

the Judge of all; that if He should call you away, we may yet feel sure that all is well. I tremble, lest to the bitterness of parting should be added the pang of remembering that the parting came in the midst of sin, or of idleness, or amid angry words and personal offence. Go, therefore, to your work with the determination, once for all, to take the better part; to be from this day onwards the Christian gentlemen that I trust you mean to be; to let no malice, nor uncharitableness, nor anger, nor evil-speaking, nor uncleanness, come between you and your profession; and, finally, pray to God daily, with us, that you and we may continue to encourage each other, by precept and example, in every good word and work.

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REMARKS ON ALCOHOL. *By DAVID PRIDE, M.D.* ✓

“Give strong drink unto him that is ready to perish.”—*Prov.*

IN this paper I propose offering a few remarks on the use of alcohol as a medicinal agent. It would appear that the reasons assigned by medical men for the administration of alcoholic liquors, and the unsatisfactory explanation given of the manner in which they act in bringing about a good result, have led some well-meaning persons to denounce such articles altogether, and to assert,—“That medical men are all but universally deluded in this matter,” and “that medical prescription in this point is a delusion,” and “that society in this land of light is in a state of delusion in the matter.” Now, before attempting to show that these statements are in a great measure gratuitous, it will be well, first, to take a short glance at the various ways in which medicinal agents operate upon the animal economy, in order to define with some sort of accuracy under what class a substance of the nature of alcohol can be arranged.

All medicines act as relative agents, and the various ways they do so are: 1st, locally; 2d, chemically; 3d, they may be absorbed undecomposed, and influence the system through the circulatory, or nervous system, or both; 4th, they may be decomposed, and act through only one or more of their components; 5th, they may produce an impression upon the nerves, and affect the other parts of the body through sympathy. The 3d class is that with which we have got to do, viz., those substances that pass undecomposed with the circulation, &c.—Hence, to place the question in as small compass as possible, I

observe that alcohol is a stimulant which can pass undecomposed into the system, and is capable of influencing the habit through the medium of the circulatory, or nervous system, or both.

In considering how alcohol behaves itself when introduced into the stomach of a human being, it will be necessary to view it in a two-fold aspect, in order to meet the object proposed in this paper, namely, 1st, What is the effect produced, and how does alcohol comport itself when taken into the stomach, unaccompanied by articles of diet; and, 2d, What is the effect, and how does it comport itself when taken into the stomach along with articles of diet.

First, then, of alcohol taken alone, or without food.

If alcohol be applied to dead animal matter, it will act as an astringent, lessening its bulk and condensing it, chiefly by abstracting the water from it, and substances thus acted upon are undoubtedly less liable to undergo decomposition. It is, therefore, antiseptic. The same property of attracting water gives alcohol the power of coagulating the albumen in animal matters, by which they are rendered more capable of resisting the action of other agents. "The consideration of this influence of alcohol on dead matter," says a recent writer, "has induced some to believe that it acts nearly in the same manner upon the living body. But," he continues, "this is not the case. For, while vitality continues, no power with which we are acquainted can coagulate the fluids." Well, though this may hold good of matters actually composing of the living frame, the case stands very different with those taken into the stomach undigested, and, consequently, not components of the economy; upon such substances there can be no doubt that spirituous liquors will exercise to their fullest their antiseptic, hardening influences. Hence, to administer alcohol along with articles of diet, and especially animal food, is anything but following the dictates of science, since their tendency is, by abstracting the fluids, to render them less decomposable, and more permanently capable of resisting the influence of digestion. There is still another reason for not administering alcohol and food together. It is now a well established fact, that, before any article of food can be digested, it must come into actual contact, and be saturated with gastric juice. So long as the stomach is empty, it remains quite quiescent, the glands are inactive, and no gastric fluid is poured forth; but, when irritated by the presence of food, or any foreign body, the inertia passes off, the mucous membrane becomes turgid and slightly reddened by the influx of blood to its surface, and an acid fluid is poured forth in small quantities, which, slowly running together down

the walls of the viscus, soaks into, and saturates the substances introduced.

Speaking of this most curious fluid, Drs. Prout and Dunglison say it consists of an acid, several salts, and an animal matter, which the latter has named "Pepsine," soluble in cold, but insoluble in hot water. Dr. Bowman remarks of this fluid, that it is clear, transparent, inodorous, slightly saltish, and perceptibly acid, readily diffusible in water, wine, and spirits, and is a most effective solvent of the *materia alimentaria*. This pepsine, then, is an animal matter, which, joined by a peculiar affinity to an acid, has the power of acting as a digestive agent, but, separated, neither the acid nor the pepsine have this power. This being the case, then, any substance taken into the stomach, either when digestion is about to commence, or when it is in full vigour, which has the power of destroying this affinity, must be hurtful in its tendency, and should be most scrupulously guarded against. Now, it has been shown by Bidder and Schmidt, that, if alcohol be added to gastric juice, it immediately destroys the affinity that obtains between the acid and the pepsine, and the consequence is they are both at once rendered quite inactive. Hence, any article of food in the stomach undergoing digestion, however thoroughly, will be lost; for, if alcohol be now introduced into the viscus, it at once pounces upon the gastric juice, and, in a catalytic manner—*i.e.*, undergoing no change itself—destroys the affinity subsisting between the pepsine and the acid, and, by decomposing the fluid, renders it quite inactive, arrests the digestive process, and holds all in perfect abeyance for so long as it is present in the stomach. Thus, secondly, we are forcibly led to the conclusion, that, to prescribe alcohol *along with* articles of diet, is not following the dictates of science, by which alone we should be guided. For, not only does it, as we have before seen, act injuriously primarily, as an antiseptic in hardening the article of food, but secondarily, by destroying that upon which the integrity of the whole process depends, *viz.* : the gastric juice.

We have thus seen that alcohol should not, for reasons assigned, be prescribed along with articles of food, but alone. Moreover, that it may only exercise a stimulating influence over the mucous membrane of that viscus, it should be administered in a state of dilution, and not in full potency. On patients weakened by protracted disease, as by fever, in which the struggle between the patient's strength and the fever poison, has all but worn out the sufferer, alcohol is found to exercise its greatest and most beneficial influence. Not, however, as an article of food, as has been maintained by very

high authority, but as a medicinal agent. But, to examine this more in detail, we shall suppose alcohol, properly diluted, has been administered to a patient over or before the crisis of a fever, as a pneumonia (for it matters not which, if a stimulant is required), alone, and before partaking of any article of diet. It appears in an organ languid and listless, which has not power to retain the food so necessary for the patient's existence (a condition not uncommon under such circumstances). In this position it is brought into contact with numerous minute nervous ramifications, acting upon whose sentient extremities it stimulates them to action. This influence is transmitted through a host of channels, but chiefly through the pneumogastric nerve to the brain, spinal marrow, cardiac ganglia, and other nervous centres. The different parts of the system so impressed respond to the stimulus, and reflect a power back upon the organ whence it primarily originated, and by this means the heart is roused to a more regular action, the muscular movements of the stomach are invigorated, the power to secrete the gastric juice increased, and the general languor passes off. The liquor, however, speedily passes from the stomach to take its place in the blood vessels, there further to exert its influence, as we shall presently consider. The stomach is now in a fit state to receive food. With this increased activity it is the more able to pour out its juice, and perform its peristaltic action, and, on the whole, do its duty with greater alacrity. The stimulant has, meanwhile, passed into the circulation, where it continues its influence upon the heart and blood-vessels, and an agreeable increase in the temperature is diffused through the whole body. The alcohol calls forth the latent energy of the organs, and supplies a strength, artificial it may be, yet highly beneficial, by which the process of chymification is performed in such a manner as could not otherwise have been accomplished, and the functions of nature are performed with greater ease and efficiency. By these means, and others of a like kind, we gradually collect back the dissipated powers of the patient, and in this manner does alcohol benefit digestion, and add to the patient's vigour in disease.

We shall now consider the subject of *alcohol* and *heat*, or, alcohol as a heat-evolving or heat-generating agent.

It has been the impression of almost all who have partaken of alcoholic liquors, that an increase in the temperature of the body is experienced; of late this impression has assumed the appearance of a positive opinion, so much so, that it became necessary for chemists and physiologists to render some answer, to the part of science, explanatory of this sensation. In

furtherance of this object alcohol was looked upon as performing the same or an analogous part in the human economy to what was well known to be performed by the non-nitrogenous constituents of our food. "That by the rapidity with which it was oxidized, heat was evolved and added to our system," and thus it was looked upon and classed as one of the great heat-generating agents. Some conviction of this kind seems to have been entertained even before the days of Baron Liebig. But that celebrated chemist was supposed to have completed the explanation of the subject, and to have placed it far even beyond the possibility of doubt, when he advanced his theory, which was, "that alcohol taken into the stomach, becomes absorbed into the sanguiferous current, when almost immediately it underwent decomposition, giving up its oxygen, which, uniting with the carbon of the blood, at once, by a previously slow combustion, or chemical combination, gave origin to an increase in the temperature of the body." The world, however, was speedily directed to look for some other explanation of the phenomenon. For, though it was most undoubtedly true that the alcohol did enter into the vascular stream, it was soon found that the idea of it undergoing decomposition, so universally believed in, was in a great measure untrue, if not altogether without foundation. But, on the contrary, it became more and more evident, from research, that it performed its action, whatever that might be, in an unaltered and entire state. People now oscillated to and fro, distracted by these conflicting opinions and sentiments. The formerly all but settled opinion of alcohol being the fuel of the blood, now no longer tenable, persons of different stamp flew to the conclusion, in the unsettled state of knowledge, "that it was all a delusion." "There is no increase in the temperature of the body." Doubtless this is the feeling, but it is altogether false. But, as was to be expected, this procedure fell far short of satisfying the desires of enquiring men. Denouncing might well stifle a conviction, but it could not destroy a sensation, and so the cry was still afloat. How is it that we feel an increase of heat, if we are in reality cooling? And if our sensations and feelings, judged of by our reason, are not to be trusted, how after this are men to be guided? And what may be considered satisfactory proof of the existence of anything in nature? This too much savoured of Bishop Berkley's theory to receive credence amongst scientific men.

But that there must be an increase in the temperature of the body, after partaking of alcohol, appears to be absolutely necessary to the explanation of the following facts. We have seen that spirituous liquors taken into the stomach are

conveyed by absorption, undecomposed, into the circulation. That in both situations, *i.e.*, in the stomach and in the blood-vessels, they come into contact with the filamentary termini of nerves so abundantly scattered over thin surfaces, upon whose sensory extremities they exercise a stimulating influence: that this impression or influence is carried through these nerves to the various nerve centres with which they are connected: that from these a reflex power is issued back, which leads to general contraction of the arterial system. For, so closely are these two systems associated in their action, that we cannot act upon the one without producing an effect upon the other. Well, the primary effect is contraction of the blood-vessels, but what are the secondary effects? Those which result from general vascular contraction? The effect of contraction of the blood-vessels manifests itself in acceleration of the blood and increased action of the heart. And this increased impulse of the blood may be felt for a length of time proportionate to the quantity and strength of the liquor taken.

Now what is the inevitable result of the premises we have thus before us? The blood bounding along the branches of the arterial tree, after passing through the capillary vessels, is again collected back into the large venous trunks, to be transmitted, through the heart, to the lungs, for the purpose of aeration. But what is this process of aeration? It is a process of chemical combination, or, as Baron Liebig called it, a process of "slow combustion" continually going on within the breast of man, and one of the principal channels through which, to a considerable degree, the whole body is heated. To meet this demand in the economy of nature is the great use of the lungs; and such is their construction, that the blood within them is exposed to the largest possible surface, and brought into intimate contact with the largest possible amount of atmospheric air. Now this being the case—that aeration of blood is a species of slow combustion, and one of the greatest sources of animal heat—it follows, as a natural sequence, that when there is an acceleration in the flow of blood, there must be a corresponding increase in the pulmonary combustion, and, of necessity, an elevation in the temperature of the body. Then as a correlative to these facts, it follows—1st, that for any given time during the influence of the alcohol upon the system, more blood will flow through the lungs; and 2nd, that the temperature of the blood will be increased in direct proportion to the activity with which this pulmonary transmission takes place. In other words, increased velocity of circulation will bring new particles of blood more frequently into contact with the contained air, the process of pulmonary

combustion will take place with greater intensity, and a greater degree of heat will be generated in the blood, which, rapidly carried along with the circulation, will result in an increase in the temperature of the whole body. Thus does science confirm experience, and show, in this instance at least, that our feelings are not delusions.

But, to consider the influence of alcohol on the nervous system. Whilst we readily admit that alcoholic liquors are taken into the blood, and, further, that it is through this medium they are carried to the different parts of the body, yet it appears they produce their effect upon the system through the instrumentality of the nerves with which they are everywhere brought into contact within the body. This position, were it necessary to do so, might be amply proved both by experience and experiment. But let me give one instance of what is meant, at least an instance which will serve to illustrate the mode of operation to which I refer. Amongst experimental physiologists it is a fact well known that the sensation of hunger, though constantly referred to the stomach, does not originate in that organ, but is an effect more general, resulting from the impoverished state of the blood; and, moreover, that it is through the filamentary terminations of the nerves distributed to the blood-vessels we are more conscious of the appetite and the deficiency of aliment in the system. The knowledge of this fact teaches us that the nerves distributed to the mucous lining of the blood-vessels are capable of being influenced by the condition of the fluid circulating within them, and throws light upon the manner in which alcohol taken into the blood produces its influence upon the nerve termini; that by simple contact it so operates as to call forth the nervous energy by which, through reflex action, without participation of the will, the blood-vessels are induced to contract, lessening their caliber, increasing their tone, as well as their propulsion-power. The blood is carried forward with far greater velocity, as is evidenced by the pulse and the heart, than when the system is in a languid condition, which is always the case with fever patients, where the struggle on the part of nature is to eliminate and rid itself of an exhaustive and depressing blood-poison.

With regard to the prescription of alcohol, there can be no absolute rule laid down as to what cases or what classes of diseases it can be used in; but it cannot be prescribed in a routine manner without being productive of the most disastrous consequences. There must be discriminating care exercised, and judicious selection made, in order to reap the advantages of this agent without its disadvantages. It may, however, be safely stated—that when the heart is flagging in its action

through a languid debilitated state of the system, in consequence of protracted and exhausting disease, whether it be fever or not, and when prescribed in such a state of dilution as shall best suit the urgency of the crisis, and not as an accompaniment of food, but as a preparatory tonic, it will be found highly beneficial as a safe, sure, and useful stimulant.

The administration of alcohol has thus been considered in a three-fold point of view. 1st, in its bearings upon digestion; 2nd, as a heat-evolving agent; and 3rd, as a nerve stimulant, when prescribed in a medicinal form. The object of this paper shall have been gained, if it be the humble means, in however small a degree, of leading to a more thorough appreciation of the action and general comportment of alcohol in the human body, and of the great moral issues involved in its use.

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SURGICAL APPLIANCES AND MINOR SURGERY. *By Thomas Annandale, F. R. C. S., Lecturer on Surgery, and Assistant-Surgeon to the Royal Infirmary, Edinburgh. Edinburgh: M'Lachlan & Stewart.*

SOME time ago, Mr. Annandale published a memoir on the Diseases of the Fingers and Toes, which belonged rather exclusively to the domain of scientific surgery, but the little volume before us at present is essentially a practical one. It is in fact a series of instructions as to how the common operations of surgery which may fall to the lot of any one to perform are to be gone about. It may be argued that it is hardly worth while to write a book showing how a stump is to be bandaged, or a catheter tied in, or chloroform administered, while, on the other hand, there are abundance of text-books which descant *ad libitum* upon the treatment of fractures and dislocations. But, in spite of all this, it is a melancholy fact that no sooner does a house-surgeon enter upon his duties, or a young practitioner put up his door-plate, than he begins to find that he has to do a hundred little things, the theory of doing which he is quite conscious of thoroughly understanding, but the actual mode of performance of which he is equally ignorant. By such, and by every medical student who is conscientiously anxious to learn the practical details of his profession, while he is also studying its theory,—and in Scotland the latter has a strong tendency to monopolize all his attention—Mr. Annandale's book will be found a literal *vade-mecum*.

The subjects treated of are so numerous that it is impossible