

weight at the stomach, eructations, dryness of the œsophagus, heaviness of the head, giddiness, headache, followed by sleepiness, faintness, and a sensation of heaviness in the whole body; and in very large doses, trembling of the limbs, and even convulsions. The pulse, it is said, is strengthened and quickened. Trousseau and Pidoux failed to obtain many of these symptoms, noticing only headache with giddiness; the pulse was unaffected.

These remedies are employed in melancholia, and for many of those anomalous but distressing symptoms grouped under hysteria. They have been given in chorea, epilepsy, whooping-cough, nervous palpitation, cramps of different parts of the body, and even in tetanus. Dr. Graves employed musk in typhus and other fevers, to prevent prostration, and to strengthen a weak and feeble pulse.

ALCOHOL.

For many reasons alcohol might be grouped conveniently with chloroform and ether, there being much similarity in the action of these three medicines. Each, at first, produces much excitement, with increased strength of the pulse, this stage after a time giving way to another of unconsciousness, which may be profound; but with this general similarity there is an important difference between alcohol on the one hand, and chloroform and ether on the other. With chloroform and ether the stage of excitement is brief, soon passing into that of insensibility, which may endure a long time without danger to life. But with alcohol the early stage of excitement and intoxication is of considerable duration, insensibility and unconsciousness not coming on till very large quantities have been taken, and some time has passed. In this stage of insensibility the danger of death is imminent from paralysis of the heart and of the movements of respi-

ration. It will be easily understood, therefore, that while chloroform and ether are used as anæsthetics, alcohol is inadmissible for this purpose, and is of service only in its early and stimulating stage.

Owing to its volatility, alcohol is sometimes employed to abstract heat, and cool the surface of the body, as in inflammation of the brain, etc., but it is not a very effectual refringerator, and ice is preferable.

If its evaporation is prevented, it penetrates the skin, owing to its tolerably high diffusion-power, and excites the tissues beneath the cuticle, causing a sensation of heat and some inflammation. It may be thus employed as a counter-irritant.

It coagulates albumen, and is sometimes used to cover sores with a thin, protective, air-excluding layer, which promotes the healing process. Alcohol, in the form of brandy or eau de Cologne, is often applied to harden the skin of parts exposed to pressure, and to obviate the occurrence of bed-sores. This excellent practice should be adopted before the occurrence of abrasion, or even before redness.

It is a useful practice to bathe the nipple with brandy each time after a suckling, then carefully to wash the part, and dab it dry. The brandy may be applied some days before delivery, so as to harden the tissues, and prevent the formation of craked nipples, which give rise to so much pain and distress.

In virtue, probably, of its power to coagulate albumen, and perhaps of other properties, it constricts to a small extent the mucous membrane of the mouth, and is sometimes used, diluted with water, as an astringent gargle in relaxed throat, scurvy, salivation, etc.

In the stomach it exerts a double action. Thus it may affect both the gastric juice and the secreting mucous membrane. Its action on these will be considered separately. The effect of a small quantity of alcohol on the pepsine of the gastric juice is insignificant; but a large quantity destroys the pepsine and its food-dissolving property.

As with the gastric juice, so with the mucous membrane,

the effect of alcohol differs according to whether a large or a small quantity is taken. It has been experimentally proved that in very moderate doses it increases the secretion of the gastric juice, and every-day experience confirms this fact. Large quantities upset the stomach, destroy the appetite, inflame its mucous coat, cover it with a thick tenacious mucus, and abolish its secreting power.

Owing to this influence on the functions of the stomach, alcohol is a remedial agent, as the following examples will illustrate:—

I. Some persons after undergoing considerable fatigue are apt to lose all appetite and digestive power, and on taking food to suffer from an undigested load on the stomach. A glass of wine or a little brandy and water, taken shortly before food, will in such cases restore appetite and digestion.

II. In the convalescence from acute diseases, when digestion and strength may remain a long time depressed, alcoholic stimulants taken just before or at meal-times are often serviceable.

III. Many dwellers in towns, who lead a sedentary life, and suffer often from weak digestion, find that only by the help of alcohol in some form can they properly digest their food.

IV. Stimulants are most serviceable in the prostration from acute illness. In common with the other functions, digestion at this stage is much depressed, while it is most important to support the strength until the disease has done its worst. Strength can, no doubt, be best supported by food, but the weakened stomach can digest but sparingly. In such critical circumstances alcohol spurs the flagging digestion, and enables the patient to take more food.

Next, the time of giving the alcoholic stimulant is a matter of great importance. It should not be given at hap-hazard, as is too commonly the case. The stimulant should be given with the food, not at random. To a patient labouring under great prostration, in whom digestion is very feeble, food and stimulants should be mixed together, given in small quantities,

and frequently repeated; but a stronger patient had better take food at the ordinary meal-times, as from habit the stomach digests better under such circumstances.

It is necessary to insist on this point, as it is common with both medical men and the laity to trust to alcohol alone, forgetting that while it benefits by stimulating the heart, it also effectually aids the digestive process, and thus supports the patient in the best and most natural manner.

It has been mentioned that large quantities of alcohol excite catarrh of the stomach; but it is singular how considerable an amount a person prostrated by fever can take without producing this result. The same fact may be noticed in convalescence from exhausting diseases. Still, care must be exercised in the administration of stimulants, since it sometimes happens that if too freely given they upset the stomach so that all food is vomited, an untoward circumstance greatly adding to the patient's danger.

The prolonged indulgence in alcoholic drinks, after a variable time, seriously damages the stomach by producing chronic catarrh. The mucous membrane, coated with tenacious mucus, excites unhealthy fermentation in the food, while the structure of the membrane itself undergoes considerable alteration by great increase of the connective tissue, which, by its contraction, obstructs and destroys the secreting follicles and their lining cells. The mucous membrane thus becomes thickened, hardened, and uneven; and, owing to obliteration of the orifices of follicles, cysts are formed in its substance, which enlarge from the accumulation of cells within them.

In consequence of these serious changes, little gastric juice is poured out in response to the demand made by the food, while the unhealthy mucous coating of the stomach, by exciting morbid fermentations, induces the production of much gas, with various acids, such as butyric, acetic, etc., whence acidity and heartburn. Morning vomiting of a scanty, sour, bitter, and tenacious fluid is a characteristic symptom of this condition.

Owing to its high diffusion-power, alcohol passes readily into the blood, so that but little can reach far into the intestines. Spirits, especially brandy, are often successfully employed to control the after-stages of acute simple diarrhœa, after the removal of the exciting irritant, and when the relaxed condition of the mucous membrane allows the liquid parts of the blood to pass into the intestines, producing frequent watery stools.

Even in large quantities alcohol appears neither to promote nor to hinder the conversion of starch into sugar.

Observations on the influence of alcohol on the blood and organs have yielded contradictory results, the most recent and elaborate investigations of Drs. Parkes and Wollowicz clashing in most particulars with those of previous experimenters. Hitherto it was held that alcohol diminishes the oxidation of the body, but Parkes and Wollowicz's observations are opposed to this conclusion. Dr. G. Harley found that alcohol in small quantities added to blood withdrawn from the body lessened its absorption of oxygen and its elimination of carbonic acid.

As the result of a great many observations taken every quarter of an hour for several hours, on persons of all ages, the author, in conjunction with Dr. Rickards, found that alcohol, brandy, and wine diminish the body temperature. After moderate doses, the fall was slight, amounting to not more than 0.4° to 0.6° Fah., but after poisonous doses the depression in one instance reached nearly three degrees; in rabbits the fall was much greater, reaching to ten or more degrees. These observations have been confirmed by Professor Binz, of Bonn, and by Dr. Richardson, who asserts that all alcohols reduce the animal temperature. Drs. Parkes and Wollowicz, whose observations are opposed to the foregoing, gave to a healthy young man, in divided quantities, for six days, a daily amount of absolute alcohol varying from one to eight ounces, and on a subsequent occasion twelve ounces of brandy daily for three days. The temperature of the body was observed every two hours. The average temperature of

the alcohol and of the brandy-drinking days was found to be almost identical with that on days when only water was taken. These conflicting results it is difficult to reconcile; but it must be granted that a considerable quantity of alcohol repeated several times a day does not permanently reduce the body temperature. Dr. Parkes has recently re-investigated this question, and he finds that dietetic doses (2 fluid ounces of absolute alcohol) given to a healthy fasting man at rest, often reduces the rectal temperature rather less than half a degree; but when the alcohol is given with food even in doses of 4 to 8 ounces of absolute alcohol, it produces no effect on the temperature. In a boy aged ten, who had never before taken alcohol in any form in his life, through a large number of observations I found a constant and decided reduction of temperature. It is possible that alcohol when given in repeated doses may soon lose its power of depressing the temperature. Excessive habitual indulgence appears to have this effect; for Dr. Rickards and the author gave to an habitual drunkard, making him dead drunk, twelve ounces of good brandy in a single dose, without the smallest reduction of the temperature.

In their experiments on the urine, Böcker and Hammond found that "the formation of urea, of the extractives, and of sulphuric acid and phosphoric acid, was lessened by alcohol and beer; the water and free acidity of the urine was diminished;" but in Parkes' and Wollowicz's observations, alcohol, brandy, and claret produced no decreased elimination by the urine of urea, phosphoric acid, or free acidity. They however increased the amount of urinary water.

Edward Smith found that brandy and gin diminishes, while rum increases, the pulmonary carbonic acid. These conflicting statements it is impossible to reconcile; but Parkes' observations were so carefully conducted, and are so complete, that they must be accepted as authoritative.

How much alcohol is consumed in the body? The results of investigations to determine this point are so contradictory, that it is impossible to decide the value of alcohol as a food.

Bouchardat, Sandras, and Duchek conclude that alcohol is freely consumed in the body, little escaping by the urine, unless very large quantities are taken. On the other hand, Perrin, Duroy, and Lallemand deny that alcohol is consumed in the smallest degree in the body. Anstie concludes from careful experiments that the greater part of the alcohol is consumed, and he has undoubtedly proved that only a little escapes with the urine, while Parkes and Wollowicz believe that a considerable quantity escapes with the sweat and breath. Dupré's recent observations confirm those of Anstie, proving that only a fractional part of alcohol escapes from the body; and Anstie believes that this never occurs till a narcotic dose has been taken, which varies in different people.

Even if the greater part of alcohol is consumed and thus administers to the forces peculiar to the body, yet alcohol by depressing functional activity, favouring degeneration, &c., may do more harm than any good it may effect by the force it sets free in its destruction; even if taken in quantities too small to do harm, yet it can scarcely be classed as an economical food for the healthy. Granted that dietetic doses check oxidation in the healthy and thus protect the blood and tissues, still, unless it can be shown that in health there is constantly an excess of consumption over and above that required by the body, such a diminution of oxidation could only result in lessening the amount of force set free and put at the disposal of the organs, and consequently a diminution of the functional activity of the body. Physiology failing to guide our steps amid these conflicting statements, it is obvious that, in estimating the value of alcohol in health or disease, we must rely solely on experience, which plainly shows that, for the healthy, alcohol is not a necessary or even a useful article of diet. Varied, repeated, and prolonged experience, and the testimony of army medical men, prove that troops endure fatigue and the extremes of climate better, if alcohol is altogether abstained from. The experience of the celebrated Moscow campaign

showed this; so also quite recently the Red-river Expedition. During arduous marches it has always been found that the health of the men is exceptionally good without alcohol, but, as soon as spirits are allowed, disease breaks out. Modern trainers recognize the fact that the power of sustained exertion and resistance to fatigue is best promoted by abstaining from alcohol. The ill health of many athletes depends, not on the rigour of the system to which they are subjected, but on the excesses they indulge in after the contest for which they trained.

There can be no doubt that healthy persons capable of the fullest amount of mental and physical exertion without the stimulus of alcohol, not only do not require it, but are far better without it.

It must be recollected, however, that these remarks apply to pure alcoholic drinks, as spirits, and not to beers and wines which contain ingredients highly useful as food. The amount of alcohol in the lighter beers and wines is small, and can hardly be prejudicial to the robust, while they brace up and improve the flagging functions of the weakly, as town-dwellers, especially those who pass much of their time indoors, in an unhealthy atmosphere. Some indeed cannot properly digest their food without a stimulant.

Dr. Anstie speaks highly of alcoholic stimulants in the debility of old age, especially in the "condition of sleeplessness attended often with slow and ineffectual digestion and a tendency to stomach cramps." He employs "a generous and potent wine," containing much ether.

The pain of neuralgia may often be relieved by alcoholic drinks, especially by those containing a large quantity of volatile ether, the alcohol removing the temporary nervous depression which produces the paroxysm. The distressing symptoms occurring is so-called hysteria, generally met with in middle-aged women, are for a time relieved by alcohol; but, as the stimulant must be taken in increasing quantities, there is great danger lest the patient should acquire the habit of taking alcohol to excess. Nervous or neuralgic

patients often are prone to imbibe alcohol in excess and many women become in this way confirmed tipplers. It behoves, then, the doctor to be very guarded in his recommendation of alcoholic stimulants.

Whatever doubt may exist concerning the usefulness of alcohol in moderate quantities, there can be no question of its pernicious and poisonous effects when taken in excess. It then injures and degenerates the tissues of all parts of the body and produces premature old age. The lungs become prone to emphysema; there is diminution of both physical and mental vigour; the kidneys, liver, and stomach may become cirrhotic. Even when the effects of hard drinking are not very apparent in a state of so-called health they become evident on the occurrence of illness or accident, when the constitution manifests its undermined condition and its diminished power to resist disease. Thus drunkards succumb to accident or illness which temperate men easily overcome.

Delirium tremens is another alcoholic disease. It may arise in different ways; sometimes being produced by a single debauch, but commonly occurring in those who habitually take an excessive quantity of wine or spirits, without perhaps ever getting drunk. In an attack arising from an exceptional debauch, it is merely necessary to withhold spirituous drinks for a time, to allow the system to become free from alcohol. On the other hand, delirium tremens is often excited in habitual toppers by altogether withholding intoxicating drinks, so that in treating these chronic drinkers a moderate quantity of some alcoholic drink must generally be allowed.

The influence of alcohol on the heart is most noteworthy. It strengthens the contractions of the heart, especially when this organ is weakened by debilitating diseases, which are always attended by a quickened and weakened pulse. Owing to its tonic influence on the heart, alcohol strengthens the pulse, and reduces its frequency. It must be considered one of the most powerful cardiac tonics. This tonic property,

together with its power to promote digestion by increasing the gastric juice, explains the great usefulness of alcoholic beverages both in debilitating chronic, and acute diseases.

In most diseases accompanied by weakness or prostration, alcohol in one or other of its forms often proves a very valuable remedy. It is of conspicuous service in acute diseases running a limited and definite course, in the treatment of which the cardinal point is to sustain the vital force beyond the critical stage.

Brandy or wine are the best remedies when the heart is suddenly enfeebled, from fright, loss of blood, accidents, or other causes.*

Great as are the beneficial effects of alcohol in disease, yet it may do harm as well as good. In its administration certain precautions must therefore be observed, and its effects on the different functions must be carefully watched. Although the heart affords the most trustworthy information on this point, yet the influence of alcohol on the other organs must not be overlooked, as it may happen that while alcohol benefits one system it injures another, doing good in one respect, yet on the whole inflicting much harm.

The following rules regarding the use of stimulants in fever, were laid down by Dr. Armstrong, and have been endorsed by Dr. Graves:—

1. If the tongue become more dry and baked, alcoholic stimulants generally do harm. If it become moist, they do good.
2. If the pulse become quicker, they do harm. If it become slower, they do good.
3. If the skin become hot and parched, they do harm. If it become more comfortably moist, they do good.
4. If the breathing become more hurried, they do harm. If it become more and more tranquil, they do good.

* In threatened fainting it is a good plan to direct the patient whilst sitting down to lean forward and place the head between the legs as low down as possible so that the blood may gravitate to the brain.

These excellent rules might be supplemented by a fifth: alcohol does good if it produce sleep, and quell delirium.

In judging of the influence of alcohol on the pulse, its compressibility is of more importance than its volume. Under the action of alcohol a soft and yielding pulse of large volume often becomes much smaller and less compressible, changes indicating an increase in the tonicity of the arteries, and in the strength of the heart.

Such are the rules which must guide us in the employment of alcohol in disease. They give us data as to the quantity we should administer, and whether we should continue, increase, or withhold the dose.

There are other circumstances which we must carefully regard in respect to the employment of alcoholic drinks. At the two extremes of age, the powers of the body being easily depressed, stimulants are accordingly called for early, and must be freely used. In the aged, especially, it is of great importance to anticipate prostration by the early employment of alcohol; for it is very difficult to overcome this condition, and to restore the patient to his former state. Young children prostrate from disease, take stimulants with benefit, even in large quantities. Next, the knowledge of the course a disease ordinarily runs, gives us timely indications in respect of this question. In some acute diseases, as typhus, in which often the depression is very marked, especially at the extremes of life, stimulants should be employed early.

Alcohol has been given lately, to fever patients in very large quantities on the Continent, and to some extent in England. Dr. Anstie is the chief supporter of this treatment in this country. Alcohol is given to reduce fever and to check waste. In fevers, no doubt there is great increased destruction, certainly of the nitrogenous tissues, shown by the large quantity of urea eliminated by the urine. At the same time all the functions of the body are much depressed, and can appropriate less of the force set free by oxidation than in health. From these two causes, and partly likewise from diminution of perspiration, so that the heat fails to pass off

duly by the skin, preternatural heat of the body takes place in fevers. Alcohol in large doses, it is maintained, lessens oxidation and prevents waste, and thereby lowers the temperature of the body and diminishes the amount of urea in the urine. But to effect this, very large doses must be given—doses which, in some cases at least, I should imagine might do harm in other ways; hence, the influence on the pulse, respiration, &c., according to the rules just laid down, must be carefully watched.

Several years ago, I made a large number of observations concerning the influence of alcohol on the temperature of fever, and found that in health, so in fevers, alcohol slightly reduces the temperature; but its power in this respect is so insignificant, and doses so enormous must be taken to produce even trifling results, that it is useless to give alcohol solely with this intention.

In my judgment there can be no doubt that alcohol is not required in all febrile diseases; on the contrary, many cases are best treated without it; and in no instance should it be given unless special indications arise. The enormous quantities of alcohol which used to be given a short time ago, and are indeed, now, sometimes administered, are, I believe, rarely needed, although sometimes very large doses are needed and are undoubtedly the means of saving life.

The kind of alcoholic stimulant employed is not a matter of great importance, provided its quality is good. It is undesirable to give several kinds of stimulants at about the same time, or they may derange the stomach; but they may be changed from time to time according to the patient's desire. Anstie recommends strong alcoholic drinks in fevers, as brandy in the early and middle stages; but when the heart flags, and the nervous system becomes weakened, he prefers wines containing plenty of compound ethers. Stimulants should not be given in large quantities to weakly persons at distant intervals of the day; it is far better to give them in small and frequent doses. A large dose at one time strongly stimulates the heart; then, as the alcohol is decomposed or elim-

inated, the heart is left unsustained, when great weakness may set in; whereas the frequent administration of smaller quantities keeps the heart more uniformly supported.

Some easily digested food in small quantities should be given with the stimulant, which, by promoting digestion, supports the patient's strength in the most natural and most effectual way. As a rule, where food is freely taken and digested, stimulants are little needed.

Weakly children derive more benefit by taking stimulants about an hour before rather than with food. This plan enables them to take more food, and to digest it better, than the more common one of giving the stimulant with food.

In common with ether and chloroform, alcohol is an anti-spasmodic, but in this respect ether and chloroform are more effective.

It does sometimes happen that one alcoholic stimulant is harmful, while another is found useful; a fact especially noticeable in coughs, which are aggravated by porter or beer, but are unaffected or even relieved by brandy or wine. Beer or stout sometimes produces sleepiness, heaviness, even headache, and flushing of the face, while the same person can take wine or brandy without inconvenience. Individual peculiarities abound in respect of wines; for example, one person cannot take sherry without suffering from acidity, while another is speedily seized with gouty pains on taking port.

The wish of the patient for any particular form of stimulant is often a correct indication of its desirability. A free draught of the weaker beers will often gratefully slake the urgent thirst of fever.

Stout is very supporting and nourishing to persons brought low by exhausting discharges, and to women weakened by suckling. In many cases unfortunately it disagrees, producing headache and sleepiness. The good old-fashioned remedy, rum or brandy and milk taken before breakfast, is useful in phthisis and in exhausting diseases. A little rum and milk an hour before rising is a good prop to town-

living women, to whom dressing is a great fatigue, who, without appetite for breakfast, suffer from morning languor and exhaustion, often lasting till mid-day, and to convalescents from acute diseases.

The ill effects of alcohol in gonorrhœa are well known. A cure is much more readily effected if the patient will abstain altogether from alcoholic beverages. Even when the cure seems near completion, a single indulgence in spirits, wine, or beer will bring back the scalding and discharge. Exercise too should be interdicted.

CHLOROFORM.

CHLOROFORM, when applied to the surface of the body, speedily volatilizes and cools the skin; but it is seldom used as a refrigerator, being in this respect inferior to other agents.

Owing to its high diffusion-power, chloroform readily penetrates the animal textures. If evaporation is prevented it penetrates the cuticle and excites inflammation, and, thus applied, chloroform is rubefacient.

In quantity insufficient to excite inflammation, chloroform deadens sensation, and acts as a local anæsthetic. It is sometimes applied to relieve pain, and occasionally with good effect, although it often fails, and is inferior for this purpose to many other external applications. It has been used in neuralgias, sometimes with success, but it generally fails, and even when successful, the relief is ordinarily very temporary, the pain soon returning.

In faceache or toothache, two or three drops on a small piece of cotton-wool, introduced into the ear, gives occasionally complete and permanent relief; but if too large a quantity is used, it will excite inflammation, even vesication, and give much annoyance. The pain of cancer, when the skin is broken, leaving a painful, irritable sore, is relieved by play-