whereas the very opposite to this is the generally admitted fact. Hæmorrhage to any extent short of causing exhaustion and prostration is, in my experience, and I believe also in the experience of most observers, rather salutary than otherwise, tending to relieve the patient, and to render the disease more chronic, both by removing local congestion and inflammation, and by separating, to a greater or less extent, diseased or tuberculous blood. Nature in such cases appears to do in her own way internally what the physician often does in his way externally by local depletion. I am far, however, from denying that blood escaping into the lungs in large quantity is, from its mere pressure and the obstruction which it occasions, a frequent source of distress to the patient, and of temporary aggravation of disease. I am merely maintaining that it is not an original source of phthisis; and that, when it happens in the progress of consumption, it is not a new focus for the development of tubercle.

[To be continued.]

CASE OF POISONING BY CHLORAL HYDRATE.

By W. J. HUNT, L.R.C.P., and R. W. WATKINS, F.R.C.S.,
Towcester, Northamptonshire.

THIS being the first reported case (so far as we are aware) of poisoning by chloral, we have thought it our duty to place on record the observations which we have made, and all the facts we have been able to ascertain.

A clergyman, aged 51, single, of sanguine temperament, and subject to dyspepsia, commenced taking chloral at night on November 15th, 1870; the dose at first being twenty grains, combined with twenty grains of bromide of potassium. This dose was gradually increased, but to what extent, and how rapidly, is uncertain; and the bromide was omitted. He at first had the prescription (which had been sent to him by a relative) dispensed by a chemist, but afterwards procured from him the chloral alone in ounce-bottles. The chemist, Mr. Tite, thinking that he was taking larger doses than were safe, cautioned him as to the use of it, and showed him an article in the *Pharmaceutical Journal* describing the ill effects of an overdose, loss of power in the lower extremities being the most prominent one. He informed Mr. Tite that on one occasion, after taking three doses in one night, he had felt that effect in the morning, having fallen down twice on getting out of bed. Mr. Tite estimated that on that occasion he had taken seventy-five grains. He subsequently procured a copy of that number of the journal, and in it there happened to be an advertisement of hydrate of chloral from a wholesale house. This, it would seem, induced him to obtain from that firm a box containing sixteen ounce-bottles of hydrate of chloral, half of which he had expressed his intention of sending to his relation.

On Friday, January 27th, he was found by his housekeeper, at half-past 8 A.M., dead in bed, the left arm being placed over the top of the head. When Mr. Hunt saw him, about 9 A.M., the face was perfectly calm and pale, covered with profuse perspiration, the clothes in good order, and no appearance of any struggle or vomiting. The body was still warm, with the exception of the exposed parts of the face and the left arm. The housekeeper had often seen him dissolving the chloral in water, in a half-pint bottle (labelled "Chloral Hydrate, 1870"), from which he was in the habit of taking a wineglassful at bedtime; but she did not know the quantity of chloral dissolved each time. She had seen him take a dose from the bottle the night before his death. On January 17th, he had purchased from Mr. Tite an ounce of chloral; and the supply from London had arrived subsequently to that date. After his death, fifteen of the bottles were found full, and one empty; about two ounces of the solution remaining in the bottle above mentioned, on the table in his bedroom. From this we conclude that, in the ten days between the 17th and 27th of January, he had taken fourteen drachms of chloral—presuming that the solution in the bottle contained an ounce to the half-pint. If, however, it contained half an ounce only, the bottle must have been four times filled; and he had, therefore, taken fifteen drachms in the ten days. He was constantly in the habit of "doctoring himself," and, among other things, frequently took carbonate of soda, as much as eighty grains at one dose—purchasing it from Mr. Tite by the half-pound. His housekeeper was not aware whether he had taken any on the night before his death; and we are, therefore, unable to ascertain whether any decomposition of the chloral had taken place.

EXAMINATION OF THE BODY, fifty-four hours after death.—The body was well nourished and fat. There was no decomposition. The heart was perfectly natural in size and appearance, covered with fat

about the auricles and on the ventricular septum. On the left ventricle anteriorly, there was a white patch in the investing membrane, about the size of a thumb-nail, perfectly smooth. There were no adhesions. The heart, which was carefully examined, was in all other respects perfectly natural. The lungs and pleural cavity were quite healthy. The liver and gall-bladder were also healthy. The stomach was large and distended; its pyloric extremity was of uniformly pink hue, anteriorly and posteriorly; there was increased vascularity about the cardiac extremity and along the lesser curvature, with minute extravasated patches of blood (claret-coloured) under the mucous membrane at the cardiac extremity. No thickening or ulceration of the mucous membrane was found. The pylorus was healthy. The large and small intestines were quite natural. The stomach contained about three-quarters of a pint of thick fluid, about the consistency of gruel, with very small pieces of fat and red muscular fibre partly digested. The kidneys were perfectly healthy, and surrounded by much fat. The bladder contained about half a pint of urine. The cerebral membranes were adherent to a small extent on each side of the superior longitudinal sinus, with some old deposits of fibrine slightly puckered in appearance. The membranes generally were much congested, and contained about one ounce of red serum. The convolutions of the brain were remarkably large and pale. The substance was pale, and very soft and friable. There was no increased vascularity in any part, except the choroid plexus; no effusion in the ventricles, nor extravasation of blood.

ON THE USE OF THE TURKISH BATH IN ALBUMINURIA.*

By EDWIN MORRIS, M.D., F.R.C.S., etc.

ONE of the principal constituents of the human blood is albumen, which circulates in it in a dissolved state, playing an important part in the nutrition and formation of the human frame. It is of the greatest importance in the physiology of the human system. Albumen, in its free and normal condition, never coagulates; but it readily assumes a solidified form on the application of heat, or the adding to it of the mineral acids. There is a singular peculiarity with regard to albumen, that, when once it has been coagulated, it cannot again be brought, by any chemical process, to its original dissolved condition. It is true, acetic acid will in some degree dissolve it, and potash completely so; but the albumen so treated will have lost its principal physical features by which it is easily recognised; viz., the solidifying on the application of heat or on the addition of acids. According to the celebrated chemist Lecanu, the relative quantity of albumen in 1000 parts of blood is about 80. M. Denis, in his *Essai sur l'Application de la Chimie à l'Etude Physiologique du Sang de l'Homme*, states that albumen constitutes the greater part of an entire blood-globule. It is only right that I should add that several eminent physiologists doubt the correctness of this statement. It is, however, sufficient for us to know that it is an essential element in the human blood, and that its escape from the system by the urine is indicative of structural disease, or dependent on temporary congestion of some important viscera, and is generally followed by most disastrous consequences. The term "albuminuria" was proposed by the late Dr. Bright, when he first drew attention to the subject in 1827, and has been generally adopted by pathologists ever since.

It is not my intention to point out to you in this paper under what conditions of the system albuminuria occurs, or from what cause it originates, as many modern writers have thrown so much light upon this interesting subject that the profession generally are well acquainted with it. But I will confine myself to the treatment of that form of it which depends upon a peculiar disorganisation of the kidneys, called Bright's kidney, or sometimes Bright's disease, where the albumen becomes greatly diminished in the system, apparently by the abundant dropsy, and not by the actual loss through the kidneys.

In Bright's kidney, the gland is generally mottled or speckled with uneven projections; and, in the advanced stages, is contracted in bulk and hard. The chief seat of disorganisation is in its outer or cortical portion; the tubular parts of the gland are almost entirely absorbed; in fact, the internal structure of the kidneys becomes broken up, and incapable of performing the normal functions. We must, therefore, take into our consideration two points which specially merit our attention—the albuminous condition of the urine, and the disorganised state of the kidneys.

Albumen is the great agent in nutrition, and is not an excrementitious

* Read before the Midland Branch.

product. Dr. Christison states that, the more the urine is loaded with albumen, the less of this substance there is to be found in the serum of the blood, and the specific gravity of the serum is much lowered. Subsequent experiments have confirmed this statement. We may, therefore, with considerable reason suppose that the urine obtains its albumen at the expense of the serum of the blood. Another change also takes place in the blood, and that is, its red particles or colouring matter rapidly disappear. There is no disease which exhausts the red particles so much, or which so impoverishes it, except hæmorrhage. It is not, therefore, surprising that we should have that waxy or leucophlegmatic aspect which is peculiar to persons suffering from this disorganised condition of kidney.

In this particular renal disease the secreting cells and tubes become broken up, the Malpighian capillaries become thickened, and occasionally oil-globules are seen within them, and, as a natural consequence, serum escapes and becomes mixed with the urine; there is also serous effusion into the cellular tissue and serous cavities, the result of impeded capillary circulation consequent on the retention of urinary excrementitious matters in the blood.

From whatever cause the kidneys may become congested, the result would be, ultimately, albuminous urine; and, if the congestion were of great and prolonged severity, there would be induced change of structure, and the urine would become permanently albuminous and contain casts of the uriniferous tubes, composed of matter and broken up epithelium.

Congestion in the kidney must precede the changes in the cells and the effusion of serum, either in the kidney or externally to it. In those cases where the disease originates in the kidneys, the order of the phenomena is first in the secreting cells, leading to the process of desquamation, which may go on for a time before there is evidence of congestion or the effusion of serum. I believe that this state happens in scarlatina; the difference is only in degree, the process the same. If, under these circumstances, the urine be examined, there will be found evidences of desquamation in the presence of portions of epithelial cells. As the disease advances, the urine will become highly albuminous. We cannot explain why it should be so; but it is a law that, when the secreting cells are found in the urine, some abnormal substance is passing off in it. It is very doubtful if the primary cause of all this be not a deficiency of nervous power and consequent deterioration of the blood, and if the first change do not take place in the organic nerves supplying the kidneys.

However pathologists may differ with regard to the morbid condition of the kidneys, one thing we are agreed upon, that the leading feature of this disease is the voiding of a highly albuminous urine of low specific gravity; it is also occasionally red, or dark-coloured, as well as albuminous. The skin is dry and harsh; the countenance pale; sooner or later dropsy is always met with; there is a considerable anasarca swelling of the legs and feet, and infiltration of the scrotum; a general sensation of lassitude and pain in one and sometimes in both sides of the abdomen; nausea and vomiting; uneasiness or a dull pain in the loins, together with a scanty secretion of albuminous urine, coagulable by heat and nitric acid. In some cases, the secretion of urine will be altogether suspended; comatose symptoms will come on; and a speedy death is the result.

Such is a brief description of that morbid condition of the kidneys known as Bright's disease, together with its leading symptoms, culminating in a general dropsy, of which I am about to treat.

Up to the present time no remedies have been used with special adaptation to the removal of albumen from the urine. It is my design and intention, however, to speak of a mode of proceeding for getting rid of those accumulations of serous fluid which take place in the cellular membrane, inundating at once almost every cavity of the body, and producing such distressing and alarming symptoms in those persons who are the subject of Bright's disease. With regard to diuretics, Dr. Cullen says: "It happens, unluckily, that none of these are of very certain operation; neither is it well known why they sometimes succeed and why they so often fail, nor why one medicine should prove of service when another does not." Purgatives have also been used for the purpose of evacuating the accumulated fluid. Drastic purgatives, certainly, have the power of removing large quantities of watery fluid. The objection to these is the temporary fever and heat which they are liable to cause: and as it is laid down as an indispensable rule that they should be given as frequently as the strength of the patient can possibly bear, almost daily, till the water is removed, it is obvious that, if the complaint be not carried off by these means, it must be aggravated by them, and an increased debility will follow, particularly of the digestive organs.

What remedy or remedies, therefore, shall we use which shall be less objectionable and uncertain in their effects? It is through the medium

of the skin, as an independent organ possessed of great power of elimination, that we must look for the removal of those dropsical accumulations, the result of disorganisation of the kidneys. And of all means none can surpass or even equal the immersion of the body in heated air, or what is generally termed the "Turkish bath". It is to Mr. Urquhart that we are indebted for the introduction of the Turkish bath into England, and to Mr. Erasmus Wilson for forcibly drawing the attention of the profession to the bath as a means of not only promoting a healthy condition of the skin, but of preventing disease, and as an adjuvant in its removal when already established.

It is well known that the human body can support a temperature of 300 and 400 degrees of Fahrenheit in dry air; of course vapour is scalding at 120 degrees and boiling at 212 degrees.

Mr. Wilson says: "Looking at the skin in relation to the other organs of the animal economy, we recognise it as one of the great emunctories or scavengers of the body; and we may fairly place it by the side of those other great emunctory organs—the liver and the kidneys, and probably the lungs.

To my friend Dr. Thudichum is certainly due the credit of suggesting that advantage should be taken of this eliminant function of the skin for the speedy removal of that general anasarca condition of the system which is a concomitant of Bright's disease. To give rest to the kidneys when they are unable to work out their normal functions is a very important matter; and this may readily and safely be done by submitting the body to hot air having a temperature from 130 to 150 degrees Fahrenheit, thus calling upon the skin to perform not only its own office but that of the kidneys as well.

The less we stimulate the kidneys by diuretics, when they are being structurally broken up by disease, the better chance will there be for the reparative process to go on. Acting on this principle, Dr. Thudichum, who was consulted by a patient of mine who was suffering from a severe attack of Bright's disease, and whose cellular tissues were loaded with serum, suggested that he should take two Turkish baths daily at a temperature of 140 degrees Fahrenheit, and afterwards submit to a cold shower-bath. My patient, Mr. C., was an intelligent farmer, about fifty-eight years of age, and very temperate and regular in his habits. The quantity of albumen in his urine was so great that the fluid became nearly solid on the application of heat. He had an intermitting pulse; pain about the loins and heart; his countenance had a peculiar cachectic aspect; and his lower limbs were so swollen as to render it impossible for him to put on his ordinary trousers or boots. Such was his condition when he first saw Dr. Thudichum. He began taking the Turkish bath during his stay in London, and derived the greatest benefit from it. He described the hot air as being very peculiar and distressing, until the skin began to act freely. After a few baths the skin acted with greater rapidity, and the perspiration ran down the arms in large pearly drops even to the finger-ends: the temperature was most delicious, and the sensation most delightful. During this dreamy and felicitous state, his troubles all vanished as if by magic. So convinced was he of the utility of the Turkish bath in his complaint, that on his return home he had one constructed on his premises, and every morning with a surprising regularity went into his bath at 6 A.M., and remained from two to three hours; and this he repeated always twice, and sometimes three times, daily for upwards of four years, always having a bucketful of cold water thrown over him immediately after the bath. His dropsical symptoms soon left him, and he became much better in every respect: he was enabled to go about and attend to his ordinary business with comfort. The urine did not lose its albuminous character, and but little was passed from the bladder—in fact, the kidneys were kept in a state of comparative repose, and were not subjected to the wear and tear of their ordinary duty, but were supplanted by that great emunctory of the body, the skin.

Thus was this man's life prolonged upwards of four years—no small portion of a man's lifetime—by the daily submitting of the nude body to a temperature of from 130 to 140 deg. Fahrenheit, producing a forced and increased action of the skin, by means of which a larger quantity of water containing much effete matter in solution escaped.

My experience in the treatment of Bright's disease is, that no medical agent we employ has so great power of arresting the complaint, or of prolonging life, as the Turkish bath during the progress of this intractable disease of the kidneys.

The only objection raised against its use by the patient is the length of time required for a complete bath, at least two hours being necessary for this process; and when this has to be repeated two or even three times during the day, it becomes a heavy tax upon means, and shortens business hours. This objection may, however, be overcome in some measure by taking the bath early in the morning and the last thing at night.

If it were necessary, I could give the details of many cases similar to

Mr. C., wherein the daily use of the Turkish Bath has been equally as efficacious. This would weary you, and is, however, unnecessary, as my object is to bring before you the fact, obtained from some considerable experience, of the utility of the Turkish bath in diminishing dropsical accumulations—more especially those caused by Bright's disease of the kidney—and with the hope of inducing some of you at least to try so valuable an agent.

SMALL-POX AND SCARLET FEVER DISINFECTANTS.

By CHARLES ROBERTS, Esq., late Surgeon to the North
Yorkshire Prison, etc.

THE subject of disinfectants has got into a sad state of confusion; and, amongst the various substances recommended as such by their numerous advocates, we hardly know on which to lay our hands in our present emergency. Nothing can be more confirmatory of this than the experiments published in the JOURNAL for December 24th by Dr. F. C. Calvert, on the relative antiseptic powers of carbolic acid (in various forms), chloralum, chloride of zinc, chloride of lime, and permanganate of potash. He thinks that, by suspending pieces of meat over these substances, he proves that carbolic acid is the only true antiseptic. The experiments are simply worthless for any purpose whatever; for the various substances are very different in their mode of action, and the circumstances under which they were placed were all in favour of the carbolic acid. Common salt and sugar are powerful antiseptics; but what would be thought of the cook who hung her meat and fruit above them, instead of immersing the article to be preserved in them? Carbolic acid and chlorine were the only volatile substances employed, and their chemical action is totally different. It is quite unnecessary to examine Dr. Calvert's experiments further, and I only refer to them because they are likely to mislead many who are too busy with the practice of their profession to examine their merits. I think, too, that we have already laboured too long under the incubus of carbolic acid, which has, it seems to me, gained its popularity on purely theoretical grounds.

Many of us are so enamoured of the new germ-theory of disease, that we allow it to warp all our thoughts into one channel; and to the true believer carbolic acid is as necessary as the germs themselves.

All the substances mentioned above, and many others, as sulphurous acid, iodine, nitrous oxide, etc., have powerful antiseptic properties, if properly used; but their *modus operandi* differs much. Thus chloride of zinc, chloralum, carbolic acid, salt, tannin, corrosive sublimate, chromic acid, etc., prevent decomposition by excluding septic agents, by chemically combining with the albuminous elements, or by simple mechanical obstruction. These are direct or positive antiseptics. On the other hand, sulphurous acid, chlorine, permanganate of potash, nitrous oxide—and to these I may add heat—destroy septic agents, and prevent them from producing decomposition. These are indirect or negative antiseptics; they are also disinfectants; and it is to some of them that we must look for our remedy against small-pox and scarlet fever infection.

I have intentionally omitted carbolic acid from this latter class, because I think it still remains to be proved that it possesses active disinfecting powers. I saw it used very extensively during the epidemic of cattle-disease, and I used it myself very extensively during the recent epidemic of scarlet fever, without any apparent results. The carefully executed experiments of Mr. Crookes failed to prove that it checked the spread of the cattle-plague; and the recent observations of Trautmann, if they be worth anything, only show that the vapour of carbolic acid suspends, but does not destroy, cell-growth. Even in surgical practice, I believe, the mode of its action is quite misunderstood. Very dilute solutions of carbolic acid coagulate albumen; and the only noteworthy fact in a recent case of poisoning by it, recorded in this JOURNAL, was the firm coagulation of the blood all over the body. I think it will be found that its beneficial effect on wounds is due to this simple chemical action; and that, by coagulating the secretions, it gives the wound more time to heal. The compound of carbolic acid and albumen is very slow to enter into decomposition; and I have no doubt that the use of solutions of chloride of zinc, chloralum, or tannin, would be equally efficacious in the treatment of wounds.

The cheapest, oldest, and most easily applied disinfectants for general use are heat and sulphurous acid; and they are both so well known to the profession, that little need be said about them. Dr. Henry of Manchester showed, some years ago, that heat was the

most complete disinfectant which we possess. So low a temperature as 140 deg. was found to destroy vaccine lymph; and no doubt a temperature of 300 deg. would be amply sufficient for all purposes. Bedding and wearing apparel, exposed to this temperature for a few hours in a drying stove, would be perfectly disinfected; and boiling would suffice for linen and cotton goods. Much anxiety is naturally felt by the public lest small-pox and scarlet fever should be brought home from the laundry—and this is a most fruitful source of contagion; but, if the things were submitted for a couple of hours, in the drying stove, to the degree of heat I have mentioned, there need be no fear of that. I believe that stoves for disinfecting purposes are now made by a large firm in London.

Sulphurous acid is exceedingly inimical to organic life, and is probably equally potent in destroying organic poisons. The great objection to its use has always been its irritating effect on the respiratory organs; but, even in the small quantities in which it can be breathed with tolerable comfort, it must be a powerful disinfectant. To illustrate this, I may mention that sulphur was found to be the most powerful remedy for the vine and hop disease (*oidium Tuckerii*), which committed great ravages here and on the Continent about the years 1855 and 1856. On investigating the action of the sulphur, I found that it was due to the presence of a trace of sulphurous acid, which is always present in common commercial sublimed sulphur; and, when sulphur was still more highly impregnated with the gas, its beneficial action is very much increased. I believe also that the action of sulphur ointment in the cure of scabies is due to the presence of this small quantity of free acid; and its action may be increased by increasing its quantity. In a recent number of the *Pall Mall Gazette* there was a statement that cholera was much less frequent among the workers in the gunpowder factories in India than elsewhere. This is probably due to the presence of sulphur and sulphurous acid. If, then, so small a quantity of the gas suffices to destroy a rank vegetable growth like the *oidium* and the itch-insect, a much larger quantity in the air, though not more than can be comfortably breathed, may fairly be expected to destroy minute organic poisons and germs.

For disinfecting hospitals, prisons, schools, and private houses not occupied, nothing is required beyond burning sulphur with closed windows and doors, as recommended by the health-officers. Charging the room with steam would probably facilitate the disinfection by condensing on and precipitating any floating particles of cuticle or other matter. For local applications, the solutions of the gas in water or in alcohol, as recommended by Mr. John Gamgee, are useful; and for disinfecting water-closets, drains, etc., sulphur highly saturated with the gas—and it takes up a very large quantity—would answer very well; but some of the other disinfectants are probably more convenient for this purpose.

Bolton Row, February 1871.

PATHOLOGICAL MEMORANDA.

GANGRENE OF THE LUNG IN ASYLUM PRACTICE.

SINCE reading the interesting paper by Dr. Crichton Browne in the JOURNAL for the 11th inst., on "A Case of Gangrene of the Lung" occurring at the West Riding Asylum, I have taken the trouble to examine the records of such cases of that disease as have occurred in this asylum since its opening in 1845, and the following is the result.

I find that gangrene of the lung was the cause of death in fourteen cases out of 1,325 deaths from all causes up to the end of the year 1869. Eleven of these were males, and three were females. With the exception of two cases, aged respectively 15 and 40 years, all the cases were above fifty years of age at death. In four cases, both lungs were affected. The form of mental disease was, in four cases, mania; in three, dementia; in three, imbecility; in two, general paralysis; and in two, melancholia. In three cases only is it recorded that there was refusal of food, and only one of the patients was an epileptic. The records of cases in this asylum show that gangrene of any part of the body is by no means of common occurrence; and that, when it does occur, it most frequently affects the lungs. And this is not surprising, when we know how common inflammation and other diseases of the lungs are amongst the insane; and that there is an intimate connexion between injuries and diseases of the brain, especially of the base, and diseases of the lungs, as has been shown by Dr. Brown-Séquard in a recent number of a contemporary journal.

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Exminster, February 1871.