect to every individual; but, in general, two-thirds or three-fourths of vegetables, to one-third or fourth part of meat, appears to be the most proper. By this judicious mixture, we may avoid the diseases arising from a too copious use of either. Much, however, depends on the peculiar properties of alimentary substances, belonging to one or the other of the different classes which we have now to investigate.

Of Animal Food.

It may serve as a preliminary rule, that *fresh meat* is the most wholesome and nourishing. To preserve these qualities, however, it ought to be dressed so as to re-

main tender and juicy ; for, by this means, it will be easily digested, and afford most nourishment.

The flesh of *tame* animals is, upon the whole, preferable to *game* ; and although the latter be, in general, more mellow, and easier of digestion, it does not contain the sweet jelly, and mild juices, with which the former is, almost uniformly, impregnated.

By the usual mode of dressing victuals, they lose a considerable part of their nutritious quality, and become less digestible. *Raw meat* certainly contains the purest and most nourishing juice, and there are some substances which are frequently consumed in a state nearly approaching to that of rawness. Such are the Westphalia hams, Italian sausages, smoked geese, salted herrings, and the like.

Various modes of preparing and dressing meat have been contrived, to render it more palatable, and better adapted to the stomach. By exposure to the air, flesh becomes softer, which obviously is the effect of incipient putrefaction ; for, by this process, the volatile particles of ammoniacal salt are disengaged, and it is rendered more agreeable to the taste. Pickled and smoked meats,* so commonly used in the northern and eastern countries of Europe, acquire an unnatural hardness, and communicate a great degree of acrimony to the fluids of the human body. By *boiling*, flesh is deprived of its nourishing juice, as the gelatinous substance of the meat is extracted, and incorporated in the broth ; and it is thus converted into a less nutritive and more oppressive burthen for the digestive organs ; because the spirituous and balsamic particles are too much evaporated during the boiling. The *broth*, indeed, contains the most nourishing part of it, but it is too much diluted to admit of

* It is remarkable, that *smoked meat* is more readily digested in a *rare* than in a boiled state. Experience affords ample proof of this assertion, especially in the articles of smoked hams and sausages : for the soft gelatinous fluids which, by the joint processes of pickling and smoking, have been effectually decomposed, or converted into a neutral substance consisting of ammoniacal salt combined with animal jelly, are completely extracted by boiling, so that little more than the dry fleshy fibres remain behind.

an easy digestion. A better mode of dressing meat is *roasting*, by which its strength is less wasted, and the spirituous particles prevented from evaporating; a crust is soon formed on its surface, and the nutritive principle better preserved. Hence, one pound of roasted meat is, in real nourishment, equal to two or three pounds of boiled meat.

The boiling of animal food is frequently performed in open vessels, which is not the best method of rendering it tender, palatable, and nourishing: close vessels only ought to be used for that purpose. The culinary process, called *stewing*, is, of all others, the most profitable and nutritious, and best calculated to preserve and concentrate the most substantial parts of animal food.

When we expose articles of provision to the fire, without any addition of moisture, it is called *baking*. That such substances may not be too much dried by evaporation, they are usually covered with paste. Thus the meat, indeed, retains all its nutritive particles, becomes tender and easily digestible; but the paste is extremely detrimental to the stomach, as it generally consists of an undue proportion of butter, which cannot be readily digested in that state. When meat is *fried*, it is, in some degree, deprived of its substance; but, if the fire be strong enough, a solid crust will soon be formed on its surface, by which the evaporation will be checked, and the flesh rendered mellow: the butter, or other fat, used to prevent its adhesion to the pan, gives it a burnt or empyreumatic taste, and renders its digestion in the stomach rather difficult.

Vegetables are, in general, not so readily digested as even hard and tough animal substances, which, from their nature, are more speedily assimilated to the body; but the flesh of young animals, with a proportionate quantity of wholesome vegetables, is the diet best adapted to our system. The flesh of fattened cattle is by no means wholesome; these animals lead a sluggish and inactive life, and, as they are surrounded in their

dungeons by a bad and putrid air, their flesh, consequently, does not afford salutary fluids.

Though fat meat is more nourishing than lean, fat being the cellular substance of animal jelly, yet, to digest this oily matter, there are required, on account of its difficult solubility, a good bile, much saliva, and a vigorous stomach. To prevent any bad effects, we ought to use a sufficient quantity of salt, which is an excellent solvent of fat, changes it into a saponaceous mass, and renders it more easy of digestion.

Luxury has introduced an unnatural operation, which makes the flesh of certain animals at once delicate and nutritious; but the flesh of the same animals is still more wholesome in their unmutated state, before they have been suffered to copulate. The mucilaginous and gelatinous parts of the animals alone afford nourishment; and, according to the proportion of these contained in the meat, it is more or less nourishing. We find mucilage to be a principal constituent in vegetable, and jelly or gluten in animal bodies: hence, farinaceous substances contain the most of the former, and the flesh of animals most of the latter. A substantial jelly, as, for instance, that of calves' feet, is more nourishing than a thin chicken broth, but it is also more difficult to be digested.

In summer it is advisable to increase the proportion of vegetable food, and to make use of acids, such as vinegar, lemons, oranges, and the like, the blood being, in that season, much disposed to putrescency. The man who continually takes nourishing food is liable to become fat and plethoric; while, on the contrary, the parsimonious, or the religious fanatics, from their abstinence, become thin and enfeebled: hence, the medium, or a proper mixture of both vegetable and animal nutriment, seems to be most conducive to health. I cannot sufficiently recommend the following caution to those who are frequently troubled with a craving appetite: the more food the stomach demands, the more sparingly it

ought to be furnished with strongly nourishing substances, in order to avoid obesity, or fatness; and much vegetable food is, in this case, required, to counteract that disposition to putrescency which the frequent eating of nutritive substances necessarily occasions.

There are people who feel the sensation of hunger in a painful degree, which generally arises from too much acid being generated in the stomach. A vegetable diet would be prejudicial to such individuals; they ought to increase the proportion of animal food; and dishes containing oily substances, in general, agree well with them. Bread and butter is useful to such persons, in order to neutralize their acid acrimony, and, at the same time, to change the fat into a more soluble saponaceous substance. The cause of this acid is frequently a weakness in the stomach, which cannot be cured in any other manner than by strengthening bitters, and articles of nourishment that are mildly astringent and promote warmth in the intestines; and, in this respect, cold meat, as well as drink, is preferable to hot.

The jelly of animals being the very substance which renovates the solid parts, it is obviously serviceable and necessary to nourish the human body. As, however, each kind of animal has its peculiar jelly and fat, which can be nourishing only when assimilated to our nature by the digestive organs, and as the different parts of animals require different degrees of digestion, it will be necessary to enter into more minute inquiries respecting these particulars.

Experience informs us, that the flesh and intestines of young animals afford a thin, easily digestible, and nutritive jelly: old animals, hard and tough flesh, cartilages, sinews, ligaments, membranes, membranous thick intestines, and the sinewy parts of the legs, produce a strong and viscid jelly, which is difficult to be digested and assimilated to our fluids. The more healthy the animal is, the stronger will be the jelly, and the more nourishing its fluids. The most nutritious flesh is that of animals living in the open air, having much exercise

and a copious mass of blood, and, particularly, if they are kept in dry and warm places. The alkali contained in the flesh of carnivorous animals is the cause of the indifferent nourishment it affords, and of the injurious consequences attending its use. From the similarity in the structure of quadrupeds to that of man, it may be conjectured, that their jelly is not unlike ours; that such as are fed upon milk give the best nourishment; and that the flesh of female animals is more easily digested, but less nutritious, than that of the castrated males, which, in every respect, deserves the preference. Next to quadrupeds, we may class birds, in point of nourishment; then fish; next to them amphibious animals; and, lastly, insects.

As animal food is strongly nourishing, it generates blood, fat, and spirituous particles, in a much greater quantity than vegetable aliment. The activity and courage of carnivorous animals prove, that the feeding upon flesh gives spirit and strength, heats the body, and preserves the muscles in a vigorous state. For these reasons, much animal food is improper for those of a full habit and abundance of blood, for febrile patients, and those who are disposed to hæmorrhages or losses of blood. The phlegmatic, on the contrary, and those of thin watery fluids, and a weak digestion, may, with safety, eat more animal than vegetable food.—Of the different kinds of flesh, game is most heating; that of young domestic animals least; for instance, of calves and chickens, particularly when they are eaten with vegetable substances containing an acid, such as sorrel, asparagus, &c. That animal food disposes to putrescency I have before remarked; hence, it ought to be sparingly used in summer, and in hot climates. Persons whose fluids already evince a putrid tendency, and who are reminded of it by frequent eruptions of the skin, or who have a disposition to corpulency, should abstain from a too copious use of animal food.

I have also observed, that the flesh of carnivorous animals has an extraordinary tendency to putrefaction,

as is obvious from their foetid perspiration; that it contains an acrimony and alkalescency foreign to our nature; and that it does not afford mild nutriment. The flesh of granivorous animals, partaking more of the vegetable principle, is less subject to putrefaction; and though it be less nourishing, and less abounding in spirituous particles, than that of the former, yet it supplies us with a milder and more congenial aliment.

The meat of fish, being, like the element in which they live, most distinct from the nature of man, is, of all others, the least wholesome and nutritive.

The tame quadrupeds that suck the mother's milk, if they rest too much and are quickly fed, do not afford a good and well prepared food. In animals which have tender muscles and little exercise, those parts are probably the most wholesome which are more in motion than others, such as the legs and head.

Poultry furnishes us with the most valuable aliment, as it has excellent and well-digested fluids, from its more frequent exercise and constant residence in the open and pure air. Some animals, when young, have tough and spongy flesh, which is mollified and improved by age, and can be eaten only after a certain time, such as eels and carp. Others are hard when young, and must be used early, because that hardness increases with their age; as the haddock and many other species of fish. The flesh of old animals, that have less muscular parts than the young ones of the same species, is indigestible; and we may lay it down as a general rule, that the more the flesh of an animal is disposed to putrefaction, the more it is unwholesome.

Veal, although affording less nutriment than the flesh of the same animal in a state of maturity, contains many nourishing and earthy particles, and produces little or no disposition to flatulency: it ought, however, not to be brought to market till the calf is, at least, six weeks old, and fed, if possible, on the mother's milk. Veal is not of a heating nature, and may, therefore, be allowed to febrile patients in a very weak state, espe-

cially with the addition of some acid;—it is also the most proper food for persons who have a disposition to hæmorrhages. On account of the great proportion of viscosity it contains, persons disposed to phlegm and complaints of the abdomen ought to abstain from its use. For these reasons we recommend veal-broth, especially in pectoral and inflammatory diseases. The lungs, the liver, and the tongue of calves, are less viscous than the flesh; and, being soft, mild, and easily digested, they are very proper for sick persons and convalescents. No animal fat is lighter than this; it shows the least disposition to putrescency; and it may, therefore, be used, in preference to any other, by persons of a scorbutic taint. The fat of veal should not be boiled; as that operation softens its fibres too much, dissolves the jelly, and renders it unfit for digestion. But, by roasting, it becomes drier and somewhat more solid; both the serous and thick parts of the blood are incrassated in the external vessels, the fibres are dried up, and a crust is formed, beneath which the fluids are moved, and changed into vapour, by the continued application of heat. In this operation all the fibres lie, as it were, in a vapour-bath, and are perfectly softened without losing any of the jelly. Roasting, therefore, may be considered as the best mode of preparing this meat. Baking also forms a crust over it like roasting, but the fat, incrassated by heat, may occasion inconvenience, as it possesses an oily acrimony, and is with difficulty digested. For the same reason, it is improper to eat the burnt crust of any meat, of which some persons are particularly fond, though it contains an empyreumatic oil, highly pernicious, and altogether indigestible. For roasting, the mellow and juicy kidney-piece, or the breast of veal, deserves the preference: the leg is too dry and fibrous; it requires good teeth to be well chewed, renders the use of tooth-picks more necessary than any other dish, and is frequently troublesome to the stomach. In short, veal does not agree well with weak and indolent stomachs, which require to be exercised

with a firmer species of meat. When boiled, it is but slightly nourishing; and when we make a meal upon veal alone, we soon feel a renewal of the cravings of the appetite. For removing the acid from the stomach, veal is the most improper article of diet. But to patients recovering from indisposition, first may be given veal broth, then roasted veal, and, lastly, beef, the properties of which we shall now consider.*

Beef affords much good, animating, and strong nourishment; and no other food is equal to the flesh of a bullock of a middle age. On account of its heating nature, it ought not to be used where there is already an abundance of heat; and persons of a violent temper should eat it in moderation. It is peculiarly serviceable to hard-working men; and its fat is almost as easily digested as that of veal.

It deserves, however, to be remarked, that the tongue, the intestines or tripe, and the sausages made of beef, are more difficult of digestion than the muscular part; and that it would be extremely improper to give them to nurses, children, or lying-in women.

The meat of old bullocks, fed and kept in the stall, when unfit for labour, is scarcely digestible; it is burthen some to the stomach, and, as well as that of old cows, which is still worse, contains no wholesome fluids. Though beef be more frequently eaten boiled, yet it is more nourishing and digestible when roasted. Finally, beef is almost the only species of animal food with which the stomach is not easily surfeited, and which is in proper season throughout the year.

Pork yields a copious and permanent nourishment, which does not disagree with the robust and laborious; but which, from its abundance of acrid fat, is not

* A horrid custom has been introduced by luxury, of feeding calves cooped up in boxes so small as to prevent all motion, and from which light is totally excluded: by this cruel refinement their flesh is, by epicures, thought to be rendered more white and delicate; but, if humanity does not revolt at this practice, those who have any regard for health should avoid eating the flesh of an animal reared in this unnatural and putrescent state.

wholesome to persons of a weak stomach or sedentary life; as these animals live, and are fed in sties, without exercise, and in an impure air. From the want of clean water, their flesh acquires a tough and strong consistence, and is indigestible but by a healthy bile. Persons who have impure fluids, and a tendency to eruptions, as well as those who have wounds or ulcers, should refrain from the use of pork; for this food will dispose them to inflammation and gangrene; it is equally improper in a catarrhal state of the breast, in weak stomachs, coughs, and consumptions.

The ancient physicians considered pork as the best and most nutritious meat, if assisted by proper digestive powers. But they were certainly mistaken in this supposition; for, although its quality is such as requires a smaller quantity to satisfy the cravings of the stomach, yet veal and beef, taken in increased proportions, afford equal, if not more, nourishment, and, doubtless, a more wholesome supply of animal jelly, than pork, under similar circumstances of the individual, would produce. By allowing these animals clean food, and the enjoyment of pure air and exercise, their flesh might be much improved in salubrity; but the farmer is not solicitous about the quality of the meat, if he can produce it in great quantities, in which he is certain to succeed from the present unnatural mode of feeding swine. People of delicate habits may sometimes eat pork sparingly; but it is an erroneous notion, that a dram is necessary to assist its digestion; for spirituous liquors may, indeed, prevent, but cannot promote, its solution in the stomach. It would be more advisable not to drink for a short time after eating pork, as it is usually very fat, and this fat is more subtle and soluble than any other, and has nothing in it of the nature of tallow.

Pork, when eaten in moderation, is easily digested. With those whose digestive organs are weak, no other species of meat agrees, in general, so well as a small quantity of this. Hence, the objections made against it relate more to the quantity than to the quality or

substance; for, if too much of it be eaten, it is apt to corrupt the fluids, and to produce acrimony. We ought, therefore, to eat it seldom and sparingly, and the inclination which many have for this food should be kept within moderate bounds. The most proper additions to pork are the acidulated vegetables, such as gooseberry or apple sauce; which not only gratify the palate, but correct its properties, neutralize, in a manner, its great proportion of fat, and thus operate beneficially on the alimentary canal.*

The flesh of *wild hogs*, as they have more exercise than the tame, and do not live upon substances so impure and corrupted, is more palatable, more easily digested, less tough, not so fat, and, on account of their residence in the open air, is like all game, purer, but more liable to putrefaction.

Smoked hams are a very strong food. If eaten at a proper time, they are a wholesome stimulus to the stomach; but boiling them renders their digestion still more difficult.—In *salting* any kind of meat, much of its jelly is washed away, the fibres become stiff, and thus heavier for the stomach. The salt penetrates into the jelly itself, prevents its solution in the alimentary canal, and, consequently, makes it less conducive to nutrition.—By *smoking*, the fibres of meat are covered with an incrustation, the jelly is half burnt, the heat of the chimney occasions the salt to concentrate, and the fat between the muscles to become rancid; so that such meat, although it may stimulate the palate of the epicure, cannot be wholesome.

Sausages, whether fried or boiled, are a substantial

* There is little to be apprehended from the worms in swine, which, according to a late discovery of the celebrated Naturalist GÖRZE, in Germany, are natural to these animals. They reside in the cartilaginous vesicles of the liver, and when these vesicles burst in very hot weather, while the worms are yet extremely small, they pass into the blood with other fluids, and gradually increase in size. But there is no instance that they have produced diseases, unless arising from disgust. Should it, however, be found, that these animalculæ become visible externally, and in great quantities, the butchers ought not to be permitted to kill such hogs, as the flesh easily acquires an uncommon acrimony, is much disposed to putrify, and, consequently, improper to be used as food.

kind of nourishment; they require, therefore, a strong bile to dissolve, and a good stomach to digest them. They are not of an acrid nature, provided they have not too much pepper in their composition, and be closely filled, so as to contain no air. *Blood Sausages*, usually called Black Puddings, consisting of bacon and coagulated blood, which is totally indigestible, are a bad and ill-contrived article of food; and still more so if they have been strongly smoked, by which process the blood becomes indurated, and the bacon more rancid: thus prepared, nothing can be more pernicious and destructive to the best fortified stomach. The spices usually added to sausages correct, in some degree, their hurtful properties, but are insufficient to counteract the bad and highly disagreeable effects of rancid substances.

Bacon is indurated fat, accumulated in the cellular texture under the skin, and is, of all meat, the most unwholesome; it easily turns rancid on the stomach, or it is so already by long hanging, and is particularly pernicious to those who are subject to the heart-burn.

Lard, a softer fat collected from the entrails and the mesentery of hogs, becomes easily rancid, and is otherwise relaxing to the digestive organs; for which reasons it is seldom used in English cookery.

The *mutton* of sheep fed on dry pastures is a better and more nourishing food than that of others reared in moist places. Those also fed near the sea-shore are excellent meat, the saline particles which they imbibe giving, at once, consistency and purity to their flesh. The meat of rams is tough and unpleasant, but that of ewes, and still more that of wethers, is of a rich, viscous nature. Young mutton is juicy and easily digested, but is rather tough, and has not that balsamic alimentary juice peculiar to sheep above a certain age. The best mutton is that of sheep not less than three and not above six years old. Under three years of age it has not attained its perfection and flavour.

A roasting piece of mutton ought to be exposed to the open air for several days, according to the weather

and season; it then affords a palatable dish, which is easily digested, and agrees with every constitution. But the fat of mutton is almost indigestible; for it easily coagulates in the stomach, and oppresses that organ: hence, the lean part of mutton is more nourishing and conducive to health.—The feet of this animal are nourishing, on account of their jelly, and are of great service, for injections, in those diseases which originate from acrimony in the intestines.

Lamb is a light and wholesome food, not so nutritious as mutton, but uncommonly useful to delicate stomachs. The vegetables most proper to be eaten with lamb are those of an acidulated nature, as gooseberries, sorrel, and the like. It is customary to eat this meat when very young; but a lamb that has been allowed to suck six months is fatter and more muscular, and, in every respect, better, than one which has been killed when two months old, and before it has had time to attain its proper consistency.

House-Lamb is a dish esteemed merely because it is unseasonable. Like all animals reared in an unnatural manner, its flesh is insipid and detrimental to health.

The flesh of *Goats* is hard, indigestible, and unwholesome: hence, the meat of kids only is esculent, being more easily digested, and yielding a good nourishment.

The flesh of *Deer* (*Venison*), and that of *Hares*, contain much good nutriment; but, to the injury of health, these animals are generally eaten when half putrified, though they are naturally much disposed to putrescency. When properly dressed they afford a mellow food, and are readily assimilated to our fluids. But, as wild animals, from their constant motion and exercise, acquire a drier sort of flesh than that of the tame, it should never be boiled, but always ought to be roasted or stewed. From the same cause, the fluids of wild animals are more heating, and more apt to putrify, than those of the domestic kind. Persons, therefore, who have a predisposition to scurvy, or other putrid diseases,

should not eat much game, especially in summer. This pernicious tendency of game may be corrected by the addition of vinegar, acid of lemons, or wine; salad also is very proper to be eaten with it. Those parts of wild animals which have the least motion are the most juicy and palatable: the back, for instance, is the best part of a hare.

The *lungs* of animals contain nothing but air and blood-vessels, which are very tough, solid, difficult to be digested, and afford little nourishment. Besides, on account of the encysted breath, and the mucus contained in them, they are, in reality, disgusting. The *liver*, from its dry and earthy consistence, produces a vitiated chyle, and obstructs the vessels: hence, it requires a great quantity of drink, and ought never to be used by the plethoric: the blood-vessels and biliary parts adhering to it are particularly disagreeable. The *heart* is dry, scarcely digestible, and not very nourishing. The *kidneys* also are acrid, hard, tough, and not easily digested by the delicate. These intestines, however, of young animals, such as calves and lambs, produce aliment sufficiently wholesome.

The *fat* and *marrow* of animals afford, indeed, solid and elastic alimentary juice, increase the blood and fluids, but are difficult to be digested; they require a powerful stomach, perfect mastication, sufficient saliva and bile, and agree best with persons who take much bodily exercise. If not duly digested, they occasion diarrhœa, weaken the stomach and the bowels, stimulate too much by their uncommon acrimony, and easily turn rancid, especially when eaten with meat much disposed to putrefaction. They are apt to destroy the elastic power of the first passages, as well as of the whole body, to produce the heart-burn, cramp of the stomach, and head-ache, particularly in irritable habits, and, at length, to generate an impure and acrimonious blood.

The *blood* of animals is completely insoluble, and, consequently, in no degree nourishing.

The *milk* is of very different consistence and pro-

perties, not only according to the various kinds and species of animals, but also in the same species, in consequence of the difference in feeding, constitution of body, age, time of milking, and other circumstances. Milk takes the lead among the articles of nourishment. It affords the best nutriment to persons whose lacteals and blood-vessels are too weak for deriving nourishment from other provisions; because it is already converted into an alimentary fluid in the intestines of an animal.

Nature has appointed milk for the food of children; because infants, on account of their growth, require much nourishment. From this circumstance we may also conclude, that milk is easily digested by healthy stomachs, since, at the early age of children, the digestive powers are but feeble.—Milk-porridge, as well as those dishes in the composition of which milk and flour are used, have a manifest tendency to obstruct the lacteals or milk vessels of the intestines and the mesentery; a circumstance which renders them extremely unwholesome, particularly to children. Milk, although an animal production, does not readily become putrid; as it is possessed of the properties of vegetable aliment, and sooner turns sour than putrid. It affords a substantial alimentary fluid; and, hence, it is of service to persons enfeebled by dissipation or disease.

As the milk of animals contains more cream than that of the human breast, it ought to be diluted with water when given to infants. It combines both saccharine and oily particles, and is a very serviceable article of diet in a putrescent state of the blood, in inveterate ulcers, and in the scurvy. It is well calculated to assuage rigidity, cramps, and pains, being a diluent and attenuating remedy, *especially in the state of whey*; it promotes perspiration and evacuation in general, and is highly beneficial in spitting of blood, hysterics, hypochondriasis, dysentery, inveterate coughs, convulsive affections, the putrid sore throat, and in complaints arising from worms. Milk is also used for fomentations, baths, emollient in-

jections, and washes for inflamed and sore parts. If intended as a medicine, it should be drunk immediately, or soon after it comes from the cow; because, through boiling, and even by long standing, the best and most nutritious balsamic particles evaporate.

The milk to be employed for diet in diseases ought to be taken from healthy and well-nourished animals; for we see in children how much depends on the health of the mother; and how suddenly they suffer from an unhealthy or passionate nurse. In Spring and Summer the milk is peculiarly good and wholesome, on account of the salubrious nourishment of the herbs. In Winter it is much inferior. It is farther necessary, that the animal furnishing the milk should be kept in the free air, and have daily exercise. In order to obtain good milk, it would be advisable for private families, who have the opportunity, to keep a cow; for, besides the adulteration of that which is sold, cows are frequently milked at an improper time, by which the milk is much injured, and cannot be wholesome.

The best milk is obtained from the cow at three or four years of age, about three months after producing the calf, and in a serene Spring morning. Good cow's milk ought to be white, without any smell; and so fat, that a drop being allowed to fall on the nail, will not run down in divisions. It is lighter, but contains more watery parts than the milk of sheep and goats; while, on the other hand, it is more thick and heavy than the milk of asses and mares, which come nearest the consistence of human milk. Ewe's milk is rich and nourishing; it yields much butter, which, however, is so unsavoury, that it cannot be eaten. Both this and goat's milk produce much cheese, which is tough, strong, pungent, and difficult to be digested.

As goats are fond of astringent herbs, their milk is superior in strength to that of other animals; hence it has been sometimes used with the most happy success in hysteric cases.—Goat's whey, and ass's milk are chiefly

used in pulmonary consumptions; and where ass's milk cannot be got, that of mare's may be used as a substitute.*

Milk consists of caseous, butyraceous, and watery parts; that which contains a well-proportioned mixture of the three is the most wholesome. But this mixture is not always met with in due proportion:—frequently the two first, namely, cheese and butter, predominate; and, in this case, it affords, indeed, a strong food, but is difficult of digestion. If the water forms the greatest proportion, it is then easily digested, but less nourishing. This is particularly the case with ass's milk, which, more than any other, affects the urine and stool, while it has a tendency to purify the blood.

On account of the warmth and the mechanical process of the digestive organ, joined to the chemical properties of the acid generated in it, milk necessarily coagulates in every stomach. The caseous part is dissolved, and diluted by the admixture of the digestive liquors, and thus prepared for being changed into a pure chyle or milky fluid. Indeed, it makes no difference whether we take cream, cheese, and whey in succession, or whether we consume them united in the mass of the milk: in the former case, the separation takes place without, and, in the latter, within the stomach.

It is, however, improper to eat acid substances together with milk, as this mass would occasion fermentation and corruption: while, on the contrary, the natural coagulation is only a separation of the constituent parts, not a transition of this mild fluid into the stage of acid fermentation; for this is prevented by the saponaceous digestive liquors, though the milk itself be coagulated.

Yet milk is not a proper food for the debilitated in all

* *Artificial Ass's milk*, not inferior in its properties to the natural, may be made by the following process:—Take of eryngo root, or sea-holly, and pearl barley, each half an ounce; liquorice root three ounces; water two pounds, or one quart; boil it down over a gentle fire to one pint, then strain it, and add an equal quantity of new cow's milk.

eases; nay, under certain circumstances, it may even be hurtful. It does not, for instance, agree with hypochondriacs; as it occasions cramp of the stomach, colic, heart-burn, and diarrhœa. Febrile patients, whose weak organs of digestion do not admit of nutritive food, and whose preternatural heat would too easily change the milk into a rancid mass, must abstain from it altogether. It disagrees also with the plethoric, the phlegmatic, and the corpulent; but particularly with tipplers, or those addicted to strong spirits. Its butyrous and cheesy parts may obstruct digestion and oppress the stomach.

Lastly, *sour milk* is unfit for use, on account of the chemical decomposition which has taken place in its constituent parts, and because it can hardly be digested by the most powerful stomach: even sweet milk ought not to be eaten together with flesh, and, in most cases, the whey is preferable to the milk.

With these exceptions, milk is an excellent species of diet, which does not require strong digestive organs, unless a variety of other substances be eaten with it. On the contrary, persons much reduced in bodily vigour have received benefit, and, in a great measure, been cured, by eating milk only. We daily observe, that children at the breast, with the natural inclination to acidity and viscosity, feel its bad effects only when, together with milk, they are fed upon cakes, pastry, gingerbread, and other trash. Milk, being free from all acrimony, produces wholesome, light, and sweet blood. Sugar and salt are almost the only proper spices to be added to it.

Cream is exceedingly nourishing, but too fat, and difficult to be digested in a sedentary life.

Butter possesses, at once, all the good and bad properties of expressed vegetable oils; it is the sooner tainted with a rancid bitter taste, if it be not sufficiently freed from the butter-milk after churning.—Bread and butter require strong and well-exercised powers of digestion. It is a most pernicious food to hot-tempered and bilious persons, as well as those of an impure stomach.

The good quality of butter is marked by a very fat shining surface, yellow colour, agreeable flavour, and sweet taste.*

Butter-milk is a species of whey, but contains a great number of butyrous particles. If we drink it while new and sweet, it is refreshing and cooling.

Before I quit the subject of milk, I cannot omit remarking, that this fluid, besides the qualities before enumerated, contains some spirituous parts, *in a latent state*, with which our chemists are little acquainted. And, although these parts cannot be disengaged from the milk, and exhibited in a separate form, yet it is certain, that the Persians, and other inhabitants of the East, prepare a kind of wine from milk, which possesses all the properties of intoxicating liquors. Such is the report of respectable travellers; but I am inclined to suspect, that these Orientals make some addition to the sweet whey, after the caseous parts are separated from it, by which they induce a vinous fermentation. Whether they add honey, sugar, or any mucilaginous vegetable containing the saccharine principle, I shall not attempt to decide; but it is well known, that the Chinese ferment and distil a liquor from a mixture of rice and veal, which is not unpleasant when new.

Cheese is obtained from the tough part of the milk, which subsides in coagulation, and which must be completely freed from the whey. All cheese is difficult to be digested, being the coarsest and most glutinous part of the milk, which the healthy and laborious only can concoct. To others it is too heavy; it imparts a thick and acrid chyle to the blood; it hardens in a weak stomach, and accumulates in an indurated earthy lump. When eaten new, in any considerable quantity, it corrupts the fluids; and, if old, it becomes putrid. In

* I am inclined to think, it would be beneficial to society if the making of *butter* were strictly prohibited, as well as the importation of salt-butter into every civilized country, where the hurtful properties of it are sufficiently understood.—*Melted fat*, or the *drippings* of baked and roasted meat, are equally, if not more, pernicious to the stomach than even stale butter, and both ought to be used only for greasing cart-wheels, and not for injuring human organs.

small quantities, after dinner, it can do no great harm; but it is absurd to suppose that it assists digestion; its effects, at best, being of a negative kind, that is, by producing a temporary stimulus on the stomach: and even this is the case only with sound old cheese, which is neither too fat nor too far advanced in the process of putrefaction.

Toasted cheese, though more agreeable to some palates than raw, is still more indigestible. Cheese, if too much salted, like that of the Dutch, acquires, when old, a pernicious acrimony. The green Cheese of Switzerland, which is mixed with a powder of the wild Melilot, or the *Trifolium Melilotus*, L. and the milder Sage-Cheeses prepared in England, are almost the only kind which may be eaten without injury; and even these should be used in moderation.*

Birds, as they move in the purest and most healthy atmosphere, possess the best prepared and most wholesome alimentary substance; yet the flesh of birds, though more easily digested, is less nourishing than that of quadrupeds; for, on account of their almost constant exercise, the winged tribe have drier muscles, consequently a less nutritious juice. Those birds, particularly, which subsist upon worms, insects, and fishes, are not wholesome; and if they frequent swampy and filthy places, their flesh will afford meagre and impure nourishment.

Some parts of fowls are less wholesome than others. The wings of those whose principal exercise is flying, and the legs of those that generally run, are the driest parts of their bodies: hence, the breast is, in all, the softest

* To show the strongly viscid quality of cheese, and what powers of digestion it must require to assimilate it to our fluids, I shall mention a composition which may be useful, as the strongest cement yet contrived, for mending china cups, glasses, and the like. A piece of Cheshire or Gloucester cheese is boiled in three or four different waters, till it forms a soft and elastic mass, freed of the whey and other extraneous ingredients. After having expressed all the water from this mass, and while yet warm, it must be gradually rubbed upon a piece of marble, such as is used by colour-men, and as much unslacked or quick lime, in powder, must be added as will be absorbed by the cheese without making it too hard. This compound forms the strongest possible cement; if allowed to dry slowly, it is able to withstand fire as well as water.

and most nutritive part. Young poultry is preferable to that of some years old, which has very tough muscles, and is heavier to the stomach.

Birds living upon grain and berries are, in all respects, the best; next, those which feed upon insects; and, lastly, that class of birds which preys and subsists upon fishes. These, indeed, like all other animals whose proper food is flesh, are eaten only by savage nations, wild and tame ducks and geese excepted, which, by their strong flesh, and the inclination of their fluids to putrescency, are less wholesome than any other bird. Water fowl afford the least beneficial food. In general we find winged animals out of season in Spring; partly because most of them are then pairing, and partly on account of the long journeys of those that are birds of passage, by which they become leaner than at any other time of the year; yet some birds of passage do not arrive in this climate till towards Autumn.

It is remarkable, that most birds, when taken from their wild state, and fed in captivity, such as partridges, larks, and others, lose much of their peculiar flavour, which is also the case with wild quadrupeds. Yet those tame and domesticated fowls and animals, that are well fed in yards and stalls, are generally more fat and muscular than those which are obliged to seek their own food. Old fowls are the most serviceable for broth; or they may be boiled in close vessels, where they can macerate for some hours, till they are completely softened by the steam. Fowls lose much of their fine flavour if boiled; they are, therefore, best roasted, except the smaller kinds, which ought to be baked.

All birds living upon grain and berries afford good nutriment, except geese and ducks. The flesh of the goose is unwholesome, especially when fed in small inclosures, without exercise; which practice is sometimes carried so far, as cruelly to nail the animal to a board through the feet, to prevent its motion. Its fat is almost totally indigestible; its flesh produces a very obvious and bad effect upon wounds and ulcers. It is also pernicious.

cious to those who are disposed to inflammatory diseases, and frequent cutaneous eruptions. A young hen, or chicken, is a very wholesome dish; its vegetable aliment produces a mild and sweet chyle; and the whiteness of its flesh is a proof of its excellent quality. As it is easily digested, it is a dish to be recommended to the weak and debilitated; and it agrees best with individuals of an acrid and mucous tendency, or such as are troubled with biliary and stomachic disorders.

The Capon is one of the most delicate dishes; if eaten when young, he yields a strong and good chyle; his flesh is not of a heating nature, nor disposed to putrescency, and the fat itself is easily digested. Turkeys, as well as Guinea or India fowls, yield a strong aliment, but are more difficult of digestion than the Capon; particularly the legs, wings, and fat. These birds, when roasted, are usually filled with some kind of heavy pudding, which is a favourite morsel with many, but requires the strongest digestive powers.—The old prejudices, that the flesh of capons is productive of the gout, and that of sparrows brings on epileptic fits, are too absurd to require refutation.

Among the birds subsisting on insects there are few eaten, except the various kinds of snipes and starlings. All of them, without exception, consist of hard, unflavoury, and scarcely digestible flesh.

It would be useless to enumerate the various birds, living upon fish, which are eaten in other countries. They all have a fishy taste, and afford a poor aliment. Ducks and geese only are eaten in Britain: of these the former afford the better nourishment, as they are generally not so abundant in fat as the latter, and are permitted to move about in the open air. But they ought not to be suffered to repair to stagnant waters, which they swallow, and which taint their fluids and flesh with qualities detrimental to health.

Next to milk, no nutriment is so simple and so salutary as that of birds' eggs, among which those of hens justly deserve the preference, in respect of nourishment,

taste, and digestion. The albumen, or the white of eggs, corresponds to our serum, or the water of the blood; it is dissolved in a warm temperature, but considerable heat makes it hard, tough, dry, and insoluble. The yolk of eggs is more soluble, contains much oil, and is uncommonly nourishing, but has a strong tendency to putrefaction: hence, eggs must be eaten while fresh. People of a weak stomach ought to eat no kind of food easily putrescible, consequently no eggs. To those, on the contrary, who digest well, a fresh egg, boiled soft (or rather stewed in hot water, from five to ten minutes, without allowing it to boil), is a very light, proper, and, at the same time, nourishing food.

Hard boiled and fried eggs, pancakes, and all artificial preparations of eggs, are heavy on the stomach, corrupt our fluids, and are unwholesome. The eggs of ducks and geese ought to be eaten only by persons of the most active and powerful stomachs. All eggs require a sufficient quantity of salt, to promote their solution in the digestive organ; yet butter renders them still more difficult of digestion: hence, it is equally absurd and pernicious to use much butter, with a view to soften hard boiled eggs. We cannot be too circumspect in the use of eggs, as to their freshness; for examples are not wanting of persons, after having used corrupted, or only tainted, eggs, being seized with putrid fevers.*

* Various modes of preserving eggs have been contrived in domestic life. To prevent the external air from pervading the egg, is the principal requisite. With this intention, some smear them with butter, others pack them in bran, or common salt; the farmers in Germany suspend them in fresh river water, by means of a net; but all these methods are troublesome and uncertain. The best way of preserving them to any length of time, is, to place them in a very strong lime-water, to leave some lime at the bottom of the vessel, and, if the water should become turbid, to pour it off and supply it with a fresh infusion. This may be done with boiling water, to dissolve more of the lime; but it must be allowed to become perfectly cold before the eggs are placed in it.

I shall here take notice of a method lately contrived to preserve animal and vegetable substances, to almost any length of time, without salting or pickling. A Mr. DONALDSON has obtained his Majesty's Letters Patent, for inventing a powder, which is said to possess the extraordinary virtues of preserving the flesh of animals, as well as vegetable roots, to an indefinite length of time. If this be true (though I am much inclined to doubt it), it is easy to conceive how the Egyptian mummies could be preserved for several thousand years. Our East

Fish afford, upon the whole, but a weak nourishment: they are more or less difficult to digest, according to the different kinds of water in which they live. Being, of all animal substances, the most putrescible, they are much inferior in quality to birds and quadrupeds, on which account they ought not to be eaten by febrile patients or convalescents. Their fat is still more insoluble and indigestible than that of other animals, and readily turns rancid. On account of their indifferent qualities, no satiety is more noxious than that of fish.

Acid sauces and pickles, calculated to resist putrefaction, render fish somewhat better, and more wholesome for the stomach; while butter has a tendency to prevent digestion, and to promote the corruption of their flesh. On the contrary, spice and salt, used in moderate quantities, stimulate the fibres of the stomach to exert their action, and facilitate the digestive process.

Fish dried in the open air, and afterwards boiled soft, are easily digested; but all *salted* sea-fish, as well as smoked fish, are injurious to the stomach, and afford little nutrition. The same remark, though in an inferior degree, applies to fish preserved in vinegar and spice. In general, the heads and tails, which contain the least fat, are the lightest parts for digestion, as, on the contrary, the belly is the heaviest. Such as have a tender flesh are sooner digested than those of a hard and tough consistence.

The soft and mucilaginous fish, like the eel, are partly composed of an oily slime, partly of tough fibres,

and West India vessels may now save themselves the trouble of taking live stock on board.

In order to afford an opportunity of deciding on the merits of Mr. DONALDSON'S powder, or of giving it a fair trial, I shall briefly state its component parts, as recorded in the Patent.—Any quantity of vegetable gum, such as Gum Arabic, or that of cherry trees, in fine powder, is mixed with an equal quantity of fine flour of wheat or barley; this is made into a paste, and baked in an oven, contrived for that purpose, with a very gentle heat, so as to prevent it from forming a crust. The dry mass is again reduced to a fine powder, and this is the great and astonishing *preservative*.—Either animal or vegetable substances, surrounded with this powder, and packed in close boxes in that state, according to the professions of the Patentee, keep fresh, and free from corruption, for almost any length of time.—*Relata refero.*

and are, therefore, not easily digested. Those living in ponds, ditches, and other standing waters, are certainly less wholesome than river fish, whose exercise is greater, and whose natural element is purer. For standing water easily corrupts, and the fish, lodging in the mire of such reservoirs, continually feed upon the putrid parts. But the same kind of river fish are also of different qualities, according to their different nourishment. Hence, those caught in rivers contiguous to great towns are less salubrious than others; because they necessarily imbibe great quantities of the impurities thrown into such rivers.

Salt-water fish are, perhaps, the best of any, as their flesh is more solid, more agreeable, and healthy, less exposed to putrescency, and less viscid. They possess these excellent qualities, when fresh; when salted, they have all the properties of salt-flesh, and, consequently, its disadvantages. With respect to *herrings*, it is certain, that, of all the sea-fish, they are most easily digested; and salt herrings, in particular, if eaten in small quantities, dissolve the slime in the stomach, stimulate the appetite, create thirst, and do not readily putrify by long keeping.

Among the *amphibious animals*, the legs of frogs are, in some countries, esteemed a delicate dish; yet, as they contain a large portion of fat, the stomach cannot easily digest them, without the addition of much salt. The same observation applies to the Turtle, as well as the West-Indian Guana, a species of Lizard, two or three feet long, of a most forbidding appearance; but its flesh is delicate and salubrious, much resembling that of a chicken.—We also eat lobsters and crabs, which are a species of water-insects: as both of them, however, generally arrive at a stage approaching to putrefaction, before they are sold in the inland towns, their consumption is attended with considerable danger. Besides, the meat of lobsters, in particular, is not easily digested, as it possesses a peculiar acrimony, which, in swallowing, sometimes occasions pain in the throat.

Some people, it is said, have been affected with eruptions of the skin, pain in the stomach, and rheumatisms, arising from the use of lobsters. Their jelly, however, is mild and nourishing.*

Oysters are eaten both raw and dressed: when raw, they are, in every respect, preferable; for, by cooking, they are deprived of the salt-water, which promotes their digestion in the human stomach, as well as of a great proportion of their nourishing jelly. Raw oysters are easily digested, and may be eaten, with great advantage, by the robust, as well as by the weak and consumptive; as this shell-fish possesses more nutritive animal jelly than almost any other. They, farther, are generally attended with a laxative effect, if eaten in any quantity: hence, they afford an excellent supper to those liable to costiveness.

Snails, though seldom eaten in this country, are equally nourishing and wholesome. On account of their gelatinous nature, they have lately been much used in consumptions; and, as these complaints are now very frequent in Britain, it were to be wished that such patients would give this remedy a fair trial, by boiling

* The flesh of *river lobsters* is more delicate than that of the sea-lobster; but it is, at the same time, more subject to putrefaction, and ought, therefore, to be used in a fresh state, with much salt or vinegar. In Germany, and other parts of the Continent, lake and river lobsters are always boiled alive, and generally in milk; a dish much esteemed in families, and of which children are particularly fond. The Germans cook various species of fresh-water fish in milk; and, although palatable dishes may thus be prepared, yet, on account of the incongruous variety of substances, I cannot approve of the mixture. There is, however, a method of obtaining from lobsters a very excellent and wholesome jelly, the particulars of which I shall here communicate to the reader, upon the authority of a respectable physician at Hamburgh. "Take the flesh of about thirty river lobsters sufficiently boiled; cut it in small pieces, and place it in a capacious earthen vessel, over a gentle fire, with one ounce of fresh butter. After the butter is completely absorbed, add the clean flesh and skin of two calves' feet, and four quarts of pure soft water. These ingredients must be simmered over a moderate fire, till the whole of the mass amount to rather more than one quart. In that state, half a drachm of powdered nutmeg, and a handful of chervil, must be added; and, after having allowed it to boil up again, the purest part of this mass is to be pressed through a strong linen cloth. When placed, for some hours, in a cellar or other cool place, it forms a strong jelly, two or three spoonfuls of which will impart uncommon richness and flavour to a basin full of common veal or chicken broth."—I make no doubt, that a similar jelly may be prepared of small sea lobsters, if they can be had alive.

a dozen of the red garden-snails every evening in a quart of sweet milk or whey, for half an hour, then straining the liquor through a coarse cloth, and drinking it with sugar every morning gradually, upon an empty stomach, and repeating these draughts for a month or two if required. This red garden-snail (or the *Helix Pomatia*, L.) has also been used externally in the open hæmorrhoids, where fresh snails were applied, every two or three hours, in a raw state, with remarkable success.

Muscles are of a more solid texture, and, therefore, not so easily digested as oysters. The sea-muscles afford a hard, indigestible, and, as some imagine, poisonous food. Although the examples of their deleterious nature are very rare, yet they ought not to be eaten without vinegar, or some other vegetable acid, acting as a corrector of their bad qualities, or, in the opinion of others, as an antidote.

Of Vegetable Aliment.

The various articles of nourishment we derive from the Vegetable Kingdom may, with propriety, be divided into five orders :

- 1st. The different species of farina, or grain, such as wheat, rye, barley, and oats.
- 2d. The legumes, or pulse, such as pease, beans, &c.
- 3d. The various kinds of salads and pot-herbs.
- 4th. All the different roots; and,
- 5th. Fruit, or the production of trees and shrubs.

The first of these, namely, the farinaceous, are very nourishing, on account of the copious mucilage they contain; but they are likewise difficult to digest. Bread itself, though justly called *the staff of life*, if eaten too freely, or to serve as a meal, produces viscidities or slime, obstructs the intestines, and lays the foundation of habitual costiveness. All dishes prepared of flour are not only nourishing, but are emollient, attenuating, and correct acrimony. Leavened bread, or such as has acquired an acidulated taste by a slow fermentation of the dough,

is cooling and antiseptic; a circumstance well established by experience. By this process of preparing the dough, all the tough parts are intimately mixed with the drier parts of the flour, and the fixed air is expelled in baking. New-baked bread always contains much of an indigestible paste, which is remedied, either by allowing it to dry for two or three days, or by toasting it. This ought to be constantly done, particularly in times of scarcity, both on account of health and economy. Stale bread, in every respect, deserves the preference: and persons troubled with flatulency, cramp of the stomach, and indigestion, should not, upon any account, eat new bread, and still less hot rolls and butter. Indeed, all pastry whatever is unwholesome, especially when hot. Those who devour hot pies with avidity, should consider, that they contain an uncommon quantity of air, which distends the stomach, and produces the most alarming and dangerous colics, and incurable obstructions, inasmuch that the stomach and bowels have been known to burst. The porous quality of bread arises from the fixed air having been expelled in baking; and the more spongy the bread, it is the more wholesome. But new-baked bread, and rolls in particular, require a sound stomach; because they contain much mucilage, not having parted with all their moisture; and wheat-flour is more viscid than that of rye, which is the bread-corn of most nations on the continent.

Bread and butter, together with cheese, as they are eaten in Holland and Germany, form a mass scarcely digestible. The external surface of bread, or the crust, which has been more dried by the heat of the oven, is easiest digested; it contains the empyreumatic part, expelled from the flour by fire; it produces an emollient effect on the bowels; but, at the same time, is more heating and less nourishing than the softer part, or crumb.

The great difference in bread is owing, partly to the various species of grain from which it is made, and partly to the time the flour has been kept; for, when new, it is more difficult to deprive it of its tenacity, on account of

its being more or less cleaned from the bran; owing to the different methods of fermenting and baking it, to the difference in the water with which the flour has been kneaded, and, lastly, to the various ingredients of which the paste has been compounded. The softness of the mill-stones used in grinding the flour, may also vitiate the bread, by introducing particles of sand and marble, so as to make it equally noxious to the teeth, and oppressive to the stomach. Well-baked, and thoroughly dried bread, is easily dissolved by water, without rendering it viscid or gelatinous: hence it is adapted for the use of the debilitated, as well as for every age or temperament.

Hasty-pudding, on account of its tenacity, and the quantity of mucilage it contains, is not so easily digested as people, who feed their infants upon this dish, are apt to imagine. Porridge made of oat-meal, the common food of children, and the lower class of adults in Scotland, is not so heavy as that of wheat-flour; though both of them require vigorous digestive organs, robust constitutions, and strong exercise, in order to produce a proper nutriment.

The *vermicelli*, and *macarone* of the Italians, as well as all the different dishes made of flour mixed up into paste, and either boiled in water or stewed in butter, are ill calculated for patients and convalescents, to whom they are frequently administered. A paste, when it is so elastic that it can be formed into balls, is extremely difficult to be digested. All unfermented pastry is excessively trying to the stomach; and, instead of being a subject of surprise that the lovers of such dainties are continually troubled with indigestion and other stomachic complaints, it would be against the order of things if it were otherwise.

Bread ought not to be eaten with every dish; it is more useful and necessary with those articles that contain much nourishment in a small bulk, in order to give the stomach a proper degree of expansion. Besides, the addition of bread to animal food has another advantage, namely, that

of preventing the disgust attending a too copious use of flesh, and its strong tendency to putrefaction. But if we accustom ourselves to eat new-baked bread with provisions already indigestible in themselves, such as fat geese, bacon, blood-sausages, and the like, we make them still more insupportable to our digestive organs. Of the different kinds of grain from which bread is prepared, that of rye is by far the most wholesome for people of a sedentary life, as well as the delicate and nervous; for, though it be less nourishing, it is likewise less tenacious, and more easily digested, than bread made of wheat.*

Rice contains a thin, unelastic, and easily soluble mucilage. It is one of the popular prejudices, that rice has a tendency to produce costiveness: this is only so far true as the use of it, by persons of languid and debilitated constitutions, is sometimes attended with flatulency, which sufficiently accounts for its secondary effect. To avoid such unpleasant consequences, rice ought to be eaten with the addition of some spice, such as cinnamon, fennel, carraway, anise-seed, and the like, particularly by those of a phlegmatic habit and slow digestion.—In India, where this grain is almost the only food of the natives, it is regularly eaten with such quantities of pepper and other strong spices, that Europeans, on their first arrival, cannot partake of this high-seasoned dish. From a custom so beneficial in its physical effects, we may conclude, that the Indians, though directed more by instinct than scientific induction, are not altogether unacquainted with the rules of diet.

* A few years since, when serious apprehensions of an approaching famine were entertained, in consequence of the scarcity, or rather the high price, of flour in this country, the minds of men were sedulously employed in researches tending to avert the impending calamity. Compositions of various substances, to serve as substitutes for bread, such as grey pease, horse beans, potatoes, and many other farinaceous vegetables, were repeatedly tried. And, though a very nourishing and palatable bread was formed of flour mixed with rice and potatoes, yet the prejudices of the lower, as well as the higher, classes of the people, in favour of wheaten bread, were too great and inveterate to admit of so useful and beneficial an innovation. It is, therefore, much to be lamented, that no attempts have since been made to convince the vulgar and the ignorant, that such compositions are not only proper in respect of *public* and *private economy*, but that they are not in the least detrimental to health.

One of the best preparations of rice is the mucilage, or jelly, which is obtained by boiling two ounces of it, ground to fine powder, and a quarter of a pound of loaf-sugar, in one pint of water, until it becomes a transparent, thick broth: this, when expressed through a cloth, and allowed to cool, is a palatable and wholesome jelly.

Oats, when hulled, or deprived of the husk, and reduced to groats, are used as the common dish for the infirm and sick in England, France, and Germany. They impart to the water a thick mucilage, which, with the addition of a few currants boiled in it, is of a nourishing and slightly aperient quality.

Barley, or rather pearl-barley, may be used with a similar intention, and is, perhaps, still more nutritive; but, after decoction, the grosser parts which remain, ought not to be eaten.

Millet, or hirse, is inferior to either oats or barley; it possesses too crude a mucilage for relaxed or inactive stomachs.

Manna-grass (the *festuca fluitans*) is so called in Germany and Poland, because its seeds have a remarkably sweet and agreeable taste, particularly before the plant comes to its full growth. It excels, in richness and nutriment, all the other vegetable productions of Europe; and, boiled in milk, it affords excellent soups as well as puddings. Two ounces of this manna, properly cooked in milk and water, would be a sufficient meal for the most robust and laborious man. Boiled in water alone, in the proportion of one ounce to three pints of water evaporated to one quart, with the addition of some sugar and white wine, it makes an agreeable and nourishing dish for lying-in women and other patients for whom animal food is improper, and whose situation requires the occasional stimulus of wine.

The *second* order of vegetable aliment includes all the leguminous productions, as beans, pease, lentils, and the like; these contain a solid gluten or mucilage, and afford a rich and strong nutriment, which best agrees with a

vigorous stomach. They also have a considerable proportion of crude particles, which cannot be assimilated to our fluids, and must therefore remain undigested in the bowels, to the great detriment of the alimentary canal. The *meal* of the leguminous class is digested with more difficulty than that of grain; besides, it contains much fixed air; on which account it is extremely flatulent, it is apt to occasion costiveness, and to communicate various kinds of acrimony to the blood. These effects, however, it produces only when it is eaten too frequently and copiously. Hence bread made of pease or beans, either alone or mixed and ground together with wheat, is improper for daily use.

We must not, however, imagine that even the most wholesome articles of food are altogether free from air: this element is a necessary and useful ingredient to promote the digestion of alimentary substances. The proportion of fixed air varies extremely in different vegetables: all the leguminous plants particularly abound with it; and, even persons with whom they agree well, must have experienced flatulency and torpor, after a copious use of pease or beans. Those who are fond of pease-soup, would better consult their health, by boiling the pease whole, than split and deprived of their husks; for these promote the grinding of the pease, and prevent them from turning acid in the stomach, which split pease readily do; they are also apt to occasion oppression in the bowels, and a very troublesome heart-burn.

Green pease, as well as *French beans*, boiled in their fresh state, are equally agreeable and wholesome; for they are less flatulent, and more easy of digestion, than in their ripe state. It deserves to be remarked, in general, that all vegetables of the pulse kind, as they advance in growth, become more oppressive to the stomach, and, consequently, less salutary in their effects.

The *third* order of vegetables comprises the various kinds of salads and herbs used in cooking, such as greens, cabbage, spinage, and the like. These contain a great

proportion of water, and little nourishment: they serve to fill the stomach, resist putrefaction, and may, therefore, be eaten more freely in summer than in winter; being, besides, of a softening, laxative, saponaceous, and, consequently, solvent nature, they are well calculated to relieve the bowels. On account of their watery consistence, they are of peculiar service to lean people, to those who lose much moisture by perspiration, or who are troubled with flushings and undulations of the blood (in which case animal food is improper); and, as these vegetables contribute to promote insensible perspiration, they are cooling, and assist all the emunctories of the body. Their nourishment is in proportion to the mucilage they contain; but, as this is in a very diluted state, the aliment they afford is inconsiderable. They are farther distinguished by their earthy, acrid, and aerial particles, both with respect to their nutriment, and their effects upon the first passages. They become soft by boiling, many of the aerial particles are expelled, and are thus rendered more digestible. But the practice of boiling them in large quantities of water, which is afterwards poured off, is extremely absurd and injudicious; for, with the water, their best and most nutritious parts are consequently thrown away: hence these vegetables ought to be thoroughly washed, and, cabbage excepted, stewed in a small quantity of water, which will so far be reduced by slow boiling, that it may be brought to the table, together with the substance dressed. To improve their relish, as well as to render these vegetables less flatulent, spices are generally added with a view to assist digestion: and, for the same reason, they are eaten, in a raw state, with vinegar, salt, pepper, and the like.

Salads, being in general eaten with oil and vinegar, require all the powers of the stomach to digest these liquids, together with the raw herbs. *Baked* vegetables, with paste and milk, as they are prepared in some countries, lose all their principal virtues, and readily acquire an empyreumatic oil upon the crust, which is indigestible, and taints the fluids with a dangerous acrimony.

Asparagus is an excellent article of nutriment, although somewhat flatulent and diuretic in its effects. The young shoots of this plant are not only the most palatable, but, at the same time, the most salutary. As a good substitute for it, I can, from experience, recommend the *young buds of hops*, which are more easily procured, scarcely inferior to the former in taste, and, on account of their aromatic quality, are very grateful and wholesome.

Artichokes afford a light and tender food, perhaps still more nutritive, but less diuretic, than asparagus; and, for this reason, they are preferable for culinary uses.

Spinage, a favourite dish with many, affords but little nutriment, passes quickly through the stomach and bowels, almost undigested; and, being usually dressed with butter, it weakens the alimentary canal, produces looseness, and, consequently, is not proper food for the weak and debilitated. In languid stomachs, spinage is apt to produce acidity and the heart-burn.

Sorrel possesses an acrid acidity, which deprives the teeth of their enamel, and ought to be avoided by those who are already troubled with an acid taste in the mouth.

Red cabbage is one of the most indigestible vegetables, particularly as the French and Germans eat it, with ham and chesnuts; it is thus rendered heating, flatulent, and laxative, and contains no nourishment. More digestible, cooling, and less hurtful to the bowels, are the young sprigs of cauliflower; but the most indigestible of all is the colewort (*caulis rapicius*). What has been said with respect to cabbage, is applicable also to the orach, or *atriplex*, and the lettuce, when eaten boiled or stewed.

White cabbage is possessed of excellent properties; it is less flatulent than the common greens, and, being full of water, it is diuretic, and somewhat laxative. It is remarkable, that all herbs and plants, in general, are more or less flatulent according to their digestibility, and are disposed to putrescency in proportion to the time they remain in the alimentary canal.

Of white cabbage, sliced or cut in thin shreds, and af-

terwards seasoned and salted, the Germans make *sauer kraut*, which is easily digested, on account of the salt mixed with it, and the acetous fermentation it has undergone before it is used, and, by which process, the greatest part of its fixed air is expelled. Sauer kraut may be preserved for a long time; it operates powerfully on the first passages, being a most excellent antiseptic: it has proved of singular service at sea, in resisting the ravages of the scurvy, and curing it in the most alarming stages. We are indebted to Captain Cook for introducing this salutary dish among the sailors, in spite of all prejudices, and thus preserving the health of many brave mariners. Lastly, sauer kraut has been found the best preventative of epidemic distempers, particularly of the dysentery, and the putrid and petechial fevers, which it has even frequently cured.

Lettuce contains many nitrous particles, is very cooling, and useful in the evening to those who cannot sleep, from the too great heat and undulations of the blood. But the copious addition of oil and the yolk of eggs renders it less digestible than when eaten in its simple state; and if these must be used, it is better to add some sugar, which decomposes these substances. The most suitable ingredients of Salads, besides the Lettuce, are the various Cresses, Chervil, (*Charophyllum bulbosum* Lin.) and the scurvy-grass, which, together with other cooling herbs, produce the effect of cleansing the humours, or, as some say, of purifying the blood, and are, at the same time, diuretic; especially if eaten in Spring, and upon an empty stomach.

The *fourth* order of Vegetables consists of all the esculent roots, or such as are used at our tables. They are either of the mild or of the astringent and acrid kind. The former are much more nourishing and less flatulent than the latter, which, however, possess some medicinal properties, such as the various species of radishes, onions, garlic, and the like.

Roots are neither so nourishing, nor so easily digested, as animal food. Yet we may consider it as a certain rule, that any kind of aliment, for which we feel a natural and permanent appetite, is conformable to our nature. Of this kind is that beneficial root, the potatoe, which, in the most simple preparation, and without any addition, affords an agreeable and wholesome food to almost every person, and particularly to children. It is one of the lightest alimentary substances, occasioning neither viscidities nor flatulency, and can be hurtful only when immoderately used: but, being a dry vegetable, and containing many earthy particles, it requires a proper quantity of drink to prevent obstructions. Its excellent nourishment is sufficiently obvious in the healthiness of those country people whose principal food is potatoes, as well as in animals that are fattened upon these roots.

The quickness with which the chyle made from potatoes is assimilated to the blood, leaves no doubt that they are easily digested; for it is a general remark, that labouring people sooner feel a renewal of their appetite after potatoes, than any other species of food. It is a groundless assertion, that they generate a thick and crude chyle, and, consequently, a gross and viscous blood. A supposition equally unfounded and refuted by experience is, that the potatoe is a narcotic root, and that it is apt to stupify the powers of the mind. This effect is produced only from a too copious use of it, together with want of exercise; in which case, any other food would be attended with similar consequences.

The stimulating powers ascribed to potatoes appear to me merely imaginary. Those of a farinaceous consistence are much more easily digested than the heavy and gelatinous kind. The flour made of potatoes is more wholesome for pastry, and for all those dishes prepared of meal, than any other. The French have lately contrived a method of preparing a granulated flour from this root, which is grateful to the palate, and very nourishing. It is performed by a machine of simple construction, a representation of which, together with a descrip-

tion, was given some time ago in the Repertory of Arts and Manufactures; and it has also been used successfully, when mixed with wheat-flour, in making bread.*

The *beet-root* contains a large proportion of saccharine matter. By the latest experiments of M. ACHARD, of Berlin, it has been proved, that about fourteen pounds weight produced one pound of raw sugar, exceedingly sweet, and without an intermixture of any other taste. Independent of this consideration, the beet is a valuable root, both in an economical and culinary respect: it is possessed of mild, aperient qualities, and ought to be eaten more frequently, for supper, by those who are of a costive habit. Although it is not difficult of digestion, yet some less flatulent root, such as parsley, celery, or even potatoes, ought to be used together with the beet; which addition will render it not only more palatable, but also more suitable to the stomach and bowels.

Carrots are extremely flatulent, and therefore an improper food for the weak, and those inclined to acidity; by such individuals they can scarcely be digested, unless taken with the addition of spice, and a proper quantity of salt; by which means their fermentation and corruption in the stomach will be in a great measure prevented. In other respects, they contain a good and copious alimentary fluid, at the same time powerfully affect the kidneys, and are likewise anthelmintic, or destructive of worms.

Parsnips, besides their sweet mucilage, contain somewhat of the aromatic principle, being more nourishing, and less flatulent, than carrots. To deprive them entirely of the latter quality, they ought to be boiled in two different waters; but, by this precaution, they partly lose their sweet taste, and become less nourishing.

Turnips are nutritive, but flatulent, and not easy of digestion; they become still more indigestible when of a

* Whatever has been formerly said against the use of potatoes, it is now well understood that they are wholesome, nourishing, and light to the stomach, even in the weakest constitutions.—M. PARMENTIER, of Paris, lived for several weeks on potatoes only, without experiencing any ill effects on his health.

large size and long preserved in cellars.—The least flatulent and most nourishing of these roots are the long kind, or Swedish Turnip, lately introduced into this country.

Parsley, as well as *Smallage*, are of a sweet, stimulating, and aromatic nature. The former, especially, was by the ancient physicians supposed to purify the blood; an effect which modern medical observers would not only doubt, but even ridicule. So much, however, is certain, that parsley is a mild aperient and diuretic. Yet, for these salutary purposes, it ought not to be eaten in a raw but boiled state.

Celery is one of the most fragrant roots we possess in our climate, though its shoots and leaves are more commonly used for salads than the root itself. There are two species of celery known among gardeners, both of which are estimable: one produces thick knobby roots, not unlike the size and figure of a short pine-apple; and the other has a variety of small, white, tender, and odorous roots. The latter species is more common in this country, while the former is much esteemed in France and Germany, where it is eaten in thin slices, previously soaked in vinegar; a preparation which, in summer, affords a cooling and wholesome dish. In a raw state celery is digested with some difficulty, which may be removed by boiling it in water, or soaking it, as before observed, for a short time in vinegar. The Germans prepare an artificial coffee from this root, by cutting it into small square pieces, which are dried and roasted in the usual manner. Dr. UNZER occasionally recommends this native coffee to his patients, particularly to nurses and lying-in women, as a wholesome substitute for either tea, or a real coffee.

The *skirret-root*, and the *scorzenera* of Spain, possess more spicy and stimulating than nutritive qualities. Both these roots, as well as the three preceding, are diuretic, and, consequently, in a slight degree stimulating. The *skirret*, in particular, has an agreeably sweet and spicy flavour, and is so tender, that it can scarcely bear

to be boiled. For this reason it is most properly eaten when raw, like fruit, or may be used as an excellent ingredient in soups and broths.—The scorzenera, on the contrary, ought to be deprived of its black skin, and only eaten boiled: by soaking the raw root for half an hour in cold water it loses its bitter taste, and is likewise rendered less flatulent.

The *Salsafy*, or Goat's-beard, is a root containing still more of the saccharine principle than the scorzenera: being a good substitute for asparagus, and more easily reared in this climate, it certainly deserves to be more generally cultivated in our gardens.

Onions, Garlic, Shallot, and Chives, are stimulants: they assist digestion, relieve the bowels, expel flatulency, dissolve slime or mucus, and are, therefore, beneficial in diseases which proceed from too much viscosity; besides, they increase the appetite, and ought to be used principally as spices, or medicines. They are powerful expectorants, but should be avoided by very hot, irritable, and choleric temperaments. Although these roots are eaten in quantities by whole nations, yet, from their penetrating and volatile smell, which they communicate to the human breath, it is certain they agree best with individuals of a cold and phlegmatic habit, and those whose stomachs require so powerful a stimulus.

All kinds of *Radishes* may be considered as medicinal roots; they are peculiarly calculated to dissolve slimy humours, to generate, and also to expel flatulency; moving the air inclosed in the intestines, and expelling it by the copious air contained in themselves. They are salubrious to strong and active stomachs; but, in those which are deficient in elasticity, radishes increase flatulency to the highest and most troublesome degree. The small salad-radishes are more readily digested than the large root; they propel all the alimentary fluids towards the stomach, increase the appetite, and are, therefore, proper to be eaten before a meal. Old radishes are altogether indigestible, and the whole genus, like onions, and garlic, occasion a very offensive breath.

The *Arrow-root powder*,* lately imported into this country from the East-Indies, appears to afford a larger proportion of nutritive mucilage than any vegetable hitherto discovered.

The *fifth* and last order of vegetable substances comprehends the *fruit*, or productions of the different trees and shrubs.

Fruit, in general, possesses strongly resolvent powers, and it is the more beneficial, as it comes to maturity at a time when the body is relaxed by the heat of summer, and when the blood has a strong tendency to inflammation. It is besides of great service in attenuating the thick bilious impurities collected during the summer, and of evacuating them by its laxative virtues. The acid contained in most kinds of fruit is as useful to quench thirst as to resist putrefaction. In weak stomachs, however, or such as are filled with impurities and slime, it is apt to ferment, and occasion some inconvenience; but this may be avoided by a temperate use, and especially by eating it boiled.

The more sap or juice we meet with in fruit, it will prove the more flatulent; and, as the juicy, cooling, and watery species of fruit require strong digestive organs, to prevent them from producing fermentation, flatulency, and diarrhœa, a glass of old wine is very proper to promote their digestion. A gentle diarrhœa, brought on by eating ripe fruit in summer, has frequently a salutary effect. Acrid and astringent fruit, being rather a medicine than food, is less hurtful to the healthy, and to children, than is commonly imagined. Instead of being noxious, as some imagine, in inflammatory disorders, it is of the greatest service. Persons of a thick and languid blood cannot eat any thing more conducive to health

* It gives me great pleasure to observe, that the price of this valuable article has, since the last edition of these Lectures, been reduced from *eight* shillings to the more reasonable value of *two* shillings the pound weight: so that no invalids and convalescents will, in future, be precluded from using this excellent root in broths and jellies.

than fruit, as it possesses the property of attenuating and putting such blood in motion; but those of a watery and phlegmatic constitution ought carefully to avoid it.

Fruit, preserved with sugar, is antiseptic and nourishing, but, at the same time, flatulent; and, if preserved with sugar and spices, it is heating and drying. It is most wholesome when eaten on an empty stomach, which can exert all its power to expel the air disengaged from it, and to remove it before it begins to ferment. Boiling, as well as drying, corrects the flatulent tendency of fresh fruit; so that, thus prepared, it will agree with every body. By either of these methods it is deprived of its superfluous humidity, as well as of its fixed air; whence it becomes more nourishing, but less cooling, than in the fresh state.

Sago is the medullary part, or marrow, collected from a species of palm-tree growing in the Mulucca and other islands of the East-Indies. This substance, although not strictly the fruit of a tree, well deserves the first place here; for it is used as bread by the natives of India, who macerate it in water, and form it into cakes. The grains of sago, sold in the shops, are obtained by a more artificial process: they produce a nourishing and agreeable jelly with water, milk, or broth; but require to be previously cleaned of the dust, mould, and sea-water. To make a complete solution of sago, the first decoction ought to be strained, and afterwards boiled a second time, for about half an hour. Prepared in this manner, it is a proper dish for the consumptive and convalescent, as well as for those whose digestion is weak or impaired.

Cherries produce the effects above stated, in a very pre-eminent degree; they are excellent in scurvy, in putrid fevers, and in dysentery; they correct the blood, when inclined to putrescency, and, by their saponaceous and melliferous juice, they powerfully resolve obstructions in the intestines. Those who use them with this intention, may eat them at any time of the day, though they operate most effectually in the morning, on an empty stomach. But even the sweet species contain a

stimulating acid, which, in proportion to their juicy consistence, disagrees more or less with the weak and debilitated; for this sap or juice easily ferments in the stomach, and produces flatulency, diarrhœa, and acidity. On account of these peculiar effects, persons whose stomachs are bilious and vitiated, who are troubled with putrid eructations, and an offensive breath, ought to eat them freely, to counteract the disposition to putridity.

Cherries are divided into the aqueous-sweet, the aqueous-acid, and the dry pulpous kinds. The Spanish cherries are the most difficult to digest, but are also the most nourishing. The aqueous-sweet kind, as our early common cherries, are unwholesome; because their juice easily ferments, and occasions colic and diarrhœa. The watery-acid sort are the best of any; their juice strengthens the stomach, purifies the blood, and is the least flatulent.—Dried cherries are in many diseases an excellent article of diet, on account of their cooling and antiseptic properties.—To swallow cherry-stones, however, is highly pernicious, as these stones have sometimes been found to accumulate in the intestines, to form lumps cemented together by viscid phlegm, and thus to produce the most violent and fatal symptoms.

Plums also possess medicinal virtues; they are nourishing and attenuating. Prunes, or dried plums, are of peculiar service to costive habits, affording an agreeable and nutritive food; but, as they are apt to produce flatulency, it would be advisable to eat them either when the stomach is empty, or for supper, without mixing them with other aliment. Under this limitation, they are both aperient and cooling, and agree with almost every constitution; but, plums eaten fresh, and not quite ripe, especially in large quantities, are very apt to occasion looseness, colics, and other maladies of the stomach and intestines. The larger sort of plums are in general more dangerous, in this respect, than the small ones, as they (particularly the green and yellow kind) are seldom allowed to grow perfectly ripe.

Tamarinds are more frequently employed for medicinal

purposes, than as an article of diet. The pulp of this fruit is one of the most grateful acids; which, if taken in the quantity of from half an ounce to an ounce or more, proves gently purgative. By its acidity, it is well calculated to quench thirst and allay immoderate heat.

Peaches abound with juice, and, though not very nourishing, they are not productive of diarrhœa. This salutary fruit was formerly decried as unwholesome; but it is rather serviceable in obstructions and bilious disorders. Sugar, wine, and the like, diminish the good qualities of peaches; and, even when preserved in brandy, they are not so wholesome as when fresh; since they become hard by all artificial preparations. The kernels, likewise, of peaches are a wholesome bitter, and are cleansing, on account of their astringent properties.

As there are various kinds of peaches, of an inferior quality, it will be useful to point out the distinguishing marks of that fruit in a mature state. The best sort of peaches have a delicate thin skin, which is easily separated from the pulpy part. Those which are not naturally smooth ought to be covered with only a small quantity of down; for too much down or wool on the surface is a sign of their inferior quality. They are likewise not to be depended upon as wholesome, if they are of a size either too small or preternaturally large. Their pulp ought to be delicate, yet solid, somewhat fibrous, and full of juice; it should not adhere to the stone or kernel, and ought readily to melt in the mouth.

Apricots are more pulpy than peaches, but, perhaps, less nutritive: their juice readily ferments and turns acid in weak stomachs; yet, when ripe, and used with moderation, they are cooling and antiseptic, particularly for bilious and plethoric individuals.

Of *Pears*, some are extremely hard, astringent, and difficult of digestion; but the more juicy pears have a saponaceous, nourishing, and readily digestible fluid; in their effects they resemble the sweet kind of apples, except that they are less relaxing to the bowels. Pears are of a more flatulent tendency than any of the fruits

before mentioned, especial the hard winter pears, which are eaten at a time when the stomach requires stimulating more than cooling food.

Apples are, in their general effects, similar to other fruit, and, besides their aromatic virtues, are possessed of laxative properties. They are serviceable in diseases of the breast, to remove spasmodic contractions, to neutralize acrimony, and to attenuate viscid phlegm. With this intention, apples are most beneficial when eaten either roasted or boiled. The common people in Germany are so sensible of their excellent properties, in inflammatory diseases, that they boil even the wild apples, and drink the water. This preparation deserves to be imitated, especially when apples become scarce in Spring.

Apples may be divided into the spicy, the acidulated, and the watery species. The first, the various kinds of rennet, for example, have the most delicate flavour, and are certainly the best; they do not contain a superfluity of water, and, from their vinous nature, are not apt to excite flatulency. Other kinds of apples, such as pippins, are too hard, consequently heavy to the stomach, though somewhat more nourishing than the former. Stewed apples are easily digested and wholesome.

The kernels or seeds of apples are bitter and aromatic: Nature seems to have intended these productions for correcting the watery and fermentable fluids of this and all other fruit, apricots excepted. Hence, the kernels of apples and pears, as well as those of plums and cherries, ought to be eaten with the fruit, and not be thrown away as useless.—The butter, in the paste of apple-pies, may be considered as an useful addition, on account of its tendency to prevent fermentation, though the pastry itself always disagrees with weak and irritable stomachs.

Of *Quinces* we have two species, namely, the apple and pear-quince: the latter are the most wholesome, particularly those of Portugal. They are an excellent

antiseptic; and, in this respect, the best kind of fruit, as they contain an acid and much mucilage. They are not productive of obstructions; but their pulp, like that of all other fruit, is digested with some difficulty. They are generally eaten boiled with sugar, and are excellent in dysentery, on account of their copious mucilage.

In *Lemons*, *Oranges*, and other fruit of that kind, we meet with three different substances. The external rind contains an essential oil, strongly astringent and heating; the second, or white rind, is tasteless; the third part is a salubrious, cooling, and acid pulp, highly efficacious in counteracting the putrid tendency and dissolution of the blood. The juice of lemons and limes is one of the strongest vegetable acids;* and that of oranges and shaddocks, though milder, is not less salutary.

These acids are of a very saponaceous consistence: they attenuate the fluids, remove obstructions, encourage digestion, stimulate the appetite, quench thirst, cool the blood, counteract putrefaction, are a principal remedy in pectoral, bilious, and inflammatory diseases, as likewise in scurvy, in all affections of the kidneys, and are true antidotes against the narcotic vegetable poisons. Hence the largest dose of opium may be checked in its narcotic effects, if a proper quantity of

* If the objections started against the use of these acids, by a late physician in Germany, Dr. UNZER, be well founded, we ought to guard against their use. He maintains that, although lemons and limes may be wholesome and refreshing fruits in their native country, yet, as they are packed up and sent to us in an unripe state, they possess an acrid and unnatural acid, from not having undergone the vinous and acetous fermentations, and which, consequently, cannot be wholesome. The juice, especially, which is obtained from the middle of those fruits, having acquired an highly astringent, though not unpleasant taste, from the styptic quality of the bitter kernels, is extremely unwholesome. It is, according to the observations of Dr. UNZER, very apt to impair digestion, and to occasion either diarrhœa or constipation of the bowels.—Such effects, however, will be produced only when these acids are *immoderately* used; in which case the most wholesome substances will be attended with bad consequences, and ever form exceptions from the general rule. Yet I must agree with Dr. UNZER, that the peel of lemons and oranges contains an inflammable and heating oil, which, if rubbed on sugar, for making punch, lemonade, &c. is apt to produce dangerous effects.

the acid of lemons be taken with, or immediately after it. Four grains of pure opium, for instance, or one hundred drops of laudanum, are a very powerful, and sometimes fatal dose; yet if one ounce of the pure acid of lemons, or two ounces of orange-juice, be added to every grain of opium, or to twenty-five drops of laudanum, it will produce a very different effect. Instead of stupifying the person who takes it, and of being attended with painful costiveness, it will not only prove laxative, but induce first a cheerfulness, not attainable by the use either of opium or strong liquors, and afterwards bring on a gentle and refreshing sleep.

Of these effects I can speak from my own experience, as well as that of others. Opium, used with this addition, is one of the most salutary and beneficial substances with which we are acquainted. I am farther inclined to believe, that the Turks, who eat very little animal food, could not bear the large quantities of opium they swallow, were it not for the copious use of vegetable acids. And that these form a principal part of a Turkish summer diet, every traveller knows who has visited the eastern climates.

For these reasons, I cannot sufficiently recommend the use of acids to persons who are either accustomed or obliged to take opiates in large doses. In choleric, bilious, and plethoric habits; in those liable to obstructions, whose alimentary canal is unclean; and, lastly, in those who feel a determination of the blood to the head, opium is an uncertain, and even dangerous medicine, without the addition of vegetable acids. The want of the acid of lemons may be effectually supplied by an indigenous production: barberries afford an acid fully as strong, and nearly as agreeable, as that of lemons.

The juice of the various species of *Raisins* is not unlike that of *ripe* lemons in its properties, but less efficacious. There are various kinds of that excellent fruit. Among the larger sort, those of a blueish colour, imported from Marseilles, are the best; while the Spanish

raisins, of a light brown colour, are inferior to those of any other species. Both kinds, as well as *Currants*, contain much nutriment, but cannot be recommended for frequent use, as they all tend to produce flatulency, particularly in individuals of relaxed habits and a sedentary life. On this account they ought to be eaten with other food, in which case they are emollient, gently laxative, and, in some instances, anodyne.

Gooseberries, having less acid than either raisins or currants, are perhaps more wholesome, especially if their skin and other impurities are not swallowed together with the juice. When used in a green state, for sauces and pies, they are cooling and refreshing; and, when ripe, possess similar properties with cherries.

Figs abound with saccharine matter, and are uncommonly nutritive, though at the same time of a flatulent nature, unless eaten with bread or other mealy substances. Of similar effects are mulberries and raspberries: the former have a more mucilaginous and nourishing juice, while that of the latter is of a vinous nature, and one of the best cordials for allaying thirst and affording refreshment.

Grapes and *Strawberries* are both excellent fruits. They are uncommonly resolvent, laxative without debilitating, and promote all the natural evacuations; but, at the same time, grapes are in a high degree flatulent.

The quality of grapes depends much on climate and soil. Only those of a sweet taste, and aromatic flavour, ought to be used. They agree best when eaten on an empty stomach, with a small quantity of bread. Besides their slightly nourishing quality, it is affirmed, by some writers, that they cool the blood and animate the nerves.

Strawberries, if eaten plentifully, have been found a safe preventive against the stone in the kidneys; as is attested by the experience of the celebrated LINNÆUS. Yet, the small stones contained in strawberries, as well as in grapes, are said to accumulate in the intestines of some individuals, and to give rise to the most obstinate constipations, nay, even to the iliac passion. The best

method of eating strawberries is with pure water, and sweetened with a little sugar; they are more heating with wine, but less wholesome; with milk or cream they are an agreeable but improper composition. As a medicine, the wild strawberry is far preferable to any other.

Cucumbers are a wholesome, gently opening, and cooling fruit, which may be of considerable service to the consumptive, as it has the property of sweetening acrid humours. They show a tendency to ferment, and produce diarrhoea; but this may be prevented by the addition of vinegar and pepper, which also counteracts their natural coldness. Prepared with oil, vinegar, salt, and pepper, they are insupportable to some weak stomachs, and occasion frequent eructations and flatulency; but, properly pickled, they are an excellent antiseptic, though unfit to be given to children and wet-nurses.

The nature of *Melons* is nearly similar to that of Cucumbers; but the former are more aromatic, and, in this respect, more wholesome. *Water-melons*, however, require more spice and wine than *Musk-melons*, as they partake still more of the nature of Cucumbers.

Gourds are a fruit of the melon-kind, but less sweet, and of a much larger size: if boiled in milk, after the first water has been poured off, and with the addition of salt and pepper, they afford sufficiently wholesome and nutritive food.

Olives, in their natural state, are bitter, acrid, and exceedingly disagreeable; though their taste is much improved when pickled, as we receive them from abroad, particularly in the smaller kind, or Lucca olives.—On account of the abundance of oil which they contain, they are unfit for delicate stomachs, and are pernicious, especially when eaten for desert, after a heavy dinner.

Almonds, *Walnuts*, *Hazlenuts*, and *Nuts* in general, are extremely difficult of digestion, on account of the oil they contain, which readily turns acrid and rancid on the stomach, and occasions the heart-burn. Bilious individuals should by no means eat them; and there is nothing so absurd as to administer *almond-milk*, as a

common diet-drink, to febrile patients. This milk consists altogether of oily and almost insoluble parts, which heat and vitiate the stomach, stimulate the bile, and are easily decomposed from the water with which they are mixed. It quickly spoils; frequently, indeed, before it is introduced into the stomach: it is not in the least degree cooling, and its nourishing quality is very improperly employed in fevers, and all those diseases which are attended with debility of the alimentary canal.

Nuts and almonds ought to be eaten only while fresh, and when the skin, which is extremely astringent and unwholesome, can be removed. They should be well chewed, and eaten with salt; for every piece swallowed entire is indigestible, and the salt renders them miscible with our fluids as a saponaceous mass. If eaten in large quantities, they remain in the stomach, cannot be expelled by any medicine, and produce alarming and sometimes fatal disorders. In general, they occasion difficult breathing, vomiting, and complaints in the bowels, which have been observed to be very common in those autumns that were productive of great quantities of nuts.

Last among the vegetable productions, we may class the various species of *Mushrooms*. They are all of a tough, leathery consistence; and, being almost indigestible, they afford little nutriment, notwithstanding they, in a great measure, resemble animal food.

Several kinds of mushrooms are said to contain a narcotic and acrimonious poison: and, as those of a harmless kind cannot be easily distinguished from the bad ones, this might be a sufficient reason to abstain from the use of them altogether. But, if they must appear at our tables, vegetable acids, or vinegar, are the best antidotes to counteract their pernicious effects. Pickled with vinegar, or salted, mushrooms become still more tough; and, roasted with butter, they are an indigestible mass, and extremely liable to turn rancid in the stomach.

CHAP. VI.

Of DRINK and SPICES—their respective Nature, Properties, and Effects on the Human Body.

I. *With respect to the Quantity of Drink.*

DRINKING is, perhaps, more necessary to the support of animal life than *eating*; for drink is indispensable to the solution and digestion of food. Those who drink too little, people, for instance, of a sedentary life, and particularly women, are subject to complaints of indigestion. Sufficient drink prevents the incrassation of the blood, and the obstruction of the smaller vessels, it tends to clear the blood of the acrid particles generated in it; and it promotes the necessary secretions, such as the bile and the gastric juice of the stomach.

We ought to drink only when we are thirsty, and to desist when thirst is quenched: but this is seldom the case, because many of our liquors stimulate the palate. Pure water, therefore, is an inestimable beverage, as it will not induce us to drink more than is necessary. We should drink in a greater proportion than we eat; for the quantity of our fluids by far exceeds that of the solids, and, consequently, there must be secreted more fluids than solids. The general rule may be given, to take about double the proportion of liquid to the dry food; but this cannot be accurately observed, nor is it applicable in all cases.

The season, the weather, cold, heat, the nature of our food, and the greater or less degree of our exercise, require more or less drink at one time than at another. Thirst, however, is as good, if not a better guide, than hunger; and he who is accustomed to drink water only, will not easily transgress the measure, if he drink as often as nature calls upon him. With a proper choice of food every one would drink conformably to his wants. Hence it is needless to recommend water as a beverage to per-

sons who will not be persuaded to change their irregular mode of eating.

The more we eat in quantity, and the drier our victuals are, the more we ought to drink. The phlegmatic have less inclination to drink than those of a sanguine and choleric temperament. The laborious ought to drink more than the sedentary, and still more in summer than in winter, to supply the humours lost by insensible perspiration.

In the morning when we rise, we generally feel an inclination for drink, which is gratified by tea, coffee, or other warm liquors. Water would, unquestionably, be a more proper beverage at this time; and, I venture to say, it would be disagreeable to those only whose stomachs are spoiled by the habitual use of warm liquors and hot rolls. A glass of pure fresh water, and, a while after it, a piece of bread, with some fruit, or even butter, would afford a very wholesome breakfast, by which the stomach and intestines might be cleared, the blood and humours refreshed, and the whole body strengthened. If the stomach be not loaded with mucus, or relaxed by tippling, a basin of sweet cow's milk, with a piece of stale bread, is an excellent breakfast in Spring and Summer.

To drink immediately before a meal is improper, because the stomach is thereby swelled, and rendered less fit for the digestion of food. Hence, to avoid the necessity of drinking, it is advisable not to take any violent exercise immediately before dinner. To drink much at night, previous to our going to bed, is likewise hurtful. But the drinking before a meal is more noxious than at any other time, because the stomach is filled with the liquid we swallow, the bile and the gastric juice there collected are too much diluted, and, consequently, the important office of digestion is checked.

It is also objectionable to drink much during the time of taking food, as the stomach is thus rendered incapable of receiving the due portion of aliment. Cold beer or water does not well agree with warm victuals; and the teeth are injured by taking hot and cold substances in

immediate succession. In the hot weather of Summer, it is scarcely possible to delay drinking till the dinner be finished; and it is the more necessary, or rather less hurtful, at this time, as the bile, which serves to dissolve the victuals, then requires greater dilution. In Winter, unless we eat very dry and salted provisions, we feel less inclined to drink at table. But, if we must drink in the intervals of eating, it would be most conducive to digestion to drink water only, and in small quantities; as pure water is more proper during the time of eating, because it agrees with all dishes without exception. Yet a glass or two of wine, during dinner, particularly for the aged and debilitated, is proper and conducive to digestion.

Some observers advise us never to drink without eating something; but he who drinks only when Nature requires it, has no occasion to eat every time he drinks. Persons, on the contrary, who are once accustomed to drink more than is necessary, or to make use of hot, stimulating, and intoxicating liquors, would do well always to eat some bread or other solid food along with them. Indeed, we ought to begin to drink only after our appetite for food is satisfied, and then it should be done gradually during digestion. This function may be disturbed by large draughts of liquor, which occasion fermentation and flatulency.—Glass is the most proper substance for drinking-vessels; for no other but the fluoric acid will affect it.—For the sake of delicacy, as well as health, every person at table ought to be furnished with a separate glass or other vessel for his drink.

Excessive drink loads and oppresses the stomach, by distending it too much; but it is not nearly so hurtful as too much food. Every beverage relaxes the stomach; and persons whose bowels are not sufficiently elastic, should be careful in the quantity they drink; for an immoderate proportion of it may weaken digestion, dilute the fluids too much, and conduct the food too quickly through the alimentary canal. An undue portion of drink renders the mass of blood too thin and watery;

from a thin blood arises also a weak alimentary fluid, consequently a general debility of the body, and relaxation of the urinary and other passages.

On the other hand, too little drink is equally improper; digestion is weakened; many parts of victuals remain undissolved, and are not conducted to the lacteals, because the proper means of diluting them are wanting; the blood becomes thick and viscid; and, finally, the secretions and excretions are not duly performed, because the different canals are too dry and contracted.

II. *With respect to the Quality of Drink.*

There is almost as great a diversity among the kinds of beverage as there is among those of food: water itself is of very different qualities, according to the particles with which it is impregnated, and the places from which it is obtained. That of wells, springs, rivers, lakes, swamps, and the various mineral waters, all differ in their sensible properties. Even cold and warm water produce different effects. The former, when moderately used, strengthens the stomach, and only proves debilitating when it is drunk in too large quantities. Warm water is always relaxing, and still more so when taken in copious draughts: it remains longer in the stomach than cold water, and, consequently, is more oppressive. Cold liquor stimulates the stomach, but warm drink diminishes its elasticity.

If the stomach be overfilled with drink, and its elasticity weakened, a glass of strong wine, or other spirituous liquor, may remedy this inconvenience.—Water can only so far be called nourishing, as it supplies the aqueous parts we continually lose. It is the basis of all other liquids, and the greater proportion of water they contain, the better is digestion promoted.

Spring-water originates partly from that of the sea, which has been changed into vapours by subterraneous heat, and partly from the atmosphere. As it is dissolved, purified, and filtered in a variety of ways, before it be-

comes visible to us, it is lighter and purer than other waters.

Well-water is more or less pure, according as it passes over beds of earth which contain soluble or minute particles. Wells, opened in a sandy soil, are the purest, because the water is there most completely filtered. The more frequently a well is used, the better is its water, provided that no impure substances are introduced into it; for the longer water stands unmoved, the sooner it turns putrid. Well-water, finally, may be most effectually purified by filtering it through a quantity of sand and small pebbles; and still more conveniently by means of filtering stones.*

River-water is more pure and wholesome, if it flow over a sandy and stony soil, than if it pass over muddy beds, or through towns, villages and forests, from which it receives many impure substances: water is rendered foul by fish, amphibious animals, and plants. Lastly, the more rapid the course of the river, the more easily it clears itself of feculent particles, and the water becomes pure.

Lake-water much resembles river-water in its properties; but, being less agitated, it is more impure, and better adapted to washing than cooking.

The water which, in cases of necessity, is obtained from *swamps* or *ditches*, is the worst of all; because a great variety of impurities are there collected, which, in a stagnant water and a soft soil, readily putrefy. And, as the mere exhalations of such waters produce a pestilential atmosphere, it may be easily conceived, that the use of them must be attended with putrid and other dangerous diseases.

Rain-water is also impure, as it contains many saline and oily particles, soon putrefies, and principally consists of the joint exhalations of animals, vegetables, and minerals, of an immense number and variety of small in-

* The filtering machines lately invented by Mr. JOSIAH COLLIER, of London, promise to be very useful for domestic purposes, as they are applicable to all fluids, but more particularly water.

lects and their eggs, feeds of plants, and the like. Rain-water is particularly impure in places filled with many noxious vapours, such as marshy countries, and large manufacturing towns, where the fumes of metallic and other substances are mixed with the rain. In high and elevated situations, at a distance from impure exhalations, if no strong winds blow, and after a gentle shower, rain-water is then purest; because the vapours of the atmosphere have already subsided. In Summer, however, on account of the copious exhalations, rain-water is most objectionable.

Snow-water possesses the same properties as rain-water, but is purer: both are soft, that is, without so many mineral and earthy particles as spring, well, and river-waters. *Hail-water*, being produced in the higher regions of the atmosphere, is still purer from its congelation, a state in which it cannot easily partake of impurities. Lastly, *Dew*, as it arises from the evaporation of various bodies of the vegetable and animal kingdoms, is more or less impure, according to the different regions and seasons.

As the health of man principally depends on the purity and salubrity of the water he uses, we ought, where necessary, to deprive it of its pernicious qualities; and this can be done by boiling, and filtering, but most effectually by distillation. The putrid substances in the water, may be corrected by the addition of an acid. Thus, half an ounce of alum, in powder, will make twelve gallons of corrupted water, pure and transparent in two hours, without imparting a sensible degree of astringency. By the addition of a very small quantity of quick-lime, water may be preserved from corruption in long voyages: or, to prevent water from putrescence at sea, add a small quantity of alkali and vitriolic acid to every cask, which will preserve it pure and wholesome for a twelvemonth. Charcoal-powder has also been found to be excellently adapted to check the putrid tendency of water, and, for this reason, the staves of the casks, used on shipboard, ought to be well burnt in the inside, to keep the water

from corruption. Vinegar, or other strong acids, are also well calculated to correct putrid water; and may be either mixed with it, or drunk immediately after, to prevent its bad effects.

Wine, that salutiferous liquor to the infirm and the aged, may be divided into *five* principal classes:

1st, The *sweet wines*, for instance, those of Hungary, Spain, Italy, Greece; the Malaga, Malmsey, Madeira, and Cape wines. If these be genuine; if they have not been adulterated, by the addition of sugar or honey, &c. and if they have been properly fermented, they afford a true medicine to the weak and convalescent.

2d, The *weakly acidulated wines*, such as old Rhenish, Champaign, those of the Mosel, of the Neckar, Franconia, and Austria; of these, the Rhenish, Mosel, and Champaign wines are the best.

3d, The *acid and tart wines*, among which are most of the wines of Franconia, Thuringia, Saxony, Silesia, and some parts of Brandenburg. These wines, in general, are apt to occasion head-aches, complaints of the stomach, and are, besides, of an unpleasant taste.

4th, The *acidulated sweet wines*, particularly those of France, as the common white wine and claret, are wholesome, provided that they be neither too old, nor too new; and,

5th, The *sharp and astringent wines*, such as Port wine, Burgundy, the dry or hard kinds of Madeira, Sherry, and the like, which, on account of their heating and binding nature, ought to be used chiefly for medicinal purposes.

There are a great variety of fruit-wines, which are fermented like wines from the grape; for instance, the currant and raisin-wines: but the artificial wines of this country are, in general, liable to many strong objections. Among our home-made wines may be reckoned Cyder and Perry, which are properly wines of Apples and Pears. Cyder and Perry are, it is said, generally fermented and kept in leaden vessels, or, at least, the Apples and Pears are passed through leaden tubes; and

the lead, being readily dissolved by the acid, is gradually introduced into the body, which produces painful and dangerous colics, and frequently gives rise to the most desperate and incurable obstipations, among those habituated to the free use of these liquors.

With respect to the constituent parts of wine, I shall only remark, that every kind consists of three principal ingredients, *water*, *alcohol*, or pure spirit, and *sugar*. If these three substances could be so intimately combined as they are in wines, and if, afterwards, the proper aromatics were added, to impart to them the particular flavour, there is no doubt but we could perfectly imitate every wine whatever. But the greatest obstacle to this speculation is, the length of time which wines require to arrive at a proper state of maturity, and which, in made wines, ought to be still farther prolonged.

The more water wine contains, it is the more suitable a beverage at table, and, when weak, it is, in some degree, calculated to quench thirst. Strong wines, on the contrary, excite thirst, as they are drying, and affect the organs of secretion. As every kind of wine contains a greater or less quantity of acid, it is an excellent antiseptic remedy, and, hence, it is given copiously in putrid ulcers and malignant fevers. When moderately used, it increases the circulation of the fluids, and dilates the blood-vessels; promotes both the secretions and excretions, and invigorates all the functions of the body. Every motion is performed with greater vivacity, as is obvious from the additional lustre of the eyes. But the strength and vigour which wine imparts, is of no longer duration than while it remains in the stomach, before it enters into the mass of the blood, and while the stimulus, received by the nerves of the stomach, is propagated to the brain. This explains the cause why strong liquors are so intoxicating, when drunk upon an empty stomach.

That wine operates on and through the stomach, is clear from experience; for an emetic, taken immediately

after it, will soon make a drunken man sober. But, if its spirituous parts be communicated to the blood, so as to occasion fluctuations, the body becomes disordered, weak, and relaxed. It is only a stimulant, and not a permanently strengthening cordial; for most wine-drinkers, who indulge in excess, die of relaxation and debility. There may, however, be cases in which an occasional excess of this kind will be salutary; for instance, to a person who has been long sitting at study, or whose mind is depressed, and whose fluids are nearly stagnating: as passions sometimes conduce to animate the mind, and tempests to purify the atmosphere.

The *state of intoxication* is, in every respect, similar to that of incipient apoplexy or palsy.—Drunken men stagger; their tongue loses its power of speech; they stammer, and see things double and moving circularly. The mind is equally affected, and imbecility is the concomitant effect. All these partial palsies arise from the pressure of the blood-vessels on the brain, which are then surcharged with blood. If the intoxication has arrived at its utmost height, there is no longer any difference between this and the true apoplexy; all the organs are paralysed, except the heart, which continues its action, and breathing is not suppressed. The imprudent sufferer is deprived of sensation; and, if one of the smaller blood-vessels, that press on the brain with an unusual weight, should accidentally burst, he is in danger of instant death. But still more frequently does one of the pulmonary vessels burst, and occasion spitting of blood.

In drinking, also, much depends on the bodily constitution and other circumstances. Thus, persons are soonest intoxicated in a cold place, where perspiration is checked, and when the blood is moving from the external to the internal parts. The same is the case on an empty stomach; but this may be prevented by eating a little at intervals, especially fat or oily substances. Individuals of much sensibility and irritability, and per-

sons after having taken violent exercise, are more liable to become intoxicated than those of a calm and a phlegmatic temperament.

For these reasons, a person much inebriated ought to be carried, without delay, into a temperate room, and placed in a bed, between the blankets, with his head raised, in order to promote the circulation of the blood from the head and the internal organs towards the surface of the body and the lower extremities. All close bandages of the shirt and garters must be loosed, and the feet should be bathed in lukewarm water, not exceeding the ninety-eighth degree of Fahrenheit. Plenty of tea or other diluent drink ought to be given, and a gentle emetic is frequently of great service.

After a good sleep, which has overcome the intoxication, the whole body feels weak and tremulous; and the stomach disordered. In this state, persons are generally troubled with much acid in the digestive organ, which may be removed by the absorbent earths, such as magnesia; after which, some sedative and strengthening remedies may be given, such as hot red-wine negus, warm ale with ginger, strong coffee, and the like.

The copious use of wine, though not to a degree of inebriation, is yet exceedingly debilitating to the stomach; as it checks digestion, and excites diarrhœa, if white-wine, and obstructions, if Port-wine be the favourite liquor; it makes the fibres dry and rigid; and the cheeks, and the whole surface of the body, turn fallow, a symptom of bad digestion; the powers of the body and mind are enfeebled, and dropsy or gout, and sometimes sudden death, are the consequences. Plethoric young men, and such as have weak stomachs and lungs, should not accustom themselves to the use of wine. To give it to infants or youth, is a practice highly pernicious, except in very small quantities indeed. In short, wine should be used as a medicine only, if intended to produce salutary effects. To the phlegmatic, to the aged, and to those who are disposed

to flatulency, and after fat meat, it is highly beneficial, if used with prudence and moderation.

As wine encourages perspiration, it dries the body, makes it lean, and may, therefore, be of service to cold and phlegmatic constitutions. It stimulates the bile, and excites the appetite to a repetition of excess, so that persons once habituated to drinking can but gradually relinquish this seductive practice. To drink wine copiously every day, is as improper and pernicious as to take medicines by way of diet: nothing is so much calculated to occasion habitual indigestion. And as wines are frequently adulterated with sugar of lead, and other poisonous ingredients, to render them more agreeable to the palate, I propose to bestow some attention on this important subject, in order to enable the reader to detect such pernicious mixtures, which may expose his health, and even life itself, to the greatest danger.

Some of the adulterations of wine are rather harmless, others extremely dangerous. The common red-wines are frequently made of new, tart, and half-spoiled white wines, by tinging them with red sumach, or other woods and berries. In order to make wines stronger and more pungent, a variety of spices are employed, such as galangal, cardamom, mace, and the like; or an unfermented must, wort, or the mash for distilling spirits, are occasionally added, and allowed to ferment together with impure wines. To impart to wine the flavour of muscadell, the leaves of the *Horminium*, a species of Sage, (*Salvia Horminium*, L.) are often used; though it be a plant of a strong stupifying smell, and very pernicious effects.

All adulterated wines, and what we call British wines, if drunk in any quantity, are more or less detrimental to health. For, even by the most innocent mode of preparing them in large quantities, the manufacturers are induced to season them with spices of a heating and stimulating nature. But the most deleterious of all adulterations of wine, is that with the various prepara-

tions of lead, to give it a sweet taste. This infamous practice was carried on, some years ago, in Paris, to such an extent, that the Excise-Office could not account for the prodigious increase of Vinegar entered at the city-gates. But it was at length discovered, that this vinegar consisted only of tart and adulterated wines, imported under the pretended character of vinegar, in order to avoid the high duty imposed upon wines, on their entrance into Paris: and sugar of lead, joined to some absorbent earths, was employed to change these vinegars into sweet wines, which destroyed the lives of many thousand persons. This secret, of the utmost importance to health and life, was confessed by a rich old wine-merchant, on his death-bed, to relieve, in some degree, his tortured conscience.

Such adulterated wines operate like slow poisons; they first occasion head-ache, contraction of the throat, pain of the stomach, uneasiness, cough, difficulty of breathing; afterwards colics, and particularly the dry belly-ache, with continual obstipations, and, at length, palsy, convulsions, consumption, and death.—The brass cocks also, which are, by some dealers, used to draw off wine or cyder, are of the most dangerous tendency; as they easily yield and mix their verdigrise with the liquor.

To detect adulterated wines, we must attend to the following particulars: every white, or straw-coloured wine, of a sweetish taste, afterwards astringent, and, at the same time new; every wine that has an unusually high colour, not in proportion to its strength and age, or, if it has the flavour of brandy, penetrates the tongue, or, lastly, if it has an uncommonly strong flavour, may be justly suspected of adulteration.—Red wines, either of a very deep, or a very faint colour; of a woody or tart taste; and those which cover the inside of the glass, as well as the bottom of the bottles, with a red sediment, are generally tinged with some colouring substances. If such a wine be passed through filtering paper, the colouring particles will remain behind.

By the following method we may easily discover whe-

ther wines be adulterated, or tinged, with burnt sugar, raisins, whortle-berries, and the like. A small phial must be filled with the suspected wine; the opening is stopped with the finger, and the phial, being inverted, is plunged into a tumbler of water: the finger being withdrawn from the mouth of the phial, if the wine be adulterated, the substance with which this is done, will visibly escape from the phial, and mix with the water: in so far, at least, as the addition is heavier than water, which is generally the case.

These adulterations, however, are of little detriment to health, if they contain no *metallic* particles. In order to discover these, we are possessed of an excellent chemical test, contrived by Prof. HAHNEMANN, in Germany, and known by the name of *Liquor vini probatorius*. It is prepared as follows: One drachm of the dry liver of sulphur, and two drachms of cream of tartar, are shaken in two ounces of distilled water, till it be completely saturated with hepatic air: the liquor is then filtered through blotting paper, and kept in a close-stopped phial. From sixteen to twenty drops of this liquid are dropped into a small glass, filled with wine that is suspected to have been adulterated. If the wine turn only thick, with white clouds, and deposit only a white sediment, we may be certain that it contains no metallic ingredients whatever; but if it turn black, or even muddy, if its colour approach to that of a dark red, if it have first a sweet, and then an astringent taste, it is certainly impregnated with sugar of lead, or some other preparation of that metal, equally destructive. If, however, the dark colour be of a blue cast, not unlike that of pale ink, we may suspect the wine to contain iron in its composition. Lastly, if the wine be impregnated with copper or verdigrise, it will deposit a sediment of a blackish grey colour. This experiment ought to be made with a fresh-prepared test, and in the open air.

It farther merits attention, that white wines are very frequently coloured with burnt sugar and other vegetable bodies; they acquire a darker colour by being kept

in oak casks, or by containing much tartar; and in all these cases they will be made somewhat darker by the test above described; but the sediment will not be of an uniform colour, and will consist only of some brown streaks.—It is well known, that all white wines must be impregnated with a small quantity of sulphur, in order to preserve them: if this be done in moderation, it is not detrimental to health; but if too great a proportion of sulphur be used, such wine occasions great heat and thirst, it soon intoxicates, produces eruptions of the skin and face, head-ache, trembling of the limbs, and palpitation of the heart, hæmorrhoidal complaints, gout, and a variety of nervous symptoms. Nothing is so easily discovered as sulphur; for by putting a piece of silver, or even the shell of an egg, into an over-sulphurated wine, it will instantly turn black.

Wines are sometimes adulterated by mixing quick-lime with them, in order to produce a beautiful ruby-colour. If such a wine be poured into a tumbler, and allowed to stand for a day or two, a thin crust or pelticle will be formed on the top, by which the lime held in solution will be detected. It is affirmed, that such wines, if used for any length of time, bring on gouty and gravelly complaints.

The most innocent adulteration of wine, and, perhaps, the most frequent, is that with water. If a small quantity of wine be poured on quick-lime, and if the lime be slackened by it, the wine then certainly contains water. But if the lime continues whole, the wine is pure and unmixed.

Ardent Spirits comprise all those liquors obtained by fermenting vegetable, and particularly farinaceous, substances to a certain degree, and afterwards subjecting them to distillation. All distilled liquors consist of a great proportion of alcohol or pure spirit, a greater or less quantity of water, and generally of a very small proportion of an empyreumatic oil, especially if distilled once only, or if this process be carried on too quickly. Pure spirits are perfectly free from this oil, which, from

its burnt and acrid nature, is altogether indigestible. Proof spirits ought to consist of 55 parts of alcohol, and 45 of distilled water, in 100: but rectified spirits of wine ought to have only 5 parts of water in the hundred: the specific gravity of the former being as 930, and that of the latter as 835, to 1000.

The intoxicating effects of spirits are but too well known; if they be distilled over peppermint, balm, anise-seed, or carraway, their strength is not much increased, but if over cinnamon, cloves, mace, or other hot spices, they are rendered still more heating and pernicious to health.

If drunk in hot weather, or after violent perspiration, they check this function, by contracting the vessels of the skin, and closing the pores. On account of this contracting power, they are sometimes of service to a person whose stomach is overloaded with beer or water, to assist their passage through the proper emunctories. After violent exercise and heat, a dram of spirits is more proper than cold water or beer, though a cup of tea or other diluent drink is preferable. After fat or strong food, spirits are exceedingly improper: for, instead of promoting the solution and digestion of food in the stomach, they rather tend to retard it. We may be convinced of this, by attending to the effects they produce on inanimate substances: for these are preserved from dissolution and putrefaction more effectually in spirits than in any other liquid. Thus we may learn, that spirits will impede digestion, and render strong food, taken into the stomach, still more indigestible. Many persons are accustomed to take a dram as a remedy against flatulency: if the stomach be clean and undepraved, they certainly will be relieved by it; but, on the contrary case, their expectations will be disappointed.

Ardent spirits are rendered still more contracting and prejudicial to the stomach, when combined with acids, as in punch; and, for the same reason, the habit of taking drams after fruit, or any acid vegetable, is ab-

furd. Notwithstanding the frequent abuse of spirits, they afford one of the most excellent antiseptics; but, if the human body be already replete with vitiated humours, and troubled with frequent eructations, it is too late to cure it with gin or brandy. These liquors, however, are of considerable service in preventing the bad effects of a moist and cold atmosphere, of pestilential vapours, of very unclean occupations, of a damp military camp, and, occasionally too, of a temporary abstinence from food.

To persons of relaxed fibres, distilled liquors may, under certain limitations, be useful, as they increase the elasticity and compactness of the vessels. But, to those, whose fibres are already rigid, spirits are obviously pernicious, and have a tendency to bring on a premature old age. They stop the growth of, and are otherwise very improper for young persons.

That spirituous liquors incrassate and coagulate the fluids, we may easily discover in those who are addicted to the use of them: they have a thick blood, are troubled with constant obstructions of the intestines, and their unavoidable consequences, such as a gradual depravation of the nervous system, loss of memory, debility of mind, hypochondriasis, jaundice, dropsy, and, at length, consumption of the lungs. The throat and stomach of habitual tipplers are rendered callous, and, at length, almost closed; the glands are indurated, and, consequently, digestion is, in the highest degree, impaired.

Beer, considered according to its ingredients, consists of water, malt, and hops;* and, in proportion to the quantity, quality, and manner of compounding

* Besides these ingredients, Brewers are apt to add a number of other substances, some of which are extremely noxious, and all prohibited by law. These are, *Cocculus Indus*, Coriander Seeds, Alum, Liquorice and Liquorice Root, burnt Sugar, Treacle, Capsicum, Ginger, Copperas, &c. &c.—An useful pamphlet has lately been published, called, "*Every Man his own Brewer*," detailing this manufacture, and, at the same time, showing, practically, how any private family, or even lodgers, may make Porter and Ale, in the smallest quantities, at less than half the expense at which these articles are vended.

them, it has received different names, and is possessed of various degrees of salubrity. The more water there is used in brewing beer, it is the better calculated to quench thirst; but less so, if it contain a great proportion of the mucilaginous and saccharine principles of the grain. Strong beer, therefore, is very nourishing, and may be employed with advantage as a medicine in emaciated habits.

The greater or less addition of hops to the malt, furnishes us with bitter or sweet beer. The former kind is preferable as a medicine; the latter is more used as a common beverage; but it is apt to excite flatulency and diarrhœa. Hops, like other bitter substances, preserve beer in its vinous state, strengthen the stomach, and dissolve viscid phlegm. Beer made of a great proportion of hops, and a small quantity of malt, is a good beverage, and well calculated to allay thirst.

There are great varieties in beer, according to the degrees of fermentation; some kinds, such as those made of oats, in some parts of Germany, which are scarcely allowed to ferment at all, are very cooling in Summer, but soon spoil; others are only half fermented, such as the Dantzig spruce or black beer; others again, to a sufficient degree, like our porter and ale; and, lastly, some which are more than sufficiently fermented, such as Burton ale, and most of the strong home-brewed ales. All these are different in their effects, according to the various degrees of fermentation.

Every kind of beer is inclined to ferment, on account of its constituent parts. If it be not properly fermented, this takes place in the stomach; the fixed air, being disengaged within the body, distends the stomach and bowels, and occasions flatulency and looseness. However, when drunk in small quantities, it is not attended with any great inconvenience, particularly in Summer, or in hot climates. It is used with great advantage at sea, against that great enemy of the mariner, the scurvy. Those persons who have corrupted gums, that are painful and bleed on the least touch, ought to drink half a

pint of wort, or unfermented beer, every morning and evening, keeping this liquor for a good while in their mouth, and they may promise themselves great benefit from this simple remedy.

Many consider beer or porter as excellent when it foams much, and makes a head, as it is called, on the top of the vessel; which is drunk by some tipplers with avidity before it disappears. But this froth is not a proof of its excellence, but rather of its imperfect fermentation, which is continued and completed in the stomach. It is likewise often artificially increased, by the addition of improper ingredients. The volatile vapour or gas disengaged from such beer in the stomach and bowels, produces a quantity of stimulating and contracting air, by which the alimentary canal is almost at the same time expanded and contracted, so that the most dangerous spasms and colics may thence arise. Such beer likewise emits a quantity of sulphurous vapours; and, for this reason, it is dangerous to go into cellars where it is kept in a state of fermentation. A candle will often be extinguished by the vapour of these cellars, which is sometimes so noxious as to suffocate persons on their entrance.

If bottles filled with beer, ale, or porter, are not soon enough corked, it turns flat or sour, acquires an unpleasant taste, and produces flatulency, colics, and spasms. If bottled and corked in proper time, the gas which it contains is not dissipated, its agreeably pungent taste is preserved, and it is then a very excellent and nourishing liquor, which allays thirst, and does not affect digestion like wine.—A person who has a good appetite, and takes nourishing food, requires no beer for its digestion; and, by drinking it, he is exposed to plethora, or a full habit, and all its concomitant complaints. Those, on the contrary, who take a great proportion of vegetable food, and have a weak stomach, will find a strong and bitter beer salutary.

As every new sort of beer is not equally grateful to the stomach, we should do well to desist from using

that kind to which we cannot habituate ourselves in the course of two or three weeks. On account of the great variety of this liquor we meet with in travelling, it is much better to drink no beer at all on journies, and instead of it, to use lemonade in hot weather, and wine or spirits, mixed with water, when we travel in a damp and cold season.

Beer, in general, is nourishing, and has a tendency to fatten such individuals as are of dry and rigid fibres, and whose bile is good. Hence, the inhabitants of countries in which beer is the principal beverage are commonly more phlegmatic and indolent than those of wine countries. Many sorts of beer, however, in which a greater than usual proportion of grain is used, contain much spirit, and are of a heating and inebriating nature. Such is, for instance, our Burton and several other ales, and all the strong kinds of foreign beer.

Light and well-fermented beer is a wholesome, and, at the same time, diluent species of nourishment. With persons already plethoric, or disposed to become corpulent, the lightest beer generally agrees best. Thick and nourishing beer is of service to wet nurses and the debilitated. Sweet beers are only nourishing, but the bitter kinds are strengthening also. The latter are beneficial in a weak state of digestion, and to people troubled with acid in the stomach; yet sweet beer is more wholesome for daily use, and, at the same time, less exposed to dangerous adulterations. In short, beer is not a proper beverage for people of a thick, black-bilious blood, and with a disposition to melancholy: it is the most useful species of drink to the weak, the lean, and the laborious; provided they are not very subject to flatulency, nor troubled with diseases of the breast. In both of these cases I have found it uniformly to disagree, and to be much inferior in salubrity to water.

A moderate use of fermented or distilled spirituous liquors, is far less prejudicial to the constitution than the habitual and excessive drinking of warm liquors. *Tea*, the common favourite among all ranks, if taken

regularly twice a-day and in large quantities, is attended with bad consequences. It thoroughly relaxes the coats of the stomach, weakens the bowels, predisposes them to flatulency upon the least occasion, and destroys all the energy of the digestive organ. These effects, however, are not so frequent, nor, indeed, to that extent, if the tea be drunk strong, sufficiently diluted with milk, and sweetened with sugar: it is chiefly the warm water which renders the tea of the common people so destructive to the constitution, as they generally make up for the indifferent quality of the tea by the quantity of water.

The tea-tree, which has employed the pens of so many eminent writers, still deserves some attention, as the nature and properties of it are but imperfectly understood. It certainly is an aromatic, slightly astringent, and somewhat narcotic plant. Whether it possesses any diuretic, diaphoretic, or other virtues, for which it has been celebrated, is rather doubtful, as these may be, in part, owing to the great quantities of warm water with which the infusions of it are made. Good tea, particularly the black sort, made strong, and used in a moderate quantity, is antispasmodic and refreshing. It is, therefore, calculated to relieve the cramp of the stomach, and pains of the abdomen, if they proceed from flatulency. But, according to circumstances, it may even increase spasmodic contractions; for instance, if they arise from a vitiated bile, from worms, or from hysteric and gouty complaints; in either of which cases, tea will most certainly not relieve, but rather prolong the spasmodic contraction of the vessels. The relaxation which tea occasions in the first passages, renders it peculiarly hurtful to females of lax fibres, a thin blood, and irritable habits. To enumerate the great diversity of nervous symptoms, attending its abuse in such constitutions, would lead me too far from the prescribed limits; but so much is certain, that the vapours arising from liquors, drunk very hot, like tea, weaken the lungs, and dispose their vota-

ries to frequent colds and catarrhs, which readily make a transition into consumptions.

Individuals of a rigid and solid fibre, of a dry and firm body, may be allowed to drink tea in moderation, as it will not easily hurt them. By adding a table-spoonful of old Rhenish wine or ardent spirits, to every cup of tea, it may be so far improved as to make it less flatulent; but the frequent repetition of it, even in this form, must be detrimental to the body. A moderate use of tea may sometimes be of service to persons in a perfect state of health; yet, for daily use, it cannot be recommended. It, doubtless, occasions a gentle stimulus, and rouses the mind for a short time; hence it is, perhaps, the best and safest refreshment after violent heat and fatigue of the body; hence, as the means of increasing perspiration, tea is an useful beverage to travellers in cold weather, when insensible perspiration is liable to be checked.

Hypochondriac and hysteric people, however, are much deceived in the efficacy of tea, as a diluent drink; for all the evils arising from relaxation, a weak stomach, and flatulency, under which such persons usually labour, are, by the habit of drinking tea, increased to the most alarming degree. The *cold* stomach, which they propose to *warm* by it, is a mere phantom of the brain: for this sensation of cold is nothing but relaxation, which, instead of being removed by *hot* liquors, is increased by every repetition of them.

It would be a great proof of patriotic spirit in this country, if the use of this exotic drug were either altogether abandoned, or, at least, supplied by some indigenous plants of equal flavour, and superior salubrity. The Chinese have good reason to smile at our degenerate taste, when they are informed, that we actually possess an immense variety of the most valuable aromatic plants, much better calculated by Nature to invigorate our stomachs, and to revive our spirits, than tea, which we purchase from them at a great expense. These sentiments may

be ungrateful to tea dealers, or East-India merchants, but every honest truth should be candidly told to an unbiassed public.

It would undoubtedly be more conducive to our health if we could altogether dispense with the use of warm liquors, at least when in a healthful state. But, if this practice must be indulged in, we ought to choose the herbs growing in our own meadows and gardens, instead of making ourselves tributary to distant nations. With this intention the late Dr. SOLANDER introduced his *Sanative Tea*; not with a view of making it a secret or quack-medicine, under which character it is now sold in this country, but of recommending the use of it to those individuals who require diluent liquors, and to the heavy, sluggish, and phlegmatic. Dr. TISSOT had previously recommended the stalks of cherries, and the leaves of peach and almond trees, to the poor people of Switzerland, as substitutes for tea; but we possess a variety of plants infinitely superior to these, of which I have myself occasionally made trial. I shall divide them into three classes; namely,

1st, The strong, spicy, and balsamic plants, such as balm, peppermint, sage, and the like.

2d, The strongly aromatic flowers, among which those of the *Rosa pimpinellifolia* (or the rose whose leaves resemble those of the Burnet-saxifrage) and the *wood-roof*, or the *Asperula odorata*, L. deserve the first place, and far excel in flavour all the teas imported from China; and, lastly,

3d, The mild aromatic leaves and blossoms of trees and shrubs; for instance, the blossoms of the lime-tree and the black-thorn, the leaves of the peach and almond trees, and particularly the first tender leaves of the *whortle-berries*, or the *Vaccinium Myrtillus*, L. which cannot be distinguished from real tea, when properly gathered, and dried in the shade.

After having pointed out the best substitutes for Indian Tea, I cannot suppress my earnest wish, that even these indigenous vegetables may not be abused by de-

cocting them in too much water, which, when swallowed hot, must be detrimental to the stomach, the lungs, the nerves, and the whole human frame. I cannot better conclude this important article, than by quoting the prophetic words of an experienced physician. "Tea," says he, "will induce a total change of constitution in the people of this country. Indeed it has gone a great way towards effecting that evil already. A debility, and consequent irritability of fibre, are become so common, that not only women, but even men are affected with them. That class of diseases, which, for want of a better name, we call nervous, has made almost a complete conquest of the one sex, and is making hasty strides towards vanquishing the other." And Dr. BUCHAN emphatically concludes: "Did women know the train of diseases induced by debility, and how disagreeable these diseases render them to the other sex, they would shun tea as the most deadly poison. No man can love a woman eaten up with vapours, or washed down with diseases arising from relaxation."

Coffee is a decoction of the well-known bean or berry of that name, roasted and ground into powder. The bitter and astringent powers of the beans, in some measure, correct the bad properties of warm water; but if they be too much roasted, their empyreumatic oil is expelled, and they acquire an insipid taste. If, on the other hand, they be not sufficiently roasted, this burnt oil is not evolved to the surface of the bean, and the coffee acquires a bitter and unpleasant flavour. This beverage is generally considered as strengthening to the stomach. It promotes digestion, dispels flatulency, removes vertigo and torpor, exhilarates the animal spirits, increases the circulation of the blood and insensible perspiration, attenuates viscid humours, is diuretic, and sometimes gently aperient. These properties of Coffee being, in a great measure, confirmed by experience, justly make it a valuable medicine, which is eminently qualified to cure the most troublesome head-aches, provided they originate from the stomach. Coffee, drunk after

dinner, promotes digestion; and agues, diarrhœas, and giddiness, have been frequently removed by it. Its subtle oil stimulates the solids, rarefies the blood, and, consequently, is of peculiar service to females of a sedentary life, and to those who suffer from phlegmatic and catarrhal diseases. If drunk too strong it affects the nerves, and, by its penetrating property, often occasions tremor of the hands and sleeplessness; but, in some phlegmatic and indolent individuals, it is apt to excite sleep.

If coffee be not used merely as a diluent for relaxing the fibres, it ought to be made strong. The best proportion is, one ounce of well-roasted and ground coffee to one pound or one pint of water, which should be just allowed to boil up: for the longer it is boiled, it loses the more of its volatile and aromatic particles, and, consequently, becomes weak and insipid.—As coffee is possessed of excellent antispasmodic virtues, it is a favourite beverage with the hypochondriac and the hysteric; and, according to early observation, it is also the best and most effectual remedy in spasmodic asthma.

The steam of boiled coffee has frequently been beneficial to weak eyes. If drunk in the morning, or immediately after dinner, of a proper strength, and not above one or two small cups, it is a wholesome substitute for tea or spirits, particularly to persons in a good state of health, and to such as are not habitual wine-drinkers, or of a very irritable temperament. Lastly, the coffee of the Levant far excels that imported from the West-Indies, which is frequently steeped in sea-water, in order to make it weigh heavier. This fraudulent practice may be easily detected, by soaking the raw coffee in water, and examining its taste.

An *immoderate* use, however, of this decoction is prejudicial to the healthy, and destructive to the diseased: it debilitates the latter still more, by causing great undulations in the blood, tremor of the limbs, giddiness, and a certain insupportable timidity. It leads people of a sanguine temperament, and particularly females, to the

long train of all the fashionable nervous diseases. It frequently occasions a disagreeable eruption in the face, and brings on many troublesome disorders, occasions bleedings of the nose, and sometimes spitting of blood, induces frequent hæmorrhoids, a hectic cough, and, at last, consumption and death.—If coffee be drunk after dinner, with a view to promote digestion, it requires no milk to dilute it, and render it weaker; but, if it be used for breakfast, some milk or cream is necessary to sheathe or neutralize the empyreumatic oil it contains, which fires the blood, and occasions violent flushings, accompanied with choleric sensations.

All the kinds of mock coffee, made of rye, wheat, peas, dried carrots, beet, the succory-root, and the like, have little resemblance to it, except what they acquire by their burnt taste and empyreumatic oil. A coffee made of acorns is much recommended in asthmatic and spasmodic complaints; but, as it contains an uncommon quantity of oil, which is dangerous and heating to the blood, too much circumspection cannot be employed in the use of it. From my own experience, I recommend to begin with adding about one-eighth, then one-sixth, and gradually a greater part of the burnt acorns to the coffee, till, at length, they may be used in equal quantities.

Chocolate, especially when boiled with milk and eggs, is exceedingly nourishing: but the spices with which it is mixed, such as cinnamon, cloves, musk, vanilla, and the like, make it more heating and less wholesome. Vanilla, which we always find in the Spanish chocolate, is an extremely volatile and pungent aromatic; even its flavour is frequently insupportable to hysteric and hypochondriac persons; it occasions violent head-ache, trembling, giddiness, and other symptoms occurring in these complaints.—The common chocolate, prepared with sugar, eggs, milk, and water, is the most nutritive and wholesome; but a too frequent and immoderate use of it is always hurtful, particularly to the individuals before alluded to, as the cacao is too fat and indigestible

to them, and creates a false or forced appetite. *Cacao*, of itself, is less heating and lighter than if made into chocolate, but it is not so nourishing. The immoderate use of this oily beverage is apt to induce a febrile state in young people, and to supply the sedentary with superfluous nourishment; while it frequently brings on, like coffee, a state of irritability and uneasiness. To the corpulent and weak it is improper; and if they be immoderate eaters, it induces inflammatory diseases and apoplexies. It also disagrees with persons much employed in mental pursuits; and those who imagine that it will supply their losses, sustained by nocturnal debaucheries of whatever kind, will find themselves disappointed in their hopes: by continually drinking chocolate, and using other nutritive substances, they will, indeed, be stimulated to new irregularities, but, eventually, at the expense of their palsied nerves and their broken frame.—In children threatened with a wasting, or *tabes dorsalis*, as likewise in some kinds of consumption in adults, chocolate, with a sufficient quantity of milk, may be beneficial; but, even in these cases, a strong decoction of roasted oatmeal in milk, with a small addition of chocolate, is much better calculated to effect a cure.

Punch is a well-known beverage, the composition of which requires no description, as it may be made of every kind of spirituous liquor, diluted with water, acid, and sugar. If a proper quantity of acid be used, it is an excellent antiseptic, and well calculated to supply the place of wine, in resisting putrefaction, especially if drunk cold with plenty of sugar: it also promotes perspiration; but, if drunk hot and immoderately, it creates acidity in the stomach, weakens the nerves, and gives rise to complaints of the breast. After a heavy meal, it is improper, as it may check digestion, and injure the stomach.

Negus is one of the most innocent and wholesome species of drink, especially if Seville oranges be added to red port wine, instead of lemons; and drunk moderately,

it possesses considerable virtues in strengthening the stomach; but, on account of the volatile and heating oil in the orange-peel, negus, if taken in great quantities, is more stimulant and drying than pure wine. Persons, troubled with the hæmorrhoids, and diseases of the breast, should not indulge themselves in this, nor the preceding species of drink.

I cannot conclude this section, without mentioning vinegar and oil, two substances which partly belong to the department of drink, and partly to that of spices.

Vingar is an excellent preservative of animal substances from putrefaction, especially in a warm temperature; and I cannot but regret, that this invaluable liquor is too little used in our kitchens, as well as at our tables. It promotes digestion, and is, perhaps, never communicated to the blood in its acid state: hence it is an erroneous notion, that vinegar is detrimental to the secretion and quality of the milk in wet-nurses. In some individuals, however, it is apt to produce a sudorific effect, and even laxity of the bowels, on account of its astringent property; but used with moderation, as an article of seasoning rather than drink, especially in warm weather, and with animal food, it is both savoury and wholesome.* But we ought to be careful to obtain *good* vinegar; for various kinds of it, which are made of floes, the husks of nuts, and other strong astringents, certainly are pernicious to health. The best and most palatable vinegar is that obtained from white wines, raisins, and sugar.

Oil is preferable to animal fat, but ought to be fresh, mild, and of a sweetish taste. It seldom or never agrees with weak stomachs; for, in them, even in its mildest state, it easily generates a rancid acrimony, extremely injurious to digestion. It should be eaten with much bread, when used in salads or otherwise, as it requires a powerful and active bile to assimilate it to alimentary

* Individuals subject to habitual costiveness, or those who labour under spasmodic complaints of the bowels, colic, and other concomitant symptoms of flatulency, ought to abstain from the use of vinegar and all vegetable acids.

matter. Olives and almonds yield the greatest quantity of oil; and next to Provence oil, that expressed from walnuts and chesnuts, is the sweetest, and easiest of digestion.

III. *Of Spices.*

Spices, of themselves, are not nourishing, but are used merely to improve the taste and flavour of substances, to prevent flatulency, and to promote digestion. Some spices, being extremely volatile, and occasioning too strong a stimulus, do more harm than good. As they are apt to heat the blood, to increase perspiration, occasionally to affect the head, and to stimulate the nerves, spices, in general, should be used only by persons possessing a strong constitution, or by those of a lax fibre, and cold phlegmatic habit: but individuals naturally lean and dry, as well as the choleric and phlegmatic, ought to be sparing and cautious in the use of heating drugs. The most conducive to health would be the indigenous spices, though some of the foreign kind have now become indispensable in our present mode of living. The most common, and, perhaps, the most useful, are,

I. *Salt.* It corrodes the fibres of plants and animals, disorganizes the connection of parts too firm for the solution of the stomach, dissolves the glutinous particles, and prepares them for being better digested. Provisions of a tough and viscid consistence require much salt; for instance, beef, mutton, fish, pease, beans, fat, &c.* Hence, salt beef and herrings agree so well

* There is little danger of using too much salt with *fresh* victuals, as the only injury arising from excess would be a slight laxity of the bowels.—In order to obtain salt, as pure as possible, and free from the bitter magnesia, which is the great promoter of putrefaction, I take this opportunity of recommending an ingenious and simple process, lately invented by Lord DUNDONALD, one of the most zealous and able cultivators of the useful arts: Dissolve as much common salt in a given quantity of boiling water as it is capable of containing in solution. Take another quantity of salt, not larger than the former, and put it into a glass funnel, or similar vessel of wood or earthen-ware, which ought to be lined with coarse thick linen cloth. While the strong brine is hot, pour it over the

with vegetables, because the abundance of salt in the former seasons the latter. But too copious a use of salted provisions is extremely prejudicial; they weaken the solids, the blood becomes thin, acrid, and disposed to putrescency; and hence arise scurvy in all its stages, eruptions of the skin, consumptions, and other diseases.

2. *Sugar* is at present one of the first necessities of life. It is an unfounded conjecture, that sugar renders the blood thick or viscid; on the contrary, it is possessed of diluent and attenuating properties. But the immoderate use of sugar, especially the moist and coarse sort, may, in a considerable degree, prevent digestion, by consuming the oleaginous part of our fluids, impeding the assimilation of food, and generating mucus and acidity in the alimentary canal.

It has frequently been asserted, that sugar injures the teeth: this, however, is not strictly true; for it is only by its vitiating the stomach, and generating impure blood, that the teeth become sympathetically affected. Hence, persons of weak digestion, those with debilitated nerves, the hypochondriac, hysteric women, and especially children subject to complaints arising from worms, ought to use this luxurious substance sparingly, and only occasionally. If moderately used, it promotes digestion, being a gently solvent and stimulating salt. But, where people take it without moderation, sugar may prevent digestion, not on account of its substance, but by obstructing the assimilation of food, so that it produces slimy and acid matter in the alimentary canal. The acid which sugar contains renders it an excellent remedy against putrescency. The finest sort of

dry salt, of which it will not dissolve a particle, but merely wash away the magnesia and other impurities adhering to its surface; and, by repeating this affusion several times, the washed salt will become tolerably pure. The whole of this process depends on the principle that water can dissolve only a certain quantity of salt, and that the magnesia may be washed away by such a super-saturated solution, while the salt, to which it adheres, remains insoluble. Salt, thus purified, will, doubtless, be more wholesome, and more effectual for all the purposes of salting and pickling provisions; as the magnesia, contained in the common salt, renders double, perhaps triple, the quantity necessary which would be required were it in a pure state, or deprived of the magnesia.

sugar, being free of all impurities, is the best and most wholesome. Yet, in sore throats and other catarrhal affections, I would prefer sugar-candy, or moderately fine loaf-sugar, to that which is double refined, on account of some particles of lime and clay necessarily remaining in the latter, from the manner in which it is prepared.—Other sweet substances, such as honey, cannot, altogether, supply the place of sugar, as they are not possessed of the same properties; but many successful experiments have lately been made with the American maple tree (*Acer saccharinus*), which afford great hopes that we may obtain this valuable and indispensable article, in future times, from that quarter of the globe, in sufficient quantities, and at a reasonable price, when the most flagitious of all trades, that in human flesh, shall have been entirely abolished.*

3. *Honey*, like sugar, contains an acid, but a greater proportion of inflammable particles: it easily ferments, and, therefore, produces flatulency. In some particular habits it is apt to occasion gripes and looseness: as a medicine, it is useful to the asthmatic, to promote the expectoration of tough phlegm; and so far it is a proper detergent and aperient. But, as a part of diet, when immoderately used, it is hurtful to weak stomachs, and ought to be avoided by people who are troubled with a superabundance of bile, and whose humours incline to putrefaction.

4. The different species of *Pepper*, being very heating and stimulating, should be used with precaution. Yet its peculiar warming and stomachic virtues make it an excellent spice, and proper to be used with fat, tough, and smoked meat, with flatulent vegetables, with cucumbers and melons, as well as with fish and other substances difficult of digestion. Pepper ought, for these purposes, to be coarsely ground. If taken in whole grains, it imparts to the stomach only a small part of its virtues, and

* I must, on this occasion, refer the reader to the account I have given of the *beet-root* (p. 253), which promises to become an invaluable, plentiful, and permanent substitute for sugar.

cannot be reduced in digestion. In this form it is an old and effectual domestic remedy of the Germans, against viscidities in the stomach, flatulency, weak digestion, and consequent giddiness. For these purposes, from six to ten pepper-grains should be swallowed in the morning, on an empty stomach. Yet I would not advise this practice to be followed, except to some very vitiated stomachs, which have been accustomed to spices and spirituous liquors, and with whom the pepper may serve as a substitute for drams.

5. *Cubebs*, *Cardamoms*, *Vanilla*, and *Cloves*, are hot, pungent, and, consequently, improper for daily use.—*Cubebs* are much inferior in pungency to pepper.—*Cardamoms* are a warm and grateful aromatic; they do not, like those of the pepper kind, immoderately heat and inflame the bowels; hence they certainly deserve the preference for common use.—*Vanilla** is warming, resolvent, strengthening to the stomach, and a remedy for flatulency. In chocolate, it assists the digestion of the oily substance of the cacao.

Cloves are hot and stimulant aromatics, but were formerly seldom obtained genuine in this country, as the Dutch frequently mixed them with other cloves previously deprived of their essential oil by distillation.—*Mace* and *Nutmeg* are less heating, and, therefore, preferable for common use; but the former is still more so than the latter, which is supposed to possess an astringent virtue, and is employed with that intention in diarrhœas and dysenteries.—*Cinnamon* is, undoubtedly, the most delicate spice, but is seldom obtained pure from the mercenary Dutch, who were accustomed to

* *Vanilla* is the pod of the *Epidendron*, L. growing in Cayenne and some parts of Spanish America. The largest pods are sometimes six inches long, narrow and almost triangular, soft, oleaginous, externally of the appearance of leather, and internally filled with a dark brown pulp, in which we find a great number of small black or brownish red and shining seeds. These have a pungent aromatic and oily taste, and a strongly balsamic odour, much resembling that of the Peruvian balsam. A very small proportion of these seeds, for instance, a grain to an ounce, is sufficient to impart to chocolate the very agreeable flavour which we generally meet with in that imported from Spain and Milan.

send us more cassia than real cinnamon. The *Cassia* bark, though resembling that of cinnamon in taste, is much less heating, and certainly more beneficial for common use than cinnamon, which is better calculated to answer medicinal purposes. The bark of cassia is thicker and coarser; it breaks short and smooth, while the cinnamon breaks fibrous and in splinters.—*Pimento*, or Jamaica pepper, resembles in its smell a mixture of cinnamon, cloves, and nutmeg, whence it has received the name of *all-spice*; it is milder than the East-India pepper, and is an useful addition to broths and stewed dishes, when used, as it ought to be, in whole grains.—*Ginger* is one of the most agreeable and wholesome spices, especially boiled whole in beer, and drunk by people moving in the open air, and in cold weather. But this spice, as employed by the bakers for ginger-bread, does a great deal of mischief, especially to the stomachs of children; though it may occasionally be serviceable to travellers, early in the morning, and on an empty stomach.*

The indigenous, spicy, and balsamic herbs, such as *parsley*, *marjoram*, *thyme*, *sage*, and the like, cannot be too much recommended for culinary use, especially in broths; as they are well calculated, by their aromatic virtues, to assist the digestion of many strong articles of food, which daily cover our tables; and these excellent herbs are not liable to the adulterations with which most of the foreign spices are vitiated.

6. Among all the native spices, there is none, in my opinion, which excels, in medicinal virtues, the common *Caraway*. The seeds of this plant are the mildest and most useful carminative we possess. To people of a weak digestion, troubled with flatulency and colics, they afford the most certain relief, if used in sufficient quantity; for instance, a table-spoonful at a time, early in the morning, and one hour before a meal: or still better, if these seeds are plentifully used in bread, and among

* If the bakers knew what the substance is with which they gild the outside of ginger-bread, to entice children to eat it, I venture to hope they would desist from so pernicious a practice. This gold leaf, or Dutch gold, is actually manufactured of brass or copper, one of the most virulent metallic poisons.

cooked victuals. Yet here I must caution those of a hot and bilious temperament, as likewise individuals liable to obstructions and habitual costiveness, not to use these feeds indiscriminately, and without consulting a professional man.

Caraway-seeds, finely pounded, with a small proportion of ginger and salt, spread upon bread and butter, and eaten every day, especially early in the morning, and at night before going to bed, are successfully used in Germany as a domestic remedy against hysteries, and will doubtless effectually cure the disease, provided it does not arise from improper diet, obstructions of the intestines and other vessels, passion, bile, acrid humours, and the like; in all which cases the caraway and ginger will certainly do more harm than good; as each of these causes must be removed by the apposite means.

If, however, caraway be kept in a pounded state, for the purpose of overcoming the disposition to flatulency and indigestion, it soon turns rancid, and may prove hurtful, on account of the strong oil it contains.—The plant of caraway is one of the early spring-herbs, and makes an excellent addition to salads. The seeds, when distilled with ardent spirits, yield a very heating and pernicious oil, which renders such spirits still more detrimental to health than when they are in a pure state.

CLASSIFICATION

Of the various Species of Food, Drink, and Spices, according to their particular salubrity.

I. FOOD.

Division First.

Alimentary substances containing wholesome fluids.

CLASS I. Articles affording strong nutriment.

ORDER I. Vegeto-farinaceous substances.

Genus i. With soft juicy fibres.

1. *Such as contain a saccharine matter; as the skirret or sugar-root (Sium Sifarum, Linn.) the common carrot, beet, and polypody-root (Polypodium vulgare, L.)*

2. *Sweetish substances affording a tender farina or meal*; as the parsnip, the turnip-rooted cabbage (*Napobrassica*), the colewort (*Caulis rapicius*), viper's grass (*Scorzonera*, L.) the goat's-beard, or falfafy (*Tragopogon pratense*, L.) the Solomon's seal (*Convallaria polygonatum*, L.) parsley-root, asparagus, turnips, and potatoes.

Genus ii. Substances affording flour, or those of a viscous, earthy consistence; viz. every species of grain, as wheat, rye, barley, oats, buck-wheat, millet, maize or India-corn, the chickling-vetch (*Lathyrus tuberosus*, L.) and the like.

ORDER II. Gelatinous animal substances.

Genus i. Of a soft and juicy muscular substance; viz. veal, lamb, young beef, mutton, pork, venison, turtle, hare, rabbits, badgers, domestic fowls, pheasants, partridges, the greater number of land-fowl, oysters, small lobsters, and fresh eggs.

Genus ii. Of a hard and tough consistence; viz. all the animals before mentioned, when old; as well as the bustard, the starling, the woodpecker, the sparrow, the goose, the duck, the lapwing, muscles, snails, crabs, hard boiled eggs, &c.

ORDER III. Fat or butyro-oleaginous substances.

Genus i. Of the sweet kind; viz. cacao, sweet almonds, walnuts, hazle-nuts, water-caltrops, chesnuts, beech-nuts, cashew-nuts (*Anacardia*), pistachio-nuts, wild pine-apples (*Karatas*), milk, and fresh-cheese.

Genus ii. Of the bitterish and tart kind; viz. bitter almonds, acorns, all the seeds of fruit, and olives.

CLASS II. Slightly nutrimental substances.

ORDER I. Those of a viscous and watery consistence, or the vegetable mucilage of which is diluted with much water.

Genus i. Of a sweet taste; viz. melons, and several species of pears and apples; sweet citrons, lemons, oranges, figs, mulberries, raspberries, sweet grapes, cherries, and plums; jujube-berries, dates, &c.

Genus ii. Of a sweetish taste; viz. green pease and beans, white cabbage, cauliflower, spinage, orach, blite or strawberry-spinage, cucumbers, and gourds.

Genus iii. Of a compound sweet and bitter taste; viz. the succory, the rampion (*Phyteuma*, L.) the borage, the saw-wort (*Serratula*, L.) the young shoots of hops, the sow-thistle (*Sonchus*, L.) the hedge-mustard, artichokes, capers, the brooklime, endive, and lettuce.

Genus iv. Of a mildly sweetish and spicy taste; viz. celery, angelica, shepherd's-needle (*Scandix cerefolium*, L.) fennel, and the common balm (*Melissa officinalis*, L.)

Genus v. Of an acrid taste; viz. radishes, turnip-radishes, horse-radishes, tarragon (*Artemisia Dracunculus*, L.) scurvy-grass, and rue.

Genus vi. Of an acid taste; viz. sorrel (*Rumex acetosa*, L.) purslane (*Portulaca*, L.) sour citrons, lemons, limes, cherries, plums, &c.

Genus vii. Of a vinous quality; viz. all sweet apples, particularly rennets, apples of Borstorf, and some few varieties from America; the pineapple (*Ananas*), the honey or paradise-apple, shaddocks or sina-apples, bramble-berries, straw-berries, whortle-berries, gooseberries, currants, grapes, apricots, peaches, and nectarines.

Genus viii. Of a tart and astringent taste; viz. all the wild-growing apples and pears, quinces, cran-berries, red whortle-berries, bar-berries, the green summer and winter pears, sour apples, medlars, the fruit of the dog-rose or hip-tree, and of the service-tree; sloes, or the fruit of the black-thorn; and the green Brazilian plums.

ORDER II. *Those of a gelatinous watery consistence.*

To this order belong all the various species of fish.

Division Second.

Alimentary substances containing unwholesome fluids.

ORDER I. *Those of an acrid nature.*

1. *Coarsely viscous and saline substances; viz.* all salted and smoked animal food, both of quadrupeds and fish.
2. *Putrescent or easily putrescible substances; viz.* the ram, the he-goat, the bull, the otter, water-fowls, the blood of animals, roasted eggs, tainted eggs, and, lastly, all the flesh of wild and tame animals kept too long, to make it more tender and flavoury.
3. *Substances of a furry and leathery appearance, or such as discover a suspicious acrimony; viz.* truffles, morels, and all kinds of mushrooms.

ORDER II. *Those of gross fluids, or a coarse earthy consistence; namely,* the various leguminous feeds, such as dried pease, beans, lentils, and the like.

II. DRINK.

(A) Watery Liquors.

I. *Simple or uncompounded; namely,* all kinds of common water.

II. *Mucous-watery-spirituos.*

1. All *fermented* liquors known by the name of beer or ale.
2. *Spicy-balsamic* liquids; such as the vernal sap of the birch or maple, as well as the artificial preparations of tea, coffee, and chocolate.
3. *Sweetly-acidulated; namely,* lemonade, orgeat, mead, must, cyder, perry, &c.

(B) Spirituous Liquors.

I. *Distilled*; namely, all kinds of ardent spirits, from whatever grain or vegetable substance they may be extracted.

II. *Fermented*; all kinds of wine.

1. *Sweet wines*; those of Hungary, Spain, Italy, Greece, and the Cape; as likewise all wines made of currants, raisins, &c.
2. *Slightly acidulated wines*; among which Champagne, Rhenish wine or old Hock, and that of the Moselle, are the principal.
3. *Acid and tart wines*; to which chiefly belong the wines of Franconia and Saxony.
4. The *acidulated sweet wines*; such are most of the French wines, and particularly Claret; and, lastly,
5. The *sharp and astringent wines*; the chief of which are the wines of Oporto and Burgundy.

III. SPICES.

1. Of the *sweet* kind; such as sugar, honey, manna, and the inspissated sap of the maple and beech trees.
2. Of the *acid* kind; namely, the juice of citrons, lemons, unripe grapes, &c.
3. Of the *saline* kind; namely, common salt, whether obtained in a solid form, as rock-salt, or from the evaporation of the sea and salt-springs. Lastly,
4. Of the *pungent and balsamic* kind; such as garlic, shallot, onions, chives, nutmeg, mace, pepper, pimento, cubebs, vanilla, cardamoms, bay-berries, juniper-berries, ginger, calamus, cloves, cinnamon, saffron, caraway, coriander, fennel, parsley, dill, sage, marjoram, thyme, penny-royal, mugwort, hyssop, peppermint, and rue.

CHAP. VII.

Of EXERCISE and REST;—their occasional advantages and disadvantages explained;—their manner and limits ascertained;—together with directions for the regulation of both.

MOTION, or bodily exercise, is necessary to the preservation of health, which is promoted, while the bounds of moderation are not exceeded. Too violent exercise, or a total want of it, are attended with equal disadvantages. Much also depends on the kind of motion, and the various postures of the body.

The essential advantages of exercise are the following: bodily strength is increased; the circulation of the blood and all other fluids promoted; the necessary secretions and excretions are duly performed; the whole mass of the blood is cleared and refined, so that it cannot stagnate in the minutest capillary vessels; and if any obstruction should begin to take place, it will thus be effectually removed.

That exercise is enjoined by Nature, we may learn from the whole structure of the human body, the number of muscles formed for motion, and the mechanism in the circulation of the blood itself. There are, indeed, no healthier people than those who take strong daily exercise. Man, in a state of health, is instinctively excited to muscular exertion; and children that are perfectly healthy, are constantly running about, and in almost uninterrupted motion.

But if exercise, either by its violence or duration, exceed the proper limits, it naturally quickens both respiration and the circulation of the blood, which may occasion the bursting of small blood-vessels, miscarriages, inflammations, and collections of blood towards certain parts of the body, such as the heart and the brain. The saline acrimony of the fluids is thus more disengaged; the fat is dissolved; and inflammatory fevers, hæmorrhages, and palsies, may be the consequence.

Violent exercise is particularly hurtful to persons unaccustomed to it, or who have committed excesses in drinking, and, what is still worse, in eating more than is necessary: and those whose bodies have not been sufficiently nourished by food and drink, may also be injured by too much exercise.

The sudden transition from a state of rest to violent action, is likewise hurtful, and still more so in hot than in cold weather. After strong emotions of the mind, every species of bodily exercise ought to be avoided, till mental tranquillity return after bodily repose; and we ought to guard against the effects of cold, as it may prove extremely prejudicial in such a state.

With respect to the manner of taking exercise, three principal points are to be attended to:

1. As to the *kind* of exercise,—the various species of which may be aptly divided into *active* and *passive*. The active are of a very diversified nature; *walking, running, leaping, swimming, riding, fencing, the military exercise, different sorts of athletic games*, as well as every other kind that requires muscular exertion.—*Passive* exercise comprises *riding in a carriage, sailing, friction, swinging, &c.*

The more active species of exercise are beneficial to youth, to those of a middle age, to the robust in general, and particularly to the corpulent, the plethoric, and those whose evacuations are not in due proportion to their supplies. The passive kinds of exercise, on the contrary, are better suited to infants, to old, dry, and emaciated persons, to the delicate and debilitated, and especially the asthmatic and consumptive.

2. As to the *time* in which exercise is most proper—this depends on so great a variety of concurrent circumstances, that the rules by which it may be regulated cannot be universal, and must therefore be collected from the preceding observations on the properties and effects of Air, Food, Drink, &c.—Other particulars, such as

relate to the greater or less degree of fatigue attending the different species of exercise, and its utility in certain states of the mind and body, must determine the time, as well as,

3. The *duration* of it;—for it is almost impossible to lay down positive rules, how long every individual, in every particular situation, may continue a certain species of exercise, so as to derive advantage. These rules, as far as they can be established, may be collected from the subsequent remarks, and then applied to the various kinds of exercise, by which we may be benefited in different cases and situations.

It is necessary first to observe, that any kind of exercise which we are accustomed to take, with a view to strengthen the body, is far preferable to an unusual one, which may be attended with a contrary effect.—We ought always to begin gently, and to finish gradually, never abruptly.—Exercise in the open air has great advantages over that in houses and close apartments.—Besides, strong bodily exertions, such as dancing, fencing, turning, and the like, if practised in small and confined places, on account of the increased perspiration, soon vitiate the air, and render it unfit for breathing.

If we take exercise for the sake of health, we ought to employ ourselves, during the time, with some agreeable object, and not perform any labour, nor seriously occupy the mind. Hence, certain kinds of exercise cannot be unconditionally recommended to every individual, as conducive to health, though they should, of themselves, be proper, and, in other respects, agree with the constitution. He who forces himself to take any exercise, or performs it with reluctance, will thence receive more injury than benefit: motions or tasks, therefore, which we impose upon ourselves, as recreations after work, or after sitting and long study, ought to be strictly relaxations, not toilsome exertions.

Persons of an active habit find a species of relaxation, and even satisfaction, in a change of their pursuits, and particularly in the transition from hard and difficult to

more pleasant and easy avocations. To such individuals any exercise is frequently of great advantage, especially if it answer or appear to them to be conducive to any useful purpose. To one who has habituated himself to grave and serious pursuits, it should not be recommended to join in amusements that require bodily exertion, and are attended with dissatisfaction and irksomeness; for his health will not be improved by an exercise at once unusual and unpleasant.

To continue exercise until a profuse perspiration, or great lassitude, take place, cannot be wholesome. In the forenoon, when the stomach is empty, or, at least, not too much distended, muscular motion is most agreeable and healthful; it strengthens digestion, and heats the body less than after a full meal. A good appetite after it is a proof that it has not been carried to excess. But it is not advisable to take violent exercise immediately before a meal; as this might occasion a deficiency of those humours which are necessary to promote digestion. If we sit down to a substantial dinner or supper, immediately after a fatiguing walk, when the blood is heated, and the body in a state of perspiration, the worst consequences may ensue, especially if we begin with the most cooling dishes, or with salad, or a glass of cold drink.

Exercise is likewise hurtful directly after meals; since it obstructs digestion, and propels those fluids too much to the surface of the body which are designed for the stomach, to promote the solution of food, and without which many crude and undigested particles are forced to enter and to mix with the blood. The old precept of the *Salernian School*, "*Post cœnam stabis, seu passus mille meabis*," (i. e. after supper stand, or walk a mile), is as frivolous as it is absurd; for experience sufficiently informs us, that most persons, particularly the nervous and irritable, are liable to the heart-burn, eructations, and even vomiting, when they are obliged to move about, or to take any exercise, immediately after meals. The instinct of the lower animals also contradicts this rule;

because the wildest creatures are inclined to rest after food.

Persons who are under the necessity of moving immediately after their meals, or who have no other time for walking, must cautiously endeavour to overcome these inconveniences by custom, and a more rigid temperance: they should first take the most gentle kind of exercise, and gradually increase it; and, as the late hours of dining now so generally in fashion, have, in a manner, abolished heavy suppers, a moderate walk after a slight evening's repast cannot be injurious. But, at all events, fatiguing exercise, after a full meal, should be delayed till the stomach has digested and assimilated the food, which generally takes place in the third or fourth hour after eating. The most proper occupations, after dinner, are such as can be performed with facility, or without intense reflection, or great bodily exertions, and such as afford a kind of amusement.

Walking, the most salutary and natural exercise, is in the power of every body; and we can adapt its degree and duration to the various circumstances of health. By this exercise the appetite and perspiration are promoted; the body is kept in a proper temperament; the mind is enlivened; the motion of the lungs is facilitated; and the rigidity and contraction of the legs, arising from too much sitting, is relieved. The most obstinate diseases, and the most troublesome hysteric and hypochondriacal complaints, have been frequently cured by perseverance in walking.

The most proper walk for health is in an agreeable country, in a healthy, pure, dry air, amidst social and cheerful conversations, in a mild sunshiny day, whether in spring, autumn, or winter; in the summer mornings and afternoons, but by no means in the oppressive heat of the sun. To walk in towns, though it gives exercise, is less conducive to health; because the atmosphere is generally filled with vapours arising from impure exhalations.

Those who are not hardened against the vicissitudes of

the weather, must avoid not only hail and rain, but also the cold mornings and evenings, and ought, in rough and moist cold weather, rather to take exercise within the house, with the admission of fresh air. Violent wind should also be avoided; and, if we are obliged to face it, we ought not to walk too fast, particularly in winter, when the small pores of the skin are compressed by the air.

In walking, the proper choice of place is a matter of much importance. Marshy and damp fields should be avoided; and in autumn, when the foliage is decaying, it is not advisable to choose woods, groves, and damp meadows, for our pleasure walks. In summer, on the contrary, a walk in the forests or meadows is both agreeable and healthful. Hills and elevated situations deserve particularly to be visited, not only on account of the purer air we breathe, but because we enjoy a variety of exercise, in ascending and descending.

The inhabitants of towns require longer walks for the preservation of their health than country-people. The latter, even with less exercise, derive vigour of body, and serenity of mind, from a purer air, and more simple manners. Regular and daily walking cannot be too much recommended to the citizen, who, in the present age, is so much harassed with nervous and hypochondriacal complaints; but, though this be an useful and excellent species of exercise, yet some rules ought to be observed, if we expect to derive from it the wished-for advantage.

1. We should contrive to procure as much recreation, after serious occupations, as is possible, and consistent with our situation in life.

2. To read during a walk, whether the subject be of a grave or amusing nature, is a custom improper in itself, and detrimental to the eyes, besides the danger it occasions of falling: this practice not only deprives a person of the principal advantages of a walk, but people easily accustom themselves to an unsafe and ungraceful manner of carrying the body. It is attended with the

worst consequences to the eyes, because the focus is continually shifted, and the retina is thus excessively fatigued.

3. We should not frequent the same, perhaps often a dull and unvaried path, though most convenient. It is better to change the walk occasionally, and gradually to extend the distance. The most agreeable prospects should be chosen for variety; otherwise the perpetually uniform walk will excite melancholy and unpleasant sensations as much as the closet or the study.

4. We ought to accustom ourselves to a steady and regular, but not a quick pace.

5. An agreeable companion contributes much to serenity of mind: but let us rather go alone, than in dull or frivolous company, if we, at all, possess the art of profiting by solitude.

6. In the choice of our companions we should attend not only to congeniality of character and taste, but should also, in this exercise, associate with those whose pace accords with ours; for, if the heavy and corpulent man make a lean and light-footed person the companion of his walks, he will remain behind, or be overheated and fatigued if he endeavour to keep pace with his partner, who must likewise suffer from the constraint of slower motion.

7. Some people cannot speak or converse in walking without frequent stops, and thus make little progress. From this singularity they are generally much fatigued at their return, without having reaped any benefit from their exercise.

Running not only shakes the body with greater violence than walking, but it heats the head and face, and too much accelerates the circulation of the fluids. Soon after a meal it prevents digestion, mixes the pure fluids with the impure, and obstructs the secretion of humours. If long continued, it is hurtful to every one, particularly to persons unaccustomed to it, to the plethoric, to those subject to hæmorrhages, gravelly complaints and frequent nervous head-ache, and to the sedentary and

studious.—To run up a hill, too much fatigues and strains the muscles: and to run against the wind, produces giddiness in the most robust, and makes them liable to various accidents, that may be attended with danger.

Dancing, under proper limitations, is an admirable exercise, especially in winter, when the heavy atmosphere, much inactivity and sitting, render the blood thick, and dispose persons to hypochondriasis. Moderate dances have every advantage of a gentle exercise, besides the beneficial effects produced on the mind by cheerful company and music. On the other hand, the more violent dances may be, and frequently are, attended with pernicious effects. The exertion of so many muscles, and the quick inspiation of a warm atmosphere in a crowded assembly, impel the blood to circulate with a rapidity equal to that in the hot stage of a fever, and propel it to the head and breast, so that the vessels seldom possess a sufficient power of resistance. If we add to this, the effect of heating liquors, of too sudden an access of the cold air so eagerly courted, of exposing the face, head and breast suddenly to its influence, together with the imprudent use of cooling drink, and ice itself, we can no longer be surprised, that spitting of blood, consumption of the lungs, and inflammatory disorders, are the frequent consequences of such excesses.

This violent species of exercise is particularly dangerous to females: and the use of fans, in order to cool themselves, and thus check perspiration (which is wisely designed by Nature to produce the same effect, in a more salutary degree, if not wantonly repelled), is extremely imprudent. Delicate persons ought, for their own sake, to join only in the shorter and less fatiguing dances, especially in summer.

A dancing-room ought to be cool, but without admitting currents of air, and without too much smoke from candles. It would be advisable for the whole company, after dancing is over, and before they venture into the open air, to change their linen, and afterwards

to wait a quarter or half an hour, before they return home. During that time, they may be refreshed with tea, and thus encounter the open air without danger. Every dancing-assembly ought to conclude with minuets. Persons of an indisposed and debilitated body, such as the consumptive, those troubled with ruptures, gravelly and similar complaints, should not attempt to dance. Lastly, this exercise is hurtful to every person, in the hot and sultry days of summer, when Nature renders cooling drink indispensable, and when we are much inclined to perspire, without any additional inducement.

Riding in carriages is an exercise the more conducive to health, as the gentle jolts tend to resolve stagnations in the intestines of hypochondriacs, corpulent people, convalescents, and the consumptive. But if the motion of the carriage be too rapid it is hurtful, as it not only accelerates perspiration before the matter of it is properly prepared, but also injures the solid parts, especially the kidneys; generates congestions of the blood towards the head, and, consequently, head-ache, giddiness, vomiting, and obstructions. If, however, we wish to derive all the good effects from riding in a carriage, the body of it ought not to be too nicely suspended in straps and springs, nor should the motion be too slow. One of the windows, at least, ought to be kept open, that the perspiration and breath of several persons, inclosed in so narrow a place, may not too much vitiate the air.

The infirm, who cannot enjoy the free air in bad weather, should take exercise upon rocking-horses, or similar contrivances, in halls and spacious apartments, while the upper part of the windows is kept open, guarding, however, against a current of air.—Lastly, the furious driving in open carriages, in sultry weather, may be, indeed, pleasant, on account of the agreeable current of air; but it may also become dangerous to persons subject to violent perspiration.

Leaping, fencing, the fashionable military exercise, and manœuvring with horses, are violent kinds of exercise,

which cannot be recommended to those who are not in a perfect state of health, or to the corpulent and plethoric, whose blood-vessels may be so overstrained as to burst by motions which require the muscular exertion of the whole body.

To those who are otherwise healthy, but cannot afford to take sufficient exercise, either by their particular situation in life, or from want of time, I would recommend a *new* species, which, in its salutary effects *on the whole body*, is equal, if not superior, to any other. It simply consists in moving the whole body, in the middle of a room (if convenient, with open windows), and let the operator, while he inclines forward upon his toes, raise his arms, and drop them with the alternate motion backward on his heels. Thus the *whole* muscular system will be duly exercised, without confining the motion to one particular part. This is even preferable to the *dumb-bells*, which, like every other species of *partial* exercise, if persevered in, are so far objectionable, as they require the uncommon exertion of certain muscles, while the due and uniform circulation of the blood to those parts is disturbed, to the detriment of others which are at rest.

To persons who are deprived of the use of their limbs, and are weak and delicate, the motion of a sedan-chair is of great benefit, if it be continued for a sufficient time; for it disposes the body to a free perspiration. Of the same nature is the sailing in barges or boats, either on lakes or rivers.

A much more active kind of bodily motion is produced by short voyages. Those who are unaccustomed to it generally experience giddiness of the head, nausea, and vomiting: hence it is beneficial to an impure stomach. To consumptive patients it frequently is the last resource; but it is wrong to delay it till all other remedies have failed. For it is not in the last stage of consumption, when the lungs are ulcerated, or when an abscess has burst in the thorax, and the ichorous matter has been communicated to the blood, that we can ex-

pect any benefit from voyages. The changes of scene and climate, indeed, powerfully co-operate in effecting changes in the human system; but, if the disease has preyed too much on the vitals of a patient, or if he is spitting blood, the motion of the vessel must necessarily prove injurious. On the other hand, the debilitated, the nervous, and particularly the hypochondriac, cannot resort to a better remedy than a short voyage.

Riding on horseback is, in a certain respect, an excellent gymnastic remedy, by which all the muscles, from the toes to the head, are in reciprocal motion, and which manifests its principal effects on the intestines of the abdomen. It clears the intestinal canal, promotes the evacuation of crude substances, strengthens the stomach and bowels, improves digestion, prevents or resolves incipient obstructions, and facilitates the perspiration of the whole body. To the hypochondriac it is an inestimable remedy; but, if the obstructions should be too far advanced, riding ought either not to be attempted at all, or practised in as slow a pace as the horse can walk. In short, it is to be undertaken with the same precaution as sailing in those stages of consumption which admit of these remedies.

Farther, riding is not advisable in cases of hæmorrhoids, ruptures, and gravel. The feeble and relaxed ought to begin with a gentle pace, and to increase it gradually; for a moderate trot is the proper medicinal mode of riding. And persons, who expect to derive real advantage from riding on horseback, must neither trot too fast, nor make use of a heavy and jolting horse. Such patients as are unaccustomed to this exercise, particularly hypochondriacs, generally ride with great timidity. Their lives are, as it were, in continual danger; and, by the awkward posture of their bodies on horseback, they are frequently hurt in places accessible to injuries;—stitches in the side, congestions of blood in the head, and violent perspiration, counterbalance every advantage received from their excursions. To most of these patients, if they can afford it, the

riding-school cannot fail to be extremely useful; for the regular manner of training the horses there, their uniform and steady motion, the attention paid to the proper posture of the rider, by keeping his breast and abdomen erect, and the legs properly extended, all are circumstances very favourable to the patient and convalescent. But, even here, it is the moderate kind of exercise only, that promises real benefit in a medical sense;—continued furious driving and hard trotting are always extremely dangerous.

For similar reasons, riding on horseback, as well as in carriages, immediately after a meal, is still more dangerous than walking. The most proper time for riding is the morning, when the stomach is empty. It should, however, not be long continued; one hour, in general, is quite sufficient; and, in this respect, riding is preferable to any other exercise, as it can be practised by persons, whose business does not permit them to devote much of their time to amusement.

Swimming is likewise an useful exercise, which has the additional advantage of a cold bath. The motion and muscular exertion, which it requires, increase its utility: some rules and precautions, however, must be attended to. They have been stated at considerable length in Chap. III. “On the use of Baths.” I shall, therefore, at present only remark, that we should not enter with the feet, but with the head, into a cold bath; that the body should be neither too warm nor too cold; and that we should not choose dangerous rivers, or ponds, nor enter the water before the rays of the sun have, in some degree, warmed it, and rendered it more temperate. The sensation produced by cold water is, indeed, less to be apprehended, than the consequences arising from imprudently plunging into it, when the body is either too much cooled or heated.

Playing at Hand-ball, Cricket, and the like, has a more powerful effect on the muscles than the abdomen; and is, therefore, in one respect, unavailing to sedentary people, and, on the other hand, unnecessarily fa-

tiguing.—*Carouffels*, or riding on machines in a circle, are movements which require too much muscular exertion of the debilitated, whose strength admits only of a moderate exercise. These, as well as *swinging machines*, and the lately-contrived *swinging cars*, which move on a wheel with perpendicular pivots, are improper for those who are inclined to giddiness, and nervous symptoms in general, on account of the fear they occasion, and the dangerous accidents that may happen. But, at the same time, both species of exercise are extremely favourable in such a state of health, as requires an uniform and gentle motion of the whole body, in the pure and open air, particularly the high swinging cars, which are well calculated for that purpose.

Speaking is one of the most healthful and necessary species of exercise; and, without any ludicrous allusion, I may assert, that this practice is particularly salutary to the female sex, who are more confined at home than men. Here, however, as in other cases, excess is prejudicial. Loud reading, and speaking, are of singular advantage to literary men, and afford them good substitutes for other kinds of exercise, for which they seldom have sufficient leisure or opportunities. It is to this cause we may justly ascribe the longevity of many schoolmasters, and teachers in universities, who, notwithstanding their sedentary employments, and the vitiated air which they daily breathe in school-rooms, attain to a long and healthy life. To speak very loud, or exercise the voice immediately after a meal, is pernicious to the lungs, as well as to the organs of digestion.

Singing remarkably promotes the circulation of the blood through the lungs, and all parts of the body; the lungs, as well as the abdominal intestines, are shaken by the vibrating motion of the air, in a manner very conducive to health. Thus, the phlegm, and other noxious matter, collected about the pulmonary vessels, are resolved and carried away, so that they cannot mix with the blood, and the most dangerous stagnations in the smaller vessels are thus prevented: the blood uniformly

circulates, while it is impelled to the larger veins and arteries. For the same law of Nature, by which river-water is preserved sweet and fresh, while that of pools and ditches stagnates and putrifies, is also fully applicable here.—The air, inhaled in singing, is of similar service to us, as the current to the water. Those sedentary artificers, or mechanics, who, from habit, almost constantly sing at their work, unintentionally contribute much to the preservation of their health.

All *Wind Instruments* are more or less hurtful; for, as much air is thus introduced into the lungs, and, as it is but gradually and partially emitted, that organ soon becomes debilitated. Hence, persons of weak lungs, who are very fond of playing the flute, hautboy, or French horn, are frequently afflicted with spitting of blood, cough, shortness of breath, and pulmonary consumption. Besides, blowing checks the circulation of the blood through the lungs, accumulates it towards the head, and disposes such musicians to apoplexy. By the violent expulsion of the air, the abdominal muscles are contracted, all the parts of the abdomen are compressed, the circulation of the fluids is retarded, and many unpleasant, and, frequently, fatal consequences are induced.

There are other kinds of *musical instruments*, which, in a dietetical view, deserve to be condemned. Such is the *Harmonica*, which, by the rotation of the glasses on the fingers (a kind of negative electricity), induces a great degree of nervous weakness. And this effect is much accelerated by the acute and vibrating sounds of this instrument, by which the organs of hearing are intensely affected. Perhaps all stringed instruments, which are played by the touch of the fingers, such as the harp, the guitar, and the violin, produce a similar effect on the nervous system; especially if it be true that the *papillæ*, or points of the fingers, are the strongest conductors of the supposed nervous fluid. It is at least probable, that to be able to play on such instruments, with expression, requires a more than common sensibility of the nerves, which, indeed, may be sometimes artificially acquired,

but to the detriment of health. For it cannot be doubted, that a local excitement of irritability may be gradually propagated over the whole nervous system; and that, from raising some parts of the body to a preternatural state of sensibility, the character of those who are called *Virtuosi*, is generally marked with nervous debility. The extraordinary influence of music is universally known; by it the passions of persons of sensibility may be most effectually roused or allayed; nay, in some individuals, every feeling of the mind can be affected, at pleasure, by the various modifications of harmony. As grief, and other depressing passions, may be alleviated by appropriate music, it is an exercise deserving every commendation. Yet we must neither expect to cure by it diseases of the mind, nor their concomitant bodily disorders: this is beyond the power of music, which acts as a palliative only, or as a nervous stimulus, the effect of which is instantaneous, but of short duration. For, as soon as the exciting cause ceases, it is succeeded by an uncomfortable sensation of debility and relaxation. It is even probable that music, like all other anodyne and soothing remedies, may, in the end, increase the disposition to nervous weakness, by its too frequent repetition.

Lastly, the posture of the body, in practising music, also deserves attention; as the breast and abdomen may be compressed by stooping, so as to cause very serious complaints; and as the eyes may be injured by reading the notes, at too great or short a distance, especially for the double keys of the harp and harpsichord: indeed, reading music is, in general, more fatiguing to the eyes than any other kind of exertion.

Friction of the body, which can be performed either by the naked hand, a piece of flannel, or still better by a flesh-brush, is one of the most gentle and useful species of exercise. The whole body may be subjected to this mild operation, but principally the abdomen, the spine, the arms, and legs. It clears the skin, resolves stagnating humours, promotes perspiration, strengthens

the fibres, and increases the warmth and energy of the whole system. In rheumatism, gout, palsy, and green-sickness, it is an excellent remedy.

Daily friction of the whole body was, with the ancients, and is still in the East Indies, considered one of the most indispensable requisites of a people, who, by their indolent manner of life, seem to have adopted it more with a view to indulge in sensual pleasures than as a preservative of health. It is, however, one of the most salutary expedients, by which the whole body receives nearly as much benefit as from a tepid bath, and which, as being in the power of every person, ought to be more frequently and more generally used. To the sedentary, the hypochondriac, and persons troubled with indigestion, who have not leisure to take sufficient exercise, the daily friction of the belly, in particular, cannot be too much recommended, as a substitute for other means, in order to dissolve pituitous stagnations, which may be forming in the abdomen, and to re-invigorate the vessels. And though it be not attended with all the advantages enjoyed from exercise in the open air, it still produces a powerful effect on the organs of digestion; for the moderate exercise of a whole day will scarcely invigorate the abdominal vessels, and particularly the stomach, so much as the friction of these parts, continued for half an hour. But, if it be intended for these beneficial purposes, it should be performed in the morning, on an empty stomach, or, in bed before we rise, gently and steadily in a circular direction, and, at least, for five, or ten minutes at a time.

In a weak state of the abdomen, and the nerves, in general, we may derive still more salutary effects from friction, if the stomach and the whole abdomen be rubbed every morning, and at night before going to bed, with a sponge, or a piece of flannel, dipped in cold water. This possesses still greater advantages over internal medicines, because it can be safely employed, even in cases where the alimentary canal, from its obstructed state, scarcely admits of any other remedy, while friction, and

the affusion of cold water, generally relieve these obstructions, and even habitual costiveness.

Motion, or exercise, ought to be continued only till we feel an agreeable lassitude, and a sensible degree of perspiration. If it be carried farther, it weakens, instead of strengthening the body, and produces bad effects, by filling the lungs with heated blood. Even the robust man will experience some, though less unpleasant effects than the debilitated, if he has committed an excess of this nature.

After having taken exercise, we should not venture to rest in a cool place, nor upon a green plot; still less should we expose ourselves to a current of air; but, rather frequent a place, warmed by the mild rays of the sun in summer, or a moderately warm apartment in winter, so that the sudden change of temperature may not injure us, by suppressing perspiration.

For the same reasons, the thirst we generally feel after exercise, ought not to be instantly satisfied by cooling drink. It is, however, allowable to drink some warm, or diluent liquors, if we cannot wait till the natural warmth be restored. The late Dr. Fothergill very properly advised, that people in a state of perspiration should, to avoid all danger, eat a mouthful of bread, with a little salt, and thus gain time, till the blood, and the liquor to be drunk, had acquired a more equal temperature. A small quantity of vinegar, or the juice of lemons in water, is well calculated to quench thirst, and, at the same time, to promote perspiration. Travellers, on foot, ought to be upon their guard against too much drink; for, the more liquids they take, the more they will perspire, and the greater will be the subsequent relaxation and danger of catching cold, when their clothes are saturated with perspirable matter. They should also abstain from drink, productive of a laxative effect, which would cause debility, and even faintings. The most suitable of all substances to mix with water, is the pure or essential acid of tartar, with a small quantity of sugar. This affords a cooling and refreshing beverage,

without relaxing the bowels, like lemonade. Persons, with whom the vitriolic acid agrees, may take a teaspoonful of a mixture, consisting of six or eight parts of spirits of wine, and one part of vitriolic acid, to a pint of water. A beverage, made of weak acidulated wine and water, is cooling and strengthening. In the very cold weather of winter, people ought to avoid all heating liquors, such as ardent spirits, and strong wines. Warm diluents, such as tea and coffee, are equally improper, and a poor protection against cold; for their warming property is of short duration; they are productive of debility, a more torpid circulation of the blood, and, consequently, of an increase of cold. It is much better to eat previously some solid meat, by which the digestive organs may be exercised, such as cold animal food and bread, and to drink after it some bitter ale or beer. On the other hand, when we suffer from intense cold, or have been exposed to the wind and weather, a few cups of strong tea, with plenty of cream and sugar, is then the best and safest refreshment: and it is equally invigorating in summer after extreme heat and fatigue. Feeble individuals, whose stomachs generate much acid, and who are frequently troubled, on their journies, with a sudden voracious appetite, are liable to the most painful attacks of weakness on the road, and, on that account, they ought always to be provided, in their excursions, with some kind of solid food. Such persons should carefully abstain from the use of wine, brandy, or other heating and stimulating cordials, while travelling, especially in the morning: they might, with more advantage, eat some bread and butter, warm, or buttered ale, strong broth, gruel, or similar nourishing substances.

We are now to consider the consequences arising from the *want of exercise*. This, indeed, is still more debilitating than too violent motion. The solid parts of the human frame are relaxed by it; the circulation of the fluids is retarded; they gradually stagnate in the smaller capillary vessels; the secretions are diminished; and abundance of moisture or fat is generated, which renders

the body, as well as the mind, more indolent and lethargic;—relaxation of the muscles, obstructions of the intestines, hæmorrhoids, apoplectic fits, various species of dropfy, and, at length, a premature death, are the sad consequences. Men of letters are the most unhealthy of all human beings, because their bodies have scarcely any other exercise but the imperceptible motion of the arms. Want of appetite, flatulency, anxiety, at one time obstructions, at another diarrhœa, and the most diversified nervous symptoms, are their attendants. Sleep is beyond their reach; a thousand tormenting inconveniences, hypochondriasis, and, at length, a complete state of melancholy is too frequently their lot. Temperance, alone, will not remedy all these evils; for, since we cannot remain vigorous and healthy for two days together, with the same mass of blood, a new access of the purest and most subtle parts of our fluids must daily support the nervous system, in order to preserve its regular functions. If this be not continually restored, weakness and relaxation of body and mind are the inevitable consequences; with this difference only, that, in a state of debility, from too much bodily exercise, the thick and coarse particles of the fluids are carried into circulation with the others, and the next meal, or the first sleep after it, very soon supplies the deficiency: in mental labour, on the contrary, digestion is interrupted, the crude and viscid parts of food remain unassimilated, and the body is prevented from receiving proper nourishment. In like manner, sedentary mechanics and artificers are affected; particularly shoemakers, tailors, and weavers. They experience maladies similar to those to which men of letters are subject; and it has been frequently observed, that they are very liable to diseases of the mind, and especially to religious fanaticism.

Standing, though useful as a change after long sitting, is apt to occasion accumulations of blood, or rather of the serous part of it, in the lower extremities. Swelled legs are, therefore, common among printers. It is a posture little calculated to relieve the studious, and the

body is, at the same time, more fatigued by standing than sitting. If we sit much, we must attend to the two following rules: 1. that no part of the body be compressed: and, 2. that sitting be not too long continued at one time. The common manner of sitting, with the head reclined, is extremely pernicious; for the circulation of the fluids in the abdomen is thus checked; the intestines are compressed, and the vessels of the breast contracted. The head also suffers by bending it too much forward; as the blood is thus impelled to circulate towards it more copiously than is consistent with health. The studious, especially, would do well not to perform all their avocations in a sedentary posture, but occasionally to relieve at once their body and mind, by standing or walking about the room. The mode of sitting ought also to be made as convenient as possible, so that both the body and head may be kept in an almost perpendicular posture; that the breast and abdomen may not be obstructed in their alternate expansion; and, lastly, that the arms and legs may not be held in a crooked and unnatural position: all this should be particularly attended to by those who teach children to read and write. The pressure of the abdominal muscles may, in a great measure, be prevented by high tables and desks, and by raised stools or chairs, upon which a person rather stands than sits.

To lie or rest horizontally, is attended with a cessation of all exercise. If the head be placed low, and this too long continued, head-ache may be the consequence from the increased pressure of the blood on the brain. Here, likewise, a frequent change of posture is necessary, in order to obstruct none of the bodily functions, and to prevent the stagnation of humours.

Finally, the *faculties of the mind* deserve no less attention than those of the body.

Alternate changes of tranquillity and activity are equally beneficial to the mind as rest and exercise to the body. Too long continued, too frequent, and too profound reflections, are alike injurious to both. The same powers

are diminished here as in bodily labour, and in a still greater proportion; for muscular exertions, though fatiguing, are reproductive of new vigour. By study, the mind, indeed, improves in capacity, but the body is a sufferer from every unusual exertion of the intellectual faculties, and they both gradually become diseased. In profound meditations, the vital spirits are, as it were, withdrawn from the organs of sense; the body is, for the time, almost deprived of sensation; and we frequently become in a manner absent. Reflection always directed to one object, not only debilitates, but also suppresses the other faculties of the mind, and does not permit it to deviate from its favourite pursuit. Thus we sometimes see melancholy, nay, madness itself, overwhelm persons devoted to the contemplation of one particular object. Intense and abstruse thought, in general, if not checked in time, may be attended with stupor or insanity.

To enable us to reflect seriously upon an important subject, time and place ought to be so chosen, that the mind may be diverted by no other object; for two ideas cannot be conceived at one moment of time. Hence we should study in an apartment which is not too light, and where we are undisturbed by noise: the muscles should not be actively employed during study: it is, therefore, improper and pernicious immediately after meals, or before digestion is completed. The morning, indeed, is the most profitable time for study; though necessity and custom make many exceptions; so that some persons, from gradual practice, are able to perform their mental tasks during the greatest noise, and in a room full of children.

Much and frequent inactivity of mind agrees, indeed, well with the body, which, in that state, fully performs its functions; but it becomes unwieldly, inasmuch, at length, as to stupify the mental powers: the ideas become obscure and confused; and a total loss of memory, or oblivion of the past, is but too often the consequent effect of such indolence.

CHAP. VIII.

Of SLEEPING and WAKING;—their just proportion with regard to age, the constitution of the body, mode of life, and other circumstances.

SLEEP and wakefulness are nearly in the same relation to each other as exercise and rest. Waking always pre-supposes a certain degree of activity; all the *natural* functions, digestion, the preparation of the chyle and blood, assimilation, secretion, and excretion, are then more vigorously performed, and would soon exhaust their powers, if sleep did not restore to them the beneficial and indispensable supplies.

Sleep is, therefore, necessary to existence and health, and it is an improper and fruitless attempt to deprive ourselves, by an ill-directed activity, of the requisite portion of this refreshment; for Nature will maintain her rights, in spite of our efforts to subvert them; and both body and mind will suffer, without attaining any real advantage from an extravagant watchfulness.

Before I proceed to inquire into the consequences of either too much or too little sleep, it will be useful to premise a concise theory, or the physiology, of this suspension of the mental powers.

When the body is fatigued, and the senses, together with the voluntary motion of the muscles, have, for some time, been active, we stand in need of the alternation of rest, which is obtained by sleep. During a sound sleep, the senses, and the voluntary muscular motions, are not exercised; but the *vital* functions, such as respiration, and the circulation of the blood, as well as most of the natural functions afore-mentioned, are regularly, though more slowly performed. While we are asleep, the motion of the heart, and the blood-vessels, even the action of the brain, and the nervous system, as likewise the peristaltic or vermicular motion of the stomach and the intestines, and the secretion of the fluids, are performed

in an uniform and steady manner. Previous to sleep we perceive a languor of the senses, of the muscles which are subject to our will, and of those also which keep the body in an erect posture; the head inclines downwards, the upper eye-lid and the lower jaw-bone likewise sink; the venous blood accumulates towards the heart, and compels us to yawn, in order to facilitate the transition of the blood into the lungs, by the deep breathing which takes place: finally, the brain itself, as the organ of the mind, appears to be fatigued; hence our ideas become irregular, and there arises a slight imbecility of the understanding. That the motions of the heart are stronger during sleep, and that perspiration is more active, must be ascribed to the warmth of the bed-clothes, by which the insensible perspiration softens and relaxes the skin. But a person who sleeps in his usual dress will feel chilly; and those animals that sleep long, as the hedge-hog, the murmur-deer (*Marmota Alpina*, L.) suffer an extraordinary degree of cold.

As the senses are inactive during sleep; as the nervous energy is less exhausted, and its secretion continued, a new supply of it is collected, and the organs of sense, as well as the muscles, receive additional vigour. This occasions us to awake, particularly if roused by any stimulus. While we are asleep, the nutritive particles can more easily attach themselves to the fibres, and fat also is more readily generated, from the retarded circulation of the blood. After we have slept sufficiently, we are apt, on awaking, to stretch the limbs and joints, and sometimes to yawn: the latter, with an instinctive desire of promoting the circulation of blood through the lungs, which was retarded during sleep; the former, namely, stretching, in order to assist the extensor muscles, which, by the flexion of the limbs in sleep, had been more extended, and in order to expand again the flexor muscles, that had been moderately contracted.

The proximate cause of sleep appears to be an impeded motion of the nervous fluid in the brain. This motion is produced by a kind of collapse of the subtle insertions

of the nerves, as well as by a mechanical compression of them. Hence we can explain how things so totally opposite are able to produce sleep, when they either exhaust or compress the tubes of the nerves. Of the former kind is every violent and fatiguing species of labour, a considerable loss of blood, perspiration increased by external heat, and every thing that withdraws the blood from the head; for instance, warm bathing of the lower extremities, a stomach filled with much food, &c. Of the latter kind of incitements to sleep, namely, those that act by compression, is every mechanical pressure on the brain, whether it proceed from water accumulated in its ventricles, from a local depression or fracture of the cranium, or from extravasated blood: in like manner the impeded regress of the blood from the brain, or the increased access of it to that organ, may affect such a pressure, by distending the blood-vessels, as is the case in using narcotics, or wine and other spirituous liquors; and, lastly, an intense degree of cold, as well as the state of an approaching apoplexy.—Sleep is promoted by tranquillity of mind; by the absence of every stimulus to the body; by silence and darkness around us; by a complete rest of the senses; by gently and uniformly affecting one of the senses, for instance, by music or reading; and, lastly, by a gentle external motion of the whole body, as by rocking or sailing. On the other hand, every painful sensation, a great noise, a bright light, strong exertion of mental powers, and particularly violent passions, are calculated to prevent sleep. Thus, likewise, sleep may be impeded by hot, spicy, and other stimulating drinks, which are said to occasion a more speedy secretion of the nervous fluid.

Dreams are vagaries of the imagination, and, in most instances, proceed from external sensations. They take place only when our sleep is unsound, in which case the brain and nervous system are capable of performing the motions before mentioned. We seldom dream during the first hours of sleep; perhaps, because the nervous fluid is then too much exhausted; but dreams mostly

occur towards the morning, when this fluid has been, in some measure, restored. Every thing capable of interrupting the tranquillity of mind and body may produce dreams. Such are the various kinds of grief and sorrow, exertions of the mind, affections and passions, crude and undigested food, a hard and inconvenient posture of the body, &c. Those ideas which have lately occupied our mind, or made a lively impression upon us, generally constitute the principal subject of a dream, and more or less employ our imagination, when we are asleep. Animals are likewise apt to dream, but seldom; and even men living temperately, and enjoying a perfect state of health, are seldom disturbed with this play of the fancy. Nay, there are examples of lively and spirited persons who never dream. The great physiologist, HALLER, considers dreaming as a symptom of disease, or, as a stimulating cause, by which the perfect tranquillity of the *sensorium* is interrupted. Hence, that sleep is the most refreshing, which is undisturbed by dreams, or, at least, when we have no clear recollection of them.

I have before observed, that most of our dreams are sports of fancy, and derive their origin chiefly from external impressions: almost every thing we see and hear, when awake, leads our imagination to collateral notions or representations, which, in a manner spontaneously, and without the least effort, associate with external sensations. The place where a person whom we love formerly resided, a dress similar to that which we have seen her wear, or the objects that employed her attention, no sooner catch our eye, than she immediately occupies our mind. And though these images, associating with external sensations, do not arrive at complete consciousness, within the power of imagination, yet, even in their latent state, they may become very strong and permanent. I have been informed, for instance, of a young man who was attacked with convulsions every time he heard the name of *Jesus* repeated; owing, it seems, to the circumstance of his mother having once invoked the name of *Jesus* in a terrific voice and manner, when she,

as well as the boy, was much frightened by a tremendous peal of thunder. But this is only an indirect demonstration of the existence of a faculty, which is very active in dreams, and which may be aptly called the *sub-reasoning faculty*, or the power of abstracting similarities. The conclusions thus formed are more frequent and active than in the waking state; because they are seldom controuled by the reflections of reason. I shall make use of one illustration only.

Very frequently we find, that in a dream, a series of representations is suddenly interrupted, and another series of a very different kind occupies its place. This happens as soon as an idea associates itself, which, from whatever cause, is more interesting than that immediately preceding. The last then becomes the prevailing one, and determines the association. Yet, by this, too, the imagination is frequently reconducted to the former series. The interruption in the course of the preceding occurrences is remarked, and the power of abstracting similarities is in search of the cause of this irregularity. Hence, in such cases, there usually happens some unfortunate event or other, which occasions the interruption of the story. The representing power may again suddenly conduct us to another series of ideas, and thus the imagination may be led by the sub-reasoning power before defined, from one scene to another. Of this kind, for instance, is the following remarkable dream, as related and explained in the words of Professor MAASS, of Halle: "I dreamed once," says he, "that the Pope visited me. He commanded me to open my desk, and carefully examined all the papers it contained. While he was thus employed, a very sparkling diamond fell out of his triple crown into the desk, of which, however, neither of us took any notice. As soon as the Pope had withdrawn, I retired to bed, but was soon obliged to rise, on account of a thick smoke, the cause of which I had yet to learn. Upon examination, I discovered that the diamond had set fire to the papers in my desk, and burnt them to ashes."

This dream deserves a short analysis, on account of the peculiar circumstances which occasioned it. "On the preceding evening," says Professor MAASS, "I was visited by a friend, with whom I had a lively conversation, upon Joseph II.'s suppression of monasteries and convents. With this idea, though I did not become conscious of it in the dream, was associated the visit which the Pope publicly paid the Emperor Joseph at Vienna, in consequence of the measures taken against the clergy; and with this again was combined, however faintly, the representation of the visit, which had been paid me by my friend. These two events were, by the sub-reasoning faculty, compounded into one, according to the established rule—that things which agree in their parts also correspond as to the whole;—hence, the Pope's visit was changed into a visit made to me. The sub-reasoning faculty, then, in order to account for this extraordinary visit, fixed upon that which was the most important object in my room, namely, the desk, or rather the papers it contained. That a diamond fell out of the triple crown, was a collateral association, which was owing merely to the representation of the desk. Some days before, when opening the desk, I had broken the glass of my watch, which I held in my hand, and the fragments fell among the papers. Hence, no farther attention was paid to the diamond, being a representation of a collateral series of things. But afterwards the representation of the sparkling stone was again excited, and became the prevailing idea; hence it determined the succeeding association. On account of its similarity, it excited the representation of fire, with which it was confounded; hence arose fire and smoke. But, in the event, the writings only were burnt, not the desk itself; to which, being of comparatively less value, the attention was not at all directed."

It is farther observable, that there are in the human mind certain obscure representations, and that it is necessary to be convinced of the reality of these images, if we are desirous of perceiving the connection which subsists

among the operations of the imagination. Of the numerous phenomena, founded on obscure ideas, and which, consequently, prove their existence, I shall only remark the following. It is a well-known fact, that many dreams originate on the impressions made in the body during sleep; that they consist of analogous images, or such as are associated with sensations that would arise from these impressions, during a waking state: hence, for instance, if our legs are placed in a perpendicular posture, we are often terrified by a dream, that implies the imminent danger of falling from a steep rock or precipice. The mind must represent to itself these external impressions in a lively manner, otherwise no ideal picture could be thus excited; but, as we do not become at all conscious of them, they are but faintly and obscurely represented.

If we make a resolution to rise earlier in the morning than usual, and if we impress this determination on our mind immediately before going to rest, we are almost certain to succeed. Now it is self-evident, that this success cannot be ascribed to the efforts of the body, but altogether to the mind, which, probably, during sleep, perceives and computes the duration of time, so that it makes an impression on the body, which enables us to awake at an appointed hour. Yet all this takes place without our consciousness, and the representations remain obscure.

Many productions of art are so complicated, that a variety of simple conceptions are requisite to lay the foundation of them; yet the artist is almost entirely unconscious of these individual notions. Thus, a person performs a piece of music without being obliged to reflect, in a conscious manner, on the signification of the notes, their value, and the order of the fingers he must observe; nay, even without clearly distinguishing the strings of the harp, or the keys of the harpsichord. We cannot attribute this to the mechanism of the body, which might gradually accustom itself to the accurate placing of the fingers. This could be applied only where

we play a piece of music, frequently practised ; but it is totally inapplicable to a new piece, which is played by the professor with equal facility, though he has never seen it before. In the latter case, there must necessarily arise an ideal representation, or an act of judgment, previous to every motion of the fingers.

These arguments, I hope, sufficiently evince the occurrence of those obscure notions and representations, from which all our dreams originate.—That among the thousands and millions of fanciful and supposed ominous dreams, some are occasionally realized, is not an object of astonishment ; but many people, particularly the victims of the lottery, too frequently find reason to regret, that these omens are not always to be depended on ; if these deluded visionaries would permit themselves to reason, and to calculate, they would discover, that there are as many chances against their dream being realized, as there are against their ticket turning up a prize of twenty thousand pounds.

Before I quit this subject, I shall relate an extraordinary dream of the celebrated Italian, GALILEO. When this great man, at a very advanced age, had lost his sight, he was once conducted, in his walks, over a beautiful plain, by his pupil, TORICELLI. “Once,” said the venerable sage, “my eyes permitted me to enjoy the charms of these fields: but now, since their light is extinguished, these pleasures are lost to me for ever. Heaven justly inflicts the punishment which was predicted to me many years ago. When in prison, and impatiently languishing for liberty, I began to be discontented with the ways of Providence; COPERNICUS appeared to me in a dream; his celestial spirit conducted me over luminous stars, and, in a threatening voice, reprehended me for having murmured against him, at whose *fiat* all these worlds had proceeded from nothing. “A time shall come,” said he, “when thine eyes shall refuse to assist thee in contemplating these wonders.”

After this long, though I hope not uninteresting di-

gression, I proceed to state the consequences of too much or too little sleep.

To continue awake, beyond a proper time, consumes the vital spirits, disorganizes the nerves, and causes so many uneasy sensations, that a considerable while must elapse before we can fall asleep, namely, until their greatest violence has abated. The fluids of the body become acrid, the fat is consumed, and there arises, at length, an inclination to vertigo, violent head-ache, anxiety, actions without connection, without design, and without consistency. Those who indulge themselves in much sleep, are seldom liable to very strong passions. Persons, on the contrary, who sleep too little, frequently contract a violent and vindictive temper. Long continued wakefulness is capable of changing the temper and mental disposition of the most mild and gentle; of effecting a complete alteration of their features, and, at length, of occasioning the most singular whims, the strangest deviations in the power of imagination, and, in the end, absolute insanity.

Excess of sleep, however, is not less prejudicial. The whole body sinks gradually into a complete state of inactivity, the solid parts become relaxed, the blood circulates slowly, and remains particularly long in the head: perspiration is disordered, the fluids are incrassated, the body increases in fat and thick humours, and is rendered incapable of being the medium of mental exertion; the memory is enfeebled, and the unhappy sleeper falls into a lethargic state, by which his sensibility is, in a great measure, destroyed.

Persons troubled with hypochondriasis and hysterics do themselves much injury by sleeping too long, especially in the morning, when the body is enfeebled by its continuance in a heated and unwholesome atmosphere. To such individuals, it is also dangerous to remain, for a considerable length of time, in a state of inactivity. Indeed, excessive sleeping is detrimental to the muscular powers of every person; to the phlegmatic, especially, whose fluids will thus soon become vitiated, and san-

guine temperaments thence acquire a superabundance of blood. The melancholy, whose blood circulates slowly, must suffer inconveniences in their secretions and excretions by this indulgence; and we generally find, that long sleepers are afflicted with costiveness and obstructions. Early rising, and timely going to bed, if persevered in, will render them more healthy and vigorous.

If it can be advantageous to any description of persons, to sleep beyond the usual proportion of time, it is to the choleric.—Sleep, immediately after supper, is apt to occasion the night-mare, or a stagnation of the blood, which, by its pressure, produces the sensation or idea of this troublesome bed-fellow. It is principally the nervous, the debilitated, and those of an impaired digestion, who are visited by such terrific dreams.

The proper duration of sleep, in youth and adults, is usually settled at six or seven hours; in children, and the aged, from eight to nine hours. Yet the individual deviations in the constitution of the body, and its various wants, scarcely admit of any precise rules. The more bodily weakness we feel, the more we may indulge in sleep, provided it be refreshing. If people in a state of health are perfectly cheerful in mind and body, when they first awake, this is the most certain criterion that they have slept sufficiently.

We should, however, be on our guard, not to confound the natural wants of the body with a blameable custom. For most persons habitually sleep too much, or remain longer in bed than they ought. The origin of this destructive custom undoubtedly arises in infancy, when children are permitted to sleep on very soft and warm beds, and encouraged to lie longer than is proper, from a mistaken notion that they cannot sleep too much. By such injudicious treatment they cannot attain a solid texture of the body, and a foundation is laid for many subsequent diseases. The rickets, so very common in many families, in the present age, often originate in such indulgences, since the general relaxation of the body, and the tendency to profuse perspiration, is thus in an extra-

ordinary degree promoted. At the age of puberty, this effeminacy of the body, and the inclination to sleep, together with the pleasant sensation which a soft and warm bed affords in a waking state, are certainly the first and most frequent causes of a vice, that might be effectually prevented by early rising.

The custom of sleeping long, when continued to the state of manhood, becomes so habitual, that it cannot be relinquished without great struggles, and a firm resolution. Those, then, who are not possessed of this firmness, instead of attaining a strong constitution, will acquire a phlegmatic, relaxed, and cold temperament, which will render them irresolute, and incapable of energetic efforts; and from which the mind, by degrees, becomes as indifferent towards every object, as the body is unfit for muscular exertion.—Hence, to listen to the voice of Nature, in this respect, will contribute more to our happiness, than to shorten our repose by many of the usual but violent means of excitement, when the body is in want of rest.

To children, at a very early period of life, no limits of sleep can be prescribed; but, after the sixth or seventh year of their age, some regulations become necessary, to habituate them to a certain regularity. The just proportion of sleep can be ascertained only by their more or less lively temperament, by their employments, exercise, and amusements through the day, and according to the state of their health. In pursuing this measure, however, we must not attempt to awaken children from their sleep in a violent or terrifying manner, which is frequently done, and is extremely pernicious.

In great disquietude of mind, and after violent passions, sleep is the more necessary, as these agitate and exhaust the frame more than the most fatiguing bodily labour. Hence many persons never sleep so sound as when they are afflicted with grief and sorrow. A fretful and peevish temper, as well as a fit of the hypochondriasis, cannot be more effectually relieved than by a short sleep. Frequently, after a sleep of a few minutes only, we

awake refreshed, we can reflect on our difficulties with a calm mind, and again reconcile ourselves to the troubles of life. In such situations, though we should not be able to sleep, even a quiet posture of the body, with the eyes closed, is of some advantage.

There is scarcely any misfortune so great, that it cannot be relieved or alleviated by sleep; as, on the contrary, we should inevitably sink under the pressure of affliction, if this beneficent balm did not support us. Yet, frequently too, uneasiness of mind, by its continual stimulus on the *sensorium*, entirely prevents sleep: hence the unquiet repose, and even whole sleepless nights of those whose heads are filled with cares or important schemes. As mental labours exhaust our strength more than those of the body, literary men, who employ themselves in long and profound reflections, require more sleep than others. Though some persons, whose body and mind are equally indolent, have a greater inclination to sleep than the lively and laborious, yet it is not so beneficial to them, since they are destitute of the essential requisites to health, namely, activity and vigour.

The most healthy, and those who lead the most regular lives, frequently have an uneasy and very short sleep: they also require less rest at one time than another. He who digests easily, stands less in need of sleep than others. After taking aliment difficult of digestion, Nature herself invites to the enjoyment of rest, and to sleep in proportion to the time which is required for the concoction and assimilation of food. Excessive evacuations, of whatever kind, as well as intoxication by strong liquors, render additional sleep necessary. In winter and summer, we require somewhat more time for sleep than in spring and autumn; because the vital spirits are less exhausted in the latter seasons, and the mass of the blood circulates more uniformly, than in the cold of winter or heat of summer, when it is either too much retarded or accelerated.

It is very improper to sit up too late in the long winter evenings, whether at the desk or the bottle, either of which is then more hurtful than in summer, because the

want of sleep is greater. Those who wish to spend the winter in good health, and useful labour, should retire to bed at eight o'clock in the evening, and rise at three or four o'clock in the morning. A winter morning, indeed, is not very charming, but the evening is *naturally* still less so; and there is no doubt that we can perform every kind of work with more alacrity and success in the early part of the day than at night; and that our eyes would likewise be benefited by this regulation, after sleep has invigorated them, to undertake any task in the morning; but they are fatigued at night, from the exertions of a whole day.

Every stimulus may interrupt sleep, or, at least, render it uneasy, and often occasion dreams, the cause of which is generally owing to the irritation of the stomach, or intestinal canal. Dreams are, as it were, a middle state between sleeping and waking, and generally indicate some defect in the body, unless they give representations which originate in the occurrences of the preceding day.

An uneasy sleep, accompanied with startings, abrupt and incoherent speeches, and a frequent change of posture, is, at no time, a good symptom: it is as frequently a forerunner, as it is the effect of disease, and may be owing to the following causes:

1. Emotions of the mind and violent passions always disorder the vital spirits: at one time they increase, at another diminish, and sometimes altogether check their influence, the consequences of which extend to the whole circulation of the blood. Sorrows and cares produce a similar effect. Hence the nocturnal couch is a very improper place to pursue moral researches, or to recollect what we have done, spoken, and thought through the day. To read interesting letters, received late in the evening, usually occasions an unquiet sleep.

2. A bad state of digestion, and especially hard or corrupted food, on account of the connection of the brain with the stomach.

3. A repelled perspiration, if we have not covered ourselves conformably to the climate, season, and weather.

—In this case a current of air is still more hurtful than intense cold.

4. An apartment or bed to which we are not accustomed may also occasion an uncomfortable sleep, as travellers frequently experience. It is, therefore, an essential part of a good and healthful education, to accustom children to sleep alternately upon couches filled with materials of different degrees of softness and elasticity; and to remove them occasionally to various parts of the house, more or less temperate: this change consequently enables them to sleep comfortably in a simple but clean bed, in whatever place or situation they may find it.

Debilitated persons injure themselves much by sleeping in the day-time, against the order of Nature, and keeping awake the greater part of the night. Day-light is best adapted to active employments; and the gloom and stillness of night to repose. The evening air which we inhale soon after sun-set, and night-air in general, which is vitiated in the country by the exhalations of plants, is very detrimental to the delicate. The forced watchfulness of those who apply themselves in the night to mental pursuits, is exceedingly prejudicial. A couple of hours sleep before midnight is, according to old experience, more refreshing than a much longer sleep after that period.

The question, whether to *sleep after dinner* be advisable, must be decided by a variety of concurrent circumstances; custom, bodily constitution, age, climate, and the like.

In a weak and slow state of digestion, after having taken hard or solid food, we may indulge ourselves in a short sleep, rather than after a meal consisting of such nourishment as, by its nature, is easily concocted. But debilitated young people, especially, should not sleep too much, though their weakness induce them to repose; for the more they indulge in it, the greater will be their subsequent languor and relaxation.

Individuals of a vigorous and quick concoction may

undertake gentle exercise immediately after meals, if they have eaten food that is easily digestible, and which requires little assistance, but that of the stomach and its fluids. And even such persons, if they have made use of provisions difficult to be concocted, ought to remain quiet after dinner, and may occasionally allow themselves half an hour's sleep, in order to support digestion.

To rest a little after dinner, is farther useful to dry and emaciated persons, to the aged, and individuals of an irascible disposition; to those who have spent the preceding night uneasily and sleepless, or have been otherwise fatigued, in order to restore regularity in the insensible perspiration; but in this case the body must be well covered, that it may not be exposed to cold. Persons who are fond of sleeping at any time of the day, are usually more indolent and heavy after it than before. A sleep after dinner ought never to exceed one hour; and it is also much better sitting than lying horizontally; for, in the latter case, we are more subject to fluctuations of the blood towards the head, and, consequently, to head-ache.

Much depends upon the manner of lying in bed, and on the posture to which we accustom ourselves. To lie on the back, with the arms over the head, prevents the circulation of the blood to the upper extremities, and is not unfrequently productive of serious consequences. It is equally pernicious to lie in a crooked posture, or with the breast very low and bent inwards; by which the intestines are compressed and obstructed in their motions, and the blood cannot easily circulate downwards; whence may arise giddiness, and even apoplexy. Lying on the back is equally improper, and productive of frightful dreams, together with many other inconveniences; the reverse posture is likewise noxious, as the stomach is thus violently oppressed, the free respiration much impeded, and the whole circulation of the fluids in the chest and abdomen prevented, to the great injury of health.

The most proper posture, then, is on one side, with the body straight, the limbs slightly bent (not stretched,

because they ought to rest), so that the body may lie somewhat higher than the legs. When the head is laid high, a short sleep is more refreshing than a longer one when it is reclined too low. To healthy people it is a matter of no consequence on which side they lie, and they may safely, in this respect, follow their own choice. Some dietetical observers allege, that it is better to lie, in the evening, on the right, and, in the morning, on the left side; that in the evening the aliment may more readily leave the stomach, and that afterwards this organ may be better warmed by the liver.

In the evening we should eat light food only, and that sparingly, wait for its digestion, and, consequently, not retire to rest till two or three hours after supper. The mind ought to be serene and cheerful previous to going to rest: we should, then, as much as possible, avoid gloomy thoughts, which require reflection and exertion. It is, therefore, a pernicious and dangerous practice to read ourselves asleep in bed. We would do much better to take a little exercise before bed-time, by walking up and down the room.

Sleep, without dreams, of whatever nature they may be, is more healthful than when attended with these fancies. Yet, dreams of an agreeable kind, promote the free circulation of the blood, the better concoction of food, and a due state of perspiration. The contrary takes place in unpleasant dreams, which excite anxiety, terror, grief, fear, and other depressing passions. In the latter case, they are symptoms of irregularity in the system, of an approaching disorder, or are occasioned by an improper posture of the body. The functions of the body before alluded to, are impeded by such dreams; and the vital spirits, which ought to be restored and cherished, are dissipated by violent emotions, insomuch that the body and the mind continue unrefreshed.

In order to preserve the body warm, we make use of feather-beds and covers;—in summer, at least, we ought to sleep upon mattresses. It is a most essential requisite to every person who wishes to lead an agreeable, active,

and useful life, to provide himself, in time, with a *proper* couch. To insure all the advantages which may be thence derived, nothing is better than a mattress filled with horse-hair, or, if cheapness be an object, with dry moss, at least six inches thick. Several of such mattresses may be placed one above another; the bolster ought to be well stuffed and elastic; in winter with feathers, and in summer with horse-hair, more or less high, according to circumstances, but always so that the head may lie considerably more elevated than the breast and the rest of the body.

The cover should never be tucked in too closely, that the access of external air may not be wholly excluded. If we make use of a bedstead, or a sofa with steel springs, one of the mattresses before described, with a similar bolster, and the light cover of a double blanket, will be found sufficient. These beds are not only the most convenient for early risers, but also the most conducive to health. The higher classes of society in Ireland appear to be so well convinced of the salubrity of this mode of sleeping, that their children, instead of being placed on enervating feather-beds, are habituated to sleep upon bags filled with cut straw, overspread with blankets, and a light cover. I understand, that this praiseworthy practice is every day becoming more general.

Indeed, there is no doubt that the muscles and nerves are more effectually braced by a proper elastic couch, than either by the most exquisite down of Norway, or the most powerful tonic or strengthening remedies taken internally. Yet these remarks are applicable only to the healthy state of the body, when Nature requires no additional aid or precaution, in managing the organs of perspiration. Every bed ought to be so regulated, that it may slope down imperceptibly towards the feet; and, if the particulars before stated be attended to, a healthy person will never sleep too long; he will generally awake in six hours, feel himself refreshed, rise with cheerfulness, and be fit to undertake his usual tasks, either of body or mind.

What has been remarked in a former chapter on drefs, and the advantages derived from covering the skin with animal wool, particularly in enervated and infirm persons, is likewise applicable here, with respect to the drefs, and the immediate covering of the skin, when in bed.— Though we usually undress ourselves as far as the shirt, partly for the sake of cleanliness, and partly with the view of relieving the body from every pressure and incumbrance, and of promoting a free circulation of the blood; yet, we should be cautious, lest we injure ourselves by a sudden exposure to the air, when undressing, especially after the hot and sultry days of summer. A long and commodious gown of flannel would be a proper night-dress, especially for those who retire to their bed immediately after the bath, in order to preserve a gentle degree of perspiration.

The head should not be covered with a warm flannel or worsted night-cap, as it were to make it a vapour-bath; the thinnest cotton or linen cap being fully sufficient. The consequences resulting from the pernicious practice of keeping the head too warm, have been explained on a former occasion. The shirt-collar should be loose, the wristbands open, and if, from a bad habit, we have been accustomed to wear neck-cloths during sleep, they should be tied as loosely as possible. Persons who are naturally chilly in the lower extremities, or are liable to pains of the stomach and abdomen, would do well to sleep in woollen stockings, but not in the same which they have worn through the day.

The *feather-beds*, in which we usually sleep, are certainly hurtful in many diseases, some of which they may even produce: for they absorb or imbibe the perspired vapours of the body, without our being able to cleanse them of these impurities, which are again re-absorbed and re-conducted through the pores, to the great injury of health. For this reason, mattrasses, filled with horse-hair, or moss, are, in every respect, preferable. But as many individuals have not sufficient resolution to use these, or are apprehensive of the consequences of sudden

change, they may at least cause their feather-beds to be frequently and carefully shaken, aired in the sun, and furnished with a new covering. For the same reason the bed ought not to be made immediately after we rise, as is generally practised; but the clothes should be taken off, spread out, and not laid on the bed till the time of going to rest draws near. Farther, it is highly improper to sleep in beds overloaded with clothes: they heat the blood more than is consistent with health, and produce an immoderate and enervating perspiration, which still more weakens the organs already relaxed by sleep.

The custom of sleeping with the curtains drawn close is pernicious to health, because the copious exhalations which then take place cannot be properly dissipated, and are, consequently, re-absorbed. It is also imprudent to cover the head almost entirely with the bed-clothes. Persons who cannot sleep without curtains, should tuck up the lower ends of them, or place them over chairs, so that they may not lie close to the bed, but admit a more free access of air;—that side alone which is next the wall ought to be entirely covered with the curtain.

For similar reasons, the large common sleeping-halls, or wards in public schools, as well as in hospitals, are extremely prejudicial to health; though they may be necessary evils, and cannot be easily remedied in the great seminaries of education. Neither the most healthy situation, with high, lofty, and spacious apartments; nor the daily practice of airing and cleaning them, are sufficient to counteract the bad effects that arise from this baneful custom of crowding so many persons together, to breathe in a common and confined atmosphere.

From these considerations, as well as in many other respects, the sleeping together in one bed, whether children or adults, cannot be recommended as a custom conducive to health; though it be sanctioned by the authority of time immemorial. Indeed, it has been remarked, in the domestic economy of barbarous nations, that, in general, every individual has a separate couch.

The old custom of warming the bed also deserves to

be condemned; as it has a direct tendency to produce weakness and debility. This will be still more dangerous, if done with a charcoal fire, which, by its poisonous vapours, may prove very pernicious. A person who is accustomed to sleep in a cold bed will not feel much inconvenience in the severest weather; for, after being a short time in bed, the natural warmth of the body will overcome it: as, on the contrary, those who sleep in a warmed bed will be the more liable to feel cold, as soon as this artificial heat is dissipated.

If it can be avoided, the bed-chamber ought not to be on the ground floor, nor towards the north. Many people prefer this situation in summer, on account of the cool air; they should, however, consider that, in such an apartment, the morning, as well as the night-air, is damp and unwholesome. A bed-chamber ought to be exposed to the early rays of the sun, which awake man in a state of health at a proper time, and enliven, strengthen, and incite him to rise, after having been refreshed by rest. It is, farther, more advisable to endure a moderate degree of heat, which may be modified at pleasure, by various means, than to inhabit damp and low apartments, from which the moisture cannot be easily dried up in summer.

A spacious and lofty room should always be chosen for a bed-chamber; for small closets, and particularly concealed beds, are extremely objectionable.—The windows should never be left open at night; and as damp rooms are very prejudicial to health, we ought to pay attention, that the bed may not stand near a damp wall. It is in every case preferable to place the bed so that all the sides of it stand free. This method of placing the bedstead in or about the middle of the room has another advantage, which, with timorous persons, is perhaps of importance. It is well known that a flash of lightning, if it accidentally enter through a window, will take its direction along the walls, and not touch any thing placed in the middle of a room.

Lastly, no candle or rush-light should be kept burn-

ing during the night in a bed-room; for it not only vitiates the air in a very considerable degree, but it disturbs and prevents the rest of those whose sleep is uneasy, particularly the aged. In a dark apartment, sleep generally comes without much invitation; as, on the other hand, the light of a candle stimulates the brain, consequently the whole nervous system; and the approaching comforter, whose arrival we so fondly wish, is thereby prevented, or easily interrupted, and banished to calmer regions.

CHAP. IX.

SECTION FIRST.

Of EVACUATIONS in general;—their different species, as well as their peculiar nature investigated; together with the necessary directions for their management, according to the different states of the body.

THE evacuations of the body, from its superfluous, impure, and noxious particles, are no less necessary than its nourishment. The same power which changes and assimilates our food and drink, likewise effects the due and timely evacuation of the secretions. It is an object of the first consequence, that nothing remain in the body which ought to be evacuated; and that nothing be ejected which may be of use to its preservation.

How many persons do we find who complain of bad health, notwithstanding every attention they pay to the air they breathe, to aliment, exercise, sleep, &c. while others enjoy a good state of health, though totally careless with regard to these particulars! Indeed, much depends on a proper state of the evacuations. If these be disordered, the most rigorous observance of dietetic rules is insufficient to insure our health; while, on the contrary, most of those rules may be neglected for some time, without any injurious consequences, if the evacuations be regular.

Nature removes not only noxious matter, or such as is in a state of corruption, but likewise the useful fluids, if they become superabundant; for instance, the milk, semen, and blood. In such cases, therefore, these must be considered as objects of evacuation, equally natural and salutary.

By *stool*, the thick and feculent remains of assimilated food are evacuated; for every kind of aliment contains a proportion of dregs, and their purest particles only can be changed into the milky fluid, or chyle.

By *urine* we eject the oily and saline particles, secreted from the blood, in a diluted state, which prevents them from injuring the external membranes by their irritating acrimony.

By *insensible perspiration*, which is carried on through the smallest orifices of the pores, the most subtile and noxious particles of the fluids are evaporated; which, if they were retained within the body, would occasion its total corruption.

Nature expels all crude and acrid substances by these three principal emunctories; and, accordingly as they are disordered, diseases of different degrees of malignity and duration will necessarily ensue. Nature also frequently relieves herself by more unusual channels; such are, the bleeding of the nose in plethoric young men, the hæmorrhoids, with which persons of a middle age are sometimes troubled; the various ulcers common to those whose fluids are in an impure state; the excretions of saliva, and the expectorations of others, &c. By a premature suppression of these troublesome but salutary efforts of Nature, great mischief may be produced to the individual.

Many persons perspire much under the arm-pits, others in their hands or feet; others again are subject to eruptions in the face or different parts of the body: such canals, however, if Nature be once accustomed to eject by them certain useless and hurtful particles, cannot be suddenly stopped, without occasioning greater and more dangerous inconveniences;—cleanliness, in the strictest

sense of the word, is almost the only safe remedy to counteract their fatal effects.

Of Evacuations by Stool.

As the food and drink we consume every day, necessarily deposits useless matter, daily opening by stool is extremely salutary; particularly to persons subject to costiveness and the many disagreeable consequences thence arising. Of these I shall only enumerate frequent headaches, difficult breathing, flatulency, eructations, and spasms: hence peevishness of temper, general lethargy, and, at length, hypochondriasis;—the abdomen of such persons feels tumid: the circulation of the blood in the intestinal vessels is retarded; and, consequently, the general circulation interrupted.—These complaints, sooner or later, certainly attend habitual costiveness; especially if no other kind of evacuation, as that by urine, or insensible perspiration, be in an uncommon degree promoted.

In healthy individuals, the evacuation by stool usually takes place once or twice a day; and, according to the habits of the person, either in the morning or evening. Those who are troubled with costiveness should visit the customary retreat, regularly every morning at a fixed hour, and thus endeavour to promote this necessary evacuation by proper efforts, though they may not, at the moment, feel much inclination; for it is well founded, on experience, that Nature, at length, will be habituated by perseverance, to observe a certain regularity in this respect. The most proper time for these attempts is early in the morning, or late in the evening.

Whatever dietetic means may be adopted to promote stool, ought to be employed either from three to four hours previous to the time we wish to succeed, or immediately before going to bed. If in the morning, we ought to rise early, to take first a slice of bread, with much fresh butter; then eat some boiled prunes; drink two or three cups of the decoction; and, if necessary, assist the operation of the whole with a tea-spoonful or two of cream of tartar in treacle. Thus prepared, we

ought to walk a little in the open air, or, if the weather be unfavourable, about the room; to rub the lower belly with the palm of the hand; and, when we sit down, to retain the breath, by frequently, though moderately, inspiring; and, lastly, to change the posture of the body from a straight to a crooked and side-long direction, till we succeed in the attempt.

Although these trials should repeatedly fail, we must not be discouraged from persevering in them; nor ought we, without absolute necessity, to choose any other than the wonted hour to attain the end proposed; so that this, at length, may become the only time, when Nature shall spontaneously assist our endeavours. During these practices, however, the choice of our diet is of the greatest moment; as we can powerfully promote the desired end, by living chiefly upon rye-bread, spinage, boiled fruit, particularly prunes, decoctions of currents, the sweet and emollient vegetables, especially the beet-root, and occasionally salted meat; the last of which should be assisted with sufficient drink, not of the spirituous kind, but rather of a mild and aperient nature, such as sweet table-beer, whey, infusions of malt, apples, pears, and the like.

It deserves to be remarked, that if every effort of this kind prove abortive, the voluntary exertions in promoting stool should not be carried to an extravagant degree; as by unnatural pressure we may bring on ruptures, the bursting of veins in the rectum, or the piles. Hence it is more advisable to abstain, for some time, from all crude and solid aliment, and to use only such articles of food and drink as have been before pointed out. And if this also should not be attended with the desired effect, we may then have recourse to the mild purgatives, such as rhubarb, senna, cream of tartar, and the neutral salts.

While too much rest, and a sedentary life, prevent this species of daily evacuation, gentle exercise, and serenity of mind, seldom fail to promote it. In many families, costiveness is an habitual and hereditary distem-

per. Sometimes too it originates from a weakness of the intestinal canal, brought on by diseases, but more frequently from the habitual use of certain substances of food and drink; for instance, the lean flesh of quadrupeds, game, the leguminous vegetables, red Port wine, strong and bitter malt liquor, and the like. Hence, the predisposing cause of the complaint should always be attended to. If it arise from weakness, red wine, bitter ale, and other corroborants, are well calculated to effect a cure. In every instance, frequent exercise in the open air is extremely useful. Persons who live sparingly on animal food, and are otherwise temperate in their passions and desires, are seldom deprived of this natural benefit; and, even though they should be costive for two or three days together, they have little to apprehend from such irregularity; for, if they do not wantonly overload their stomach, the accumulation of impurities cannot be considerable.

Where weakness and atony, or laxity of the intestines, are the causes of a costive habit, the external use of cold water, by affusion on the lower belly, or merely washing it with that fluid, is frequently preferable to all other dietetic remedies. This is one of the most simple means of preventing painful costiveness; though it ought not to be applied indiscriminately, and least of all in those cases where the use of the cold bath is improper and hurtful. If debility and relaxation of the intestinal canal be the cause of costiveness, clysters of cold water alone are generally productive of singular benefit; yet these, also, cannot be used without many exceptions—not, for instance, by females, during the menses, by persons afflicted with the piles, or having weak lungs, nor in certain kinds of colics and spasms.

The discharges by stool ought to be neither in too liquid nor too dry a state. Strong labour, heating drinks, and long fasting, render them disagreeably hard, even in the healthiest individuals; from the fæces remaining too long in the region of the lacteals, so that the nutritious or milky part of the concocted mass is entirely exhausted,

and there remains only dry, excrementitious matter. These stools are, therefore, frequently a symptom of good digestion, such as attends sound constitutions in general.

When the excrements are too dry, and in a globular form, they often occasion head-ache, inflammation of the eyes, febrile complaints, hæmorrhoids, ruptures, paralytic affections, and frequently produce flatulency and spasms, in persons subject to hysterics and hypochondriasis: nay, even the suppression of flatulency is extremely dangerous. Those who are apt to delay going to stool, expose themselves to many serious inconveniences; and when this sensation is lost, it does not usually return for some time. The fæces collected in the intestinal canal powerfully distend it, give rise to the blind hæmorrhoids, and sometimes even to a falling down of the anus; the excrements become dry, and their re-absorbed fluid parts irritate and vitiate the blood, and produce many obstinate distempers. If a person has been costive for several days, the inclination to go to stool is sometimes lost, until restored by artificial means.

Loose and frequent stools are common with those who take more aliment than their stomach can digest; for the food, from the stimulus occasioned by its corruption in the alimentary canal, is too soon ejected, without being duly assimilated. Hence, debilitated persons, who eat immoderately, generally are thinner and less muscular than others, who observe a regular and temperate diet. The stools are a tolerable criterion of the quantity and quality of the food we have taken, and whether the digestive powers be adequate to its concoction: for, in weak intestines, the unassimilated matter of food turns acrid, and contributes nothing to the nourishment of the body. Thus it happens, that debilitated individuals, and such as are of a phlegmatic habit, continue lean and emaciated, whatever quantity of food they consume. For this reason they ought to live principally on milk, eggs, broths, tender meat, emollient vegetables; and to eat only when they feel a true appetite, and after moderate exercise. It is not the man who

takes comparatively little food that can be called temperate, but rather that person who makes use of no more aliment than he is able to digest. Thin and copious stools are a certain proof of indigestion.

Some persons are accustomed to go to stool more than once a-day, others only every second day, and yet enjoy a good state of health. It is, however, more desirable and wholesome to have a regular evacuation every day; and children, especially, ought to have two or three discharges daily. Aged persons, in general, have but one stool in a day. The air we breathe makes, in this respect, a remarkable difference. The more we perspire in summer, the fewer are the evacuations; and, on the contrary, moderate exercise is productive of more regular excretions than that which is too violent. Robust and muscular individuals perspire more than the weak and enervated; hence the evacuations of the former, by other emunctories, are more limited; while the latter, whose fluids are not duly determined to the surface of the body, have more frequent openings by stool.

Obstructions and costiveness, of which many persons now complain, are owing to a great variety of causes, but chiefly to our luxurious mode of living, and to the custom of making too many meals through the day. The time requisite to the digestion of a meal, cannot be well ascertained, as some stomachs concoct quickly, and others slowly; and there is a remarkable difference in the degrees of digestibility among the various species of food; the nature and properties of which have been already pointed out in the fifth chapter: but this may serve as a general rule, that we ought never to take a new supply of food till the preceding meal be digested.

Some moderate livers, after having deviated from their usual temperance, do not feel any inconvenience till after two or three days, when they are troubled with copious evacuations, head-ache, uneasiness, and dejection of mind. Such excesses are frequently accompanied with serious consequences, of which costiveness is only the forerunner. Neither the emetics or laxatives, to

which the glutton has recourse, nor the fashionable stimulants and strengthening bitters, can prevent or remedy the ultimate effects of such brutal habits. The emetics and purgatives inevitably weaken the first passages, and lay the foundation of constant obstipations; while the stimulants deprive the intestines still more of the necessary humours, and render the evil much greater. The most proper means of preventing these hurtful consequences, are the following:

1. A due degree of bodily exercise, by which the muscular power will be invigorated, the nervous system strengthened, and the circulation of the blood promoted.

2. We ought to take a proportionate quantity of drink to our victuals; a circumstance not always sufficiently attended to by persons of a sedentary life. Drink dilutes the food, and softens the bowels. A weak, well-fermented, and well-hopped beer, is an excellent beverage: so is water, with the addition of a little wine. Warm diluents, on the contrary, have a manifest tendency to increase obstructions, by the relaxation they produce in the intestines.

3. Let us choose the quality of our food according to our constitutional wants. Those who cannot digest well, ought to avoid all thick, mealy dishes, pastry, onions, warm and new bread, and such as is not thoroughly baked. Costive persons frequently complain of an acid generated in their stomach; while others, on account of this acid, are subject to loose and very frequent stools. Vinegar, and tart wines, are but rarely the cause of this acidity; never, indeed, except when they disagree with the stomach. New wines, on the contrary, as well as vegetables of an acescent kind, and particularly long-kept and roasted fat meat, have the strongest tendency to produce acidity, the heart-burn, and, at length, obstructions in some constitutions, and diarrhoeas in others. The proper species of food, in such cases, are herbs, carrots, sugar-peas, French beans, parsley-roots, the scorzonera, artichokes, horse-radish, mustard-leaves, and similar plants, boiled soft in broth, suffi-

ciently salted, and without the addition of fat or butter. With these, only a small quantity of meat ought to be used, and this should be tender; but not fat fish, nor game kept too long, for the purpose of rendering it mellow; and, lastly, all kinds of fruit ought to be eaten boiled, rather than raw.

4. We should not too much indulge in sleep, which, particularly after dinner, is hurtful to persons whose digestion is languid, and whose evacuations are preternaturally slow. During sleep, all the motions in the system are performed with less vigour, and more tardily: and, in this respect, to keep awake, may be considered as a species of exercise; for the nerves, in that state, are more active, and the circulation of the blood is carried on with greater energy.—Evacuations by stool can be suppressed, by sleeping an improper length of time, for instance, ten or twelve hours instead of seven or eight; and we may prevent these salutary discharges, by sitting down to any inactive employment, previous to the usual inclination to retire to stool.

If it be our wish to preserve health, we ought not only to guard against costiveness, but likewise to prevent, by all proper means, too frequent excretions. Copious evacuations of this kind exsiccate the body, and deprive it of that strength, which is necessary to support its exertions. Persons subject to diarrhœa, cannot be too cautious in the use of watery, saline, and easily fermentable articles of food and drink, and in avoiding violent fits of anger and other passions. On the contrary, they will promote their health, by using provisions of a drying nature, drinking a well-fermented bitter beer or ale, or, if they can afford it, good old wine:—all of which have the beneficial tendency to promote perspiration, and thus prevent superfluous humidity in the body.

If too copious evacuations proceed from a relaxed state of the intestines, daily exercise is of considerable efficacy; for the fibres of the whole body are thereby invigorated; and, if irritating or peccant humours should

be the cause of the complaint, nothing is better calculated to expel them by perspiration, urine, or stool, than spirited and persevering muscular motion, till the body be tolerably fatigued. But, in this case, we must not attempt to remove or suppress the material stimulus by astringent remedies; for, instead of evacuating the noxious matter by the proper emunctories, such medicines will necessarily produce dangerous and often fatal diseases.

It would be a desirable object, in houses which are not provided with water-closets, that every individual were furnished with a night-chair; as most of the common places of retirement are literally ventilators, where some parts of the body are exposed to a current of air, which is frequently the cause of disorders, particularly in persons subject to colds and all other complaints originating from suppressed perspiration; accidents which cannot fail to injure those whose lungs are unsound. Men who are troubled with the piles, and, above all, women during the menses, ought to be very cautious in resorting to such places.—In the usual privies, there generally prevails in summer a pestilential fœtor; so that it becomes almost impossible to wait for the proper evacuation, both because of the disagreeable smell, and the danger of being infected with disease.

After every stool, there is a slight bearing down of the anus; a circumstance which renders some precaution in the cleaning of it necessary. The substance used for that purpose ought to be previously examined, whether its surface contain any rough and loose particles, which would be immediately communicated to the anus, and might gradually produce the blind hæmorrhoids. Lastly, all unnatural forcing and straining of costive persons, is not only useless, but may also be attended with dangerous consequences. It is, therefore, more advisable to use all proper means of keeping, if possible, this important excretion in due regularity; and, to attain that desirable end, it is likewise necessary to abandon all strait garments, especially laced stays and tight waistbands.

Of Urine.

In a state of health, this discharge takes place oftener than once in a day. The urine of those who live moderately, and take proper exercise, if examined in the morning after rising, and after having spent a quiet and comfortable night, is thin, clear, of a straw colour, or inclining to yellow, with a white, loose, and uniform sediment rising in the middle: it makes no foam, but what immediately vanishes, and has no unusually disagreeable smell. If it correspond to this description, it is a symptom of good digestion, and of the body being free from impurities. The quantity of this evacuation, in healthy persons, depends on their constitution, the season, and the weather. It is less in warm than in cold climates, on account of the increased perspiration. In winter we generally eject more urine than in summer; and this nearly in proportion to the degree of insensible exudation. In spring and autumn, it is probably voided in an equal proportion.

We may judge (not prognosticate) respecting the state of the body, from the appearance of the urine in the morning only; for, during the day, this would be a fallacious criterion, from the nature and quantity of food and drink we consume. The ancients were extremely fond of predicting the different states of health and disease in the human body, from the appearances observed in the urine. Among the moderns, who are better acquainted with the animal œconomy, these appearances are not implicitly attended to, as they have frequently been found to mislead the observer; yet, the early morning urine, if allowed to stand for an hour or two, exhibits some phenomena, which render it an object worthy the attention of the medical practitioner. Thus, a thin, pale urine, which is voided by the hypochondriac, the hysteric, and persons afflicted with spasms in the abdomen, indicates great weakness, or the approach of cramps, originating from a contraction of the smaller secretory organs. It is likewise of a whitish colour, after taking

much weak drink. In debilitated individuals, the urine is foamy, and this froth remains on the top for a considerable time; because it abounds in tough and viscid particles. The health of such persons, however promising in appearance, is by no means permanently established.

The urine is of a red colour, after too little drink, or after drinking spirituous liquors, after violent exercise, profuse perspiration, and after having spent a restless night. It yields a sediment resembling brick-dust, when the stomach is impure, and the tongue white with a yellowish tint, and covered with viscous matter. According to the higher or paler colour of the urine, in an ordinary state of health, the body may be considered as being more or less vigorous. If, after long standing, no sediment be deposited, great weakness is indicated: but if a cloud be observed swimming in the middle, the conclusion is more favourable, although the urine be thick and sandy.

Indeed, it is less dangerous to suppress the evacuations by stool, than by urine; for, if it remain too long in the bladder, it becomes acrid and corrosive. If the inclination to make water is accompanied with a discharge of a few drops only, it is called a *strangury*; if the difficulty of voiding it is attended with pain, a *dysuria*; and, if a total suppression of it takes place, it is then called an *ischuria*. These diseases are frequently the effects of some malt-liquors, or of certain articles of food, particularly vegetables containing much acidity. In the beginning of such painful complaints, relief can be given by fomenting the patient about the genitals with flannel-cloths, as hot as he can bear, by keeping him sufficiently warm, and allowing him plenty of warm, diluent drink.

Although the quantity of the urine to be voided through the day cannot be accurately ascertained, yet this evacuation ought always to be proportionate to the drink we have taken, and to the degree of perspiration. If we perceive a deficiency in this discharge, we ought to take moderate exercise, to drink light, thin, and aci-

dulated diluents, and to eat a variety of such herbs and fruits as possess diuretic virtues: of this nature are, parsley, asparagus, celery, juniper-berries, strawberries, cherries, and the like. We should be careful not to retain the urine too long; a practice which would occasion relaxation and palsy of the bladder, and which might at length produce the gravel or stone.

Many maladies may arise from voiding too small a quantity of urine: hence the necessity of attending to this excretion, from which we may frequently discover the cause of the disease. The relative state of vigour or debility in the individual, the mode of life, more or less drink, dry or damp weather—all produce a difference in the quantity of this evacuation. Robust persons eject less urine than the debilitated; a copious emission of it is always a symptom of a relaxed body, which is not possessed of sufficient energy to expel its noxious particles by transpiration through the cutaneous vessels.

The more exercise we take, the less we lose by the urinary passages; since they are drained by the pores. Cold and moist air checks perspiration, but promotes the excretion by urine. When this canal is suppressed, the bladder sometimes becomes so much distended that it bursts, as may easily happen to parturient women; and hence arise incurable *fistulae*; or, if the passages be obstructed, the urine retreats into the cellular texture of the whole body, and penetrates even into the cranium. Women, however, are able to retain it longer than men. Too copious an evacuation of urine constitutes a peculiar disease, known by the name of *diabetes*, which, not unfrequently, proves fatal to the sufferer, after he has discharged several gallons a day for a considerable length of time.

Among the rules and cautions for the proper management of this evacuation, it deserves to be remarked, that it is hurtful to make water too often, or before a proper quantity of it be accumulated in the bladder. By such practice, this vessel gradually contracts into a narrower compass than is assigned by Nature, and cannot again be

easily distended. Too long a retention of urine, on the contrary, preternaturally enlarges the bladder, weakens its muscular power, and may, with the advancement of age, occasion *ischuria*, or a total suppression; besides which, it promotes the deposition of mucus and sand in the bladder, and inevitably leads to that troublesome and painful complaint, the stone.

Of insensible Perspiration.

Of all the natural evacuations, none is so important and extensive, none is carried on with less interruption, and none frees the body from so many impurities, particularly from acrid and thin humours, as insensible perspiration. The health of man chiefly depends on the proper state of this function: the irregularities occurring in it, occasionally produce peevishness of temper, headache, disturbed sleep, heaviness in the limbs, &c. and, on the contrary, we find ourselves most lively and vigorous when it is duly and uniformly performed.

A person of a middle stature, and in perfect health, perspires, according to the calculation of some, from three to four pounds weight; according to others, about five pounds, within twenty-four hours. The exudation by the pores is most essential during the night, the noxious particles only being then separated; which, on account of the disturbances we are exposed to through the day, cannot be so well effected, as the circulation of the blood is interrupted; while, at night, it is comparatively more calm and regular: besides which, the nocturnal perspiration is more copious, from the greater uniformity of the surrounding atmosphere.

Most of the febrile diseases arise from a suppressed perspiration; as the exuded matter is of an acrid and irritating nature. To transpire beneficially, means, that the impure and pernicious particles only be ejected, in which case the perspiration is invisible and imperceptible. This is so essential a requisite, that without it the health of the individual cannot long subsist. The re-

ciprocal connection between the functions of the stomach and of perspiration, is so obvious, that if the latter be checked, the former is immediately affected; and the reverse takes place, if the stomach be disordered.

The more vigorously a person perspires (it ought to be well remarked, that the question here is not of *sweating*), the more active are the powers of the body, in the regular concoction of the alimentary juices; and the more certain it is, that no fluids will superabound: for the fluids, though refined and subtile, far exceed in weight the more compact and solid parts of the system, so that they would oppress the machine like a heavy burthen, if not evacuated by the pores of the skin. Most individuals, however, are accustomed to direct their attention only to evacuations of a more gross nature, or such as are more obvious to the senses. But *insensible* perspiration is of greater moment than all the other excretions; and by paying due regard to that function, if it should be accidentally disturbed, we may frequently discover the lurking cause of a distemper, and remove it, before it has materially injured the body.

Yet, even in the most healthy, this perspiration is not at all times, nor at all hours of the day, equally active. It is weaker after a plentiful meal; but as soon as the food is digested, we again perspire with increased energy; for the new chyle being changed into blood, imparts additional efficacy to the vital powers, as well as to the circulation of the blood itself. As we perspire considerably more in summer than in winter, our mode of life, with respect to sleep, as well as to food and drink, ought to be regulated accordingly. We know from accurate observation, that if we retire to bed immediately after supper, the process of perspiration is checked in a remarkable degree: we also know, that it is highly conducive to health, that this important function of the body be preserved in the most uniform state: hence it necessarily follows, that, after supper, we ought to sit up, at least, two hours; and to afford this benefit both to the organs

of digestion and perspiration, our suppers should not be delayed to the late hours now so absurdly in fashion.

According to the experiments made by different inquirers into the nature of insensible perspiration, this process is most forcibly affected, and sometimes totally suppressed, by the following circumstances:

1. By violent pain, which, in a remarkable degree, consumes the fluids of the body, or propels them to other parts.

2. By obstructions of the cutaneous vessels, which are frequently occasioned by the use of salves, ointments, and cosmetics.

3. By severe colds, especially those contracted at night and during sleep.

4. When Nature is employed with other objects. Thus perspiration is weaker during the time of concoction, particularly after using food difficult of digestion. This is likewise the case when Nature endeavours to promote any other species of evacuation, which more engages the attention of the senses; for instance, vomitings, diarrhœas, considerable hæmorrhages, and the like; as also when the efforts of Nature are too weak: hence the aged, the debilitated, and poor persons, unable to supply the wants of the body, or to pay due attention to cleanliness, perspire less than others. Lastly, the same must happen to individuals, of a sedentary life, who neglect the necessary exercise of the body; and those, likewise, who wear tight garments and improper ligatures about the joints.

Perspiration, on the contrary, is promoted,

1. By stretching or expanding the limbs; as the lungs and muscles thus acquire an additional impulse, and the fluids, circulating too slowly in the smaller vessels, are propelled to the larger veins and arteries, and forwarded to the heart; so that this principal muscle is then obliged to extend and contract its ventricles with greater force, and, consequently, to quicken the whole circulation of the blood.

2. By the lukewarm bath, which is well calculated to

soften the skin, and thus to open the pores for a better perspiration.

3. By moderate bodily exercise.

4. By mild sudorific remedies; and, for this reason, it is extremely proper, in the case of a recent cold, to drink two or three cups of tea, especially when going to bed.

If perspirable matter collect in drops, it *should* then be called *sweat*, and is no longer a natural and necessary evacuation; on the contrary, we find very healthful and robust persons who seldom or never sweat. By means of this exudation, both noxious and useful particles are, at the same time, ejected from the surface; the body is enfeebled; the blood is rendered impure; and the secretion of bad humours is prevented by every violent effort of the cutaneous vessels.

If sweating be carried to excess, it is extremely injurious, and may even be productive of consumption. By insensible perspiration, on the contrary, the superfluous particles only are expelled; because the circulation of the fluids is slower, and more calm and uniform. This important purification of the blood ought never to be checked: if, therefore, we wish to take a bracing exercise, it should by no means be continued till profuse perspiration take place.

Cold only checks perspiration, when it occasions an unusual stimulus on the skin, and when we too suddenly remove from a warm to a cold atmosphere. Hence the necessity of accustoming ourselves, from early youth, to the vicissitudes of heat and cold, of walking every day in the open air, and of washing the whole body, at least once a week, with lukewarm, or, still better, with cold water. By this practice, the pores are braced, and insured to undergo the different changes of the weather and seasons, without suffering (as most people now do, upon the slightest occasion) by severe cold and catarrhs.

It is never too late to begin this strengthening process, by frequently washing and rubbing the whole surface of the body with cold water; for, if cautiously managed

at first, it cannot fail to invigorate young persons and adults, as well as the aged. To sleep on feather-beds, occasions a constant vapour-bath at night, which destroys the beneficial acquisitions of the day. To remove from a cold temperature to a still colder one, is not nearly so prejudicial as to exchange, suddenly, the air of a warm room for that of a moist and cold atmosphere. This accounts for the frequent colds caught in summer, even by going from the burning rays of the sun to the cooling shade; and hence too the first cold of autumn is most sensibly felt, because we are then unaccustomed to that impression.

Much, also, as has been before observed, depends on the nature and properties of our food and drink, in respect to the state of insensible perspiration. The subtle and rarefied fluids only, not those of a coarse and oily consistence, can pervade the skin. Too many oleaginous, viscous, and crude articles of nourishment, such as fat meat, pastry, boiled mealy dishes, smoked hams, sausages, &c. have a strong tendency to obstruct the free perspiration of the body, and, consequently, to affect the serenity of the mind.

All the depressing passions and emotions are a powerful check to insensible perspiration; while, on the contrary, those of an exhilarating nature may promote and increase it to such a degree, as sometimes to prove the predisposing though distant cause of consumptions. Moderate daily exercise is eminently calculated to support this function, and to strengthen the whole body. Cleanliness produces a similar effect; for some impurities continually settle on the surface of the body; and these, if not removed in time, clog the pores, and are so detrimental to health, that they may occasion many obstinate distempers, which might be easily prevented, or at least checked in their progress, by a proper and constant attention to the skin.

Too violent a perspiration indicates great debility of the body, or a laxity of the cutaneous vessels, which may frequently be removed by cold bathing or wash-

ing. When persons are troubled with unusual night-sweats, they may receive benefit (if it be not a symptom of hectic fever) by taking, immediately before going to bed, two or three drachms of cream of tartar, in either beer or water. But, if this simple remedy, after repeated trials, should prove ineffectual, a professional man ought to be consulted; as long-continued night-sweats may, in the end, produce great weakness, and even consumption.

In most of the common colds, the popular stimulant remedies, such as heating liquors, and particularly sudorifics, are ill calculated to relieve the complaint. If the patient, at the same time, be troubled with pain in the bowels, head-ache, a foul tongue, &c. a gentle laxative will be of greater service than the diaphoretics. But if the stomach be peculiarly affected, if the tongue be clean, and the appetite good, two or three cups of warm diluent drink, a tepid bath for the legs, a moderately warm room and dress, gentle exercise, and friction of the skin with warm cloths, are the most proper and generally effectual means of relief.

As the retention of useless and superfluous matter is hurtful, it is not less detrimental to health, if substances, not prepared for evacuation, are ejected from the body. Of this kind are bleedings from the nose, the mouth, and the vessels of the anus: though these are not natural evacuations, yet they may occasionally be beneficial, as Nature sometimes makes an effort to expel noxious matter in an unusual manner. But these parts or fluids, ejected as pernicious, strictly speaking, ought not to exist in the body; and, though the evacuation of them be beneficial, it is a symptom of disease. If, therefore, such preternatural discharges take place too violently, or frequently, they ought to be checked with judgment and circumspection; and we should endeavour to lead (but not to force) Nature to a more salutary canal than that she has adopted, either by accident or wanton compulsion.

Of the Saliva.

The saliva should not be confounded with mucus, or slime; the former is a fluid not intended by Nature to be evacuated, as it serves the important purpose of mixing and preparing the food for the stomach; hence it ought not to be unnecessarily wasted by frequent spitting: the latter, mucus, may be safely thrown out as burdensome and offensive. The absurd custom of smoking tobacco is extremely prejudicial, as it weakens the organs of digestion, deprives the body of many useful fluids, and has a direct tendency to emaciation, particularly in young persons, and those of lean and dry fibres. To these it is the more detrimental, as it promotes not only the spitting of saliva, but likewise other evacuations. This plant is possessed of narcotic properties, by which it produces, in those who first begin to smoke it, giddiness, cold sweats, vomiting, purging, and, from its stimulus on the salival glands, a copious flow of the saliva.

Frequent smoking makes the teeth yellow and black; while clay pipes are apt to canker them to such an alarming degree as to infect the breath, and produce putrid ulcers in the gums. Delicate persons especially suffer from this nauseous habit; as it has a direct tendency not only to exsiccate their bodies, by contaminating the fluids, rendering them acrid, and vitiating the digestion and assimilation of food, but likewise to impair the mental faculties. These effects, however, are less to be apprehended, if smoking has become habitual, and is not carried to excess. To persons of a middle age, or those of full growth, particularly the corpulent, the phlegmatic, and such as are subject to catarrhal complaints, it may occasionally be of service, if used with moderation, especially in damp, cold, and hazy weather. Yet such persons ought never to smoke immediately before or after a meal, as the saliva is materially requisite to assist the concoction of food, which is not accomplished till about three or four hours after dinner;—they should smoke slowly; frequently drink small draughts of beer,

ale, tea, or any other diluent liquors, but neither spirits nor wine; and, lastly, they should use a clean pipe with a long tube; for the oil of tobacco, settling on the sides of the pipe, is one of the most acrimonious and hurtful substances, and may thus be absorbed, and mixed with the fluids of the body.

Of the Mucus of the Nose.

The secretion of this humour is intended by Nature to protect the olfactory nerves: hence every artificial method of increasing that discharge is preposterous, unless required by some particular indisposition of the body. The remarks, then, made with respect to the saliva and smoking, are also applicable to the mucus of the nose, and the custom of taking snuff. The question here is not respecting that catarrhal secretion of viscid slime, which is ejected as useless. Snuff stimulates the mucous membrane of the nose, and, sympathetically, the whole body; by which the mental powers are in a slight degree affected. If used as a medicine* only, and on occasions that require such a stimulus, it may be productive of some advantage; but a liquid sternutatory deserves every preference to a powder, which, though at first stimulating and occasioning a flow of viscous matter, in the end always obstructs the nostrils. And if this stimulus be too violent, it may bring on so profuse a discharge of

* By the persuasion of some friends, who were anxious to see the farcical performance of an empiric, whose name does not deserve to be recorded here, I joined a party, on the 25th of September, 1798, to witness the pretended effects of a certain *snuff-powder*, together with what he called his *acroamatic belts*, which were, at best, but a clumsy imitation of *Messmer's Animal Magnetism*, (vid. page 106, and foll.); and, as such, had not even the merit of originality. The medicated snuff appeared to be an assistant agent, contrived by this *Charlatan*, to stupify the heads of his patients, who were generally of the lowest class. The German adventurer stood in need of no external remedies to affect the nerves of the *Parisian* fanatics, while our *London Mountebank* could not, without some additional stimulus, operate on *English* brains. All this is characteristic of the vile and despicable plans adopted by quacks; but, to hear an ignorant pretender to medicine descanting on the virtues existing in his *acroamatic belts*; maintaining, that an universal magnetic spirit pervades them; that this spirit alone cures all the diseases incident to the human frame, even broken limbs and exfoliations of bones; and, lastly, to permit an audacious impostor to impeach the *bonesty* of the whole Faculty, before a deluded audience—such outrage loudly calls for the interference of the civil magistrate.

matter from the delicate membrane lining the nose, as to relax and corrode it, and to produce a *polypus*, or a concretion of clotted blood in the nostrils.

In several diseases of the head, eyes, and ears, however, the taking of snuff may occasionally supply the place of an artificial issue; though an extravagant use of it will most certainly produce a contrary effect; namely, accumulation of matter in the head, bleeding of the nose, and other complaints. Farther, it would be extremely injudicious to advise the use of snuff to persons of a phthical constitution, or those afflicted with internal ulcers, and subject to spitting of blood; as, by the violent sneezing it at first occasions, such individuals might expose themselves to imminent danger. Public speakers of every kind, as well as teachers of languages, and, in short, all those to whom a clear and distinct articulation is of consequence, ought to avoid this habit, which, when carried to excess, is, in this respect, extremely prejudicial. Those, too, who have a regard for cleanliness will not accustom themselves to this hurtful practice. In short, the continual use of snuff gradually vitiates the organs of smell, weakens the faculty of sight, by withdrawing the humours from the eyes, impairs the sense of hearing, renders breathing difficult, depraves the palate, and, if taken too freely, falls into the stomach, and, in a high degree, injures the organs of digestion.

Besides the many bad effects already mentioned, taking snuff may be attended with another consequence, equally dangerous to the alimentary canal. While the nose is continually obstructed, and a free respiration is impeded, the habitual snuff-taker generally breathes through the mouth only; he is always obliged to keep his mouth partly open, and, consequently, to inspire more frequently, and with greater efforts. Thus, by inhaling too much air, he probably lays the foundation of that troublesome flatulency which is common among those hypochondriacs who habitually take snuff. Hence every person, unless good reasons can be assigned in favour of

it, ought to be seriously dissuaded from the use of snuff, as well as of tobacco: and it deserves to be remarked, that both these practices may be safely, and cannot be too suddenly, relinquished, as soon as reason prevails over sensual gratifications.

Of Wax in the Ears.

If the ears be seldom, or not properly cleaned, there sometimes accumulates a species of wax, which grows tough and hard, diminishes the acuteness of hearing, obstructs the passage to the ear, and may, at length, produce total deafness. Abundant ear-wax, if it become thin and acrid, may occasion pain, and sometimes a running or suppuration in the ears. Daily washing with cold water, strengthens these organs, and is an excellent preservative of the sense of hearing. If it be apprehended, that insects have made their way into the cavity of the ear, it may be useful to introduce some sweet oil into the orifice, and to repose on that side, the ear of which is the seat of the complaint.

Of Hæmorrhages.

These are fluxes of the blood, salutary to both sexes, when required and regulated by Nature; but, if suppressed, they may be productive of serious and fatal consequences. The *menfes* are irregular in their appearance and disappearance; being much influenced by climate, and the constitution of the body; the *hæmorrhoids*, on the contrary, originate from the mode of living, joined to a particular temperament of the individual. *Bleeding of the nose* arises either from a superabundance of blood, and its impetuous circulation, or from the bursting of one of the small arteries. As long as these fluxes continue within proper limits, and do not exhaust the strength of the person subject to them, there is not the least necessity to employ any artificial means of suppressing them, because Nature must not be rudely checked in her be-

nescent efforts. Nay, even the affections and passions of the mind ought to be duly regulated, particularly by females of an irritable temper, during the recurrence of the menses; for these may, according to circumstances, be either preternaturally increased, or totally suppressed, to the great injury of health.

Lastly, it is extremely imprudent for young women to expose their feet and legs to dangerous colds, in washing the floors of rooms and passages upon their knees, at a time when they ought particularly to guard against the access of damp and cold. Humane and sensible persons would not require their servants to follow this prejudicial practice, by which they are liable to contract the most obstinate disorders: it produces obstructions in the abdomen, swelling of the legs, dropical complaints, palsy, and even consumptions:—hence the multitude of female servants continually taking refuge in the different hospitals.

Of the Retention of Milk.

Not less hurtful than the suppression of hæmorrhages, is the retention of the milk in the female breast. This, likewise, is generally occasioned by indulging in fits of passion, or by exposing the body, and particularly the lower extremities, to the influence of damp and cold places, or wearing wet clothes, or linen not properly aired. Hence may arise nodules, or small lumps in the breasts, troublesome swellings, especially if the milk be abundant, inflammations, accompanied with excruciating pain and violent fever, ulcers in one or more parts of the body at the same time, or schirrous callosities; and, at length, if neglected or mismanaged, cancer itself. In many instances, a premature stoppage of the milk, in lying-in women, has produced inflammation of the womb, and a severe child-bed fever. Lastly, imprudence with regard to food and drink, dress, air, &c. may occasion the suppression of the milk, as well as of every other evacuation.

SECTION SECOND.

Of the SEXUAL INTERCOURSE in particular;—its physical consequences with respect to the Constitution of the Individual;—under what circumstances it may be either conducive or detrimental to Health.

A subject of such extensive importance, both to our physical and moral welfare, as the consequences resulting from either a too limited or extravagant intercourse between the sexes, deserves the strictest inquiry, and the most serious attention of the philosopher.

The inclination to this intercourse, and the evacuation connected with it, are no less inherent in human nature than other bodily functions. Yet, as the semen is the most subtle and spirituous part of the animal frame, and as it contributes to the support of the nerves, this evacuation is by no means absolutely necessary; and it is, besides, attended with circumstances not common to any other. The emission of semen enfeebles the body more than the loss of twenty times the same quantity of blood, more than violent cathartics, emetics, &c. hence excesses of this nature produce a debilitating effect on the whole nervous system, on both body and mind.

It is founded on the observations of the ablest physiologists, that the greatest part of this refined fluid is re-absorbed, and mixed with the blood, of which it constitutes the most rarefied and volatile part; and that it imparts to the body peculiar sprightliness, vivacity, and vigour. These beneficial effects cannot be expected, if the semen be wantonly and improvidently wasted. Besides, the emission of it is accompanied with a peculiar species of tension and convulsion of the whole frame, which is always succeeded by relaxation. For the same reason, even libidinous thoughts, without any loss of semen, are debilitating, though in a less degree, by occasioning a propulsion of the blood to the genitals.

If this evacuation, however, take place only in a state of superfluity, and within proper bounds, it is not de-

trimental to health. Nature, indeed, spontaneously effects it, in the most healthy individuals, during sleep; and, as long as we observe no difference in bodily and mental energy after such losses, there is no danger to be apprehended from them. It is well established, and attested by the experience of eminent physicians, that certain indispositions, especially those of hypochondriasis and complete melancholy, incurable by any other means, have been happily removed, in persons of both sexes, by exchanging a single state for that of wedlock.

There are a variety of circumstances by which the physical propriety of the sexual intercourse is, in general, to be determined.* It is conducive to the well-being of the individual, if the Laws of Nature and society (not an extravagant or disordered imagination) induce man to satisfy this inclination, especially under the following conditions:

1. In young persons, that is, adults, or those of a middle age, as, from the flexibility of their vessels, the strength of their muscles, and the abundance of their vital spirits, they can more easily sustain the loss thence occasioned.

2. In robust persons, who lose no more than is speedily replaced.

3. In sprightly individuals, and such as are particularly addicted to pleasure; for, the stronger the natural and legal desire, the less hurtful is its gratification.

4. In married persons who are accustomed to it; for Nature pursues a different path, according as she is habituated to the re-absorption, or the evacuation of this fluid.

5. With a beloved object; as the power animating the nerves and muscular fibres is in proportion to the pleasure received.

6. After a sound sleep; because then the body is more energetic; it is provided with a new stock of vital spirits;

* That the question cannot, in this place, be directed to the *moral* propriety of the sexual intercourse, must be evident from the point of view in which this subject is here considered: hence every apology becomes unnecessary.

and the fluids are duly prepared: hence the early morning appears to be designed by Nature for the exercise of this function, as the body is then most vigorous, and, being unemployed in any other pursuit, its natural propensity to this is the greater; besides, at this time a few hours sleep will, in a considerable degree, restore the expanded powers.

7. With an empty stomach; for the office of digestion, so material to the attainment of bodily vigour, is then uninterrupted. Lastly,

8. In the vernal months; as Nature, at this season in particular, incites all the lower animals to sexual intercourse; as we are then most energetic and sprightly; and as the spring is not only the safest, but likewise the most proper time, with respect to the consequences resulting from that intercourse. It is well ascertained by experience, that children begotten in spring are of more solid fibres, and, consequently, more vigorous and robust, than those generated in the heat of summer, or cold of winter.

It may be collected from the following circumstances, whether or not the gratification of the sexual impulse has been conducive to the well-being of the body; namely, if it be not succeeded by a peculiar lassitude; if the body do not feel heavy, and the mind averse to reflection: these are favourable symptoms, indicating that the various powers have sustained no essential loss, and that superfluous matter only has been evacuated.

Farther, the healthy appearance of the urine, in this case, as well as cheerfulness and vivacity of mind, also prove a proper coction of the fluids, and sufficiently evince an unimpaired state of the animal functions, a due perspiration, and a free circulation of the blood.

There are, however, many cases in which this gratification is the more pernicious to health, when it has been immoderate, and without the impulse of Nature, but particularly in the following situations:

1. In all debilitated persons; as they do not possess sufficient vital spirits; and their strength, after this ener-

vating emission, is, consequently, much exhausted. Their digestion necessarily suffers, perspiration is checked, and the body becomes languid and heavy.

2. In the aged, whose vital heat is diminished, whose frame is enfeebled by the most moderate enjoyment, and whose vigour, already reduced, suffers a still greater diminution, from every loss that is accompanied with a violent convulsion of the whole body.

3. In persons not arrived at the age of maturity:—by an early intercourse with the other sex, they become enervated and emaciated, and inevitably shorten their lives.

4. In dry, choleric, and thin persons: these, even at a mature age, should seldom indulge in this passion, as their bodies are already in want of moisture and pliability, both of which are much diminished by the sexual intercourse, while the bile is violently agitated, to the great injury of the whole animal frame. Lean persons generally are of a hot temperament; and the more heat there is in the body, the greater will be the subsequent dryness. Hence, likewise, to persons in a state of intoxication, this intercourse is extremely pernicious; because, in such a state, the increased circulation of the blood towards the head may be attended with dangerous consequences, such as bursting of blood-vessels, apoplexy, &c. The plethoric are particularly exposed to these dangers.

5. Immediately after meals; as the powers requisite to the digestion of food are thus diverted, consequently the aliment remains too long unassimilated, and becomes burdensome to the stomach.

6. After violent exercise; in which case it is still more hurtful than in the preceding, where muscular strength was not consumed, but only required to the aid of another function. After bodily fatigue, on the contrary, the necessary energy is, in a manner, exhausted, so that every additional exertion of the body must be peculiarly injurious.

7. In the heat of summer it is less to be indulged in

than in spring and autumn; because the process of concoction and assimilation is effected less vigorously in summer than in the other seasons, and, consequently, the losses sustained are not so easily recovered. For a similar reason, the sexual commerce is more debilitating, and the capacity for it sooner extinguished, in hot than in temperate climates. The same remark is applicable to every warm temperature combined with moisture, which is extremely apt to debilitate the solid parts. Hence, hatters, dyers, bakers, brewers, and all those exposed to steam, generally have relaxed fibres.

It is an unfavourable symptom, if the rest, after this intercourse, be uneasy; which plainly indicates, that more has been lost than could be repaired by sleep; but if, at the same time, it be productive of relaxation, so as to affect the insensible perspiration, it is a still stronger proof that it has been detrimental to the constitution.

There are, as has been before observed, two principal causes, from which the indulgence in this passion has a debilitating effect on the constitution, particularly in men:—1. by the convulsive motion of the whole frame, combined with the impassioned ecstasy of the mind; and, 2. by the loss of this essential fluid, more than by any other circumstance. It certainly is ill-founded, that swellings of the scrotum may arise from a stagnation of the seminal fluid: such swellings, if they really take place, are not attended with any danger; as experience informs us, that they are either re-absorbed, to the benefit of the body, or, if the accumulation of the semen become too copious, it is spontaneously evacuated by Nature.

The relaxation of those who keep within the bounds of moderation, in this respect, does not continue long; one hour's sleep is generally sufficient to restore their energy. Such temperance is highly beneficial to the whole body, while it serves to animate all its powers, and to promote insensible perspiration, as well as the circulation of the blood. The semen can be emitted without injuring the body, if Nature alone demand it, that

is, when the reservoirs are full, and a material stimulus occasions it, without the active concurrence of the imagination.

As it is principally this fluid which affords vivacity, muscular strength, and energy to the animal machine, the frequent loss of it cannot but weaken the nerves, the stomach, the intestines, the eyes, the heart, the brain—in short, the whole body, together with the mental faculties;—it in a manner destroys the ardour for every thing great and beautiful, and surrenders the voluptuary, in the prime of his life, to all the infirmities and miseries of a premature old age, from which even the conjugal state cannot save him. The most certain consequence of excess in venery is hypochondriasis, frequently accompanied with incurable melancholy: the unhappy victim endeavours to exhilarate his mind, by a repetition of these convulsive exertions of his vital spirits, and thus precipitates himself into still greater misery. Many of the diseases of the eyes originate from such intemperance; and these votaries of pleasure are not unfrequently attacked with *tabes dorsalis*, or consumption of the back, which generally proves fatal.

In this respect, also, every individual ought to pay proper regard to his constitution. Some are provided, by Nature, with an uncommon portion of bodily vigour, while others are but sparingly supplied; the former, therefore, overcome slight transgressions of this kind without much danger, while the latter cannot commit excesses with impunity. The natural instinct ought always to be consulted, in whatever relates to this function; but it should not, as is frequently the case, be confounded with the artificial stimulus. Hypochondriacs, indeed, as well as those who make use of many nourishing species of food and drink, are sometimes stimulated merely by a certain acrimony in the abdominal vessels; such a stimulus, however, is totally unconnected with the impulse of Nature.

Frequent and copious emissions, during sleep, are productive of equally bad effects; they bring on the frailties

of age at an early period of life, and soon prepare the exhausted sufferer for the grave. But infinitely more dangerous is a certain secret vice, which debilitates the body more than any other species of debauchery. By this execrable practice, a greater quantity of semen is evacuated than by the natural commerce between the sexes; the vital spirits cannot operate so uniformly, as to counterbalance the convulsive effects which agitate the whole animal frame; and the circumstances which render this hateful vice so destructive to both sexes, particularly at a tender age, are, that the opportunities of committing it are more frequent than those of the sexual intercourse, and that it but too often becomes habitual.

The imagination, which, by the natural union of the sexes, is, in a certain degree, gratified, becomes more disordered by every repetition of the crime alluded to, as it is continually filled with libidinous images: and although the frequent loss of semen is, for a considerable time, supplied by a fluid of an inferior quality, yet, even by this imperfect supply, the body is drained of the spirituous and most valuable parts of its fluids.

All kinds of evacuation, when immoderate, are prejudicial to health; but that of the semen is particularly so; for it is an established fact, that every stimulus increases the secretion of humours, and that Nature is necessarily forced to make unusual efforts to restore the losses sustained, in the most speedy, though, in its consequences, the most ruinous manner.

As most female animals, while they are in a state of pregnancy, refuse to receive the males, so the connection with pregnant women appears to be physically improper. Although the dangerous consequences thence arising, both to the mother and child, may have been exaggerated, yet the embrace of women far advanced in pregnancy is certainly not conformable to the laws of Nature, and ought not to be considered as a matter of indifference. Such females as wantonly submit to it may readily miscarry; for the foetus is thus much compressed, and

an additional flow of humours is thereby occasioned. If, however, in married life, this intercourse, notwithstanding its impropriety, be indulged in, it ought to be practised with precaution, and not too frequently; as such excesses may not only enfeeble the mother, but likewise be attended with effects very hurtful to the child. Nay, it is asserted by some authors, that the frequent cases of *hydrocephalus*, or dropsy in the head, are to be ascribed chiefly to this practice;—a conclusion, which, though hypothetical, is not unreasonable.

A connection with females suckling children is not less improper; as the milk is thereby vitiated, and the health of the infant affected. Nor is it justifiable to gratify this passion during the menses; which may thus be either suddenly suppressed, or, by the increased access of the fluids, they may terminate in an hæmorrhage of the womb: besides which, the sexual intercourse during this period, as well as for some days immediately preceding, cannot answer the purpose of generation; because the ovum of the female, being but slightly attached, is again separated by the periodical discharge. Hence, the congress of the sexes is most generally crowned with fertility, after the catamenia have ceased; for then the female is in the most proper state for fecundation, because that the ovum has sufficient time to be consolidated before the next menstrual evacuation.

Not with a view to satisfy idle curiosity, but for the information of the reader, I shall give some particulars relative to the nature of the seminal fluid.

The semen in men, as it is emitted, consists of various compound humours. Besides the real semen prepared in the scrotum, and deposited in the proper vesicles, it is mixed with the peculiar moisture contained in the latter, with the liquor secreted by the prostate gland, and probably also with some mucus or phlegm from the urethra. It is of a greyish colour, inclining to white, is glutinous and tough, has a very volatile, penetrating smell, and is of considerable specific gravity. In water, the thicker part, which, in all probability, is the pure se-

men, sinks to the bottom; another part appears in fine threads, and forms a thin pellicle on the surface of the water. In persons not arrived at the age of maturity, and likewise in enervated adults, it is of a thin and serous consistence.

In the fresh semen of those who are capable of procreating, we find a great number of animalcula, which can be perceived only by means of the most powerful microscopes: these do not appear to be mere vesicles filled with air; as they are formed irregularly, one extremity being somewhat spherical, the other smaller and rather pointed.

As part of the small artery, through which the blood is propelled into both testicles, runs immediately under the skin, and, consequently, the blood is conducted from a warmer to a much colder place; as the seminal tubes in the testicles are very delicate and long, and take, throughout, a serpentine course—the canal traversing the upper testicle (*epididymis*) being alone thirty feet long and upwards; as, lastly, the narrow seminal tubes pass over into the wider canal of the epididymis, and this again into the still wider seminal passage: it is obvious, that the secretion and evacuation of the semen not only takes place very slowly, but also in a very small quantity.

Nature seems to employ a considerable time in preparing and perfecting a fluid which is indispensibly necessary to the propagation of the species. The quantity, therefore, which is emitted in every intercourse between the sexes, and which is computed to be equal to half an ounce weight,* can be but gradually replaced. Hence it happens, that even men of strong constitutions cannot indulge in venery more than once in three or four days, for any considerable time, without impairing their health and diminishing their strength. These remarks, however, apply chiefly, and almost exclusively, to the male

* This assertion, as well as that immediately following, rests upon the authority of Professor LODER, of Jena; and I here refer to his excellent work, "*Elements of Medical Anthropology, &c.*" (in German), p. 411. 2d edition, 8vo. Weimar. 1793.

sex; for, with regard to women, it is an erroneous notion, that they secrete any semen;—what has formerly been considered as such, consists merely of a pituitous liquor, proceeding from the womb and the vagina.

To return from this short digression, I shall farther observe, that, where it may be otherwise proper, it is an excellent and healthful rule (however ludicrous it may appear to the sensualist) to gratify the inclination for the sexual commerce only at regular periods, so that Nature may become habituated to it, without making unusual and hurtful efforts. Such regularity might be attended with the additional advantage, that persons, in a conjugal state, would not be so apt to commit excesses, which, in the end, are productive of satiety and indifference towards the object formerly beloved, and which are undoubtedly the frequent cause of a feeble and degenerate offspring.

No irregularities whatever are more certainly punished than those of venery; and, though the consequences should not immediately take place, they unavoidably follow, and generally at a time when they are most severely felt; sometimes in the organs of generation alone, and sometimes over the whole body. Even a connection with the most beloved object, the possession of whom has been long and anxiously wished for, does not exempt the voluptuary from these prejudicial effects, if the bounds of moderation be exceeded: at length the imagination becomes disordered, the head is filled with libidinous images, and the predominating idea of sensual enjoyment excludes the reflections of reason. Thus Nature becomes, in a manner, forced to conduct the fluids to the parts of generation, so that such unfortunate persons cannot relinquish this destructive habit; they are troubled with involuntary emissions of the semen, which are extremely debilitating, and either deprive them entirely of the faculty of procreating, or destroy the elasticity of the parts, and exhaust the semen to such a degree, as to produce only feeble and enervated children.

To those who lead a life of debauchery, spasmodic

affections, and even ruptures, are not uncommon: women are afflicted with the *fluor albus*, violent fluxes of the menses, bearing down of the vagina, and innumerable other maladies of a disagreeable nature. These destructive effects on the body are at first manifested by a general relaxation of the solids: the whole nervous system is reduced to a state of extreme debility, which is seldom, if ever, removed by the most rigorous adherence to diet, and the most apposite medical remedies. Hence generally arise, as has been already observed, the almost infinite varieties of hypochondriasis, and imbecility, to so alarming a degree, that persons of this description cannot direct their attention to one object for a quarter of an hour together; their spirits are exhausted; their memory, as well as their judgment, is greatly impaired; and, in short, all the faculties of the mind, all its serenity and tranquillity, are so much affected, that they scarcely enjoy one happy moment.

The external senses do not suffer less upon these occasions: the eyes, especially, become weaker, imaginary figures are continually floating before them, and frequently the power of vision is entirely destroyed. The stomach, also, on account of its intimate connection with the nerves, in a great measure partakes of these infirmities; whence arise diseases of various degrees of malignity: the lungs, too, become disordered; hence the many lingering and incurable consumptions, which destroy such numbers in the prime of life. If, however, they survive the baneful effects of their intemperance, their bodies become bent from absolute weakness, their gait sluggish and tottering, and the residue of their days is marked with painful debility.

Young persons, as well as those whose employments require great muscular exertion, are, in an uncommon degree, weakened by frequent debaucheries. Indeed, the sexual intercourse, even within the limits of moderation, is more hurtful to some individuals than to others. Thus, a person born of strong and healthy parents is not nearly so much hurt by occasional extravagance as

another, whose parents were weak and enervated, or who is himself threatened with consumption; and, lastly, those also ought to be abstemious in this respect, who feel an unusual lassitude and weakness, after the least indulgence.

There are individuals who, from ignorance, have long been in the habit of committing excesses, and who wish at once to reform their mode of life: the consequence of this sudden change generally is an indirect debility; and they become very liable to fits of the gout, hysteric and hypochondriacal complaints. As they are sensible of their growing weakness, they expect to relieve themselves by strengthening remedies, which render their situation still worse, being apt to occasion involuntary emissions of semen in the night, to relax and destroy the stomach, and, at length, to produce an irritating acrimony in the intestines, which is the frequent cause of such emissions. Even the mild corroborants cannot be used here with any hopes of success; as the body is overloaded with pituitous phlegm, from which readily arise jaundice and dropsy. Hence it is more advisable, and, at least in a physical respect, more salutary, to return from such irregularities by gradual steps, than by a too sudden and dangerous change.

It is farther remarkable, that most persons, especially in the higher ranks, do not marry at a proper period of life; partly from caprice and family considerations; partly on account of the difficulty to maintain a family, in the present more expensive mode of living; and partly from other causes, which are best known to batchelors. Thus they enter into the conjugal state, when their frame is enervated by dissipation of every kind; but such debauchees ought not to be permitted by the State to encumber the world with a degenerate offspring.

On the contrary, to be married too early, and before a person has attained the age of maturity, is likewise improper and hurtful. Every candidate for matrimony should endeavour to obtain the most accurate intelligence, whether the object of his affection be qualified

for the various duties of that state, or whether she be subject to phthifical, hyfteric, and nervous complaints, all of which ought to be guarded against; as, besides the misfortune of being united to a valetudinary partner, healthy women only can produce sound and vigorous children.

Those who do not marry for the sake of wealth and family interest, should choose a well-shaped and agreeable partner, as deformed mothers seldom bring forth handsome children. The natural disposition of a woman likewise deserves to be investigated, previous to the union; for it is the opinion of accurate observers, that children most generally inherit the propensities and passions of the mother. There ought to be no remarkable difference between the age of the married couple; and the most proper time of life for matrimony, in our climate, in general, appears to be that between the age of eighteen and twenty in the female, and from twenty-two to twenty-four in the male sex.

Lastly, women who are hump-backed, or who have had the rickets in their infancy, ought not to enter the state of wedlock; the former, in particular (according to the rules of sound state policy), should, by no means, be allowed to marry, until examined by professional persons, whether there be any impediment to child-bearing from the preternatural structure of the *pelvis*: this frequently renders the Cæſarean operation necessary; or the artificial separation of the pelvis is connected with imminent danger of life. For the same reason, even elderly women should not be encouraged to engage in matrimony, as they either remain barren, or experience very difficult and painful parturition.

In some rare instances, however, two great abstinence may be the cause of serious distempers. A total retention of the semen is not indeed always hurtful; but it may be so, occasionally, to persons naturally lascivious, and to those of a corpulent habit. These are, generally, provided with an abundance of the feminal fluid, which, if too long retained in the body, causes involuntary eva-

cuations, plethora, swellings, pain and inflammation of the feminal vessels, the inspissation, and, at length, corruption of the stagnating semen—sometimes priapisms, convulsions, melancholy, and, at length, furious lewdness.

The female sex are not less liable to diseases from inevitable abstinence: loss of strength, *chlorosis*, *fluor albus*, hysterics, and even *furor uterinus*, may sometimes be the consequence. Yet I cannot, upon this occasion, omit to remark, that these effects seldom, if ever, take place in those who live regularly, and do not encourage libidinous ideas; and that both males and females would, undoubtedly, derive greater benefit from total continence, till marriage, than by an unlimited indulgence in venery; in the former case, they would not only in a great measure contribute to their vigour of body and mind, but also to the prolongation of life. Young women, of an habitually pale colour, may be justly suspected of being troubled with the *fluor albus*; or of having an ardent desire to change their state.

To repair the injuries brought on by an excessive indulgence in the sexual commerce, such means ought to be employed as are calculated to remove the irregularities which have taken place in the functions of digestion and perspiration, and to give new energy to the solid parts. With this intention, the quantity of food is not of so much consequence as its quality; hence, the diet should be nourishing, of easy digestion, and have a tendency to promote insensible perspiration: in all states of debility, a light and spare diet is the most suitable to restore strength, without exerting too much the digestive organs. Rich nourishment, therefore, as well as tough, flatulent, and crude victuals, or those which are liable to ferment in the stomach, would, in such cases, be extremely pernicious. But, above all, a rigid degree of abstinence from the intercourse which has occasioned the weakness, cannot be too seriously recommended; as this alone is generally sufficient to restore muscular vigour, especially where youth and soundness of constitution are in favour of the individual.

Although we are possessed of no specifics, strictly deserving the appellation of *aphrodisiacs*, yet there certainly are means, which tend to promote the desire, as well as the capacity, of carrying on the sexual intercourse: these are either such as contribute to increase the seminal fluid, or stimulate the genital organs. Of the former kind are those which afford a rich chyle and salubrious blood, which conduct this fluid more abundantly to the parts of generation, and are, on that account, mildly diuretic; for instance, milk, eggs, tender and nourishing meat, herbs and roots of a mild, spicy nature, and such as promote the secretion of urine; moderate bodily exercise, particularly on horseback, &c. Merely stimulating remedies, however, should not be employed without great precaution, especially by the infirm, and those beyond a certain age; for the emission of semen, in the latter, is generally attended with debility and disgust: while, in young and robust persons there is no necessity to increase the secretion of that fluid by artificial means.

There are likewise remedies of an opposite tendency, which more effectually answer the purpose of moderating, or rather checking too violent a propensity to venery, than those before stated for promoting it. In the present state of society, and particularly among maritime nations, where a great proportion of men and women are obliged to lead a single life, the means conducive to diminish this passion, deserve every attention. Of this nature are:

- I. A laborious and rigid life, much bodily exercise, little sleep, and a spare diet; so that the fluids may be more easily conducted to other parts, and that they may not be produced in a greater quantity than is requisite to the support of the body. For the same reason it is advisable, as soon as the desire of committing excesses rises to any height, immediately to resort to some serious avocation, to make use of less nutritious food and drink, to avoid all dishes peculiarly stimulating to the palate, and to abstain from the use of wine, and other spirituous liquors.

2. To shun every species of excitement ; such as intimacy with the other sex, amorous conversations, libidinous narratives, seductive books, pictures, &c.

3. A cool regimen in every respect :—hence PLATO and ARISTOTLE recommended the custom of going bare-foot, as a means of checking the stimulus to carnal desire ; so that this indecorous practice was considered by the ancients as a symbol of chastity. The cold bath was likewise suggested for the same purpose ; others, again, among whom may be reckoned PLINY and GALEN, advised thin sheets of lead to be worn on the calves of the legs, and near the kidneys. With the same intention, and probably with better effect, may be used the cooling species of nourishment, such as lettuce, water-purslane, cucumbers, &c.—for common drink, mere water ; and, if the impulse of passion should increase, a small quantity of nitre, vinegar, or vitriolic acid, may occasionally be added to the water, to render it more cooling. Yet, all these, and similar remedies are of little or no advantage to the habitual voluptuary, especially if subject to hypochondriasis. The exciting cause in such persons not unfrequently proceeds from a diseased abdomen, which, as has been before observed, may be so much obstructed, that all other remedies are in vain, until the material stimulus of such obstructions be removed.—Lastly,

4. The various *extenuants*, such as spices of all kinds, and the smoking of tobacco, violent exercise, &c. are equally improper ; as these would inevitably impair the health of persons naturally lean, sanguine, and choleric ; while, in cold and phlegmatic temperaments, they would rather tend to increase than to abate the stimulus.

CHAP. X.

Of the AFFECTIONS and PASSIONS of the MIND; and their relative good and bad Effects on Health.

THE boundless ocean does not exhibit scenes more diversified than the various affections and passions of the human mind. They arise partly from the mind itself, and partly from the various constitutions and temperaments of the individual. While no other remedies but rational arguments can influence the mind, the disposition of the body may be changed and improved, by an infinite variety of means.

It is, indeed, principally from bodily causes, that many persons are violently affected from the most insignificant motives, and others are little, if at all, influenced by the most calamitous events. It is, for instance, obviously from a physical cause, that violent medicines, poisons, the bite of mad animals, &c. produce timidity, or fits of anger and rage;—that accumulations of black bile in the abdomen make people reserved, peevish, melancholy, and stupid. What we wish to think, and in what manner to continue the operations of the mind, frequently does not depend upon ourselves. The thoughts of the sober are very different from those of the man in a state of intoxication. A certain dish, a particular kind of drink, may suspend the powers of reason.

The temperament of man is, as it were, the source of his mental operations. Affections and passions are different one from another in degree only. The former imply the inclination or propensity to a passion; the latter, the realized affections, whether simple or compound; or, in other words, they constitute an actual and perceptible degree of sensual desire or aversion. According to Lord KAIMES, passions are active and accompanied with desires; affections are inactive and destitute of passion. He also distinguishes between wishes and desires: the former he calls the highest activity of the affections. Compassion and wishes for the better, are, in his idea,

affections: pity, and a desire after what is better, he calls *passions*.

Passions operate upon the body either suddenly, or slowly and gradually. Sudden death, or imminent danger of life, may be the consequence of the former: a gradual decline and consumption, that of the latter. The passions, as such, may be aptly divided into two principal classes, those of an agreeable and of a disagreeable nature. Men of strong imagination chiefly suffer from passions of the violent kind, while those of more understanding, and less fancy, are subject to slow emotions of the mind. Indolent persons, whose sensations are dull, are less passionate than those who combine acute feelings, and a lively imagination, with a clear understanding. The greatest minds are generally the most impassioned.

All passions, of whatever kind, if they rise to a high and violent degree, are of a dangerous tendency; bodily disease, nay, death itself, may be their concomitant effects. Fatal apoplexies have frequently followed sudden dread or terror. Catalepsy and epileptic fits sometimes accompany immoderate affliction, or distressing anxiety. Hypochondriasis, hysterics, and habitual dejection, may indeed arise from a variety of physical causes; but they are as frequently generated by the passions or sufferings of the mind alone, in individuals otherwise healthy.

Diseases of the mind, after some time, produce various disorders of the body; as diseases of the body occasionally terminate in imbecility. In either case, the malady must be opposed by physical as well as moral remedies.

It is only by the management of the constitution, and education of the individual, that the passions may be rendered useful; for, if uncontrouled, they affect us as a tempest does the ocean, without our being able to counteract their pernicious influence. Since all affections whatever consist in desire or aversion, they must necessarily be accompanied with representations of so lively a nature, as to induce the individual to perform the corresponding voluntary motions. Consequently the affec-

tions must also be accompanied by *sensible* motions within the body, not only by voluntary actions, but by those also which contribute to the support of life, and which are more or less violent, according to the degree of the affection. Joy, for instance, enlivens all the corporeal powers, and, as it were, pervades the whole animal frame. Hope has nearly a similar effect; and these two affections contribute to the preservation of health and life, more than all the medicines that can be contrived. But of the other affections of the mind, we can, in most instances, observe scarcely any effect but that of irregular motions, which, not unlike medicines, in a limited degree, and under certain circumstances, may be occasionally useful. *Hence the dominion over our passions and affections is an essential and indispensable requisite to health.* Every individual, indeed, is, at his birth, provided with a certain basis of inclinations, and with his peculiar moral temperament: the most tender infant, even before he is capable of speaking, discovers, by his features and gestures, the principal inclinations of his mind. If these be fostered in his susceptible breast, they will grow up with him, and become so habitual, that the adult cannot, without the greatest exertion, overcome them by the power of reason.

The physical state of the body is most happy when the mind enjoys a moderate degree of gaiety, such as is generally met with in healthy and virtuous persons. The circulation of the fluids and perspiration are then carried on with proper vigour; obstructions are thereby prevented or removed; and, by this lively and uniform motion, not only digestion, but likewise all the other functions of the body, are duly performed.

Joy is that state of the mind in which it feels extraordinary pleasure; in which it enjoys a high degree of contentment and happiness. The activity of the whole machine is enlivened by it; the eyes sparkle; the action of the heart and arteries is increased; the circulation of all the fluids is more vigorous and uniform; it facilitates the cure of diseases in general, and forwards con-

valescence. The different degrees of this affection are, *Gaiety, Cheerfulness, Mirth, Exultation, Rapture, and Ecstasy*.—Habitual joy and serenity, arising from the perfection, rectitude, and due subordination of our faculties, and their lively exercise on objects agreeable to them, constitute mental or rational happiness.

Evacuations which are moderate, a proper state of perspiration, and all food of an aperient quality and easy digestion, may be considered as contributing to a joyful state of mind. A pure, dry air, and every thing that invigorates the functions of the body, on the well-being of which the serenity of mind greatly depends, has a tendency to obviate stagnations. Joy, also, is more salutary when combined with other moderate affections: and the various bodily and mental exertions are then successfully performed. A moderate degree of joy removes the noxious particles of the body, and, in this respect, is equal, nay, superior in salubrity, to bodily exercise; but excess, and too long duration of this passion, attenuate and carry away not only the superfluous, but likewise many useful fluids, and more than the natural functions can restore. Hence, this too violent motion and dissipation of humours is attended with relaxation and heaviness; and sleep also is prevented, which alone can reinvigorate the nerves that have suffered from too great tension. On this account, the celebrated SANCTORIUS dissuades persons from gambling who cannot controul their passions; because the joy which accompanies their success is followed by sleepless nights, and great abstraction of perspirable matter. Sudden and excessive joy may prove extremely hurtful, on account of the great waste of energy, and the lively vibration of the nerves, which is the more noxious after long rest. Nay, it may become dangerous, by causing expansion or laceration of the vessels, spitting of blood, fevers, deprivation of understanding, swooning, and even sudden death. If we have anticipated any joyful event, the body is gradually prepared to undergo the emotions connected with it. For this reason we ought to fortify ourselves with the

neceſſary ſhare of firmneſs, to meet joyful as well as diſ-aſtrous tidings.

Laughter is ſometimes the effect or conſequence of joy; and it frequently ariſes from a ſudden diſappoint-ment of the mind, when directed to an object which, inſtead of being ſerious and important, terminates un-expectedly in inſignificance. Within the bounds of mo-deration, laughter is a ſalutary emotion; for, as a deep inſpiration of air takes place, which is ſucceeded by a ſhort and frequently repeated expiration, the lungs are filled with a great quantity of blood, and gradually emp-tied, ſo that its circulation through the lungs is thus beneficially promoted. It manifeſts a ſimilar effect on the organs of digeſtion. Pains in the ſtomach, colics, and ſeveral complaints that could not be relieved by other means, have been frequently removed by this. In many caſes, where it is purpoſely raiſed, laughter is of ex-celient ſervice, as a remedy which agitates and enlivens the whole frame. Experience alſo furniſhes us with many remarkable inſtances, that obſtinate ulcers of the lungs and the liver, which had reſiſted every effort of medicine, were happily opened and cured by a fit of laughter artificially excited.

Hope is the anticipation of joy, or the preſentiment of an expected good. It is attended with all the favourable effects of a fortunate event, without poſſeſſing any of its physical diſadvantages; becauſe the expectation of hap-pineſs does not effect us ſo exceſſively as its enjoyment. Beſides, it is not liable to thoſe interruptions from which no human pleaſure is exempt; it is employed prin-cipally with ideal or imaginary objects, and generally keeps within the bounds of moderation: laſtly, the ſenſe of happineſs contained in hope far exceeds the ſatisfaction received from immediate enjoyment, conſequently it has a more beneficial influence on health than good fortune realized. Although hope is, in itſelf, merely ideal, and preſents its flattering and embellished images to the fancy in a borrowed light, yet it is, nevertheleſs, the only ge-nuine ſource of human happineſs. Hope, therefore, is

the most favourable state of mind to health, and has frequently preserved the serenity, and prolonged the existence, of those whose situation appeared to be forlorn.

Love, viewed in its most favourable light, presents to us a picture of permanent joy, and is attended with all the good effects of that passion. It enlivens the pulsations of the heart and arteries, promotes the operations of the different functions of the body; and it has frequently been observed, that a strong attachment to a beloved object has cured inveterate disorders, which had resisted all medicinal powers, and which had been considered incurable. The changes which this passion can effect on the powers, and the whole disposition of the mind, are equally remarkable. For the extraordinary exertions made to obtain possession of the object of our wishes, excite a sensation and consciousness of strength, which enables man, not only to undertake, but also to perform the noblest and most heroic actions. In that exalted state, he sets all difficulties at defiance, and surmounts every obstacle.

Sorrow is the reverse of joy, and operates either suddenly or slowly, according as the cause of it is of greater or less importance and duration. The lowest degree of it is called *Concern*;—when it arises from the disappointment of hopes and endeavours, it is *Vexation*;—when silent and thoughtful, it settles into *Pensiveness* or *Sadness*;—when it is long indulged in, so as to prey upon, and possess the mind, it becomes habitual, and grows into *Melancholy*.—Sorrow, increased and continued, is called *Grief*;—when agitated by hopes and fears, it is *Distraction*;—when all these are overwhelmed by sorrow, it settles into *Despair*.—The highest degree of sorrow is called *Agony*.

Sorrow seldom proves suddenly fatal; for, though it injures the nervous energy, it does not hasten the circulation of the blood, with the rapidity of other passions, but rather retards its course. Yet there are examples of its speedy and fatal effects. Sorrow, like a slow poison, corrodes the powers of the mind and the body; it en-

feeble the whole nervous system; the heart beats slower; the circulation of the blood and other fluids becomes more inert; they frequently stagnate in their channels, and generate evils more serious than sadness itself. Farther, the face at first turns pale, then yellow and tumid; the body and the mind are worn out; the course of the blood through the lungs must be assisted by frequent sighing; the appetite and digestion become vitiated; and thus arise obstructions, hysteric and hypochondriacal complaints, and, at length, consumption, which is inevitable destruction to the body, frequently in the prime of life, and in spite of the healing art. Persons who indulge themselves in peevishness, very soon lose their appetite, together with the power of digestion; their mouth has a bitter taste; flatulency, colic, spasms, faintings, and the long list of stomachic complaints necessarily follow. Men become subject to the blind hæmorrhoids, and women to suppression, or other irregularities of the menses, costiveness, or chronic diarrhœa. The bile, on account of the retarded circulation, either grows thick, and produces indurations of the liver, or it is mixed with the blood, and generates jaundice or dropsy. Such persons, in time, become very irritable and peevish; and, with the frequent return of grief, the mind, at length, is totally employed in contemplating its wretched situation, so that it finds new food for increasing it, in almost every object it beholds. Hence the whole imagination is, by degrees, obscured, and the most usual consequences of it are, the deepest melancholy—succeeded either by a nervous fever, or insanity—sometimes cancer, and, at other times, a speedier dissolution, by what is then called *a broken heart*.

Solitude and idleness are not only the remote causes of many passions, but also support and foster them, without exception: they collect and fix the attention of the mind on the favourite objects, and make us reflect the more keenly on the causes of the passions, the less we are interrupted in these fond reveries by other sensations. Though it certainly is not in our power to avert grief,

from which even sages and heroes are not always exempt, yet we can do much to alleviate it, by denying ourselves the enjoyment which this indulgence in certain situations affords. Moral arguments of consolation, if properly adapted to the capacity and mental disposition of the sufferer, have, in these cases, generally a powerful influence. Those whose minds are affected by sorrow, ought to avoid, as much as possible, the company of persons who are fond of relating their calamities, and recounting their misfortunes. On the contrary, whatever has a tendency to cheer the mind, and to divert it from disagreeable objects, ought to be instantly resorted to. Of this nature are company, business, cheerful music, and the social affections. The body should be frequently rubbed with dry cloths, perfumed with amber, vinegar, sugar, and the like; the lukewarm bath may be employed with great advantage; and, if circumstances permit, the patient should remove to a warmer and drier climate.—If temperately used, a weak and mild wine is of excellent service; but an immoderate indulgence in this palatable drink may disorder the stomach, by the quantity of acid it produces.

Weeping generally accompanies sorrow, if it be not too intense: tears are the anodynes of grief, and ought not to be restrained by adults. We feel, in weeping, an anxiety and contraction of the breast, which impedes respiration; probably because a superfluous quantity of air is then contained in the lungs, which is forcibly expelled by sobbing. By this obstruction in breathing, the blood, which ought to be reconducted from the head, accumulates in the lungs, and, consequently, in the veins: hence arise redness, heat of the face, and a flow of tears, which are regulated in quantity by the degree of sadness that produced them. Their principal good effects are, that they prevent the danger to be apprehended from grief, by diminishing the spasmodic motions in the breast and head, and by restoring regularity in respiration, as well as in the circulation of the blood: hence persons find themselves much relieved after a

plentiful flow of tears; which, however, is extremely prejudicial to the eyes.

Grief, arising from an ungratified desire of returning home and seeing our relations, is productive of a disease, very common among the Swiss, and which sometimes, after a short state of melancholy, trembling of the limbs, and other symptoms apparently not very dangerous, hurries the unhappy sufferer to the grave, but more frequently throws him into a consumption, and generates the most singular whims and fancies. Persuasions, punishments, medicines, are here of no service; but a suddenly revived hope, or gratification of the patient's wishes, has a powerful effect; provided that an incurable consumption, or insanity, has not already taken place.

There is also a singular hystERIC or nervous fever, which affects many unfortunate sufferers in mental disorders, and which was first accurately described by RICHARD MANNINGHAM. Debilitated persons, and those of great sensibility, of both sexes, after melancholy affections and other exhaustions of strength, are particularly subject to this disorder. It begins with irregular paroxysms, and manifests itself by an undefinable indisposition, a dry tongue without thirst, anxiety without a visible cause, want of appetite, a low, quick, and unequal pulse, a pale and copious urine, occasional sensations of cold and shivering, sometimes clammy sweats, sometimes colic, sleeplessness, and insanity. According to the experience of MANNINGHAM, this fever generally terminates, in the course of thirty or forty days, by faintings, silent reveries, and death; unless it be removed, in the beginning, by bracing and strengthening remedies.

Among the mournful passions we may also include an *extravagant degree of love*, or such as transgresses the bounds of reason. It is then no longer a pleasure, but a disquietude of mind, attended with the most irregular emotions; it disorders the understanding; gradually consumes all the vital powers, by a slow fever; prevents nutrition, and reduces the body to a skeleton. All the passions, indeed, may, in their more violent degrees, oc-

caſion a deprivation of the underſtanding; but ſorrow and love are peculiarly calculated to produce ſo fatal an effect. This mental diſorder, to which both ſexes, but eſpecially women, are ſubject, ſhould be oppoſed, in time, by phyſical as well as moral remedies. Much may be done here by education, and a proper choice of ſociety. The imagination ſhould be withdrawn from ſuch images as may encourage inordinate and exceſſive love; and it cannot be denied, that young females particularly are frequently precipitated into this weakneſs, merely by reading improper novels. This imbecility of mind becomes the more dangerous in young people, as it is generally increaſed by ſolitude, and their ignorance of the real world. Exalted ideas of virtue, of magnanimity, and a generous ſelf-denial, are excellent antidotes; but, if the body ſink under the weight of paſſion, even theſe exertions are inſufficient to ſupport the energy of the mind. The phyſical remedies to be reſorted to in theſe ſituations are, rigid temperance, a frugal and leſs nourishing diet, conſtant employment, and much exerciſe; but the moſt ſucceſſful of all is a happy marriage.

Of all the paſſions that can aid the medical art, there is none from which we may expect greater benefit, than from a rational gratification of love. On the contrary, a too ardent paſſion is attended with the moſt dangerous phyſical conſequences: it is nearly related to diſappointed love, and uſually ſhows itſelf by a reſerved melancholy, a general diſtruſt, and a gloomy miſanthropy, which, however, externally appears only under the character of laſſitude and depreſſion. It is apt to be followed by a ſuppreſſion of the menſes, conſumption of the lungs, and even insanity.

Diſappointed love is extremely detrimental to health, and gradually deſtroys the body; it ſometimes produces *furor uterinus* in females of an irascible temper and romantic turn of mind, unleſs the paſſion itſelf be radically cured.

The moſt dangerous effect of love is *jealouſy*;—this pitiable paſſion, like diſappointed love and pride, is very

liable to terminate in madness.*—In sanguine temperaments, the excess of this affection is productive of consequences most prejudicial to the body; their fluids are impelled to a more rapid circulation, and they secrete, with preternatural velocity, that valuable fluid which stimulates them to venery. Such persons are much addicted to ease, pleasure, and every species of gratification, which suits their irritable nerves: their skin and muscles being soft, and accessible to every stimulus, and their fluids thin and rarefied, it may be easily conceived, that their humours circulate with rapidity to the parts of generation, and that their nerves are thus constantly excited to desire. The dreadful consequences are but too frequently visible in young persons, whether single or married, who have too early indulged in such excesses. Hence originate, *tabes dorsalis*, wasting of the limbs, spitting of blood, pulmonary consumption, hectic fever, and the whole train of undefinable nervous diseases, so called for want of more proper names; besides a host of other disorders, mostly incurable.

In order to prevent, or, at least, to oppose the torrent of these and similar passions, man must not only be seriously apprised and convinced of the danger and the dreadful misery attendant on intemperance and excess, but he must also submit to a strictly temperate mode of life, if he aspire to rise to the dignity of his nature, and above the rank of the lower animals. He is a rational being, though his sensitive faculties every where remind him of his animal nature. Hence the following rules cannot be too rigidly adhered to: A constant and useful employment; salutary exercise of the body, till it be moderately fatigued; temperance in eating and drinking; abstinence from strong and heating food and liquors: avoiding the habits of effeminacy, solitude, and too much rest; and, lastly, a strict attention, from early youth, to the most rigid modesty and purity of manners.

* In the houses appropriated to the unhappy victims of insanity, we generally meet with three different classes. The first consists of men deprived of their understanding, by pride; the second of girls, by love; and the third of women, by jealousy.

Envy arises from self-love, or self-interest, particularly in such individuals as have neglected to cultivate their own talents, or to whom Nature has denied certain qualifications of body or mind, which they cannot avoid seeing in others: it is principally excited, when they are witnesses of the prosperity of persons who possess such superior endowments. People of a narrow mind, and those of a confined education, are most subject to this mean passion. Envy deprives those addicted to it of an appetite for food, of sleep, of every enjoyment, and disposes them to febrile complaints; but, in general, it is hurtful to those only who brood over, and indulge in this corrosive passion. There are, however, vast numbers who show their envy at almost every event productive of good fortune to others, and who yet often attain a very great age. Joy at the misfortunes, or the discovered foibles of others, self-love, calumny against their neighbours, satire and ridicule, are the never-failing resources of their malignant dispositions. Medicines cannot cure a disease so odious; education and improvement of morals are its only antidotes. Envious persons commonly give too much importance to trifles: hence they ought to be instructed to employ themselves in more useful pursuits; to judge of things according to their true value, and to accustom themselves to a philosophic calmness; they ought to learn how to overcome, or, at least, to moderate their selfishness; to counterbalance their expectations with their deserts, and to equal or surpass others in their merits rather than in their pretensions.

Fear, or *anxiety*, is the apprehension of evil. Fear weakens the powers of the mind, relaxes and congeals every part of the human body, retards the pulse, hinders respiration, obstructs the menses, sometimes also perspiration; hence it produces tremor and dread; frequently too, it excites perspiration, since it disorganizes every thing linked to the body by means of the nerves. It is apt to occasion diarrhoea, and, in some individuals, an involuntary discharge of semen. Some persons of a relaxed habit are, by great fear, thrown into a perspiration

resembling the agonies of death; and others cannot retain their urine. Timorous persons are more readily infected by epidemical disorders than those possessed of courage; because fear not only weakens the energy of the heart, but, at the same time, promotes the absorption by the skin, so as to render the timid more liable to contagion. In short, fear increases the malignity of diseases; changes their natural course; aggravates them by a thousand incidental circumstances, so that they resist all remedies; and suppresses the efforts of Nature, so as to terminate in speedy dissolution. The usual consequences of violent and superstitious fear, produced by a disordered imagination, are eruptions in the face, swellings, cutaneous inflammations, and painful ulcers. In some instances, too, fear has produced palsy, loss of speech, epilepsy, and even madness* itself.

Bashfulness is an inferior degree of fear, which retains the blood in the external vessels of the breast, and the whole countenance. Hence in females of a delicate constitution, and transparent skin, we observe the blush not only overspread the face, but also the bosom. If carried to a greater degree, it is attended with dangerous consequences, particularly in the individuals before-mentioned: it may stop the flux of the menses, and prove fatal, if attended with a fever.—A very high degree of bashfulness may generate a dangerous fever, even in men; though, from modern education, instances of this latter kind become every day more rare. Excessive bashfulness closely borders on fear: if it does not proceed from vice or corrupted manners, it may be corrected by social intercourse with persons of a cheerful disposition.

Terror, or the dread of an evil surprising us, before we are able to prevent it, is, of all passions, the most destructive, and the most difficult to be avoided, because its operation is unforeseen and instantaneous. To shun

* One instance of this effect I have myself witnessed, in a gentleman, now living in Edinburgh, who was at Lisbon in the awful earthquake of 1755; and who, from the great fright which seized him upon seeing whole streets and churches tumble down before him, has been deprived of his understanding ever since.

all occasions that may produce it, is, perhaps, the only remedy. Persons who are feeble, and possessed of much sensibility, are most subject to terror, and likewise most affected by it. Its effects are, a sudden and violent contraction of almost every muscle that serves to perform the voluntary motions. It may farther occasion poly-pous concretions of the heart, inflammations of the external parts of the body, spasms, and swoons; at the same time, it may stop salutary evacuations, particularly perspiration and hæmorrhages; it may repel ulcers and cutaneous eruptions, to the great detriment of health, and danger of life. The menses are sometimes instantaneously suppressed: palpitation of the heart, trembling of the limbs, and, in a more violent degree, convulsions and epileptic fits, or a general catalepsy, and sudden death, are the subsequent effects of terror.

As terror quickly compels the blood to retreat from the skin to the internal parts, it forcibly checks the circulation of all the fluids. If anger accompany terror, there not unfrequently arise violent hæmorrhages, vomiting, and apoplexy. Terror has been suddenly known to turn the hair grey. An inattentive and injudicious mode of educating children often lays the foundation of this infirmity, which is difficult to be eradicated at a more advanced age. Persons, under the influence of this passion, should be treated like those who suffer from any other spasmodic contraction. Tea, a little wine, or spirits and water, may be given to them; vinegar, lavender-drops, or spirits of hartshorn, may be held to the nostrils; warm bathing of the feet, and emollient injections may be of advantage; and, lastly, the different evacuations ought to be promoted;—but, above all, the mind ought to be duly composed.

Anger arises from a sense or apprehension of suffered injustice, and an impetuous desire of revenge. Its different degrees depend upon the impressions made by the injury, or the ardour of the disposition to vengeance. In the former case, namely, when the sense of injustice is the prevalent feeling, anger affects us like ter-

ror, and produces spasmodic contractions and stagnations in the liver and its vessels, sometimes so considerable, as to change the bile into a concrete mass: from this cause alone, often arise the gravel and stone of the bladder. The more usual consequences of anger, if joined to affliction, are paleness of the face, palpitation of the heart, faltering of the tongue, trembling of the limbs, and jaundice.

If, on the contrary, the hope of revenge be the predominant feature in anger, violent commotions take place in the whole system; the circulation of all the fluids, as well as the pulsation of the heart and arteries, are perceptibly increased; the vital spirits flow rapidly, but irregularly, through the limbs; the muscles make uncommon efforts, while some appear almost palsied; the face becomes red; the eyes sparkle; and the whole body feels elated and inclined to motion. This species of anger is by far the most common.

Anger and terror are, therefore, particularly injurious to the tender bodies of infants, who are possessed of extreme sensibility, easily affected, and, consequently, much exposed to the influence of these passions, on account of the proportionably greater size of their nerves, and their inability to restrain passion by the influence of reason. They are liable to be so severely affected, that they may die suddenly in convulsions, or retain, during life, an imbecile body and mind, liable to be terrified upon the slightest occasion. When children are apt to cry in sleep, when they start up and make motions, indicating fear or terror, it must not be always ascribed to actual pain, but frequently to dreams, which fill their young minds with terrible images, especially if they have often been terrified while awake. All parents know how much some children are addicted to anger and malice, and how difficult it is to suppress the ebullition of these passions. Hence we ought to beware of giving the most distant encouragement to such destructive emotions. For it is certain, that both men and women of an irascible temper generally die of a consumption of the lungs.

Persons of an irritable disposition are more frequently exposed to anger than others; they are more easily affected by every passion. Hence the tendency to anger is particularly visible in individuals troubled with hysterics and hypochondriasis, as well as in debilitated and disappointed men of letters. Persons of a hot and dry temperament, of strong black hair, and great muscular strength, are likewise much subject to fits of anger.

A moderate degree of this passion is frequently of advantage to phlegmatic, gouty, and hypochondriac individuals, as it excites the nerves to action; but, if too violent and raging, it dissipates the more volatile part of the fluids, and is productive of the most hurtful consequences. In the epileptic, scorbutic, choleric, and such as have open wounds, it causes fever, spitting of blood, convulsions, inflammations, throbbing pains in the side, jaundice, apoplexy, &c.

No fluid is more affected by anger than the bile, which, by its violent influx into the *duodenum*, produces a fixed spasmodic pain in the region of the navel, flatulency, vomiting, a bitter taste in the mouth, uneasiness and pressure about the pit of the stomach, and, at length, either obstructions or diarrhœa. Wine, or other heating liquors, drank immediately after a fit of anger, and strong exercise or labour, are attended with consequences still more pernicious, as are also emetics, laxatives, and blood-letting.

The propensity to anger is increased by want of sleep, by heating food and drink, bitter substances, much animal food, rich soups, spices, and by all things that have a tendency to inflame the blood. Persons subject to this passion should use diluent, acidulated, and gently aperient drink, and observe, in every respect, the most rigid temperance. Such persons ought to sleep more than others; and employ the lukewarm bath, gentle cathartics of cream of tartar or tamarinds, fruit, butter-milk, whey, vegetable aliment, &c.

Among other arguments against anger, young people, especially females, should be informed, that, besides the

physical dangers attendant on this passion, it deforms the face, and, like all the impetuous emotions of the mind, deprives the passionate of every charm, and induces a strong aversion to such companions. Those who feel the approach of anger in their mind, should, as much as possible, divert their attention from the objects of provocation; for instance, by reciting a passage they have learnt by heart; or, as Julius Cæsar did, by repeating the Roman alphabet.

Inward fretting, in which sadness is combined with anger, is the more destructive, that it does not vent itself in words, or external actions. There may arise from it, giddiness, inclination to vomiting, sudden pain in the side, great anxiety, and similar complaints. Somewhat related to this infirmity is, what Dr. WEIKARDT, a German author, calls the "*mal de cour*:" a cruel malady, which comprehends anger, avarice, envy, and sadness. From a sense of neglect and unmerited injury, whether real or imaginary, which torments courtiers, the habitual peevishness of a great proportion of men leads them to avenge their disappointment, by oppressing and ill-treating their dependants. To accustom themselves to consider the physical and moral vicissitudes of life, and the perishable nature of all terrestrial happiness, with becoming firmness, and to enlarge their minds by the acquisition of useful knowledge, are the best remedies for this mental disease.

When sadness or fear has so overpowered the heart and the understanding, that all hopes of averting the apprehended evils are extinguished, the mind sinks into *despair*. We then see no comfort in futurity, and our ideas of approaching misery become so intolerable, that we think ourselves incapable to sustain it, and seek a remedy in death. There are attacks of despair, and an inclination to suicide, in which people are, upon any unforeseen event, suddenly deprived of their understanding, and reduced to temporary insanity. This precipitate species of despair more nearly resembles terror. Others are solitary and reserved; continually reflecting

on their misfortunes, till, at length, all their hopes and resolution fail. Their despair, consequently, is more nearly allied to melancholy than to any other passion.

A sudden fit of despair is owing to very irritable muscular fibres, which are quickly excited to the most irregular motions, and from which arises confusion in the senses and the imagination. In profoundly thoughtful and melancholy individuals, the solid parts are weakened, the fluids become thick, heavy and stagnating; and this weakness of the solids gives them a sensation of peculiar debility. They are dispirited and dejected; their stagnating, or, at best, slowly circulating fluids, occasion in them a sense of anxiety and timidity; whence gloomy representations are but too easily impressed on their mind. This is very apt to be the case with persons who eat more animal than vegetable food, which produces very rich and substantial blood. From this source some authors derive the choleric disposition of the British in general; but I have endeavoured to prove, in the fifth Chapter, on Food, p. 215, and following, that this observation cannot be maintained on rational principles, and that it is inconsistent with actual experience. It is also said of the Negroes, that they are more subject to melancholy, and even to suicide, because their blood is more compact, florid, and substantial, than that of the Europeans.

The ambitious are likewise frequently seized with this affection, when they meet with any thing to give them offence or obstruct their projects. Prodigals, and those who are strangers to the troubles and difficulties of life, are subject to fits of despair, whenever they are reduced to a state of adversity. Too rigid conceptions of virtue have also, though seldom, been the occasion of this infatuated passion. The cautions and rules for preventing despair and suicide, are the same which must be employed to counteract such other passions as depress the suffering mind; but they must be modified according to the temperament of the individual; and the cure of

such evils ought to be directed principally to the body, and partly also to the mind.

Nothing, indeed, is better adapted to protect us against all the uneasy and turbulent emotions of the mind, than a temperate and active life: but intemperance unavoidably occasions irregular commotions in the fluids, and may be the source of disease and imbecility. Hence PYTHAGORAS advised his pupils to abstain from animal food, which excites wrath, with all the other passions and desires. Idleness, and want of exercise, are not less productive of many malignant propensities.

It cannot be doubted, that those who, at an early, docile age, combine solid principles of virtue with a sober and active life, and who are, by frequent examples, reminded of the turpitude and disadvantages attending violent passions in others, will, of themselves, repress these enemies to human life. Yet it is much more difficult to suppress passions that have already made some progress; in which cases censure and rational remonstrances are seldom availing. To those, however, who have not reached such a pitch of obstinacy as to be above taking advice, the following hints may not be unprofitable:

1. To remove, without delay, the object that gave rise to the passion, or, at least, to deprive it of its nourishment, so that it may die of itself, by going to some other place, which presents a different scene.

2. One affection frequently assists in subduing another of an opposite nature; such as to inspire the timorous with courage; the angry, with fear; the too violent lover with hatred, and so forth.

3. Let us direct our thoughts to other objects of pursuit, such as public amusements, the chase, travelling, agreeable company, or other favourite employments of an useful and assuasive nature.

4. *Music.* Nothing is so well calculated to moderate and calm the nerves, to quiet the mind, and to assuage the passions; provided that the hearer possess a musical ear, and the kind of music be adapted to his particular

taste and situation. Hence, we cannot be too much on our guard in the choice of music, as certain kinds of it have a tendency rather to increase than to allay the paroxysm of passion.

5. The state of perspiration deserves particular attention. For it is confirmed, by numberless experiments, that passions decrease in the same degree as perspiration is increased, particularly if they be of such a nature as to check insensible perspiration; for instance, melancholy, terror, fear, and the like. Indeed, all the evacuations are beneficial in this case. Lastly,

6. Let us make use of no medicines immediately after a fit of passion. The most advisable regimen consists in temperance in eating and drinking, especially in abstaining from hard indigestible food, cold drink, and cold air. We should better consult our health, after any such emotions, by keeping ourselves moderately warm, and drinking tea, or some similar beverage.

After a very violent paroxysm of anger, it is sometimes necessary to open a vein, in order to prevent inflammation, or to cause the evacuation of the bile by an emetic; which cases, however, are to be determined only by professional men. The saliva should not be swallowed in such a situation: for it is by some supposed to possess a slightly poisonous quality.

Persons under the influence of terror sometimes stand in need of a cordial; but the hypochondriac will find in wine and other strong liquors rather an uncertain remedy, or one which, at best, is only palliative; and, if immoderately used, they must necessarily promote sadness, as well as every other passion, which these supposed anodynes, in the end, always increase by their alternately stimulating and relaxing effects.

CHAP. XI.

Of the different ORGANS OF SENSE, and their respective Functions—Of the supposed Seat and Operation of the Soul—Motion—Muscular Action.

BEFORE we proceed to investigate the peculiar functions of the different senses, it will be useful, if not necessary, to premise a short analysis of *sensation*, or, in other words, of the seat and operation of the soul.

The ancients imagined the seat of the soul to be in the stomach, because of the acute feeling of this organ, and the multitude of nerves with which it is provided, and by which it is connected with other parts. But it is now universally admitted by physiologists and anatomists, that the operations of the mind are carried on principally in the brain; that this is the point of union, in which all the nerves meet, and which is to be considered as the assemblage of all sensations, or the *sensorium commune*. The brain is in the most immediate connection with the perceptive faculty; and here all the nerves are, as it were, concentrated into one point.

Professor SOEMMERING, of Mayence, has lately endeavoured to prove, in a very ingenious publication, that the ventricles of the brain properly contain the more immediate cause of the various operations of the soul; that there is a fluid, or at least a subtile vapour, secreted from these parts, in consequence of the activity of the mind exercised in the ventricles of the brain; and that all the varieties of intellect, in human beings, depend upon the diversity of the structure of these ventricles, and the various states of vigour and mental energy there exerted.

Without attempting to decide upon a question so remote from human investigation, I may be allowed to observe, that all conjectures respecting the seat of the soul are, in reality, frivolous and unsatisfactory, until we have ascertained in what manner the important functions of the brain, which is intimately connected and

thoroughly blended with the nerves, are affected within the cranium; whether this be done by vibrations, by secretions of humours or vapours, or by the peculiar manner in which the numerous blood-vessels are disposed in the brain, so as to allow the blood to exert its influence, and to produce all the changes there, by the force and momentum of its own circulation;—all these particulars must be ascertained before we can form a decisive opinion respecting the situation of the soul.

This much, however, is certain, that one of the principal offices of the nerves consists in communicating to the brain those impressions which are made on the body by external objects. As soon as, by means of this communication, a certain change takes place in the brain, the mind becomes conscious of it. But every perception must be acquired through the senses; because the impressions, of whatever kind, must previously strike the organs of sense before they can be communicated to the nerves.

Although it be established and admitted, that the nerves are the medium of all the operations between body and mind; yet no philosopher has hitherto been able to discover the ultimate chain or link by which they are connected, or the exact point at which they originate. Much, however, depends here upon our idea of the mind. It appears, from the contradictory opinions which, from time to time, have prevailed on this interesting subject, that the inquirers have been too much in the habit of evading the materiality of the soul; and yet they assigned it a certain place of residence in the body, which, to this day, is imagined to be in either one or other part of the brain. I conceive the soul to be the primary animating power, and the maximum of all powers in the animal body. And why should we hesitate to consider matter (of the *primary* properties of which we are but little informed) as perfectly simple, and yet extremely operative?

The mind, then, is probably not confined to any particular part of the body, neither exclusively to the brain,

to the stomach, nor to the blood; but distributed through the whole system, always one and the same power, save that it is sometimes more, sometimes less concentrated; and, if I may be permitted to say so, it is a pure, elementary, ethereal agent. In the *brain* it displays its principal energies: here are seated consciousness, the capacity of thinking and judging, memory, and all the higher faculties of the mind. But again, it must be observed, that the different parts of the brain seem to contain different faculties; so that memory, probably, occupies more the external crust, and the power of thinking, the interior substance of the brain.

With respect to memory, it is remarkable, that nervous and epileptic patients are usually deprived of that faculty before any other of their mental powers are impaired. Perhaps the efficient cause of the disease has not penetrated the brain deep enough, so as to affect the seat of the understanding and judgment, till, at length, with the progress of the disease, the higher powers of the mind become affected.

Even the lower faculties, the emotions of the mind, and the various passions, appear to be situated in different organs. Thus, the seat of terror and anger seems to be in the stomach, and in the biliary system; the more amiable feelings, as philanthropy, compassion, hope, love, &c. seem to be situated in the heart; fear and surprise, in the external surface of the head and back; and sudden pain in the breast.

The next question arises, how are these powers put in motion? Has the assemblage of these faculties, or the *sensorium commune*, an original and independent capacity of receiving ideas; of forming new ones from its own materials; of being conscious of these internal sensations, and of comparing them, so as to reproduce others, through itself, and from its own origin? I am inclined to answer these questions in the affirmative. For, as soon as the senses are stimulated, the sensation is communicated to the sensorium, where it makes a real, corporeal, and sensible impression. All this is accom-

plished by the medium of the nerves, because the nervous energy appears to be more nearly allied to the mind than any other power. The more frequently, therefore, the same stimulus and impression is repeated, the more firmly the idea of it is imprinted, and the longer we retain the impression. If the stimulus be too violent and permanent, or if an impression of too many objects be at once made on the brain, our nerves experience the same relaxation as the chords of an instrument, after a strong and repeated tension.

Man, when he is without clear consciousness, and in the moment of confusion, feels as if his mental powers were palsied, or had suffered a temporary suspension. In a severe disease, and previous to death, we perceive the ideas of early life vanish first; we lose the impressions of such ideas on the brain more readily, in proportion to the distance of time when they were made, or accordingly as they have been more or less frequently repeated. If eventually the patient recover, he may, without difficulty, observe how progressively the suppressed ideas reappear in the head, exactly as if they had been stored up there, and remained in a latent state, till the soul attained sufficient energy to use them. From this indubitable fact I am disposed to deduce a stronger argument for the immortality of the soul than from any other physiological source.

The organs by which the sensitive powers of the nerves can be excited from without, are called the senses; in contradistinction to the *internal* faculties, such as imagination, memory, attention, and the various affections of the mind. The latter we exclude from the present inquiry, which is directed to the *external* senses alone. The number of these has been hitherto limited to *five*, or it may be said with more propriety, that they are five modifications of *one* sense.

This universal sense, which, in a manner, forms the basis of all others, is that of *Touch*. If we abstract from the difference subsisting in the structure of the organs, the other senses are subservient to that of touch, and are

little more than a variety or modification of it. All the senses agree in this, that they may be improved by exercise, or depraved and blunted by neglect: Nature has not formed them with the same degree of perfection in every individual. The loss of one sense is, in general, partly supplied by the greater perfection of another; yet, it is equally true, that exercise and attention are the principal sources of this improvement.

In the most perfect state of our senses we are liable to be misled by them into many errors and mistakes; but the sense of touch or feeling is least liable to deceptions, while that of sight is the most uncertain. The order in which we shall consider the five senses hitherto admitted as being distinct from one another, is the following: viz. 1. *Touch*; 2. *Sight*; 3. *Hearing*; 4. *Smell*; and, 5. *Taste*. Besides these, there are perhaps several others, which deserve to be added to that number; such as hunger and thirst, and the sensations peculiar to the different sexes. If these be not admitted, as distinct from the five others, we may still discover a *sixth* sense in the animal economy. And, though this additional sense is chiefly manifested in diseases, and scarcely perceptible in a healthy state of the body, yet its existence is so obvious to patients in chronic disorders, and particularly in palsy, gout, and rheumatism, that they are thereby enabled to ascertain, with wonderful accuracy, not only the present state, but also to predict the impending changes of the atmosphere.

Without losing time in abstruse disquisitions respecting these occult senses, I proceed to examine those which are more generally known.

The *first*, namely, that of *Touch*, comprehends not only the sensation which is excited by any particular impression, but also that change which external objects produce on the skin, and particularly on the ends of the fingers. It is in the latter, and more limited meaning, that I now consider the sense of touch. In order to understand more clearly the great importance of this sense, I shall premise a concise description of the external integuments of the human body. For there is no doubt,

that the skin is the medium of all the senses, and, if I may be allowed the expression, it is the most unerring guide, and least subject to the illusions of the imagination.

The whole human body is inclosed in certain integuments or covers: they consist of *three* different layers, each of which is wisely designed by Nature for protection, benefit, and ornament. The uppermost, that is, the scarf-skin, or epidermis, is the thinnest of the three, and is nearly transparent. It covers the whole body, both externally and internally, not only the mouth, stomach, and bowels, but also every cavity and protuberance of the body; as it forms the upper skin of most of the intestines, the lungs, the heart, the liver, the spleen, &c. This covering is of essential service to the whole frame, by protecting the parts inclosed in it from external injury, by preventing them from adhering internally, and by keeping every thing within the body in its proper situation. It is destitute of sensation, which even children know, since they run pins between it, without feeling pain. But it is possessed of the admirable property, that it is very quickly renewed, after it has been destroyed by accident, or by the measles, scarlet-fever, and similar diseases.

Immediately under this universal and uppermost covering of our body, there lies a second, reticular, and mucous membrane, which has received from anatomists the name of *rete mucosum*. It is in most parts of the body extremely thin, but it grows considerably thicker in others, for instance, on the heels, and the palms of the hand.

This second skin deserves particular attention, as it is the seat of the colour of different nations; though the cause of this diversity has not yet been discovered:—in the negroes it is black; in the American Indians nearly of copper-colour; and in the Europeans generally white. That the colour of the human body is altogether contained in this second or middle skin, is sufficiently ascertained; for not only the third, or true skin of the negroes is as white as in the Europeans, but the uppermost, or

scarf-skin too, though rather of a greyish tint, is scarcely darker in blacks than in white people; and, in the latter also, the middle skin frequently is of a yellowish, brown, or blackish colour; in which case the whole external skin exhibits a similar appearance.

This difference of colour has led some authors to suppose, that there is a variety in the origin, as well as in the mental capacities of different nations. So palpable an error, however, could not long remain unrefuted: and it is now almost universally admitted, that there was originally but one species of man, though diversified by the climate, the air, the sun, and the mode of living, which produce all the difference in the colour, as well as in the structure of man. Thus, we know, that those Americans, who live in the calmer western and mountainous regions, are not of so deep a copper-colour as those who are more exposed to winds and other contingent causes; that the inhabitants of the northern bank of the river Senegal are of a diminutive size, and of an ash-colour, while those of the opposite bank are black, and, at the same time, tall and robust. We farther know, that after some generations, the negroes are bleached, and people of a white colour become black, when the former emigrate to the cold northern, and the latter to the torrid southern climates. This difference is also discoverable in our climate, where people moving much in the open air and sunshine, acquire a dark colour, somewhat resembling that of the swarthy Portuguese.

That there may be also a colouring substance in the blood, whether owing to the iron said to be contained in this fluid, to the bile, or to an excess of what the old chemists called *phlogiston* (or what would now be termed the want of *oxygen*)—all of which may have a share in the modification of colours, I am much disposed to admit; because the blood, bile, brain, nay, the very vermin on the bodies of the *Æthiopians*, partake of their native colour.

The *third*, and innermost of the integuments of our body is the true skin, or the *cutis vera*, which immedi-

ately covers the fat and the muscles. It is of a compact, interwoven, cellular texture, which is very thick and smooth on its upper surface, of a white colour in all nations, loose or pliable on its inner surface, and furnished with more or less fat. It not only possesses a considerable degree of expansibility, and contractility, but is also provided with numberless pores. Its thickness varies in different individuals. It is traversed by a great number of fine arteries, interwoven in the form of a net, and which may be exhibited to the eye, by injecting them with a red fluid, so that the skin then has the appearance of being thoroughly coloured. It is likewise furnished with an equal number of veins, and delicate absorbent vessels.

From the many nerves which pervade the true skin, it possesses an uncommon degree of sensibility, especially in those parts where we can perceive the *papillæ* of the nerves. These are small protuberances in different forms, of a reticular structure, and a pulpy consistence. In some places, as the lips, they are not unlike flakes, though they generally resemble little warts. Such we observe on the points of the fingers and toes, as well as on many of the most sensible parts of the body, but particularly the tongue. They are most visible on the ends of the fingers in delicate persons; they can be traced with the naked eye, by the spiral lines terminating almost in a point, and are protected and supported by nails growing out of the skin. It is in these papillary extremities, that every external impression is most distinctly and forcibly perceived, on account of the number of nerves lying almost exposed to view in these places.

The sense of touch can be improved, by practice, to an astonishing degree. There are many examples of blind people having attained so great a perfection of this sense, that they could, with accuracy, distinguish the difference of coins, of metals, and even of colours, merely by the touch. I knew a blind man, who had learnt to take a watch to pieces, to clean it perfectly, and to put it together again, without any other assistance but that of the instruments commonly used, and the exquisite feeling of his fingers.

I have now only to describe the operation or mechanism of this sense.—When the nervous papillæ are pressed against external objects, the nerves receive a kind of vibration, which is communicated to their branches, and thence to the brain. Thus we are enabled to feel the hardness, roughness, moisture, warmth, gravity, figure, size, and even the distance of bodies. But, that this feeling may not become painful, Nature has provided another cover, namely, the scarf-skin, which serves the important purposes of secluding the air from the true skin, and preventing the body from being too much dried.—The nails increase the energy of touch, and render the sense of it more acute, as they resist the pressure of external substances.

The *second* of our senses, though less essential to animal life, is more conducive to our welfare and happiness. Without *Sight* we cannot justly contemplate the wonders of Nature, and existence is deprived of its greatest charms. An anatomical description of the eyes would lead us too far from the object of these inquiries, and would not be intelligible, without a more particular analysis and demonstration than our limits allow.

In the sense of sight, we are far excelled by most of the lower animals. Eagles and hawks, in particular, descry their prey beyond the reach of our sight, even when aided by a telescope. Yet in men, also, this sense may be wonderfully improved; and I remember to have heard the celebrated Baron TRENK assert, that during his long captivity in the state-dungeon at Magdeburg, he had so much improved his sight, that he could see the mice traversing his gloomy cell in the midst of the darkest night—whether this assertion was exaggerated, I do not pretend to decide.

The operations of sight are performed in the most accurate manner. By the structure of the eye, no rays of light can pass into it, unless emitted within an angle not exceeding 90 degrees. Every thing here is regulated upon optical principles, sensation excepted; which is situated in the *retina*, a membrane having the form of a

net, and being, as it were, the mirror by which external objects are represented to the mind. If this mirror be destroyed, as is the case in *amaurosis*, or *gutta serena*, our sight is irrecoverably lost.

All vision consists in the refraction of the rays of light, by means of the crystalline humour, till they are concentrated into one distinct image on the retina. The rays, while they pass through the arched surface of the *cornea*, or the horny skin, are broken and brought in contact with each other; and this is still farther promoted, while they pass through the more dense crystalline lens. They then converge at the spot where the vitreous humour is contained: here they again diverge, once more come in contact, and finally collect in as many points as are represented by the external object. This image, which is depicted on, and stimulates the retina, is communicated to the mind, and produces the sensation of sight.

It is partly owing to the before-mentioned refraction, and partly to the constant and uniform reference to the internal sense, that in the act of vision we see objects in an upright posture before us, though they are portrayed on the retina, in an inverted posture. By this admirable mechanism, all objects are invertedly presented to the eye, so that we cannot err in this respect, since the relation and proportion of things uniformly remain the same.

But it will be asked, how does it happen, that with two eyes we see only one object? This question is easily answered by those who inform us, that with two nostrils we are sensible of only one particular smell, and with two ears we hear but one distinct sound; that a similar external stimulus, in similar nerves, will always produce the same internal sensation, and that accidental deviations, or diseases only, can affect this principle. Yet the explanation now given is altogether insufficient, as it proceeds from analogical reasoning.

If we wish to form a clear conception of this faculty, we must, above all things, direct our attention to the

axis of vision, or that imaginary line, which we draw in a straight direction from the centre of the eye to the object, and which is prolonged before and behind that organ. We must next advert to the situation in which the eyes are placed. They do not lie perfectly straight in their sockets, but somewhat in an oblique direction towards the nose. If, then, we prolong, for a short space only, the axis beyond the eye, we shall soon find, that the two imaginary lines meet in a certain point. This is called the *Focus*, or the point of vision—the termination of the external rays of light.

If a person be able to see to a great distance, his lines of vision intersect each other at a greater distance from the eye, and, consequently, his focus is farther removed from it. This defect is called *presbyopia*, or far-sightedness, and may be remedied by means of convex glasses; but, if from the too great convexity, or an extraordinary converging power of the eye, the rays of light too soon unite in one point, and, as this point is placed before the retina, from whence the rays of light again diverge, vision becomes indistinct, till the object be brought nearer to the eye; in order to place the point of union, as it were, farther behind the eye—this deficiency of vision is called *myopia*, or short-sightedness, and may be relieved by concave glasses. Of these, as well as other defects of the eye, and the most proper methods of preventing and curing them, I shall treat in the next chapter.

It farther deserves to be remarked, that the optic nerves cross each other in the brain, and that we are accustomed, from our infancy, to see only one object at a time. Hence children should be so placed in bed, that they may not learn to squint, or that the eyes may not be directed upwards and downwards, but rather downwards and inwards, in order to habituate them properly to form the axis above described. That custom has great influence, in this respect, is obvious from the circumstance, that those who squint not unfrequently see two objects at once; and that such eyes as, by accident or disease, have become double-sighted, may, by continued exertions, be again habituated to view objects distinctly.

Every one must have observed, that, upon entering suddenly from a very dark place into bright sunshine, he could scarcely see any object, felt pain the eyes, shed involuntary tears, or sneezed. This temporary deprivation of sight is owing to the pupil of the eye being dilated in a dark place, and contracted again at the approach of light. The dilatation and contraction of the pupil is in proportion to the darkness or brightness of the place. If the change from a dark to a bright place be instantaneous, the pupil cannot dilate and contract quickly enough; for it is, as it were, palsied, together with the retina, and we cannot see at all. The pain of the eyes, and the flow of tears under these circumstances, must be ascribed to similar causes. Every stimulus, whether occasioned by heat, cold, winds, colours, and the like, excites a sensation, which is agreeable, if it be moderate, and not too long continued; but which becomes painful and disagreeable, as it increases in violence and duration.

There remains another curious phenomenon to be explained, namely, that of *sneezing*, which often takes place when we suddenly go from darkness to a strong light. Here the same cause operates, though under different circumstances. The optic nerves consist of the second pair of the nerves of the brain; with these are united the third, the fourth, and some branches of the fifth and sixth pair. Yet the second pair, or the peculiar optic nerve, has the most important share in vision. It proceeds from the brain straight to the pupil of the eye, which it pervades almost through the middle of its posterior internal part, where it terminates and dilates itself, or, as it were, melts into a soft, downy skin, forming the *retina*, which covers a great part of the posterior internal eye. Now, from the fifth pair of nerves there proceeds but one branch into the eyes, while another takes its direction to the nose. When the eye is suddenly impressed with the rays of light, that branch of the fifth pair which extends to the eyes, is stimulated in common with the other branch of the same pair proceeding to the

nose. If the stimulus be violent, it is communicated to both branches; hence that of the nose is likewise stimulated, and we are compelled to sneeze.

To conclude this description of the sense of sight, I must remark, that the representations of the mind scarcely display their influence on any other of the senses to so extensive a degree as they do upon this: hence it happens, that we sometimes imagine we see images before us, in the clearest manner, though the representation of them be merely a phantom of the brain. The impression forcibly made on the retina remains there for some time, even after the object itself has vanished; thus we imagine we see a fiery ring, when a burning coal is swiftly moved in a circle. That we believe we see many bright colours, when we rub and press the closed eye with the fingers, is owing to this cause, that the same kind of effect is produced on the nerves of the eye by friction, as usually accompanies the view of the colours themselves. But whether colours, in general, depend on the different degrees of vibration of the air, or on the elements of the rays of light which, by their division, appear singly and distinctly in the prism, is a problem not yet, and which, perhaps, never will be satisfactorily solved.

By the next sense, namely, that of *Hearing*, we perceive the vibrations of the air which occasion sound. For this purpose, our ears are formed partly of cartilages, and partly of bones, in order to communicate these vibrations to the auditory nerves, and thence to the brain. This sense also is more acute in the lower animals than in the human species. The hare, for instance, is warned against approaching danger by her exquisitely fine ear; and the owl, being sensible of the lowest sounds, makes use of her acute ear to assist her in the discovery of prey.

The warm-blooded animals have an external and an internal ear; but in almost every species it is of a different structure. Most animals can move their ears—an advantage not enjoyed by man; though it was not Nature which formed our ears immoveable, but an ab-

fur'd custom, continued for many centuries, gradually produced this effect. That the ears were not naturally designed to lie flat on the head, is sufficiently obvious from the number of muscles with which they are provided, and each of which is designed to perform different motions.

The manner in which the sense of hearing is produced is shortly this: The vibrations of the air, which take place by the concussion of any elastic body, first strike the external ear; hence the sound agitates the *tympanum*. But that the vibrations may not become too violent, and the tympanum may not burst, as is to be apprehended from a very loud and near sound, the ear is provided with a siphon, which anatomists call the *Eustachian tube*, and through which the air collected on the tympanum again escapes. But the vibration of the tympanum is also communicated through the four little bones of the ear; it is forwarded through what is called the *stapes*, or stirrup, to the vestibule, or the first entrance, and through the membrane of the *fenestra rotunda*, as far as the innermost cavity of the ear, which resembles the shell of a snail, and is, therefore, called *cochlea*. The whole labyrinth of the ear being filled with a small quantity of subtile water, this fluid gently agitates the substance of the auditory nerve; in consequence of which sound is communicated to the brain. The humour contained in the labyrinth of the ear obviously serves the purpose of preventing the soft, pappy substance of the auditory nerve from being too violently agitated.

The use of the cochlea, which is very artificially constructed, cannot be easily determined; it is, probably, rather designed for the more accurate distinction of the varieties of tones, than for the perception of sounds in general; for we may consider the delicate nerves that run along the spiral line of this cochlea as a number of chords, growing progressively shorter, and which, in a manner, repeat the external vibrations of the air in the internal parts of the ear. This repetition appears to be performed according to a geometrical scale, since

the same vibrations of the air take place here in a reduced proportion. Hence sounds which are too loud and penetrating offend our ears, because they shake the auditory nerves too quickly and violently, so that these may even be lacerated, and produce deafness; but this is not the case when the tympanum is broken by accident.

Some persons, who are defective in this sense, are obliged to make use of ear-trumpets, and to turn their ear to the quarter whence the sound proceeds; to place the hand at the side of the ear; to open their mouth, or use some other assistant means. All this is done with a view to supply the motion of the ears, of which we have been deprived by habits contrary to the laws of Nature: these motions the lower animals perform by pointing their ears in the direction from which the sound proceeds. In this manner the ear receives a greater proportion of sound; and many divisions of it, which might otherwise escape, are conveyed to the nerves.

By means of the teeth, and other bones of the head, sounds may be conducted to the auditory nerves, so as to communicate the necessary vibrations to the internal ear, though we can hear more easily and distinctly when the sound comes through the organ itself. There is, however, a method of communicating sounds to the deaf with better success than by the common ear-trumpets, which instruments, at length, entirely destroy that sense. This is effected by means of a cylindrical rod or tube of ivory, or any similar hard substance. The tube may be from twelve to twenty-four inches long, and from a quarter to half an inch in diameter: if it be made hollow throughout, the part which is placed in the mouth, between the front teeth, ought to have a much smaller aperture than the other extremity. This tube is well calculated to assist those deaf persons who wish to enjoy the music of a harp, harpsichord, or other instrument. I once knew a gentleman who was quite deaf, but with the assistance of a cylinder, such as I have described, was enabled to hear the softest notes distinctly, and to enjoy all the pleasures of music.

Lastly, it is a false assertion, that there is always a hole in the tympanum; for it is owing to the double opening of the Eustachian tube, that many jugglers can cause the liquor they drink to flow out of the ear, in the same manner as they discharge the smoke of tobacco through the nose and ears.

Our *fourth* sense is that of *Smell*. It is nearly related to the sense of taste, probably from the great similarity of structure in the organs of these two senses, and their vicinity to each other. This is attended with the manifest advantage, that man and animals are generally enabled to discover, without danger, any unwholesome food. The functions of this sense are exercised by the nose, but chiefly by the mucous membrane which lines that organ. The whole inside of the nose is covered with this membrane, which is a continuation of the general integuments of the body, but much softer, more mucous and porous, full of vessels, exquisitely sensible, and covered with hair towards the lower part of the nostrils, to prevent any impurities from ascending too far.

Of all the parts of the mouth connected with the nose, the most remarkable is the cavity of the jaw-bone, or the *sinus maxillaris*, which extends over the whole breadth of the two upper jaw-bones, and opens itself into the nose between the middle and lower shell. In new-born children, all these cavities are not yet formed, and this is the cause of their imperfect smell. In order to moisten the membranes, which otherwise would become too dry, by the air we inhale through the nostrils, there descends a nasal canal from each cavity of the eyes, which communicates with the lower shell, in order to conduct the tears continually into the nose.

If we make an effort to smell, we draw up the air filled with the volatile, oily, and saline particles of odorous substances: these particles come in contact with the fine branches of the olfactory nerves, which have the capacity of receiving impressions, and thus the sensation is imparted to the brain. These nerves rise immediately from the brain, and are larger in many animals than in

man. The bigness of the nerves, however, is no proof of the greater degree of sensation in the animal, or of the superior abilities of the mind. On the contrary, it is now pretty generally believed, that the mental capacities of organized beings are in an inverted proportion to the size of the nerves rising out of the brain, and the medullary substance of the spine. Thus, for instance, the amphibious animals have strong nerves, in proportion to their small brain, and yet they are, in general, extremely insensible and stupid. Lean people, and rickety children, on the contrary, have very thin and fine nerves to a large brain; and who has not observed their sensibility of mind, as well as their quick and acute feelings?

But to return from this digression. The saline and oily particles which affect the smell, are more volatile and subtiler than those distinguished by the taste; yet this difference may, in a great measure, arise from the nerves of the tongue being covered with thicker membranes than those of the nose. In many animals, the sense of smelling is more acute than in man, who would probably be much incommoded by too refined a perception of this kind. But it may be much improved by exercise, or depraved by neglect. Hence the American Indian can discover the footsteps of man and other animals by smell alone;—while persons who live in a bad and foetid atmosphere, are scarcely sensible of the difference between the most fragrant and offensive substances. It is remarkable, that most maniacs and chronical hypochondriacs are excessively fond of snuff, and every thing that stimulates the nose.

In the acuteness of this sense, the dog excels all other animals; and there are many extraordinary instances recorded of his peculiar and astonishing powers of smell; with one of which, as well authenticated as it is extraordinary, I shall conclude this subject. In the year 1582, LEONHARD ZOLLIKOFER set out from his Chateau Altenklingen, in Switzerland, for Paris; the distance of which is upwards of five hundred English miles. A fortnight after his departure, his faithful dog, who had,

till then, been confined, also set out alone for Paris; where he arrived in the course of eight days, and discovered his master in the midst of a crowd, after having searched for him in vain at his lodgings.

We are now arrived at the *fifth* and last of our senses, the *Taste*, which is so distinguished a favourite of a great number of persons, that it appears as if they wished to live only for the sake of its gratification. I have, in former parts of this work, endeavoured to inculcate the propriety and absolute necessity of attending to the effects produced on this sense by food and drink, without which animal life cannot be long supported. In this place, therefore, there remains to be described only the mechanism and the functions of this sense.

The principal organ of taste is the tongue, which, in very few animals, is as sensible as in man. The former, indeed, accurately distinguish the useful herbs on which they feed from the noxious plants; but this appears to be more in consequence of their acute smell than from the guidance of their taste. To describe the figure and shape of the tongue is not consistent with my plan; but I shall briefly observe, that this organ is provided with innumerable nerves, which terminate in certain warts, or papillæ, of a different size and figure, some of them pointed, others oblong, and others fungous.

These nervous papillæ are the peculiar seat of the sense of taste or the palate. But, to taste any thing whatever, either the tongue should be moist, or the substance applied to the tongue should contain moisture. In ascertaining the difference of taste, the little warts are, in some degree, dilated: every substance we can taste contains a greater or less proportion of saline and oily particles, which must be soluble by the tongue. If the sensation of the saline particles be acrid, the taste is strong, disagreeable, and, at length, becomes painful: this is also the case, if the tongue, by burning, or other accidents, be deprived of any part of the epidermis, or scarf-skin.

Such bodies as contain no saline particles, as pure water,

excite no kind of taste whatever. The difference of taste cannot be accounted for from the variety of figure in the crystals of the different salts, but appears to arise from the chemical properties inherent in saline bodies. It may be laid down as a general rule, that every substance, which affords an agreeable taste to a healthy person of an undepraved palate, is wholesome: as, on the contrary, substances of an acrid and disagreeable taste are commonly pernicious.

The different degrees of taste depend on the greater or less sensibility of the nervous papillæ before-mentioned, as well as on the quality of the saliva, in a more or less healthy state of the body. If our nerves be blunted, and relaxed by smoking tobacco, by too strong and highly-seasoned food, by the copious use of spirituous liquors, by age, or other causes, we cannot reasonably expect to possess the same degree of sensibility of taste as if we had been more attentive to the economy of Nature. The more simple our usual aliment is, the less it is seasoned with hot spices, and the less we stimulate the palate by wine and ardent spirits, we shall the better preserve our taste, together with the nerves of the tongue; and we shall have a greater relish for rich dishes when they are but occasionally presented to our palate.

The senses, then, are those organs, by means of which the mind perceives or feels external objects. They may be considered as the satellites of the mind; and, though some animals enjoy particular senses more acutely than man, yet his senses are more comprehensive, and he is amply compensated by the extensive use he can make of them, while the inferior creatures possess a more intense application of their sensitive faculties.

We have now considered the mode in which the senses operate; we have seen that every thing depends upon a nervous stimulus, which, by the most diversified organs, is communicated to the mind: there remain to be added only a few remarks and explanations relative to animal motion, or muscular action.

The machine of the human body is put in motion by

a great diversity of powers. Of these, the highest and most energetic is that of the *mind*; the next subordinate power is that of the *nerves*, immediately after which follows the most operative of the corporeal powers, that is, *muscular irritability*, or the peculiar faculty of the muscles to contract, in consequence of any stimulus applied to them. I purposely omit, in this place, what physiologists have called the vital power, the peculiar power of life, or BLUMENBACH'S *vita propria*; and the healing power of Nature, or *vis medicatrix naturæ* of the ancient physicians. All these powers are, in a great measure, hypothetical, though their frequent operations, in a diseased state of the body, cannot be denied. And, as the muscular powers of men and animals are the most obvious to the senses, I shall content myself with describing what has a reference to these.

A *muscle* is a bundle of thin and parallel plates of fleshy threads or fibres. These are connected by a loose and generally fat cellular membrane; they separate into greater bundles, till, at length, several divisions, lying parallel, or inclining towards one another, are again surrounded by a tender membrane of cellular texture, which forms one substance with the collateral partitions; and these, being again separated from the contiguous flesh, by a somewhat thicker cellular texture, are then considered as one distinct muscle.

The human body has a considerable number of muscles, yet many of the lower animals are provided with a much greater proportion of them. The caterpillar (*Phalæna Cossus*, L.) has about 3500 muscles, while the human body can count scarcely 450. The muscles of animals, in general, are more powerful than those of man. What astonishing power, for instance, is the leaping chafer, or the grasshopper, obliged to employ, in order to jump several hundred times the length of their own bodies! Another small insect, the flea, excels all other animals in its prodigious leaps, and is able to carry a weight eighty times heavier than its body. All these apparent wonders are accomplished by means of the muscles. The

figure of them, in man, is very irregular; those only, which are designed to perform certain *valvular* motions, such as the muscles of the mouth, the eye-lids, the bladder, the anus, &c. are of circular or round figure.

All the muscles contract in the direction of their fibres: the middle part, or belly, of the muscle swells; hence it shortens, and both ends approach each other. Most of our muscles operate in the manner of a lever; the two ends of every muscle, in the extremities of animals, are fastened to the bones, by means of tendons or sinews; one of these extremities only being moveable, while the other remains fixed. Hence, in the contraction of the muscles, the moveable bone is drawn according to the direction of their fibres. If a muscle be contracted, it necessarily swells in thickness, which may be distinctly felt by placing the hand upon the *masseter*, a muscle of the lower jaw, and compressing the back teeth. As soon, however, as the nerve of the muscle is cut, or only tied, the contracting or swelling power instantly ceases, whence we are inclined to suppose, that the nerves have the principal share in regulating the powers of contraction, extension, and locomotion. Whether this be done by the influx of a fluid into the nerves, or by some other latent power, has not yet been discovered.

The energy of muscular action is remarkable in every healthy individual, but particularly in very strong men, and frequently too in maniacs. With the assistance of a few muscles only, they are enabled to raise a weight often much exceeding that of the whole human frame. In order to support the pressure of the lever, which is accomplished with a great loss of power, and to preserve and consolidate the muscles in their situation, they run at one time under cross ligaments, as is the case on the fingers; at another time they move in rollers; for instance, in the eye; and, again, in other places, they are supported in their position by the peculiar structure of the bones, as we find on the upper part of the shoulders.

If a computation could be made of all the losses of power which the muscles experience, partly by their fre-

quent insertion at very acute angles, partly by their being extended as a chord, and drawing a weight opposite to its fixed point; partly by passing over certain joints which break the force to be applied to a particular joint; and, lastly, by their fleshy fibres being obstructed by the angles they make with the tendons: if all these impediments could be reduced to an accurate calculation, we should be astonished at the contractile force exerted by the muscles, as it would exceed any amount of powers raised upon mechanical principles. It is confidently asserted, that the effect is scarcely $\frac{1}{60}$ th part of that force which the muscles exert; and yet a small number of them, the substance of which is equal in weight to a few pounds only, possess the power of lifting, or, at least, moving, several hundred weight, and this with inconceivable facility and swiftness. It would be presumptuous to ascribe the great losses of muscular power to any defect in the animal economy: for, if we had the full use of our muscles, the just symmetry or proportion of the parts would be destroyed, and it might otherwise be attended with many physical evils, the consequences of which we cannot comprehend.

As an ample compensation for the want of this unnecessary strength, Nature has provided the upper ends of the muscles which bend the joints, and chiefly those of the knees, with certain bags, *bursæ mucosæ*, which contain a lubricating mucus, to facilitate the motion of the tendons. And to this beneficent arrangement we owe the ability of exercising the power of the muscles with such extraordinary activity, and without feeling them rigid and inflexible, after violent and long-continued exercise.

Being now acquainted, in some degree, with the *nerves* and *muscles*, it will also be necessary to say a few words relative to the *blood*; especially as the doctrine of *temperaments*, already treated of in the Introduction, was principally founded on the nature of these three substances.

The quantity of blood in a human body of full

growth is generally computed at 30lbs. This liquid apparently consists of two parts only, namely, the *serum*, or water, and the *crassamentum*, or thick and coagulable part of the blood. But as the latter can be again separated into two parts, namely, the *cruor*, or the thick and red part, and the coagulable *lymph*, the blood consequently consists of three principal constituents—the serum, the cruor, and the lymph. Besides these, there is also a considerable quantity of air contained in the blood, which is, as it were, the medium of combination in all vegetable, animal, and mineral bodies; for, when the air is expelled, whether by combustion, fermentation, putrefaction, or any other process, they hasten towards their inevitable dissolution.

There is, farther, contained in the blood much water, a small proportion of oil, some salt, earth, and a little iron, which, together with the heat produced by respiration, is supposed to impart the red colour to that fluid. The red colour is confined to the *cruor*, which consists of very minute red globules, nearly resembling, in shape, the eggs of silk-worms.

Much remains to be said on the properties of blood, and its wonderful circulation in the human body; but as this subject, from want of room, cannot be satisfactorily discussed here, I am under the necessity of concluding this Chapter with the following remark: that the variety of temperaments in man appears to be owing to the different mixture of the fluids, and the diversified structure of the solids, particularly of the nerves and muscles. This is so true, that the whole picture of his physical life, together with his moral character, depend chiefly on the various combination of these parts. Yet there are different means by which peculiar temperaments are generated: the first of these is *climate*, which forms the national character—the second is a certain *hereditary disposition* which we derive from our parents—and the third is the peculiar *organization* of the individual.

CHAP. XII.

Practical Remarks and Rules relative to the TREATMENT and PRESERVATION of the EYES:—On the Importance of bestowing proper Care on these Organs—Of Short-sightedness, and the reverse—General Rules for the Preservation of the Eyes—Of the Conduct to be observed in weak Eyes—Dietetical Precepts respecting the Eyes in general—Some additional Rules, addressed to those who are obliged to make use of Eye-Glasses.

I. *On the Importance of bestowing proper Care on these Organs.*

THERE is scarcely any part of the sensitive faculties which contributes more to our physical enjoyments than the unimpaired power of vision. Hence the management of the eyes deserves the attention of every person who wishes to preserve them in a sound and perfect state, and to retard, although we cannot altogether avert, the natural consequences which accompany the advance of years. By our mode of life this infirmity is much accelerated, and the eyes are weakened and worn out, or, at least, rendered too irritable. Such is particularly the case in those classes of people who are much employed in sedentary occupations, who are much exposed to dust, or who work by candle-light, &c.

The remarks, rules and observations of this Chapter, will relate chiefly to the treatment both of sound and weak eyes, and occasionally to the regimen of them in a diseased state.

More accuracy is required in this respect than inexperienced persons generally imagine. Till of late years, proper attention has not been paid, to lay down and establish well-founded and practical rules on the subject of the eyes, and their treatment. Some modern physicians and oculists, however, have usefully devoted much time and labour to inquiries into the maladies of

this organ. The fruits of these researches, as well as my own experience on this point, I now proceed to lay before the reader.

II. *Of Short-sightedness, and the reverse.*

Man probably enjoys his sight to a later period of life than any of the lower animals, and might preserve it still longer if he were better informed respecting its preservation. Those who are naturally short-sighted may expect an improvement of vision with the advancement of age; for their eyes then gradually begin to lose that uncommon roundness which produces this defect, and thus to arrive at a greater enjoyment of the beauties of Nature. Persons who can see objects distinctly at a great distance only, cannot, however, be considered as less unfortunate, as they stand in need of glasses chiefly for the better distinguishing of more minute objects.

The nursery, or the room appropriated to the use of children, is generally the smallest, if not the lowest apartment in the house; so that the infant, having the opportunity to exercise its eyes on near objects only, often becomes more short-sighted than it is naturally. To prevent this, children ought to be frequently carried to the window, and have their eyes directed to a distant view. On this account, a nursery enjoying an extensive prospect is much preferable to one where the view is confined. Many persons, who see well at a distance in their infancy, injure their sight by reading and writing by candle-light, but particularly females, by fine needle-work; as the eye is thereby too much accustomed to near and minute objects.

One of the bad consequences of short-sightedness is, that people get into a habit of making use of one eye only. The effort of directing both pupils to the object before them is attended with too much trouble; hence they look at it sideways. It would be less detrimental, if they were to use the eyes alternately; but here too there is danger of acquiring a bad habit; for the eye, which is spared or not exercised, becomes inert and useless. Still

worse is the use of a magnifying or reading glass, by which people accustom themselves to shut the eye then unemployed. The other, which is thus unduly exerted, somewhat shifts its position; it becomes progressively less flexible in its internal parts; and persons who have recourse to this temporary aid, do not find their powers of vision improve with the advancement of age.

To prevent these bad habits, the following advice may be useful:—Children suspected of being short-sighted, should have their eyes directed to an object held close to them; and if they appear to make use of one eye only, it should be occasionally closed, so that they may be obliged to exercise the other. When they learn to read, they should be taught to hold the book straight before their eyes; thus they will exert themselves to discover the printed letters at the greatest distance, at which they are made to place it. The eyes will gradually become accustomed to the necessary internal change of their posture, and the child will, in time, certainly improve in its sight. Many persons indeed have, at a juvenile age, got rid of their short-sightedness; but there cannot be found one instance of this improvement among those who have, either from fashionable indulgence, or necessity, habituated themselves to use only one eye.

It is to be regretted, that in short-sighted individuals, the breast and abdomen suffer much from compression, during sedentary occupations, so that they are frequently troubled with hypochondriasis, and, what is still worse, are sometimes thrown into a consumption of the lungs. Though standing at intervals agrees with employments that do not require great mental exertion; yet, in the contrary case, it consumes more strength than is generally imagined; and, in acute reflections, the mind ought not to be fatigued by the body. In this case, well-chosen *concave spectacles* may be used with advantage, so that the body may be placed, while reading or writing, in the most convenient posture: for such glasses will oblige the wearer to remove the object somewhat farther from the eyes.

After severe diseases of the eyes, one of them frequently becomes short-sighted, while the other is scarcely, if at all, affected. The consequence is, that we employ the sound eye alone, while the weak one is totally impaired by this neglect. In such a situation, we ought to use glasses in reading or writing, one of which should be carefully selected for the short-sighted eye (according to the rules hereafter specified) and the other made of plain clear glass, chiefly for the sake of affording an equal degree of light to both eyes. If, by this precaution, the weaker eye has perceptibly gained strength, we may employ a less concave glass instead of that first used, so that, in time, it may be similar with the other; and, at length, the patient will be enabled to do without this assistance.

Eyes, which form too extensive a focus, require no aid, unless they be extravagantly so. Then, indeed, we should not hesitate to make use of convex glasses. It is, however, a vulgar prejudice, that, by such glasses, the eye is too much indulged, and rendered still more *far-sighted*. On the contrary, it is generally improved during the use of these spectacles, and, after the lapse of several years, they may again be dispensed with.

It is a consolation in many diseases of the eyes, that a long-continued weakness is seldom the forerunner of total blindness. This fatal event generally happens by sudden accidents, and is speedily decided. Adults are not very subject to external complaints of the eye, or such as deprive the *cornea* of its transparency.

Small round spots, hovering before the eyes like strings of hollow little globules connected with one another, are defects of no great consequence, and from which, perhaps, no eye is completely free.

III. *General Rules for the Preservation of the Eyes.*

In all employments whatever, let us attend, as much as possible, to this circumstance, that the eyes may have an uniform and sufficient light, so as to affect the *retina* on all sides alike. The eyes materially suffer, when the

rays of the sun are strongly reflected from the opposite wall or window.

In children, many disorders of the eye, which would never have had so fatal an issue, have terminated in total blindness, when parents have neglected to provide the cradle, or window, with proper curtains. For this reason we ought to be extremely cautious in the choice of an apartment appropriated to the labours of the day. We should not place ourselves directly opposite to the light, in reading and writing; we ought rather to take the light in a lateral direction.

A great obstacle to this arrangement is the change of light in the same apartment, by the progress of the sun. Where the sun dazzled in the morning, we find, in the middle of the day, the most uniform light, which again, in the afternoon, particularly in towns, becomes reverberatory, and extremely hurtful. This inconvenience should be remedied, if possible, by a frequent change of the room; or, at least, we might obtain more uniformity in the light by means of window-curtains or blinds; and those of green or whited-brown linen are best adapted for this purpose.

It is an useful practice to protect weak eyes from the descending rays by means of shades, because the vivid light from above is thus intercepted. But we ought to consider that the lower part of the eye is by such means completely shaded, while the upper part of this organ is stimulated by the light it receives from below; a practice which cannot be productive of good consequences. If the malady be situated in the upper part of the eye, this conduct is still more improper: for the healthy part is in this manner protected, and that already relaxed is still more weakened.

Darkness, or shade, is, then, only beneficial to the eyes when they are unemployed, when the obscurity is natural, and, consequently, every where extended. To rest a little during the twilight is very suitable to weak eyes. No artificial darkness, during the day, is ever so uniform, but that the eye must exert itself at one

time more than at another, and necessarily suffer by this change. Persons with weak or diseased eyes, who spend the whole day in an apartment darkened with green curtains, injure their sight still more by this pernicious practice. It is far more prudent to repair to clear day-light and the fresh air, and to direct the eyes to distant prospects, than to confine them to the close atmosphere of a room, and to the sight of near objects.

Lastly, it is an error, that weak eyes, when employed in minute vision, ought to have a faint light, for by this practice they are certainly still more weakened. Thus green spectacles are very hurtful to some eyes, as they deprive them of that light which is necessary to a distinct perception of objects.

IV. *Of the Conduct to be observed in regard to weak Eyes.*

The artificial light of candles and lamps is detrimental to weak eyes; not, as some imagine, on account of the light being too strong, but because the flame of a candle too powerfully illumines the eye in one point, and does not uniformly stimulate the *retina*.

The means used to prevent the great stimulus from the rays of light, are, in general, so regulated, that the screen may not only cover the flame, but also concentrate the greatest part of the light. Thus the room is darkened, and only a small spot above and below the apparatus is illumined; a practice highly injudicious. The study-lamps, with large round screens, seem to be purposely contrived to impair the soundest eyes by their continued use.—The green parchment screens formerly used were likewise objectionable; for, though they admitted the free access of light on both sides, yet they produced too great a shade before the eyes. The best and most proper defence of weak eyes, by candle-light, is a flat screen, projecting about two or three inches over the forehead; or even a round hat, with a brim of a proper size.

Those who are afflicted with weak eyes should always make use of two candles, placed so that their flame

be neither too low nor too high for the eye. This is a circumstance of great importance, as the light, when placed too low, is uncommonly stimulating and fatiguing. Candles have this advantage over lamps, that their light is less offensive to the eye, and less pernicious to the lungs; as they do not, in general, emit so much smoke. But, on the other hand, all candles have the following disadvantages: 1. that, by their burning downwards, the fatigued eye is progressively more strained in the latter hours of candle-light; 2. that the unequal light they give is attended with the additional trouble of snuffing them; and, 3. that by the least commotion of the air, or if made of bad materials, they injure the eye by their flaring light. Hence, a clear chamber-lamp, burning with the least possible smoke and smell, is far preferable, and more soothing to the eye, than even wax-candles. Some of the lately-improved Patent-lamps, originally contrived by M. D'ARGENT, in Switzerland, are well calculated to answer every useful purpose; but, instead of the common round screens, I would recommend another immediately to be described.

Those *screens* are the best which are applied to one side of the light only, which are not larger than is necessary to cover the flame, and which still admit a small quantity of light to pass through them. This is obtained by a simple apparatus of taffety, slightly gummed and folded, so that it can be carried about in the pocket. These little screens are very portable, and are possessed of the essential advantage, that they overshadow only the small angle formed for the individual who is affected with weak eyes, without depriving the rest of the company of light. In the day-time, on the occasion of sealing letters, for instance, the light of a candle or taper is more prejudicial to the eye than in the evening.

In the morning we should not too much exert the eyes immediately after rising. Hence it is advisable to remove the candle to some distance, and under shade in the long winter mornings, till the eye be gradually accustomed to it. For the same reason, the window-shut-

ters ought not to be suddenly opened in very bright day-light. This immediate change, from darkness to the clearest light, occasions sensible pain even to the strongest eye.

Writing fatigues the eyes less than reading; for the letters we form on the paper are previously imprinted on the imagination, and, consequently, require much less acuteness of sight than the series of letters and words we read. It is, for the same reason, much easier to the eye to read our own hand-writing than that of a stranger, however distinct. Besides, the letters and lines in writing are more distinguishable by the lower part of the blank paper, than the lines in a printed book, or on a manuscript; in both of which they appear to flow together, and can be kept asunder only by great exertion of the eye. The case is considerably changed, when we endeavour to write remarkably well, or when we make use of a glossy white paper, and particularly when we copy the writing of another person with great accuracy; in all which instances, the sight is more impaired than in reading, especially by changing the direction of the eyes too frequently to papers or books of different types.

The extravagant elegance in the letter-press of many modern books, the splendid whiteness and smoothness of vellum paper, or of hot-pressed woven paper, and the broad margin injudiciously contrasted with the printers' glossy ink, are ill calculated to preserve our eyes. And if the lines be too close to each other, the columns too long, as in our newspapers, the ink too pale, as is now becoming fashionable, and the paper of a bluish cast—the eyes are then in a fair way of being totally blinded.

I read in the *Gentleman's Magazine* for April, 1794, a proposal to print on dark blue paper with white letters, or on green paper with yellow letters. This plan certainly deserves a fair trial, though it might meet with great difficulties in the execution. The eyes would also be greatly preserved, by making use of a fine light blue writing-paper, rather of a greenish tint, instead of the fashionable white or cream-coloured paper.

Every exertion of the eyes is most hurtful immediately after a meal, as well as at any time when the blood is in great agitation.—In the dawn, in twilight, and in moonshine, we ought not to read or write, nor direct our sight too attentively to objects.

Refracted rays afford an unpleasant light, and oblique rays are particularly painful. When we take exercise in a long, irregularly-lighted apartment, we feel sensible vibrations in the pupil of the eye. The most suitable apartment, in this respect, is one forming a regular square, with large windows to the east, in which there is an uniformly-divided light, or still better by means of sky-lights. Garret windows afford a bad light; it being generally introduced, as it were, by a funnel, and illuminating only one part of the room, while the rest remains dark.

A sitting-room, the walls of which are pale green, without paintings, is best adapted to preserve the eyes; two or three uniformly high windows, so as to give an equal light (yet so contrived as to prevent its being too strong); close and moveable green blinds; a green carpet on the floor; and, lastly, such shutters as may occasionally leave the upper part of the window uncovered, in order to admit sufficient light.—To sit with the back to the window, occasions a shade which forms a disagreeable contrast to the surrounding light. The writing-desk, therefore, ought to be placed so that the left window may be on the left hand, and that the right hand may throw no shade on the paper, and not too near a corner of the room, as this generally has an unfavourable light. A space sufficiently broad between two windows, is a still more convenient situation for a desk; but we should not sit too near the wall; a custom which is excessively hurtful to the eyes.

An oblique position of the desk is the most proper; for it presents to us the writing materials in that position in which we are habituated to place a book, when we hold it in our hands, and from which the rays of light diverge more gradually than from a horizontal table.

It is less hurtful to the breast, to the abdomen, and also to the eyes, to use a desk of this form, and to write standing rather than sitting; provided that the height of the desk be proportionate to the length of the body, that it stand firm, and that both arms rest upon it, without being fatigued by raising them too high.—In *standing* before a desk, we have this additional advantage, that there is less occasion to direct the eyes upwards, than in sitting. Hence the conversation between tall persons and those of a low stature is most troublesome to the latter, as they are constantly obliged to look upwards.—Those with whom we converse ought not to stand between our body and the light, as it is both rude and prejudicial to our eyes.

At night we ought to place the candle so that we may receive light from it in the same direction as we do from the window in the day-time. Even if it be provided with a green screen, as before described, a weak eye will not long be able to support its glare in a straight line. Were the candle to be elevated at our back, so as to allow the light to come down over our shoulders, we should then experience the same inconvenience which attends that posture in day-light. Hence it is necessary to place it sideways, and to keep the book or paper in a lateral direction.

We should not expose ourselves in a straight direction to objects strongly illuminated by the flame of a candle, or fire from a grate. Thus the highly-polished fenders and other fire-irons are injurious to sight; and not less so is a smooth and shining wax-cloth over a table, as refracting too much the rays of light: a green cloth is preferable. In all cases the light should at least be of equal height with the forehead; not close to a white wall, and still less before a looking-glass, or other polished body. To walk up and down a room lighted with a single candle, so that at one time we have the light full in our eye, and at another are nearly in darkness, is very prejudicial to weak eyes. It is better to place the candle in the middle of the room, in order to illumine it more

uniformly, or, what is still preferable, to hang it higher than the shade of our own body.

Where persons must have a light during the night, it ought to be placed in the next room, or, at least, within the chimney, that it may be entirely out of sight. If neither of these methods be convenient, we should place it behind or at the side of the bed, rather than in an opposite direction. For, if this be not attended to, the light may produce very noxious effects during sleep, even through the closed eye-lids. The same attention is required, to prevent the rays of the sun or moon from striking the eyes of the person asleep, either directly or by reflection from the opposite wall.—As some men are known to sleep with their eyes open, it would be advisable to employ somebody to shut them, that they may not suffer by the accidents before mentioned.

Those who have weak eyes should carefully avoid strong fires, and even hot rooms; for heat still more exhausts the eyes already suffering from want of moisture. Indeed, it is highly probable that the weakness of sight and early blindness, so common in this country, are, in a great measure, owing to the bad custom of hastening to the fire-side, whether coming from the cold air, or from the dark streets.

Weak eyes must be indulged with shady places, and protected against every dazzling object. But green arbours should be avoided, on account of the twinkling light occasioned by the agitation of the leaves. The exercise of the eyes ought never to be suspended for any considerable length of time: too much rest is hurtful; and, to sit whole hours of the evening without candle-light, is extremely pernicious. It is, however, very soothing to the eyes, to let them rest for half an hour during twilight. This should teach us to adopt the general and salutary rule, to rise with the dawn, and, likewise, gradually to accustom ourselves to the artificial light of the evening. For a similar reason, those who complain of weakness of sight ought not to resort to places artificially lighted in the day-time, such as theatres,

&c. Even the soundest eyes must inevitably suffer by a sudden change from light to darkness, or from darkness to strong light.

If it become necessary to let the eyes rest, we should by no means press the eye-lids too closely together, which, if long continued, is very hurtful. So is strong and frequent friction, which powerfully stimulates the nerves and injures the eyes. If we sit for any length of time with closed eyes, we are easily overtaken by sleep, which, though beneficial, ought to be of short duration, that the eyes may not be overheated. As a protection against injury from external causes, it is most useful to wear a shade at such a distance as may allow the eye free motion, and not keep it too warm. The green veils worn by ladies are, in this respect, well calculated to prevent dust from entering the eye, as well as to protect it against cold winds, and the burning rays of the sun.

The common eye-cases, used by travellers, and by artificers who work in substances abounding with dust, are, for the following reasons, improper: 1. the glass in the case stands too prominent, and diminishes the horizon; hence, as those who wear them can only see in a straight direction, they do not travel with safety on an uneven road. 2. The glass, in these cases, being easily covered with vapour, both from internal perspiration and external cold, prevents distinct vision. These eye-cases might be much improved by making the brim somewhat narrower, and substituting a fine filken gauze, or rather a thin plate of ivory dyed green, with a small horizontal incision, in preference to glass.

All glasses used to assist vision appear to require some effort of the eyes, and, unless they be indispensable, they should never be employed by persons at an early time of life. In proof of this assertion, I shall only remark, that by looking through a window of the finest glass, we feel our eyes much more fatigued than if the window had been open. This is particularly the case in looking through coach-windows, where additional injury is occasioned to the eyes, by the motion of the carriage,

and the impure air arising from respiration. Green curtains in coaches are, therefore, judicious and proper.

Of all the remedies for preserving weak eyes (for diseased eyes require professional assistance), bathing them in pure cold water is the most refreshing and strengthening. But this ought not to be done above three or four times a day, otherwise it has a tendency to give an unnecessary stimulus to the eyes. Nor should it be done immediately after rising in the morning, but only when the moisture, which, during sleep, is deposited even in the soundest eyes, is nearly evaporated. This partial cold bath may be repeated after dinner and supper, at which times the eyes stand as much in need of it as in the morning. Not only the eyes, but also the brow, the region behind the ears, sometimes the whole head, and particularly the upper lip, which is closely connected with the optic nerves, should be bathed or washed as well as the eyes. In the morning the eye ought not to be precipitately, but gradually exposed to the water; and the washing should be expeditiously performed. In drying or wiping the eye, we should proceed gently and with caution; and immediately after washing, we should particularly guard against any rays of light, as well as every kind of exertion.

A large piece of sponge, saturated with water, so that it may not too soon become warm, is far preferable in these partial bathings, to the warm, smooth hand, or towel. The sponge should be frequently dipped into cold water, and occasionally allowed to lie for a few moments on the eye, with the head bent backward, while the eye is gently moved and cautiously opened during the operation.

The bathing of the eye in small glasses is less advantageous, as the water very soon turns lukewarm, and is perhaps too cold, when suddenly renewed. These glasses occasion another disagreeable sensation, as their edges will, in some degree, attach themselves to the skin, not unlike cupping-glasses.

The cold bath, under certain restrictions, is useful;

as it invigorates the whole body, and, consequently, strengthens the eyes; but in some cases it may injure them, by propelling the blood too forcibly to the head. This can, in a great measure, be prevented by not only washing the eyes and the whole head previously to entering the bath; but also by diving the whole face and head under water.

V. *Dietetical Precepts respecting the Eyes in general.*

Above all things we must observe the old rule; to try carefully what best agrees with us, and to attend to moderation and regularity in our manner of living.

Smoking tobacco, and taking snuff, are injurious; as, by either practice, the eye is too much stimulated. It is a vulgar error, that people cannot resign these improper habits without injury to their health. They may be safely abandoned at once; though occasionally prescribed as medicines. Tobacco* has only been known in Europe since the beginning of the seventeenth century, and was long used merely as a luxury. This plant is now much abused; and those who are once accustomed to it, cannot leave it off without great resolution. To such persons it does not afford relief as a medicine; their olfactory nerves having become almost insensible to its stimulus. As a medicinal remedy, it serves to draw superfluous humours from the head; but, in those who use it extravagantly, especially in snuff, it imperceptibly weakens the nervous system, as well as the memory.

After meals, and the above-stated bathings, it is beneficial to the eyes to remain in the open air, to direct our looks to a grass-plat, or to divert them with some amusing employment. Some have observed, that their eyes are not so strong after they have eaten weak soups or broths as after solid food: they farther affirm, that their sight is

* The tobacco-plant was first discovered growing wild in South-America; in the year 1496 it was also found in Saint Domingo; and, in 1520, in Jutacan; from which last place the first seeds were brought over to Portugal in 1560, by the French Ambassador, *Nicot*, who gave it its present name from the Island of *Tobago*, where it grew in great abundance. Hence *Linnaeus* calls it by the compound name of *Nicotiana Tabacum*.

stronger after a meal consisting entirely of vegetable aliment, than after a very moderate portion of animal food. These observations are far from being unimportant, and, if fully confirmed by experience, they may throw some light on the dietetical treatment of the eyes—a branch of medicine that has hitherto been too much neglected.

A short sleep after dinner can only be beneficial to the eyes of those with whom this practice does not disagree: at all events, the eyes ought to be protected from daylight, which would hurt them more than they can be refreshed by a short slumber. The particular rules respecting this practice, I have stated in the eighth chapter. The steam of boiled coffee, gently applied, has also been recommended after dinner to persons afflicted with weak eyes: but nothing has a more salutary tendency, in this respect, than to go to bed at an early hour; for most people impair their sight by heavy suppers and heating liquors, so that their eyes remain inflamed till next day. The same, indeed, is also the case with those who indulge too much in sleep.

A pure, serene air is an essential requisite to the preservation of the eyes. Fœtid exhalations sometimes instantaneously affect the eye; hence we should avoid the putrid effluvia from marshes and ditches, or other places in which the air is filled with noxious vapours; for instance, the vicinity of colour-shops, hartshorn-distilleries, and the like. It is, perhaps, unnecessary to point out every species of mephitic vapours to be shunned as the enemies of sight; yet it deserves to be remarked, that the exhalations of stables are injurious, while the stalls, and other places, where cattle are kept, are far less hurtful. Lastly, the galleries of churches, as well as the higher boxes and galleries of play-houses, are most pernicious places; for the exhalations, ascending from a great number of people assembled below, are extremely detrimental to sight.

On the other hand, the frequent enjoyment of a pure and fresh air, the occasional resort to elevated situations, nay, even the exposure to a moderate wind, are means

of improvement. The more vigorous species of bodily exercise, also, are, in a certain degree, useful; provided we do not exert the eyes by reading, writing, &c. before the circulating fluids are reduced to their proper medium. The application of electricity, which has benefited many weak eyes, by its fluid being conducted through a wooden point, is somewhat analogous to standing against the wind; as it probably operates more by the gentle vibrations of the air than by the communication of the electric fluid itself.

To read in the open air is hurtful to sound, and still more so to weak eyes, unless the light of a clear day be modified at least by the foliage of a tree from above; yet, even here, the vivid light which surrounds the book is fatiguing.

The greater or less interest we take in our employments, is of considerable importance to the organs of sight, particularly if they are in a weak state. The more alluring a book, or any other amusement is, the longer we are induced to continue it. Hence the important rule—to reserve the most interesting labours for the half-wearied eyes; yet, with prudent severity, always to appoint a task; for, without this precaution, the sight, though at a later period, will inevitably experience more or less injury from such practices.

The state of the weather has great influence on the power of vision; hence persons troubled with weak eyes should not be alarmed if, in a tempest or thunder-storm, in rainy or foggy weather, their sight be less acute, or even much impaired. Such individuals are easily affected by standing too long on cold or damp ground, by a too light dress, and particularly by a too thin covering of the legs and feet.

Riding on horseback is beneficial to weak eyes, as are also walking and riding in carriages. The principal advantage in all these exercises is, perhaps, derived from employing the eye with a great variety of objects, none of which occupies the attention too long.

Lastly, persons having black eye-lashes generally pos-

self greater powers of vision than those whose eye-lashes are of a light colour; because the former are a better screen for the eye, and admit no light from their outside, by which the image on the retina would be rendered weaker and more indistinct.

MONTALDUS gives an account of a person whose eye-lids and eye-lashes were completely white; who consequently saw but indifferently in the day-time, but much better in the evening, and at night. This man happened to be taken prisoner by the Moors, who dyed his eye-lids black, by which his sight was much improved; but, as soon as the colour was lost, his vision also became weaker.

Dr. RUSSELL mentions, in his "*History of Aleppo*," that the Turkish ladies usually dye the inner side of their eye-lids black, not so much for the sake of ornament, as with a view to strengthen their sight. It has farther been observed, that when we lose the eye-lashes, as is often the case in the small-pox, the sense of vision is thereby considerably impaired. For a similar reason, the hair combed down the forehead, if of a dark colour, will assist the sight, as well as any other contrivance.

VI. *Some additional Rules, addressed to those who are obliged to make use of Eye-Glasses.*

The cases in which eye-glasses may be used with advantage, are nearly the following: 1. when we are obliged to hold small objects at a considerable distance before we can distinguish them: 2. when, in order to discern objects, we require more light than usual; for instance, when we are obliged to place a candle between the eye and the object, a most destructive practice, by which the optic nerves and muscles are much injured; and, as the eye employs itself with the object in proportion to the degree of light reflected upon it, the pupil ought to dilate accordingly; instead of which, it is forced to contract, on account of the too powerful light produced by the intermediate candle: 3. when a near-ob-

ject, upon accurate and attentive examination, becomes obscure, and begins to appear covered, as it were, with a mist or fog: 4. when, in reading or writing, the letters seem to flow into one another, and look as if they were double or treble: 5. when the eyes are easily fatigued, and we are obliged from time to time to shut them, or to direct them to fresh objects, for temporary relief.

In the choice of spectacles we need not attend so much to their magnifying power as to the circumstance of their agreeing with our sight; that is, when they enable us, clearly and without exertion, to see at the same distance, in which we formerly were accustomed to read or work. Hence we ought, out of a number of glasses, to choose those which afford the best and clearest light in every state of the eye. But if a person be short-sighted, he should select a second glass, magnifying a little more than the other, but somewhat less distinct, yet so that it may not obscure the object. This is unpleasant at first, but the eyes in time become accustomed to it, and daily improve. If, after some time, we make use of less concave glasses, there is no doubt, that in the course of a few years, according to particular circumstances, the defect of short-sightedness may be gradually removed.

He who observes this regular gradation with his spectacles, may preserve his eyes to the latest period of life. But we should not make these changes too suddenly, lest the aid of art be too soon exhausted, and the wearer of glasses perhaps be unable to find any of sufficient magnifying powers. It is farther a hurtful practice, to use any other but our own glasses, to which the eye has been accustomed;—every irregularity is injurious, and the preservation of the eyes depends chiefly on uniformity, with respect to glasses as well as to the light, in which the organs of sight are exercised.

In using one glass only, people accustom themselves to neglect one of the eyes; and on this account spectacles are preferable. Yet both glasses must be separately fitted to each eye, and by no means indiscriminately used; for this would increase the disease.—If, however,

we make use of one glass only, each of the eyes ought alternately to be habituated to it.

Many persons wear glasses in the evening, and dispense with them in day-light. This is an imprudent practice; and if it be not too late, they should choose a second pair of glasses, somewhat more magnifying, to be used by candle-light only. In this manner, the retina would receive an equal proportion of light, at one time as well as another, and the eye would longer preserve its vigour.

Green glasses are said to be most suitable to the eye, since they modify the impression of light on the retina. Though this be in a great measure true, they cannot be indiscriminately recommended, and certainly not to such as have weak eyes. Green is, indeed, pleasing to the eye, more than any other colour, but, at the same time, it somewhat obscures objects, especially at first. Those of a vigorous sight only should use green glasses, as preservatives, especially against the fire or candle-light. But, if white or light-coloured objects appear red, after having used green glasses for a short time, we should discontinue their use; as this phenomenon is a certain proof, that they will, in the end, destroy the eyes. If the green colour does not in two or three days become imperceptible, but appears constantly upon the paper, as it did at first, it is a farther criterion that the use of them is improper.

Many persons give the preference to large reading-glasses; in order to avoid wearing spectacles. It is, however, obvious, that it must be a pernicious practice, to keep the eyes in constant exertion, as is the case here, where every motion of the hand and the head necessarily alters the distance. Besides this inconvenience, the dazzling splendour of the rays, reflected from the surface of the glass, weakens the eye to such a degree, as to render the use of spectacles ultimately indispensable, with this difference, that the eyes require greater magnifying powers than might have been necessary without this depravation.

Hence spectacles are in every respect preferable, as they are not only more conformable to the nature and mechanism of the eye, but also more convenient: they are uniformly placed before the objects by the imperceptible motion of the head; they leave the space between the object and the eyes open and free; and being generally thinner, and lying at an uniform distance before the eye, they present the objects more clearly and distinctly than reading-glasses.

Those who have weak eyes ought not to employ themselves, even occasionally, in a manner that may be fatiguing to the sight. Particularly hurtful are those occupations, in which one eye only is exerted, and must, consequently, be placed in positions different from those of the other eye, which is at rest. For this reason, the use of magnifying glasses, of whatever kind, is more pernicious to weak eyes, if we always use one eye, and purposely shut the other, than if we alternately make use of either. On this account, microscopical investigations are less hurtful, if while one eye be employed we can keep the other open.

We should not make too frequent trials to discover whether we have improved in sight, or not; for the exertion necessary upon these occasions, is uncommonly stimulating and fatiguing.

Spectacles ought to be used only for the purposes for which they are designed; namely, in such employments as require the assistance of art, and where the eye is always kept at an equal distance; for instance, in reading or writing. We should not, without a full trial, make choice of a pair of glasses, nor be satisfied with those which at first exhibit the objects clearly and distinctly. For objects will not always be at the same distance before us as they appear at the first experiment. It would be proper to try a pair of glasses for a short time, especially by candle-light; to use them in that posture of the body to which we are accustomed; and, if with the usual kind of labour, we do not feel our eyes fatigued, but rather somewhat relieved, we then

ought to adopt these glasses. But as it is almost impossible to meet with a pair of glasses in the shops, which fit both eyes, there is nothing more absurd than to purchase spectacles ready made. Certain as it is, it may not be generally known, that there is perhaps not one person among thousands, whose eyes are both of an equal size and constitution. For this reason, different eyes should be accommodated with different glasses; and, if we consult our interest in an affair of such consequence, we shall be cautious in selecting for each eye a proper glass. The following advice is submitted to those who have no optician at hand:

A short-sighted person, who wishes for a proper concave or magnifying glass, may take the exact focus, or point of vision, by presenting the smallest print very close to the eye, and gradually removing it as far as he can read the letters distinctly, and without much exertion. When he has accurately ascertained the focus, after frequent trials, let him employ another person to take the measure of this distance, with a slip of paper, in the nicest possible manner. An optician, on receiving this measure, and being informed at what distance the glasses are intended to be used, will be able to judge, in a certain degree, what glasses are necessary, although by no means so accurately as by a conference with the short-sighted person.

Those whose eyes are inclined to far-sightedness, may proceed exactly in a similar manner. But all eye-glasses ought to be furnished with double joints or springs; as those with single joints are not only inconvenient to the nose, but what is worse, they are apt to shift the point of vision with every motion of the head, and, consequently, injure the eyes.

Lastly, in such occupations as require a more or less extended view of the objects; for instance, in playing at cards, where the distance of the objects must be frequently varied, it would be extremely injudicious to use spectacles; as no eye whatever can bear such exertions without uncommon fatigue. For a similar reason, it is hurt-

ful to these important organs, to keep the spectacles on the head at close work; when, by some accident we are obliged to search for something dropt, or mislaid. Thus, we force the eye to make uncommon efforts, in seeing farther than it is enabled to do, by the construction of the spectacles. I need not observe, that many good eyes are spoiled by such imprudent practices.

CONCLUSION.

THE preceding Chapters contain the principal outlines, relative to the treatment of the human body in a healthy state, so far as the limits of this work would admit, without transgressing too much on the indulgence of the reader.

I shall conclude with a few general reflections, and recapitulate, in a concise manner, several useful precepts, which have been more fully laid down in former parts of this work.

Moderation, in every respect, ought to be the first and leading maxim of those who wish to live long, and enjoy health. Extremes, in the most opposite things, frequently border on each other. The greatest joy may occasion the most acute pain; and, on the contrary, moderate pain is often accompanied with feelings, not altogether disagreeable. The highest animal gratification, indeed, is closely connected with disgust, and it is difficult to avoid the latter, after the enjoyment of the former. Hence, prudence enjoins us to restrain violent sensations and affections, before they have attained the highest degree, and become ungovernable.

The illustrious MEAD, in his “Medical Precepts and Cautions,” originally written in Latin, when treating of the affections of the mind, makes the following remarks, the truth of which has induced me to insert them:

“All mankind,” says that medical philosopher, “have a natural desire for the enjoyment of pleasures, which

are of two different kinds, namely, the sensual and mental. The former engrosses the greatest part of men, while those few only 'whom kind Jove has befriended,' are captivated with the charms of intellectual pleasure. The reason why so great a proportion of thinking beings indulge in sensuality is obvious: it proceeds from being unacquainted with the serenity of mind resulting from a dignified conduct, and the joy that animates a good man, when his reason presides over his passions. But the sensualist, being devoted to grovelling enjoyments, is incapable of relishing the real charms of Virtue, and the superior beauties of Nature. The man who wishes to enjoy true happiness, should habituate his mind to cherish Virtue, and carefully avoid the opportunities which excite and inflame the passions.

"CICERO illustrates this by a sentiment of CATO, which he received from the great ARCHYTAS, of Tarentum;—'that Nature never afflicted mankind with a more destructive disease than the pursuit of bodily pleasure, which stimulates to enjoyment with ungovernable rashness.'* Indeed, the perusal of that great philosopher's writings on the subject, must delight the mind of every rational man: and Virtue's exclamation in SILIUS ITALICUS, is equally just and impressive:

"Pleasure, by gliding on the minds of men,

"More mischiefs hast thou wrought than hostile arms,

"Than all the wrath of Gods!"†

"As the rational subjugation of the passions strengthens the mind, so *temperance in diet* renders the body less subject to these turbulent emotions. And this observation is applicable not only to individuals who are naturally of a hot constitution, but even to those who controul their appetites; because moderation is a great means of tranquillising the mind."

Cleanliness is a principal duty of man, and an unclean or filthy person is never completely healthy. It is better to wash ourselves ten times a day, than to allow one dirty spot to remain on the skin. On a place where im-

* DE SENECA, cap. xii.

† PUNICORUM, lib. xv. v. 94.

purities are suffered to clog the pores, not only insensible perspiration, but likewise the absorption by the skin is entirely suppressed; and, if the whole body be, as it were, covered with a varnish, formed of perspirable matter, it is impossible that a person in such a state can possess sound blood, or enjoy good health.

Many diseases originate from an impure *atmosphere*, but a still greater number from the sudden changes of the temperature of the *air*. Hence the necessity of exposing ourselves daily to such changes, and of renewing the air in the house and apartments we inhabit, by opening the doors and windows every clear morning, or during the day, as often as convenient. Indeed, cold weather, however intense, has the effect of bracing the fibres of the system in general, and is attended with danger only when we suddenly remove to a warmer temperature. For this reason it is extremely injudicious, and a negative compliment paid to a visitor, to invite him to the fire-side upon his first entering a house;—we should better consult his health, by conducting him to a cold room, or to some distance from the fire, till the temperature of his body be more equal to that of the apartment.

Every thing calculated to remove or cure diseases may also produce them; for, whatever has a tendency to accomplish useful changes in the body, may, under different and opposite circumstances, be attended with the contrary effect. Hence no *medicine* whatever ought to be used as daily food—a favourite practice among invalids, valetudinarians, and the votaries of quack medicines.

Feeble individuals ought to eat frequently, and but little at a time: the number of meals should correspond with the want of strength;—for it is less hurtful to a debilitated person to eat a few mouthfuls every hour, than to make two or three hearty meals in one day; yet this observation is liable to exceptions, respecting those persons who have naturally weak stomachs.

There is no instance on record of any person having injured his health, or endangered his life, by *drinking water* with his meals; but wine, beer, and spirits have

produced a much greater number and diversity of patients than would fill all the hospitals in the world. Such are the effects of intemperance in diet, particularly in the use of drink; for neither beer, wine, nor spirits, are of themselves detrimental, if used with moderation and in a proper habit of body.

It is a vulgar prejudice, that water disagrees with many constitutions, and does not promote digestion so well as wine, beer or spirits: on the contrary, *pure water* is preferable to all brewed and distilled liquors, both for bracing the digestive organ, and preventing complaints which arise from acrimony, and fullness of the blood.

It is an observation not less important than true, that by attending merely to a *proper diet*, a phlegmatic habit may frequently be changed into a sanguine one, and the hypochondriac may be so far altered, as to become a cheerful and contented member of society.

The duration of *work* or *exercise* cannot be easily ascertained, with regard to every individual. Generally speaking, we ought to work only when we feel a mutual inclination to either literary or mechanical labours. To force ourselves to any exertions, particularly those of the mind, is productive of imperfect performances.—It is better to exercise the mind in fine than in bad weather; but those who are continually making excursions in the former, cannot usefully employ themselves in the latter.

Of the twenty-four hours of the day, we ought, in a good state of health, to devote, upon an average, twelve hours to useful occupations, six to meals, amusements, or recreations, and six to sleep. This would be at once a natural and arithmetical proportion. It is, however, to be regretted that the hours cannot be thus accurately divided.—An industrious person frequently counts but twenty-three hours in a day; as one, and sometimes even two, hours slide away imperceptibly.

“Sleep,” says Dr. MEAD, in the sequel of the work above mentioned, “is the sweet soother of cares and restorer of muscular energy, which is wasted by bodily and mental exertions during the day. But excessive

sleep has its inconveniences; for it blunts the senses, stupifies the mental faculties, and renders both less fit for performing the duties of active life. The proper time for sleep is the night, when darkness and silence invite and cherish it; because sleep during the day is less refreshing. The observance of this rule, if proper for the multitude, is still more necessary for persons devoted to literary pursuits, whose bodies and minds are more susceptible of injuries."

The modern inventions for promoting luxury and effeminacy are really surprising. It were to be wished, that the ingenious contrivers could be persuaded that their pernicious arts resemble those of the Quacks, whose poisonous productions gradually, though ultimately, consume the vital spirits of their victims.—Every new expedient we use with a design to diminish the labour of man, and encourage indolence, is an additional proof that our age is not in a state of improvement, but rather on the decline. Wretched is the man who requires the aid of Art, more than of Nature, to prolong his life, and support so precarious an existence!—Conveniency leads to effeminacy; effeminacy to general relaxation; and this is eventually attended with total enervation and imbecility.

"Although pleasure, riches, power, and other things," concludes the author before quoted, "which are called the gifts of Fortune, seem to be dealt out to mankind with great partiality; yet those things which constitute real happiness, are more equally distributed than is generally imagined. People in the lower ranks enjoy the common advantages of existence more intensely than those in the higher walks of life. Wholesome food is acquired by moderate labour, which improves the appetite and digestion; hence sound sleep, uninterrupted by corroding cares, refreshes the wearied limbs; a healthy progeny fills the cottage; and the sons perform their father's labour, making his hoary locks sit comfortably on him. How vastly inferior to these blessings are the delicacies of the affluent, which are ever accompanied with real evils! Their appetites, in order

to relish their food, must be stimulated by poignant sauces, which heat and vitiate the blood, and render the body liable to distempers. Their excesses disturb their repose; and as a punishment for their vices, their sons, who ought to be the ornament and support of their families, contract diseases from their mother's womb, and are afflicted with infirmities through the course of a languid life, which seldom reaches to old age. They are frequently tortured with anxieties for obtaining honours and titles, insomuch that they lose the advantage of their possessions, by the vain desire of new acquisitions:

In wealth like this,
I always wish to be extremely poor!

HORACE, Satire i. v. 78.

“But the worst inconvenience that results from Epicurean modes of living is, that, by supplying the body with superabundant nourishment, the faculties of the soul become stupified, and the passions inflamed; while the sparing and homely diet of the laborious poor neither oppresses the bodily functions, nor fosters a propensity to vice. Hence, unless prudence be a constant attendant on opulence, it is, in these respects, better and more conducive to the preservation of health and prolongation of life, to live on a small fortune.

“Nor is Nature to be deemed an unjust step-mother, but a most provident and beneficent parent. In short, it behoves a wise man, in every stage of his life,

To hold the golden mean,
To keep the end in view, and follow Nature.

LUCAN, Book ii. ver. 381.

“Whoever investigates the imperfections of human nature, will find that as some men are vastly superior to others in the endowments of the mind, yet, mournful reflection! even the best minds are blended with some degree of depravity; so the healthiest bodies are often afflicted with diseases; and these, being the seeds of death, ought to remind us of the shortness of this life, and that in the words of LUCRETIVS,

“None have a right to life, all to its use.”

P O S T S C R I P T.

IT has been frequently and justly remarked, that popular books on medical subjects are generally deficient in their practical application; insomuch that they leave the reader doubtful *whether* and *when* he is to apply for professional advice. As my design, in these Lectures, has not been to lay down particular rules for the distinction and treatment of diseases, but rather for their prevention, and, consequently, for the preservation of health, I think it necessary to remark here, that a work seems to be wanting, which should impart instruction to general readers, how to discriminate diseases, and how to treat them, by a due attention to diet and regimen, as well as to regulate the habits, peculiarities, temperament, and, in short, the whole state of the patient's mind and body:—such a work being a desideratum of the present age.

When I began the revival of these Lectures, I had it in contemplation to give the outlines of a treatise corresponding with this description: but being confined within the limits of a single volume, and conscious that a mere sketch of so extensive and important a work could be of little if any *practical* benefit, I have purposely delayed the publication of the whole to next year, when a separate volume shall conclude my dietetical labours.

Having treated, in the present volume, of almost every subject that relates to the management of the human body in its *healthy* state, my next work shall be entirely appropriated to its treatment in a *diseased* state. It shall comprehend an accurate and clear description of Diseases, together with a plan, founded on the rules of experience, how to treat and eventually to cure them, especially those of a chronic nature. The administration

of medicine ought, in such a work, to be only a secondary mean of removing disease; for, by strictly medical remedies, we can cure *symptoms*, and afford occasional alleviation of pain; but we cannot effect a favourable change in the nature and progress of a disease, whether chronic or acute, without due attention to food, drink, air, sleep, exercise, or rest, &c.

Hence I hope to be exempt from the charge of presumption, when I venture into a larger field of inquiry than has hitherto been explored by practitioners; for, as novelty is not my object, though I think that too little has been done by professional men, in guiding the unhappy sufferer, and assisting him with those simple remedies which are placed more immediately around him, I shall enter upon my proposed work with the confidence arising from the importance and utility of the undertaking.

It is much to be regretted, that the boundaries between safety and danger cannot be perspicuously laid down in a popular book, without deviating from the usual terms and definitions adopted by medical writers: but I shall not hesitate to avail myself of such idiomatic phrases as will render my writings intelligible to the generality of readers. To give a short specimen of this deviation, for which I allege the respectable authority of the late Dr. TISSOT, I have subjoined a few Queries, which ought to be distinctly answered by individuals who consult a physician, whether personally or by letter. Indeed, it is not always an easy or practicable task to form an accurate judgment of the state of a patient, without an interview, let his case be ever so clearly and circumstantially described: yet many of the difficulties may be removed, if the following questions be answered with candour and precision. For, as the success of the medicine entirely depends on a previous knowledge of the disease, this knowledge can, in such cases, be derived only from a clear and faithful account communicated to the physician.

General Questions.

Of what age is the patient?

Has he previously enjoyed perfect health?

In what manner has he lived—frugally or luxuriously?

How long has he been ill?

How did the disease commence?

Is he disposed to be feverish?

Does the pulse beat strongly or weakly?

Has the patient still muscular strength, or is he much debilitated?

Does he remain the whole day in bed, or alternately walk about?

Is his state the same at all hours of the day?

Is he uneasy or quiet?

Is he troubled with heats or shiverings?

Is he afflicted with pains in the head, throat, breast, stomach, abdomen, thighs, or the extremities?

Is his tongue dry, accompanied with thirst; disagreeable taste in the mouth, nausea; and has he an aversion to, or appetite for food?

Has he any stools, and how often?

Of what appearance and consistence are the excrements?

Does he evacuate urine freely and copiously?

Of what colour and consistence is the urine—is there any sediment in it?

Is he troubled with night-sweats?

Does his skin feel soft and pliable, or dry and parched?

Is there any expectoration, and what?

How is his sleep—quiet or disturbed?

Does he breathe with or without difficulty?

To what mode of diet and regimen has he been accustomed, since the commencement of the present complaint?

What remedies has he used, and with what effect?

Has he ever before been afflicted with the same malady?

In female and infantile diseases, there occur circum-

stances peculiar to the sex and age;—these, as well as the preceding general questions, require to be attended to, in consulting a medical man.

Queries relative to Females.

Do the menses appear regularly, and in moderation?
Is the patient pregnant, and how long has she been so?
If in child-bed, how was the delivery—successful, or attended with difficulty?

Were the discharges easy and regular?

Has the patient a good breast of milk?

Does she suckle the child herself?

Is she subject to *fluor albus*, hysteric fits, &c.?

Queries relative to Children.

What is the exact age of the child?

How many teeth has it, and did it suffer much pain in teething?

Is it ricketty?—Is it of a stature corresponding with its age?

Has it had the small-pox—natural or inoculated?

Has it a large and hard belly, with strong, or emaciated limbs?

Does it sleep quietly, or start up, grind its teeth, scream, &c.?

Does it discharge worms, and of what kind?

If worms are suspected to exist in the child (and the same observation will apply to adults) it ought to be examined whether some of the following, that is, at least, four or five of the principal symptoms (marked with *italics*) concur, which warrant such a conclusion: viz.—Slight colic pains—frequent discharge of water from the mouth—*fætid breath*—*itching of the nose*—a swollen or chapped upper lip and nose—a ravenous appetite for, or aversion to food—oppression at the stomach—vomiting—*an effort to swallow during sleep*—costiveness or diarrhœa—*bloody excrements*—*sudden and frequent inclination to go to stool*—a large belly and thin limbs—continual thirst—occasional debility, and sadness—*frequent change of co-*

lour—languid eyes, with a livid hue around them, and standing half open during sleep—terrifying dreams—frequent startings of the tendons—*grinding the teeth*—uneasiness and anxiety—a *milky urine*—palpitation of the heart, fainting fits, convulsions—a *profound and long sleep*—*cold sweats, appearing and vanishing suddenly*—temporary dimness—dumbness, or difficulty of speech—weakness or lameness of the joints—*corroded gums*—*frequent hiccough*—a small and irregular pulse—delirious fits—a *slight and dry cough*—*evacuation of thick slimy matter*—worms discharged from fistulous ulcers, &c.

Besides the general questions which ought to be put and answered in all diseases, those likewise must not be neglected which more immediately relate to the present indisposition of the patient. For instance, in a quinsey, we ought to be informed of the particular state and condition of the throat:—in diseases of the breast, the seat of the pain, the straitness of the chest, the nature of the cough, and expectoration, should be distinctly mentioned. It would be useless here to enter into farther particulars, as the intention of these questions must appear self-evident to every intelligent reader: and though the queries appear numerous, they may be easily answered, and in as few words as they are formed.

The illustrious TISSOT observes, in his valuable work “On the Diseases of Country People,” that it would be a desirable object, if persons of all ranks, in their letters to physicians, were to adopt a plan similar to that above specified; as this would be the means of insuring satisfactory answers, and prevent the necessity of repeating their applications, and explaining the contents of former letters.

LISSE-STREET, PADDINGTON,
June, 1800.

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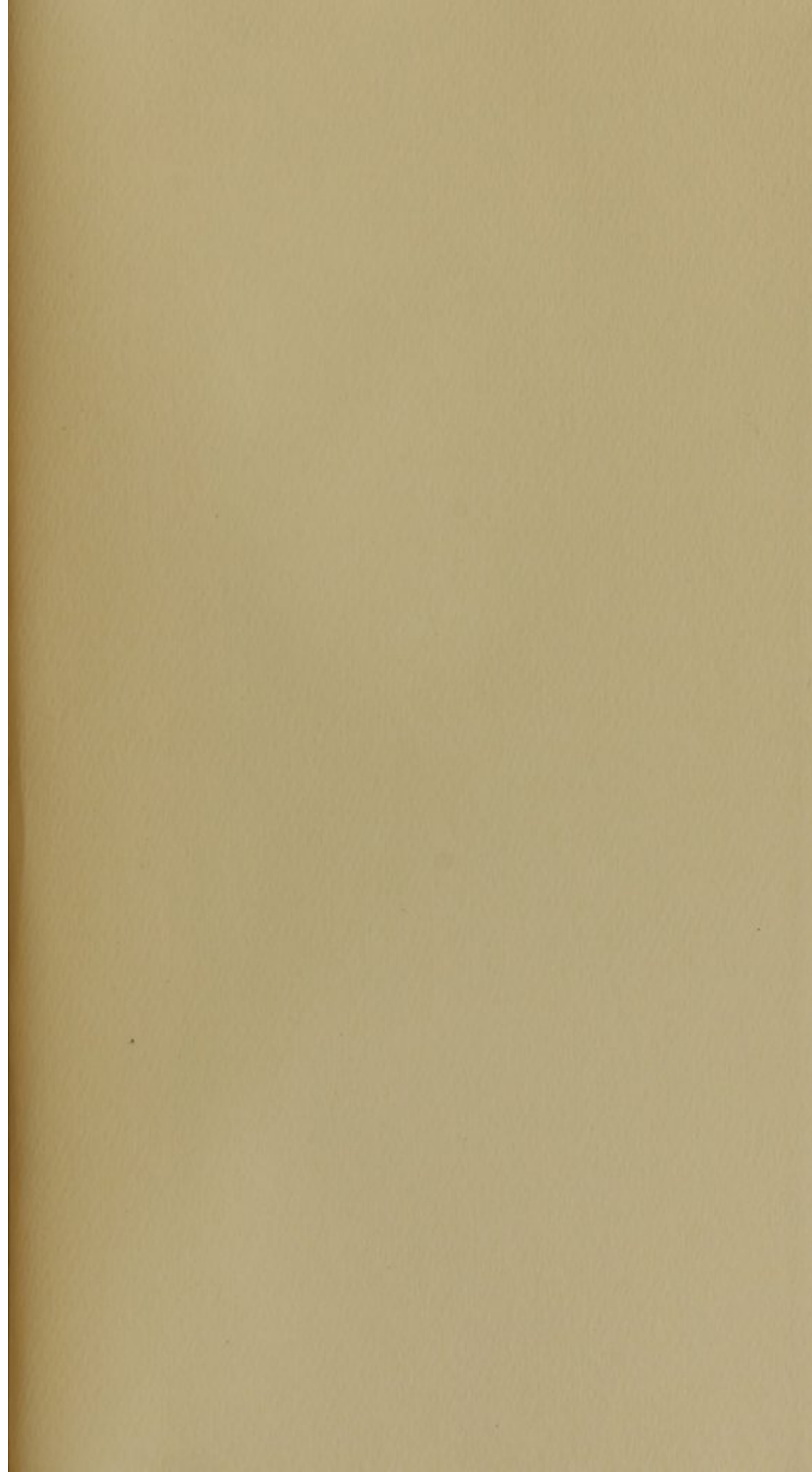
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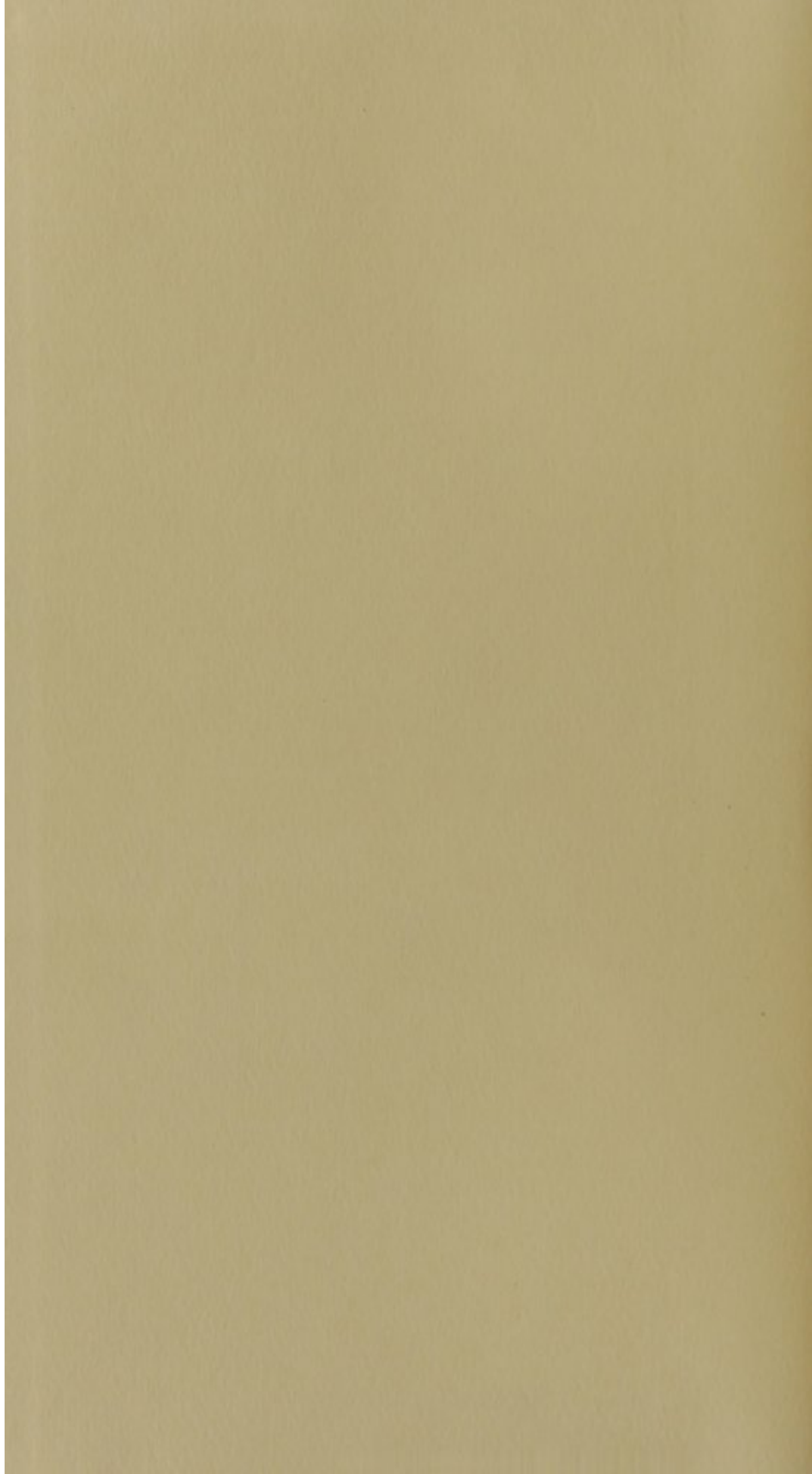
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