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ON VARIOUS CIRCUMSTANCES IMPORTANT TO BE ATTENDED TO IN PRESCRIBING MEDICINES.

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INDEPENDENTLY of a knowledge of disease and of its treatment, much of the success of the medical practitioner depends upon various circumstances connected with the form in which medicines are administered, and the causes which regulate their action upon the animal economy. In prescribing a medicine, even the best qualified for fulfilling the purpose wanted, it becomes necessary to take into consideration the following important circumstances, and to regulate it by them:—

1. The age of the individual;
2. The sex;
3. The temperament;
4. The habit;
5. Idiosyncrasy;
6. Situation in life; and
7. Effects of disease on the system before the dose can be properly determined upon, and as far as the medicine itself is concerned, the most agreeable form of administering it—whether it should be given alone, or combined with other ingredients, and how far these are likely to impede or facilitate its operation.

Attention to all these circumstances is necessary to prevent the errors which so often occur in drawing up prescriptions. For nothing distinguishes the well-educated medical practitioner, or tends more to the future recovery and comfort of his patient, than the nature of his prescriptions. Doses of medicine are not reducible to any general rule, from their general similarity of operation, or any other circumstance; they are, therefore, specific with regard to each other.

I will now proceed to make a few practical remarks upon each of the circumstances already alluded to, as affecting the

action of medicines upon the animal economy, considering them in the order which I have laid down above.

AGE.—I commence this section with the table originally drawn up by Gaubrus, and copied from him by all successive writers to the present day, and which possesses no equal for perspicuity and correctness.

For an adult suppose the dose (of any medicine) to be 1 drachm;

Under 1 year will require ..	1-12th or 5 grains
2	1-8th .. 8 grains
3	1-7½th 10 grains
4	1-4th .. 15 grains
7	1-3rd .. 1 scruple
14	1-half .. ½ drachm
20	2-3rds .. 2 scruples
Above 21 the full dose	one .. 1 drachm
65 the inverse gradation of the above.	

From infancy to manhood, a larger dose of any medicine is required to produce its effects in proportion to the advance in life. From manhood to old age there is a similar gradation with regard to diminution of dose, though in a much less proportion than that which regulates the increase. In the two extremes of life,—childhood and old age, the animal economy is weak, and susceptible of all impressions, whilst during the intervening period, or what is termed adult age, it remains stationary. From infancy to adult age, therefore, the dose of medicine should gradually increase. During adult age it should remain the same, and this is what is given in all medical works as the standard dose; whilst from adult up to extreme old age, it must again gradually diminish in quantity, but not in so rapid a ratio as it increased from infancy to old age.

With regard to medicines, however, it is of consequence to observe, that there are many which do not act with greater violence in a large dose, than in one comparatively small. Ipecacuanha, as an emetic, is more certain in its operation when given in a large dose, than in a small, and is not more violent. The same may be said of aloes and others. In fact, almost all the medicines included under the classes of emetics and purgatives, come under this observation. In the action of an emetic or purgative upon the animal economy, it seems probable that that portion of the medicine which comes

into immediate contact with the internal villous coat of the intestinal canal, stimulates it to action, when the remainder will be thrown off or evacuated, without producing any further effect. From a large dose of such medicines, therefore, disagreeable effects are not to be apprehended. Whereas, when too small a dose is given, no effect is produced, the remedy remains in the intestinal canal, acting as an extraneous body, aggravating the symptoms which it was intended to relieve, causing the loss of valuable time. This remark applies to the generality of medicines.

Sex affects to a considerable extent the operation of medicine upon the animal economy. Although some women possess nearly as much bodily strength and vigour of constitution as the majority of men, yet the greater general delicacy and sensibility of the female frame at every period of life, require 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 fulfil the indications required without much violence. The state of the uterine system must be attended to in prescribing for females. Drastic purgatives, aloetic ones, and astringents, may be avoided during the flow of the catamenia.

Temperament affects the operation of medicines upon the animal economy. By temperament is understood a predisposition, derived from original conformation, to be affected in a more peculiar manner by external causes acting on the system, and much laborious investigation has been bestowed in distinguishing the different temperaments, or original conformation of body, and the diversities to which they give rise. It is undoubtedly true that persons of different temperaments are differently affected by the operation of medicines. Stimulants more readily affect those of a sanguine than those of a phlegmatic, temperament, and therefore smaller doses are required. In the phlegmatic also, the bowels are generally torpid, and require both descriptions of medicines, and such doses of them, to excite the proper peristaltic motion, as would induce either inflammation, or be followed by an alarming state of debility, were they administered to those of a sanguine temperament. Hence the necessity of attending to this circumstance in prescribing.

Habit or custom exerts a most important influence upon the operation of medicines. Persons addicted to the use of spirits, narcotics, and other stimulants, are less easily excited at an after period, both by medicinal stimulants and narcotics; and the same takes place with respect to purgatives. A knowledge of the habits of the

patient, as far as the exhibition of all these is concerned, is absolutely necessary for the prescriber, many people being in the almost daily habit of taking these remedies without consulting the 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. In the employment of medicines which require to be long continued, the beneficial effect is soon lost if the dose be not increased.

In a few cases, the reverse of the above will be found to hold good, as, for example, with regard to the saline cathartics. As an example of the first of the cases alluded to, I may mention opium, one grain of which will produce upon an adult, unaccustomed to its use, all the effects of a narcotic, whereas ten grains will not do so at an after period, in the same individual, when long accustomed to its use. The first thing, therefore, that the medical attendant must do, upon being called in to a patient previous to prescribing opium, is to ascertain whether or not he be in the habit of taking that medicine, and to what extent. The dose must be regulated accordingly. With regard to the saline purgatives, as sulphate of magnesia, the dose requires to be diminished after long use; half an ounce at last producing effects equal to one ounce at first. The same remark applies to castor oil.

Situation in life has a considerable effect in regulating the action of medicines upon the animal economy. Individuals of the higher ranks—and this applies particularly to females leading a sedentary life, little exposed to air, exercise, or variations of weather, not compelled to gain their bread by their own industry, are much more susceptible of the action of medicine, and of course require milder ones, and in smaller doses, than individuals belonging to the lower orders. In other words, a female of the lower orders requires as strong medicines, and as large doses, to produce equal effects as a male belonging to the higher ranks, and *vice versa*. In the higher ranks I have always found the common aloetic pill sufficiently active as a purgative, whereas in the lower it has generally disappointed me, proving weak or inert, so that I have for many years past been obliged to give it up, under such circumstances having recourse to the compound colocynth pill, which has always answered my expectations. The practice of dispensaries, hospitals, &c., and that confined to the lower ranks of life, as far as regards medicines, is considerably different. Upon a similar principle the practice of different

countries varies greatly, and that which has been followed by the practitioners of a place for ages, must always be superior to the innovations of the stranger. The population of France, Italy, &c., enjoying a settled, warm, southern temperature, and living principally upon fruits, vegetable diet, &c., cannot bear the active medicines and practice adapted to the inhabitants of Great Britain, Russia, and other northern regions, exposed to every variety of weather, living upon animal food, and accustomed to the use of spirituous liquors. A wandering life passed in these countries firmly establishes the accuracy of this remark upon my mind. The treatment of syphilis in southern and northern latitudes—its yielding without mercury in the former, whilst it absolutely requires its active ministration in the latter for its extirpation, may be given as illustrations of the above.

DISEASE exerts an influence on the action of medicine in the animal economy very important; the susceptibility to external impression and to action being much varied in morbid affections, and the operation of medicines of course being modified by such variations. The state of susceptibility being in general different when it varies much from that healthy standard, the doses of the medicine administered are regulated accordingly, and thus it is obvious does not admit of much general observation, as being entirely dependent on the nature and state of disease. I may mention, however, two striking extremes. In the diseases arranged under the class *febres* and *exanthemata* of Dr. Cullen's arrangement, all characterised by febrile action, the animal economy is remarkably irritable, and susceptible to stimuli; the mildest medicines, and in the smallest dose, produce powerful effects. In the diseases arranged under the class *neuroses*, of the same arrangement,—mania, melancholia, hypochondriasis,—all characterised by stupor and insensibility to stimulants, the most powerful medicines, and in the largest doses, are required to produce even moderate effects.

Besides these guides now mentioned in the administration of medicines, the choice of the practitioner must occasionally depend upon the circumstance of the patient being more or less immediately under the practitioner. Then, if the patient can be seen every day, or frequently, by the practitioner, the most active medicines which the nature of the case requires should be chosen. But if he cannot be seen, or is not resident in the same place, the practitioner should choose a remedy of the same class, but less likely to have a violent effect. Thus in prescribing for intermittent fever, where a patient cannot be visited every day or oftener, the Peruvian bark should always

be preferred to the arsenical solution. In dropsical complaints, the supertartrate of potash to the digitalis or elaterium.

In apportioning the dose of any very active medicine, it is of the greatest moment to determine the relative degrees of power between the system and the remedy; and to know to what extent the latter is likely to be carried consonantly with the power of life to resist it. Thus, after a patient has been exhausted by protracted or severe suffering, a dose different, or milder than one at the commencement of the disease, becomes necessary.

THE VARIABLE ACTIVITY of a medicine should also be appreciated, and the practitioner would act judiciously, if he were to reduce the dose, should it be a very considerable one, whenever a fresh parcel of a medicine is commenced, especially of the powders of active medicines liable to deterioration from being long kept; those of *cicuta*, *digitalis*, &c.

THE TIME OF DAY at which remedies should be administered, likewise deserves attention. Evacuating medicines ought to be administered late at night or early in the morning. It would seem that during sleep the bowels are not so irritable, and consequently not so easily acted upon, which allows time for the ready solution of the substance. The same observation applies to alterative and other medicines, which are liable to suffer from vexatious irritability of the bowels. It is on this account eligible to exhibit *guaiacum*, *pil. hydrargyri*, &c., when they are not intended to purge, at bed-time. On the other hand, when the effects of a medicine are likely to be lost by perspiration,—as is the case with diuretics, many of which are by external heat changed into diaphoretics—it becomes a question with the judicious practitioner whether he cannot select some more favourable period for their exhibition. Medicines which are in the form of a pill, as they are liable to be long kept in apothecaries' shops, and of course to become remarkably hard, should generally be administered at bed-time, to give time for the gastric juice and other secretions of the intestinal canal to complete their solution. Under these circumstances they will pass through the whole tract of the bowels as inert bodies, disappointing the intentions of the practitioner and patient. Aloes administered in *powder* operates in from two to three hours; given in *pill* it requires from eight to twelve hours to produce its full operation.

IN FEVERS it is of importance to consult in all respects the quiet and comfort of the patient. Dr. Hamilton, in his admirable work on purgative medicines, justly observes that on this account the exhibition of purgatives should be so timed that their

effects may be expected during the day. In some cases the time of administering the remedy must be regulated by the stage of the disease. In fevers a dose of opium will either increase the heat of the fever, augment the thirst or restlessness, or occasion tranquillity and sleep, according to the temperature of the body at the time of its administration. For this reason Dr. Currie advises us not to give the evening dose of opium in typhus fever till very late, or about one or two o'clock in the morning, when the heat is subsiding and moisture coming on.

EMETICS, administered for the cure of the slighter cases of pyrexia, should be given in the evening, as their operation has a tendency to sleep and diaphoresis, which it is useful to promote. Remedies that require to be absorbed will probably be more efficient in the morning after sleep. The old custom of giving medicines in the morning, fasting, is not quite so absurd as some modern practitioners have been led to suppose. A weak or mild medicine, taken two hours before breakfast, upon an empty stomach, will operate equally powerfully as a much stronger one will if taken at a later period, or upon a full stomach. Every practitioner must be struck by the truth of this remark, when administering mineral waters, as those of Cheltenham or Harrogate.

THE INTERVALS between doses of medicine must be regulated by the nature of the remedy, and that of the object which it is intended to fulfil, and whether it is desirable or not that the last dose should support the effects of the preceding; or whether there be any fear of a reaction, or collapse, taking place after the effect of one dose has subsided, unless immediately repeated. Thus the effects of diffusible stimulants, ammonia, or of ether, are very evanescent; they should therefore be repeated at short intervals. The same may be said of diaphoretics. We ought not to allow the periods between the doses to be so remote as to occasion any striking abatement in the impression. So opium, when stimulant operation is required,—as in diseases of debility, fevers of the typhoid kind, &c., should be given in small doses at short intervals, so that it may produce a uniform and regular state of excitement. But when the object is to mitigate pain, allay irritation, and produce sleep, it ought to be exhibited in full doses at distant intervals. There is a caution also which it is very necessary to impress upon the practitioner, respecting the power which some medicines possess of accumulating upon the system. This is notorious with regard to lead and mercury. Dr. Withering has observed that the repetition of small doses of digitalis at short in-

tervals, till it produces a sensible effect, is an unsafe practice, since a dangerous accumulation will frequently take place before any signals for forbearance present themselves.

From a combination of medicines, beneficial and mild effects result, which would not be produced by any of them given separately. From two distinct emetics, combined together, or from two distinct purgatives, an effect results, which is far more certain and mild, than from either of the two administered separately; and the same holds good with other medicines.

Besides the causes now detailed, affecting in a very material point of view the action of medicine upon the animal economy, and which ought to be minutely attended to by every medical practitioner, it is necessary to take notice of a few others not less important, affecting the vegetable and animal world. There are SOIL, CULTIVATION, CLIMATE, SEASON, AND ADULTERATION. There can be little doubt but that soil, cultivation, climate, and season, may very materially influence the active properties of a medicinal plant; while the two latter of these causes (climate and season) may as essentially change the type and character of a disease, and modify the vital susceptibility of the patient. This must be admitted to its full extent, or it will be extremely difficult to explain the contradictory and even opposite opinions, and to reconcile the conflicting testimonies of the physicians of different countries, with respect to the efficacy of the same remedies in similar diseases.

THE INFLUENCE OF SOIL may be exemplified by many well-known facts. Thus, strong-smelling plants lose their odour in a sandy soil, and do not again recover it by transplantation into a richer one. *Assafoetida* varies much, according to station and soil, not only in the shape of the leaves, but in the peculiar mucous quality of the juice; and Dr. Woodville states, that it is frequently so modified, that the leaves are eaten by goats. In Russia, the *rhododendron chrysanthemum*, a celebrated remedy among the peasantry for rheumatism, syphilis, &c., varies in its effects very materially, according to the *natale solum*. That product in a certain spot has proved uniformly narcotic; that in another cathartic; while a sense of suffocation has been the only symptom occasioned by a third. Every medical practitioner knows that the wild digitalis, or fox-glove of the sandy hills ground, the *valeriana officinalis*, &c., possess medicinal qualities far more energetic than those of the low-ground production, or those of our gardens.

CLIMATE produces a powerful impression upon vegetable and animal life. It is probable that in some southern countries, some

vegetables enjoy more energetic properties than in northern climates. Senna, by transportation from Arabia into the South of France, assumes a morbid change in its physiognomy and virtues. The leaves are more obtuse, and its taste is less bitter and nauseous, than the pointed leaved variety, whilst its effects will be found to be less purgative. Can a more striking proof of this fact be adduced, than the well-known effect of perfumes at Rome! The inhabitants are unable to encounter the strong scent of flowers in that climate, without experiencing a sensation highly oppressive, and which, in some cases, is even succeeded by syncope. Dr. Harrison, who resided some time in Italy, states, that he has no difficulty in asserting, that narcotics act with greater force even in small doses, at Naples, than in England. The extract of hyosciamus, when given to the extent of three grains thrice a day, produced in two patients temporary amaurosis, which disappeared, and again recurred on the ultimate suspension and administration of the medicine. And it deserves particular notice, that these very patients had been in the habit of taking similar doses of the same remedy in England, without any unpleasant effect. Now that this depended rather on an increased susceptibility of the patient in the warm climate, than on any increased power in the remedy, is unquestionable, since the extract which was administered in Italy had been procured from London. I treated several cases of epilepsy in Italy with the nitrate of silver, and with complete success, whilst in England I have certainly not met with the same fortunate results. At the baths of the island of Ischia, the most prevalent diseases were effects arising from the abuse of mercury. Hence we may fairly conclude, that the metal is more active in its effects there, than in our own country. "The doses of medicines," says Dr. Harrison, "as seen in the prescriptions and works of English physicians, excite universal astonishment amongst the faculty of Italy." Medicines act differently on the same individuals in summer, in winter, and in different climates.

CULTIVATION.—Of all the circumstances that produce change in the aspect, as well as in the virtues of the vegetable creation, the most conspicuous is cultivation, which may either destroy the medicinal properties of a plant, or raise in it new and most valuable qualities. Cultivation converts single into double flowers, by developing the stamina into petals,—a change which in many cases destroys their efficacy, as in the *anthemis nobilis*, or camomile; for since all the virtues of the plant reside in the disc *florata*, it is of course greatly deteriorated by being converted into the double

flower variety. Many other instances might be mentioned.

ADULTERATION deserves to be ranked amongst the most powerful causes which have operated in affecting the reputation of many medicinal substances. The Peruvian bark fell into total disrepute in the year 1779, from its inability to cure the ague, and it was afterwards discovered to have been adulterated with bark of an inferior species. Sydenham speaks of the adulteration of this substance before the year 1678. He tells us he had never used to exceed two-drachm doses of cinchona in the cure of any intermittent, but that of late the drug was so inert, rotten, and adulterated, it became necessary to increase the dose to one, two, or three ounces. "Very few practitioners have any idea (says Dr. Paris of London, who has paid particular attention to this subject) of the alarming extent to which the nefarious practice of adulterating medicines is carried on. There can be no doubt that it has been carried on in all ages, but the refinements in chemistry have enabled the manufacturer of the present day not only to execute this fraud with greater address, but, unfortunately, to vend them with less chance of detection. It will scarcely be accredited, when I affirm that many hundred persons are supported in London by the art of adulterating drugs; besides a number of women and children who find employment and excellent profit, in counterfeiting cochineal with coloured dough, isinglass with pieces of bladder, and the dried skin of soles; and by filling up with powdered sassafras the holes which are bored in spice and nutmegs, for the purpose of plundering the essential oils.

In prescribing medicines, the principal object to be kept in view is simplicity, and this was greatly neglected in the prescriptions of former days, and is even so still in those of surrounding countries. This is strongly remarked by Dr. Boyce in his *Sketch of Medical Knowledge at Constantinople*, recently published. Dr. Paris informs us that he was told by a medical practitioner in the country, that the quantity, or rather complexity, of the medicine which he gave his patients, for there never was any deficiency in the former, was always increased in a ratio with the obscurity of their cases. "If," said he, "I fire a great profusion of shot, it is very odd if some of them do not hit the mark!" Sir Gilbert Blane, in his *Medical Logic*, has given us a similar anecdote. A practitioner being asked by his patient why he put so many ingredients into his prescription, is said to have answered, more facetiously than philosophically, "In order that the disease may take which it likes best."

With regard to the directions in a pre-

scription how medicines are to be taken, they ought always to be written distinctly in the vernacular (English) language. In prescriptions, perspicuity is our first object; it is not here that a medical man is called upon to display his learning, and by clearness,—by writing the directions distinctly—he puts it out of the power of any individual to injure his reputation, or to endanger the safety of the patient.

Edinburgh, March, 1832.

OBSERVATIONS ON

THE INFLUENCE OF FEAR

IN PREDISPOSING TO DISEASE.

By JAMES CLARKE, Esq., Assist. Surg., R.N.

THE human body, it is evident from repeated observation, possesses at different periods of life, greater or less powers of resistance within itself, to the operation of those diseases excited by means of atmospheric influence.

In whatever mode a vitiated atmosphere has the effect of lighting up disease in the body, of this we are certain, that a continued and modified exposure to its influence, deadens its power, and in a peculiar manner having impregnated the constitution, renders it free from attack.

A robust state of health is by no means necessary to a person undergoing this trial; although, at the same time, absolute debility is to be avoided. How often do we see nurses, who in general do not enjoy good health, engaged, daily, attending the most fatal cases of typhus, small-pox, and other acknowledged contagions, while a casual visitor in rude health falls a victim to the pest! Often does it happen that a delicate female may attend on a relative during the whole range of a fatal case of typhus without experiencing any bodily illness, but the moment the object of her hope has died, her mind sinks within her, and the deadly poison works upon her harassed frame.

In the operation of miasmata on the system, a great deal I conceive must be taken into consideration, with respect to mind and body. In the case of a nurse or physician having a comparative immunity from contagion, it is evident, as regards the operation of all poisons on the body, aerial or otherwise, that habitude to them materially weakens their force. Let us add, that from constant intercourse with the sick, their minds are perfectly free from alarm, and no useless fears prey on their nervous system. In accordance with this rule, an infant will

be found uninjured sucking the breast of a mother dying of plague. When a stranger, perhaps in rude health, visits a patient from choice or necessity, labouring under a contagious fever, from the want of habitude to scenes of this description, he naturally feels an awe, if not actual fear, come over him. This of course must render his body more susceptible to the influence of the morbid cause, and it is no wonder if he imbibes the contagious miasm.

Again, on the other hand, we have seen the wonderful influence of hope in preserving the body secure during the intercourse with the sick, and the consequent infection on its being lost. There can be little doubt that during the panic of an epidemic disease, a great many are rendered susceptible by the influence of fear and other depressing passions. This is more particularly the case on board of ships, where the healthy and sick are necessarily nearly approximated.

That the operation of a morbid poison may be called into effect by dint of mental depression, or protracted fear, I have little doubt. And I think the following circumstances, which occurred on the coast of Africa, will tend to confirm it. At the same time I do not mean to ascribe all to the operation of the above cause, yet I do so in a great part, as the crew were constantly under my eye, and dissipation would have been immediately detected.

H. M. *Black Joke*, tender to H. M. S. *Sybilie*, formerly employed in the slave-trade, was purchased in 1827 for government on account of her sailing qualities; from that period up to August 1829, she never lost a man by fever, and was remarkably healthy. No alteration had been made with regard to her slave-deck, which was composed of moveable planks, under which were stowed the wood and water. This deck was about four feet and a half from the beam; but the ventilation was complete. In the month of August 1829, H. M. S. *Sybilie* had contracted a malignant yellow fever, it were said, at Fernando Po; about this period the *Black Joke* received five men from her in lieu of smugglers, whose period of servitude had expired. These men were reported healthy; but one of them who had slept on deck all night, which was generally the custom of the crew of the *Black Joke*, was taken ill next day, and died on the fifth with black vomit. All his clothes were buried, and the vessel was fumigated and white-washed. Nine days elapsed, when three cases were put on the list, and a second interval of thirteen days, when the fever fairly broke out. It continued during seven months, and attacked seventy-seven persons, of whom twenty-seven died. During this period the greatest possible de-