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Alcohol
as an
Etiological Agent.

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After fixing on the above as the subject of a Thesis, I at first felt that it might not be quite suitable for an Academic exercise; but on reflection I could not fail to perceive the claims which it has on the Medical Profession, as its great importance must be evident whether we view it in reference to the diseases which it produces in the individual, or to the mental degradation which closely follows in its train, or yet again, to the influence which may be entailed on distant generations by the hereditary transmission of the diseases so acquired.

The serious constitutional effects both the continued use of Opium or Mercury give rise are suitable subjects for medical dissertations and are acknowledged to be so by all: and why should not alcohol, the abusive use of which, if persevered in, is no less productive of ruin to the system than either of the above? Especially seeing that the abuse of alcoholic drinks has operated in increasing very much the frequency of some diseases and in altering the characters of others, so that new trains of morbid symptoms manifest themselves, and a degree of danger, otherwise unknown, attaches itself to some maladies of the victim of intemperance, which materially affects the prognosis of the physician. *

As guardians of human life it demands the attention of the medical world, for the pestilence that sweeps over countries strewn with the wreck of mortality in so much that even the "extrema funera" seem likely to be denied from the multitudes.

* see Appendix B

=ude involved, cannot number among its horrid trophies so many as this scourge which, slowly it may be, moves along engulfing in its fearful vortex unnumbered thousands. Its depopulating effect exceeding that of disease is seen in the remark of Lord Kaimes that the small-pox among the North American Indians had not killed so many as intoxicating liquors had done, and it is a fact of great notoriety that whole tribes of these Indians have become extinct by intemperance; yet, while the pestilence from its suddenness causes alarm & dismay & is carefully studied and energetically opposed, the latter, till very recently, has attracted but little attention and has been very much left to do its work of desolation on its more extensive scale. The reason of this may perhaps be found in the great increase of drunkenness of late years, for it is now the clamant evil of our day: the votive offerings laid on the altars of heathen idolatry are small when compared with those presented at the shrine of this god. In estimating the effect of alcohol in shortening human existence we must not overlook the influence which particular habits of life have on the general rate of mortality. Sir Henry Hallford in speaking of the speculations with which philosophers amused themselves as to the period of decay as ascertained from the successive alterations which the frame underwent in early youth, says, that such calculations must be imperfect, seeing that, in addition to neglecting moral causes, they leave out of consideration that various accidents & habits of living more frequently determine the number of a man's days than the stamina with which he was born.

And M. Villermé by his valuable observations made on the ~~causes~~^{causes} of disease in Paris has satisfactorily shewn that no cause, save that of the habits of the individuals, bears a just relation to the amount of mortality. Now when we take this fact into consideration we cannot fail to see how intemperance, which sinks the physical condition & moral character of those who are addicted to it, is but too fit a subject for medical investigation, & while drainage is improved, ventilation attended to &c &c it would behoove a want of that enlightenment which has so long characterized the profession did they omit to consider the real cause, that which lies as a canker-worm at the root of so many of our social evils & which paves the way to the most aggravated and extensive forms of epidemic maladies.

Again even in an economical point of view the subject of intemperance deserves medical attention, for from this vice our hospitals and asylums are greatly peopled, our public charities often wasted, and our Dispensaries crowded, for all feeling of self-respect & independence are sunk in the one absorbing feeling of the momentary gratification of the vicious & depraved appetite which previous indulgence had fostered, till, having gained the ascendancy, it tyrannises over its victim with despotic sway.

Nor is this a vice which has but a recent origin and which is confined within narrow bounds, for we find it existing at the most remote periods of antiquity, & in every soil it has struck its roots deeply, so that - however separate from each other in the scale of civilization the nations are, - however opposite the nature of

the climates in which they reside; - or antagonistic their religious creeds - however remote from each other in Botanical arrangements the plants are which have yielded them; - or various the processes by which they have been obtained, in almost if not in every region of the globe intoxicating druggs have been prepared.

(I have illustrated this subject in ~~the~~ appendix, A.)

I shall not enlarge further by adducing more proofs of the importance of this theme in a medical point of view, as what has been already adduced cannot, I think, fail to justify my making the effects of ~~excess~~ in alcoholic liquors on the human frame the subject of a dissertation.

Before treating of alcohol as a cause of disease it may be well to describe its physiological action as exhibited in the various phenomena which are generally included under the vulgar term "a fit of intoxication" since many of the transient effects so produced, when rendered more permanent by habitual intemperance become merged into some of the diseases of which we shall afterwards treat.

When alcohol is first taken into the stomach we observe a marked effect on the action of the heart both as to its frequency & strength, these being increased, which effect seems to be produced by the well-known sympathy that exists between the two organs which may be owing & indeed the whole vegetable functions are

summoned to increased action, which may be owing to the stimulus given to the Semilunar ganglion & to the sympathetic system generally whose special function it is to preside over this part of the economy, the digestive powers are for the time increased as the gastric juice is poured out in increased quantity, & the other secretions also share in the same exaltation of function from the augmented supply of blood which is now sent to them, and a glow of warmth is diffused over the whole body. The animal functions are also excited to increased action, there is a liveliness in the whole appearance, a tranquil condition of mind is present & the imagination often pictures the most pleasing scenes, while acting on the maxim "vino pellite curas" the individual seems to have succeeded in removing to a distance all the anxieties which may have previously engrossed him; & a volubility of language is also present. But, while this is the condition of those who are constitutionally of a happy disposition, or whose previous melancholy was produced by circumstances *ab extra*, the very reverse is generally witnessed in the case of the constitutionally morose; their surliness often assumes a darker shade while they quarrel with, & fret at, all around. Between these we have endless varieties of characters in whom as various effects are manifested but in all at this stage reason is still present though the mandates of the will are less effective than formerly. The muscular power is now also exalted. When the stimulus is further indulged in, a new train of symptoms manifest themselves,

the eyes which were but a little before bright & sparkling are now dim & glazed objects appear indistinct which may arise from the following circumstances, the disordered condition of the cerebrum, compression of the optic nerve by the distended state of the arteria centralis retinae, & the projection forwards of the retina by the turgescence of the choroid vessels behind so that the proper focal distance is inter^{fered} with; - or diplopia is established, from the axes of the eyes being in a different plane; the countenance which was lighted up with intelligence is now unmeaning and idiotic, & the individual experiences tinnitus aurium & vertigo, his ideas are far from being clear, reason is hurled from her seat & the disordered mind finds in the tongue an organ equally with itself unable to discharge its function of giving expression to the thoughts, for the speech is thick as its movements are impaired. Often the effect on the brain at this stage produces a state of nausea & the stomach may by the act of vomiting get the noxious material, in great measure, dislodged, or at least the system by the succussion so produced may rally completely from the effects or have the symptoms much mitigated: this last is probably the more correct view, for the mere removal of the alcohol from the stomach by the stomach-pump does not confer on the individual the same palpable benefit which the act of vomiting does. The muscular action, I should have mentioned, is now weakened as evinced by the tottering & unsteady gait & the inability to stand erect; & to add to the loathsomeness of the scene, the sphincter muscles are

Sometimes, in such cases, relaxed. Sleep may succeed to this, but he awakes ^{the victim of intense prostration} with febrile symptoms, as marked by the excessive thirst, the dry & coated tongue, corporeal & mental languor, a chilling sensation over the surface of the body, a feeling of nausea, & the appetite gone. Such is the morbid train, which the Righteous Governor of the world has linked with such excess, intending it as a plain intimation of the total contrariety to our moral and physical nature which such a course implies.

There is yet a stage in advance when coma supervenes & with it brings a complete suspension of all the cerebral functions & sometimes this is of such a nature as to be attended with no small danger, for the medulla oblongata may become affected from the circulation of the venous blood, so that, on the one hand, no impression is felt of the necessity for breathing, nor, on the other, is any nervous influence transmitted, & hence the respiration gradually grows slower & slower until it at last ceases, & on post-mortem examination, the same appearances as in death by asphyxia are presented to the view; the left side of the heart being comparatively empty, while the right auricle and ventricle together with the pulmonary arteries are found gorged with blood.

Dr Carpenter has described these physiological phenomena in the following clear & able manner. "The selective power of alcohol appears to lead it in the first instance to attack the cerebrum, the intellectual powers being affected before any disorder of sens="

ation or motion manifests itself; & to this it seems to be limited in the first stage of intoxication. But with the more complete perversion of the intellectual powers which characterizes the second stage we have also a disturbed function of the sensory ganglia upon which the cerebral hemispheres are superposed; this disturbance being indicated by the disorders of sensation & also by the want of that control over the muscular movements which require sensation for their guidance. In the third stage the functions of the cerebrum & sensory ganglia appear to be completely suspended & those of the medulla oblongata & spinal cord now begin to be affected as we see to be indicated by the difficulty of respiration, the strabismus, the dilated pupil & the tetanic spasms. As already stated the admixture of alcohol has a tendency to give a venous character even to that of the arteries; & when this tendency is augmented by imperfect respiration the blood will become more & more venous until its influence on the medulla oblongata is so directly poisonous that its functions are completely suspended, the respiratory movements are brought to a stand & death takes place by asphyxia precisely as in narcotic poisoning by other substances." Thus we find in regard to alcohol what is common to all stimulants, that when employed in a minor degree there is an exaltation of the functions as illustrated by the vivid imagination, increased muscular power &c: when carried to a greater extent we have a perversion of these functions as shewn in the

confusion of ideas & staggering gait; & when carried to a still higher degree, a loss of these functions as manifested in the total unconsciousness & complete prostration of strength.

In considering the diseases produced by Intemperance whether as a predisposing or exciting cause, I shall, for the sake of greater method, group them together according to the systems to which they belong. - Thus then the first we have to consider is the Nervous system; and in connection with this we have Insanity, Dipomania, Delirium Tremens, Encephalitis, Apoplexy, Epilepsy, Paralysis & Hysteria, all occasionally caused by alcoholic excess. We shall consider each separately.

Insanity. - Dr Prichard remarks that, among the physical causes of madness, one of the most frequent is the immoderate use of intoxicating liquors, & that "ardent spirits are perhaps of all the most injurious in their effects, particularly on the lower classes in the Northern countries of Europe & America": and that these have been the real cause in many cases is evident from the fact which he mentions viz. that "it often happens that when the exciting cause is removed the effect begins to lessen & eventually ceases. When these patients are prevented from obtaining stimulating liquors & are treated with sedative remedies, they quickly shew signs of amelioration & the subsidence of disease". But not only have

we his authority, however high that deservedly is, but repeated observation bears its testimony to the same fact, that, in pauper asylums for the insane, we have a great proportion of the cases arising from intemperance. We have evidence of this on a larger scale in the tables published by the Metropolitan Commissioners of Lunacy in 1844, in which we find that 1799 out of 12007 cases of which the causes were supposed to be known were put down as being caused by intemperance; & 551 are laid to the account of vice & sensuality, in which we must include alcohol as having an important share in the production of the insanity. In commenting on this table Dr Carpenter judiciously remarks that of those which are set down to hereditary predisposition the fact is notorious that often this predisposition remains latent till summoned into being by habitual intemperance; & accordingly a great number of the 2526 cases set down to the score of hereditary taint should be attributed to intemperance; also of the 3187 which are marked as from bodily disorders, & the 2969 said to be owing to moral causes we must allow a considerable share to the effects of intemperance.

In the Medical Times, Vol XV, Dr Joseph Williams gives a table, in which the total admissions into a number of asylums is given, & the proportion of these which were owing to intemperance in spirituous liquors, which bears out fully the justice of enlarging the influence of the sphere of excessive indulgence

in spirits beyond what the Metropolitan Commissioners attributed directly to this cause. The table is as follows.

	Total Admissions	Proportion caused by Intemperance	Those caused by intemperance are (when the returns from all these asylums are considered) to those from other causes in the proportion of about 1 to every 5.3.
Charenton	835	134	So marked is the resemblance between certain stages of intoxication & insanity that the remark of Seneca is not more strong than true "ebrietas est voluntaria insania"; & when this indulgence is long per-
Bicêtre & Salpêtrière	2012	414	
Bordeaux	156	20	
Turin 1830-31	158	17	
Turin 1831-36	390	76	
Gard	209	4	
United States	551	146	
Palermo	189	9	
Caen	60	16	
Dundee	14	4	
M. Parchappe	167	46	
M. Bottey	288	54	
Total	5049	940	

severed in, the continual excitement of the functions of the cerebrum & the organic changes in its substance, remove the possibility of exercising its functions aright beyond the sphere of the will. Again, when we consider the phenomena of Delirium Tremens, which has been called "Mania e potu", of which we shall immediately treat, we can be at no loss to understand how true mania might result, that is, that what we observe in the former case to be of a more transient nature, should, in the latter, become more settled & perhaps permanent; I have

said perhaps for Dr Prichard has observed that such cases of mania are commonly among the most easily cured.

I have spoken of chronic changes in the cerebral substance as causing insanity, for it has been stated as the result of post-mortem examinations in 100 cases, that chronic or acute cerebritis is the great cause of mental alienation; and hence, whether the disease be functional or organic, we see how alcohol would be a potent agent in producing it.

Dipsomania or Oinomania, which is called in legal language "Dementia affectata", consists in an utter inability to resist the strong inward impulse to excessive alcoholic potations. It is a species of insanity & is often the result of previous intemperance, occasionally exhibiting the ordinary features of the periodic form of drunkenness: but it may be hereditary, being transmitted from an insane or intemperate parent; or it may arise from whatever weakens the nervous system either directly, as by hæmorrhage, or as the result of previous over-excitement, as in excessive venereal indulgence, or where there has been great mental exercise & the brain has been called upon to perform more work than it was capable of doing; or yet again, it may occur at the menstrual period when the appetite seems to be often peculiarly morbid as seen in the substances which it craves e.g. chalk, slate pencils, & this among the rest.

Delirium Tremens is proverbially the fruit of excessive

indulgence in alcohol, appearing after the stimulus has been suddenly withdrawn; the nervous system, seeming to have been previously exhausted & only able to exercise its ordinary functions when stimulated, manifests this exhaustion when the exciting agent is withheld. The delirium which is induced during intoxication when the face is flushed, the pulse full & hard, & the symptoms of violent excitement more clearly shown exhibiting fierceness & malignity, & which is in fact only one form of Delirium Tremens as occurring in the robust & plethoric & which may consequently be expected at an earlier stage of the career of the person so addicted, as nutrition has not then been so seriously interfered with, - has been called by some Delirium Ebriosum & is very much allied in its character to mania, & may be owing to a temporarily congested state of the membranes of the brain. The other form of Delirium Tremens is where the face may be pale, the pulse often quick, but soft, tongue loaded but moist, skin soft & perspiring often profusely; sleeplessness forms a prominent feature in the disease, being sometimes for three, four or five days; there is a constant & incoherent talking; busy delirium; catching movements of the fingers on anything that may be near; often also subultus tendinium. On speaking to the patient he may answer quite correctly, but, in a little while, again becomes

incoherent & wandering, sometimes supposing that some other individual is present, he addresses him, & after waiting during the time when the reply should have been given, again speaks. Sometimes he imagines some spirit to be present, & all the objects ~~commonly~~ ^{commonly} which his disordered imagination brings up are of a painful & distressing kind: Thus rats or mice may be conceived to be running over him, or some one to be anxious to take his life or to injure his person, hence his look is one of suspicion to discover his supposed enemy. Indeed the extravagant notions that pass through the patient's mind are innumerable: there is no indication of local pain; a very constipated condition of the bowels is present; the urine is scanty & pale and deficient in the phosphates, Dr Jones having found them in one case so low as .06 per 1000, which together with the pale colour of the urine seems to show that this is not of the nature of an inflammatory affection; for in Phrenitis the phosphates are much increased, there being a great destruction of cerebral substance, & it is also in such cases of a high colour; the condition of the pulse, countenance, state of skin &c also aid us in forming our diagnosis as to the nature of the disease, which is of great importance, the treatment which would be salutary in the one case proving most pernicious if employed in the other. The symptoms may increase in severity & a low typhoid state supervene & a convulsion may close the scene; or a

season of quietude may occur, & death succeed to this without a struggle. The pathology of the disease is very obscure, it seems to be merely functional & to result from nervous irritation; though some, as M. Levielli, think that it results from some poisonous influence exerted on the brain by the alcohol after being absorbed & conveyed thither. It seems to reside essentially in the grey matter of the convolutions, but the highest powers of the microscope have failed to discover any organic change. Although it very frequently indeed traces its origin to alcoholic liquors, it is by no means always so associated, for it may result from the habitual use of opium & even from a state of intense mental anxiety; an example of the latter fell under my notice, of which I regret I did not take notes; but so far as I can remember them I ^{shall} ~~would~~ relate the circumstances of the case, & for the imperfect account which I may give, the above may serve as my apology. It is interesting also as showing the amount of opium which may be taken without the pervigilium being counteracted, & also as exhibiting the beneficial effects of Chloroform. - Mrs. G., aged 49, reputed to have been of very intemperate habits, had an attack of apoplexy in the month of August last when I attended her for the first ^{time}; she was purged, & cupped on the nape of the neck & from that time was put upon spare diet & all the usual injunctions were enforced as to mental excitement being

avoided &c &c: & I have good reason to believe that they were strictly attended to. Nevertheless she had, from time to time, similar attacks, unattended with any subsequent paralysis, which gradually assumed more & more of the epileptic character, the spasmodic action forming a prominent feature in the seizure. I attended her also during two of these, but during the subsequent ones another pupil from the Dispensary saw her, I having left it for the time; I however, though not in attendance, occasionally saw her during some of them. On Monday January 27th I was summoned to see her, the messenger declaring that she had been from the previous Thursday in a state of high excitement. On my arrival I found her as he had described, in a state of constant motion, starting up in bed very now & then & having in her countenance the appearance of intense anxiety: the pulse was weak but not much excited. She continued in the same state while I remained. I ordered ℥ʒ of Sol. Mur. Morph. to be given her in two doses at an interval of two hours between them, also cold to be applied continuously to the head by means of wet cloths. By ~~cont~~ perpetually rubbing her left eye she caused slight conjunctivitis to be lighted up. At one o'clock I returned along with a pupil from the Dispensary as I wished them to get the benefit of that Institution. We found her still in the same condition, earnestly entreating us to put her out of pain by depriving her of life, for she

seemed willing to suffer at our hands that death, which, she supposed, some unseen individuals were attempting to inflict; & she could scarcely be kept in bed. We found on enquiry that she had taken the draughts, but they had only produced a slight alleviation of the symptoms for a short time, for all these were again as before. As it had all the appearance to our minds of a maniacal paroxysm, we thought that water in the form of the douche might be beneficial in allaying the excitement; accordingly we poured over her head, in a continuous & pretty full stream & from a considerable height, four pail-fuls of cold water, after which she was greatly calmed. We then ordered the following prescriptions \mathcal{R} Sol. Mur. Morphiae \mathcal{Z} ij aquae Cinchamoni \mathcal{Z} ij \mathcal{M} . Sig. One half to be taken immediately & if the excited state still continue, the other in two hours after. - also \mathcal{R} Gum. Camphor. \mathcal{r} XVIII test. Hyosciami \mathcal{r} XII \mathcal{M} ft. maza quatuor in pilulas XII divide. Sig. Two to be taken every two hours. We observed that the skin was moist, & a suspicion began to be entertained that it might be Delirium Tremens.

At 4 o'clock M.C. (the gentleman who had accompanied me at 1) called & found her much in the same condition as that in which we had seen her three hours before: the tongue at the back was coated & moist; the skin was also moist. She was now observed to be picking at the bed-clothes & looking with suspicion under them from time to time.

On questioning her daughter he discovered that Mrs G. was of a pensive character, & that she had for some days before her illness been observed to talk very much about a son who had gone to sea some years before, & who, she feared, was now lost, as she had heard nothing of him for a long time. On considering all the above circumstances he was now confirmed in the former suspicion of its being Delirium Tremens, & accordingly intermitted the Camphor & Hyosciamus Pills, & ordered 2grs of Opium immediately, 1st two hours after & 1gr every hour subsequently till sleep was induced; he limited the number to be taken to 5. About 8 o'clock I called & found her as before, & in addition to the above prescription, I ordered Rj. Sinct. Assafoetidae ℥j; Ol. Ricini ℥j; Atheromat. Oj. Rft enema, in rectum injiciendum, in consequence of the constipated condition of her bowels & the great flatulent distension of the abdomen, also, Turpentine cloths to be applied to the abdomen externally. Mr C. on visiting her on the following morning at 10 o'clock found no improvement but rather the opposite, for her voice was now scarcely audible; she complained of her throat being "pown up", as she expressed it, & said that she had lost her reason. The bowels were still unmoved notwithstanding the administration of the enema the night before; another enema was ordered & Croton oil pills. He found that the opium pills ordered had been taken, the

again ordered 2 pills of Opium (18 each) to be taken immediately & one every hour thereafter till sleep was procured. She returned at 4 o'clock & still found her becoming weaker & weaker, & gave directions for the pills to be continued.

On considering the matter we feared that a rapid & fatal termination would ensue were this restlessness & nervous excitement to continue much longer, judging from the great change which had taken place from the previous day; & we thought that what was denied to opium might be conceded to Chloroform, we accordingly in the evening at 7 o'clock visited her, & finding no amelioration of the symptoms, (though 9 opium pills had been taken of those last ordered,) but the weakness rather augmented, we administered the anaesthetic agent; she speedily came under its influence, all sources of disturbance were removed, the light being excluded & perfect quiet maintained. As she had, within 32 hours, taken 5iss of Sol. Murial. Morph. & 14 opium pills (18 each), we feared that, while she was under the Chloroform, the action of the opium might be favoured, & therefore returned in about 3 hours & found her again awake but calmer than she had been, but still picking at her neck & looking suspiciously under the blankets; we learned that she had only remained under the Chloroform for 25 minutes: we administered it again & she again recovered quickly from its influence; a third time the

agent was administered & we left her sleeping. When Mr. C. returned in the morning he found her sleeping calmly, the pupils presenting natural contractions, the breathing also natural; & on questioning he ascertained that she had continued under the influence of the third dose for half an hour, after which she sat up in bed but as quietness was preserved she soon sank back on the pillow & again fell asleep. At 1 o'clock P.M. we found her still sleeping, we got her awaked & ordered some nourishing food to be given her, which she took, & again falling asleep, she slept, with little interruption, till next morning; the pupils being in a natural state during the whole time. When she awoke next morning she was calm & rational, & improved rapidly from that time.

Encephalitis. - Habitual drunkenness is perhaps one of the most powerful causes of cerebritis & arachnitis, & the reason is apparent on considering the direct contact of the irritating alcohol with the substance of the brain & its membranes, causing as it does cerebral congestion & also destroying that nice balance which exists between the process of nutritive assimilation & that of absorption of the effete portions of the cranial contents; or again it may predispose by exalting the functional activity of the organ & so rendering it more liable to take on an inflammatory action when some other circumstance may supervene, which, but for the previously excited condition would have been inert, & this latter event is far from

being unlikely, seeing that the individual while in a state of intoxication is specially liable to external injuries of the head. The vitiated state of the secretions of the alimentary canal to which alcohol gives rise & which ~~is~~ is regarded as a very active & frequent cause of this disease, points us to another way in which alcohol may produce it

Apoplexy, which is a complete suspension of sensation & motion while the respiration & circulation still continue, is among the evils of intemperance; & when we consider how nearly this condition is realized in the case of a thoroughly intoxicated individual, we can have no difficulty in conceiving how the above affection could be induced. The pupils dilated in some cases, contracted in others; the inspiration attended with starts, & the expiration with puffing out of the cheeks; respiration slow & laborious; the face turgid, in some cases flushed, & in others livid; the alvine evacuations passing involuntarily, & the urine unconsciously & c. c. these, which are regarded as some of the symptoms characterizing the apoplectic attack, have also been observed in advanced cases of drunkenness. Nor have these symptoms, in the latter case, been always evanescent, for D. Ogston relates some instances in which they did not pass off for 8 or even 16 hours. Were anything else needed to show the difficulty of distin-

quishing the two conditions, it is to be found in the following anecdote which the late Professor Gregory used to tell of his father, who, on being called to a case of this kind, ordered blisters & sinapisms &c to the unfortunate individual who, on awaking on the morrow free from the effects of his night's debauch, was in no small degree surprised to find that he had been the subject of such heroic treatment, as it had been but the result of his too free indulgence in the intoxicating beverage. It is easy to understand how a case of simple apoplexy, as Dr Abercrombie called it, where a congested state alone of the cerebral vessels seems to have been present during life, would result from a merely exalted condition of the ordinary fit of intoxication. Again the serous Apoplexy might be so induced: at least in some cases where death has occurred suddenly after coma induced by intoxication, serous fluid has been found effused in increased quantity, as, for example, in a case that occurred to Dr Alison where a person, after reeling home in a state of drunkenness, fell into a lethargic condition & died in 20 minutes; & the only morbid appearance after death was some watery effusion on the surface of the brain & in the ventricles. The sanguineous or common form of apoplexy in which blood has been extravasated into the substance or on the surface of the brain is a common result of intemperance. Dr McNish remarks that 7 out of every

10 Many liquor drunkards die of apoplexy or palsy, & to account for this, we have only to remember what the researches of Liebig have pointed out, viz. that there is a gradual shrinking of the substance of the brain from the alcohol displacing the ordinary aqueous fluid in that as in other organs & thus the vessels, being, at many parts of their course, left unsupported, will have a tendency to yield before the strong current which the increased action of the heart has occasioned: we must not omit to mention that, in the case of the intemperate, the coats of the blood vessels, as we shall subsequently see, are apt to undergo degeneration & also that the heart is very apt to become hypertrophied; & thus a triple cause for the explanation of the occurrence of apoplexy exists.

Again, we may consider the altered condition of the blood (the fibrin being deficient in plasticity,) as tending to favour morbid exudations; we observe such an effect in scurvy; & the experiments of Magendie on dogs have shewn that by removing a portion of fibrin by whipping blood drawn from a vein & re-injecting the cruer, there was an exudation of this altered blood: Now in the case of the drunkard the abnormal shrinking of the substance of the brain would invite the occurrence of the exudation there. But, whether or not the changed condition of the blood be a reason for the exudation, we know that haemorrhage from different parts of the body is very liable to occur in drunkards, explained ~~as~~ how we

may. Besides the purely physical change in the cerebral substance which we have adduced from Liebig, Dr Armstrong mentions a state of chronic inflammation of the brain & its membranes resulting from intemperance in alcoholic drinks where the diameter of the vessels is diminished in one place & increased in another so that they assume a varicose appearance, while the surrounding brain losing its delicate & elastic texture, is in some places unnaturally hard & in others unusually soft, & hence in such a case as this apoplexy might easily occur. In estimating the liability to, & explaining the occurrence of, this disease in the intemperate, we may also take into account the great liability to external injuries of the head in their case, viewed in connection with the congested state of the cerebral vessels at the time.

The unanimous voice of the Medical profession declares that alcohol is regarded by them as an undoubted cause of this disease, for abstinence from all spirituous liquors has long been enjoined on those who have had any threatening of an attack. When a person has once been affected with apoplexy, specially if advanced in life, it is astonishing how small an amount of alcohol will, in some such cases, again induce it. A singular instance of this kind is recorded by Dr Trotter of a gentleman who could not take two glasses of wine without defect of voice & speech. & Stator supervening

Epilepsy may occur during the existence of a fit of intoxication as is shown in an interesting case related by Dr Christison, as communicated to him by Dr Traill, of a boy 7 years of age, who had been induced to take nearly 5% of undiluted whiskey, & who suffered for two days from the ordinary effects of excessive intoxication, which were then immediately followed by epileptic convulsions, which continued to recur with more or less violence, but always frequently, for two months at least. Indeed there are some who cannot indulge their morbid appetite at any time without having an epileptic attack. If we regard epilepsy, as is now done by many, as connected with a disordered state of nutrition of the cerebral substance, it is very manifest how alcohol could produce it; for, as we have mentioned under the head of apoplexy, the natural amount of water, which, in the case of the brain, is equal to four-fifths of the whole substance, is displaced in a great degree by the alcohol, (it is stated by Dr Sharpey that by immersing a brain in alcohol & afterwards evaporating we can remove the water) & thus that agent, which performs so important a part in the various changes which are continually going on in the substance of organs, being removed, the changes themselves will be seriously interfered with; & besides, it is not unlikely that the albuminous matters are coagulated to a certain extent, though of course slowly from the limited

amount of alcohol which is in contact with them at one time, & this may partly account also for the hardened condition in which the cerebral substance has sometimes been found, though no doubt in many such cases it is the result of chronic inflammation. Again, by giving rise to congestion of the brain or to organic diseases of the heart &c it may predispose to this affection. A most severe case of epilepsy came under my notice last autumn in a Dispensary patient whom I had treated for general dropsy in connection with albuminuria, which had greatly disappeared, so that he was again able to resume his work. Being from home at the time when sent for, which was 7 o'clock on a Monday evening, I did not see him till between 10 & 11 o'clock P.M., when I found he had had 7 epileptic attacks, which, notwithstanding the remedies employed, continued to return from time to time, at very short intervals, till the morning of the following Thursday, when he died. I discovered afterwards, on questioning, that he had for some days previously been indulging immoderately in spirituous drinks, & I could not but regard this as an instance of the disease being so produced, though probably, in this instance, through the medium of Bright's disease, constituting what some, through over-refinement, have called Nephritic epilepsy, wh is in fact only one of the forms of Eccentric epilepsy

Again, puerperal convulsions, which have a very close resemblance to an intense form of epilepsy, are traceable to excessive indulgence in ardent spirits as a very common cause.

Paralysis Agitans in drunkards results from the irritability of the nervous system induced by their habits of life; ^{results from the} it is, moreover, ^{state of the nervous system arising} greatly enfeebled, from the same cause, as manifested, among other things, in the great facility with which certain secretions, for example, the lachrymal, are induced, very trifling causes being sufficient for this end; now we find this same liability to be easily moved in the case of those who have been affected with diseases of the nervous system which have weakened it. An aggravated form of this involuntary motion is on record, where a woman, greatly addicted to intemperance, if, during intoxication, she was violently excited, was often seized with convulsive motion in the muscles of the lower part of the face, which sometimes produced dislocation of the lower jaw.

Dr Huss has recently described very fully this affection of the nervous system as constituting a part of what he calls "alcoholismus chronicus," where, after a long continued use of spirituous potations, the voluntary muscles become unsteady & are affected with tremors, those of the upper extremity being first affected, then those of the lower, & lastly those of the trunk, & as the habit is continued, the loss of power

increases, & paralysis may supervene." The patient first remarks that he cannot hold things so fast as heretofore, soon too he finds that objects, which he has taken up, fall involuntarily from his hands; & as he exerts himself to avoid this inconvenience, the hands begin to shake & tremble, & he calls this nervous debility, & endeavours to correct this by fresh doses of ardent spirits. This loose-handedness, if I may so term it, passes on sooner or later to incomplete paralysis, wherein, at first, nothing can be retained, & subsequently nothing can be grasped, by the hands. Though the hands & fingers are thus weakened, the humeral portion of the arm retains a considerable degree of strength, so that the debility is most marked in those parts which are farthest from the nervous centres." The lower limbs in this case also gradually exhibit the same phenomena; & in some cases where there were tremors & occasional convulsive twitchings & loss of power, there was observed to be present spinal irritation in the lower part of the cord. One reviewer of Dr. Russ' work has suggested that these phenomena might be owing to the adulterations of the spirituous liquors; now, while I doubt not that this may form an important item among the facts from which the conclusion is drawn, still, when we consider the effects on the nervous system which alcohol produces, as witnessed in the case above mentioned, & in many others which might be adduced, & remember,

moreover, that Sweden, according to Dr Huss, has the miserable pre-eminence of being the most drunken country in Europe, we cannot but strongly suspect that a great part at least of the effects was really owing to the ardent spirits. Mr Marshall, Deputy-Inspector General of Army Hospitals, mentions the case of an officer, a patient of his, who was suffering from paraplegia in consequence of intemperance, & remarks regarding adulterations being supposed (as they were very frequently by the soldiers) to be the cause of the diseases under which they suffered, "I am disposed to think that the extensive & demoralizing & poisonous influence of spirit-drinking in the army on foreign stations is to be attributed much more to the quantity of spirits drunk than to any peculiar quality of the liquor."

Hysteria. This protean malady may be found as an effect of the indulgence in intoxicating drinks. It may occur before the effects are worn off, but it is also frequently traceable to the influence which over-indulgence has had in causing Amenorrhoea which is well known to be frequently attended with hysteria. The peculiar mobility of the whole nervous system which forms so marked a feature in this disease is one of the results of excess in alcohol; & many women have experienced an aggravation of all their symptoms by still continuing their potations. It may be an interesting question how far a propensity to

drunkenness in a father may be the cause of the occurrence of this affection in his daughters, from his having transmitted to them that constitution which in their sex would naturally exhibit itself in hysteria. The affirmative answer is that to which we certainly incline.

Circulatory System

Blood. The effects of alcohol on this fluid are very important in a pathological point of view. When blood is mixed with alcohol & viewed microscopically, there has been observed a diminution of the volume of the red corpuscles (which is just what we might ^{have} expected from the chemical action of the alcohol on their albuminous walls) & a certain amount of the colouring matter has been found mingled with the liquor sanguinis. Now as these corpuscles are undoubtedly the great agents in conveying oxygen to the tissues, thus securing the removal of those portions of them which are effete, it must at once appear how important an influence for evil alcohol must exert; this injurious influence will be more manifest when we take into account the altered condition in which the fibrin exists, under like circumstances, as shown in many of the experiments of Dr Percy, who, instead of finding the blood in the form of a solid clot as Orfila had supposed to occur in alcoholic poisoning, found it in a state of liquidity, just as we find in poisoning by tobacco & some

Other narcotics-acrids. Thus in the case of a Mr. C. who killed himself by an excessive dose of rum Dr Percy found that the right ventricle & auricle & the vena cava ascendens & descendens were much distended with dark coloured fluid blood. & in Expt XI having slowly injected ʒss of alcohol into the jugular vein of a terrier, & having in 9 minutes afterwards repeated the injection; in 30 seconds the heart ceased to beat, subsequently a few gasps were taken; chest was immediately opened & the superior cava punctured with a scalpel when a perfectly fluid stream of blood issued from the puncture on slightly compressing the right auricle & ventricle. Not the slightest appearance of a coagulum was found in this ventricle or auricle which were distended with blood. So in Expt. VIII the same fluidity was observed. Dr Benee Jones also found the blood contained in the cavities of the heart of a very dissipated man who died of Delirium Tremens to be fluid & very thin. The modus operandi of alcohol in producing the altered condition of the blood is twofold 1 By acting injuriously on the processes of digestion & chymification & 2 By being mixed with the blood. In addition to these two methods we must not overlook the important office performed to the blood by liver, kidneys &c in separating the bile urea &c from the nutritive fluid, which when they remain in the system may produce most serious consequences; we shall presently see to what a condition these organs are frequently reduced

in the case of the drunkard, & hence it must be apparent how the blood in his case may become altered in quality from this cause. But to leave these sources of altered state of blood which originate from various other causes besides alcohol, there is one which is much more peculiarly connected with the subject of drunkenness. The fatty particles which exist normally in the blood are very much increased in that of the intemperate; & by reflecting on the chemical constitution of alcohol it becomes evident how easily by a slight alteration of the elements fat might be produced, for though the possibility of a similar change viz: the conversion of the saccharine elements of the food into the oleaginous was formerly denied by Dumas who held that animals were only an apparatus for combustion, he has recently conceded that the views of Liebig on this matter are just. But another ~~is~~ cause for the fatty condition of the blood may be found by considering what Dr Budd has said regarding the greater facility with which some compounds of Carbon & Hydrogen are consumed than other similar comp^s are, arising from the physical state in which they are present in the blood i.e. whether gaseous, fluid or solid; thus he says "as sugar furnishes a material for respiration which is soluble in the blood it is acted on by Oxygen much more readily than the insoluble fat which is thus protected & retained in the system; alcohol has a still stronger protecting power for similar reasons."

Both of these causes probably conjointly operate in the production of this morbid condition, thus while a portion of the alcohol is consumed directly, another portion may be transformed into fat. There is still another change in the blood of the intemperate, namely, the venous hue which that in the arteries assumes & which apparently results from the Oxygen being, in great measure, consumed by uniting with the Carbon & Hydrogen of the alcohol & also from the Oxygen from the atmosphere not being admitted in consequence of the defective elimination of the carbonic acid which we know to occur at ^{the} first as shewn by the interesting experiments of Dr Prout on himself, which he frequently repeated: in his paper on Respiration he remarks, that alcohol & all liquors containing it, which he tried, he found to have the remarkable property of diminishing the quantity of CO_2 in the expired air much more than anything else which he made the subject of experiment; he found that alcohol, in every state, & in every quantity, uniformly lessens in a greater or less degree the quantity of CO_2 eliminated according to the quantity & circumstances, in which it is taken, i.e. whether on an empty or a full stomach; he found, moreover, that, when the effects were passing off, the quantity of CO_2 given out was much above the natural standard. —

The circulation is primarily much accelerated when alcohol has been taken, the heart being summoned to increase

action & a fulness of pulse is present. These effects on the heart may result from direct contact of the alcohol with its internal or serous membrane but from the rapidity with which the effect is manifested it is more probably that it arises, as we have already stated, from the peculiar sympathy subsisting between the stomach & the heart, which sympathy is manifest in a blow on the epigastrium producing fatal syncope, or when the same immediate effect is produced in some cases when poisonous doses of alcohol have been taken, thus Orfila mentions the case of a soldier who drank 8 pints of brandy & died instantly. After this stage of excitement, one of depression succeeds, in which the circulation becomes slower than natural.

Heart. This organ is liable to suffer as a result of the increased functional activity, & since this implies both a more frequent contraction of the muscular fibres & a greater resistance to the escape of the blood the form of hypertrophy is often that in which it exhibits the morbid change.

Again, the contact of the alcohol with the endocardium may produce endocarditis, especially when we conjoin with this the frequent existence of rheumatism on which the other is a common attendant, & which is certainly favoured by alcoholic drinks; thus, indirectly, by causing rheumatism, & directly, by contact with the tissue, alcohol must be regarded as in no small degree tending to endocarditis,

which, by the warty excrescences which result from the inflammation, combine with the above mentioned functional causes to produce or increase the hypertrophy of the organ. Again, the heart in drunkards is peculiarly liable to the fatty degeneration which has been regarded by many as the result of a chronic state of inflammation & in which, as in the fatty liver & granular kidney, the functional part (which in this case is the muscular fibres) is atrophied while this morbid deposit occupies its place, so that the bulk of the organ may remain normal or seem even increased, as the walls are apt to yield, & hence the left ventricle is often dilated. Dr. Bennet Jones gives the following account of the appearances in the heart of an habitual drunkard; - heart pale in colour & soft in texture; all its cavities dilated but without hypertrophy of the walls. Both the aortic & mitral valves were slightly thickened & somewhat contracted; now this is just the fatty heart & when we look at the character of the man & his age, being only 35, we are justified, I think, in attributing them to alcohol as their cause.

The arteries in like manner suffer from alcohol. Dr. Latham, in his Diseases of the heart, states that "in a multitude of cases where the lining membrane of the heart & arteries has been beset with cartilaginous or atheromatous or earthy deposits the patients have been habitual spirit-drinkers for years." & Dr. Jones in the case above mentioned

in addition to the cardiac lesion found a few patches of atheromatous deposit at the root of the aorta. Nor is this to be wondered at, for while in health we have a beautiful adaptation in the amount of fluid transmitted, the force with which it is so, & the capacity of the vessels through which it passes; when alcohol is taken we have the propelling force increased while the channels of transmission are diminished in calibre, so that these last are strained & the base vasorum by a vital act throw out a portion of their already morbid contents (being of a fatty nature) & thus a degenerate condition of the walls is established, or a deposit may take place in the interior of the vessels & thus an obstruction would be offered to the onward passage of the living fluid. Now, from these considerations, it is easy to see how aneurismal sacs form, & hæmorrhages occur in the case of the drunkard! - In speaking of the heart I omitted to mention the valuable testimony which Dr Alison gives in his lectures, viz. that he has often seen that the heart was the first organ which became affected in those addicted to intemperance, & that he has observed it as often diseased in such cases as the liver. Mr Paget also calls attention to the connection between intemperance & disease of the heart.

Respiratory System

The peculiar influence which alcohol exerts on the process

of respiration, in preventing, for a time, the elimination of CO_2 has been already mentioned, & its apparent cause explained: but, in addition to this general influence which it thus exerts on the whole frame, it operates here also in producing local affections e.g. Bronchitis, Pneumonia &c

Bronchitis. This disease may very naturally result from the irritating vapours of alcohol coming into contact with the mucous membrane of the bronchi, for that it is exhaled by the lungs (as turpentine & other volatile oils are) unchanged, is too evident to the sense of smell to admit of being questioned; & if any other evidence were wanted, we have it in the melancholy instances on record, where the other test viz. its inflammability, was shown unequivocally to be present, from the combustion of the gas emitted on coming in contact with an ignited body e.g. a candle &c. Again the occurrence of this bronchial inflammation was feared, & that not without reason, by many excellent practitioners, when ether (a substance belonging to the same class as alcohol and having a similar action to it,) was so extensively used. In this respect, these differ materially from Chloroform, which, though in the liquid form it is equally, if not more irritating than they, in the form of gas is perfectly bland. That the vapour of alcohol can produce irritation, is shown

in the irritated state of the Schneiderian membrane in the case of many drunkards.

The organic disease of the heart, which we have seen to be sometimes induced by the use of alcoholic stimulants, must operate most powerfully in predisposing the subjects of it to this disease, in consequence of the congested state of the lung arising from the impediment to the passage of the blood through the left side of the heart; while, at the same time, the exciting cause being present will render this event more certain in its occurrence. The exposure to cold in the case of the drunkard must not be overlooked in estimating his liability to bronchitis.

Pneumonia. I shall not enlarge on this, but shall simply state that the irritation resulting from the contact of the alcohol, & the tendency to local congestions which the presence of alcohol in the system produces both tend to give rise to this disease, especially when cold also is applied, which, as we have so frequently mentioned, is found to be present in so many instances in the case of the inebriate.

Pleurisy. Except in alcoholic liquors is spoken of as one of the causes of this disease. A case of this kind, which proved fatal, is recorded in the Medical Times. June 21. 1845 where a man, having taken 1 pint of whiskey during dinner, & 16^{oz} of raw rum in the evening of the same

day, became comatose; & on the stomach-pump being used, he was on the following day rational, but feverish & breathing quickly; on the third day, he was suddenly seized with great difficulty of breathing, & died in about an hour. On post-mortem examination pleuritic effusion was ^{found}. The mode in which alcohol acts in producing this disease is the same as that, which we have just stated, in the case of Pneumonia

Phthisis. Those who advocate the purely chemical view regarding the etiology of this disease, (overlooking, in great measure, the agency of the vital force, or giving it only a negative power in the elimination of the effete tissues) attribute it to the excess of Oxygen in the system, & may, perhaps, object to alcohol being a cause of its occurrence since the venous condition of the blood, supplies the chemical desideratum. Whether, however, they do so or not, there are some who do not reckon pulmonary Phthisis to be one of the catalogue of diseases induced by intemperance or at least that its appearance from this cause is unrequent; in this number is Dr Huss, who thinks that this affection is seldom found in the drunkard. But to this I cannot assent, for if imperfect nutrition & mental depression, on the one hand, & irritation, on the other, are the predisposing & exciting causes of this formidable malady, surely in the cachectic condition, arising from the defective

digestion & assimilation from the presence of alcohol, & the hepatic affections, with the attendant mental condition viz Hypochondriasis, together with the irritating vapours coming into constant contact with the pulmonary organs, supply those very conditions which are requisite; hence we think there is no small amount of truth in what Sir James Clark remarks regarding it; "we believe," says he, "that the abuse of spirituous liquors, among the lower classes in this country, is productive of tuberculous disease to an extent far beyond what is usually imagined. Indeed it is only necessary to observe the blanched, cadaverous aspect of the spirit drinker to be assured of the condition of his internal organs." And Dr Rush had long before observed a hoarseness or husky cough, arising from intemperance in alcoholic drinks, often terminating in consumption. Dr Alison also bears his testimony to the fact that Phthisis is often so produced.

Digestive System

Stomach. The effects of alcohol on the mucous membrane of this viscus are those of an irritant, producing, when in a concentrated form, evident signs of inflammatory action; thus Dr Percy found, in his experiments on dogs, that the mucous membrane was, in one case, intensely injected both in the intervals & on the summits of the rugae, while florid & irregular spots were observed in the vicinity

of the pylorus; & similar observations were made in most, if not in all, his subsequent expts. Again, in the case of a man who had drunk 2 pints of pure rum on the 28th June & who died on the 2nd of July, the internal coat of the stomach was found inflamed in patches, & the internal & external coats of the intestines were in a similar condition; in short, in some cases, a bright red colour has been observed on the mucous membrane, while in others it has presented a purple hue, in others the colour has been brown, all these arising from the congested state of the vessels of the part. In other cases, again, extravasation has occurred. The mucous membrane has also, in such circumstances, been altered in consistence, having been, in one case, reduced to a pulpy state, so that it could be removed with facility by the finger nail. Even the muscular coat has been observed to be reduced to a soft mass in which the fibres could not be detected. In other cases, however the mucous membrane has been found thickened & very firm in consistence; while in other cases still, the serous, muscular & mucous coats have been all so blended together that it was impossible to distinguish them, & have been $\frac{1}{2}$ inch or even 1 inch in thickness. The inner coat has even been found in a state of gangrene, as in a case mentioned by Dr Christison. But we are not left to draw our conclusions, from post-mortem appearances, as to the effects produced on the stomach by alcohol; for, in the

case of Alexis St. Martin, Dr. Beaumont, among his other ex-
periments, ~~and~~ ^{observed} what was the effect of stimulating liquids
when introduced into the stomach, & the following notices shew
the results. "July 28th Stomach empty, not healthy; some erythema
& aphthous patches on the mucous surface. St. Martin has
been drinking ardent spirits pretty freely for 8 or 10 days past.
Aug. 1st examined stomach before eating anything; inner
membrane morbid, considerable erythema & some aphthous
patches on the exposed surface: extracted 3j of gastric juice,
not clear & pure as in health; quite viscid. Aug 2nd extracted
3j of gastric fluids consisting of unusual portions of vitiated
mucous, saliva & some bile, tinged slightly with blood
appearing to exude from the surface of the erythema & aph-
thous patches, which were tender & more irritable than usual
Aug 3rd Inner membrane of stomach unusually morbid; the
erythematous appearance more extensive, & spots more livid
than usual; from the surface of some of which exuded small
drops of purinous blood, the aphthous patches larger & more
numerous, the mucous covering thicker than usual & the
gastric secretions much more vitiated, & gastric juice with
thick ropy mucus & considerable mucus-purulent matter
slightly tinged with blood." Marks of general derangement
of the system now began to appear, but to no great extent,
& from Aug 4th the morbid appearances, under the use of a low
diet & diluent drinks, gradually declined, till, on Aug 6th,

I forgot to mention that the villi of the stomach are, in some cases, enormously enlarged.

the coats of the stomach were clean &c, he felt perfectly well, & had a voracious appetite. Dr Beaumont remarks that "Improper indulgence in eating & drinking has been the most common precursor of these diseased conditions of the coats of the stomach. The free use of ardent spirits, wine, beer, or any intoxicating liquor, when continued for some days, has invariably produced these morbid changes." Now these facts are important as showing (by an extended observation on one, who from his general state of health, may be taken as a fair average specimen,) what are the results to be expected, under these circumstances, in the generality of mankind. Effects like these are just what we might have expected, though perhaps not to the same degree, from the above considerations regarding undiluted alcohol, Rum &c. The facts mentioned above seem to justify the conclusion, that, when diluted alcohol is taken frequently & in considerable quantities at a time, the same effects are produced in the stomach as when it is taken in a much more concentrated form.

Intestines. The large & small intestines have been found participating in the same inflammatory condition from the exhibition of alcohol. Haemorrhages from the mouth & intestinal canal not infrequently occur as a consequence of intense local congestion, & are probably greatly favoured in their occurrence by the altered condition of the blood,

which we have already noticed. It is a curious fact that the same tendency to hæmorrhage has been observed in fowls which are fed upon the sediment of the liquors in brew-houses. The intestines have also been found softened & ulcerations have been observed in the lower part of the ~~Stomach~~ ^{Intestines} as a consequence of this inflamed condition of the small intestines, diarrhoea is a frequent result of intemperance. From a similarly inflamed condition of the large intestines dysentery may result. The influence, which alcoholic liquors have in producing this last mentioned disease, is seen in what Mr Annesley states, viz. that after the soldiers got their pay the sick-list was always increased & dysentery was the general disease. The exposure to cold, ^{wet} after being over-heated & the irritating effects of the alcohol on the mucous membrane give us a conjoint cause fully adequate to the production of the disease.

Dyspepsia. - We purposely omitted mentioning this sooner & in connection with the Stomach, in order to view consecutively the inflammatory condition of that organ & of the intestines. - It is a law of vital action, that, if an organ be overexcited, a state of debility is certain to ensue. We find this occurring in the case of the stomach, which, being over-stimulated by alcoholic liquors, naturally acquires subsequently an enfeebled condition, so that food taken at this stage is not properly digested, & hence lays the found-

=ation of that train of morbid symptoms which characterize the dyspeptic. Besides this functional effect which alcohol produces, it also seriously interferes with the nutrition of the coats of the stomach, becoming intimately dispersed through, ~~then~~ & adherent to, them, or chemically combined with some of the elements of their constitution; for Dr Percy found, that, after the stomach of a dog, to which he had given alcohol, had been repeatedly washed, it still retained the odour of alcohol on the following day. The secretion of the gastric juice is impaired, & the gastric juice itself altered, as shown in the case of St. Martin, & hence the food is not properly digested. Besides its influence on the gastric juice, by acting on the stomach, alcohol seems, to a certain extent to act chemically in regard to the acids present in the gastric juice, by entering into combination with, ~~them~~ & neutralizing ^{them off}. This statement seems borne out by the fact, that, in the case of an alkali, administered a little before death, it was found by Spallanzani & others that the solvent power of the gastric juice on the dead membrane of the stomach was prevented; alcohol given in like circumstances is followed by the same effects. However this may be, the fact of the digestive process being interfered with by alcohol has been proved experimentally by Dr Beddoes in the case of two dogs: he found that the stomach of the one, which had got ʒij of alcohol diluted with water, was,

after a time, about twice as full of food as that of the other to which no alcohol had been given, but which had had an equal amount of food with the other. And, in the evidence borne before the Committee of the House of Commons, by several eminent physicians, it was stated that indigestion had now become a common disease among the poor which they attributed to the habitual use of ardent spirits: The appetite is affected: anorexia being present in most cases, so that the inability to take a good breakfast has long been regarded as a common occurrence in a drunkard. To such an extent may this want of appetite proceed, that I have heard of a woman, who was addicted to the potatoes of gin houses in the habit of going to the distilleries to get her propensity indulged, who was quite satisfied with one half-pennyworth of bread in the course of the 24 hours. We find this also occur in the case of opium, thus the messengers among the Turks know, that, with a scanty allowance of dates, & a portion of coarse bread, provided they have also a small piece of opium, they can traverse the trackless desert amidst privations & difficulties otherwise intolerable. - Other symptoms of dyspepsia besides the anorexia are also present, for the digestive process being delayed, & the food consequently detained in the stomach, gases become disengaged, & to remove the uneasy sensations arising from this source, the stimulus is, too often, again applied, & the

evil only aggravated. Bile is often retched on the morning after a debauch, & so is viscid phlegm, which the observation of Dr Beaumont would lead ~~us~~ to expect

Obesity and Emaciation - The effects of alcoholic drinks on the amount of fat found in the body are very various according to the kind of which the person partakes; thus it accumulates greatly when malt liquors are used. Nor is the reason of this difficult to be explained; for, as there is a considerable amount of saccharine matter present, this last, by a process of chemical transformation, under the influence of the vital principle, becomes converted into fat, which, as the alcohol, with which it is connected, adds to the amount of Hydrocarbon to be consumed, is laid up in store for the subsequent wants of the system. Besides, as the alcohol is not in a great amount here, the effects on the system are less felt, the appetite being less impaired, & hence food is taken with a relish; so that malt liquors are rather to be regarded as something taken in addition to the ordinary food, & consequently the increase of adipose tissue might be expected, as the consumption is thus rendered very inadequate to the supply.

In the case of those who indulge in ~~the~~ wine we may also have a tendency to obesity, for while the saccharine element does not here fulfil a condition, yet the second consideration under malt liquors has a place in the case

of wine, for the system is not so greatly affected by it, as by spirits, (this probably arises, as we shall see subsequently, from the acids or colouring matter entering into some combination with the alcohol,) & thus a considerable amount of food can be taken; & in some cases, the wine, if not taken in too great an amount, excites the appetite.

In the case of ardent spirits these considerations have no place, there being no sugar here & the system being seriously impaired, so that a disinclination for food, as we have just seen, is an almost inseparable accompaniment of excess in this kind of drink. Yet there are some strange exceptions to this general rule, as in the case of the woman, whom I mentioned, whose main, & almost sole diet was gin, who was nevertheless represented as being in a fat condition; & Dr Farre states, that the largest man he had ever seen, was one dying of the effects of gin, & yet he was the fattest man who had ever come under his notice; this man's allowance was 3 or 4 pints of gin daily; sometimes even 72 glasses were swallowed by him at a sitting. These are exceptional cases, & form a striking contrast to the picture presented to us by those who have witnessed the wasted forms & shrunken features of the miserable victims, who are addicted to gin, as they hurry along to the gin palaces to obtain their momentary gratification. In their case we may find the hoary locks, like

the blossoms of the almond tree, much anticipating the usual time, while all the symptoms of wasting & decay soon manifest themselves throughout the frame; so that "a ruined constitution" is what we every day hear expressed by physicians in reference to those whose habits of intemperance have procured this state. And how could it be otherwise, when we consider the condition of the organs which are concerned in the preparation & absorption of the food? The stomach, liver, pancreas, mesenteric glands &c. organically deranged! it would indeed be marvellous if the body of the habitual drunkard could still retain the rotund form of that of the sober individual. In accordance with these views we find Dr Trotter telling us that he has seen a man of the largest size, reduced, in the space of a few months, to a mere skeleton, by the immoderate use of spirituous drinks. In cases where ardent spirits are taken the process of absorption must prevail over that of nutrition, & the exceptional cases seem to be owing to protective mucus having been thrown out in large quantities guarding the stomach & intestines from the baneful influence of the ardent spirits & hence the gastric juice & lacteal vessels have both gone on performing their respective functions. We know that this increased amount of mucus is occasionally poured forth preventing the action of some powerful drugs, & in follicular dyspepsia, we have it present as a morbid

condition.

Liver. There are some substances which can never be assimilated & which are destined to be excreted, by the various organs appointed for that purpose, either immediately, or ^{afterwards,} by being laid up in the areolar interstices in the form of adipose tissue, to serve as a supply for subsequent emergencies. Now alcohol is undoubtedly of this class, having no Nitrogen in its composition & consequently being unfit to take any part in the building up of the albuminous tissues. When this is thrown into the system in great amount, not only have the excretory organs to rid the system of the debris, which results from the disintegration of the tissues, but they have, over & above, to eliminate this superfluous matter, & having, in consequence, been roused to much greater functional activity, they, in accordance with what is common to all vital organs, become especially liable to assume a morbid condition. In the case of alcohol, in addition to the above consideration, the lungs are found for a time at least, to eliminate less CO_2 & accordingly the liver must be excited to still greater activity in the performance of its function; for the vicarious nature of the liver & lungs has been well ascertained, both being excretors of hydrocarbon from the system. As the latter is dependent for the rapidity & efficiency with which it discharges its function, on the O of the atmospheric air inspired,

it is manifest how an elevated external temperature, by diminishing the amount of oxygen in a given volume of air, must tend still further to over-burden the hepatic organ; hence, while hepatic disease is produced by alcohol in this country, it is so, to an immeasurably greater extent in warm climates. The following shews the influence of alcohol, in these circumstances, in producing hepatitis. It was found, in a Cameronian regiment in Bengal, that, during 3 years in which from 10000-14000 gallons of spirits were consumed, the mean number of cases of liver disease was 128, while, in the 2 subsequent years, during which only about $\frac{1}{5}$ of the above quantity of spirits was consumed, the mean number was 66 being only about $\frac{1}{2}$ of what it was before.

But, besides this increased functional activity tending to lead to inflammatory action, we must not omit to mention that the alcohol, being not a bland hydrocarbon, but a direct irritant, will, by coming in contact with the substance of the liver, which it does very speedily after absorption, exert a strong influence in determining the occurrence of Hepatitis. Again, the inflammatory action, which the alcohol excites in the duodenum, may, on some occasions, extend along the ductus communis choledochus & biliary duct & so reaching the liver may cause acute Hepatitis. It is very frequently, perhaps most commonly, in the chronic

form that the inflammatory affection of the liver, which owes its origin to alcoholic drinks, is seen. Dr William Ferguson, who was chief of the medical staff of the windward & leeward islands in the West Indies, observed that there was a regular increase & aggravation of chronic affections of the liver among the troops after they received their monthly pay, at which time they drank large quantities of ardent spirits.

As a result of chronic inflammation we not uncommonly find the fatty degeneration, in which the organ appears of a lighter colour than natural from the amount of fat deposited interstitially. This fatty condition of the liver, which is frequent in Phthisis Pulmonalis, has been supposed, in that case, to be owing to the absorption of a great amount of fat (from those parts of the body where it should naturally exist,) into the current of the circulation, thus favouring local deposits in abnormal positions; now, in the case of the intemperate, this fatty condition of the blood is known to be present, & this, some times, to such an extent, as to have a greasy feel when ^{the blood is} rubbed between the fingers; & in this case, when chronic inflammation is excited in the liver, the deposit will be much more likely to occur in that organ. In this diseased condition, the liver may acquire an apparent great size, but we find that the secreting portion is greatly diminished. It seems to have been a case of this kind which occurred to Mr Lyle, while dissector in the Edinburgh University, the

subject was a drunkard, who had lived long in the East Indies, & in whom the liver was of the enormous weight of 50^{lbs} & concerning whom it is added, that he died with deficiency of secretion of bile. In a case, which occurred to myself in dispensary practice, I found the liver about twice its normal size, & on microscopical examination, it was found to be quite fatty; the person had been greatly addicted to intemperance.

The Nutmeg liver, so called from its presenting the appearance of a nutmeg on a section of it being made, & which occurs of two forms, according as the branches of the veins, belonging to the hepatic or portal system, are in a congested state, since it may be produced by whatever tends to cause congestion of the organ, is not infrequently the result of excessive indulgence in potations of gin, & hence, not unjustly, though, perhaps, too exclusively, has been called the gin-drinker's liver.

The Hornail liver, which is also known as cirrhosis of the liver, & which consists of a thickening of the capsule of Glisson which encloses the portal vein, hepatic artery & biliary duct as the result of the chronic state of inflammation, is chiefly caused by intemperance; in 99 per cent this is the case. While there is thus an hypertrophied condition of Glisson's capsule, we have a corresponding atrophy of the secreting substance, which

may result to a certain extent from the pressure which its nutrient artery (the hepatic) experiences from the chronic thickening of the areolar tissue, as above mentioned. It may be also owing to the diminished supply of blood, for carrying on its functions, which is brought to it in consequence of the same cause of compression acting on the portal vein: for we know that when an organ is prevented from exercising its usual function it diminishes & ultimately disappears; thus, when the cystic duct has been obstructed, the gall-bladder has disappeared; so also the tubules of the kidneys have been found atrophied, when Bright's disease was present, from the lining membrane of the tubules having been abraded, & the ordinary function having been in consequence arrested. The liver, under this condition, is sometimes only $\frac{1}{2}$ its ordinary size, & it has even been found no more than $\frac{1}{6}$, it is in such cases possessed of an indurated character. Becquerel remarks that when the heart is affected with obstructive disease the tendency to cirrhosis from the action of alcohol is increased. This is what we might have expected when we consider the tendency of the liver to take on morbid action when there is impeded circulation through the lungs, as occurs in chronic pleurisy, empyema &c as well as in disease of left side of heart, & the explanation is simply that such diseases cause mechanical congestion in the liver, &

this congested state easily merges into inflammation. Jaundice. As we might have expected, from the above considerations concerning the state of the liver, jaundice is no infrequent attendant on those who indulge immoderately in alcoholic drinks. Whether we adopt the more ancient or the more modern view regarding the functions of the liver, as to whether the cells form the bile, or merely separate it already existing in the blood, in other words, as to whether it is a secreting or an excreting organ, it does not at all affect our conclusion; for the atrophy of the proper substance of the gland, as occurs in the fatty & hot-nail liver, must effectually prevent any function whatever from being performed; & consequently, either the bile itself, or the elements from which it would have been formed, remain circulating in the blood till some other organ takes on the vicarious action of eliminating it.

another cause of jaundice, in connection with alcohol, is found in the compressed condition of the ducts, which would prevent the passage of the bile, even if removed from the blood, arising from the increased size of the organ, or from the thickened areolar tissue pressing on the bile-ducts, which it sometimes does; & hence the bile would be re-absorbed from the biliary ducts into the current of the circulation. Mr Twining has mentioned another cause of obstruction to the biliary ducts, & as he speaks of the con-

nection between its occurrence & intemperance, I shall state his view of the matter. He says, there are two small bodies, which, he thinks, are absorbent glands, one situated near the termination of the gall bladder, in the cystic duct, the other, at the upper part of the ductus communis choledochus. Enlargement of these by inflammation may close the biliary ducts. He says, he has found the ducts obliterated exactly at the point where these enlarged glands were causing pressure, & he adds, we see a distinct reason for the obliteration of the cystic & of the common duct in the ~~same~~ chronic disease of old drunkards, (these glands being temporarily irritated on the occasion of inflammatory disorder in their vicinity,) in whom the closure of the ducts most frequently takes place.

Ascites and Anasarca. We may just as well mention these here as elsewhere. They are very frequently caused by intemperance, as all the conditions necessary for their occurrence are apt to be produced by such habits. The obstructive disease of the heart & the impediment to the circulation at the liver, together with the general debility of the whole system, all of which, as we have already seen, are very frequent in the intemperate, show us some reasons why we may, in their case, expect to see the above affections. In addition to these, we have another manifest cause in Bright's disease, which, ^{as} we shall immediately see, is

a most common result of excess in alcoholic liquors. The Pancreas and Spleen have both been found indurated in the case of drunkards, & the latter has been found considerably enlarged, weighing in one case $2\frac{1}{2}$ lbs $14\frac{1}{2}$ oz probably the hardness & increased size were both the result of chronic inflammation. Dr Percy, in one of his experiments in which the dog did not die from the effects of the alcohol given, but which he killed 4 days afterwards by Stychia, found "on the surface of the spleen two small swellings, (about the size of small marbles,) which, when cut into, seemed to be progressing towards suppuration; & in another experiment in which the dog died about 5 or 6 hours probably after the injection of alcohol, he found the pancreas presenting a beautiful & variegated appearance; that part of it, which was contiguous to the intestine on the right side, was much congested, & in the same part also there was bloody extravasation under the serous membrane & between the lobules which was the cause of the variegated appearance already mentioned. And, in the case of a woman of intemperate habits, Dr Ogston found the pancreas & duodenum adherent, the former having, in the vicinity of these adhesions, a full rose hue

Genito-Urinary System

Kidneys. As one important office of the kidneys is that of depurators of the blood, we should naturally expect that

We would find alcohol in the urine of the person who has taken it in large quantity, just as we do lead or zinc when these have been taken into the system; & though Liebig & Pereira have both denied that it is found in this excretion, the experiments of Dr Percy have now put the matter beyond question. He found, (in exp. II,) it present in the urine of a dog to which he had previously administered a full dose of alcohol; & again, in the case of a grave-digger addicted to habitual intemperance, the urine yielded the same substance to his chemical tests. The effect of alcohol, when taken, is certainly to increase the amount of urine secreted, & one of the preparations of this kind, which is so abundantly employed in the metropolis of the sister-kingdom, is a well-known & approved medicinal agent in the list of diuretic remedies. Now this, being drunk, as it is, very freely, by constantly irritating the kidneys & causing them to discharge a greater amount of work, may be expected to give rise to some form of renal disorder, & accordingly we find that fatty degeneration of this organ is most commonly caused by alcoholic excess. The acute form of inflammation is not perhaps so often witnessed, as that of a more chronic kind, to arise from this cause.

Diabetes Mellitus. This peculiar & interesting affection, which seems to be purely functional, & in which the urine is secreted to an unusual & often enormous amount

It is loaded with saccharine matter, is another of the numerous catalogue of diseases, which may owe their origin to intemperance, inasmuch as that condition implies imperfect nutrition of the tissues, primary excitement of the frame, & subsequent depression, all of which are reckoned among the ordinary causes of this complaint. Again, as there is often a speedy transition from a heated apartment to the open air, & this too at a time when the cutaneous system has, in many cases, been pouring out an excessive secretion, which is thus suddenly checked, & thus, one avenue having been abruptly closed, the kidneys in addition to the ordinary increase of fluid, which, in that condition, they must eliminate, have to sustain the burden which the other organ, from the application of the exciting cause of cold, had refused to bear. When this disease has once been established, a very slight amount of malt liquors will certainly augment it, as these do, as it were, add fresh fuel to the fire already kindled, by adding to the system a certain amount of saccharine ingredients.

albuminous Nephritis. That condition of the kidneys, which is more allied to chronic inflammation than to anything else, & which is commonly known under the name of Bright's disease, numbers, among its predisposing causes, ebriety. We do not say this is the only cause, for we occasionally find little children, between

5 & 6 years old, labouring under it, but it certainly has an important place in the production of this affection, & hence probably one reason, why we find it so very much a disease of advanced life. Dr Christian mentions that from $\frac{3}{4}$ to $\frac{4}{5}$ of the cases of this disease which occurred to him here owed their existence to alcohol, being either in the persons of thorough drunkards or of those who indulged habitually & frequently during the day in the potation of ardent spirits. & Dr Carpenter, in alluding to this, observes, "the experience of English Hospital practice is, (so far as I can ascertain) precisely similar. The disease is very rarely met with in the private practice of those, whose patients are of a class not given to excessive spirituous potations." As this disease bears a great resemblance to one of the conditions which the liver assumes, inasmuch as the proper secreting substance gradually disappears while the fatty matter is deposited in the cortical substance, we must consider that the same general causes, (i.e. those which act on the constitution) which we stated to have so much influence in producing the hepatic disease, have also an important bearing on the similar condition of the renal organ. We have already seen the increased secretion of urine which alcohol produces, now this, & the irritation of the alcohol on the secreting surface, must be borne in mind, in judging of alcohol as a cause of Bright's

disease

Bladder. Dr Prout remarks that drinkers are more particularly liable, especially as life advances, to affections of the bladder & its connections.

Cystitis may be produced in at least 2 ways by intemperance. First & directly by the presence of alcohol in the bladder, coming in contact with its mucous lining & causing irritation; & secondly by a continuation downwards along the ureter of an inflammatory action which may have been produced in the kidneys. Besides, we have the liability to frequent exposure to cold & moisture which, in this, as in many other of the affections which we have considered, is such a common cause.

Uric acid calculi may arise from intemperate habits, & a marked connection, in this respect, has been long observed between the calculous & gouty tendency. If we adopt the views of Liebig on this subject (although I admit that these views must be taken with certain limitations,) we have an easy explanation, for the carbonaceous elements, being thus thrown, in much larger amount, into the system, consume a large portion of the Oxygen, which would otherwise have been employed in producing urea by the oxidation of the uric acid & consequently this last, from its very insoluble nature, becomes deposited. Liebig thus expresses himself, in his Animal Chemistry p. 139,

"The use of wine & fat which are only so far altered in the organism that they combine with oxygen, has a marked influence on the formation of uric acid. The urine after fat food has been taken is turbid & deposits crystals of uric acid. (Prout.) The same thing is observed after the use of wines in which the alkali, necessary to retain the uric acid in solution, is wanting" again he says "this deposit of lithic acid, in the case of the Rheish wines does not occur as they have so much alkali in the form of Tartar." Dr Prout says "It may be observed generally that malt liquors, particularly when both sweet & acerbent, rank among the most powerful in producing lithic acid deposits"

Organs of Generation are also affected, at first the sexual desire is excited, & hence many, under the excitement of this stimulus have been hurried to excesses from which, in their cooler moments, they would have recoiled. When, however, indulgence in spirituous drinks has been continued for a long time the very reverse of the above occurs, probably owing to the complete undermining of the nervous system by the long continued & excessive stimulation, so that the ordinary stimuli cease to affect it: & if this course be persevered in to a greater degree, complete impotence may be the result. I have not seen any account of the appearances which the testes

presented, after death, in such cases, & consequently can say nothing of their morbid anatomy. But we cannot doubt that this effect is due also to the general system-ic weakness by which all the secretions are more or less interfered with; it is not unlikely that a chronic inflammatory process in the organs has also an important influence in the production of this effect. However this may be, the fact of its occurrence is undeniable as the following illustrative cases will show. Dr Farre relates the case of a farmer whose allowance was seven pints of the strongest ale per diem, who, though previously possessed of a most vigorous constitution, was now, at the age of 42, "maimed in important organs." Again we see it on a large scale in the fact which Lord Kaimes mentions, viz that, before the use of gin was prohibited, the people of London ~~xxx~~ ^{were} debilitated by it to a degree of losing, in great measure, the power of procreation. To the same effect is the remark of Dr Moseley, in his treatise on Tropical diseases, who says that "there are very few frog-drinkers who long survive the practice of debauching with it without acquiring the odious nuisance of drunk-drinkers' breath, & downright stupidity & impotence."

cutaneous System

Skin. That this is an important vicarious organ is now undoubted, being sometimes so with the liver, at other

times with the Kidney as in *Ischuria renalis* where a strong urinous smell has frequently been observed in the perspiration 24 hours before death, as in 3 cases out of 5 mentioned by Sir Henry Hallford; so again it may act vicariously with the lungs as proved by the experiment of Bichat in which, having removed the lungs of a frog & tied the bronchi, he found a greater amount of CO_2 given off by the skin. Now these considerations have an important bearing on the condition of this organ in the intertemperature, for many of the affections arise merely, under such circumstances, from the lesion of some internal organ preventing it from discharging its functions aright, thus the skin aids the kidney, when a large amount of alcohol has been taken, & the latter organ is consequently brought into a state of undue functional activity, in such circumstances, the former, though itself also having its functions increased from the same cause, has been found to excrete daily a considerable amount of urea. The effect of alcohol is to exalt its function for when it is introduced into the system an increased amount of blood is determined to the surface of the body & by its presence in this fluid it gives a stimulus to the sudoriferous glands. It also affects the nutrition of the skin & even the hair-bulbs seem to be affected, a striking illustration of this fact is found in the curious circumstance mentioned by Dr Rush, that hair-dressers have found that the hair

of drunkards possesses a crispness which renders it less valuable, for the purposes for which they employ it, than the hair of sober individuals. & Dr McNish remarks that it is generally dry, slow of growth & liable to come out. Liebig denies that alcohol passes off with the perspiration & he makes a similar remark as to its non-existence in the expired air & the urine; & though Dr Pereira owns that it may be given off, in some measure, by the lungs, yet he says it is not so by the Kidneys or Skin. But these authors have certainly been mistaken, for, as we have already seen, Dr Percy found it present, on two occasions, in the urine, & Dr McNish has shewn that the Skin also may discharge it, "the perspiration of a confirmed drunkard has often a strong spirituous odour": & he had met with "two instances, the one in the claret, the other in a port drinker, in which the moisture which exuded from their bodies had a ruddy complexion similar to that of the wine on which they had committed their debauch". — Many of the eruptions which occur on the Skin are produced by derangement of the digestive system; & indeed some have supposed that such eruptions were an effort of nature to relieve some internal organ from its diseased condition; thus even Phthisis itself has been supposed to be mitigated. In confirmation of this view the following observations of Dr McNish may be adduced "I have observed" he says "that drunkards who

have a foul livid & pimpled face are less subject to liver complaints than those who are free from such eruptions. In accordance with this view we find Urticaria, which arises most frequently from gastric & intestinal irritation, may often be traced to alcohol as its cause. Dr. Gregory mentions two instances of persons attacked with this affection after drinking portor. Erythema also among the exanthemata may be so produced. - Among the vesicular affections, Eczema Herpes & acuto Pemphigus are found sometimes as results of intemperance; & as the chronic form of the latter disease has been often found by Bielt to be associated with the fatty liver, we can see how it also may be found in the inebriate. - Impetigo, Ecthyma & Miliaria among the Pustulæ may be caused by alcohol; & of the same class is the Acne rosacea of great notoriety, which specially affects the nose, which, in drunkards, suffering from defective nutrition, & a weakened state of vitality, would lead us naturally to expect that inflammation would be lighted up there; so that Bardolph who carried the "lanthorn in his poop" is a true picture of the class to which he belonged. The allied affection mentagra is occasionally owing to a similar cause. - Lichen, especially Lichen agrinus, & Prurigo formicans among the Papular affections; & of the Squamæ, - Psoriasis & Pityriasis are occasionally caused by intemperance. - As Erysipelas numbers,

among its predisposing causes, a debilitated condition of the system, it is very frequently associated with continued excess; as is witnessed in the brewers in London who partake largely of malt liquors & though they have the rotundity of form which obesity produces, yet, to the eye of the physician, it is no index of a healthy condition, for in them the smallest irritation, e.g. a mere scratch, or the bite of a leech, will give rise to this disease & in their case it is almost certain to pass on to gangrene. — Ulcers also are sometimes apt in drunkards to assume an intractable character, refusing to heal under the usual appliances. This is evidently owing to the unhealthy condition of the blood plasma thrown out, since the fibrin is so altered in character, & also to the weakened state of the tissues in the neighbourhood of which it is effused. —

It is difficult for me to get a proper "heading" for Gout & Rheumatism; for, while the Muscular system would include the latter, it would exclude the former; I, therefore, think it best simply to mention them here without reference to any system.

Gout. Excessive indulgence is the great source of gout specially when combined with indolence; hence, when we find the affluent in many cases the subjects of its torturing paroxysms, the poor & labouring man is very generally exempt. It seems to be a disease of the system

which more manifestly itself in deposits in or around the joints, or at least in arthritic inflammation. It is supposed to be owing to an excess of lithic acid in the system & as Dr Prout says, principally developed during the mal-assimilation of the albuminous tissues. Now we can easily see how drunk Kennels should be a fertile source of this affection, as it operates in two ways. 1st by deranging the digestive system. & 2^{ndly} by preventing the proper oxidation of the blood, which would have reduced the lithic acid to compounds of a more soluble nature, as, for example, urea or palic acid &c. So certainly has intemperance been regarded as a great cause of gout, that some, acting on the consideration of the great relief to the system which a paroxysm procured, have actually urged such a course in order to produce one. But it is not the intemperate use of any kind of alcoholic liquors which is soliable to produce this disease; but, mainly, when this excess is exhibited in potations of malt liquors or wines, particularly those which are of an acid character; the disease not being solikely to occur when ardent spirits alone are taken immoderately. On this subject Dr Alison says, "those who drink only distilled spirits, although living in other respects as similarly as possible, & although becoming plethoric, are affected in a proportion very much less

than those who drink fermented liquors: on the other hand, those who drink fermented liquors to excess, as the London Coalheavers, although, in other respects, particularly as regards exercise, in circumstances generally favourable to avoiding the disease, are frequently affected by it." Even Small-beer has, in one case at least, been known to be followed by paroxysms of gout; & entire abstinence from every form of alcohol has afforded immunity from the disease.

Rheumatism. This is so closely allied to the former disease, being apparently connected with the same diathesis, viz. excess of uric acid in the system, that the remarks made above will hold true of this. As cold is a frequent cause of its occurrence, the exposure to this after intoxication, which is so frequently the case, shews the no uncommon dependance of rheumatism on intemperance.

Lactation

Milk. Since by the medium of this secretion (when alcohol has been taken,) serious injury may be done to the offspring, I think it right to notice it here.

The presence of alcohol in the various secretions might have been gathered from a work which long preceded those of our modern authors, & which, though not professing to teach scientific, but only moral & spiritual truth, nevertheless contains

many valuable hints, which had been quite overlooked till the progress of discovery arrayed them in a new light to scientific enquirers; I refer to the Bible: there we read that Samson was to be a Nazarite from his mother's womb & was to taste neither wine nor strong drink, & accordingly the same prohibition was laid on the wife of Manoah, for, during the period of pregnancy & also of lactation, she must otherwise have been the means of transmitting to her son the alcoholic liquor. And this is quite in accordance with what we know regarding the effects which may follow the administration of certain medicinal agents; thus purgatives, taken during lactation, may be found to act violently on the child; & alkalies taken by the nurse have cured acidity in the child at the breast; & in treating syphilis in a child, it is well known that we have it in our option either to give the Mercurial directly to the child or to administer it to the mother.

Some supposing that the system, during this period, requires additional support, in consequence of the constant drain on it in the form of a new secretion, have had recourse to the administering of alcoholic liquors to supply the deficiency. But the case, in this respect, is often much exaggerated, for, in the first place, it is a natural process & we may expect accordingly that in all ordinary cases the system will be adequate to the demand. Again, we

must remember that the condition is not now so very much altered, for during the period of ^{the} ultra-uterine life of the child a large amount of the nutritious elements of the mother's food went to the nourishment of the foetus, nor have the catamenia generally again become established. In addition to these considerations, we cannot expect from the alcohol to have a permanently augmented secretion for it does not contain the elements fitted for this purpose being only capable, by a new arrangement of its particles, ^{of furnishing} the fatty ingredients, if it can even do that; or at most by saving the expenditure of the oleaginous & saccharine matters already in the blood, by itself being consumed by the oxygen inspired: no nitrogenous element ^{is} ~~being~~ afforded.

In the exceptional cases, while we would not recommend ardent spirits to be taken, we believe that a moderate allowance of wine, but specially, of malt liquors, might be followed by the happiest effects; the weak digestive powers thus obtain a grateful & gentle stimulus, & by nutrition being thus exalted, the system becomes strengthened, & the full amount of secretion is yielded with ease & of a rich quality, forming a striking contrast to the watery character which marked the previous secretion of an impoverished system. But this of course is only when the system is in a debilitated condition & when the above remedies are taken only occasionally & in a moderate degree, for, in conditions opposite

to these, inflammatory action may be excited, & instead of the secretion being augmented it may be diminished, or, at least, deteriorated. But, even when this local inflammation does not show itself, the immoderate use of alcoholic drinks may still prove most injurious to the quality of the milk, for the digestive system is, as we have seen, by such a course completely deranged & the introduction of food is unsolicited, & when taken, it may not undergo the proper changes which fit it for absorption, now as it is from this, when converted into blood, that the milk is to be secreted, the supply of pabulum being withheld, the secretion is diminished. Nor is it only thus that alcohol in excess proves prejudicial, for it produces an unhealthy state of the system generally & the milk in common with the other secretions suffers in consequence. Dr Combe, whose authority is great on such subjects, mentions it as an unquestionable fact, that the healthiest nurses are to be found in those who never take any fermented liquors, & who take but little solid animal food, who are much in the open air, & live on soups & farinaceous diet; in such cases they often have milk enough for a second infant. & Dr North, in his practical observations on the convulsions of infants, remarks that children nursed by intemperate females are peculiarly liable to derangements of the digestive organs & convulsive affections; he states, moreover, that he has seen these convulsions almost

instantly removed by the child being transferred to a temperate woman. Nor should this surprise us, for the nervous as well as the vascular system of children is in a state of great activity & is very susceptible of any impression as is shewn in the convulsions often attendant on dentition, or on gastric or intestinal irritation.

Spontaneous Combustion

In many melancholy instances of the persecuting spirit of bigotry & superstition against the advocates of the cause of truth we see the amount of fuel which was requisite for the consumption of the human body; & the melancholy case, in our own day, of Professor Webster, notwithstanding all his appliances of fuel &c, failing in his attempt speedily to destroy the body of his victim, testifies to the difficulty with which the human frame can, in ordinary circumstances, be consumed, & necessarily leads us to infer that, in those cases of combustion, where in a short time nothing remained but ashes to shew the miserable end which the intropicated found, there must have been a certain change in the tissues of the body. Different opinions have been advanced to account for it. We believe that alcohol, by its admixture with the tissues, displacing in some degree the water naturally present in them (which seems to be also the way in which it acts as an antiseptic on dead animal matter) has an important share in the production of this curious

phenomenon. But that it is not exclusively owing to this seems proved by the fact which Dr Apjohn mentions, viz that, ^{where} an anatomical preparation has been kept for many years in spirits, & we attempt to consume it over a candle, it will be found that only the outside of the preparation will be burned. I have tried this more than once with small pieces of muscle, put in alcohol alone, or with a little phosphorus added, & have always found that the central part remained unconsumed, though the flame did go a little depth. Some of the pieces of muscle I had previously perforated well with pins so as to ~~admit~~ ^{per-}mit the free entrance of the alcohol, but their ignition was attended with the same result.

I readily concede that in all these attempts it was impossible to imitate perfectly the working of nature, which, by means of the most minute capillaries, can reach easily every part of the ~~system~~ tissue, & own that this evidence is not quite satisfactory, but we have evidence of the justness of the conclusion, in the fact, that the body of a drunkard, in whom, of course, these nice processes had been going on during life, is not more inflammable after death than that of a sober individual. We must therefore suppose that, in addition to this, there must be some other condition; it may be the generation of inflammable gases in the system under peculiar circumstances, which, by mingling with oxygen in certain proportions, may, as Apjohn suggests, form ex =

phlosive compounds which would hasten the consumption of the body; but all this is mere hypothesis, which can only serve us for founding an argumentum ab ignorantia upon it. The term "Spontaneous" has been applied far too vaguely to cases of combustion; yet this form of combustion does seem to have occurred, & in such a case the continued & excessive use of alcoholic drinks can easily account for the production of a gas which is spontaneously inflammable on coming in contact with the oxygen of the atmosphere; I mean Phosphuretted Hydrogen; for, since Hydrogen is so large an ingredient in alcohol, & as the proper oxidation of the blood is interfered with by alcohol, we can see no difficulty in understanding how Phosphorus, (existing in the albuminous portions of our food, or ^{being} the result of the disintegration of certain textures) which would otherwise have passed to the state of Phosphoric acid, ^{will,} by being prevented from combining with oxygen, ~~will~~ continue in a free state, till, having Hydrogen in the nascent state presented to it, it immediately combines with it & may then be eliminated by the lungs. Of the existence of elemental H & P in the system, under certain circumstances, we can have no doubt, for H has been observed to be given off from the body in a case of Emphysema, which is a disease in which defective oxygenation exists; & the urine has been seen to be luminous in the dark from P in the free state, which,

having been eliminated by the kidneys, exhibited, on coming in contact with the oxygen of the atmosphere, the results of its combustion in the luminous appearance already mentioned. The breath of habitual drunkards is sometimes luminous. Dr Thomson quotes a case of this kind, "The man, a drunkard, was suffering from hæmorrhage from the bowels &c. About 20 minutes before death the nurses observed a red-hot coal-like streak on the mouth, playing on the right cheek and upper lip, & continuing till death took place. The flame was persistent with the breath of expiration, & not at all lambent."

I shall, in the form of propositions, state what appears to me to be the sum of our knowledge regarding human combustion.

- 1 The great mass of those who have been burned have been addicted to habits of intemperance in alcoholic liquors
- 2 The great majority of the cases on record took place in women, though we have some cases of men being consumed; but in their case it did not seem to be so complete as in that of the women
- 3 These women were almost all well advanced in years. The case of a girl, aged 17, is mentioned in the Journal of the Hospital of St. Ambrose; but, in her case, only one finger of the right hand was burned
- 4 In some of the cases the combustion was complete, & in others, only partial.
- 5 The combustion seems to have proceeded with great facility,

for though in some cases there was manifest a flame ensuing the commencement of the combustion, yet the consumption took place afterwards without any further exciting cause being applied

6 The combustion seems to have been very rapid in most cases.

7 In some of the cases there was a remarkable exemption from combustion of substances in the immediate vicinity, parts of the dress remaining untouched, & in one striking case, the daughter, though lying in the same bed with the mother who was being consumed, & in a similar condition of intoxication, escaped entirely. Perhaps this may be accounted for by considering the 3rd proposition concerning age

8 The body & viscera were constantly consumed, while the extremities & top of skull almost always escaped

9 While in most of the cases there could be ascertained the presence of an inflamed body giving rise to the human combustion, still there are some cases where it seems to have been quite spontaneous

10 More of the cases have occurred in winter than in summer

11 The flame seems to have varied in colour in different cases, being sometimes blue, at other times white &c.

12 Water, when employed to extinguish the flame, instead of having this effect, only rendered it more

active; & secret combustion or, to speak more correctly, con-
sumption has gone on even after the flame has ceased
13 After the body has been consumed there has been left
a fetid mass, & often throughout the chamber there has
been observed an impalpable powder, either floating in
the atmosphere or covering the various articles of furniture
see

14 When the combustion has been only partial the rest
of the body has been subsequently attacked by mortification.
These deductions are not merely curious, but are important
to be borne in mind, as such cases may become the subject
of medico-legal enquiry, as illustrated by a case of this
kind which occurred at Rheims in 1725, where a man
was suspected to have murdered his wife, & other circum-
stances connected with the case being suspicious, was ac-
cordingly sentenced to death, but was afterwards ac-
quitted, the case having been proved by medical evidence
to have been simply one of spontaneous combustion.

I feel that to treat fully of the action of alcohol as an etiological agent would involve my considering almost all the diseases to which the human frame is liable; for while it acts as an exciting cause in the production of some, it has a greater or less influence on the character of all. I shall not therefore enlarge on ~~the~~ this subject, since what has been already said, may serve to show us how its influence may be exerted in other cases. One important point still remains to be considered, viz. the circumstances which may modify its action; thus

I There are certain conditions of the body in which there is a remarkable power of resisting the ordinary effects of alcohol, thus, when the frame has been prostrated & the vital powers depressed, there is a remarkable tolerance of alcoholic drinks; such doses as would, under other circumstances, have been much more than sufficient to have caused complete intoxication, now only produce a salutary effect & raise the whole system to a state of par. Dr A. Combe gives an instance of this kind in the case of a lady, who, while recovering from fever, took to the extent of a bottle of Madeira daily with the effect of calming the mind & strengthening the heart's action, while at the same time it reduced its frequency.

II Certain mental conditions also exercise an influence in delaying the manifestation of the effects. Dr Christison

gives the case of a lad of 16 in whom mental determination caused such a delay; in consequence of a bet he had swallowed 16^{oz} of whiskey in the course of 10 minutes, & pursuant to the terms of the wager, walked up & down the room for half an hour, & seemed not the worse for his feat, but on going to the open air he became suddenly senseless & could not be roused by his companions. On this D. C. remarks that the stupor seemed chiefly to be kept off for a time by the stimulus of determination to win his bet. Every one must have observed the great influence which an animated conversation during wine has in preventing him from experiencing those effects, which, were he indulging solitarily, would be almost certainly induced by the same amount. These mental conditions may even arrest the effects when developed; thus fear may act in this way, as when people have suddenly fallen into water, while in a state of intoxication, & have emerged sober. We must no doubt allow for the effects of the cold, but the fright in these cases had an important share in the effects produced. Anger also has been followed by sobriety, as is seen in what Dr Witherspoon says of a man, who, when drunk, was always cured by the strange expedient of people speaking against religion in his presence.

III Constitutional differences. We have all grades illustration of the different powers of endurance of alcohol, from the com-

peror Maximian who surpassed his fellows as much in his capacity for wine as in his gigantic stature & Herculean strength, being able to drink six gallons of wine without committing any debauch; or from the ruddy old man of 84, mentioned so humorously by Dr Farre, whose knuckles were radiant with gout, & his face glowing with the acne rosacea of intemperance, vaunting itself at his protuberant & fiery-red nose, who had outlived three sets of his companions, & whose reformed allowance was 1 pint of brandy a day & 6 glasses of Madeira after dinner; from these, I say, down to a friend of my own who cannot take even a glass of wine without suffering from it, & who facetiously speaks of his good moral stomach.

IV State of the stomach at the time when the alcohol is taken; whether full or empty; in the former case the action being retarded, & in the latter, greatly accelerated.

V Sudden exposure to cold has been often observed to be followed by the development of symptoms which had not existed previously; how it acts it may be difficult to say, unless it be that, by propelling the blood from the surface to the central organs, it hastens the effect. I find that Dr Thomson explains this in another way. "Indeed it would seem" he says "as if the rapid decomposition of the spirit in the system by the oxygenation of its elements & the progress of the excitement advanced in the same ratio, & it is probable that, for

this reason, men, who have not felt or seemed intoxicated in a warm room, suddenly become so on passing into the air"

VI. Temperature. This has an important bearing in determining the amount of destructive influence which intemperance will have & also the rapidity with which this will be manifested; thus, while the inhabitants of cold regions can swallow with comparative immunity large quantities of alcoholic liquors, the inhabitant of the tropical regions by pursuing a similar course would speedily find the whole functions of his body seriously deranged, for, in the former case, the density of the atmosphere which he breathes supplies him with a much larger volume of oxygen at every inspiration & consequently the carbon & hydrogen are speedily burned off; while again the inhabitant of the hot climate can, from the rarity of the atmosphere, only obtain a comparatively small supply of O, & consequently, one channel of elimination being obstructed, other organs take on the action, which being thus overstimulated give rise to disease as we have already explained under the head of Hepatic disease. The inhabitants of these regions seem themselves to know this fact, for, as we have, in the appendix, quoted from Dr Falconer, the amount of intemperance augments as we pass from the equator to the poles

VII. Closely allied to temperature is the effect of Exercise in

as much as it increases the rapidity of respiration & a greater quantity of O is taken in in a given time, this is so evident as to need no illustration, still we may give a very appropriate one from the parliamentary evidence of Dr Farre. He had permitted a young female, in consequence of great exertion, to drink a quart of beer daily without any bad consequences; but, a large fortune having been left her, she passed from a state of great activity to one of perfect ease & still continuing her allowance, died of jaundice & a disorganized liver. Probably the perspiration, attendant on many cases of violent exercise, also conduces to the removal of the alcohol.

VIII Age. The same relative amount of alcohol given to a child & to an adult, produces effects most different in their kind. I doubt not that it was from a consideration of this kind that certain nations in ancient times prohibited by law the use of wine to children, or even till they had passed the period of adolescence.

IX Again we must distinguish between the different effects on the human body of ardent spirits, wines & malt liquors, the varieties of these &c &c. The former have a much more deleterious action on the body than either of the others as already explained under the head "Obesity & Emaciation" & this Dr Paris suggests may be owing, in the case of wine, to the union of the alcohol with the extractive matter, as is seen in the following

extract, "No doubt can be any longer entertained upon the subject; & the fact of the difference of effect of the same bulk of alcohol when presented to the stomach in different states is to be explained on the supposition that in wine it is not only more intimately mixed with water but that it exists in combination with its extractive matter, in consequence of which it is incapable of exerting its full effects before it becomes altered in its properties, or, in other words, partially digested;" He brings in support of this view the fact that the same individual may be very differently affected with the same wine according to the state of his digestive system.

The acids, however, such as the gallic, or malic, or tartaric, or, when fermentation has been much prolonged, the acetic, which exist in wines, may probably have an important share in causing the difference of effect, for they may combine with the elements of ether in the alcohol, as acids ordinarily do: nor does the fact, that Mr Brande, by precipitating the colouring matters & some other elements of the wine by the subacetate of Lead & then saturating the clear liquor by subcarbonate of Potash, could separate the alcohol without any elevation of temperature, prove that the alcohol was existing *quâ* alcohol at the time; for if, as we have above supposed, the acid had combined with the ether of the alcohol while water was set free, then no doubt when this salt of Ethyle was brought in contact with

The Carbonate of Potash would be decomposed in consequence of the greater affinity which the Potash has for the acid; as an illustration of this we may take the following example; when Oxalic Ether ($\text{ÆO}, \text{C}_2\text{O}_3$) is brought in contact with caustic Potash (KO, HO) we find a case of double decomposition occurring for the Potash loses the water & combines with the oxalic acid forming Oxalate of Potash, & the Ether having lost the oxalic acid combines with the water forming alcohol; this will best appear from a formula $\text{ÆO}, \text{C}_2\text{O}_3 + \text{KO}, \text{HO} = \text{KO}, \text{C}_2\text{O}_3 + \text{ÆO}, \text{HO}$; indeed the ethers generally are easily decomposed by Alkalies. This consideration, regarding the union of the acid with a portion of the alcohol, may enable us to understand how the vegetable acids are such potent remedies in counteracting & removing drunkenness, the former of these is well seen in the case of cold punch, of which a greater quantity than of either toddy or grog could be drunk without producing the effects which these last would do, even though the same amount of alcohol might be present; & the latter is shewn in cases where vinegar was taken & speedily put a stop to a fit of intoxication. Since writing the above I was glad to find that M. Dumas has the same view regarding the cause of the modification of effects in wine viz the union of the vegetable acids present with the ether.

In addition to what I stated under the above mentioned head

I need say no more about the relative effects of ardent spirits, except that while Delirium tremens & diseased liver are rarely found produced by wine, they are almost always attendant on excess in ardent spirits; while, on the other hand, gravel & gout, which are so frequently induced by habitual over-indulgence in wine, are found much more seldom connected with spirituous potations. In considering farther the modifying circumstances we must distinguish between the "light wines" such as claret, Rhock & Moselle, in which the alcohol is in comparatively small amount, & the "generous wines" which have it in much greater abundance, as Port, Madeira, Sherry & Marsala. The ages of wines must also be taken into account in estimating their effects, for some, we know, become stronger by keeping for a considerable time, as Sherry & Madeira, the sugar which was present in them at first being now converted into alcohol; other wines again are less intoxicating when old than when new. Another effect of keeping wines is that they deposit Bitartrate of Potash & colouring extractive matters which are apt to disagree with some constitutions. Besides, we have great variety in point of facility & rapidity with which wines produce their usual effects independently of the proportion of alcohol which they contain; thus, while the "sweet or luscious wines" such as Tokay, Frontignac, Constantia, Malmsley & Tent are comparatively inactive, the "sparkling or

effervescent wines" on the contrary, (probably from a minute & intimate intermixture of the alcohol with the CO_2 , thus bringing it to act rapidly on an extended surface of the stomach,) produce their effects with amazing rapidity, while the disappearance of these effects is as rapid as their appearance was; again, Burgundy among the "light wines" whose relative proportion of alcohol, as above stated, is very inconsiderable, nevertheless, in small quantities, acts much more powerfully than a much larger amount of other wines richer in alcohol would be able to do, as is manifest in the flushing of the countenance & headache which are so produced.

Another consideration presents itself to us under this head, viz. the adulterations which are practised. This would of course open up an endless field on which we do not design entering, but shall content ourselves with merely viewing this subject in reference to one wine, & making a few remarks on malt liquors. Let port be the wine for consideration. Now, in a Pamphlet entitled "a word or two on port wine", it is stated that the most of the wine which was imported into this country under that name, contained, per pipe of wine, from 28^{lbs} - 56^{lbs} of dried elderberries to give it colour; 26 gallons, at least, of brandy to give it strength; & a corresponding amount of treacle to give it the desired sweetness. In such a state of matters "we cannot," says the author,

"be surprised that dyspepsia & all the train of attendant evils are, by no means, strangers to the indulger in port, seeing that the distinctive peculiarity is absent, & that it can scarce lay claim to a more appropriate title than that of sweetened brandy". If any proof of the veracity of this statement were needed, we have it, I think, in the fact that so sensible were the wine company of Portugal of the extent to which this adulteration was carried, that they rooted out the elder-trees & prohibited their growth in the wine district. According to others we have Kins employed to give to port its roughness & astringency. -

And now in regard to porter; Opium, henbane, cocculus indicus &c have been used to increase the intoxicating power; while aloes, quassia, gentian, marrubium, absinthium, bellarius aromaticus &c have contributed largely to the bitter principle; while capsicum, ginger, & cassia buds have in some measure fulfilled the purpose for which they were employed, viz. as a substitute for CO₂. Indeed the varieties of substances employed are endless, but the above may serve as a specimen; - ex uno disce omnes. -

It was important for me to point out these circumstances in regard to wines as modifying the estimate which we might form as to their effects; but we have no observations on these effects as resulting from the habitual use of any one wine

in particular; for we find few, if any, who confine themselves exclusively to one kind; indeed, in very many cases, the whole three classes, viz. ardent spirits, wines, & malt liquors, are partaken of at one diet, & hence, in any individual case, we are liable to many fallacies, did we attempt accurately to determine the relative share which each had in causing disease; accordingly, in the body of my thesis, I have sunk the whole under the generic term "alcohol," & have considered generally that intemperance in any of the above, if habitual, would exhibit so many similar traits, as to justify me in adopting such a course; but, where these effects were strikingly different, I have pointed it out.

As a conclusion to my previous remarks I may state that it is my opinion that the occasional & temperate use of alcoholic liquors may be indulged in, in as far at least as any dreaded physical evils arising from the pursuance of such a course is concerned; & we cannot see on what grounds, besides those of expediency, the supporters of the doctrine of See Totalism can found their opinion. They make mention of alcohol as an artificial stimulant & speak of the difference between such & natural stimulants. But perhaps they put more stress

on the distinction than it can justly bear; for, however removed from each other the two classes may at first sight appear to be, yet on closer examination they have much in common. They say a natural stimulant produces no other sensation throughout the system than that of pleasurable excitement, & in a healthy state, is neither accompanied nor followed by any injurious consequences, thus, for example, light is the natural stimulant of the eye & sound of the organ of hearing. But surely they will not deny that, in a state of health, even these natural stimuli, (provided they be applied too continuously ~~or~~ or with too great intensity,) will be productive of certain disease. Again, we may ask, what is the natural stimulus of the stomach? They may reply, food. But of what kind? The only natural stimulus that we know is that which the Beneficent Author of our being has provided for the tender years of infancy. All other food has been prepared by the art of man; & many of the members of the vegetable Kingdom have been so changed by cultivation that they resemble more closely some new species than a mere variety of the original plant. Now we believe that we could truly predicate regarding alcohol, when taken in small quantities & only occasionally, all that they say of natural stimuli. Again, we think that the advocates of Teetotalism have

not given sufficient weight to the fact that Social En-
joyment has an important influence in determining
the state of the body & in promoting the process of digestion.
Now as wine has an exhilarating effect, we believe that,
within proper bounds, it is, in this respect, useful; for
we all know the effect which depression of spirits exer-
cises & how the dyspeptic symptoms of the hypochondriac
are aggravated by his mental state.

Again, a fortiori we can feel no sympathy whatever
with those who would exclude alcoholic liquors from
our list of pharmaceutic agents; their opinion affords
us another illustration of the great tendency in the human
mind to run to extremes from a deficiency in the fac-
ulty of just discrimination. No doubt in the case of chronic
maladies, as, for example, dyspeptic affections, the ne-
cessity which would exist for their long continued use
might lead us to be cautious as to the general adoption
of such a line of practice as that of recommending
stimulants of this class lest the habit should be ac-
quired which would make the patient the enslaved
victim of a sensual appetite. But, in the case of
threatened death by syncope, where the speedy ral-
lying of the vital powers is all-important, we cannot
see on what grounds such stimuli should be with-
held. Now as the general tendency of all the inflam-

matory affections, which have occurred within the last few years, has been to assume a typhoid character, the employment of such a remedy is necessarily demanded much more frequently than it was some years ago when the same diseases retained throughout much more of the sthenic type, & consequently rather required the continued use of the powerful antiphlogistic remedies. In such asthenic forms of inflammation we need not have the same fear as in cases of a chronic nature, seeing that the use of alcoholic stimuli will be required for a much shorter period, & though the use of large quantities of spirits ~~for~~ ^{is} apt to be followed by subsequent depression, yet on this score also our apprehensions need not be great, for the circumstances which call for it are but of short duration, so that if we can only get over the impending ^{danger}, the system will, to a great extent, be able, to modify its degree. In such cases, in addition to the purely stimulating effect, ~~xxx~~ alcohol affords material ready for immediate combustion, so that the animal temperature is maintained at its proper standard, & thus the injurious effects, which might have resulted from the inability of the weakened state of the stomach either to receive or digest proper alimentary substances, will be counteracted.

Appendix A

If antiquity can lend its weight to any vice or prep, its claims on our regard, that weight & these claims must be conceded to drunkenness. - It may not indeed be able to point to a monument in the antediluvian world raised in the form of a living (we cannot say rational) being to perpetuate its memory, yet, in the melancholy exhibition, which, on one occasion, the second father of our race displayed, it bids us see to what remote antiquity its pedigree can be traced; & from that day to this, it has never wanted votaries, whether in the more barbarous periods of antiquity, or the more refined periods of Greece & Rome. Nor has it in these times been confined to the lowest class of society, whose total disregard of moral & intellectual pursuits leaves them an easy prey to sensual pleasures; but, alike in the hut of the barbarian & the palace of the Eastern Monarch, (Belshazzar &c) in the despised slave & in the conqueror of the world, (Alexander) in the ignorant peasant & the intellectual & philosophic, it has found its ready advocates & has seen its ruined victims. - While the limits in regard to time are so extensive they are not more circumscribed as to place; for however unnatural the appetite may be, however acquired by successive potations giving a grateful stimulus to the system, however, we say, this may be, it is a curious fact, that, over the whole world, intoxicating beverages are employed. The effects of civilization in this respect have only been to vary the kinds made use of, thus while in France & Britain we have every variety of inebriating draught, our simple ancestors in this country were contented with what they could obtain

from the Birch & the Juniper, & the untutored inhabitant of Africa even now regales himself with beer and mead. Nor have differences in climate prevented these from finding a place, for Dr Falconer informs us "that if we go from the Equator to the North Pole we shall find intemperance increasing together with the degree of latitude, & if again we go from the Equator towards the South Pole we shall find it travelling south exactly in the same proportion to the decrease of heat." Thus though the proportion varies still in every clime this vice is found, for, while the sun-burnt negroes in Barbadoes have from the Cassava their fermented liquor resembling beer, & the inhabitants of Manilla scorched beneath the piercing rays of a tropical sun refresh themselves with the juice of the Cocoa-nut-tree converted by fermentation into an excellent Brandy, a similar liquor elicited by distillation from a member of the Gramineae invigorates temporarily the frame & enlivens the spirits of the frozen inhabitant of Kamtschatka while his no less frigid neighbour in Siberia heats his blood with a wine which he obtains from the Prunus Gutticosa, or from the various berries which abound in these regions in lieu of the grain which other nations possess, but which has, in great measure, been denied to him; & the inhabitants of Finland reckon life itself to be joyless without beer & brandy.

Differences in religious creeds have not prevented recourse being had to the same class of stimulants, for among Christians Jews & Heathens we have, it may be, varieties of forms, yet the inebriating draught

is common to all; & those Mahommedans who strictly adhere to the politic injunctions of the false prophet regarding wine have found in opium a substitute equally efficient in producing the wished for results

Again, the vegetable productions have been ransacked & perverted from their natural use to furnish the intoxicating drug. Thus the Millet, the maize & the rice are in request among the Egyptians for yielding a kind of ale & the hollow receptacle with its contents of the Ficus carica have been made by distillation to yield Mahogah an ardent spirit to the natives of Morocco & while the Bassia Butyracea by expression supplies the Bengales in the mountainous districts with butter, they have by distillation obtained from the flowers a spirituous liquor: & the inhabitants of the Friendly Islands from the Piper Myristicum when chewed by women procure the well known intoxicating drink called Kava. The "Pouchra" not unlike our cyder & so much esteemed in South America was obtained by the Peruvians from the juice of the Agave Americana, while their ancestors from the root of the Gucca had an inebriating draught. The Piper Betel, Nysciamus Niger, Atropa Belladonna & Baugue, the leaves of the Cannabis Sativa, have been employed in other countries to yield the same qualities in a greater or less degree. Nor has Tobacco failed to bestow on many what their aversion to intoxicating liquors and opium-eating had prevented ^{ed} them from acquiring from these sources; while among the inhabitants of Sumatra and Borneo

the capsules of the *papaver somniferum* & the leaves of the *Nicotiana Tabacum* have been conjointly employed to yield those grateful sensations which other nations experienced from each singly.

Again the milk of sheep have yielded to the Affghanists, and the flesh of lambs and milk of mares have conferred on the inhabitants of Tartary those luxuries, which, as we have seen, others have obtained from the vegetable Kingdom; while a large species of black ant gives flavour & strength to the brandy which is produced by the Swedish distillers, & which they may have used as a substitute for the juniper which the Dutch employ.

And, what is still more amazing & peculiarly loathsome, even the secretions & excretions of the human subject have been in request in order that the vitiated appetite might be satisfied; thus the women of Brazil, Friendly Islands &c have most obligingly employed their saliva for the proper preparation of an intoxicating liquor; while the urine of those who have partaken of *Amanita Muscaria* affords to the Kamtschadales one way of procuring inebriety, which their appetite is not so fastidious as to lead them to reject.

appendix B.

The effects of ardent spirits in predisposing to fever may be seen from the following facts which I quote from Delempeter's article in the 48th Number of the British & Foreign Medical Review & which he has extracted from the returns

which Dr Davidson furnished concerning the Glasgow Hospital for Fever. "Of 249 males admitted during the year ending Nov^r 1st 1839 just one-half are recorded as temperate, that is, as never being intoxicated; whilst of the remainder 51 were a little intemperate & 73 habitually so. Of 164 females, so admitted, 76 were temperate, & a little intemperate, & 80 habitually so." Now, unless we form an exceedingly low estimate of the morals of the inhabitants of Glasgow generally in regard to temperance, we cannot fail to see how greatly the number of drunkards preponderates over the others. The rates of mortality also in the two classes were very different, for, while of the temperate patients only 1 in 7.2 died, of the more or less intemperate 1 in every 4.5 died. And in Dr Craigmiles' returns concerning the fever in Edinburgh, as quoted by the same author, we find that, at least, one-half of the patients admitted into our Hospital were irregular or dissipated; but, in all likelihood, many more were of the same character, as, out of 31, the habits of 14 are unnoticed. Now when we consider, as in regard to the cases in Glasgow, the proportion between the sober & dissipated in our city, it must afford us a vivid picture of the high percentage which occurs in the case of the inebriate. In regard to cholera it was found that the intemperate were, in many places, almost the only sufferers; and

during the last epidemic it was observed that, of the patients admitted to the Cholera Hospital, the following is the percentage of those who were of irregular or dissipated habits. Males 76.4 per cent, - Females 68.8 per cent, - or, of both sexes, 71.5 per cent; that is, more than two-thirds of all the adults admitted were of irregular habits.

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