concerned in influencing the functions of consciousness and volition, it is equally manifest that an anæmic state of the vessels is precisely the one calculated to disarm the narcotic of its dangerous properties. But for that anæmic state, the cerebral capillaries might be goaded on by a full dose of opium into fatal coma. The necessity of a healthy amount of congestion and consequent pressure, however essential to the production of sleep, may be inferred also from considerations regarding the nutrition of the organ. "The sleep of animals", Dr. Carpenter tells us, "consists not in a state of diminished energy of the nutritive functions, but in the cessation of the sensorial activity, dependent upon a suspension of the functional power of certain parts of the nervous system, during which there is reason to believe that the nutritive and reparative operations of those organs go on with even augmented rapidity".* The value of sleep in this view, and the importance of a healthy circulation of the materials for nutrition, considering the wasting effects of sensorial hyper-activity in fever, are self-evident.

On witnessing such striking displays of the remedial virtues of opium, as in the case related above, one is fain to break out with Sydenham "in praise of the great God, the giver of all good things, who hath granted to the human race, as a comfort in their afflictions, no medicine of the value of opium, either in regard to the number of diseases that it can control, or its efficacy in extirpating them!" After all, most of its value depends on the discrimination with which it is prescribed. When injudiciously administered, as in sthenic cerebral excitement, or in the improper arrest of diarrhoea in certain states of fever, it has been observed to produce phrenitis, epilepsy, and coma; so also, when indiscriminately prescribed in delirium tremens, its employment has occasionally been followed by apoplexy. Great and marvellous, therefore, as are the virtues of opium in a variety of diseases, and admirable as are its soothing qualities in several of the forms of cerebral disorder in fever itself, yet let no man venture to prescribe it for the latter (whether in large or small doses) in the dark or at random. It is a sharp-edged tool, and of such fearful potency, that, if it fulfils not a curative intention, it will probably destroy life. There is no instance, in the whole range of practical medicine, more imperatively demanding a sure diagnosis. In short, our warrant to prescribe it hinges on our ability to ascertain precisely that condition of the brain which alone will admit of its safe employment.

It was a rare sagacity which led Dr. Graves to employ tartar emetic in combination with opium in those cases both of idiopathic fever and delirium tremens, in which the narcotic would probably stimulate to over-congestion of the brain, but for the depressing action of the mineral on the heart and capillary circulation. This complex practice finds its parallel in the analogous operation of opium in states of anæmia in fever.

Medical science is more advantaged, perhaps, by defining the circumstances to which our known remedies are applicable, than by exploring the resources of nature for others. Not only is great discrimination necessary in deciding on the cases which demand the use of opium, but also in regulating the doses adapted to each variety. Little can be added to Dr. Latham's admirable directions. Our rule of conduct, indeed, is suggested by the degree of sensorial excitement. "Simple wakefulness may be gently lulled to sleep by a few drops of laudanum, but wild delirium requires to be mastered and (as it were) forced into repose by a much larger dose." Opium, however, goes much farther; and, therefore, a much less dose is required in quelling asthenic sensorial disorder, combined with fever, than when it exists alone. Five minims in the milder cases, and twenty in the graver, may be considered minimum and maximum doses in fever. Much, after all, must be left to our vigilance in watching its effects, and to our discretion in judging when to desist, and when and in what doses to repeat the remedy. There are yet other "cases where the indications for the employment of opium are *debatful*". We shall describe the variety of sensorial disturbance in fever in Dr. Latham's own words:—

"Wild delirium, and long wakefulness, and a circulation weak and fluttering, seem to call for a considerable dose of opium. Yet, withal, there is a *certain jerk* in the pulse, so that we cannot help suspecting that the blood vessels have something to do with the sensorial excitement. Under such circumstances, I have certainly seen twenty minims of laudanum produce tranquil sleep, from which the patient has awoke quite a new man; but I have also seen the same quantity produce a fatal coma, from which he has never been roused."

Dr. Latham's recommendation, therefore, is, in so dubious a case, to avoid "striking a heavy blow in the dark", and to

administer a small dose at intervals of an hour or two, "so as to stop short of actual mischief at the first glimpse of its approach, or be led by a plain earnest of benefit to push the remedy to its full and consummate effect". Judicious as is this advice, we cannot but think, that on this mode of treatment of cases, in which, on Dr. Latham's own shewing, "the indications for the employment of opium are doubtful", any practice which aims at once to keep down vascular action and soothe the nervous system is a real improvement. And such, we need scarcely add, is the complex method of Dr. Graves.

It only remains that we should revert to the anæmic type of sensorial disturbance in fever. In that milder variety of it which, as described by Dr. Latham, we placed in contrast with a much graver form, "a moderate dose of opium", he tells us, suffices to change a state of peril to one of convalescence. But his remarks do not contemplate so frightful a form of anæmia in fever as that of which we have given an example, and which might result equally from a large intestinal, nasal, or bronchial hæmorrhage, as from uterine. He speaks of heroic doses of opium only "in extreme cases of delirium tremens", while twenty minims of the tincture, he asserts, are quite sufficient for the purpose of subduing "the very same symptoms, carried to the greatest extremity, *when combined with fever*." But while "a moderate dose" suffices to relieve the less urgent anæmic forms of the disease, the case related above as having occurred to my own observation, seems to sanction a bolder practice in the perilous cases of an extremely ex-sanguine condition of the brain in fever, coupled with the exhaustion resulting from protracted sensorial excitement.

ON THE USE OF CHLOROFORM IN OPERATIONS ON THE EYE.

By WHITE COOPER, F.R.C.S. Eng., Ophthalmic Surgeon to St. Mary's Hospital, and Senior Surgeon to the North London Eye Infirmary.

IN common with many others, I for some time hesitated before using chloroform in extraction of cataract, from a fear that the object of the operation might be defeated by the eye receiving injury during the return to consciousness, or by vomiting afterwards. It appeared to me, however, so deserving of a trial, that nearly two years ago I first employed it, and since that time have availed myself of it very frequently in operations on the eye, including sixteen cases of extraction of cataract, nine of artificial pupil, four of foreign bodies in the eyeball, and two of tumours in the globe, besides numerous needle cases. Several of the cases have been published in the *London Journal of Medicine*;* and among the gentlemen who witnessed the more difficult operations, I may mention Mr. Barnard Holt, Mr. W. F. Barlow, Mr. Holmes Coote, Mr. Charles Hawkins, Mr. G. Pollock, Mr. J. R. Lane, Dr. Toogood, etc. Having had this experience, I propose to offer a few observations, which may be found practically useful.

The advantages obtained by the use of chloroform in operations on the eye, are, a perfectly quiescent condition of all the muscles, whether of the globe or the lids, absence of congestion of the eye, and mental tranquillity for the patient. To the operator, the perfect repose of the eye affords a manifest advantage, the various steps of the operation being performed with as much facility as in a demonstration on the dead subject; the risk of prolapse of the iris (which is usually caused by muscular action) is greatly diminished, and the corneal flap can be accurately adjusted.

Under ordinary circumstances, the very act of raising the lid and fixing it, causes a sympathetic rush of blood to the eye, which vascularity is increased during the various stages of the operation. When the patient is unconscious, nothing of the sort happens. I have repeatedly completed the extraction, leaving the eye as free from congestion as before it was commenced; and the same has been noticed by gentlemen who have witnessed my needle operations at St. Mary's.

There is perhaps no operation more dreaded by nervous persons than that of extraction, from an exaggerated idea of the sensibility of the eye. The knowledge that the operation will be performed without the least suffering, inspires such persons with confidence; and the joyous state of mind which all patients experience on awaking from sleep and finding the operation concluded and the eye bound up, is highly favourable for recovery. And now as to the proceedings.

* Carpenter's "Principles of Physiology, General and Comparative", p. 78.

* "Cases of Foreign Bodies in the Eye", vol. iv, p. 301; "On Cysts in the Interior of the Eye", vol. iv, p. 787.

I strongly advise that in operations on the eye under chloroform, there should be at least one competent assistant besides the operator and the administrator of chloroform; each of these has his own department to engage his attention, and it is most embarrassing to have the patient partially recover and struggle just at a critical moment. This occurred in the first extraction under chloroform performed by me; and, as it was the first case of the sort in which Dr. Snow had administered the vapour, the patient had not a sufficient dose. It unfortunately happened that the gentleman who was to have assisted me was prevented keeping his appointment, but I imagined that the doctor and I could manage the lady ourselves: in due time, she appeared completely insensible, but just as the section was being satisfactorily completed, the patient threw her head on one side and tried to sit up; the consequence was, that the operation was impeded, considerable prolapse of the iris took place, and a closed pupil was the result.

The patient should be recumbent. In that posture he can rest quietly after the operation, and is more manageable during the period of excitement than when sitting in a chair. I have tried the administration of chloroform on a handkerchief, and by means of Dr. Snow's apparatus, and decidedly prefer the latter. When the handkerchief was used, it was in my way, and the fumes of the chloroform annoyed me,—matters of importance in such a delicate proceeding as extraction. A full dose of chloroform is necessary, and the patient should not partake of food for five or six hours prior to the operation; but he may swallow a few fragments of ice just before it is commenced, and again as soon as consciousness returns. This (which I believe was first suggested by Dr. Simpson of Edinburgh) allays any tendency to vomit. I prefer operating in the afternoon, as the soporific effect of the chloroform continuing, generally ensures a good night; but the hands must be secured, and the patient carefully watched, as under ordinary circumstances.

With regard to the operation itself, it is important to have the point of the extraction-knife as sharp, and the edge as keen as possible. If there be the least *hanging*, the eye will be pushed before the knife, from the utter passiveness of all the muscles, and unless the operator is prepared for this, there will be great probability of the counter-puncture being made too near the centre of the cornea, whereby the section will be too small.

During extraction, as ordinarily performed, the lid is dropped as soon as the section is completed, and a pause takes place to permit the eye to become quiet. Under chloroform this is unnecessary: there being no spasm, the curette may be used, and the cataract pressed out the moment the section is completed. When the lens has escaped, the eye presents a curious appearance, always supposing enough chloroform has been administered; the muscles being passive, the iris falls back in a concave form, and the cornea having no support, sinks, becoming as wrinkled as a shrivelled apple. The eye having been gently cleansed, and the lids dried with a soft rag, the upper lid should be lifted by the lashes and brought down over the cornea; then two broad strips of adhesive plaster should be crossed over the eye and cheek, a bandage applied, and the patient left quiet for half-an-hour or an hour, after which he can be removed to bed. When all fear of vomiting has subsided, the plaster may be taken off: but it must be thoroughly softened with warm water, and lifted with the utmost caution and gentleness, so that there be no dragging on the lids. The subsequent proceedings differ in no respect from those practised after the operation as ordinarily performed.

In these remarks I have especially mentioned Extraction, but the general directions are equally applicable to all operations on the eye; and I may add, in conclusion, that when operating on an eye in a state of inflammation, as in the extraction of a foreign body, a shot, a fragment of steel, or copper cap, the value of chloroform cannot be too highly estimated.

19, Berkeley Square, November 1852.

ON FIXED AND LONG-CONTINUED PAIN IN BONE.

By HENRY LEE, F.R.C.S. Eng., Surgeon to the Lock Hospital, Assistant-Surgeon to King's College Hospital, etc.

In the concluding volume of the *London Journal of Medicine*, I ventured to offer some observations on, and to relate some cases of, fixed pain in the tibia, which had been relieved by perforating the bone with a trephine. The cases appeared

naturally to divide themselves into two classes, namely, those in which the pain depended directly upon the pressure of confined matter, and those in which some other source of irritation, situated within the bone, had kept up a chronic inflammation of the part.

The following case, which has since come under my care, appears especially interesting, as partaking of both the above forms of disease; the pain having fixed itself in the part before there was reason to suspect the formation of matter, and having continued for some time after the pressure of the confined fluid was artificially relieved.

An apology will scarcely be wanted for drawing attention to the details of such cases, as the utility of surgical interference is far from being universally acknowledged. Even in a work of much authority, by a distinguished professor of surgery in Edinburgh, as late as the year 1847, we find it stated that the cases where the operation of trephining the tibia is necessary, must be extremely rare, as no case had presented itself to the professor's notice during a long and extensive practice.

CASE. During the last summer, a gentleman of a highly nervous temperament applied to me, having suffered, for between two and three years, very severe pain in his left leg. At that time there was an oval swelling over the centre of the tibia, evidently depending upon an enlargement of the bone; and about three inches lower down, was a second smaller projection, apparently of the same nature. The bone in both these places was very tender to the touch, and the upper enlargement presented at one point a sense of fluctuation, as though a small quantity of fluid were contained between the periosteum and the bone. The necessary examination of the leg was followed by a considerable increase of aching pain. When requested to point out the part where he experienced most suffering, he would pass his hand generally over the lower part of the tibia, but would not point out any one spot as habitually more painful than the rest. He however thought that the upper swelling was more sensitive at night, and the lower one during the day when the leg was hanging down. He stated, that twelve years previously, he had taken large quantities of mercury for an affection of the throat, which there was no reason to believe was of a specific character. At that time his mouth was kept sore for five months, and he took occasionally as much as twenty-five grains of blue pill a day. Six years after this he had the small-pox, which left him much debilitated.

In the year 1843, he became subject to a very severe cough, for which he consulted Dr. Golding Bird, and there was reason to believe that a small cavity had formed in one of his lungs.

During the early part of the following year his ankles became swollen, and a pain settled in his left shin. About a fortnight after the first appearance of the pain, he struck his leg severely. The pain then became suddenly increased, and continued without intermission for many weeks. At length, the pain in the leg subsided, and he passed three months in tolerable comfort; after this, however, all the former symptoms again returned, in consequence, as he supposed, of having taken a very long walk.

In the spring of the year 1851, the leg was struck a second time, and the pain then became of a much more severe character than it had previously been. From this period the pain was so severe as to prevent his sleeping at night. Between six and eight o'clock in the morning, the limb generally became bathed in perspiration, and he would then fall asleep. This was the only rest he got, except when under the influence of the iodide of potassium, which had been prescribed for him by Dr. Golding Bird. After he had taken five or six doses of this medicine, his pain was usually relieved, and he slept tolerably well; but as soon as it was discontinued, the pain returned with all its former severity. Not wishing to take the medicine unnecessarily, he tried more than once to do without it, and had, under these circumstances, passed as much as a month without any sleep, except the short nap that he got between six and eight o'clock in the morning. He was, therefore, driven latterly to have almost constant recourse to his medicine, and took from eighty to a hundred grains of it a month. At length he found, although the pain was relieved, that his gum-became spongy and apt to bleed, and in other ways it became apparent that the continued action of the medicine was exerting an injurious effect upon his system. It was under these circumstances that, with Dr. Golding Bird's concurrence, he came to me to ascertain whether any more permanent relief could be afforded by surgical means.

The existence of pain in the part previous to the reception of the first injury, the tenderness of the bone, and the evident