The physiological question : The medical discussion held at Framlingham, Suffolk, March 29th, 1843, between Dr. Frederic Richard Lees and William Jeaffreson, Esq., surgeon, (the challenger) on the nature and uses of alcohol.

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MEDICAL DISCUSSION,

HELD AT

FRAMLINGHAM, SUFFOLK,

MARCH 29th, 1843, BETWEEN

DR. FREDERIC RICHARD LEES,

AND

WILLIAM JEAFFRESON, ESQ.,

SURGEON, (THE CHALLENGER,)

ON THE NATURE AND USES OF ALCOHOL.

"Go not forth hastily to strive, lest thou know not what to do in the end thereof, when thy neighbour hath put thee to shame." Prov. xxv. 8.

London:
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MCCCXLIII.

MEDICAL DISCUSSION.

The Discussion originated in a conversation between Mr. Wm. Jeaffreson, Surgeon, and Mr. Samuel Fruer, Architect, (the Treasurer of the Framlingham Temperance Society, to whose manly and disinterested support, amidst great obloquy and persecution, the cause stands greatly indebted.) Mr. Jeaffreson observed, that "Teetotalism had assumed such a daring, that *he*, as a medical man, could not put up with it, without rebuke"; and presented his respects to R. D. Alexander, Esq., of Ipswich, as President of the Suffolk Temperance Society, saying, "that he would feel most happy, the first fitting opportunity, publicly to meet any of the Temperance Agents or others, to discuss the Temperance Question; or, rather, to inquire whether the Temperance Lecturers are sufficiently acquainted with the medical or physiological effects of alcohol upon the human system, or know anything of the laws, or basis, upon which nutrition is carried on. If teetotalers could remove the moral evil of drunkenness, they did well, but the physiological department they *cannot know* anything about—that must be left entirely to the medical profession to decide!"

The challenge was readily accepted by Mr. Fruer; and Charles Mingaye Syder, M. D., of London, and Frederic R. Lees, Ph. D., of Leeds, were invited to take up the gauntlet thus thrown down. The latter gentleman having accepted the invitation, preparations were made for the discussion; which excited great interest in the town and neighborhood. The Town Hall was taken for the purpose, by the Teetotalers, and bills were issued, announcing that on Wednesday, the 29th March, 1843, Dr. Lees would open the discussion by a Physiological Lecture, explaining the physical effects of *alcohol* upon the human system, illustrated by large Drawings of the stomach, in health and under alcoholic

disease; "*to which lecture*, Wm. Jeaffreson, Esq., Surgeon, of Framlingham, *has proposed to reply.*"

In Framlingham, as elsewhere, the Temperance Society has done much in reclaiming the drunkard, and in imposing a salutary check upon the drinking habits of the community. Nevertheless, though the wretched have been reclaimed and the backslider restored,—though the drunkard has become devout, and the swearer has learned the songs of Zion,—Preachers and Professors of religion have united with Spirit Merchants, Brewers, Publicans, and the most depraved and ignorant of the community, in bitterly opposing the temperance cause, and cruelly persecuting its friends and advocates. Many instances of such unholy sympathy and fellowship between the workers of darkness and the professors of religion, were witnessed in reference to this discussion.—The spirit animating a portion of the populace may be judged of from the following amusing circumstance. The Town Hall stands within the great court, and surrounded by the walls of the ruined Castle of Framlingham. The admittance to the yard is through an old door and ancient archway, the path to which is by a narrow lane. At the bottom of the lane is a Brewery, from a tree near which a rope was extended, and fastened to another tree on the opposite side. The rope sustained two bottles, between which was suspended a white piece of canvass, bearing this inscription—

"No Lees for us.
Rush to the Hall!
Jeaffreson Esq. for ever!"

At half-past 6 o'clock, Dr. Lees, accompanied by Mr. Fruer and other friends, on their way to the Hall, stopped to peruse this flag, while a rabble of Suffolk rustics, brewers and publicans' men, and other equally respectable characters, gathered round, howling and braying *most naturally*, if not musically. Dr. Lees laughingly suggested that it should be "No Lees for *us* Brewers—Jeaffreson Esq. for ever, *for us*"—Which greatly excited the wrath of the mob.

Mr. Smith, of Woodbridge, was moved to the chair. Dr. Lees and Mr. Jeaffreson were on the platform, the former on the left, the latter on the right of the chairman. The audience consisted of about 700 persons, admitted by tickets; reserved seats 1s., back seats 6d., gallery 3d. About 7 o'clock the chairman called upon Dr. Lees to open the business of the meeting.

Dr. F. R. LEES then addressed the meeting for upwards of an hour and a half. The following is a correct abridgment of his address.

"I wish to present to you a plain, yet brief, outline of the kind of evidence, not social or moral, but *physical* evidence, which sustains the fundamental principle of the Temperance Society. That principle, the physiological truth of which I assert, and am prepared to maintain, is embodied in the declaration—"I agree to abstain entirely from all *intoxicating beverages*,"—or "I promise to abstain from all intoxicating liquors, except for *medical purposes*, or in a religious ordinance." But what are the physical reasons for this rule? and upon what evidence is it proved to be in accordance with man's normal condition?—The reason why we abstain is simply this, *that alcohol*—the intoxicating principle of those beverages—*is a poison;* and, consequently, that its constant or occasional use, by men in ordinary health, is an injurious and intemperate use. Temperance, we contend, is the moderate use of good things only; by which we mean things fit as articles of diet or drink; but *total abstinence* from bad things, or those which are unfit. Now, if alcohol be a poison, it is, for such use, a *bad* thing; and modify or disguise it as you may, it can never possess the slightest adaptiveness to the healthy functions and natural wants of man's physical structure. If it be a poison,—so called from the unnatural effects it produces,—its moderate use, by men in health, can never be its *proper* or temperate use.

The *first* kind of evidence we have to present in proof of our position, is that supplied by EXPERIENCE. "Facts are stubborn things." Now, there never was a single principle of medicine—none upon which medical men constantly act and confidently rely—established by a tithe of that amount of evidence to which we appeal in proof of our fundamental position. If, in practice, a physician or surgeon adopts a certain treatment, or prescribes a certain medicine, for a given disease, and finds it successful in a dozen or score of instances, he unhesitatingly makes it a *rule* of practice. Or a physiological inquirer makes his sixty or more experiments, to ascertain the laws of some special function, or the properties of a certain fibre, and then the truth elicited takes its place unquestioned amongst the established principles of physiology. But what are the inductions to which the physiologist or

physician refers, compared with the "cloud of witnesses" to which we confidently point? Our induction of facts is not limited to scores, or hundreds, or even thousands; we now point triumphantly to our *millions* of living testimonies: to the disciples of our principle living in almost every region, from the tropical climates of Africa and India, to the snows of Canada and Nova Scotia. These are parties who have tried both sides of the question, and who are therefore in the best condition for arriving at a correct judgment—individuals of both sexes, and almost every age and rank, young and old, rich and poor; of every variety of constitution and temperament, engaged in the most varied occupations, and under the widest differences of circumstance,—yet what do they affirm? With singular uniformity—for in an extensive experience of seven years in this cause I have not met with two exceptions which would bear the slightest scrutiny—they affirm, that "they are *as well* in health, and can perform all the duties of life with as much vigor and comfort, without intoxicating drinks as with them,"—thus proving that these drinks are altogether *unnecessary;*—but the testimony of the great majority, perhaps of eighty out of every hundred, is still more emphatic and conclusive—they declare that "they are BETTER *without* these drinks than with them"; and if better without than *with*, then are they WORSE *with* than *without!* Common experience, therefore, has demonstrated that these drinks are pernicious—that is, that they injure or poison the human frame.

We are sometimes told, that authority—MEDICAL AUTHORITY—is against us. For my own part I care little for authority, since one fact is worth a thousand authoritative theories, destitute of fact as their foundation. But what authority is against us? That of the provincial practitioner, the village doctor, or the parish apothecary? If you *will* have authority, even to the neglect of facts and arguments, then to authority even we will fearlessly appeal. If you require authority in matters of religious doctrine, to what source, as Protestants, do you refer? Not to the word of man, but to the word of God. Why? Because that is the *best authority;* and it would be foolish and criminal to accept the less when the greater authority was attainable. It would be equally irrational to do so in reference to the question before us—one involving a great principle of health and

happiness.—Let us then appeal in this matter to the *best* authority to be obtained.

Has ever any medical man of eminence—one accepted as authority by the profession itself—disputed the fact, *that alcohol is a poison?*—and a substance, therefore, no more fitted to be introduced as an article of beverage or diet than opium, henbane, fox-glove, tobacco, or prussic acid. That the older authorities are entirely in our favor is shown from the fact, that I have recently published in "THE STANDARD TEMPERANCE LIBRARY," the Essays and opinions of the most eminent physicians of the seventeenth and eighteenth centuries, including those of Drs. Smith, Cheyne, James, Darwin, Beddoes, Trotter and Garnett, which present an invulnerable body of evidence in our support. Dr. Darwin (1794), who was one of the most eminent physicians and philosophers of his day, in his *Zoonomia*, classes "*alcohol*, wine, beer, cyder," along with "opium, laurel, tobacco, deadly nightshade, henbane, cocculus, hemlock, nux vomica," and other narcotic-acrid-poisons. I know of no *Materia Medica*, nor work on Toxicology, in which alcohol is not placed in the dark catalogue of narcotic poisons. Dr. Beddoes, in his *Hygeia*, published 1802, distinctly says—"The *greatest authorities* are against wine; there are *none worth regard on the opposite side.*"

I hold in my hand a document which characterises the notion that "the habitual use of some portion of alcoholic drink, as of wine, beer, or spirit, is beneficial to health," as "an opinion handed down from rude and ignorant times," aud which states that "anatomy, physiology, and the experience of all ages and countries, must satisfy *every one well informed in medical science*, that the above opinion is *altogether erroneous.*" Who has signed this document? Not men unknown to fame—not mere provincial luminaries—but Sir B. C. Brodie, Bart., Sergeant-Surgeon to the Queen, Sir James Clarke, Bart., Physician to the Queen, the late Dr. Hope, and seventy-seven others, the most eminent of the faculty in the Metropolis, and the teachers and professors in the hospitals, colleges, and universities. They tell you, that the man who disputes our main principle, does so because he is not duly acquainted with "anatomy, physiology, and the experience of all ages and countries," which "must satisfy every one *well informed in medical science*," that we are

perfectly correct. In short, gentlemen, they plainly hint that such a one is a mere *quack*—who comes down into the provinces to practice his ignorance upon those who are still more ignorant. In this matter of authority, *we* appeal, not to the apprentice but to the master, not to the pupil but to the teacher; and, as Dr. Beddoes observes, we find that "the greatest authorities are against wine; there are none *worth regard* on the opposite side." To prefer then, the authority of your local lights, to that of the brightest stars in the firmament of science—to neglect the authority of the splendid luminaries to which I refer, for the mere farthing-candles of the profession—would be as absurd as to walk by the light of gas in preference to the full blaze of the noon-day sun! They only who "*love* darkness rather than light," would so act.

How is alcohol described by medical writers? Dr. R. James, in his *Pharmacopœia Universalis* (1747), thus describes *vinous spirit*. "All the humours of the human body, that we are acquainted with, it *coagulates* in an instant, except pure water, whilst it *hardens* all the solid parts.—The extremities of the nerves, where it can reach, it instantly dries, *contracts and deprives of all sense* and motion. It is true, indeed, it takes from the nerves all sense of pain, but then, at the same time, it *destroys all their use*." "It is certain that *fermented liquors* are deleterious in proportion to their strength." "It *coagulates* all the fluids it finds in the stomach, which are designed by nature to promote the *solution* of the aliment. Now when these are coagulated and rendered viscid, they are *utterly unfit* to promote the above-mentioned solution, but rather *prevent* it." "It hardens animal and vegetable substances, and hinders their solution *in* the stomach, for the very same reasons that it prevents their putrefaction *out* of it. It would be well if spirituous liquors had any virtues to make amends for the havoc and destruction they make in the world."

Wine is fast losing its reputation, even as a medicine. It was formerly considered a tonic. Some months before his death, Sir Astley Cooper correctly said—"We have *all* been mistaken—we have called these drinks *stomachics* and *tonics*, when we should have called them *stimulants*." There is a great difference between the two, which Dr. Billing well states in his *Principles of Medicine*, p. 95. "Tonics *give*

strength, stimulants *call it forth.*" "Stimulants *excite* action, but action is not strength."

But even "stimulant" is too favorable a term to apply to alcohol; which is an inflammatory *irritant*—a kind of *liquid blister*. I was glad to see this correcter definition in the lately published *Dispensatory* of Professor Christison, M. D. of Edinburgh, a high authority. "Alcohol," says he, "is in its action a *local irritant* and *astringent*, and secondarily a *sedative*." p. 75. In plain English, alcohol first *blisters*, second *tans*, and lastly *induces sleep*, partly by exhausting the nervous energy, and partly by paralysing the nerves themselves. What madness to introduce such an agent into the system of a healthy man!

Another kind of evidence to which we appeal in support of our principle, is that of DIRECT EXPERIMENT. How is a poison to be known? Of course by its effects. Whatever, by its peculiar chemical nature or physiological relation, disorders the healthy functions of the vital organs, or impairs their normal structure, is a *poison*. This is a term applied to the *quality* of an agent, not to its quantity. The *quantity* may bear a relation to the *degree* of injury, though the same quantity differs as to its degree of effect upon different persons, but the *kind* of effect is still the same. The *miasms*, or vegetable poisons, floating in the air of the Lincolnshire fens, may not be so great in quantity, nor so fatal, as the *malaria* of the Pontine marshes, but this is a difference of degree only—of more or less—not a transition from bad to good. Prussic acid in one form and dose will instantly extinguish life; while in another it is daily administered as a *medicine*. Does the poison cease to be a poison in this last case? No, for it is precisely *because* of its poisonous action that it is useful as a medicine. So alcohol must, in all cases, be known by its effects, not of degree but of *kind*.

I challenge the production of any acknowleged vegetable poison whatever, which produces effects more really poisonous than those which follow the administration of alcohol. If opium or henbane is a poison, so is alcohol; if alcohol is not a poison, neither are opium and henbane. Let us take a case, upon which common sense can pass its verdict.—The work in my hand is a purely medical one, detailing certain "Experiments illustrative of the *Physiological action* of" a certain "narcotico-acrid poison" on man and the lower animals.

The eighteenth experiment will serve to show you how a poison is distinguished—viz. by the poisonous or *disordered actions* which it induces. At $6^{h.}$ $35^{m.}$ A. M. 2 oz. 5 dr. of the poison—a very *moderate* quantity indeed—was injected into the stomach of a full grown spaniel dog. Now mark the "symptoms of" poisoning which "were soon produced"!

1st. "The pupils alternated between contraction and dilatation." This was not a voluntary movement of the pupils of the eye; it was the *poison* operating on the optic nerve! Were a cup of water or milk, or a mouthful of food, to produce such an effect, would you not instantly infer that *something* had got into the milk, the water, or the bread?

2nd. "$6^{h.}$ $48^{m.}$ Has not been able to stand for some time; on endeavouring to raise her head, she immediately lets it fall as a dead weight."

Here the nervous system is poisoned—or as Dr. James observes, "deprived of all *sense* and *use*"—and the dog is for the time the subject of a paralytic stroke.

3rd. "$6^{h.}$ $55^{m.}$ Jaws now in action, as in mastication, occasional whining. Slight *spasmodic extension of extremities.*"

4th. "$6^{h.}$ $56^{m.}$ Breath strongly" tainted with the poison given. This shows that the agent—unlike food—had not been *digested and assimilated*, but passed into, through, and from, the system *unchanged*—a poison still, answering no one of the purposes of food or drink.

5th. "Vomiting of a kind of *frothy mucus.*" The gastric secretions vitiated and disorganized. "The animal still lying upon the floor, continued extremely restless: at one time *writhing*, and contorting her body in all directions, and occasionally moaning, whining, and howling loudly, as if suffering severe pain; and at another time," when the poison was operating strongly on the nervous centre, the brain, "appearing to be in a state of delirious excitement."

Here, Gentlemen, you have an unequivocal case of poisoning, so called by the Experimenter himself, the late President of the Medical Society of Edinburgh. I ask you, were a *child* who could scarce lisp its mother-tongue, to see your own dog at home exhibiting such symptoms, after something had been given it, and you should put the question—what ails the dog?—would not even its child's sense respond—"*It is poisoned.*" Could you persuade that child to drink of the liquor which it had seen followed by such effects in the dog.

But what had been given to that dog? Just about as much

ALCOHOL as is yielded by a quart of strong October! And yet, you say, the *ale* is not poisonous!—but a good creature, to be received with thanksgiving!! What was the matter with the dog? It was *intoxicated;* it exhibited the various degrees of excitement, from moderate poisoning, to what is now called *intoxication* emphatically—or descreditable poisoning, when *all* guidance of the system ceases? But can anything but a *poison* produce *poisoning*, or intoxication of this kind? Certainly not.

Suppose, for a moment, that your neighbor having seen this experiment of Dr. Percy's, were to propose that you should so poison your own dog at home, for the sake of a little *fun* or *amusement*—would you not denounce the proposal as cruel and unmanly?—And yet Englishmen, at fairs and feasts, at births, and marriages, and funerals, do, in various degrees, actually *poison each other!*—and provide, and "give and offer" to friends and kindred, as a mark of hospitality, and a token of friendship, an article which it would be cruel and unmanly to force upon a dog! They can see *the truth* when it concerns a dog, whose "spirit goeth downwards," but they are blind to the plain fact when it relates to the desecration of the tabernacle of an imperishable spirit! It is rightly said by Dr. Dundas Thompson, that men "daily make experiments upon *themselves*, which if they were to attempt upon even a *dog*, *would make them shudder.*"

The last and strongest evidence I have to adduce in support of the position *that alcohol is a poison*, is that of OCULAR DEMONSTRATION. The remarkable and unparalleled case I am about to read you, is from this volume, entitled "Experiments and Observations on the Gastric Juice, and the Physiology of Digestion: by William Beaumont, M. D., Surgeon in the U. S. army. Plattsburgh, 1833." The experiments were performed upon a young Canadian, who, in 1822, accidentally received a gun-shot wound in the side, which carried away a portion of the ribs and the lungs, and *perforated the stomach* itself. (p. 9.) In the course of a year the wound healed, leaving an opening of near three inches in circumference into the stomach, over which a bandage was frequently placed for keeping the food and drink from exuding. In the course of another year "a small fold or doubling of the coats of the stomach appeared, forming at the superior margin of the orifice, slightly protruding, and increasing *till it filled the aperture*, so as to supercede the necessity for the compress or

bandage,"—"but was easily depressed with the finger." (p.17.)

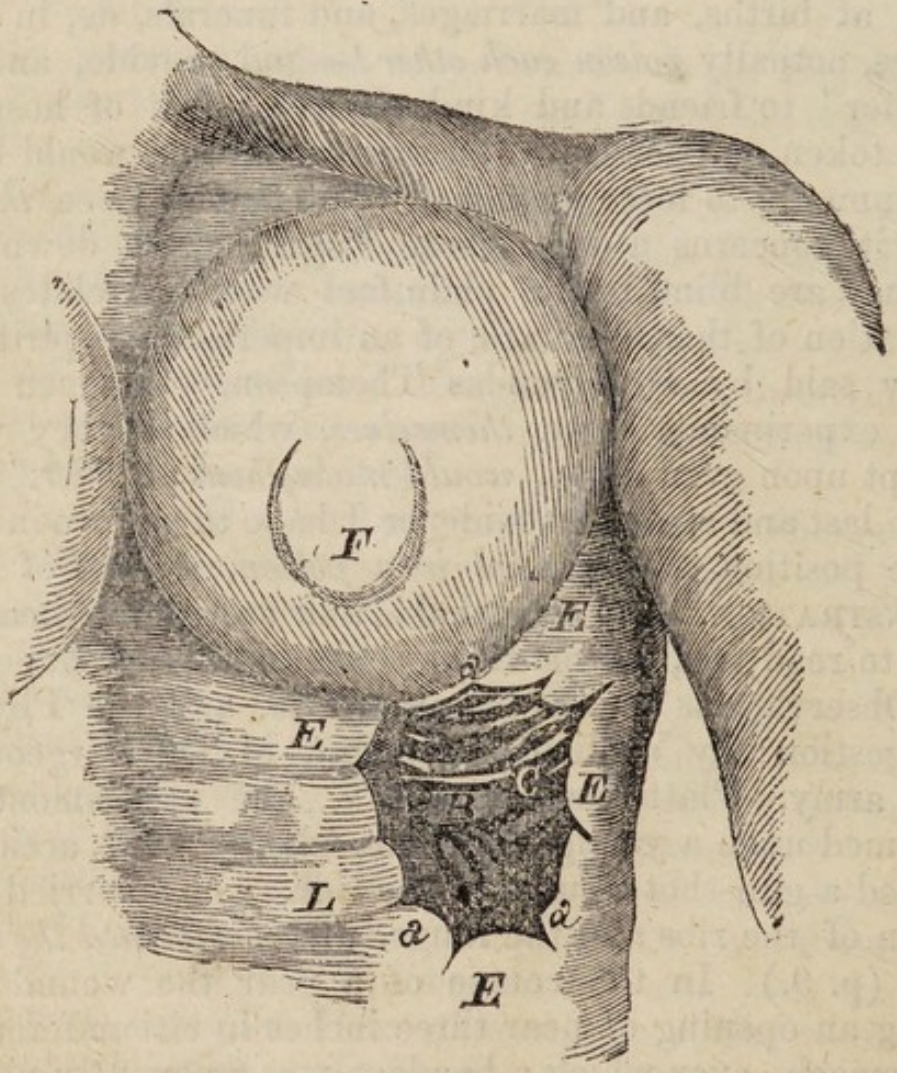
In the spring of 1824 he had perfectly recovered his natural health and strength; the aperture remained, and in 1825 Dr. Beaumont commenced his first gastric experiments, which were continued, at intervals, until 1833.*

Amongst the rest of the experiments was the administration of alcoholic drinks. And what is recorded of these?

"The *whole class* of alcoholic liquors, whether simply fermented or distilled, may be considered as *narcotics*, producing very little difference in their *ultimate effects* on the system." (p. 50.)

* POSITION OF ST. MARTIN'S WOUND.

(Copied from "the Standard Temperance Library," Edited by Dr. Lees.)



This engraving represents the appearance of the aperture, with the valve or curtain (above C) thrown back.

E E E represent the cicatrice of the original wound.

a a a. Edges of the aperture through the integuments and intercostals, on the inside of, and around which, the lacerated edges of the perforated coats of the stomach unite with the intercostals and skin.

B and the marks below, denote the folds of the stomach as seen in the cavity when the valve is depressed.

Again:—"The free use"—by which he does not mean the *excessive* use—"of ardent spirits, wine, beer, or *any intoxicating liquors*, when continued for some days, has *invariably* produced these *morbid changes*." (p. 239.)

What these "morbid changes" really were, you will perceive from one experiment.

1833. "*August* 1, 8 o'clock, A. M.—Examined stomach before eating anything."

Mark the consequences of the previous day's free moderate drinking, even after a night's repose, and twelve hours abstinence!

"Inner membrane morbid—considerable erythema *(inflammation)* and some aphthous *(ulcerous) patches* on the exposed surface—secretions vitiated—extracted about half an ounce of gastric juice—*not clear and pure as in health*—quite viscid.

"*August* 2, 8 o'clock, A. M. Circumstances and appearances very similar to those of yesterday morning. Extracted one ounce of gastric fluids—consisting of unnatural proportions of vitiated mucus, saliva, and some bile, *tinged slightly with blood*."

"St. Martin complains of *no sense of pain*, symptoms of indisposition, nor even of impaired appetite."

This reveals a fact of great practical importance—namely, that the absence of any direct *sense of injury* from the use of wine or spirits, is no proof that serious injury is *not inflicted*.

"*August* 3, 7 o'clock. Inner membrane of stomach unusually morbid—the erythematous appearance more extensive, and spots more livid than usual; from the surface of some of which, exuded *small drops of grumous blood*—the aphthous patches larger and more numerous—the mucus covering thicker than common, and the gastric secretions much more vitiated. The gastric fluids extracted this morning were mixed with a large proportion of *thick ropy mucus*, and considerable muco-purulent matter, slightly *tinged with blood*."

Here then, Gentlemen, we have the evidence of direct experiment on the stomach of a *living man*, exhibiting the inflammatory effects of this poison to the naked eye—and, surely, "seeing is believing." There was a providence in this extraordinary circumstance. Thousands of years had passed away without presenting a parallel subject for observation, until at length, the grand conception of combining

together for the extinction of all the causes and agents of intemperance, broke upon the human mind, when, just at that juncture, this extraordinary case occurred, as if to furnish to the sceptic-world the last and clearest evidence—ocular demonstration—of the physically poisonous character of that agent from which all patriotism, all humanity, and all religion loudly called upon them *to abstain!*—I have a right to affirm, in reference to this evidence, that they who will not believe *this*, neither would they believe though one rose from the dead ! *

And now, Gentlemen, I will draw this address to a close. I had indeed intended to have touched upon several other important points †—but will at present content myself with the facts, authorities, and experiments already advanced;—these, however, are to be regarded only as *specimens* of the reasons which induce us to hold fast to the good faith of teetotalism. It would occupy me many days to bring forward anything like the *greatest portion* of the facts and evidences which substantiate our principles, in all their length and breadth, and relations.—I make way, however, for the gentleman on the platform. I shall be astonished indeed, if he can show that these evidences are delusive. He announced that he "*proposed to reply*" to my lecture, even before he heard it. Solomon says—"He that answereth a matter before he heareth it, it is folly and shame unto him." (Prov. xviii. 13.)—but if our facts *can* be overturned, and our experiments rendered void, as truth is my object, I shall willingly and patiently listen to the attempt."

Mr. JEAFFRESON then addressed the meeting for upwards of an hour, during which he was listened to with great attention by the teetotalers, though three-fourths of his speech had *no bearing whatever* upon the physiological effects of alcohol.

* Dr. Lees finally referred to dissections immediately after death, before any morbid changes could occur, as furnishing evidence in exact correspondence with the case of St. Martin, and the experiments of Dr. Beaumont. He then exhibited *colossal colored drawings* of the healthy—of the moderation—the drunkard's—the ulcerous—the cancerous—and the *delirium tremens*—stomach, taken from the dissections of Drs. Sewall and Horner, Professors of Pathology; which evinced that, physically, the difference between moderation and drunkenness was simply one of degree in evil. As these and other drawings are about to be published, splendidly colored, in Dr. Lees' "*Illustrated History of Alcohol*," this part of the argument is entirely omitted.

† Including the relation of alcohol to the *function of respiration;* in which case Mr. Jeaffreson would have been literally *speechless!*

He did not attempt to grapple with a single fact or argument advanced by the gentleman to whom he had "proposed to reply"! but occupied the greater portion of the time with a pedantic lecture on chemistry, showing the composition of air, water, &c., informing his audience very emphatically why oxygen, hydrogen, nitrogen, and other technical terms, were so called, which "learned" statements are not here repeated, inasmuch as they may be found in any child's manual of chemistry, or in Chambers' three-half-penny "Information for the People." The following are the only sentences from Mr. Jeaffreson's address at all relevant to the subject in discussion :—

1. "I had been called in, professionally, to a young person in the town, and had prescribed alcoholic liquor, which the mother refused to give. This circumstance had given rise to those statements which had issued in the present meeting.

"In the case of recovery from a *fever* in that person, I had ordered him to be restricted to a *simple diet*, and had prescribed *porter* for the purpose of giving *power* to the vessels to *contract!*

2. "It is quite impossible that *un*instructed persons can understand this subject, which involves the consideration of the nicest points in physiology, pathology, and organic chemistry!

3. "I contend for the moderate use of alcoholic drinks, NOT HABITUALLY, but *under certain circumstances.*

4. "If we do not understand the *elements* of the *blood*, we cannot understand the operation of these agents!

"Blood was made up of the elements of *proteine*, (so called from *proteuo*, 'I take the first rank.') Its composition in one hundred parts was, carbon 55, hydrogen 7, nitrogen 16, oxygen 22. This *proteine* was all the *nutritious part* of blood.

"All the elements of proteine are found in vegetables: therefore the vegetable substances supply us with the essential elements for the formation of blood.

5. "But besides the *nutritious* elements of food, animals require substances composed of oxygen, hydrogen, and carbon, without nitrogen, the carbon of which unites with the *oxygen* inspired, and produces *animal heat.* For this purpose we must breathe pure air, which is composed of eighty parts of nitrogen, and twenty parts of oxygen, for were there only ten per cent of oxygen, we should be suffocated.

"Besides the *proteine* principle in vegetables, which is the nourishing part, nature has plentifully supplied us with other compounds, as gum, sugar, starch, oil, *wine*, *beer*, *alcohol*"—

[Dr. LEES—Does *nature* supply alcohol?—Are wine and beer found in *vegetables?*]

Mr. JEAFFRESON—No—but they are elements of *respiration;*—and, *under certain circumstances*, NECESSARY *to respiration!*

6. "Alcohol results from the distillation of *fermented* grape-sugar. It is merely a result of the *de*composition of this sugar. With one equivalent of oxygen, *ethule* forms *ether*, which again, in union with water, forms *alcohol;* so that *this terrible poison is* ONLY *the hydrate of oxide of ethule!*

7. "This alcohol, as an element of respiration, is necessary, under certain circumstances, to preserve the body in a state of health—*to protect it from the action of oxygen!*"

(First case.) "A Suffolk agriculturist,—*a hedger and ditcher*,—in active labor, with his feet wet, and exposed to a temperature much below that of his own body, may take a quart of good mild beer during the day with advantage!—(loud stamping in the gallery)—The *small* quantity of alcohol contained in it, being, *under these circumstances*, resolved into carbonic acid and water!—the *vegetable food* which he is always confined to, being only sufficient, with seven hours rest, to supply the *waste* of his body sufficiently to resume his labor on the following day!" *

(Second case.) "The Samoyedes are a nation of Northern Tartars, who are exposed to intense cold, and who will consume 10lbs of flesh, a dozen of tallow candles, and a quart of train oil daily. *Brandy* is *essential* to them; they can take a pint of it with apparent impunity."

(Third case.) "In certain circumstances of the constitution, when the powers of *digestion* and *assimilation* fail, as after an attack of *typhus fever*, I recommend it to supply the deficient *elements of respiration*, and as a *medicine* to give *tone* for a time!"

* As a matter of courtesy, Mr. Jeaffreson was asked to draw up an abridgment of his speech for publication. He replied, very hotly, that it was at our *peril* that we published an abridgment of his speech!—threatened us with the terrors of the law and the letters of the lawyer!—and, finally, on cooling down to the rational temperature, said, that "ALL *he wished the public to understand from what he said*" on that memorable evening was, the above quoted first case! *Parturiunt montes, nascetur ridiculus mus.*

Dr. Lees said—"At this late hour of the night, I shall not enter into any consecutive and detailed examination of Mr. Jeaffreson's address—in fact, much of it has nothing to do with the question of teetotalism at all; and of that which has, some is perfectly correct, and harmonious with it in the main, while other parts, especially that relating to Liebig's theory of *respiration*, is, in its true bearing, misunderstood and misrepresented. This I shall show you on the ensuing evening.

Mr. Jeaffreson, however, as he professes to desire the truth, will perhaps permit me to ask him a question or two, in order more perfectly to understand each other?

[Mr. Jeaffreson bowed acquiescence.]

Mr. Jeaffreson has distinctly said, that "he contends, *not for the habitual*, but for the moderate use UNDER CERTAIN CIRCUMSTANCES." Now, Sir, for anything maintained by Mr. Jeaffreson to the contrary, he might very consistently sign the pledge, which, as I explained at the opening, only declares against its use *as a beverage*.

[A Mr. Edwards here got up, and intemperately denied this! Dr. Lees replied—the gentleman's assertion is *not true*.]

Mr. T. Smeeton, the talented agent of the Suffolk Temperance Union, enquired of Mr. Jeaffreson, if he recommended wine as a *beverage*, or a *medicine?*

Mr. Jeaffreson—He recommended it in the case of recovery from fever, and, *under certain circumstances*, as an article of *diet*.

Dr. Lees said—"There is a wide distinction between a medicine and a beverage. The former stands related to a temporary purpose, and an unnatural state, or state of disease; by the latter he understood a drink habitually employed, in reference to an ordinary and healthy condition of the body. Now, were these "certain circumstances" in which Mr. Jeaffreson recommended wine, &c., circumstances of an *ordinary* or extraordinary kind?—of *health* or *disease?*

Mr. Jeaffreson—He recommended it as a *beverage, under certain circumstances*.

Dr. Lees—"The old answer! One other question, and I will then conclude, with a remark or two, for the present. Does Mr. Jeaffreson admit, that *alcohol, being destitute of one essential element of the nourishing part of blood*, nitrogen, *cannot possibly be nutritious?*"

Mr. JEAFFRESON—Who ever contended that it was?

Dr. LEES. "Who? Why, Sir, nearly the whole world. Are we not every day told of the *strengthening* and *nourishing* properties of these drinks? Take those parties in the gallery who stamped off so vehemently every mention of the use of wine or brandy in fevers, or by the naked Samoyedes,—do not *they* use them under the idea that they are nourishing? I wish those gentlemen who are laboring under *party feeling* in this assembly, and who I fear do not thoroughly *understand* how little the position Mr. Jeaffreson has taken supports *their* drinking habits"—

Mr. Edwards here again warmly interrupted the speaker, declaring that there *was* no party feeling!

Dr. LEES—"Indeed, Sir, and with the excitement prevalent in the town—and with the flag hanging across the lane *there*—'No Lees for us—*Rush to the Hall!*—Jeaffreson, Esq. for ever'—you ask me to believe that there is no prejudice or party feeling *here!!*

"Now, Gentlemen, mark the admissions of Mr. Jeaffreson. He has distinctly allowed, *first*, that alcohol cannot possibly contribute to the nourishment of the body; and, *second*, that it is not to be used *habitually*, but only moderately *under certian circumstances!*

"But what has he said to show that alcohol is not a poison? Has he refuted one fact, or replied to one argument of my opening address? *Not one!*"

Mr. JEAFFRESON. I allow 2½ ounces of undiluted alcohol *is* a poison!

Dr. LEES. "My proofs went to show that *all* alcohol was poison, and against that array of argument and authority we have the unsupported assertion of Mr. Jeaffreson! I am told, indeed, that it is an *element of respiration*. Well, now, you have Mr. Jeaffreson's authority for this; to-morrow night I will show you what the theory itself is worth; at present it is purely a question of opinion. Doubtless Mr. Jeaffreson's opinion is worth something, but I ask the gentleman himself, if he can pretend to be as high an authority in this matter as Dr. Pereira, the examiner of *Materia Medica*, in the London University?"

Mr. JEAFFRESON—I do not pretend to be.

Dr. LEES—"Well, then, Gentlemen, with reference to this alleged use of alcohol in promoting the function of *respi-*

ration, and generating heat, what says Dr. Pereira? In a paper in the *Pharmaceutical Journal*, vol. II. pp. 184-5, he says—"The *tea*-total societies"—(thus evincing his ignorance of our real principles by mis-spelling our name, as if we were extraordinary *tea* drinkers!)—"have quite overlooked this use of spirit." He is wrong here too, for I have frequently exhibited its true-relations (which are not exactly what he and Mr. Jeaffreson imagine) to the respiratory process. He adds—"it cannot be doubted that it undergoes some change in the animal economy, and *probably may* be made some use of." Granting, however, that this '*probably may*' be the case, it is evident that the sugar from which the alcohol is produced, at great cost, and loss, and labor, would answer the end as well, without producing any of the mischief. All that Mr. Jeaffreson's, or rather *Liebig's* theory would prove is this, that *after* a portion of spirit had acted as a poison on the stomach, the tissues, the liver, the heart, the lungs, and the brain, some portion of the poison is then made to answer the same purpose as would an equal portion of sugar, starch, or gum! "If" (says Dr. Pereira) "I had to point out the *injurious qualities* of alcohol, I think I could soon prove, that though it evolves heat in burning, it is AN OBNOXIOUS AND MOST EXPENSIVE FUEL. Consider its volatility, the facility with which it permeates membranes and tissues, and *its injurious operation*—BEFORE it is burnt in the lungs—*on the stomach, the brain, and the liver.* Remember, that though spirit burns and evolves heat, there are, *under ordinary circumstances*, other BETTER, SAFER, and CHEAPER combustibles to be burned in the vital lamp!"—Mr. Jeaffreson does not even pretend to put himself in opposition to so high an authority—and this authority, you perceive, is altogether in favor of teetotalism.

"Under ordinary circumstances"—says Dr. Pereira—"other better, safer, and cheaper" articles are to be had, than this poison;—but, says Mr. Jeaffreson, "the hedger and ditcher requires it!" Why, Gentlemen, I suppose that we have some thousands of these "hedgers and ditchers" included in the six millions of teetotalers in England, Scotland, and Ireland, who do very well without this element of respiration!"

Mr. JEAFFRESON (interrupting)—I know something of the habits of the Irish peasantry. These live principally on

potatoes, which contain much gum, starch, and sugar, but not sufficient of the nitrogenized elements of *nutrition*. They are compelled to go to something like a corner cupboard, and bring out a black bottle containing something like *whiskey*, and that not of the best sort either—

Dr. LEES—"And does *whiskey*, Sir, contain the nitrogenized elements of nutrition of which the potato is short?

Mr. JEAFFRESON—(puzzled)—No—but it is an element of *respiration!*

Dr. LEES—"But has not the potato an abundance of that element?"

Mr. JEAFFRESON—(much confused)—Yes!

Dr. LEES—"Then, why, in the name of common sense, must they take the *whiskey?* If the potato have *too little* of the nourishing or nitrogenized principle, the whiskey has *none at all!* Why then take it?"—

Mr. Jeaffreson here put on his hat, grasped his umbrella, and marched off the platform, at which signal great numbers of his friends (who during the cross-examination had been very noisy) also rose and left the meeting, which then broke up. One man in fustain, who had grossly interrupted Dr. Lees in his address, (and who was only quieted by that gentleman on his informing him that he should be given into the custody of the police, if he did not sit still,) now cried out—'They daren't hear *me*;'—while a noisy fugleman in the gallery proposed 'Three cheers for Jeaffreson'—to which a portion of the audience faintly responded. It was clearly seen in the countenances of the moderationists, that the apology for drinking, advanced by Mr. Jeaffreson, was almost as unsatisfactory as, to the great bulk of them, it was unintelligible.—As the teetotalers passed through the town, a great rabble followed them, howling and swearing, but furnishing, in the brutality and ignorance they exhibited, the strongest proof of the need of temperance reform. It was received, by the teetotalers, as a strong proof both of the necessity and the excellency of their cause—for when did TRUTH ever enlist the sympathies of the ignorant and degraded rabble?

SECOND DAY.

During this day much excitement prevailed in the town, "the publicans and sinners" being all on the *qui vive*, but, as might have been predicted, their love of the truth did not lead many of them to the meeting in the evening, not caring to hear the previous night's apology for strong drink further exposed. A note of invitation was sent during the day, respectfully calling upon Mr. Jeaffreson, as a professed searcher for truth, to attend the lecture, and to hear his version of Liebig's theory examined, and *defend* the position he had assumed. He did not, however, deem it prudent to attend, perhaps thinking with a boaster of old, that discretion was the better part of valor!

At seven o'clock a very respectable and select auditory was collected. A chairman having been appointed, Dr. Lees was again introduced to the meeting, and warmly greeted.

Dr. Lees then addressed the assembly for nearly three hours, during which he was listened to with the most marked attention. The following is an outline of the arguments employed, so far as they relate to the subject of discussion.

"Ladies and Gentlemen:—It is with great pleasure I proceed to address you this evening, because I feel persuaded that, though fewer in numbers than last night, you have all, or nearly all of you, come with the simple desire of ascertaining the truth, irrespective of party, appetite, or interest.

I proceed, therefore, at once to fulfil my previous pledge, by *first* examining in greater detail, as matters of fact, the objections and admissions made by Mr. Jeaffreson; and *secondly*, to illustrate the true relation between teetotalism and the new theories of the organic chemists,—a relation so imperfectly exhibited by Mr. Jeaffreson last evening. I maintain that all the great discoveries in chemistry and physiology, do most remarkably, and indeed necessarily must, support and strengthen the doctrines of total abstinence—since

those doctrines are but the expressions of human *experience.*

The first thing which powerfully strikes me on reviewing the address of Mr. Jeaffreson, are the ruinous admissions he was compelled to make. On these a few observations are necessary.

1st. He admitted that *alcohol could not possibly nourish the body.* The nourishing elements of the blood, out of which the various fibres and tissues of the body are formed, are composed of *four* chief ultimate principles,—oxygen, hydrogen, carbon, *nitrogen*, or azote,—but alcohol contains only the first *three*, and therefore is deficient in one essential element of nutrition. Hence, alcoholic drinks cannot by any possibility, at least by virtue of their alcohol, strengthen the body, or repair the waste of one atom of the living fibre.

2nd. He distinctly admitted that *alcohol in its own nature*, undiluted alcohol, *was a poison.* But alcohol mixed with water does not operate *differently* from pure alcohol. The dilution may modify its *degree* of action, but it does not alter its *kind* of action. The experiments of Dr. Beaumont on St. Martin, and the experience of teetotalers, prove that all alcoholic drinks essentially operate in the same way upon the animal economy—that they *invariably* produce the same kind of morbid changes, and with very little difference as to their *ultimate* character. (See pp. 12, 13.) In fact, when pure alcohol is given, it becomes speedily mixed with water *in* the blood. Dr. Courten (1679), as related in the *Standard Temperance Library*, p. 20, says—"We injected into the crural vein of a dog five ounces of a strong *white-wine*, which made him very drunk, and little different from what a less quantity of *spirits of wine* would have done."—Its effects upon the circulation, I believe to be even more permanent, though doubtless it will not so strongly blister and burn the tissues of the stomach on its first contact. Our position is this—as far as alcohol operates *at all*, in any form, it operates as a *poison.*

3rd. Mr. Jeaffreson admitted also, that the vegetable principles supply us with the *essential* elements for the formation of the vital fluid, blood; fibrin, albumen, and caseine, on the one hand, for *nourishment;* gum, sugar, starch, oil, &c. on the other hand, as *elements of respiration.* But, he allows that vegetables do not contain *alcohol* ready formed; and hence we have a strong *à priori* proof, deduced from the

wisdom and perfectness of nature's arrangments, that alcohol is not necessary. Had it been so, surely amidst the vast varieties of climate and circumstance in which man is found, nature would have furnished it! But while she *has* altered the kinds of food in various countries,—giving more of oxygen to the food of the tropics, and more of carbon to that of the arctic regions—adapting its composition to the wants of the animal economy, she has no where and in no case, supplied us with *this* "necessary element of respiration"! If Mr. Jeaffreson is right, then is nature wrong!

4th. He admits also, that *the moderate* HABITUAL *use of alcohol is improper.* He contends for its use only "under certain circumstances." Where those circumstances do *not* exist, therefore,—and comparatively few of us are "hedgers and ditchers" with deficient food, or persons recovering from typhus fever, and happily not any of us are half-naked Samoyedes, living amidst perpetual snows,—the use of mild beer, Bett's brandy, or brown stout, is unjustifiable. Is not this doctrine *virtually* equivalent to total abstinence from intoxicating beverages?

5th. Mr. Jeaffreson admits that "it is impossible that *un*instructed persons can understand the subject" of its *right use*, because that "involves the knowlege of such *nice points* in physiology, pathology, and organic chemistry." It ought, therefore, on his principles, to be very cautiously employed, and only under the prescription of those learned men who *do* understand these "nice points"! This contending for its use as a medical agent, "under certain circumstances" to be determined only by the doctor, not by the patient—is a strong admission in our favor. As Dr. Truman well observes, in his recent work on food, p. 190, "No disease can be cured without injury to the health, for *the remedies* employed for this purpose always cause some excessive and unnatural action in the body, which lessens its power." That is, all medicine is evil *per se*, or poisonous; it inflicts one injury to avoid a greater. Thus, granting the alleged influence of alcohol as a medicine would only tend to establish its poisonous character; and therefore its unfitness to be employed in health, or as an ordinary beverage. Consequently, if it be *right* to use it as a *medicine*, it is WRONG to use it as a BEVERAGE!

As an individual, however, without at all pledging the temperance society to my opinion, I assert, that *alcohol*, even

as a medicine, *is not necessary*. If, indeed, no other stimulant could be had, there are cases in which it might be useful; but, in ordinary circumstances, other better, and more natural medicines may be obtained.

You were told that "this terrible poison was ONLY the hydrate of the oxide of ethule"! as if, therefore, it were harmless! The gentleman, however, must have forgot himself, since he admitted that undiluted alcohol was a poison, and a small quantity of it will more suddenly extinguish the life of a dog, than opium, henbane, or arsenic. Yet it is precisely *this* "undiluted alcohol" which *is* "ONLY the hydrate of the oxide of ethule"! This ethule—which by the way is merely a *suppositional* root of several volatile stimulants, and has never been found *as* ethule!—is *supposed*, with 1 equivalent of oxygen, to form the diffusible stimulant *ether*. Ether, with more oxygen, again forms acetic acid, or the acid of vinegar. Ether and *water* will combine to form *alcohol;* and though alcohol is *only* the simple element water, added to ether, it does not, therefore, become more, but *less harmless*—a stronger poison. These *onlies* make strange differences in chemistry, as every chemist knows. And, though ether, acetic acid, formic acid, and alcohol, *only* differ in having more or less oxygen, or more or less of the elements of water in their composition,—they are nevertheless very different substances, and produce very different effects. Undiluted alcohol is admitted to be *a poison*, and calling it, in chemical nomenclature, "the hydrate of the oxide of ethule," is ONLY a piece of ridiculous pedantry, which in no degree changes its character!

But what are these "certain circumstances" under which "alcohol becomes necessary to preserve the body in a state of health, and protect it from the action of oxygen"?

With regard to the use of porter in the case of the patient recovering from illness, (see p. 15) I find, upon inquiry, that Mr. Jeaffreson has not revealed the whole truth. The same patient had the same medicine recently prescribed, but it was *not taken*, and yet he *got better without it!* Now, the question naturally arises, did he get better in the first case—two years ago—*because* of the porter or in *spite* of it? His rapid improvement in the last instance without it, (of which Mr. Jeaffreson said nothing!) warrants me in questioning its utility in the former case.

I would ask why he was restricted to a simple unirritating diet, and yet had the '*local irritant*' and diffusible stimulant alcohol, administered to him? It is alleged that the *porter* was prescribed to *give power* to the vessels to contract. It would be difficult to say what the composition of any given porter was, prior to analysis—the probability is, that it would contain opium, coculus indicus, nux vomica, or other similar *narcotics*, which would tend to paralyse the nervous system—but it *is* true, as Drs. James and Christison show, that the alcohol in it would cause the vessels to *contract* by virtue of its *astringent* or tanning property—but this is not to *give* power and elasticity to the vessels, but to *exhaust* and *harden* them! Besides, if in disease, when the vessels do not contract *enough*, we may suppose porter to be useful, then to use it in health, must make them contract *too much*, and therefore be pernicious.

I will now show you that FACTS plainly demonstrate that alcohol is neither necessary nor useful as an *element of respiration*, even under the "certain circumstances" supposed by Mr. Jeaffreson in his three extreme cases.

First case. We are told that to the hedger and ditcher, with his feet *wet* and his body exposed to *cold*, a quart of mild beer is necessary to supply the elements of respiration of which his vegetable food is deficient! Now if his food be deficient in the requisite elements—but it so happens that of these elements vegetable food contains more than beef or mutton—why not take more or better food? The ale for which he pays fourpence or fivepence, does not contain as much of those elements of respiration as a pint of milk or a piece of bread, for which he would pay one penny—that is, in the language of Dr. Pereira, the alcohol is a most *obnoxious* and most *expensive* fuel for the production of animal heat.—On inquiry, however, I find that these said Suffolk hedgers and ditchers, for whom this quart of mild beer is *so necessary*, do nevertheless not get it at their work—and yet they manage to *live on* after all! The "small quantity of alcohol" in mild beer, therefore, is *not necessary* to the hedger and ditcher; and I have the testimony of a gentleman in this hall (Mr. Mann) that exposure to wet and cold, during the night, as a coast guard; or as an agriculturist during the day; or in traveling, under great privations, amidst the snows of Labrador, can be *better* sustained *without* intoxicating liquor than

with it. After having been wrecked once amidst the Icebergs, this gentleman informs me, that the crew had to find their way back over the snows to Canada, a distance of many hundred miles. The cold was intense. The captain's party, of which he was one, used the alcohol *outwardly*, by steeping their mittens and stockings in the rum, and they all arrived safe, whilst the other parties, who took their rum *inwardly*, suffered severely from the frost, and lost several of their company. The same testimony to the superiority of *total abstinence* over *moderate drinking*, in enabling the body to withstand cold even in the arctic regions, has been given by captain Sir John Ross. Dr. Scoresby (now vicar of Bradford), who had been engaged twenty-one years in the arctic whale fishery, in his evidence before Parliament on this subject,—in reply to the question, No. 4399, "Is it not the general impression that spirits are *more necessary* in cold climates than in hot?"—said, "It *is* a very common impression; but *from my own experience*, I can say that ardent spirits are NOT NECESSARY. I did not use ardent spirits myself, and I was *better* I conceive, without the use of them."

The late William Cobbett, M. P. for Oldham, in his younger days was a soldier in Canada. In a letter (republished in the *Standard Temperance Library,)* addressed to the ladies of England, and dated January 17, 1820, entitled "A Plan for the promoting of Sobriety and Frugality," he thus gives his decided and conclusive testimony on this point.—

"It is said, as an excuse for the use of spirits, that they *keep out the cold.* Let a man once persuade himself of that, and he will soon find that they *keep off the heat!* That they drive out the heat, is very certain; for, in the northern parts of America, where the cold is so great that people are frequently *frost-bitten*, and are compelled to have their feet or hands cut off, it is a caution always given to those who are likely to be exposed to the severity of the weather, *not to drink any spirits before they go out.* And, though I have known many persons frozen to death, and a great many more to have their limbs cut off, I hardly recollect a single instance in which the suffering party had not taken spirituous liquors on his way or before he went out. Spirits are very cheap in those countries. A bottle of rum for sixpence. Of course thoughtless men will use them. I have a hundred times gone out shooting or hunting upon the snow along with others,

each of whom took a canteen of rum, while I took none. I used to *suck the snow*, which they told me would give me the pleurysie; but I found that I never had the pleurysie, and that many of *them* had. And as to ability to travel and to bear the cold, though many of my companions were much stronger and more active than myself, I always found that, at the end of the day, I was the freshest, and by far the most cheerful of them all.

"*All strong liquors*, be they of what sort they may, and *in an exact proportion to their strength*, tend to disable the frame from enduring the cold; tend to make the person *chilly*. The reason is this, that they have all an intoxicating effect. We clearly perceive that they *stupify the mind;* and at the same time, they, in a greater or less degree, *benumb the body*. Consequently they tend to render it more susceptible of the injurious effects of cold."

Thus, Gentlemen, *facts* overturn this hedging and ditching theory—and the best authority is also opposed to it. Dr. Andrew Combe, the celebrated writer on physiology and dietetics, says, "I believe that exposure to cold, wet, and fatigue, when of *frequent* occurrence or of long continuance"—just the case of the poor hedger and ditcher—"is *better supported by nutritious food*, good clothing, and pure air, *than by the use of fermented liquors;* and consequently I do not consider the latter necessary." *

Second case. As we have been told that mild beer is necessary to the Suffolk rustic, so on going further north, we are told, on the same authority, that "brandy is essential to the Samoyedes"! If I may presume that these Samoyedes *had* any ancestors, I should like to know how *they* managed to live, some centuries ago, before brandy was introduced amongst them? Mild beer is *necessary* to the hedger and ditcher, and strong brandy *essential* to the rude Tartar, and yet, somehow or other, both contrive to live without it! But why is it essential to them? "Because" quoth Mr. Jeaffreson, "they can take a pint of brandy with *apparent impunity!*" It would not, however, follow, that Englishmen could take it with impunity; but, indeed, there is no evidence to show that they can do it either. Are these brandy-drinkers a stout, healthy, and long lived race? No, on the contrary, they are a weak, puny, and short-lived generation, and much

* Vide Report of the committee of Aberdeen Presbytery, on intemperance.

of their physical and social degradation may be fairly put to the account of this same brandy.—I admit, however, that they may drink brandy with more impunity than we might, just on the same principle that a strong active laborer will receive *less harm* from a glass of ale or wine, than a weak or sedentary person. The reason is, in both cases, that the evil-thing is sooner got rid of.—Brandy is no more necessary to the Samoyedes than mild beer to the Suffolk-man. *Fatty-matter* is the kind of food which nature has designed for keeping up the heat in man and other animals in the high latitudes—*not alcohol.* Look at the wolves and bears in the arctic regions, surrounded by eternal snows and icebergs. How do *they* support respiration? Has the Polar bear learnt the art of distilling brandy? And if *he* can support respiration without this alcohol, so can the Samoyedes!

Third case. "*When* the powers of *digestion* and *assimilation* fail, as after an attack of typhus fever, *then* a little wine may be *prescribed.*" What for? Why, says Mr. Jeaffreson, first, "as an element of respiration," second, "to impart tone for a time"!

But we have already seen, Gentlemen, that alcoholic drinks do not increase warmth, but on the contrary, decrease it, and render the body more susceptible of cold, and therefore wine is a bad element of respiration. We have also seen, that alcohol is not a tonic, but an irritant; it cannot, therefore, "impart tone," but must destroy it, and ought, consequently, to be most cautiously abstained from when the powers of digestion and assimilation fail. It hardens the food also, as well as weakens the digestive powers. Hence our teetotal surgeons, as for example, Mr. Higginbottom, of Nottingham; Mr. Mudge, of Bodmin; Mr. Fothergill, of Darlington; Mr. Shearwood, of Barrow; the late Mr. Batchelor, of Dunstable; and Dr. Syder, of London; found, on trial, that they could do *better* without this medicine, even in recovery from fevers, than with it.

Dr. Cheyne, of Dublin, in his letter on wine and spirits, many years ago, justly observed, that "the benefits which have been supposed to flow from their liberal *use in medicine*, and especially in those diseases which were once universally, and are still vulgarly supposed to depend upon mere weakness, *have invested these agents with attributes to which they have no claim*; and hence, as we physicians no longer employ them

as we were wont to do, we ought not to rest satisfied with a mere acknowledgment of error, but we ought also to make every retribution in our power for having so long upheld one of the *most fatal delusions* which ever took possession of the human mind!"—If, however, they *do* possess any medical virtues, then the *habitual abstainer* will most assuredly experience a greater amount of advantage from their medical use, than the moderate drinker possibly can, whose constitution has become hardened by their constant use. Speaking of wine, Dr. Christison says, that "the artificial states of the constitution produced by the habits of civilized life are *supposed* to render it for some people a necessary stimulant, especially during exposure to unusual fatigues." (*Dispensatory*, p. 943.) But what says the Professor to this Jeaffresonian supposition? "Very few constitutions of this kind *really* exist among those who are *willing* to think they themselves possess it." You see, Gentlemen, that Dr. Christison understands the secret—the patients are "willing to think" that they possess the peculiar constitution, because they *like the medicine!* "The habitual use of wine," says he, "is safest or most salutary when the habit is united with regular exercise out of doors," or, in plain English, is *least hurtful* in those constitutions and circumstances in which it is soonest got rid of—"and *most hurtful* where the occupation is sedentary, and the mind much exerted." Thus we see, that of all people, the weak, feverish, or studious, ought most carefully to refrain from wine.

I will now pass from facts to the theory of those facts, and unfold the true relations of alcoholic drinks to the laws of nutrition and the functions of respiration—involving those "nice points in physiology, pathology, and organic chemistry" of which you have heard so much said—and I undertake to show you, that the discoveries of Liebig and the organic chemists, rightly interpreted, perfectly accord with the principles of teetotalism.

In THE LIVING TEMPLE of the healthy body three distinct sets of principles, or laws, are in constant and harmonious operation; namely—the *physical*, the *chemical*, and the *vital*.

In the texture of the fibres and the construction of the bones, forming ropes, levers, pivots, and pulleys, and in the propulsion of the blood from the heart, we have examples of *mechanical powers* in the human machine.

Man, however, is not merely a physical or mechanical structure—he possesses a vegetative existence, exhibiting the varied phenomena of growth and decay, in the movements of every day and hour,—and, in this respect, he is subject to *chemical agencies* in common with the vegetable world. The circulating system supplies the chief medium for the development of these phenomena.

But, superadded to physical and chemical attributes, man possesses a higher life; he has a *vital principle* which regulates, modifies, and controls mere chemical agencies. This principle pervades every fibre and organ, but may be said to possess, in the highly organized *nervous system*, its peculiar and characteristic instrument.

The chemical and vital principles are, in their own nature, distinct and *opposite*, yet, by the wonderful power of God, they are made to combine, in animals, to the production of health and happiness. Life, vigorous and healthy Life, is the *balance* or harmony of the conflicting powers—Disease is the encroachment of one on the domain of the other—Death is the final triumph of the chemical over the vital power.

In reference to these several principles, we find every thing in the external world wonderfully adapted and wisely arranged. All things requisite to the complete, continuous, and harmonious movement of the whole, is beneficently and bountifully supplied.

Every movement of a limb—every throb of the pulse—every beat of the heart—every thought of the intellect—every feeling of the soul—wears down a portion of this living temple,—disintegrates some part of the muscular or nervous system of the body or brain. Hence, to repair this daily and perpetual *waste* in all, and in the young to contribute also to the *growth* or increase of the mass, we see the necessity for the ceaseless supply of *new materials*. "Give us each day our daily bread." Food only can answer this purpose; food, therefore, is graciously given. This, strictly, is *nourishment*—that which contributes to the building up or repair of the living temple. But, of necessity, that only can do this which is identical, either in its proximate or ultimate principles, with the structure to be erected or repaired. "If one ask for bread, will you give him a stone?" Plants require for their nourishment the *ultimate* principles of which they are composed—namely, oxygen, hydrogen, and carbon, (which they

get from the water, and from the carbonic acid floating in the air,) and nitrogen, (yielded by the manure and rain-water,)—which principles must be given up in their decomposed or inorganic form, ere they can become nourishment for vegetables. But exactly the *reverse* happens with animals, which have no power to appropriate and assimilate the inorganic or ultimate elements, as nourishment. Plants are the appointed means of gathering up the *ultimate* elements, and out of them composing the *organic compounds*, which serve as the nourishment of animals; while these, in return, such is the harmonious round of nature, *de*compose the organic substances, and thus supply the food of the plants!

Fibrin, albumen, and caseine, are those quaternary compounds in food which alone can furnish *nourishment* to the frame—and hence, as alcohol is only a ternary compound, destitute of nitrogen, it could not possibly, in any degree, build up the waste of one atom of the living temple.

On the contrary, I maintain, that according to the principles of Liebig, it ACTS AS A POISON, by *hindering the nourishment* and *impairing the strength* of the body.

You will have gathered from what I have said about the chemical and its antagonist force, the vital, that the body is constantly undergoing COMPOSITION and DECOMPOSITION. Life, indeed, consists in the perpetual *building up* and *pulling down* of the organs of life,—the bodily estate being, as it were, perpetually subject to *Conservative* and *Destructive* influences. One process is plainly as necessary as the other. If the chemical powers did not *pull down*, the vital powers would not *build up*—if no life were expended in *action*, no *waste* would occur, no *supply* would be needed.

"All experience proves," says Liebig, "that there is, in the organism, *only one source of mechanical power;* and this is the *conversion of living parts into lifeless*, amorphous compounds." (*Animal Chemistry*, p. 243.)

Now this distinguished writer makes a three-fold division of "medicinal and poisonous substances," namely, 1, metallic poisons which combine with certain parts of the body; 2, anti-septics, camphor, essential oils, &c., *possessing "the property of impeding or retarding those kinds of transformation"* known as fermentation and putrefaction; 3, such as "augment the energy of the vital activity of one or more organs; they *excite morbid phenomena* in the healthy body."

(p. 171.) In p. 179, he speaks of *tobacco* as "a means of retarding the change of matter in the tissues;" and of "*brandy* which, acting as an element of respiration, *puts a stop to the change of matter* by performing the function which *properly* belongs to the products of the metamorphised tissues." He, moreover, distinctly admits that such substances "also *arrest digestion* when taken into the stomach."

Thus, on the principles of this philosopher, we find it admitted, 1st, that alcohol operates *as a poison* in two distinct ways; 2nd, that it retards the change of matter, consequently arrests digestion, and *prevents the nourishment* of the body, which requires the removal of old, and the supply of new and living matter; and 3rd, that it *diminishes strength* by destroying those conditions on which mechanical force depends for its development.

We have seen that the body is not merely a vegetable apparatus; it is also a nervous and *vital* structure, and requires *vital warmth*, as one of the conditions of its existence.

Life (as seen in the egg) is only developed under a certain temperature; which is just as necessary to its continuance as its commencement. Had man been merely a vegetable, the circulating fluid *might* have been as *cold* as the juices of plants; but as a *vital* being *warm blood* is essential to the process of nutrition and life. Accordingly we find that ample provision is made for securing this object in animals, under vast varieties of circumstance and climate. Animal heat, like that of the ordinary fire, depends upon *combustion;* a combustion, however, unattended with flame. Two things are requisite for its production, namely, a *combustible material* (fuel) and a *supporter of combustion* (oxygen gas). Thus, in the candle, lamp, and fire, you have the wick, the oil, and the wood, as fuel to be burned. But unless you allow a free access of *air* (containing oxygen) the candle or fire will burn dully, and if the air be totally excluded (as by putting a candle under a glass case,) the flame will rapidly go out; in fact, it will be *suffocated* by depriving it of oxygen, which *supports its combustion.* This is equally true of animal heat, and its generation in the animal machine. Now we find that the external world is arranged with beautiful adaptation to this new want of the living system. Our food furnishes not only the four-fold compounds for *nourishment*, but also certain three-fold compounds for *fuel.* The latter substances (such

as gum, sugar, starch, fat, oil, &c.) are composed only of carbon, hydrogen, and oxygen; the former have nitrogen, or azote, in addition. Non-azotised food, however, is not the *only* source of animal fuel—for the nitrogenised or nourishing part of food, after it has become vitalized, eventually dies and becomes waste lifeless tissue. In the metamorphosis of this tissue, it is made to yield up its *nitrogen* or azote, which is carried off by certain excretory organs, when the remainder of its elements become elaborated in the liver, going to the formation of *bile*, and thus fulfilling indirectly, in their decay, the same uses as the non-azotised principles fulfil more directly. What wonderful economy and wisdom are displayed in these arrangments!

Thus the food supplies (either directly in its non-azotised elements, or indirectly by the decay of the tissues formed and nourished by its nitrogenised principles,) all the fuel or *combustible materials* to be burned in the vital lamp. The *liver* may be viewed as a patent laboratory (or grate) wherein the fuel is collected and prepared, and reduced to the form best adapted for combining with oxygen, and producing animal heat.

The questions now arise, *whence* do we obtain the oxygen or supporter of combustion, to keep the animal fire burning brightly?—and by what means is it *introduced* into the system?

The *oxygen* used for this purpose is chiefly obtained from the atmosphere, which contains about 20 per cent. of it. This, for nature is always right, is just the proper proportion for animals, departure from which would be injurious. Had the air only 10 per cent. of oxygen, we should be suffocated—and hence every habit or agent which prevents this *due supply*, must, as a constant condition, be pernicious.

This oxygen is *introduced* into the system by RESPIRATION. Hence, in the language of Liebig, p. 335, "animal heat—is highest in those animals whose respiration is most active." The lungs and skin form the apparatus destined for bringing it into contact with the blood. Thus—just as, if there be sufficient fuel, the fire burns and glows vividly when you introduce an extra amount of oxygen, by the play of the bellows—so when, under the power of exercise, the natural bellows of the lungs have fullest play, the internal combustion proceeds most rapidly. The *iron* in the blood-globules

is supposed to perform an important part in this process. Liebig calls them "CARRIERS OF OXYGEN." The iron absorbs oxygen in the lungs, becoming a *peroxide*, and conveys it through the arterial system, as an element essential to vital life ;—in the capillaries, or hairlike extremities of the blood-vessels, where the arterial runs into the venous system, the vital globules yield up their oxygen ; the iron then absorbs carbonic-acid, becoming a *protoxide*, passes on with the dark colored venous current to the lungs, and there yields up its carbonic-acid-gas, or foul air, which is expired; and thus it performs an important function in the purification of the vital fluid, in the conversion of poisonous-venous into the arterial or nourishing blood. The *heat* elicited—the *change of matter* effected—and the *amount of strength* or force developed—may thus be measured by the quantity of *oxygen absorbed*, and of *carbonic acid* expelled.

I may observe, that though this process of generating animal heat, is essentially a *chemical* one, it is yet favored or retarded by the condition of the nervous system. Though Liebig says that "chemical action is the sole *source* of it," it cannot be questioned that physiological experiments have demonstrated that *nervous* and *mental conditions* intimately *affect* its production, lessening or increasing the quantity of carbonic-acid liberated, and of oxygen consumed. The truth is, that injuries to the physical or nervous system, materially affect the chemical functions and processes ; as, contrariwise, a disturbance of the last necessarily impairs or injures the former. The wisdom of nature is displayed in this—that in the healthy operations of the animal machine, those *elements of food* which stand related to the process of nutrition, do not disturb the *function of respiration*, nor, on the other hand, do the elements of respiration disturb the vital and nutritive functions, or (like alcohol) impair the nervous system. On the contrary, they are mutually dependant on, and necessary to, each other. It follows, therefore, that any element of respiration which does not assist that function *in harmony* with the laws of the nervous and nutritive functions, must be an *unnatural element of respiration*.

Professor Liebig supposes, (Mr. Jeaffreson retails only a fractional part of that great man's theory,) THAT ALCOHOL IS AN ELEMENT OF RESPIRATION—"that the elements of alcohol combine with oxygen in the body; that its carbon or

hydrogen are given off as carbonic acid and water." (p. 239.)

But, granting that some portion of this alcohol *may* become decomposed in the blood, the question arises, does this take place without injury to other functions of the system; or is its combustion effected naturally and beneficially? If not, its use must be as indefensible as ever.

"The oxygen (says Liebig) which has accomplished this change *must have been taken from the arterial blood.*" "It is, consequently obvious, that by the use of alcohol, *a limit must rapidly be put to the change of matter* in certain parts of the body. The oxygen of the arterial blood, which, in the absence of alcohol, *would have combined with the matter of the tissues*, or with that formed by the metamorphosis of these tissues, now combines with the elements of alcohol. *The arterial blood becomes venous*, without the substance of the muscles having taken any share in the transformation.

"Now we observe, that the developement of heat in the body, after the use of wine, increases rather than diminishes, *without the manifestation of a corresponding amount of mechanical force.*

"A *moderate quantity* of wine, in women and children unaccustomed to its use, produces a *diminution of the force necessary for voluntary motions.* Weariness, feebleness in the limbs, and drowsiness, plainly shew that *the force available for mechanical purposes*—in other words, the change of matter,—*has been diminished.*

"A diminution of the conducting power of the nerves of voluntary motion," that is, partial *paralysis,* "may doubtless take a certain share in producing these *symptoms;* but this must be altogether without influence on the sum of available force.

"What the conductors of voluntary motion cannot carry away for effects of force, must be taken up by the nerves of involuntary motion, and conveyed to the heart, lungs, and intestines. In this case, *the circulation will appear accelerated at the expense of the force available for voluntary motion;* but without the production of a greater amount of mechanical force, by the process of oxidation of the alcohol." p. 240.

Another consideration also proves that it is an alien to the wants, and a rebel to the laws, of the animal kingdom. The *natural* elements of respiration, such as starch, sugar, and gum, are converted into the *natural fluid bile,* BEFORE they assist in

sustaining the heat of the body, or in supporting respiration. *But alcohol cannot possibly be converted into bile.* It therefore is an unnatural element of respiration, which *prevents the combustion of natural agents*, and deranges the usual vital and chemical processes of the animal economy.

I question, however, whether alcohol is so easily decomposed in the system as Liebig represents, and I contend that many physiological experiments (of which he does not seem to have had any cognizance,) support the position, that this irritating and most indigestible substance, as regards the great bulk of it taken at any time, passes off from the system, through the skin and lungs, *unchanged and undecomposed.* Be that, however, as it may—for the matter, as regards the question of teetotalism, is scarcely worth contending for,—the experiments of Drs. Prout and Fyfe have long ago demonstrated that the use of wine is *most adverse to the function of* RESPIRATION. Those experiments proved, that as long as the effects of alcohol were at all discernible upon the system, so long did the amount of carbonic acid expired continue *less than the healthy standard.* The results are thus briefly expressed by Dr. Copland, in his appendix to Richerand's *Physiology*, (1829.)

"The passions of the mind were found to have a great influence over its production; *the depressing passions diminishing its quantity*, and those of an opposite nature the reverse; exercise, when moderate, appeared to increase in some measure the quantity, but fatigue diminished it.

"THE GREATEST DECREASE EXPERIENCED WAS FROM THE USE OF ALCOHOL AND VINOUS LIQUORS, especially when taken upon an empty stomach. In short, whatever *diminished the powers of life*, as low diet, &c., appeared to have the effect of diminishing the quantity of the carbonic acid." p. 626.

[Dr. Lees then proceeded further to evince its influence on the respiratory process, demonstrating its agency in carbonizing the blood, and thus engendering that morbid condition of the vital fluid which favors an obese and bloated habit. This exposition of what he styled "*The fat-fallacy*," and several other extracts from the address, (here omitted for want of space,) will be found in the *Appendix* to the "ILLUSTRATED HISTORY OF ALCOHOL," now publishing.]

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