

SYMPTOMATIC AND IDIOPATHIC
INSOMNIA.

ITS ETIOLOGY AND TREATMENT.

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Insomnia as a disease per se and as a symptom of many diseases I have chosen as the subject of this thesis for several reasons. I have suffered much from it myself and consequently have examined with more than ordinary clinical interest every case that has come under my notice, and in addition I have found that, with the exception of odd notes in the medical journals, the literature on this subject is comparatively rare.

During this last half century since the introduction of steam power, and following it, the telegraph, electricity in its numerous forms, not to mention countless other time-saving devices, and with an ever increasing population, competition or the race for life has become keener than at any previous time. The average human being lives at a very high pressure, and this struggle for existence, with its concomitant worries, has of late made Insomnia a much more frequent complaint than before. Indeed, in several of the older text-books on Practice of Physic (e.g. that of Dr. Hughes Bennet, published as lately as 1853)

the subject is not even mentioned. In order to work well we must eat well and sleep well: loss of appetite and lowering of all bodily functions soon follow loss of sleep, therefore all the more important is it that the etiology and treatment of Insomnia should be thoroughly understood.

Sleep - What is it? Its true nature has not and probably never will be discovered. No recognizable change can be found between the cells of a brain asleep, and one awake or functionally active. During waking periods the psychical centres of the brain are in a state ready to act at will, or, as in certain emotional states, pain, etc., whenever there is any exciting cause. An effort of thought, will or emotion we know induces molecular changes in the particular psychical centre involved, just as certainly as any movements or sensory disturbances are obtained at the cost of discharge of cell molecules in their respective motor or sensory areas. By innumerable communications the different centres excite or retard each other as so constantly shown in various paralyses. During sleep all the body functions are dimmed - no

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other process going on that is unnecessary for living existence. And it is in the psychical centres, the initiary and therefore most important change, (from the point of view of induction of sleep) takes place. When the time comes for an animal to sleep the body is either lying down or in a position in which all the muscles are relaxed, the most common position being its former intrauterine state of general flexion, and the muscles not requiring so much blood allow the heart beating from fifteen to thirty times a minute less. Usually the surroundings are quieter, and there being no need for thought the psychical centres having no call to act reach a state of Rest. The cells there do not any longer discharge any molecules and this being so are not supplied with a sufficient quantity of blood to manufacture more molecules which they could neither retain nor use, thus a point of functional inactivity is reached and maintained until they receive some stimulus which rouses them to discharge and keep on doing so more or less irregularly for another waking cycle. When sleep ensues in the psychical centres there spreads along the many paths of communi-

cation a calming sedative influence gradually involving the motor and sensory areas, spinal cord, and most other organs in the body. As has been remarked "Sleep is made up of a number of particular sleeps." It would be difficult to say with regard to the stimulus referred to what is the nature of the process that would arouse the cells to resume discharging their molecules, or in other words, make the brain awake - whether natural instinct, lowering of the nutrient quality of the blood past a certain standard, or, arguing from the pauses in cardiac action and respiration, periodic repose. As a rule sleep cannot be modified or terminated ^{at will}, but there are not a few instances of people who avouch they can awaken at a certain time they have determined upon. Some physiologists maintain that the motor centres, and not the psychical centres, are first involved when a person has laid down to sleep. The exact course is not material, but it is certain that motor reflexes are not less than in a waking period until want of consciousness sets in. Anyone can see this in a sleepy child. From the psychical and motor areas the various senses become involved through their respective centres.

HEARING:- During sleep, sounds have not the same effect, more especially those constantly recurring, as the tick of a watch, dropping water, etc. The depth of sleep can be estimated by the amount of sound required to waken, but, as is well known, this varies greatly in different persons. A burglar can work with impunity in the bedroom of one sleeper, where in another case, his mere footfall would awaken. Although the stimulus in the latter case is much less it would appear to have no relation to the amount of sleep required; light sleepers will awake quite as refreshed as those who slumber heavily.

SIGHT:- The changes occurring while asleep are very interesting here. The sphincter pupillae contracts, and only reacts to very strong light, and the eyes look upwards and inwards. The fundus, as noted by every ophthalmoscopical text-book, is paler, though to ascertain this fact satisfactorily must be very difficult. On waking, the pupil dilates. Lachrymal secretion is much diminished, if not, the eyelids get 'gummed' together.

The other senses, SMELL, TASTE and TOUCH are all much dimmed, indeed, with the exception of

circulation and respiration scarcely any other bodily function is active to more than a fractional extent of what its capability is during a waking period.

CIRCULATION:- The effect of sleep on circulation is very clearly shown by the pulse rate, which is from fifteen to thirty beats less per minute. The rythm is regular, but there is a great difference in strength between a waking and sleeping pulse, the latter being markedly less resistant, ~~though there is great~~ variation, the most marked case I have seen being that of a ship's officer, who had an hour or so previously come off a long spell of duty and whose pulse by chance I felt, while he slept heavily. It was a soft normal pulse beating quietly at forty-one, and I never found it below 70 times per minute on examination while he was awake. The cases noted in the accompanying table were not selected, being all occupants of one hospital, and in every case except one there is a marked discrepancy. (See Table) (OVER PAGE)

In children the difference is usually thirty beats per minute less during sleep and the diminution in tension and frequency, and fall below the level of

EFFECT OF SLEEP ON CARDIAC ACTION.

Sex	Age	Disease	Pulse while awake.	Pulse while asleep.
Male	21	Renal Calculus	80	61
"	40	Pneumonia (after crisis)	56	58
"	49	Chronic Rheumatism	112	56
"	63	Aortic Regurgitation	64	56
"	35	Anaemia	83	71
"	21	Acute Nephritis	136	114
"	42	Acute Rheumatism	100	92
.....				
<u>THREE CASES OF EXOPHTHALMIC GOITRE</u>				
Female	12	Exophthalmic Goitre	160	128
"	25	" "	117	94
"	31	" "	127	119

EFFECT OF SLEEP ON RESPIRATORY ACTION.

Sex	Age	Disease	Respiration while awake	Respiration while asleep
Male	40	Pneumonia (after crisis)	20	18
"	54	Chronic Bronchitis	21	18
"	35	Anaemia	18	16
"	21	Acute Nephritis	32	26
"	63	Aortic Regurgitation	18	16
"	70	Cystitis	18	15
.....				
Female	31	Psoasabscess	19	14

the skull, that can be observed in a pulsating fontanelle of an infant while asleep is most marked.

RESPIRATION.- There is a diminished frequency here of from one to five breaths per minute - the majority of healthy cases I have watched breathing fifteen times a minute, the character being almost entirely thoracic from diaphragmatic inactivity. Breathing while asleep is a quieter, shallower act, and as a consequence there is less oxygen absorbed and carbonic acid given off than when awake. There have been observations made on the difference between these gases in the two states, notably those of Pettenkofer and Voit (Physiology Notes), who found that whereas fifty-eight per cent of the total carbonic acid is given off during the daytime only forty-two per cent is eliminated at night and the quantity of Oxygen absorbed during the day is likewise far greater than at night. In man respiration is, as a rule, regular while asleep; but in animals it very often partakes of a Cheyne-Stokes character - this can be frequently seen in dogs.

SECRETIONS.- All secretions diminish during sleep and in this connection it might be mentioned that the

power of absorption of either liquids or solids is also very much less. The quantity of urine secreted during day is usually from three to four times greater than at night and as showing conclusively that sleep is the time for brain tissue recuperation and removal of its effete products the urine of sleep contains almost double the quantity of phosphoric acid that urine secreted while awake does. In certain pathological conditions notably phthisis and rickets the secretion of sweat increases at night from some unexplained cause and with regard to this product, sweat, it is still a moot point whether or not it is always diminished at night. I am inclined to think it is; two cases I know - the first a clerk whose hands perspired much while at work, and the second a housemaid who had Bromidrosis of her feet, neither of whom suffered to the same extent while asleep; both were otherwise quite healthy.

The Causation of Sleep.

As stated before the true cause of sleep is as yet unsettled and unknown. But there are many theories and it is by considering these and the conclusions from which they have been drawn that Sleep-

lessness can be best studied.

PERIODICITY:- From the standpoint that in all other bodily systems there is a period of rest (e.g. ventricular and auricular systole, the pause between inspiration and expiration, between the intestinal peristaltic waves) it has been argued that sleep is simply a resting period between the hours of waking, in order that repair of the exhausted nervous system may be effected. But why should not this be accomplished in the waking state? Some parts of the nervous system require no sleep, if the respiratory and circulatory centres in the medulla can continue through the most profound slumber, what need is there for a healthy brain to have from five to eight hours to recuperate lost energy? This theory by no means proves the cause of sleep, yet it serves to emphasize all the more thoroughly the necessity of its recurrence periodically for the maintenance of healthy brain function. Irregularity in the time set apart for sleeping is a very common cause of Insomnia.

VITAL ALKALOIDS:- Some few years ago G. Pouchardt and Bouchard, German Physiologists, ascertained the

presence of toxic alkaloids in the human urine and found a difference alike in quantity and quality of these alkaloids in the urines of waking and sleeping, there being much more in the latter. Professor Gautier also found alkaloids in human saliva which had toxic properties and in 1888 Professor Erraro of Brussels, arguing from these results stated the cause of sleep to be due to effete products (leucomaines) resulting from cerebral and muscular work, which by their accumulation gradually intoxicate the brain, till a point of functional inactivity sets in (sleep) when these products were gradually oxidised, and when this process was finished the sleep terminates.

This theory (which is quoted by Dr. A. W. Macfarlane writing on "Insomnia" in p.26 of his book) I believe to be quite untenable. ~~If it were sound,~~ **If it were sound,** Insomnia would be much more common than it actually is, among that large class of bed-ridden poor people, who, with the exception of eating and obeying the calls of nature pass their lives in almost complete inaction - cerebral as well as muscular. There are also many people who, if travelling in a train or under fortuitous

circumstances can with little delay indulge in sleep for a more or less definite period of time. Another strong point against this theory would be, that it would require a very nice adjustment of the amount of these waste products in the blood to stop their toxic influence, when physiological sleep is attained, and not go on to cause drowsiness, coma - pathological sleep.

CIRCULATORY DISTURBANCE:- A hot, wordy warfare has for many years been waged as to whether sleep is caused by congestion or by anaemia of the brain. But after a scrutiny of the various arguments, the only conclusion I can come to is, that while neither is the sole true cause, the condition most favourable to the onset and continuance, for a time, of sleep is Cerebral Anaemia. I do not judge it necessary to describe here the blood vessels of the brain, except to say that, according to present-day physiology they keep the grey substance supplied with four or five times the quantity of blood more than the white substance, and that all the arteries of the plexus are terminal, thus permitting of separate portions of brain being independently

supplied under vasomotor influence, according to the special activity each may be required to undergo.

The possibility of actually increasing or diminishing the quantity of blood in the brain has been denied by many, -indeed there may be said to be three chief lines of argument.

(1) Cerebral Congestion.:-

Such facts as (1) that full-blooded stout people are usually good sleepers, (2) coma, (3) opium and other narcotics causing congestion, (4) alcohol increasing the heart's activity, have all been brought forward at various times in support of this theory, but they are palpably erroneous by reason of their being pathological conditions in varying degree.

Further, Dr Marshall Hall (who is referred to in Dr Cappie's book, noticed later on) said that when the time for sleep comes on a state of contraction of certain muscles of the neck takes place analogous to that of the orbicularis palpebrae, that certain veins are compressed, that congestion of the brain takes place, and lastly, as a consequence of this last, sleep. He laid it down that "in sleep the entire encephalon is

congested, the medulla oblongata included." All this is completely set at nought - indeed I do not see how cerebral congestion could possibly be a cause of normal sleep, as it goes directly against the physiological law - that the functional activity of an organ is in direct proportion to its blood supply. One cannot imagine the brain functionally inactive - asleep - while at the same time it was full of blood.

(2) Uniform Mass of Blood within the Cranium:-

This has been called the "Edinburgh Dogma" from the fact of its having been maintained by Munro II. Drs. Robert Turner, Abercromby, Kellie, and latterly with much enthusiasm by Dr. James Cappie, in his book "The Intracranial Circulation" where he confutes most of the arguments of those (e.g. Sir G. Burrows and Sir T. Watson) who question its soundness. Briefly, it is this - that the mass of blood within the cranial cavity can be neither diminished nor increased directly, and that the extent to which it can be altered by ordinary physiological causes within short periods of time must be very limited. With the exception of A. E. Durham's published remarks in Guy's Hospital

Reports (Reference Library -1860 vol.) on the results of his experiments I have not read among other views anything seriously disproving it; but when Dr Cappie, admitting a primary change of lessened molecular activity, says (p. 95 of his book) that a change in the weight of atmosphere causes backward pressure in the veins and that this produces pressure from without - the compression suspending consciousness, his conclusion is open to serious question. According to him either unconsciousness is very easily produced, or the pia mater must be excessively engorged with blood to thus cause sleep when it is remembered that there is a space between brain and skull and that there are also ventricles containing cerebro-spinal fluid . Another point is that the urine of a sleeping period would not contain a larger quantity of phosphoric acid if the brain remained in that passive hyperaemic condition.

(3). Cerebral Anaemia.

The results of the standard physiological experiments, first of Blumenbach and then of Mr Durham and others have largely influenced many in their fav-

our. Durham chloroformed a dog and trephined it; through the foramen he watched the membranes dilating under the chloroform and when its effect had passed off and the animal fell into a sound natural sleep the vessels contracted and the surface of the brain became pale. After a time he roused the animal, and the pia mater became more injected and the brain substance more turgid with blood, lapsing back into the former anaemic condition when the animal was again lulled to sleep. To refute this Dr Cappie quoted Dr Kennedy of Edinburgh, who had watched the brain of a patient, part of which was exposed (the result of an accident to his skull), and who said he saw marked congestion of the veins during sleep. But here again there are far more amongst those who have had a like opportunity or who have experimented, who agree with Mr Durham. Space forbids me discussing this argument more fully, but such an array of widely known names could not be found to support Dr Kennedy's theory as - Blumenbach, Donders, Ehrmann, Hammond and C. H. Moore support that of Durham. Among the latest to advocate this theory is Tarchanoff of St Petersburg, who, in a

recent paper (quoted at the time by the Lancet 1895, p. 1065) after some remarks on sections of the spinal cord which bore out Marshall Hall's dictum that the cord never sleeps, states that, on experimenting on puppies, he found that stroking and caressing only failed to induce sleep when the head was turned downwards. He also found that, on exposing the carotids and connecting with the kymograph, the arterial pressure fell from twenty to fifty millimetres, and that when the animal awoke it returned to its former height, thus proving Durham's statements. Even supposing none of the above experiments had been made we could be almost certain that the brain is in an anaemic condition during sleep from the physiological law that has been already quoted. However, these observations confirm and serve to impress more deeply the importance of getting rid of any cause which will prevent brain anaemia when the proper time has arrived for the onset of sleep. Of course this condition is useless unless it alternates with a continual sufficiency of blood supply during the waking periods - there is no other structure depending so much for functional

activity on blood nutrition as the brain. Insomnia, sometimes of a very pronounced type, follows when pathological cerebral anaemia sets in.

Another theory as to the cause of Sleep is that of Pfluger (quoted, from notes, by Prof. M^cKendrick of Glasgow) who says it is due to want of Oxygen. He found when frogs were deprived of O_2 a state resembling profound anaemia ensued, and he took up the line that no organ of the body is so quickly affected by deprivation of O_2 as the brain. Dissociation of living matter, Pfluger maintained, is the chief factor on which the phenomena of life depends, and the dissociation of grey matter in the brain which can only be carried on when Oxygen is present is responsible for the activity of the cerebral cell contents in the psychical centres. The crux of Pfluger's theory is that a portion, but not all the Oxygen unites with the waste products of these cells forming among other substances CO_2 and if, after a certain time, these products accumulate to such an extent as to use up all the O_2 , the grey matter gets none and consequently stops respiring; thus causing a condition of cerebral-asphyxia - Sleep. Many other theoretical explanations

have been put forward, not one of which, after deliberation, I can find to be at all tenable.

A point seems to have been reached that an anaemic condition of the brain results in unconsciousness, but what causes that anaemic condition to set in we cannot as yet say.

Before taking up the various causes of Symptomatic Insomnia there are several points on the subject of sleep to be dealt with.

PERSONAL HEALTH:-

With the exception of some adventitious cause, such as sudden shock, it may be taken as an axiom that Insomnia per se never occurs without some previous departure from health. It may arise from trivial causes (such as toothache) which may set up sleeplessness which does not abate with the removal of the cause, but by its persistence lowers the system, thereby inducing a sleepless habit, which is apt to return on slight provocation. But even here there must be present a certain element of predisposition, for, as a rule, the nervous system is not so unstable as to be thus easily deranged.

Temperaments peculiarly liable to Insomnia.

That there is in certain individuals otherwise healthy a certain predisposition to sleeplessness, is proved by the number of people one meets, who say it takes very little to put them 'off' their sleep. In my own case, for example, I am perfectly free of organic disease, of stout build, and have always led a healthy athletic life. I am not in any degree neurotic, not easily worried, and pay much attention to the hygienic rules of life; I sleep nightly between six or seven hours, usually six, but should I be at all perplexed by any such cause as one or other of the cases of patients under my care not doing well I am very liable to an attack of Insomnia lasting for varying periods of several days to a week, sometimes longer. But in the vast majority of people there is no such predisposition, and as long as a fair standard of health is maintained, the circulatory organs keep in a well regulated state of tone, supplying the brain with properly varying quantities of blood bringing nutrient particles and removing effete products.

Want of Sleep.

This soon tells on a man, physically and mentally. The bright glittering eye with small pupil (curiously enough I have not yet examined a case where Insomnia was present to any extent where the pupil was not small - this is a constant symptom, and one to remember in Hysterical cases), a certain drowsy irritability and withal wearied despondent look appear before long. All this is not without its effect on the bodily functions which, while under this depressing influence are rendered less capable of resisting disease.

Liability of Insomnia to recur.

Whether it be that the strain in the brain cells set up by one attack of Insomnia, however induced, or ^{that} the vasomotor influence on the vessels supplying the various centres having been once deranged, is rendered more liable to become so again, is not easy of explanation; but there can be little doubt that the worst sufferers are those who have had previous ~~att-~~ attacks. Every now and then we read of prominent public men suffering from a return of their "old" malady -

but in the case of responsible statesmen, more particularly during times of special political activity, most probably sleeplessness results in great measure from the irregular hours they set apart for sleep.

For of periodic recurrence of sleep at stated regular intervals, the importance can hardly be overestimated if the brain function is to be maintained.

Amount of Sleep.

At the same time the amount of sleep should be sufficient. It is generally agreed that the average male and female require eight hours rest in the twenty-four hours cycle. Some people need ten, others find they can do a hard day's work on six hours of sleep, and they are very rare who really need more or can do with less without reaction sooner or later. Mr. Gladstone in a recent interview attributed his good health to the age of eighty-seven to a rule he had followed through life of never sleeping less than seven out of the twenty-four hours. A good habit of sleep is most desirable and given sound bodily structure, I feel sure can be acquired like any other habit.

Surroundings.

For healthy sleep the character of the surroundings plays an important part, more especially for those inclined to be sleepless. Ordinarily, a well ventilated room, with comfortable bed, absence of external stimuli, such as light and sound, are sufficient. These conditions, though desirable, are not absolutely necessary, as the comparatively rare occurrence of Insomnia among the lower classes can testify - in cases where whole families pass the night in one ill-ventilated room, breathing a foul atmosphere, and rise in the morning recuperated sufficiently to do a hard day's work.

Occupation.

That simple Insomnia is almost invariably met with in the upper and middle classes points to its being a disorder of brain workers. It rarely occurs among the labouring classes as is proved by any one looking over the occupations and diseases of hospital patients. In a scrutiny of the Edinburgh Royal Infirmary Register of the different diseases occurring during the past six years Insomnia per se is only mentioned twice - this of course does not indicate

the many cases where it has been present as a symptom (e.g. Alcoholism and post-influenzal and neurasthenic cases, where it frequently is a leading symptom).

Three times it is mentioned coupled with Influenza and twice with Neurasthenia. It would seem to be the rule that the more highly mentally cultured a man is the less sleep does he get or require. Probably the explanation lies in the fact that the brain of one engaged in purely physical work is not so much used, and therefore not nearly so hyperaemic during working hours as that of one whose occupation is of a mental character.

SYMPTOMATIC INSOMNIA.

By the countless ramifications of the sympathetic nervous system there is a close connection between the various organs and the brain so that by considering the different systems in turn and tabulating the results we can get a fair estimate of the causes leading to Suspension of Sleep.

Alimentary System.

The whole alimentary tract is so intimately connected with the brain by means of vagal and sympath-

etic nerve tracts, that, just as we often meet with cases where melancholic thoughts, depressing surroundings, etc., affect the digestive functions, so do we meet with many cases where the latter have a disturbing effect on the brain. Dyspepsia is by no means an uncommon cause of Insomnia, indeed, if we exclude Alcoholism (and even here the sleeplessness is due in great part to the stomachic irritation) it may be said to be the chief cause among the poorer classes. Once Insomnia is set up it accentuates the primary trouble and becomes the leading symptom in the lay mind when the patient presents himself before the doctor: it is here that hypnotics are introduced with, every now and then, disastrous results. The axiom "Seek the cause" refers - or should do so - to Insomnia almost more than to any other disease. As a rule, when the dyspepsia is discovered a cure is soon brought about, for here Insomnia does not assume the intractable form that occurs in cases of Neurasthenia etc. It would serve no definite purpose to enter into detail as to the numerous forms of stomach disorders with no particular bearing on the subject on hand. When, however, a

case occurs where, in absence of any other discoverable cause, dyspepsia is suspected as the disturbing element, it is best to restore the stomach to its normal condition before administering a hypnotic, which last should be selected from among the least irritating of its class. All digestive disorders, when uncomplicated, have their appropriate lines of treatment; but there are some varieties less easily remedied than others, e.g. two cases I have met where Insomnia proved not only a very troublesome, but distressing complication. The first, an unmarried lady, sixty years old, who had malignant disease about the pyloric end of the stomach. Opiates relieved the pain, but she only obtained sleep from about four till eight a.m. and a couple of hours in the afternoon. Hypnotics (bromides, chloral, Bromidia) to be of any service had to be given in such large doses that her stomach became intolerant of them. She refused to take more than one dose of paraldehyde and, later on, when sulphonal was tried, it made her drowsy but not unconscious. The malignant trouble she complained of far less than her continual state of excessive weariness. Latterly, I

obtained a good result, with no ill effects, though the drug was continued every second or third night for nearly two months, from twenty-five grain doses of Trional which caused her to fall asleep about half an hour after its administration, and remain so about seven hours, which gave great relief. The other case was that of a retired Civil Service Judge, aged fifty-nine, who came to winter in Cornwall, suffering from neurasthenic dyspepsia and had been in a weak atonic condition, for which he consulted a London Homeopathic doctor who had prescribed meat to each diet and in the intervals liberal quantities of beef-tea. Dyspepsia set in, and with its concomitant pain, acidity and flatulence he became sleepless, though he was previously enjoying from seven to eight hours a night. This type of case is a most difficult one to treat - the sleeplessness and indigestion react on one another and hypnotic drugs by no means help the neurasthenic condition, and it is not easy to treat the patient in such a manner that severally totally different therapeutic actions can go on satisfactorily at the same time. This gentleman improved greatly by complete rest in bed for a fortnight with Bismuth, Soda and

Nux Vomica mixture thrice daily, well regulated diet, and every other night a hypnotic drug. Without doubt the most suitable is ~~is~~ paraldehyde which does not interfere with digestion, indeed it is claimed for it that it aids the peptonizing process. It was given in one drachm doses. He was summoned to London; a week previous to ^{his} departure I discontinued the hypnotic and advised him to try static electricity. This he did, with a highly beneficial effect on the neurasthenia and consequently on the dyspepsia and insomnia, which finally left him.

Intestinal dyspepsia can prevent sleep by reason of the colic and flatulence set up, but the resulting wakefulness is not as a rule of a serious nature, such sedatives as Belladonna or Lupulin being of great service in this class of case. In children it is well to consider as to intestinal worms, when night after night they are wakeful.

Occasionally cases occur where constipation causes sleeplessness - the result of cerebral irritation from absorption of gases formed by putrefactive and fermentive changes in the faeces.

Here the obvious treatment is purgation. Frequently administering a purgative to a child "whose bowels are out of order" will induce healthy sleep. Hepatic disorders resulting in imperfect purification of the blood often cause the sufferer to be sleepless. I have noticed that in Cornwall, where the agricultural classes partake daily of "Cornish Pasty" a large doughy mass containing apples or meat, they often present themselves with enlarged liver complaining of their sleep being dreamladen and unsatisfactory, not totally unconscious in character. Attention to the main cause invariably results in normal sound sleep returning.

Circulatory System.

From the liability of cardiac diseases to cause increased or diminished blood pressure, Insomnia is not an unfrequent concomitant of many of them; a sound night's rest is not as a rule obtainable with an irregular supply of blood to the brain. The close connection between circulatory action and the brain has been shown by the reduction in number of cardiac beats and lowering of tension which takes place during

sleep. Insomnia can become a very important symptom requiring urgent and special treatment, as is often seen in cases of aortic incompetence, thoracic aneurism, pericarditis or arterial sclerosis. When a hypnotic is called for in cardiac diseases, the indication is to select one which will have little or no depressant action on the heart: Paraldehyde and Trional are two very suitable drugs. When a bromide is given it is well to combine it with Spir. Ammon. Aromat. or tincture of digitalis. The past couple of years have seen Chloralamid coming into use here and with some reason. Chloral Hydrate is among the best of pure hypnotics, and when, in its anhydrous form, it is combined with such a heart stimulant as Formamide (an ally of Formic Acid) it can be at once seen that in Chloralamid we have a very useful addition to the list of cardiac hypnotics. I have prescribed it in a case of aortic aneurism and it was of decided advantage.

Pain.

Whether due to true or pseudo-angina pectoris ^{Pain} it causes sleeplessness, not only at the time but often

in anticipation of its return. The hypnotic here indicated is morphine for the actual onset of pain and such a drug as paraldehyde (sometimes best combined with some diffusible stimulant in small quantity) or chloralamid where the patient cannot sleep for dread of the return of the pain.

Palpitation and Irregular Heart's Action.

How often this commences during sleep those suffering from it best know. Attention to its cause is the best course - whether it is neurosal or due to organic disease or mechanical difficulties - obstruction, etc., I have notes of a case where palpitation was the cause of a sleeplessness which entailed much suffering. The case was that of a ship's captain who had had Influenza which had left him in a vague post-influenzal condition. His heart was organically sound, but every night after retiring to bed about the time sleep was approaching violent palpitation came on banishing sleep, which all his previous life had been good. This kept him awake for two or three hours, when, feeling utterly wearied, he fell asleep, only to waken in a hour or two with violent

palpitation. He complained of mental and physical lassitude during the day and irritability - in fact all the symptoms of Insomnia. The treatment adopted was moderate exercise with nervine tonics and at night a dose of Bromide and digitalis which greatly relieved him, but not entirely. Later on I tried the effect of a tablespoonful of Chlorobrom every alternate night, which he said did him more good than the first mixture. He was able to do without a hypnotic in the end - a month afterward. I met this case while acting as locum tenens for two months in Leith and as he sailed shortly before I left there I did not again meet him, but the after history was interesting. During the return voyage of his vessel he was landed at Newcastle insane, and taken to the asylum there.

The liability of palpitation to have its onset during sleep is remarkable, and I suppose, can only be accounted for by the fact that during sleep the various centres are in a comparatively inactive condition and their power of inhibition lessened over any slight excito motor influence which can easily become exaggerated, and thus what in health would not be more than a trivial temporary acceleration of the

heart's beat or slightly quickened respiration becomes during sleep palpitation or dyspnoea respectively. The most suitable drugs are Digitalis and Nux Vomica - a mixture of the tinctures during the day and a bromide or chlorobrom at bedtime. In cases where there are present such complications as gout or rheumatism, if potassium iodide be given it will also help to combat the palpitation.

Dyspnoea.

No sleep can remain undisturbed during an attack of cardiac dyspnoea. Where paroxysmal its onset, as before mentioned, most usually occurs during sleep; but where it is present for a time sleeplessness is caused by the faulty heart's action not allowing of proper cerebral circulation, or of free passage of blood through the lungs and therefore imperfect aeration. The constant dyspnoea of mitral (most commonly) or aortic disease or aneurism can set up a most intractable Insomnia, adding greatly to the distress of the case. Next to Alcoholism, and dyspepsia, the most frequent cause of Insomnia in hospital cases is aortic disease or aneurism attended by dyspnoea, judging by the number of cases one sees. The main

indication is to have the patient in a well-ventilated atmosphere, propped up in the most comfortable position which at the same time admits of the best expansion of the chest. For medicine - strophanthus or digitalis and stimulants. The hypnotic which seems to be in favour with most medical men is Morphine, more especially is a hypodermic injection of it suitable when given in cases where there is an onset during sleep. Burroughes and Wellcomes' combination tabloid Morphine sulphate (1/6 to 1/4 gr.) with Atropin Sulphate (1/180 to 1/150 gr.) is a very efficient combination; the atropin prevents after sickness and the effect claimed for it of paralysing the constrictor fibres of the vagus is what is desired in cases where the brain is often in a chronically anaemic state. Among the many other hypnotics the two next most suitable are paraldehyde and chloralamid.

RESPIRATORY SYSTEM.

When Insomnia occurs in connection with respiratory diseases the plain course is to relieve as early as possible the respiratory trouble, more particularly the conditions which are primarily caus-

ing the insomnia; but the question of artifically procuring sleep is far from an easy one. There can be no harm in administering a hypnotic to a case of Whooping cough or of Phthisis where very little stimulus is required to set up a paroxysm of coughing, but it would be wrong to pursue the same course in a case of pneumonia where all the extraordinary as well as ordinary muscles of respiration are needed for breathing or expectoration. Increased temperature, pain, cough and dyspnoea are the most important respiratory causes of disturbed sleep.

Increased Temperature.

Few patients enjoy restful sleep with temperature over 101° Fahr. When the temperature is raised, any measure which will reduce it will aid sleep. With regard to the night sweats of Phthisis, might these not be part of the bodily economy whereby the temperature is reduced sufficiently to allow of sleep? It has been claimed for Chloralamid that it is specially suitable for these consumptives who are wakeful at night, as in addition it reduces the night sweats which keep them so uncomfortable. This has not been my experience of the drug. Moreover, I believe any

measure which has that effect helps to keep up the temperature.

Pain.

Where the patient cannot sleep for pain and there are not any well marked physical signs , a point to remember is that there is often very great pain caused by a pneumonic patch in the centre of the lung setting up pressure and tension on the surrounding substance.

Cough.

When present to any extent nearly always disturbs sleep. During day the act of coughing is not difficult to excite, but when the patient is asleep the respiratory centre is considerably quietened and requires a much greater stimulus; for instance the mucus brought up by a single act of coughing which comes on during a sleeping period is three or four times greater in quantity than that brought up by coughing while awake. Where the cough is troublesome at night, preventing the patient falling asleep, or waking him up frequently, give sedatives. A plan I have found to work well in such cases is to prescribe

Tabloids of Tinct. Camph. Co. (m. XV. in each) (B.W. & Co.)

telling the patient to place one or two under the tongue and let it dissolve slowly. The opium present though in small quantity is sufficient to allay the irritability and have a certain sedative action in young people. Absorption takes place very quickly by this sublingual method.

Dyspnoea.

Most liable to occur during sleep. Where it is set up by obstruction, *such as the constriction in the larynx of laryngisms stridulus or croup, etc., or is due to diseases such as asthma bronchitis or influenza, curative respiratory measures are the sole indication and avoidance as much as possible of all conditions (e.g. draughts) likely to cause paroxysms. Where the patient has prolonged dyspnoea the best plan for aiding him to have a restful night is to prop him up comfortably in the position in which he thinks he can most readily sleep. When a hypnotic is called for, the safest is a bromide.

INSOMNIA IN GOUT.

How frequently gout is a source of disorder-

ed and diminished sleep those meeting with cases of it often know well. The manifestations of Gout, as is well known, vary greatly in different persons, but there are very few sufferers, from the sthenic type of acute gout down to the most vague case of "irregular" "Suppressed" or "latent" lithiasis, who at one time or another in the course of the disease do not complain of disturbed rest. Where there is a sleepless temperament or where the neurotic powers are comparatively unstable the trouble is accentuated, indeed the indefinitely prolonged character of the insomnia makes it a most important and troublesome factor to reckon with in considering the line of treatment for this class of case. Many theories have been from time to time advanced as to the peculiar liability of gout to disturb sleep; but the pathogeny of gout itself has not been definitely settled yet. One prominent point agreed upon is that an ever present feature is the presence in excess of uric acid in the blood, and I believe that this excess acts, like the other toxic causes, e.g. alcoholism, as a toxin in producing an irritability and want of proper tone and

nutrition in the cerebral cells owing to the impurity of the blood it sets up. In a case of acute gout the pain, not to speak of any other cause, attendant on a paroxysm awakens and keeps awake the patient, and in this connection it is a remarkable fact that many diseases have their onset, or, while running their course, an exacerbation, during sleep. Examples occur in nearly every bodily system:-

Cerebral System	-	Apoplexy, Epilepsy.
Respiratory	"	Asthma, Laryngismus Stridulus, Croup.
Circulatory	"	Palpitation.
Alimentary	"	Gall Stones.
Renal	"	Renal Calculus.

Although the mention of these analogies is a digression from the subject in hand, one cannot refrain from thinking that they form a point in favour of an argument which is, that there is a nervous centre for gout.

The disturbed and disordered condition of sleep in the gouty, renders them restless and irritable during the day; they complain of morose dreams and frequent attacks of pain at night and their sleep is rarely of a refreshing character - they often have headache, migraine, in the morning.

lady

In one case I know of, an elderly lady, told her medical man, who was puzzled by her peculiarly depressed condition, that for three months she had almost every morning taken between five and ten grains of Antipyrin on awakening, because of this headache.

A common feature, often overlooked, of the disordered sleep in cases of "suppressed" gout is the curious tickling numbed feeling ("needles and pins") which comes on when sleep is about to ensue and also on awakening, and this sensation often prevents sleep for an hour or two. This is most probably due to the reduced circulation allowing of uric acid accumulating in the extremities. It also sometimes occurs in anaemic debilitated conditions. The Insomnia of most gouty persons occurs about two or three a.m. and lasts till five or six a.m. and is generally preceded and followed by two or three hours rest. It is specially important to diagnose and treat the gouty condition, for, as said before, this form of Insomnia can last for an indefinite time and moreover hypnotics are harmful, in addition to being useless. There is no need in this connection to enter into the diagnosis of gout. Sleeplessness is only one of many more or

less varying symptoms. Before the uric acid can be present in such quantity as to cause this disturbance it will present other manifestations, and it is by treating the general condition that the various symptoms, singly and collectively, are benefited. However, a well ventilated room, moderate amount of brain exercise and a warm bath with a good rub down and massaging the head all tend to help the gouty patient to have a restful night. But, when cases occur where a hypnotic is demanded from the loss of sleep becoming excessive; a twenty-five to forty grain powder of Sulphonal is as good a drug as could be given. The resulting drowsiness will often continue for a couple of nights following.

The above remarks apply to the insomnia which frequently occurs throughout all the stages of ACUTE RHEUMATISM and which can be greatly relieved by the application of cold cloths to the head. In some cases singing noises and headache are complained of as preventing and disturbing sleep, when Sodium Salicylate is being administered. Although they do not call for abandonment of the drug, yet they serve

as an indication to desist from pressing it. When a patient becomes quiet and sleepy after being previously very restless, coma must be suspected. A case to which I was called for the first time, about midnight, on account of the patient's delirium, had been quite sleepless for two nights with pains in various joints. On arriving at the house they told me he was much better, having sunk into a "nice sound sleep". I found the temperature 106° Fahr. - Coma having supervened. By dint of persistent sponging, cold sheet and antipyretics, the temperature was got down, and eventually there was recovery. Antipyretics, such as Antipyrin and Antikamnia often prove of great benefit by lowering the temperature and so inducing sleep; the latter drug - a proprietary article not long introduced - although like Antipyrin one of the numerous coal tar products seems to have more analgesic power, and one five-grain tablet or powder (sometimes two are required) will combat the night restlessness to a considerably degree. Though avoiding a routine practice of it, yet each case of rheumatic fever to which I have given Antikamnia has benefited by its administration and there was not

noticeable any depressing effect on the heart.

As being another disorder of the assimilative process, it may be well to notice here DIABETES. In this case the main cause of sleeplessness is due to the frequency of micturition. The bladder irritability set up has a like effect on the brain in addition to the impurity of the blood, and this adds to the several other miseries endured by this class of case. At one time wearied and sleepless, later on pathological sleep - diabetic coma - may set in. Morphine and Codeine, especially the latter in addition to its good effects against the diabetic metabolism by its sedative powers helps the sufferer to sleep between the calls to urinate. Opiates are distinctly the best class of hypnotics here.

There are other urinary disorders which are liable to cause sleeplessness. The outstanding feature of kidney disease - albuminuria - by its impoverishing effects on the blood can make the sufferer at times very sleepless by cerebral anaemia. The best hypnotics for renal cases I believe to be either an opiate (a very suitable form is m.x - xij of Nephenthe

or Paraldehyde. Chloral and its compounds are not indicated here.

INSOMNIA PECULIAR TO MEN.

None of the diseases of the male genital system require special mention, with the exception of one - Masturbation. When a young man comes complaining of wakeful, restless nights, and gives other indications of general loss of tone, (furtive look, etc.,) if his occupation is a healthy one, not requiring too much brain work, one may with reason sometimes suspect Masturbation as a primary cause. I know of three cases where this was so, an engineer, a stableman, and a sailor; they all complained of being tired, listless and unable for their proper amount of work, especially in the mornings, in addition to wakeful restless nights. The most suitable hypnotics are the Bromides; but only in conjunction with other treatment and total abstention from the habit. When Insomnia occurs in a working class young man - not a brain worker, where there is no other ostensible reason (e.g. alcoholism, worry, etc.,) the question of self-abuse should be required into.

INSOMNIA PECULIAR TO WOMEN.

With females of a neurotic type Insomnia is not unfrequently a complication of their menstrual disorders. Every now and then at puberty, when a girl merges rapidly into womanhood, restless nights occur adding greatly to the disorder. On this point A. W. Macfarlane, M.D., in his monograph on "Insomnia" says "Disturbed sleep at this time is by no means rare, and once initiated it is apt to recur at the catamenial periods, when evidence of increased nervous excitability and fatigue is seldom wanting. Insomnia is a most undesirable symptom at such a juncture, for a plentiful amount of sleep is urgently required for the development and recuperation of the nervous system."

He advises rest in bed for several weeks, and says the Bromides may be given in full doses, but it would be an interesting point whether smaller doses of a bromide (that of strontium for preference) with five to ten minims of Tinct.Nuc.Vom. thrice daily, would not be more beneficial, as combining a sedative with a toning influence on the unstable nervous system of this period.

While Menstruation is normal the mass of females suffer no inconvenience from sleeplessness; but where there is Dysmenorrhoea or Menorrhagia the pain of the former and the excessive loss of blood in the latter (causing Cerebral as well as general Anaemia) often result in sleepless nights. Treatment of the cause is of course the remedy. Rarely is this variety of Insomnia a difficult symptom to dispose of; but it is different when it occurs in elderly women during and subsequent to the menopause, which often causes sleep disturbance; and, when the patient had been a light and irregular sleeper before, Insomnia is all the more marked. I have known several cases, where, in addition to difficulty in falling asleep there was a waking period of two or three hours in the middle of the night. The quantity and quality of the blood is affected, and the brain cells suffer from want of nutrition in addition to the nervous disturbance caused by the general bodily irregularity at this time. In two of the cases the feeling of "needles and pins" in the extremities, as noted in Gouty Insomnia, came on during sleep disturbing it and lasting an hour or so after waking; in neither could the presence

of gout be discovered by any other signs; but that there is such a condition has also been noticed by others as occurring at this period. The lines of treatment during the menopause are very various.

Where sleeplessness is present, when special remedies are called for, these must be given with the greatest caution as women at such a time are liable to form injurious habits, and for this reason Alcohol, Morphine, Chloral, Cocaine, Bromidia and such like, should be avoided if possible. Trional will usually be found to act promptly and well, but in the opinion of a good many practitioners paraldehyde is the most safe and most efficient drug at this time. The offensive breath it causes acts as an additional safeguard against its habitual use by ladies. Half a drachm will be found to be usually quite sufficient.

The sleeplessness which, in some women, follows parturition can be remedied by a simple hypnotic - one drachm of Bromidia being an appropriate hypnotic. Unless the patient is at other times of a wakeful disposition, this variety rarely persists after the first week or fortnight of the lying-in per-

iod; but it should always be taken note of and watched, as it bears some relation to puerperal fever.

THE INSOMNIA OF INFLUENZA.

The late Dr. T. B. Pearson in an article on Influenza in Quain's Dictionary of Medicine first described three forms of it - (1) Catarrhal (2) Gastric (3) Nervous - the last form being chiefly marked by pains in the head and back, and general depression. In the later epidemics since the different clinical features of the disease have been more carefully noted and more frequently recorded, the nervous form has been found to attack the majority of sufferers, and among the many features it presents, sleeplessness is very often to be met with. I would divide this into two types, which, although there is no sharp line of demarcation, might be termed Acute and Chronic. The acute variety of sleeplessness comes on about the first or second day of Influenza, and lasts more or less during the febrile period - more during the first three or four cases. Although feeling weak and

* depressed, as many of them put it "thoroughly miserable", the patient spends the night turning from side to side, and any sleep obtained is semi-conscious, dream-laden and unrefreshing. The presence of headache points to cerebral congestion, and this in conjunction with the raised temperature and gastric disturbances produces a condition quite inimical to sleep. Most probably the stupor, which some doctors have met with, is due to a progressive continuance of this cerebral congestion. The extent to which Insomnia is present influences the course of the disease and by reason of the depression attendant upon it must be regarded as an important symptom. Cold wet cloths kept continually applied to the head with measures such as Phenacetin, to keep down the temperature, during the day, with a hypnotic at night are indicated. The sedative should not be depressant if possible. The following is the usual line of treatment adopted with success by Dr. Kingston of Liskeard in Cornwall, who has been practising many years:- Potas.Bicarb. in Gr.XX doses every four hours in water and when restless at night Ammon.Brom.

Gr.XXV-XXX, dissolved in Chloroform water. Where there is high fever going on to delirium in addition to antipyretics the most suitable hypnotic is Chloral Hydrate. If I meet with a case with cerebral congestion much in evidence - that class of case described as going on to Stupor and Coma - I would feel inclined to try leeching to the temples, which if given with such beneficial result in Congestive Neurasthenia, should do well here. Nearly every case of Influenza is attended with sleep disorder the first few days, which, if at all pronounced, should be treated early, because, if allowed to persist, it lessens resistance to the power of that general depressant agent which, entering the blood or acting on the nervous system, affects every phenomenon ^{on} the disease presents. The chronic variety of sleeplessness comes on with the general prostration, mental and physical debility and loss of appetite which occur so often on the subsidence of Influenza. The patients lie awake long after their accustomed hour for onset of sleep, when it does come it is semi-conscious and dream-laden and not unfrequently accompanied by perspiration

generally it does not last long, and the night is passed with short periods of unrefreshing sleep, interrupted by intervals of extreme wakefulness when the patient cannot for any length of time remain in one position. This state may either become improved by the tonic treatment given for the general debility or may resolve itself into pure Insomnia - the sole persistent symptom of the disease from which the patient has otherwise recovered. Where the patient can afford it, entire change of air and surroundings, with massage, more particularly to the head and neck, at bedtime will effect a great improvement and often cure without resorting to hypnotics. At some Hydro-pathic establishments it is a growing practice for the masseur to have to attend for this purpose. One case I have met told me that from various reasons having resolved to try to do without hypnotics he had found this method quite effective. The slow peculiar movements of the attendant's fingers over the scalp had a peculiarly soothing, almost mesmeric, effect in inducing five or six hours healthy sleep. I myself, on trying this plan while staying in Dun-

-blane Hydropathic mainly on account of Insomnia, found it so - on two occasions falling asleep before the masseur had left the bedroom. Static electricity where available, has one of its chief beneficial effects in the debility and sleeplessness of the post-influenzal condition. Of all the hypnotics for this class of case I recommend Trional, as it ensures a good night's rest in about twenty minutes and can, when necessary, be continued for some time with no ill effects. Plenty daily out door exercise and a certain amount of mental occupation during the day are two strong points to insist on.

Of nineteen cases I have notes of, where there was sleep disorder in Influenza, thirteen did not suffer inconvenience from it after the first week; in four the sleep was not so good for from two to three weeks after - there being more difficulty in falling asleep and generally a waking period of an hour or so in the course of the night; in one there were recurrent "bouts" of sleeplessness, and the remaining case, already cited, ended in insanity - in this case there was no previous family history of insanity.

INSOMNIA IN FEVERS.

There are some fevers, notably Typhoid, where sleeplessness is not rarely a prominent and troublesome feature influencing the course of the fever unfavourably, indeed in some cases it becomes important to concentrate all efforts in obtaining sleep, for the patient, more especially if there be any indication of coma vigil setting in. In fever, the toxic products present in the blood interfere with all normal metabolism - the various organs suffer from improper nutrition, the nervous as much as, often more so, than any of the rest on account of the "delicacy" of cerebral tissue. Every case has to be dealt with on its own merits and where hypnotic drugs are called for a careful selection must be made. Chloral Hydrate, for instance, which would be suitable in Typhoid Fever or Measles, more so in the earlier stages when there is a full arterial tension would be contra-indicated in Diphtheria. In the more immediate relief from Insomnia, cold sponging takes the chief place; for recuperative sleep the temperature must be lowered. If there is a headache and high temperature, antipyretics will be found to also act

as hypnotics. Chloral Hydraté is a favourite hypnotic. Combined with Formamide (Chloralamid) it has not so depressant an action on the heart, and has so far acted well in my hands in two cases of typhoid and four of scarlet fever, when they were wakeful and restless at night. But where a direct vascular depressant is required, as in cases where there is high fever and much excitement in the circulation along with the sleeplessness Chloral Hydrate alone is best. By its action on the nervous system and lowering the temperature it takes the place of the old plan of opium and antimony, though where there is pain present the latter combination has the advantage. Opium should however be used with the greatest caution when there is any risk of coma vigil on account of Cerebral Congestion.

INSOMNIA OF CONVALESCENCE.

There should be no haste shown (though I believe there often is) to embark on a course of hypnotics here; they are rather to be regarded in the light of a "dernier resort". Generally, as the convalescence proceeds under generous diet of easily assim-

ilated food, tonics, (Quinine, Strychnine, Iron, etc.) the sleeplessness present can be remedied by a glass of Alcohol or some other stimulant at bedtime. But Insomnia must never be allowed to retard convalescence; if it does seem to be doing so, then I would give a hypnotic - for preference Trional. A teaspoonful of Bromidia will often give considerable relief. No doubt the commonest cause for sleeplessness here is cerebral anaemia - not the temporary anaemia so conducive to sleep, but lasting also throughout the day-time, so that the brain gets weak and irritable.

NERVOUS SYSTEM.

It is among the affections of this system that sleeplessness, in addition to its being frequently present as a symptom, can take its place as a primary disease. Cases occasionally occur where a person, otherwise in good health, suffers at irregular intervals from Insomnia for which there is at the time no explainable cause. But these attacks rarely occur without the nervous system having been rendered more or less unstable at some preceding time, and thereby more liable to derangements such as sleepless-

ness. Whether from shock, mental overwork (physical overwork I do not believe can cause it) neurasthenia, worry, etc., it can become unstable, and if, as often happens, the person have a constitution of the Nervous type, he or she may be said to have a sleepless temperament, a condition daily becoming more common.

There are those who sleep badly or not at all under the most favourable conditions; in them Insomnia is present as a disease. They are distinct from sufferers from all the foregoing sleep disorders of the systemic affections, where sleep is absent as a result. Where Insomnia is Symptomatic. One sometimes meets with individuals who say they have "inherited" their sleeplessness and who can instance one or more of their ancestors who have suffered from it. I believe it to be quite as possible to inherit the habit of Insomnia as, for example, the habit of Alcoholism, about which latter there is little or no doubt. Very frequently the alcoholic habit - like Phthisis - does not show itself till the period of manhood is reached and this may explain the sleepless breakdown occurring for the first time in a full grown man, in whom no trace of organic disease can be

found; in other words when he has reached a point at which there may be more than ordinary demand on his powers from his hereditary predisposition the higher cerebral functions become more easily exhausted and assume an irritability interfering with the rythmical alternation of consciousness and unconsciousness.

Where there is a well marked neurotic family history, Insomnia occurring idiopathically may be regarded as nothing more than one of the various steps of that line of functional cerebral derangements beginning with Hysteria, going on through Hypochondriasis and ending with Insanity; indeed it must be looked upon gravely and treated with the greatest of care from the fact of its sometimes occurring as a premonitory symptom of Insanity. By reason of the progressive tendency of true simple Insomnia, it becomes important to differentiate it from Symptomatic Insomnia - this can only be done by a process of exclusion. The majority of sufferers from the former type, on going to bed fall asleep in about an hour, wakening two or three hours afterward and remaining so till morning. Where there is no evidence of worry, shock, etc., and the patient's complaint is not of extreme rest-

less wakefulness or of a mind harassed by some particular ever recurrent thought, but simple inability to regain unconsciousness, the case requires very careful management. The want of sleep soon tells on the patient and the resultant adynamic condition does not take long to merge from what before was a neurasthenic state of the higher cerebral functions into one of general Neurasthenia. From statistics, Neurasthenia is the most common cause of Insomnia and reacts by a return along the path I have described above. On account of the increasing frequency of Neurasthenia it is well discussed in the present day text-books on Nervous diseases. Therefore it would serve no good purpose to enter into the details of the various symptoms, suffice it to say, there are two leading features, which are:- (1) more or less marked and persistent diminution of nervous energy - weakness- and (2) increased reaction (mental and physical) to external impressions - irritability. The weakness acts by diminishing the nervous metabolism, and interfering with the normal vasomotor influence so that instead of cerebral anaemia the brain is oftenest in a hyperaemic state (one might almost term it - vascu-

lar paralysis) hence the frequency of that condition so inimical to sleep - Congestive Neurasthenia. In addition to weakness the other chief symptom - Irritability - keeps the sufferer awake as by the increased reaction to external impressions the slightest sound, smell, light, etc., will prevent sleep. But there is also a toxic element to reckon with, viz., Uric Acid in excess. One cannot but be familiar with the numerous instances occurring in daily practise, where gout (the irregular form) and Neurasthenia are bound together. I have seen cases of gout where the disinclination for exertion (mental and physical) and general debility made it difficult to distinguish one disease from the other. The view which has lately been gaining ground, that Uric Acid results from an disintegrating process of the nuclein in nerve cells is very suggestive. The majority of gouty subjects and Neurasthenics suffer more or less from disturbed sleep, which sometimes takes the form of persistent Insomnia, and this becomes serious and troublesome to treat, from its progressive nature and the prolonged and indefinite character of these diseases. When sleep comes on it is as a rule light and unrefreshing

and the patient wakes without feeling rested, frequently complaining of exhaustion, a sensation which is relieved by taking food. Sometimes, though not commonly, sleep is heavy and dream-laden with much the same result - that there is still present the feeling of fatigue.

The treatment of Neurasthenic Insomnia is that of Neurasthenia itself. The line laid down by Dr. Weir Mitchell is being gradually followed out by the profession as being the most satisfactory method for dealing with this class of case. As the Neurasthenia improves so also does the Insomnia in most cases. Sometimes it does not and therefore requires special attention. If there is a feeling of fulness and pain in the head it will point to Cerebral Congestion; in such a case either leeching or antipyretics will be almost sure to give relief. These latter have an important sedative effect in this connection which makes them specially useful. Antipyrine or Antikamnia are the two best. One cannot help noticing how often a sound night's rest follows their administration for a headache caused by overwork or worry - indeed they might almost be termed hypnotics.

But their use should be discontinued as early as possible. Although cases are published where Antipyrin has been taken regularly for periods of from a fortnight to a couple of months, ^{with no ill effect} on the whole it is improbable that, having regard to its powerful alterative effect, relief can be afforded indefinitely, except at the expense of some part of the system. It is known that it can have a very depressing effect, nausea and sickness not infrequently being present. Other means of combating Neurasthenic Insomnia are by pure hypnotics. Of the whole range of these the two I favour most are Ammonium Bromide and Trional. The indications for administering these will be given later on when discussing the general treatment of Insomnia

TOXIC INSOMNIA.

There are certain toxic affections of the nervous system resulting from the excessive use of certain agents.

Alcohol, Chloral, Cocaine and Opiates are most frequently used, the first named being a very common cause of sleeplessness. Although (with the ex-

ception of Chronic Alcoholism) pathological changes are rarely to be found in autopsies on the victims of the habit, toxic action most probably sets up inflammatory changes in the nervous system, (both parenchymatous and interstitial) and the brain becomes chronically congested. Thus increased nervousness is shown, also vacillation, tremors, sensory disturbances and the various other phenomena of nervous disorder. Insomnia often becomes a leading symptom and aggravates the trouble. The best line of treatment is the gradual withdrawal of the drug. The results of experience have shown that neither instant nor rapid withdrawal in a few days are so successful procedures as the first mentioned. Heart failure must always be guarded against. For subsequent treatment I would advocate good food, fresh air, directed rest and exercise, and avoidance of all other drugs.

IDIOPATHIC INSOMNIA.

Where none other than nerve structures are involved the question arises, Can Insomnia occur without Neurasthenia or any other discoverable morbid condition being present? I believe it can. The

hereditary neurotic and those who are suffering from overwork, grief, habit of worrying, keeping irregular and late hours, are all examples of persons frequently suffering from sleeplessness whose health otherwise may be said to be good. In all these conditions the brain is in a chronic state of hyperaemia as the result of continued emotion or psychological activity, and the sleeplessness will usually be found to yield to any measure which will have a calming sedative influence and produce a better state of vascular tone, which it is absolutely necessary to have. Whether it be hyperaemia or anaemia of the brain, if the one condition does not alternate with the other, Insomnia will quickly set in and remain until the affection is remedied. Not only so, but from being an effect of an otherwise trivial cause, it can itself originate, if prolonged, general body disturbance occasionally of a serious nature.

Prof. Charteris of Glasgow related a case in the Lancet of May 1895, from which I will quote as showing the extent to which pure Nervous Insomnia can disturb the system. It was that of a man aged thirty who was always a light sleeper, but, owing to un-

happy circumstances the ailment grew upon him till during a period of eight months it had been his experience to have no sleep at all for a week at a time. He was given Sulphonal and Potassium bromide but without improving his condition, and, acting under medical advice, he discontinued their use and went to the country for ten days. During these ten days, although free from all business, he had only one night's sleep of four hours duration, and on returning to business his condition became very serious. "By this time" he stated "my head had become strange and work was a matter of difficulty. At night my heart beat so loudly that no matter in what position I lay I could hear it. During the day I was dizzy and full of morbid fears. Something ticked in my left temple and my eyes felt hot and fiery. At the end of September I had sunk into a state of depression, and, dreading to go to bed, wandered about the streets, had lost hope, and formed resolutions of which I do not like to think now, and for which I can offer no very satisfactory explanation yet they were as real and natural as sober and sensible thoughts are to a person in good health."

Happily not every case of Insomnia is so pronounced as this, but the symptoms described are typical of the utter functional disorganization of the whole nervous system sleeplessness can set up. From personal experience I can corroborate the above statement, although I have not suffered to such an extent. One other point, in conclusion, I should like to note is this, that although in most cases one meets, the insomnia is attended with symptoms of irregular mental activity, where the sufferers are old they are usually tranquil, all excitement and irritability being absent, even when their sleeplessness be very great.

TREATMENT.

A very important point to be borne in mind in the treatment of all cases of Insomnia is the tendency of ~~the~~ patients to exaggerate their trouble and this element has to be taken into account when one is called upon to decide as to withholding or administering hypnotics. The relief afforded by this class of drugs too often causes the patient to become

prone to their habitual use, with the disastrous effects which are known to every practitioner. As urged before, too great stress cannot be laid on the necessity of treatment of the cause - the underlying disease. It would seem useless iteration in an essay of this character to lay down this axiom - one so much enforced on all Edinburgh students, but I do so for the reason that, while obtaining particulars and discussing cases with various medical men in addition to those cases I have personally met with, I was impressed with the fact that the majority of cases of Insomnia to be met with are symptomatic and the sufferers are very numerous from it who make it their leading symptom - often their sole complaint and who, unless their case be closely inquired into, are often subjected to a long, useless, not to say harmful, course of hypnotics. Cases in point are dyspeptics, or subjects of the Uric Acid diathesis, in both of which instances a course of hypnotics such as the bromides are often given to counteract their mental irritability, coupled with the sleeplessness they complain of; but although by their cumulative sedative effect, sleep may be at least obtained, it is tempor-

ary and only results in renewed and aggravated attacks of insomnia, accentuating the primary condition.

I now turn to the treatment of pure nervous insomnia, where no bodily organic affection can be discovered, and yet the patient cannot obtain the required amount of sleep at the proper time. Where overwork has rendered the nervous system unstable, the only course is to reduce the overtaxing cause. Absolute rest is the best course, but in many cases the "worry" caused by overwork is not nearly so great as that caused by idleness, so that it is frequently necessary not to advise total abstention from all work but to allow a daily modicum - sufficient to keep the brain healthily exercised - the while ensuring well regulated hygienic measures to restore nerve tone. No case of functional insomnia (take for instance that arising from shock) can persist for any length of time (I mean over a week) unless the nervous system be more or less unstable, and this state of affairs can be remedied to a great extent without medicine by paying attention to the ordinary rules of health.

Taking up the plan often adopted in treat-

ing dyspeptic troubles of drawing up dietetic tables and recognising the secondary position which drugs should take, I have made a point in each case of functional insomnia I have met with of drawing up a set of hygienic rules on the following lines:-

Begin the day with a cold or tepid bath, and shortly after breakfast a walk for an hour or so. What mental work has to be done should be attended to in the forenoon till twelve o'clock. Rest at least half an hour before dinner which should be a substantial midday meal. In the afternoon bodily exercise in proportion to the strength of the patient and about five or six p.m. another light meal at which the amount of tea or coffee is to be limited. The evening can be taken up with another short walk or light gymnastics, followed by mental occupation of a light nature such as music or reading and the patient retire shortly after ten. The preparation for bed - undressing - need not be hurried; attention to the details of the toilet has a sedative effect. The bed should in nearly every case be warmed, as cold has a very disturbing effect. Often a cup of hot milk or beef-tea is beneficial as the hyperaemia set

up by the stimulation is only temporary, cerebral anaemia soon follows the withdrawal of the blood to the abdominal viscera to absorb the nourishing particles of the beef-tea or milk. It is here that a glass of alcohol at night, in addition to its narcotic effects has its best use; but where it is not habitually taken the number of cases is rare where it is absolutely demanded; otherwise it should never be withdrawn unless the Insomnia be due to Alcoholism, when a very gradual diminution is the most advisable course. Such is the general plan to be laid down as a principal part of the treatment. There are certain addenda (e.g. Hot foot baths, warm baths, followed by cold douche to the spine) which are sometimes though not always of direct benefit. I would lay stress on bodily exercise; within limits it has a splendid effect in inducing healthy fatigue, and the muscular exertion involved, as was first shown by the physiologist Preyer, has a hypnotic effect by reason of the soporific action of lactic acid - one of the products of muscular action.

Massage and Electricity are being now more frequently used and rightly so. As noted earlier, I

can personally testify to the beneficial effect of the former. When massage is employed the best method is a little general massage over the whole of the body, followed by slow worm-like movements of the fingers through the hair over all the scalp. The peculiar soothing, almost mesmeric, effect of this, and its simplicity and efficacy indicate this as a method which should be tried far more commonly than it is - certainly before resorting to more complex treatment.

Electricity.

The therapeutic effect of Static, Galvanic, or Faradic Electricity in producing nerve tonics is well known. Of the different forms in relation to Insomnia, Static Electricity is, I feel sure, the best. The difficulty is its application - not every medical man is conversant with this and the apparatus is not always at hand. But there are few cases of Neurasthenic or Idiopathic Insomnia which will not yield after a few "baths" of Static Electricity, especially if applied at bedtime. The cold soufflé, ^{or breeze} as the negative pole passes round the head and neck and down the back is most refreshing. In a case of congestive neurasthenia in which I was administering it to the pat-

ient ~~she~~ said she felt as if each movement of the electrode seemed to take all the "foam" off the blood in her head. From four to a dozen "seances", one nightly at first, and then every alternate night will generally suffice, and the advantage to be looked to here is, that not only is the Insomnia cured for the time being, but healthy cerebral function is being at the same time restored which will greatly diminish the liability to recurrent attacks.

Insomnia Bed.

Within the past year a special bed has been invented, and those cases which have been tried with it have found relief. The bed is supported midway by a single stand which is connected with water-pipes. It is worked by hydraulics and the inflow and outflow of water regulated by valves gives the bed, by means of mechanism on the stand, a see saw motion. It is not improbable that the very ancient Infant's Cradle had suggested the idea. I inspected it in the wards of the Royal Infirmary, and the patient who was nightly occupying it - he suffered from dyspeptic insomnia - said he had not had a good night's rest before for several months. The gentle up and down

motion certainly has a calmative soothing effect when the eyes are closed, and although it would be very useful for hospitals the obvious objection for private practice is its expense and special application. Many people would refrain from spending £8-10 on a bed intended solely to relieve their sleeplessness.

Leeching.

I have no personal experience of this line of treatment, but in the hands of Mr. E. G. Whittle at Brighton it has been successful in cases of sleeplessness of Congestive Neurasthenia - indeed he has written a book on the treatment of this form by leeching, mentioning several cases where it succeeded, which had failed in other hands.

HYPNOTIC DRUGS.

It is often a difficult point to decide as to when to advise or forbid hypnotic drugs. The chief indications are failure of strength and loss of weight. While the patient's strength keeps up and he can take a proper quantity of nourishment the urgency is not great. It is in absence of these that active

measures are called for. In all cases of symptomatic insomnia, where it is influencing the course of the underlying disease and also in the incidental wakefulness of shock, etc., I would give hypnotics; but the safest general rule when Insomnia has been present some time or seems likely to persist indefinitely is to refrain from embarking on a course of hypnotics till Massage, Electricity, and attention to the hygienic measures laid down, have not afforded the necessary relief.

The following notes on the various hypnotic drugs are not intended to be a complete resume of their therapeutics; but are the results of personal experience and hints I have gathered and made use of from the medical journals. With this Thesis in view I have endeavoured to ascertain practically as far as possible the different therapeutic qualities and effects of the most generally used hypnotic drugs.

Bromides. (Potassium, Sodium, Ammonium and Strontium)

The bromides of these metals form the purest and safest of all hypnotics. By their general nervo-muscular depressant action, the effect is rather to bring the

brain into a condition favourable for the advent of natural sleep than to induce it artificially, if such a distinction can be drawn. Potassium Bromide is the most depressant of the group, Strontium and Ammonium Bromides least so; the last is preferable to the Potassium salt when the drug is prescribed indefinitely. In the Insomnia of overwork and worry they do well and are also very useful in the disturbed sleep of the menopause. Bromides can be taken for a long time without proving harmful, e.g. I have notes of a case where the patient (a woman) took 480 grs. of K.Br every twenty-four hours for a year. She suffered from languor and suspension of mental activity, but eventually recovered. Of the many combinations of other hypnotics with the bromides Bromidia is the best and most frequently used. A teaspoonful in water results in a very gradual natural drowsiness shortly coming on, followed by sleep from five to eight hours. In the sleeplessness of Alcoholism and when a hypnotic is called for in a gouty subject this preparation is, perhaps, preferable to any other.

Chloral Hydrate; Butyl Chloral-Hydrate.

The latter drug is rarely prescribed although it is said to be less depressant than Chloral

Hydrate - it is certainly less active. In the first named we possess a very sure and powerful hypnotic - it is a very good antipyretic hypnotic and is quick in taking effect. The depressant action on the heart is a great drawback and must never be overlooked. Sometimes it is not tolerated by the stomach (I have seen such a case) but this is rare. In all cases where there is sustained high pressure and raised temperature, Chloral Hydrate is the hypnotic "par excellence". The sleep it causes is so refreshing that a habit of taking it regularly is frequently acquired. An instance is known where a daily dose of nearly a drachm for six months produced violent hysterical mania. As a rule Chloral Hydrate is unsuitable if there also be pain present. Within the past half dozen years a new hypnotic Hypnal has been introduced. It is a combination of Chloral Hydrate and Antipyrin, and is claimed to be more soporific and analgesic. On two occasions I took m.xxv. It gave a sound refreshing sleep and I may note that it is nearly tasteless. Where there is neuralgia it is suitable.

Chloralamide. This is also one of the newer hypnotics.

Although as certain it cannot be said to have proved so prompt a hypnotic as Chloral Hydrate, but the great point is that the Formamide element in it counteracts the depressant action of the latter drug on the heart. The usual dose is grs. XXX-L. Fifty-five grains given to the worst case of mania will produce sleep safely.

Chloralose, is simply a combination of Chloral with Glucose and apparently possesses the contradictory properties of acting as a hypnotic and augmenting at the same time the excitability of the spinal cord. It has a very bitter taste and does not seem to have been used to any extent by British Medical men, though about two years ago it was noted in the "Lancet" that it had been used with great success abroad in cases of Obstinate Insomnia.

Chlorobrom is without doubt an excellent hypnotic and is composed of KBr and CH. A large sample bottle sent to me, while ship's surgeon, I gave for sea-sickness (with little specific effect) but the patients all were able to obtain sound refreshing sleep, especially when a dose was given at night. Without any

outstanding merits it may be said that Chlorobrom is a sure and reliable hypnotic among the varieties of its class and has been known to succeed where Chloral Hydrate alone has failed. Dr. Charteris' case of pronounced Insomnia which I have quoted was cured by Chlorobrom.

Paraldehyde. This is a pure hypnotic which has been creeping steadily into favour. On account of its extremely disagreeable taste and the odour it gives to the breath it possesses the great advantage that patients feel little inclined to continue its use privately and another good point is that it does not depress but rather stimulates the heart's action. Its administration is usually followed by a well-marked stage of excitement. In neither of the two cases in which I counted the pulse about an hour after falling asleep, was there any diminution between the day and night pulse. The most satisfactory way to give it is to begin with half a drachm dose at six p.m. following hourly with twenty minims till the desired effect. Paraldehyde in no way interferes with the digestion and is not followed by the same depression or uncomfortable sweating one meets with occasionally

when Sulphonal is given.

Sulphonal, Trional and Tetronal -. These drugs are all members of the same molecular group, only differing in the number of molecules chemically; they are a valuable addition to the list of hypnotics. The action of Sulphonal is fairly well known, its chief advantage is the length of time it takes to act and the continued drowsiness next day. After repeated trials of both Sulphonal and Trional, from results I have obtained and inquiries into the results of others, I have come to the conclusion that in every respect Trional is the superior drug, and I believe it to be a matter of time only before it will replace Sulphonal. In insomnia, whether idiopathic, or the result of melancholic mania, overwork, neurasthenia, or indeed in almost every case of sleeplessness, not also requiring an anodyne action, Trional is amongst the most suitable, if not the very best, hypnotic for many reasons. It is much more rapid in taking effect than Sulphonal. I have known it to act in ten minutes but usually it takes from twenty minutes to half an hour, rarely longer. Though insoluble in cold, it is readily soluble in hot water and has a much less

objectionable taste than sulphonal. For adults the dose is from fifteen to thirty grains and for children from three to twelve grains. Twenty grains can usually produce sound sleep lasting six to eight hours with no unpleasant after effects. Where it has to be taken several times it is well to order the patient to drink mineral waters during the day to preserve the alkalinity of the blood. When Trional was first introduced a warning note was thrown out as to its causing haematoporphyrin to appear in the urine. I have never seen a single case where this happened although I have watched for it and examined the urine of patients taking the drug, and as confirming this, there were recorded during last year in the British Medical Journal two cases of chronic Trional poisoning where the patients had taken it privately over a great length of time, and there was no haematoporphyrinuria, which must in a great degree be taken as conclusive. Although it has been said to be as good as Morphine where an anodyne effect is desired it must be admitted that the latter drug is better.

In three cases (abdominal cancer, ^hpsoriasis,

and Herpes Zoster) Trional failed, where an opiate (Nepenthe) succeeded. To overcome this failing (for often cases arise where it is undesirable to give opiates) a proprietary article has been introduced where the Trional is combined with Acetanilide and is said to act well though I have not tried it. But Dr. Ilott of Liskeard, Cornwall, has informed me that during the past two years in which he has almost habitually administered Trional where a hypnotic was called for, he has not had a case where it did not succeed or was attended by any ill effects. Its great advantage over Chloral is the absence of depressant effect on the heart and vessels; and this must be considered a great advance on the older hypnotic, Sulphonal. That Trional can also compete with Chloral in the rapidity of soporific action and absence of after effects. Patients do not as a rule have the same drowsy feeling they complain of when taking Sulphonal.

Tetronal, the other drug of this group, has apparently similar properties, but not having had any opportunity of using it, I refrain from discussing it, although the same advantages are claimed for it as for Trional, viz., that it is a quick, reliable and safe

hypnotic. The hypnotic action of opium and its alkaloids principally Morphine, is well known. As a direct vascular depressant Opium combined with Antimony used to be much more in vogue, but of late has been almost entirely replaced by Chloral Hydrate. Opium is not a drug to be given for Chronic Insomnia - unless due to malignant disease - on account of the liability to use it habitually, so great is the relief it affords; when sleep sets in the dreams are usually very pleasant. But a hypodermic injection of Morphine is often the best hypnotic in acute disease.

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