

The Art of Prescribing Medicines

Independent of the knowledge of diseases and the treatment of them, says Dr. Thompson, much of the success of the practitioner depends on circumstances connected altogether with the form in which the remedies are exhibited. In prescribing a medicine, even the best calculated to fulfill the object of the practitioner, it is necessary to consider the age, sex, temperament, habits and idiosyncrasy of the patient, before the dose can be properly apportioned; and, as far as the medicine itself is regarded, the most convenient and agreeable form of exhibiting it, whether it should be given alone, or combined with other ingredients, and how far these are likely to impede, modify, or facilitate its operation. An attention to these circumstances is absolutely requisite to prevent the errors which too frequently occur in forming a prescription.

FORMS IN WHICH MEDICINES ARE EXHIBITED.—Medicines are exhibited in the *solid, liquid and gaseous* state. *Solids* are employed internally in form of powder, *pill, bolus, electuary, conserve and lozenge*; and externally, of cataplasm, ointment, *cerate and plaster*. *Liquids* are employed internally in the form of *infusion, decoction, mixture, tincture, sirup and fluid extract*; and externally, of *baths, washes and liniments*. *Gases* are employed internally by *inhalation*, or by applying it locally to some of the mucous canals, as the vagina, rectum, etc.; externally they are applied in cases of local disease, or in the form of aqueous vapor to the whole surface, in cases of skin disease, or to produce perspiration.

Powders.—To form a powder, the remedy is finely comminuted, either by grinding, trituration in a mortar, levigation, elutriation, etc. It is the simplest, and perhaps the least objectionable form of preparing all remedies that can be reduced to powder; those agents, however, which are very unpleasant to the taste, those which deliquesce rapidly when exposed to the air, or are very volatile, or which are not readily diffused in water, can not with propriety be administered in this form. “Some substances can not be reduced to powder unless they be very much dried, and the heat necessary for that purpose alters their properties; even the impalpable form given to powders is injurious to some resinous substances, and we can not be surprised that a great alteration should be effected in a short time by the action of air on so great an extension of surface as takes in the operation usually adopted for reducing drugs to fine powder.”

Many object to the employment of crude drugs in the form of powder, on account of the large size

of the doses necessary, and from the fact that the woody and inert matter produces more or less irritation of the stomach.

The *active principles* of plants, as now obtained in the powdered form, are not liable to the above objections. The dose is small, there is no inert matter to produce irritation, and if the taste should be nauseous, it is easily disguised, owing to the small bulk of the agent.

Powders may be given in cold water, when they are readily miscible, and the taste is not nauseous; or in sweetened water. Resinous or heavy powders are best administered in mucilage or sirup; nauseous agents, if the bulk be small, may be enveloped in preserves, or administered in gelatine capsules.

Pills.—Pills are formed either of *extracts* having a proper consistence to take and preserve a rounded form; of dry solids which are combined with sirup, soap, extract of licorice, or some conserve, so as to form a pill mass; or of a tincture or liuid-extract combined with crumbs of bread, licorice, etc.

This form of administration is especially adapted for medicines which have a very nauseous taste or flavor, and such as require but minute doses to operate, or in cases where a Blow action of the remedy is desired. They are objected to by many practitioners from the fact that a majority of patients have an aversion to pills, and because they are slow to act, not being as readily absorbed as when given in other forms.

Electuaries, Confections, Conserves.—Electuaries are mixtures of vegetable remedies, and light, earthy powders, combined by means of sirup or honey, so as to form a mass of tolerable consistence. Confections, or conserves, are vegetable matters beat into a uniform mass with refined sugar. In either case sufficient saccharine matter is employed to preserve as nearly as possible, the properties of recent vegetables, and prevent decomposition. In many instances this is a very available form in which to administer remedies, especially in the treatment of children. In some cases, however, the stomach will not tolerate the sugar, and in fever it is often detrimental to the patient.

Lozenges.—Lozenges, or troches, are powders mixed up with glutinous substances into little cakes, and afterward dried. They are adapted for the administration of remedies of a pleasant flavor, and especially where it is desirable to bring it in contact with the mouth, fauces, upper part of the air-

passages, as in sore mouth, sore throat, coughs, etc. They are administered by slowly dissolving in the mouth.

We might here notice with advantage the two forms in which medicines are now so frequently exhibited—that of *extract*, and what are termed “*concentrated remedies*” or *proximate vegetable principles*.

Extracts.—Extracts are solid, or semi-fluid preparations, obtained by evaporating aqueous or alcoholic solutions of vegetable substances. When water is employed as the menstruum, they are termed *watery extracts*, and then consist of *gum, mucilage, albumen, extractive, and saccharine matter*, and such active principles as may be soluble in this fluid. They are generally very liable to decomposition, and owing to this fact, and that they contain large quantities of inert matter, the most of them are inferior preparations. When prepared with alcohol, they are designated as *alcoholic extracts*; and if water is employed in addition, *hydro-alcoholic extracts*. The two latter form when well prepared, and if the active principles are soluble in these menstrua, very efficient and eligible preparations.

Proximate Principles.—All vegetable remedial agents contain certain *proximate principles*, upon which the medicinal value of the agent depends. In these, when pure, there is no variation of strength, the physician knowing precisely when he prescribes them, how much medicine his patient will take, which can not be said of any other preparation. Of these principles we have the *alkaloids, resinoid, oleo-resinous, vegetable acids, and neutral substances*. Of these the two first are the ones in most common use. When “well prepared” they are, in a majority of cases, the best form in which vegetable remedies can be administered, “*but*” we have found by experience that it is not safe to take the word of every pharmacist who pretends to prepare these agents, that they are “*efficient agents*” or even that they are what they purport to be. We would be the last to throw discredit on concentrated medicines, yet we are confident that

many inert agents, of this class, are palmed off upon the profession, greatly to the detriment, not only of the physician and his patients, but to the cause of reformed medicine.

Cataplasms.—Cataplasms, or poultices, are employed externally, to soften and relax the skin, and to exclude the air. They are formed of such substances as when wet will be somewhat tenacious, and accommodate themselves accurately to the part they are intended to protect. They may be

employed solely with reference to the indications named, or they may be medicated by the addition of narcotic, stimulant, or other agents to the poultice.

Ointments.—An ointment is an unctuous substance, having a consistence but little firmer than lard, of which they are principally prepared. They are employed to bring medicinal agents in contact with the skin, by gentle rubbing, or more properly by inunction.

Cerates.—Cerates are unctuous compositions, possessing more firmness than ointments, on account of the wax which they contain, and from which they derive their names. Their consistence is such that they can be spread upon cloth, and thus form a dressing.

Piasters.—Plasters differ from cerates in possessing a much firmer consistence, so that the aid of heat is requisite to spread them, when they are pliable and tenacious, readily adhering to the skin. Each of these three forms of application may be employed to bring medicinal agents in contact with external parts, or through the skin to act upon internal organs; and, as it will readily be seen, one will be more applicable than another in certain cases.

Infusions.—An infusion is a solution of vegetable matter, obtained by maceration of the substance, either in cold or boiling water. A large proportion of vegetable remedies yield either a part or all their virtues to water by infusion; but in addition to the medicinal principles of the plant, water extracts the *gum*, *starch*, *mucus*, etc.

As far as success in practice is concerned, we have no doubt but infusion and decoction are the most eligible forms of administering such vegetable remedies as yield their properties to water. However much “*tea*” practice may be laughed at, we know that this practice has proven eminently successful in the hands of our old practitioners. In these, forms the remedy is readily absorbed; there need be no doubt of its purity, or that it is well prepared; and again, it is certain in this case, that the patient will receive sufficient diluents, a matter that is of the first importance in the treatment of many diseases.

Infusions are objectionable, principally from the large size of the doses, and sometimes from the unpleasant taste of the remedy; the objection is also urged against them that they have to be often prepared, as they are liable to fermentation. Notwithstanding these objections we should prefer to administer remedies in this form providing the therapeutic properties of the agents could not be

obtained in a pleasanter form. It may be supposed by the reader that this can be accomplished in every case, but our experience proves conclusively that some agents can only be administered in this form if we wish to obtain their full therapeutic action.

Decoction.—Decoctions are also solutions of vegetable matter in water, but they are obtained by boiling. They are intended to afford more powerful remedies than can be obtained by the simple infusion of the same substances in cold or even in boiling water; but, although by the operation of boiling, the solvent power of the water is increased, and a greater quantity of the soluble parts of any vegetable body are consequently taken up by it, yet it does not follow that the medicinal virtues of decoctions are greater than the infusions. On the contrary, if the active principles of a plant be volatile, or if they consist chiefly of extractive matter, this form of preparation often renders the remedy altogether inert, either by dissipating the volatile matters or by favoring the oxyzement of the extractive, which, in a continued temperature of 212° attracts the oxygen of the atmosphere so rapidly, that it is soon converted into a soluble, insipid, inert matter, and precipitated in the fluid. For these reasons only certain agents can be employed in this form with advantage, and it is an important point in studying the materia medica to impress the mind in regard to this point with any given agent.

Mixture.—A mixture in pharmaceutical language, is a preparation in which different ingredients insoluble in water are held in suspension by means of mucilaginous or saccharine matter. It is a very convenient and desirable mode of administering many remedies.

Tincture.—Tinctures are spirituous solutions of such of the proximate principles of vegetables and animals, as are soluble in either pure or diluted alcohol. From vegetable agents submitted to its action, dilute alcohol takes up *sugar, resin, extractive, the alkaloid and allied principles, volatile oils, camphor, tannin, most vegetable acids, etc.*, and in addition more or less of the resinoid principle upon which the virtues of many plants depend. Alcohol undiluted is employed where it is desired to extract all the resinous principles of some agents.

Tinctures are the most eligible preparations of vegetable remedies, whether we have reference to their preservation, to the ease with which they are dispensed, or to their certainty of action. With the majority of remedies in common use, the tincture is now prepared so that the dose is very small, and dispensed with water, it may be graduated to the fraction of a drop. With a good sized

pocket case a physician can carry thirty to fifty of these remedies, in quantity sufficient for two or three days' patients,—the only care being to renew the vial corks from time to time to prevent leakage.

In dispensing tinctures we usually call for a glass half full of water and a teaspoon. The few drops (v. to xxx.) are poured into a teaspoon and then into the glass. The dose is pretty uniformly one teaspoonful, repeated every one to three hours, as the condition of the patient may demand. I find that patients do not object to medicines, if they can see a clean tincture put into clean water, and there are but very few that have an objectionable taste, and none, the foul odor of the old-fashioned drugs. The child takes its medicine kindly, when it finds that the physician does not abuse its confidence by giving it a nastiness in disguise.

Sirup.—Sirups are saturated solutions of sugar in water, either simple or medicated by the addition of some vegetable principle. Medicated sirups, in the Eclectic pharmacy, are frequently prepared by extracting the medicinal principles of plants with alcohol, which is then displaced, and the residue is formed into a sirup. It is not a very eligible form for the administration of remedies, but it is very frequently employed to render more active remedies palatable.

Fluid Extracts.—“Fluid extracts,” according to Wood, are “highly concentrated solutions of the active constituents of medicines or the active constituents themselves, extracted in a fluid form.” The menstruum employed in the preparation of these extracts is diluted or undiluted alcohol, depending upon the character of the principles contained in the plant; in their preparation a portion of the alcohol is displaced, and its place supplied with sugar. According to the pharmacopeias, one pint of the extract should be equal to one pound of the crude agent; but many of the Eclectic preparations are three, four, or five times this strength, in fact, “very variable.”

If “well” and “carefully” prepared, this might be a very available form for the administration of many agents, as the preparations are usually pleasant to the taste, and do not contain sufficient alcohol to make them objectionable. But, from our experience with fluid extracts we should hesitate to recommend the majority of them as “highly concentrated solutions of the active constituents of medicines.” generally prescribed in a compound form, yet the practice of accumulating a great variety of ingredients in one prescription must be avoided.

Medicines exhibited in the fluid form operate sooner and with more certainty than in the solid

state; but in choosing the vehicle or solvent, the taste of the patient ought not to be overlooked. Thus, for those to whom peppermint-water is not disagreeable, the nauseous taste of sulphate of magnesia is more completely concealed by that vehicle than any other; if cinchona bark in powder be ordered, milk effectually covers its taste, provided the dose be taken the moment it is mixed; and if aloes, the most nauseous article of the materia medica, be prescribed in a fluid form, a solution of extract of liquorice renders it by no means unpalatable. Medicines which, when given alone, produce griping, require the addition of aromatics to correct that quality; and when they operate with violence, mucilages and demulcents are sometimes necessary to soften their acrimony, or narcotics to moderate their action. In the use of concentrated remedies, especially resinoid preparations, it is of much advantage to triturate them with sugar or sugar of milk, not only for the purpose of rendering them more soluble, and thus increasing their activity, but also to prevent irritation of the stomach and intestinal canal. In prescribing cathartics, it is often important to consider the part of the alimentary canal on which we wish them to act. Thus, rhubarb, sulphate of magnesia, leptandrin, etc., act chiefly upon the duodenum; jalap, podophyllum and juglandin upon the lower part of the small and large intestines; aloes on the rectum, and bitartrate of potassa upon the entire length of the canal. Another reason for prescribing medicines in combination is the frequent need of fulfilling two or more indications at the same time. Thus, the same dose may be required in colic, to allay pain and evacuate the bowels, or in fever to determine to the surface, to allay irritation and produce sleep. But in combining medicines, care should be taken not to bring together *incompatibles*, or substances that decompose each other, or chemically combine, altering the nature of the mixture, and forming new compounds, which may be entirely different from the agents employed—without, indeed, the resulting compound is the agent desired. Thus acids and alkalis are incompatible, unless the neutral salt they produce be the remedy required.

The following are the objects to be obtained, says Dr. Paris, by mixing and combining medicinal agents:

OBJECT 1. To promote the action of the basis or principal medicine.

- a. By combining the several different forms or preparations of the same substance.
- b. By combining the basis with substances which are of an analogous nature, i.e., which are individually capable of producing the same or kindred effects.
- c. By combining the basis with substances of a different nature, and which do not exert any chemical influence upon it, but are found by experience, or inferred by analogy, to be capable of

rendering the stomach, or system, or any particular organ, more susceptible of its action.

OBJECT 2. To correct the operation of the basis, by obviating any unpleasant effect it might be likely to occasion, and which would pervert its intended action, and defeat the object of its exhibition.

a. By chemically neutralizing or mechanically separating the offending ingredients.

b. By adding some substance calculated to guard the stomach or system against its deleterious effects.

OBJECT 3. To obtain the joint operation of two or more medicines.

a. By uniting those substances which are calculated to produce the same ultimate results, but by modes of operation totally different.

b. By combining medicines which have different powers, and which are required to obviate different symptoms, or to answer different indications.

OBJECT 4. To obtain a new and active remedy not afforded by any single substance.

a. By combining medicines which excite different actions in the stomach and system, in consequence of which new or modified results are produced.

b. By combining substances which have the property of acting chemically upon each other; the results of which are:

1st. The formation of new compounds;

2d. The decomposition of the original ingredients, and the development of their more active elements.

a. By combining substances, between which no other chemical change is induced than a diminution, or increase, in the solubility of the principles in which their medicinal virtues reside:

1st. By the intervention of substances that act chemically;

2d. By the addition of ingredients whose operation is entirely mechanical.

OBJECT 5. To afford an **eligible** form.

a. With reference to its efficacy.

b. With reference to its taste or appearance.

c. With reference to its consistence or equable mixture.

d. With reference to its preservation.

In writing a prescription, the practitioner should, if possible, use pen and ink, and the name of each ingredient should be given at full length; or if abbreviated, the abbreviation should be one in common use, and which will be readily understood by the pharmacist. The prescription should, in every instance, be written in a plain, legible hand, with the symbols correctly given, and full

directions as to dose and time of administration, and should be carefully re-read after it is written, in order to ascertain its correctness. In writing a prescription, the first object is the principal or most active ingredient, which is called the *basis*; the next, the *adjuvans*, or that which is designed to promote the action of the first; the third, the *corrigen*, or that designed to correct or modify the action of the principal remedy; and fourth, the *vehiculum*, or that in which the agents are to be administered. In writing a prescription, it is not always advisable to place the different agents in the order just named, but in the mode best fitted for compounding the medicine. Thus, salts and other soluble solids should be placed before the menstruum in which they are to be dissolved; and volatile agents should always be placed last, as they are necessarily the last ingredient added in the manipulation of the compound. When an infusion, decoction, or even poultice, is ordered to be prepared in the patient's house, it is always necessary to give specific directions to the one who is to prepare it; otherwise, in many instances, the remedy will be so poorly prepared, that no benefit will result from its use.

In country practice, where the practitioner furnishes the medicine, it should always be a rule to keep every thing in the office properly labeled, and never let a package of medicine be dispensed unless it is plainly marked with directions for use. An observance of the rules just laid down, though they may seem of minor importance, will sometimes prevent serious mistakes, and always show a laudable care for the welfare of the patient.

Circumstances connected with the State of the Patient.—Of these, we have to notice the *sex, temperament, habits, idiosyncrasy, disease, climate, mode of living, mental action*, and to some degree the previous diseases of the patient, as very important considerations in the administration of remedies.

Age.—In works on materia medica, the doses named, and the description of the therapeutic action of different remedies, apply to the treatment of adults, without the contrary is stated. As far as the dose of an agent is concerned we may, in most cases, consider the following table, originally drawn up by Gabius, as a sufficient guide for the young practitioner :

AGES. PROPORTIONAL QUANTITIES. DOSES.

For an adult, Suppose the dose to *One*, or 1 drachm.

Under 1 year, will require only 1-12th, or 5 grains.

Under 2 years, will require only 1-8th, or 7 1/2 grains.

Under 3 years, will require only 1-6th, or 10 grains.

Under 4 years, will require only 1-4th, or 15 grains.

Under 7 years, will require only 1-3d, or 1 scruple.

Under 14 years, will require only 1-2, or 1/2 drachm.

Under 20 years, will require only 2-3ds, or 2 scruples.

Above 21 years, the full dose.

Above 65 years, the inverse gradation of the above.

All tables, however, can be regarded but mere approximations, and can not apply to all remedies. Thus in early life the system is very susceptible to the action of narcotics, especially to opium, so that these agents if administered at all, should be given in much less than the proportionate dose: while of castor-oil and some other agents much more than the dose named is required to produce their effects. Again, it must be recollected that in early life the mucous membrane of the stomach and alimentary canal is very susceptible to any cause of irritation, and hence irritant remedies should always be avoided. One of the authors, in his early practice, found that he met with much less success in the treatment of diseases of children than any other class of cases, and less than some of his professional brethren; he attributed it to the administration of such agents as were not readily soluble in the stomach. Convinced that such remedies did in many cases produce irritation of the gastric mucous membrane, with its train of unfavorable symptoms, he resolved that under no circumstances would he administer them, and by carefully selecting such remedies as would not produce irritation he has found infantile cases to yield as readily to treatment as any others. From one to three years of age we find a peculiar erythema of the mucous membrane of the alimentary canal, or at least an increased predisposition to irritation, which is undoubtedly the cause (providing we do not attribute it to the medication) of a large proportion of the mortality at this age. Here especial care should be used, not only in not giving agents which produce irritation, but in constantly guarding against it by the employment of such measures as we well know counteract it. We must also notice the fact of the acute, nervous sensibility of the patient at this time, and that very great advantage may be gained by impressions made upon the skin of a soothing and agreeable character. Hence it is that baths of various kinds at this age become among our most important means of cure. In old age it is generally stated that the doses of medicines should be decreased; but this is not on account of an increased sensibility to the action of medicines, for the reverse is the case; but because the strength of the patient is unable to sustain,

without injury, the same impression from a remedy as in the full vigor of life.

Sex.—Although some females possess as much bodily strength and vigor of constitution as the majority of men, and require as large doses of medicine to produce a given effect, yet the greater delicacy and sensibility of the female frame, as a general rule, requires not only caution in apportioning the doses of active medicines, which should be less than those ordered for men of the same age, but the medicines themselves should be such as are likely to fulfill the indications required without much violence.

The state of the uterine system too must not be overlooked, for the periods of menstruation, pregnancy and lactation are attended with peculiarities in relation to the action of medicines. Thus the employment of aloetic and drastic purgatives must be suspended during the catamenia and period of pregnancy ; agents likewise which exert any powerful influence upon the system should not be administered at these times. Agents which are absorbed and communicate injurious properties to the blood, should be avoided during pregnancy and lactation; so too should all cathartic or other medicines which communicate their properties to the milk of the mother, while she is nursing.

Temperament.—It is doubtless true that temperament exercises a great and important influence over the action of medicines; yet temperaments are so poorly described, and the facts so illy defined in regard to their therapeutic relations that we are almost tempted to pass the subject by, as one that can only be learned by long practice. The *sanguine* temperament does not bear stimulants well, and is very readily affected by *quinine* and *morphia*, as is also the *encephalic*; while persons of a *lymphatic* temperament will generally require increased quantities of all remedies to produce a certain effect. We might consider the *bilious* temperament as the medium between the two named, the sanguine and the encephalic being more and the lymphatic less sensitive to the action of remedies.

Habit.—Under this head we shall consider only the previous habits of the patient in regard to taking medicine, and the influence that this will subsequently have in modifying the effects of remedies. Persons addicted to the use of spirits, narcotics and other stimulants, are less easily excited both by medical stimulants and narcotics; and the knowledge of the habits of a patient, as far as the exhibition of purgatives is concerned, is absolutely necessary for the prescriber— many

people being in the almost daily habit of taking this class of remedies without consulting a medical practitioner. In the first of these cases, larger doses of stimulants and narcotics are required to produce the ordinary effects of these remedies; but in the second a change of the purgative usually taken will generally be sufficient. It should, however, be recollected that in prescribing a narcotic which has not previously been taken, the dose should be no larger than usual. In the employment of most remedies which require to be long continued, the dose will have to be increased in order to produce the necessary effect. In some cases, indeed, a remedy will entirely lose its influence upon the system, when by substituting another having a similar action, the full effect will be produced.

Idiosyncrasy.—The individual peculiarities, or as the term is, *idiosyncrasy* of patients to the action of remedies, is of much importance, and can not be too carefully considered by the physician. It is well known that many persons are peculiarly affected by substances taken into the stomach, either in the form of food or medicine, in a manner different from the majority of mankind. Such cases are generally only discovered by accident or time; but the practitioner called to attend on a patient for the first time, should always inform himself in regard to this particular as well as he can, never neglecting such information as may be volunteered by the patient or his friends. Any facts obtained in this way, or accidentally discovered, should be stored up in the memory for future guidance when treating the same patient. A physician who, from long attendance upon a patient, is thoroughly acquainted with all his constitutional peculiarities in regard to the effects of medicines, has much greater advantages in treatment than one who has all this to learn. Hence we have here a good reason for the preference of patients to their family physicians, and a strong reason against the very prevalent custom of many Eclectic physicians changing their location every year or two.

Peculiarities in the effects of medicines are sometimes generated by disease; a remedy having an entirely different action from what was expected, or even from what it had had at previous times.

As examples of these idiosyncrasies, might be mentioned

the well-known effects of ipecacuanha, in causing in some persons, merely by its smell, severe asthmatic attacks; the cutaneous eruption sometimes produced by copaiba and the turpentine; and the very singular and inconvenient effects of opium and its salts, upon some persons, etc. In some instances the effect of the idiosyncrasy is to render the patient much more susceptible to the action of remedies; while in others it has a contrary effect.

Disease.—The character of the disease always has more or less effect in modifying the action of remedies. Thus the susceptibility of the patient to the action of medicines is sometimes greatly increased, while at others it is greatly diminished. Again, new susceptibilities are occasionally manifested, and effects wholly unexpected produced. Thus, in irritation or inflammation of the stomach, very minute doses of an emetic will act promptly, while in certain affections of the nervous system, as delirium tremens for example, it is hard to produce emesis with the largest doses of the remedy. In certain conditions of the brain, small doses of opium will excite to phrensy; while in others, as in tetanus, mania, etc., the largest dose will produce but little effect. In diarrhea opium checks discharges from the bowels, while in spasmodic colic it favors the action of cathartic medicines. Numerous other examples of this might be noticed; but in this place all that is necessary is to direct the mind of the reader to the fact, and the importance of bearing it in mind in the study of disease, and the agents to be used in combating it.

Climate.—Climate modifies the action of medicine by altering the condition of the system. Thus, in warm climates, the muscles, the heart and arteries lose power and tone, the textures become relaxed, perspiration is profuse, and internal organs, especially the liver, are too much stimulated by blood, which has lost more than usual of its water, and less of its hydro-carbon. Hence the importance of using with caution such remedies as act with harshness upon the alimentary canal, or upon the liver. There is also a marked tendency in diseases to assume a typhoid or adynamic form, which should teach us the impropriety of using agents which debilitate the system, and the absolute necessity

of using such means from the beginning as will keep up the vital powers. In miasmatic regions, it will often be found that agents which prove curative in similar diseases in other parts of the country, will have but little, if any effect; the disease being controlled, if we may so speak, by the intermittent influence. Here the agents termed *antiperiodic* will produce effects that we would not expect in disease where this influence is wanting. The influence of climate in the production of disease, and the action of remedies has not as yet been sufficiently investigated, and we have not therefore the data to give, even if we had the space, a full account of its bearings. It is, however, a fruitful field of inquiry, and one the cultivation of which will add much to our practical resources.

Mode of Living.—This like climate modifies the action of medicines by altering the condition of the system. It would be impossible, however, in this place, to notice all its bearings; all that we wish to

do, being to call attention to its existence. In persons of vigorous health and accustomed to outdoor exercise, we find disease almost always assuming a sthenic type, and remedies, as a general rule, will have to be administered in larger doses to produce their effects. This is not, however, the case with cathartics, which, when they have not been habitually used, generally operate in small doses; while in persons of sedentary habits, we usually find habitual constipation; to remove which, larger doses of medicine are generally requisite. Extreme mental exercise predisposes to affections of the brain, and in disease of such persons care will be required to administer nothing that will increase this predisposition. Want of exercise and sedentary habits not only predispose to certain forms of disease, but likewise exert an influence upon the action of medicinal agents. Thus, if we except cathartics, remedies require to be administered in smaller doses, debilitating agents have to be avoided, and much care is requisite to support the vital powers of the system.

Mental Action.—There can be no doubt but that the state of the patient's mind materially influences the action of medicines. As a general rule, they will act with greater certainty and more promptly, if the patient knows they have of using such means from the beginning as will keep up the vital powers. In miasmatic regions, it will often be found that agents which prove curative in similar diseases in other parts of the country, will have but little, if any effect; the disease being controlled, if we may so speak, by the intermittent influence. Here the agents termed *antiperiodic* will produce effects that we would not expect in disease where this influence is wanting. The influence of climate in the production of disease, and the action of remedies has not as yet been sufficiently investigated, and we have not therefore the data to give, even if we had the space, a full account of its bearings. It is, however, a fruitful field of inquiry, and one the cultivation of which will add much to our practical resources.

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