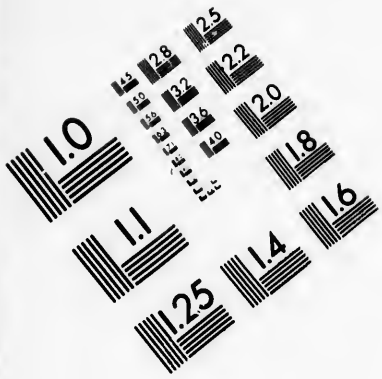

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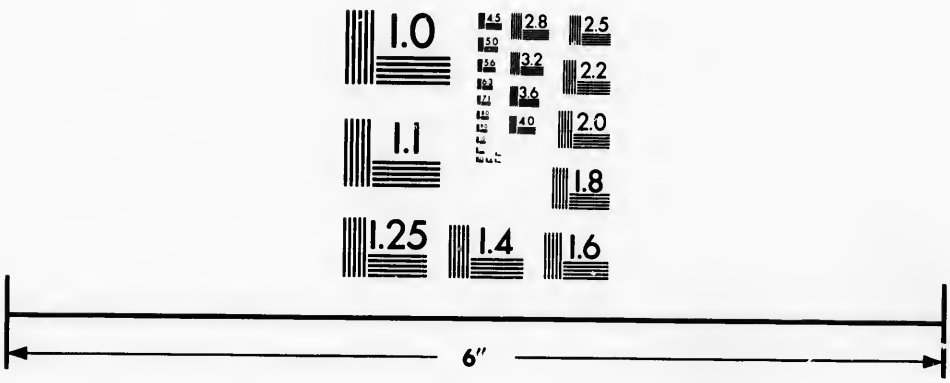

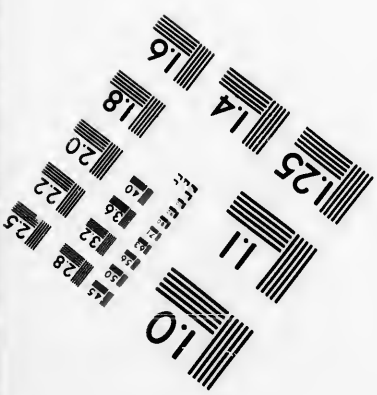

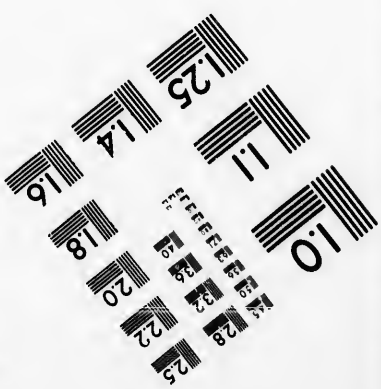

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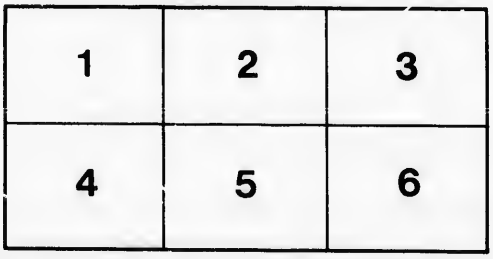

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IS ALCOHOL FOOD?

BY W. H. WITHROW, M.A.

An extraordinary popular delusion prevails among many otherwise sensible people, that wine, spirits, and especially malt liquors, are exceedingly nourishing to the system, and are, therefore, healthful and beneficial as articles of diet. In corroboration of this idea, its advocates point to the rosy and rubicund appearance and Falstaffian proportions of many wine, beer, or porter drinkers, and refer to the frequently meagre solid diet of those who use ardent spirits. These persons appear to assume that the true ideal of manly health and vigour is not the finely moulded, lithe and graceful Apollo, but the obese and drunken Silenus.

Like many popular fallacies, this theory of the nutritive character of alcoholic liquors will not bear the test of scientific investigation. The deposition of fat, which its advocates regard as a proof of nutrition and health, is actually a condition of physical degeneration and disease. "A general corpulence of the body," says Dr. Carpenter, of London University, "can be by no means admitted as an indication of healthy nutrition; indeed it must be regarded as very much the reverse." The abstemiousness from food of many spirit drinkers is at the expense of their bodily tissues, as their maciated appearance, their "lean and hungry look," fully testifies.

The fact is, pure alcohol contains not one particle of nutritive material for the human body, and even in malt liquor the amount is practically inappreciable, almost infinitesimal. "There is more food," says that eminent analytical chemist, Baron Von Liebig, in one bushel of barley than in twelve thousand gallons of malt, liquor." Or, to put it otherwise, according to the same authority

if a man consume daily eight or ten quarts of the best Bavarian beer, he will obtain from it, in the course of twelve months, no more nutriment than is contained in a five pound loaf of bread.

Professor Moleschott, in his "Theory of Food" asserts that "spirits, in their proportionate amount of nutritious matter, do not even bear comparison with sugared water. Alcohol, their essential element, and the most important substance in wine or beer, is not transformed into any blood constituent. It does not, therefore, deserve the name of an alimentary principle." The designation, therefore, of Licensed *Victuallers*, assumed by the vendors of spirits, is as flagrant a misnomer as can be conceived.

The reason for the above stated facts is obvious from the nature of the process of fermentation, which destroys the albuminous, or flesh-forming principle in the grain, or other substance subjected to its action. "Fermentation," says Liebig, "is nothing else but the putrefaction of a substance containing no nitrogen. . . It begins with a *chemical* action, which is opposed to a *vital* one. . . . Life is opposed to putrefaction. . . . Fermentation and putrefaction are stages of the return [of organic matter] to less complex formations." Hence alcohol can be formed from the most loathsome and putrescent substances, even from carrion flesh. In the latter case, however, the presence of nitrogen gives an intolerable odour to the product. A scheme has actually been projected for the manufacture of alcohol from the sewage of the city of Chicago.

Animal life is maintained, almost exclusively, upon organic matter stored up in vegetable formations or in other animals. But alcohol, says Liebig, cannot be evolved from vegetable matter till after vinous fermentation sets in, which, he asserts, is its death or decomposition, and the process of disintegration to the inorganic elements.

Alcohol is not food in any sense, moreover, because it is not assimilable into any of the tissues of the body, into nerve, brain, muscle, or bone. "It passes out of the body," says Dr. Story, "just as it goes in, unchanged, undigested alcohol." Dr. J. K. Chambers, physician to H. R. H. the Prince of Wales, asserts the same thing. "It is clear," he says, "that we must cease to regard alcohol as in any sense an aliment, inasmuch as it goes out [of the body] as

it went in, and does not, so far as we know, leave any of its substances behind it." Dr. Markham, editor of the *British Medical Journal*, states that alcohol "is, to all intents, a foreign agent, which the body gets rid of as soon as it can; . . . and none of it, so far as we know, is assimilated, or serves for the purpose of nutrition. It is, therefore, not a food in the eye of science." Dr. Rush aserts, "There is neither strength nor nourishment in spirituous liquors; if they produce vigour in the body, it is transient and is speedily followed by fatigue." Dr. Beale, physician to King's College Hospital, says, "Alcohol does not act as food; it does not nourish tissues." Dr. Mussey says, "It is not capable of being converted into food, and of becoming part of the living organs." The great French work, "On the *role* of alcohol in the organism," by Professors Lallemand, Perrin and Duroy, shows a "strong demarkation between alcohol and food." It demonstrates that it "comes out of the body in totality, through breath, skin and kidneys; and that no derivatives of alcohol are to be found in the blood and secretions." Professor Miller, of Edinburgh, inquires, "Can alcohol nourish or repair the waste of tissue?" "Not at all," he replies. "It contains no sufficient chemical constitution for that end; andbesides it is conveyed *unchanged* (*i. e.* undigested) into the blood." I am aware that Dr. Hammond, of New York, and two or three other physicians, of some authority, maintain that a *small* proportion of alcohol is assimilated in the body; but the overwhelming balance of testimony is against this conclusion.

But some assert that if not food, alcohol is, at least, its equivalent, *force*, enabling men to do what otherwise they could not do. To this Professor Miller responds, "Alcohol is not force itself, but only the excitant of force; and its invariable effect is, while producing an increased expenditure of force for a time, to bring the supply of that force to an untimely close." He sums up thus: "It is not food in any sense appreciable to common sense. It cannot nourish or give strength; it can only stimulate. It cannot give working power; it can only hurry the expenditure of what you already have; and further, it hampers and opposes you in getting that store renewed. . . . The best authorities," he concludes "place alcohol, not in the *materia alimentaria*, but in the *materia medica;* ranking it not as a nutritious but as a narcotic article

and consequently a poison." Liebig asserts that "beer, wine, spirits, &c., furnish no element *capable* of entering into the composition of blood, muscular fibre, or any part which is the seat of vital principle. . . . Their use" he says, "is attended by an inward loss of power. . . . Spirits by their action on the nerves of the drinker make up power *at the expense of his body;* he draws a bill on his health which must always be renewed; . . . *he consumes his capital instead of his interest,* and the result is the inevitable bankruptcy of his body." Like the spur in the side of the flagging steed, alcohol impels to increased effort at the time, but at the cost of the more terrible reaction afterward.

That alcohol is not assimilable with the human system is corroborated by the fact that it is found unchanged, in considerable quantities in the brain of habitual drunkards, and may be detected in the blood, bile, and other secretions. Drs. Kirk, Hare, Cook, Ogden, Percy and others bear testimony to this fact. The fluid burned readily, with the characteristic blue, lambent flame of alcohol. Dr. Percy actually distilled from the brain of a drunkard alcohol which dissolved camphor and burned freely.

The same unassimilated substance is strongly perceived in the breath of the confirmed inebriate. Indeed a very large portion of the imbibed alcohol passes off in this way. Dr. Rudolf Massing, of Germany, has recently prepared a new test for alcohol, which conspicuously shows its presence in the breath of the drunkard. A red solution of sulphuric acid and bichromate of potash in a test tube is changed to an emerald green by a very small quantity of alcohol. The breath of a sober man will produce no effect on this solution; that of a drunkard will turn it instantly green.

"Cases have occurred," says Dr. Sewell, "in which the breath of a drunkard has been so highly charged with alcohol as to render it actually inflammable at the touch of a taper." Over fifty such cases are recorded in the medical journals, in which the bodies of habitual drunkards were thus consumed. They become so saturated with alcoholic spirit as to become living volcanoes, which, when by accident ignited, burn with inextinguishable flame, leaving only a loathsome residuum of greasy and fetid soot. Dickens describes the horrible death of Krook, in "Bleak House,"

as occurring in this way. The Reviewers strongly questioned the possibility of the occurrence, but the novelist cited irrefragable medical testimony in its support. It is also recognized in the statistical nosology of the General Registrar's office under the name of *Catacausis Ebriosa*, and though rare, its possibility cannot be questioned.

These multiplied evidences all demonstrate that alcohol always acts as a foreign and unassimilable substance in the human body; that it passes out by the various excretory organs undigested and unchanged; and that, wherever it lodges, it still retains its spirituous, acrid, and irritating character. It cannot therefore be food for the body, nor supply the waste of any of its tissues.

But we are frequently told that, if not actually food, alcoholic liquors assist greatly in the digestion of food, and thus, like salt, are a valuable adjunct to other articles, and enable us to derive greater benefit from them. Now this comparison is the most unfortunate that could possibly be made. "For," says Dr. Carpenter, "salt is not a mere casual adjunct to our necessary food, but is itself an indispensable ingredient in our diet. It is contained in large proportion in the blood, and in every fluid secreted from it, and enters into the composition of most of the tissues. . . . Now, all that salt *is*," he continues, "alcohol *is not*. It is not one of the proper components of the blood or of the tissues, and its presence in the circulation is entirely abnormal."

The remarkable effect of alcohol on animal tissue out of the body, in hardening and toughening its fibre, would suggest the *a priori* probability, that it would retard rather than aid digestion. It is found to produce the same effects in the stomach, both on the coats of that organ and on whatever it may contain. This has been demonstrated by actual experiment. Dr. Figg, of Edinburgh, gave the same quantity of meat to two dogs. He then forced an ounce and a half of spirit down the throat of one of the dogs. In three hours he killed them both. In the stomach of the dog that drank the spirit the meat was found just as he ate it —undigested. The other dog's stomach was empty,—the meat having been all properly digested. Spirituous liquors have been known to protract the digestion of food in the human stomach as long as eight and forty hours.

Alcohol prevents digestion also in another way. That process is effected by the action of the salivary, gastric and pancreatic fluids on the food. The peculiar principle, however, on which digestion depends is *pepsin*, a powerful solvent of organic matter. Now the gastric juice will not digest alcohol, but is itself neutralized thereby. Alcohol is one of the most powerful solvents known, being strong enough to dissolve sulphur, iodine, ammonia, potash, camphor, resin, and all the organic vegetable alkalies. When taken into the stomach it instantly changes the pepsin from its soluble and active form to a solid, inert precipitate, which has no effect whatever on the food in the stomach. Alcohol is thus a prompt and powerful antagonist to the digestive process. "It also," says Orfilla, "coagulates the albuminous portion of the contents of the stomach, and this coagulated albumen passes out of the stomach almost unchanged."

To these facts Professors Miller, and Youmans, and Drs. Thompson, Gregory, Figg, Sewell, Story and others bear testimony. Dr. Munroe, of Hull Medical School, strikingly illustrated this remarkable effect of alcohol by an ingenious and interesting experiment. He mixed some bread and meat in two vials with some gastric juice, but to one he added a little pale ale. He set both vials in a box of warm sand, which he kept about the temperature of a healthy stomach, occasionally shaking the box to imitate the motion of the stomach. In the vial without the ale the food was digested in from six to eight hours. In the vial with the ale it would not dissolve at all, though kept warm for several days.

The continual neutralizing of the gastric juice—the true digestive fluid—by the use of alcohol, overtaxes the glands by which it is supplied in the effort to secrete the quantity necessary for digestion, till chronic dyspepsia is produced. And who are so subject to that complaint, which saps the very foundations of life, as confirmed dram drinkers? This characteristic effect of alcoholic liquors is well described in the old convivial song of Bishop Stett, in the play of "Gammer Gurton's Needle,"—the earliest specimen of the British drama,—

"I cannot eat but little meat,
My stomach is not good;
But sure I think that I can drink
With him that wears a hood.

I love no roast, but a nut brown toast,
And a crab laid on the fire;
And little bread shall do me stead;
Much bread I nought desire."

We have seen that alcoholic liquors not only cannot aid, but that they actually prevent digestion, and that they injure the tone of the entire digestive apparatus. Neither do they increase the power of endurance of fatigue, as is often asserted, but rather diminish it, as is abundantly proved by the testimony of those who have had to perform the severest labour under circumstances of the greatest physical hardship.

Dr. Carpenter has examined this subject very thoroughly, and presents ample evidence of the fallacy of the popular notions upon it. He quotes, among many other examples, the circumstances of a vessel that sprang a leak at sea, and was kept afloat for twelve weeks by the unceasing efforts of the passengers and crew. At first they partook of spirits, but their strength failed so rapidly that, by the captain's orders, coffee and cocoa were substituted, "when," says the Dr., "their vigour returned; their fatigue diminished; and after twelve weeks' incessant and severe labour (with no interval longer than four hours), the ship was brought into port with all on board of her in as good condition as ever they were in their lives."* He also received the voluntary testimony of thirty-four men engaged in the most laborious operations, furnace and foundry-men, glass-blowers, etc., "that they were able to perform their toil with greater ease and satisfaction when abstaining from liquor than when they drank moderately of it." A teetotal glass-blower, publicly stated at a meeting at Exeter Hall, that he had "worked sixty hours at a stretch, without ever lying down, at his exhaustive labour, a feat which he had never been able to accomplish while using spirituous liquors." A member of a Glasgow fire brigade states that he sustained seventy-three hours' continued exertion at a fire, with no other beverage than coffee and ginger-beer, while his spirit-drinking comrades "were beat, and fell away." The superior efficacy of total abstinence in promoting bodily vigour was uniformly demonstrated in competitive trials between two sets

* Physiology of Temperance, p. 121.

of labourers engaged in very diverse but arduous toil,—mowers, harvesters, brick-makers, miners, iron-workers, railway-navvies and the like,—the one set practising total abstinence, whilst the other relied on the assistance of alcoholic liquors.* The same truth is corroborated by the noble physique and athletic power of the boatmen, porters, and water-carriers of Constantinople, said to be strongest and finest set of men in Europe. The Mohammedan populations of the East, generally, who are all abstainers on religious principle from wine or fermented liquor, are characterized by their fine development and muscular energy. In competitions of strength between the most athletic grenadiers of the British service, and the water drinkers of the Himalayas, the latter were uniformly victorious, their average strength, according to J. S. Buckingham, the oriental traveller, being one and three-quarter times that of the strongest Europeans. The extraordinary endurance of fatigue of the New Zealand Maories, the Cape Caffers, the North American Indians, and of the Guachos of the South American pampas, who all drink water exclusively, prove, at least, the entire compatibility of total abstinence with perfect physical health and vigour.

Military experience also proves that the prolonged and often severe hardships of a soldier's life are better endured without liquor than with it. During Sir John Moore's retreat from Corunna, notwithstanding the depressing circumstances under which this march was performed, the army was found to *improve* in health and vigour, as soon as the usual allowance of spirits was unattainable. The Duke of Wellington, during the Peninsular War, feared more for his men from barrels of wine than from batteries of cannon, and sent a body of troops to destroy a large magazine of wine which lay on his line of march.

Probably no troops ever performed more laborious work than those that in 1870 proceeded by the Dawson Road to Red River merous and often steep portages. Yet all this fatigue was sucdragging their heavy boats, stores, and war-material over nucessfully undergone with the absolute prohibition of intoxicating liquors and the substitution therefor of tea *ad libitum*.

"Since it has been proved," says the gallant Havelock, referring

* Carpenter, Physiology of Temperance, pp. 121, 122.

to the capture of Ghuznee, "that troops can make forced marches of forty miles, and storm a fortress in seventy-five minutes, without the aid of rum, behaving after success with a forbearance and humanity unparalleled in history—not the slightest insult being offered to one of the females found in the Zenana—let it not henceforth be argued that distilled spirits are an indispensable portion of a soldier's ration."

Copious evidence of this nature, both from the naval and military service, was given before the Parliamentary Committee for the Suppression of Intemperance. The superiority of Cromwell's grave and temperate Ironsides over the drunken and roystering cavaliers is corroborative of the proposition here maintained.

We may learn, even from the prize ring, that the highest degree of bodily vigour is inconsistent with even a moderate indulgence in alcoholic liquors, This was also the experience of the ancient athletes of the Isthmian games.

> "Qui studet optatam cursu contingere metam,
> Multa tulit, fecitque puer: sudavit et alsit;
> Abstinuit venere, et vino."

Homer also makes Hector reject the entreaty of "royal Hecuba":—

> "Stay till I bring the cup with Bacchus crowned,
> Then with a plenteous draught refresh thy soul,
> Spent as thou art with long laborious fight."
> "Far hence be Bacchus' gifts," the chief rejoined,
> "Inflaming wine, pernicious to mankind,
> Unnerves the limbs, and dulls the noble mind."

Milton thus represents the wisdom of abstinence from wine in the drama of "Samson Agonistes."

> "*Chorus.*—Desire of wine and all delicious drinks,
> Which many a famous warrior overturns,
> Thou couldst repress. . . .
> *Samson.*—I drank from the clear, milky juice, allaying
> Thirst, and refreshed; nor envied them the grape
> Whose heads that turbulent liquor filled with fumes.
> *Chorus.*—O madness, to think use of strongest wines
> And strongest drinks our chief support in health,
> When God, with these forbidden, made choice to rear
> His mighty champion, strong above compare,
> Whose drink was only from the liquid brook."

There has long been a prevalent idea among the professional classes, that a "moderate" use of fermented or spirituous liquors conduces to intellectual vigour, and enables them better to endure the mental strain they have to undergo. But this opinion, too, disappears before the crucial test of actual experience. Those who indulge in wine or spirit drinking mistake the transient stimulation of the faculties for an increase of mental power, not considering that the subsequent reaction and depression are all the greater for the previous excitement. When men have sought the aid of these delusive supports, it has often failed them utterly after a short time. Hartley Coleridge, Mozart, Burns, Byron, E. A. Poe, and many other gifted sons of genius, who had recourse to alcoholic stimulus for the excitement of their powers, all died at an early age, "as if," says Dr. Carpenter, "in consequence of the premature exhaustion of their nervous energy."

S. C. Hall, the well-known author, and editor of the *Art-Journal*, gave his testimony as follows: "He lived by the labour of his brain, and could testify that since he became a teetotaler, he had an increase of intellectual power. He was better in body and mind, and was able to work three times longer than ever he could while he indulged, even moderately, in the use of strong drinks."

Few men have performed greater public labours than the late Mr. Cobden. He says: "No one has more faith than I have in the truth of the teetotal doctrine, both in a physical and moral point of view. I have acted upon the principle that fermented or distilled drinks are useless for sustaining our strength, for the more work I have had to do, the more I have resorted to the pump and the teapot. . . . . From what I have seen of the House," he continues, "I must say that I have the belief that the men who are the most temperate are the men who bear the fatigue of the House best." The late Col. Thompson and Mr. Bright, those indefatigable workers in the public service, were both practical teetotalers. John Howard, the illustrious philanthropist, notwithstanding his constitutional weakness, seemed to bear a charmed life amid plague and pestilence, and the extraordinary fatigues of his extensive travels, the result, doubtless, of his abstemious diet. Some dried biscuit and a cup of milk or

cold water was his usual fare. Locke, also, attributed his prolonged life and labours to his entire abstinence from alcoholic liquors. The testimony of great numbers of the clergy, physicians and lawyers, lecturers, and other public speakers, who once thought that alcoholic stimulants were necessary for the sustenance and repair of their physical and mental powers, but discovered that total abstinence was much more conducive to that object, might also be cited.

Another purpose to be served by food is that of sustaining the temperature of the body. Many articles of diet, which do not contain much actual nutriment, are valuable for maintaining the vital heat. Spirituous liquors, it is asserted, are especially adapted for that purpose. The immediate sense of warmth which is felt on their imbibition, favours the popular apprehension; and the large amount of carbon in their chemical composition—about fifty-two per cent. in pure alcohol—gives a sort of *quasi* probability to the presumption. That presumption, however, is fallacious. The true and normal supporters of combustion—which is really the process which takes place in the lungs, as well as in the capillaries—are the sugar, starch, and fatty substances of the food we eat. According to the estimate of Leibig, two hundred and sixty-six parts of spirits of the strength of ordinary brandy are required to generate the same amount of heat as a hundred parts of fat would produce; "so that weight for weight," says Prof. Carpenter, who has examined this subject exhaustively, "the heat-producing power of proof spirit, considered simply as a chemical agent, is actually less than starch or sugar;" * compared with fat, it is only as one to two and a half.

Moreover, when alcohol is in the blood it prevents the combustion of the proper fuel for maintaining the animal heat. The effete material is not removed from the blood, as by the process of respiration when uninterrupted by the presence of alcohol it always is, and these impurities are retained in the system to the great injury of the whole vital economy. After the first transient effect in quickening the circulation has ceased, the general temperature of the body is lowered, so that for the very purpose for which alcohol is so highly recommended, it is an actual injury

* Physiolgy of Temperance, p. 136.

instead of a benefit. Ammonia and camphor possess similar stimulating powers, yet no one thinks them appropriate articles of diet on that account; and there is no more reason why alcohol should be so considered. The experiments of Dr. Prout on this subject show, "that alcohol enormously depresses the combustion of carbon in the system during its existence in the body," and therefore lessens the amount of animal heat generated. "The supposition," says Dr. Lees, "that alcohol is necessary in cold climates is erroneous, and contrary alike to common experience and scientific experiment."

The result of wide and varied experience fully confirms these conclusions, based on scientific data. The unvarying testimony of arctic explorers, whale-fishers, fur-traders and trappers, and of the inhabitants of high northern latitudes, of Alpine guides and others exposed to extreme and long-continued cold, demonstrates not only the inutility, but the absolute injuriousness of alcohol as a generator of animal heat, and the vast superiority of an oleaginous diet for that purpose.

Sir J. Richardson mentions as a proof of his power of resisting cold, which he attributed to his entire abstinence from spirits, that, though advanced in years, he was enabled to go into the open air at a temperature of 50° below zero without an overcoat.

Sir John Ross says of his northern expedition: "I was twenty years older than any of the officers or crew, and thirty years older than all excepting three, yet I could stand the cold and endure fatigue better than any of them, who all made use of tobacco and spirits." "He who will make the corresponding experiments," says the same commander, "on two equal boats' crews, rowing in a heavy sea, will soon be convinced that the water-drinkers will far outdo the others." The free use of ardent spirits is one of the chief causes of the failure of so many Arctic expeditions, and when the men drank nothing but water, they endured the rigour of the climate with impunity. A Danish crew of sixty men were winter-bound in Hudson's Bay. Before spring, fifty-eight of them died. An English crew, under the same circumstances, lost only two men. The former had an ample supply of ardent spirits; the latter had none.

An old Orkney whaler narrated to the present writer a tragical illustration of the depressing effect of alcoholic liquors on the bodily powers. The crews of two ice-locked vessels were forced to abandon their ships, and to travel many miles on the ice in order to take refuge in that to which he belonged. The one had only their usual rations of fat pork and biscuit. The other had, in addition, a supply of brandy. The whole of the first crew arrived safely. The whole of the second perished from cold and exposure.

The Hudson's Bay Company for many years have excluded spirits from the north-west fur country, and the hardy Canadian *voyageurs*, or *coureurs de bois* in these desolate wilds, as well as the Indians and half-breeds, will endure the intensest cold on their generous rations of pemmican, and the bears' meat or beavers' tails they may obtain on the route.

In a despatch of the late Lord Elgin, then Governor-General of Canada, to the Colonial Secretary, he says: "It is a most interesting fact, both in a moral and hygienic view, that for some years past intoxicating liquors have been rigorously excluded from almost all the shanties of the lumber-men; and that notwithstanding the exposure of the men to cold in the winter, and to wet in the spring, the result of the experiment has been entirely satisfactory."

The setting in of a Canadian winter, or any "cold snap" of unusual severity, is generally attended with several instances of death from exposure of poor wretches enfeebled and almost devitalized by habits of inebriation.

Baron Larrey, the great French surgeon, says that "during Napoleon's retreat from Moscow, those soldiers who indulged in the use of intoxicating liquors sank under the effects of cold almost in battalions; but their fate was not shared by those of their comrades who abstained from those liquors." Marshal Grouchy says that "he was kept alive for days on coffee, while others, who took spirits, slept never more to rise." At the present time the Russian soldiers, on a winter march, have rations of *oil* served out instead of spirits, experience having shown its superiority as a generator of heat. The Esquimaux, who live largely on blubber, are able to endure with impunity the intensest cold.

Dr. Hooker, a medical officer under Sir J. Ross, says: "Ardent spirit never did me an atom of good. It does harm; the extremities are not warmed by it . . . you are colder and more fatigued a quarter or half an hour after it, than you would have been without it."

Such testimonies might be multiplied indefinitely, but sufficient evidence has been adduced to show that "for enabling the body to resist the continued influence of severe cold, alcoholic liquors are far inferior in potency to solid food, especially of the oleaginous kind;"* and that after the temporary stimulation of the circulation that they produce has subsided, "the cold is felt with augmented severity, and its action on the system is proportionately injurious."

It is also maintained that among the many fancied virtues of alcohol, is that of enabling the system to endure the effects of intense and long-continued heat, whether climatic or artificial. Indeed, it seems in the opinion of its admirers to be a universal panacea, adapted to the most contrary circumstances and productive of the most contrary effects. It enables one to endure the rigours of cold, it diminishes the effects of heat. It is a wholesome corrective of too dry an atmosphere. It is an antidote to the ill effects of wet. It is necessary to ward off the effects of malaria on the Gold Coast. It is also necessary in the breezy sanatoria in the hill country of India. It is required by those who are in health to keep them so, and by those who are ill for their recovery. It is prescribed for fevers and for colds, in cases of exhaustion and of surfeit alike. It is part of the outfit of the whaler in Baffin's Bay and of the ivory-trader in Timbuctoo. Their spirit rations are served out to the British sailors when sweltering between decks off the Slave Coast, as well as when rounding Cape Horn; and to the British soldiers at Aden—the hottest place on earth—as well as in midwinter to the garrisons at Vancouver's Island or Quebec; and it is thought equally necessary for them all. But neither the Esquimaux in the snow huts of Nova Zembla, nor the naked negroes of Senegal use these wondrous beverages, yet are superior in health and vigour to the Europeans who enjoy its fictitious aid. The first maintains his

* Carpenter's Physiology of Temperance, p. 144.

temperature on an appropriate diet of whale's blubber, the second keeps cool on melons and rice; but the Englishman, with a sublime indifference to circumstances, continues to imbibe his brandy, London stout, and Barclay's XXX, in every variety of climate, till he often falls a victim to his defiance of the laws of health and common sense. It is said that a favourite beverage in Jamaica is rum, flavoured with cayenne pepper! We find, as a consequence, that the planters die in scores from sunstroke. About as suitable to the climate, this, as that described by a Yankee in reply to the Cockney inquiry—"Do they drink hale in your country?" "Drink hail!" said Jonathan, unaccustomed to the aspirate, but not to be outdone by an Englishman, "We drink thunder and lightning!"

A vast and varied experience has shown that instead of being beneficial in any or all of those diverse circumstances, alcoholic liquors are always and everywhere injurious. But they are especially injurious to those living or labouring in elevated temperatures. It has been thought absolutely necessary, when the body is pouring out water in perspiration, to pour in alcohol in order to keep up the supply. But this, really, is adding fuel to the flames; and is increasing the amount of injurious material in the blood, which the system is trying to get rid of through the pores. Thus the blood is poisoned, the nervous and muscular energy is enfeebled, the appetite is impaired, and a state of physical collapse is induced.

Dr. Carpenter has accumulated a vast body of proof of the insufficiency of alcoholic liquors to sustain bodily vigour under the endurance of extreme and continued heat, or of great vicissitudes of temperature. The experience of men in performing excessive labour in an elevated temperature—steamship stokers, anchor forgers, glass-blowers, and others similarly engaged—confirms this theoretic opinion.

The testimony of oriental and tropical travellers and explorers, of missionaries, of military and naval commanders, all conspire in proof of the proposition that these liquors do not sustain either the mental or the physical powers under extremes or striking vicissitudes of temperature.

Sir John Ross, to whose Arctic experiences we have referred

says of exposure to heat: "On my last voyage to Honduras all the sailors, twelve in number, died, and I was the only person that went out in the ship who came home alive, which I attribute entirely to my abstaining from the use of spirituous liquors."

"Rum," says Dr. Bell, speaking of its use in the West Indies, "always diminishes the strength of the body, and renders man more susceptible to disease, and unfit for any service in which vigour or activity is required. As well might we throw oil into a burning house to extinguish the flames, as pour ardent spirits into the stomach, to lessen the effect of a hot sun upon the skin."

"I have served," says the veteran Governor of Gambia, "in all the West India colonies, and in Africa, and I never knew a dram-drinker long-lived, healthy, or always equal to the duties he was called upon to perform."

"Wherever," says an eminent medical authority, "in conconformity with their absurd national customs, European residents in tropical countries continue to indulge in their usual alcoholic beverages, they speedily fall victims to the climate or become invalided." Small wonder that the Indian nabobs, who persist in using curry powder and brandy and water, return to England, if they return at all, as yellow as their own guineas, and with a temper as irascible as that of Nana Sahib himself.

We have thus seen that neither as food proper, for furnishing nourishment to the animal tissue, nor as an aid to digestion, nor as fuel for sustaining vital heat, do alcoholic liquors possess the qualities popularly attributed to them. We have seen that they do not aid in the least degree in the formation of bone, muscle, blood, brain, nerve, nor any tissue or substance of the human body, but are an absolute injury to all its parts; and that they neutralize and destroy the digestive fluids, and thus instead of aiding, actually hinder and prevent digestion. We have also seen, that so far from increasing the power of resisting extreme cold or heat, they depress the bodily powers, and render them less capable of such resistance.

Toronto: Published at the Methodist Book Room, 80 King Street East.