incide centrally with the interspaces, and, more than that, they appeared to agree in relative brightness. He thought, therefore, that in speaking of the agreement of these lines in the solar spectrum with the lines of oxygen we ought to treat it as a matter of probability, and if, with any particular dispersion, the chances of a central or apparently central coincidence of any line with a line of the solar spectrum were x , then the probability of the coincidences of the ten lines of oxygen with the ten solar lines or interspaces would be measured by x^{10} , multiplied by something else, which would measure the probability of the observed similarity in the relative brightness. This was all that had been made out with regard to oxygen, and Mr. Christie had not shown that there was not this coincidence. With regard to the theoretical objection, that a gaseous atmosphere overlying a continuous spectrum must absorb its own wave length, and give rise to a dark line, there was the remarkable case of the D_2 line, which was seen bright in the chromosphere, but yet there was no equivalent dark line in the solar spectrum. There was also the 1474 line, which, though the brightest of the corona lines, had only a faint Fraunhofer line corresponding to it, showing that the law of exchanges did not universally hold. This was also proved by the bright lines of gaseous nebulae, for if the law of exchanges held absolutely true, the outer and cooler layers of a nebulous mass would absorb all the wave lengths emitted by the gas in the interior of the nebulae.

Dr. Schuster said that none of the bright lines of oxygen were sharp lines, but the fact which had been pointed out by Mr. Christie, that the bright bands near G did not fade off at the edges, looked very much against their corresponding with the lines of oxygen. He had himself shown, in a communication to *Nature*, that there was another spectrum of oxygen, and that there were dark lines in the solar spectrum which corresponded to it; he did not think it was probable that oxygen would be present in the sun in its two forms. With regard to the theoretical difficulty, he did not think that the question was so simple as Mr. Ranyard had put it. In the nebulae there was no background of continuous spectrum to be absorbed; the only way in which you could get bright lines in the sun without corresponding dark ones was by assuming that hot matter was thrown up from the interior. If you considered the sun as a body at rest, no thickness of layer of any gas or metal would produce a bright line.

Mr. Knobel exhibited a chronograph tracing, made by the chronograph at the Naval Observatory at Washington. The remarkably accurate going of the clock, and the equable rate of the instrument, were shown by the absolute straightness of the line of seconds' marks on a sheet, corresponding to a period of two hours.

SCIATICA AND NERVE-STRETCHING.

EDINBURGH MEDICO-CHIRURGICAL SOCIETY.—Mr. Chiene introduced a patient on whom he had performed the operation of nerve-stretching for a severe, prolonged, and intractable attack of sciatica. The man, about forty years of age, can now move the leg freely, having previously been prevented from working for a period of nine months. The subject of nerve-stretching also received attention in a paper by Mr. Johnson Symington, M.B., in which he described experiments performed with a view to test the cohesion of nerves. Out of fourteen observations on the dead body, in which weights were rapidly attached to the great sciatic nerve immediately below the gluteus muscle, 130 lbs. was the average weight found necessary to rupture the nerve. The maximum, 176 lbs., was required to tear the nerve in the body of a strong muscular man, who had died rapidly from an injury to the head; the minimum, 86 lbs., in the body of a young female, aged eighteen, who had died from phthisis. Six gave way at the hook attaching the weight, while the eight others separated at the nerve-roots. Mr. Joseph Bell had performed the operation of nerve-stretching in a case of inveterate sciatica. After opening the sheath of the nerve and laying hold of the nerve with the finger, it easily came up as a loop, and, in pulling on the nerve from the point of origin, as well as from the distal side, the feeling he had was as if he was pulling a vegetable, with long fibrous roots, from the ground. He stopped short of lifting the patient from the table by his sciatic nerve. No paralysis supervened. Mr. J. Chiene had operated in five cases of severe sciatica. He does not lift the limb from the table by the nerve, and has recently simplified the operation by making an incision, one inch in length, externally at the angle made by the lower border of the gluteus maximus and biceps cruris. What was the essential pathology of sciatica? Thickening of the nerve-sheath was often held to be its cause, and in one case he had found the veins on the nerve to be varicose. Dr. Alex. Miller showed the instruments used by the natives of Japan in the treatment of sciatica. They consist of fine gold needles, which are thrust into the limb at the seat of pain, and left there for some time. Dr. Miller said that in the operation of nerve-stretching the carbolic acid used for antiseptic purposes might have to do with the good result. Dr. J. Duncan said it was Syme's practice to thrust the needles through the nerve and down to the bone, and leave them there for an hour and a half. Dr. G. Balfour had never failed to cure sciatica medicinally, and with help of acupuncture, or morphia or atropia injections.

THE SURGEON'S DUTY.

By M. VERNEUIL.

APPROPOS of a little operation, which I am about to do on a young patient who entered our wards three months ago with a crushed hand, I must once more insist upon the course a surgeon ought to pursue in wounds of the hand. Whenever you shall have to treat a patient suffering from any crushing of the hand, adopt as an absolute rule to excise nothing and to trim nothing with a knife. In those cases the surgeon ought only to think of warding off and controlling primary complications; but he should leave to nature the care of saving whatever she can save; she will preserve more than the surgeon, and will always waste less. We do not sufficiently clearly conceive how much of the lacerated, and on the first day condemned, tissues may resume their vitality and be repaired. Allow nature then to act. Wait. Later, after weeks, or even months, when cicatrization shall have occurred, then only should the surgeon interfere and trim the wound in such a way as to procure for the patient the fullest use of the limb.—*Jour. of Med. Science.*

A PLANT named Hoang-man is attracting much attention as a remedy for leprosy.

SLEEPLESSNESS—ITS CAUSES AND CURE.

By JAMES SAWYER, M.D. LOND., M.R.C.P.,

Physician to the Hospital, and Professor of Pathology in Queen's College.

I DESIRE to submit to you some practical observations, based upon my own experience as a physician, concerning the etiology and management of insomnia. Inability to sleep at all, or inability to sleep long enough, without the aid of drugs, is one of the commonest complications and consequences of a vast variety of morbid states. Pyrexia; physical pain, if sufficiently severe and from whatever cause arising; frequent coughing, as that which often occurs in chronic pulmonary phthisis; urgent dyspnoea, such as results from extreme dilatation of the cardiac cavities, and requires an extraordinary vigilance of the nervous centers for the maintenance of the process of respiration and circulation, are conditions which prevent or shorten sleep. In such instances the cause of the sleeplessness is obvious. The insomnia may mostly be controlled either by the exhibition of remedies which directly promote sleep (hypnotics), or by the adoption of measures which combat the cause of the insomnia, by reducing the fever, by palliating the pain, by checking the cough, or by relieving the cardiac disturbance. Of sleeplessness arising as the direct effect of these and similar causes it is not my purpose to speak. I shall endeavor to unravel the complex causes, and point out the successful treatment of that kind of insomnia which may be called, for the sake of simplicity, but not with strict truth, *insomnia per se*, or simple inability to sleep—a kind of wakefulness for which we mostly fail to find an obvious physical cause, and which seems to depend upon an inability on the part of the brain and nervous system generally to adapt themselves to the conditions which are necessary for sleep. We meet with this disorder more in private than in hospital practice—mostly in persons who belong to what is known as the upper-middle class, and mostly in individuals of high mental endowment. The malady is of extreme importance, and happily, if its causes be rightly understood and judiciously controlled, there are few affections which are more within the sphere of curative therapeutics.

A close study of cases of the kind of insomnia of which I am speaking soon reveals striking differences between individual instances of the disorder, in respect both to the causes and the course of the malady. These differences demand careful consideration because they have important bearings upon both our therapeutics and our prognosis. I have endeavored to arrange the different varieties of insomnia into groups, in which the cause of the affection is the "principle of division." To these groups I give the names "psychic," "toxic," and "senile."

In natural sleep the brain is relatively anæmic. When the organ is in full activity its arteries are filled with blood; its cells are living rapidly, actively receiving nourishment from the blood, and pouring into it in exchange the effete products of their vitality. But in sleep the brain is inactive, at least all but that part of it which is concerned in the processes of organic life. The cells which think are as still as those of the muscles of a limb which is at rest. The blood flows in a smaller and gentler stream than in the waking state; the cells are not expending energy, they are leisurely renewing it and storing it up—in a word, they are resting. Any cause which prevents the due repose of a sufficient number of those brain-cells which are concerned in conscious thought will prevent sleep; relative cerebral hyperæmia is a consequence of such activity, and is also a concurrent, though subordinate, cause of wakefulness. Hence there are causes of insomnia which act primarily in sustaining cerebral activity, and with it, and in consequence of it, relative cerebral hyperæmia. Again, any cause which prevents the brain from becoming sufficiently relatively anæmic for sleep will produce insomnia.

Any agent which sustains cerebral hyperæmia, or any morbid condition which impairs the contractility of the cerebral arteries, may prevent, wholly or in part, the occurrence of such a degree of cerebral anæmia as is required for the production of sleep. Hence there are causes of insomnia which act primarily in sustaining relative cerebral hyperæmia, and with it, and in consequence of it, cerebral activity. But in such a complex condition as conscious cerebral activity, where thought implies increased blood-flow, and increased blood-flow implies thought, we cannot in any given case allow, with strict accuracy, entire casual precedence to either of the factors which are essential to the common result. These considerations are strictly pertinent to a clear conception of the causes of insomnia. In some cases of sleeplessness, as in the psychic group, undue cerebral activity is the primary vice; in others, as in the toxic and senile varieties, relative cerebral hyperæmia is the initial error, and cerebral activity its direct consequence.

I shall now consider more particularly the psychic form of insomnia. A severe and sudden emotional shock of a depressing kind—as grief at the death of a child, a parent, or a wife—will sometimes induce at once persistent insomnia, which will only yield to carefully directed therapeutic procedures. Prolonged mental strain, in all its varied phases, is a common cause of sleeplessness. Our patient may be a student preparing for an examination. For weeks, in spite of fatigue, he may have shortened his hours for rest that he might lengthen his time for reading; and he may have roused his brain to wakefulness, when it would readily have fallen asleep, by drinking strong tea or coffee, or by smoking tobacco. But he could always go to sleep at once and sleep soundly when he went to bed, until, after some weeks of abnormal work, with the nearer approach of the examination bringing increased anxiety as to the result of the ordeal, he found that he began to sleep badly or could not sleep at all; he grew miserable; he could not remember what he read; he felt unfit for any exertion, and he found that he could not face his examination.

Or our patient may be a young professional man. He has commenced practice, or rather to wait for practice, as a barrister, a solicitor, a surgeon, or a physician. He begins to find that clients or patients are not ready made and waiting for his advent. For a time he struggles on, his hope and his health sustaining him; but these at last yield under the continued pressure of new disappointments and accumulating anxieties. He wants money; his friends will give it to him readily if he will ask for it, but his pride prevents him. It is not a gift or a loan he needs; he does not want to beg or borrow money; he yearns to earn it. And all the time while he has been hoping and waiting, and growing sick with the failure of his expectations, he has been working early and late in his study, denying himself due sleep and exercise, in the trust that he might thus so skill himself as to secure the longed-for practice. At last he has fairly broken down. He has grown thinner; he looks haggard; he is

filled with groundless fears; he has constant headache and noises in his ears; he thinks his memory is failing; he is dull and listless; he has begun to sleep badly; he has been lying awake for hours after going to bed, and when he has slept he has had horrid dreams; and he comes to us for help because he can scarcely sleep at all, and he feels he is going mad.

In these cases acute or continued mental strain is the primary cause of the sleeplessness. Where the shock has been sudden and severe, it has been sufficient to rouse a given group of cerebral cells into persistent activity. Where the strain has been less intense, but long continued, it has been all the more hurtful, because the same set of ideas has been maintained in exhausting recurrence, and because, as a consequence of this monotony, the same part of the brain has been kept continuously upon the rack. But in either case sleeplessness did not occur until there arose from exhaustion partial or complete vaso-motor paralysis of the intracranial bloodvessels—until the arteries of the brain, worn out by a sustained erethism, could no longer, even when the brain most needed it, find the force for that contraction of their caliber without which sleep is impossible.

The subjects of the psychic form of insomnia are mostly men, and mostly men of the nervous temperament. We have lately been too apt to ignore temperaments; our fathers studied them better, and regarded them more than we do. But I shall not go to any authority for a portrait of the nervous temperament; I shall describe it as I think I have found it. I use the phrase nervous temperament as indicating a distinct type of outward form, of manner, of habits, and of tendencies. Temperaments present their strongest types most commonly in men; few women exhibit a well-marked temperament. Two or more of the different kinds of temperaments may appear to be blended; we may have a modified, a tempered temperament. A man of distinctly nervous temperament has a quick manner; if he do not know us well, he fidgets with his hands or legs when he is talking; he speaks abruptly, earnestly, and loquaciously, and he frequently recalls his statements to correct them, splitting up his phrases and modifying his adjectives in his anxious desire to express the finest shades of truth. When he becomes a patient he is harassed about some trivial symptom; he has felt his heart beating, and he fancies he has some deadly cardiac disease; he thinks his memory is failing, and he fears he is going mad.

A man who has suffered much from insomnia becomes the subject of a well-marked group of symptoms. Most of them are given by certain writers among the signs of cerebral hyperæmia. It is probable that they mark what may be called irritable exhaustion of the brain, attended by more or less abnormal increase of intracranial vascularity, and accompanied by some general prostration of the bodily powers.

Here are the signs as I have found them. The patient has a dull and listless look; his eyes are wanting in vivacity; the upper lids may droop a little, and they may appear slightly swollen; his complexion is sallow. He complains of headache. This is of two kinds, which may coexist or occur separately; the commoner is a dull pain felt over the whole of the vertex, together with a vague and widespread feeling of oppression in the head; the other is a sharp, shooting pain, which comes on suddenly in single flashes, and which gives the idea of a knife being driven through the head from one temporal region to the other. Occasionally the patient feels a momentary sense of giddiness; this may cause him to make a false step, but it never lasts so as to give rise to staggering. The skin of the head, especially in the neighborhood of the sagittal suture, may be tender. There are noises in the ears, in one or in both, and which are more or less persistent. They may come on suddenly, and without apparent cause, as when the patient is engaged in quiet conversation, or they may only occur when the attention is closely occupied, as in writing a letter or casting-up figures. These noises are usually of a low-pitched whistling character.

A striking sign is a slight impairment of hearing. The patient may be unaware of it, but those who live with him have noticed that he often asks them to repeat what they say to him, because he could not quite catch their words. He may complain of seeing spots before his eyes, little cobwebby black lines which come and go and float about, or bright, bluish, phosphorescent-like specks which are fixed one before each eye, and which only appear when he first directs his eyes toward an object. There are some abnormal sensations in the skin; not a feeling of formication, such as often arises in organic nervous disease, but a sharp, transitory and isolated pricking, as of the movement of a single pin, which endures only for an instant, and affects either the limbs or the trunk, mostly the former. There may be a peculiar twitching of muscles. It is not a vibratory tremor, such as occurs in progressive muscular atrophy, nor is it a contraction of a whole muscle, or of a group of muscles, such as arises in true convulsion. But, while the patient is sitting still, and wholly independently of his will, a considerable part of a muscle becomes the subject of rapid clonic movements.

These movements mostly occur in the lower extremities, but they are rarely sufficient to move the limbs; they usually affect the lower part of one vastus internus, and last for about a minute. The patient can feel the movements directly by simply attending to the affected part, and he can also feel that the muscle is moving by applying his hand to it. In such a case there is often unnatural and painful sensitiveness to external impressions. The patient craves for quiet. A bright light troubles him. Noises, the sight of moving objects, touches (as of the hand of a friend upon his shoulder), annoy him. There is not an increased sensitiveness to external impressions, but impressions which are enjoyed or unnoticed in health become irritants.

In toxic insomnia, the cause of sleeplessness acts primarily upon the vessels of the brain, giving rise to some degree of arterial hyperæmia. A poisonous agent maintains cerebral vascularity at such a height that conscious cerebral activity—that is, wakefulness—is an inevitable consequence. Such a poison may be introduced into the body from without, or it may be a product of diseased processes arising within the body itself. Of course I use the word "poison" in a restricted sense; I do not mean something which kills, but only something which produces abnormal manifestations in the living body. The external poisons which most frequently cause sleeplessness are tobacco, alcohol, tea, and coffee; the internal, certain effete products of tissue-metamorphosis which accumulate in the bodies of gouty persons or of those whose kidneys act deficiently. Many a man does not and cannot sleep sufficiently because he smokes excessively. Cut off his cavendish or his cigars and he will sleep well. Many smokers know that they sleep badly if they smoke more than their usual quantity of tobacco, or if they smoke stronger tobacco than that to which they are

accustomed. If a man who smokes two cigars every evening is induced at some time to smoke three, or if a smoker of bird's-eye ventures to replace it by cavendish, he may, when he has gone to bed, find he cannot sleep; and the cause of his sleeplessness is the smoking of more or of stronger tobacco than by habit he has hitherto borne without discomfort.

Men of distinctly nervous temperament, or men in whose temperament there is a distinct and considerable admixture of the nervous element, are usually the largest smokers. Men who are slow and calculating are rarely smokers; men whose activity is of an objective type are happy in rarely feeling the nervous unrest which tobacco calms. Tobacco-smoking stimulates the cerebral circulation; it disposes to a succession of pleasing ideas by inducing an easy flow of mental activity. But this stimulation of the blood-flow in the brain is sure, if pushed to undue limits, to induce cerebral vaso-motor debility or paralysis, and, as a consequence, persistent conscious thought. Sometimes, then, a man consults us for the relief of insomnia, and we find he is young, he has had no trouble, he takes plenty of food and exercise, and he does not overtax his brain. But he is an excessive smoker; he smokes morning, noon, and night, and he has gone on from the mildest tobacco to the strongest. He need not give up, or shorten, or change his work, and he surely does not need drugs; cut off or cut down his smoking, and he at once sleeps well. And so, *mutatis mutandis*, does alcohol cause sleeplessness. The man who drinks to commencing drunkenness mostly sleeps soundly, if not well. But many a so-called moderate drinker knows that he sleeps badly if he takes a little more than his usual quantity of wine after dinner, or even his usual quantity of some unusual wine. Alcohol flushes and dilates the smaller blood-vessels, especially those of the brain; if such a condition be maintained sleep is disturbed or wanting. We have all seen the insomnia of delirium tremens: the patient cannot sleep because the lesser arteries of his brain are paralyzed by alcohol, and sleepless cerebral activity is the inevitable consequence. Far short of what is usually called alcoholism, we often meet with cases of insomnia in which alcohol alone is the cause of the wakefulness. The patient may pride himself upon his moderate use of fermented stimulants, and he may be wholly ignorant of the cause of the sleeplessness for which he consults us. We fail to find any sufficient psychic cause for his insomnia; but if we take away or diminish his wine or his grog, or induce him to consume it before the evening, we find that he shortly begins to sleep well.

The effects of tea and coffee in causing wakefulness are well known. Some individuals are extremely susceptible to the action of these stimulants. We sometimes meet with persons, mostly women, who habitually drink enormous quantities of strong tea; such people are usually troubled with flatulent dyspepsia, and sleep badly, but they rarely suffer from serious insomnia.

On this occasion I can only mention those varieties of toxic insomnia which are apt to occur in gouty persons, or in those whose kidneys are failing, and which arise from the accumulation in the blood, in consequence of deficient excretion, of the products of tissue-metamorphosis. Insomnia of this kind is rarely complete. But the patient may complain that he sleeps very badly, that he lies awake for some hours and has great difficulty in getting off to sleep, that he is easily awakened and wakes frequently, and that he always dreams when he sleeps. In such a case we may find a pulse of high tension; the aortic second sound may be accentuated, and the first sound of the heart may be reduplicated at the apex. Where there is chronic renal disease, we may also find the direct physical evidences of the characteristic cardiac hypertrophy which accompanies chronic interstitial nephritis. I believe that insomnia in such cases is due to the maintenance of a state of high tension in the cerebral arteries. I wish to impress upon you that we find the clew to many cases of sleeplessness in the signs of the gouty diathesis or in the discovery of albuminuria.

Again, there is a senile form of insomnia. You may perhaps have observed among your friends that an exaggerated appreciation of the merits and value of early rising mostly increases as age advances. The sleeplessness from which many old persons suffer is mainly, if not entirely, the result of senile degeneration of the smaller cerebral arteries. Those vessels are less elastic and less contractile than in health, and their weakened walls often lead to their permanent dilatation; they are physically unable to adapt themselves fully to the condition of relative arterial anemia which is requisite for healthy sleep. The tendency of this condition of the blood vessels of the brain to prevent or diminish sleep is probably to a great extent counteracted by the cardiac feebleness which so frequently and so fortunately coexists with the vascular changes.

In the treatment of insomnia we must often use soporifics. Of these the chief are chloral, opium, morphia, the bromides, Indian hemp, alcohol, and affusion with cold water. The successful treatment of a case of sleeplessness follows from the discovery of its cause. In the severe forms of psychic insomnia we must at once secure sleep by some efficient hypnotic. I prefer chloral. By its use alone we can often quickly cure acute insomnia depending upon some sudden mental shock or strain. A few nights of sound and sufficient sleep, artificially induced, will do more than anything else to restore to the brain the power of sleeping without aid from drugs. In the more chronic forms of psychic insomnia, where the sleeplessness or wakefulness usually depends upon prolonged worry or overwork, I employ chloral sparingly. It should only be used as a temporary remedy, when it is necessary that we should at once secure a fair amount of sleep. The patient ought never to be allowed to swallow this dangerous but valuable drug whenever he feels disposed, or to apportion its dose for himself; he ought only to take it upon the special prescription of his doctor. An overworked man must never be permitted to go on with his overwork, and habitually secure sleep by chloral or any other hypnotic. In such a case we must always aim at preventing the sleeplessness by removing its cause, instead of permitting that cause to continue and trusting to counteract its effect by medicines. When a man cannot sleep because he works his brain too much, we must insist that he stop or greatly diminish his work. But I must warn you that real work is rarely the cause of insomnia. Work fits for rest. It is mostly worry, not work, that brings unrest. It is not work that wears, but worry. A holiday, with complete change of scene, will often do much to effect a cure. The old maxim, *Cebum non animum mutant qui trans mare currunt*, like many other maxims, old and new, is not always wholly true. Send an overworked and worried merchant or barrister from his counting-house or his chambers in a busy town to a quiet village by the sea, or across the channel to a French watering place, and let him substitute walking, and bathing, and rowing, and fishing for his books or his briefs, and he will often need no physic to make him

sleep soundly and sufficiently. But many cases of psychic insomnia can only be cured with the aid of drugs. In the well-nourished, bromide of potassium is by far the best hypnotic. It soothes the irritated and irritable cerebral cells; it is a direct and absolutely safe brain sedative, and it is marvelously powerful in producing nervous calm. But it must be given in full doses, thirty to sixty grains at bedtime. It is well to conjoin with it some drug which will favor the contraction of the weakened cerebral vessels; for this purpose we may give tincture of ergot or tincture of digitalis, one or both. In many cases of chronic wakefulness, arising from mental strain, the patient is distinctly anemic. Unless the anemia be remedied the insomnia cannot be cured. The patient's pale face and compressible pulse declare the condition of his blood. Such a person mostly feels drowsy when he is up, and wakeful when he lies down. Of course he needs iron; we may give him a grain or two of reduced iron, sprinkled on a piece of bread, or a wineglassful of Orezza water, after each meal. His diet must be liberal, containing plenty of fish, meat, and eggs. For such a patient alcohol is often the best hypnotic. To many people a "night-cap" of toddy is a superfluous and hurtful luxury. But it can give, perhaps better than anything else, rest and sleep to the exsanguine and worried brain. We must never be blind to the responsibility we incur when we prescribe alcohol. When we use it as a remedy in the treatment of disease we must state distinctly the reasons for its adoption, and we must discontinue it, as we discontinue the employment of other drugs, when the conditions which called for its exhibition have disappeared. If I am sure of anything in therapeutics, I am sure that alcohol is the best hypnotic in many cases of chronic psychic insomnia when the patient is worried, sorrowful, weakly, and anemic.

Many minor points are worthy of attention in the cure of chronic psychic insomnia. In most cases, whether he sleep badly or well, the patient ought, from day to day, to go to bed and get up at some fixed hour. Healthy sleep tends to occur periodically. Daily bodily exercise, short of great fatigue, must be enjoined. Riding in a carriage is good, walking better, riding on horseback the best of all. A worn and self-worrying man, wrapt up in the absorbing current of self-consciousness, may take exercise in a carriage or upon his legs and still keep up his fretting, but he must come out of himself when he gets into a saddle. Gardening, for those who live in the country, affords good exercise, and is very efficient in keeping up objective attention. Those who live in towns may find good objective employment in chopping wood; if they have not trees to fell, they can at least copy Archbishop Whately, and give their minds a refreshing objective turn and their muscles healthy work by cutting up firewood. People who find it difficult to get off to sleep are sometimes advised to diligently and monotonously count one, two, three, up to a thousand or more, until they fall asleep; to watch in imagination each one of a large flock of sheep squeezing through a narrow opening; to picture some familiar landscape and keep the mind fixed upon it; to repeat the letters of the alphabet, etc. These are expedients for changing the current of cerebration. For a night or two one or the other may succeed, but they cannot be relied upon. These practices often even keep up wakefulness; when the mind attends closely to them they perpetuate the subjectivity which keeps the brain from resting. Very often the surest way of keeping awake is to try hard to get to sleep. We do most things best when we forget ourselves; going to sleep is no exception to the rule. When the contractility of the cerebral arteries has become much weakened by prolonged thought, and when, as a consequence, there is wakefulness, sleep may often be induced by the temporary application of cold to the general surface of the body. A person who has been lying awake will often fall asleep at once after getting out of bed and sousing his head, neck, and hands in cold water, or after (following Charles Dickens's plan) standing at the bedside until he feels chilly, and turning over, shaking up, and cooling his pillows and the bed-clothes.

Just a word about the treatment of the other varieties of insomnia. In the toxic kinds we take away or diminish the tobacco, the alcohol, the tea, etc., as the case may be. *Cessante causa, cessat effectus*. A discussion of the treatment of gouty insomnia and of the sleeplessness arising in some chronic renal diseases would involve a consideration of the whole question of the therapeutics of the maladies upon which these forms of wakefulness depend. I shall only say that in gouty lithiasis, with a pulse of high tension, I have confidence in the curative effects of colchicum, supplemented by the exhibition of dilute saline purgatives, such as Pullna, Friedrichshall, Hunyadi Janos, or Rakoczy waters. Senile insomnia is very obstinate; perhaps in the bromides, with full doses of hop or henbane, we have the best and least harmful means for its relief.—*Lancet*.

CURARE IN EPILEPSY.

By Dr. C. F. KUNZE.

My experiments with Curare (Woorara) in 35 cases had very different results. Nine of the 35 cases made a perfect recovery. In most of them the disease had not been existing for a long time, say one, three or five years; in two of the successful cases the patients had been epileptic subjects for over 20 years. Among those who recovered there were some cases in which the disease had produced a well defined influence on the mental condition of the patients. Two of the cases which recovered were undoubtedly cases of inherited epilepsy; the history of these (brothers) is given below. I could obtain no good effect in old drinkers. My experience with Curare leads me to say that *Curare is one of the most efficient remedies for epilepsy*. A case of epilepsy should not be regarded as permanently cured until a long time after the occurrence of the last attack. A short time ago I saw the return of the disease after an apparent recovery, extending over a period of 4 years.

I make a solution of Curare according to the following formula:

R Curare.....grs. viiss. (7½)
Aque dest.....m. 75.
Acid. hydrochl. pur.....m. i

hypodermically, and I inject about 8 drops every five or six days.

The addition of this small amount of hydrochloric acid makes the solution a clear one, and by this slight modification of my former formula I have avoided almost entirely the severe abscesses at the point of injection.

History.—Edgar and Hugo Ufer are the sons of a subaltern officer in the Internal Revenue Service at Butterfield, Prussia. The father sustained a severe injury on the head, when, in 1846, during his service as a soldier he tried to stop the runaway of four horses attached to the carriage of the

late King Frederick William IV. of Prussia. He was thrown down, dragged along for a distance and received a kick on the head by one of the four stallions. In consequence of the injuries brain symptoms developed, and the man suffered for over a year from convulsions and very severe headache. Five or six years later the injured man married and became the father of two sons, both of whom were attacked with epilepsy, one in his 18th and the other in his 13th year.

Hugo, the elder of the two brothers, is now 25 years of age, and of sickly constitution. The first attack occurred July 6th, 1871, lasting for about one minute; another attack of somewhat longer duration took place the next day, being followed by three attacks on July 9th, occurring with intervals of from four to five hours. July 10th, again, three attacks; July 11th, a light, and three-quarter hour afterward a severe attack, lasting for about fifteen minutes. This last attack commenced with a disposition to weep, dizziness in the head, followed by a sudden unconsciousness. After the attack was over, there was a sensation of numbness over the entire body, the speech was heavy, the patient felt very tired and suffered from very severe headache. From July 11th to July 16th, generally three attacks occurred daily. July 16th, 1871, the first injection of Curare was given. After the injection the patient felt slight symptoms of unconsciousness and dizziness until toward night he felt perfectly well.

No more epileptic attacks occurred after the first injection. Once every week I gave the patient an injection. After three weeks the prodromatic symptoms, indicating the coming attack, became prominent, but disappeared soon after the prompt injection of Curare. After I had, during the period of six weeks, used about 3 grs. of Curare, I omitted the injections, and until to-day (end of 1877) no more attacks have occurred.

Edgar, the younger brother, is now about 21 years of age, and is also not very strong. The first severe attack occurred March 21, 1870, the second in June, the third in November, 1870. The duration of the first attack was not quite an hour, with the second one the patient was unconscious from 4 P. M. until midnight. The attacks came on without the outery, and commenced with the sensation as if a stream of cold air was flowing from the mouth. Between the large attacks small ones of a few minutes' duration always occurred. The first injection of Curare was given July 20th, 1871. From July 21st to July 25th there was some dizziness, and the patient felt as if an attack was coming on. This sensation, however, disappeared before long, and not a single attack occurred since that up to date (1877). The quantity of Curare used also amounted to 3 grs.; the injections were first given every week, afterward every second week.

Hugo Noack, in Halle, Y. S., suffered since infancy from convulsions, which first commenced when he was only ½-year old and returned about once in four weeks. No other member of the family ever had epilepsy. The attacks always were complete. As to the cause of this disease, the mother of the patient states that she once nursed the child shortly after a time of great anger. She says the attacks first made their appearance two hours later, and never disappeared since. The unfavorable influence of the disease on the patient's mental faculties was well defined during the age of school years; he did not learn well at all, and especially his memory was gone almost together. The attacks occurred so frequently that hardly a day or night passed by without convulsions. Noack came under my treatment in his 23d year. After from six to eight injections the convulsions disappeared, and since then, for about eight years, no attack has occurred. Noack is now 31 years of age, married, and is the father of two children, none of whom have suffered from convulsions up to this time. His mental faculties, and especially his memory, have greatly improved since his recovery. Noack is employed now on one of the large railroads, and fulfills his duties satisfactorily to his superiors. —Translated by PAUL H. KRETZSCHMAR, M. D., in *Hospital Gazette*.

TARTRATE OF LIME.

By A. SCHEURER-KESTNER.

TARTARS, lees, etc., are essentially composed of potassium bitartrate, with which calcium tartrate is often mixed. For the determination of the potassium bitartrate a standard alkaline liquid is generally caused to act upon a hot solution of the sample in water. But it has been found that this process leads to exaggerated results. Certain tartars, and especially certain lees, contain acid substances of the nature of tannin, which act upon litmus paper and consume the alkaline liquid just as potassium bitartrate would do. To obtain exact results it is therefore necessary to ignite the sample, and determine the potassium in the residue by means of standard acid. The determination of calcium tartrate is often made by dissolving the sample of tartar in hydrochloric acid, and precipitating with caustic soda. This method gives satisfactory results if the specimen to be analyzed is free from calcium sulphate. In the contrary case the numbers found are always erroneous, the error being proportionate to the quantity of gypsum present. It is known that calcium sulphate, in presence of an alkaline solution of a neutral tartrate, is converted into neutral calcium tartrate, while the alkaline base combines with the sulphuric acid. The reaction is so complete that in certain works it is used for the preparation of calcium tartrate for the formation of tartaric acid. At the moment when the hydrochloric solution of the tartar is neutralized, in order to precipitate the calcium tartrate, the most favorable conditions are obtained for the formation of this body at the expense of the calcium sulphate, and if there is gypsum in solution, as often happens, the quantity of calcium tartrate obtained by no means represents the amount actually present, but is augmented in equivalent proportions. Some authors have recommended the following process: Calcination of the tartrate to be analyzed, when the tartrates and bitartrates are converted into carbonates. The potassic carbonate is dissolved in water, and shows on titration the quantity of bitartrate originally present. The calcium carbonate remaining on the filter shows, in like manner, the value of the pre-existing calcium tartrate. But this process, though accurate when the tartar is free from gypsum, is otherwise defective. Hence the following method is to be preferred: The sample is dissolved in hydrochloric acid, and the filtered solution is neutralized with caustic soda, and then precipitated with calcium chloride. All the tartaric acid is precipitated as calcium tartrate. The precipitate is washed, calcined, and the calcium carbonate obtained is titrated in the ordinary manner. If the tartar has been previously titrated with a standard alkaline liquid it is easy, from these two data, to calculate the respective quantities of potassium bitartrate and calcium tartrate; but this is only possible when the sample is free from other acid products.