An appeal to the public and to the legislature, on the necessity of affording dead bodies to the schools of anatomy, by legislative enactment / By William Mackenzie.

AN

APPEAL

TO

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AND TO

THE LEGISLATURE,

ON THE NECESSITY OF

AFFORDING DEAD BODIES

TO THE

SCHOOLS OF ANATOMY,

BY

LEGISLATIVE ENACTMENT.

By WILLIAM MACKENZIE,

ANDERSONIAN PROFESSOR OF ANATOMY AND SURGERY,
MEMBER OF THE ROYAL COLLEGE OF SURGEONS OF LONDON, THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW,
AND THE MEDICAL AND CHIRURGICAL SOCIETY OF LONDON,
AND CORRESPONDING MEMBER OF THE MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

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AN APPEAL

&c.

MEDICINE, besides the curing of diseases, has two other great objects in view; namely, the preservation of health, and the solution of a numerous set of important questions connected with the administration of justice.

In the *first* case, the medical practitioner takes his place by the side of the legislator, to point out the necessary regulations for the preservation of the public health, to afford a variety of information regarding the causes which affect population, regarding the physical education of children, the healthfulness of different countries and districts, the wholesomeness of different kinds of food, the means of preserving the moral effectiveness of fleets and armies, the establishment and management of hospitals, and the construction and economy of prisons,

to indicate the means by which pestilential diseases are to be extirpated, and the precautions by which new contagions are to be averted from the shores of his country.

In the *second* case, the medical practitioner is called into the courts of justice, not so much in the character of a witness, as in that of a judge; for it is in a great measure according to his opinion, that many and weighty questions in the administration of civil and criminal law, are decided. These questions respect marriage and divorce, pregnancy, delivery and infanticide; the duration of life; the proofs of insanity; and the crimes of rape, homicide, and murder; and are often of such a nature, that without the aid of medical evidence, they would remain obscure or entirely unanswerable.

Such being the vast extent of medicine, even when regarded independently of its chief object, which undoubtedly is the curing of diseases, some idea may be formed of its importance in a land of civilization and freedom—some idea may be formed of the dignity and high responsibility of the medical profession, and of the necessity of laying well the ground-work upon which a KNOWLEDGE OF MEDICINE is to be founded. If that ground-work, which is an acquaintance with the human structure, has ever in this country been difficult of attainment, and now from a complication of causes, has become almost quite unattainable, it is time that a SOLEMN APPEAL should be made to the PUBLIC and to the LEGISLATURE, so that being fully furnished with the

facts of the case, they may adopt such measures as shall secure to those who are to embrace the medical profession, the opportunities necessary for qualifying themselves for the discharge of its difficult and important duties. Such an appeal is so much the more necessary, as a remedy for the present shackled and depressed state of anatomy, can be drawn only from the public, and be brought into activity only by legislative interference.

The human body is a living machine, consisting of a great variety of parts, exceedingly complicated, and liable both from many external, and from many internal causes, to become disordered. This machine differs from all the contrivances of man, in this remarkable particular, that it possesses in a very considerable degree, a power of self-restoration; so that when accident deranges from without, or when disease springs up from within, there is an immediate attempt made by the living powers of the body itself, to bring matters back to their original state and to their natural play. But in many cases, the accidental disorder is so extensive, or the internal disease is so general and overpowering, that the self-restoring principle is unable to effect a return to health, and the individual, often after the endurance of severe and long-continued suffering, is relieved only by death.

By the slowly accumulated experience of ages, it has been discovered, that the self-restoring power may often be assisted by human inventions; for instance, that when

the bones of a limb are broken, by laying and keeping the limb in a particular position, the restoration shall be so perfect, that the limb shall retain its natural length, and shape, and use, while had it been left without artificial adaptation and support, it might have mended shortened, and crooked, and lame.

The blood, the vehicle of life, is propelled with great force from the heart, so that it rapidly travels through the body in a set of tubes, called arteries, of which if one of the more considerable be opened, the blood gushes in a stream from the wound, and in a very little time life is extinguished. This is what happens every day in the accidents of common life, and three-fourths of those who die in battle perish thus from loss of blood. But if a skilful man be at hand, who knows the course, the depth, and the exact situation of these tubes, he applies his finger over the wounded artery, lays it bare, and tying it up with a bit of thread, arrests the flow of blood, and saves the life.

Those who have seen a man tormented with the stone, need no description of his agony from me; to those who have not, no description of mine can adequately paint the excruciating sufferings, to which those who are afflicted with that malady are doomed to submit. In a fit of the stone, the slightest change of position is dreadful. Getting in or out of a bed is a trial so severe, that often the resolution fails, and the poor sufferer has not courage to move, but falls down in a state of exhaustion

from the anguish he has borne. From so dreadful a disease, is there any mode of relief? There is; but it is a mode altogether artificial—the self-restoring principle can here do nothing—but the surgeon can remove, with quick and dextrous hand, the cause of all this pain. But if that hand be uninformed, if it has not previously, on the dead body, dissected often and carefully the parts to be divided, and the parts to be left untouched, if it has not often repeated on the dead, the operation which it has now to perform upon the living, it cannot be trusted, and the sufferer must be left to pine by turns, and by turns to madden again, till his frame is worn out, and at length he expires.

The three instances which I have selected, are sufficient to illustrate the nature of the HEALING ART, and to show its absolute dependence on a knowledge of the human structure. The healing art is plainly a handicraft, of which the subject is the living body. If the handicraftsman know the structure of the body, he will operate upon it dextrously and to much good purpose, but if he know it not, he will mangle and abuse it. The art of surgery differs from other handicrafts only in this, that while they are exercised upon dead matter, on stone, and wood, and iron, this is exercised upon the moving and sensible body of man. When the mechanic errs in working, as from inexperience or carelessness he may sometimes do, he throws the spoiled materials from him, and coolly resumes his labour upon others; but when the bungler in surgery errs, his hand trembles, and his heart fails, he

hears the frightful cries of his victim, and sometimes sees him expire under hand. The error he has committed is irretrievable; he has destroyed a fellow-creature.

It is true that a living being and a mere mechanical engine are not ex tly upon a par; and that a medical practitioner may sometimes seem to set the one to rights, although he knows little of its structure, while any attempt to mend the other by a person who had not previously taken the engine to pieces, and examined its several parts, would be at once pronounced a proof of folly and presumption. That a medical practitioner may sometimes contribute to rectify a disorder, although, from his ignorance of anatomy, he may not be able to tell what part of the body appears to be affected, and much less what is the intimate structure of that part, and what its relations to the parts around it, is a fact which depends entirely on the constant tendency in diseased nature to restore itself. This constitutes a striking difference between a disordered living body and a disordered mechanical engine; and upon this difference, is built the different success which occasionally attends the medical practitioner ignorant of anatomy, and the artist who should pretend to mend a machine, the structure of which he had never studied. Such an artist men would treat at once as a knave; but so unreflecting is the world, that such a medical practitioner is still treated as honest, and is even not unfrequently regarded, by those who happen from the excellence of their constitution to escape out of his hands alive, as a man of no inconsiderable skill.

If the productions of art possessed the same advantage with the living body, if when the movements of a machine were by any accident impeded, it had within itself the power of throwing out the obstructing cause, if when a spring chanced to break, it could solder itself and heal spontaneously, we might then see men rise to eminence as mechanics, just as we often see men rise to eminence as medical practitioners, without understanding the principles of their art, and without knowing one wheel or lever from another of the particular engine which they treated. But as no work of human art is endowed with the faculty of self-restoration, the artist is under the indispensible necessity of understanding the structure of his subject, and the laws by which it acts. Those who apply to the art of medicine ought to follow, and ought not merely to be permitted, but ought to be obliged by law to follow the same plan, and to study the human structure and economy with as much assiduity and minuteness, as if, like the watchmaker, they had nothing to depend upon but their knowledge.

There is one branch of the healing art, which imperiously demands from him who is to engage in it, exactly the same kind of knowledge of the human frame, as the mechanical arts demand from those who are to engage in them; I mean the practice of surgery. The setting of a broken bone, the reducing of a dislocated joint, the stemming of the tide of a divided blood-vessel, the releasing of a portion of protruding and strictured intestine, the cutting out of a stone from the bladder, the

raising of a piece of depressed skull, the treatment of a gun-shot wound, the removal of a shattered or mortified limb, these are things about which no cunning will be of any use but the cunning learned by practical exercises in the schools of anatomy. If the surgeon is acquainted with the structure of the body from careful and repeated examination with his own hands, he will proceed in such cases with a calm and confident assurance that he can meet only with parts which he knows, and that the whole object of his practice is to bring these parts back, as far as is possible, to certain relations with which he is perfectly acquainted, and to that harmonious action, the mechanism of which he perfectly understands. If his knowledge of anatomy has not been derived from actual dissection, but amounts merely to the vague recollections which remain of what he had seen and heard at public lectures, being in fact unacquainted with the natural position of the parts of the body, how can he judge of the degree of their derangement, and how can he ascertain that his reduction of them is complete? Unacquainted with the relations between the muscles, arteries and nerves of a limb, a knowledge of which can be obtained in no other way than by repeated dissections, how shall he avoid the muscles and nerves, and put down his finger upon the bleeding artery? Knowing no more of the anatomy of the parts concerned in the operation for stone, than what he has gathered from the demonstrations of another person, or from seeing a preparation of the bladder, separated from all the parts with which it was connected, how else can that operation be regarded

in his hands, than as a hazardous and desperate tampering with the life of his fellow-creature?

Indeed, the necessity of anatomical knowledge to the surgeon is so plain, that it is sufficient only to know what surgery and anatomy mean, to see that they are inseparably linked together, and that a man might as well talk of running a race and winning it, whose limbs were struck with palsy, as of going a single step into a sound knowledge of surgery, without a previous practical acquaintance with anatomy.

I say *practical acquaintance;* for there is no error more fatal to the progress of that science, nor more calculated to satisfy the minds of students with a worse than imperfect knowledge of this ground-work of the healing art, than the notion that anatomy may be learned by an exercise of the sense of sight alone; or in other words, by viewing the dissections made by others, attending public demonstrations in theatres and colleges, reading books, and looking at plates and imitations of the body in wax and plaster. These are all useful as auxiliaries, but they are quite insufficient to convey that practical knowledge of the structure of the body, which the surgeon in particular requires. The exercise of several of the senses, and above all of that of touch, is absolutely necessary to the knowledge of what has been termed surgical or relative anatomy. The student must bring into view the parts of the dead body which he is studying, with the very hand which is afterwards to divide and separate them

in his operations on the living: he must meditate for hours and for days over the dissection he has made, displacing and replacing the different muscles, arteries and nerves, many times over, before he can impress upon his mind an accurate idea of their structure, their situation, and their mutual connexions.

Even supposing then that an ample provision of dead bodies were made for the teachers of anatomy, on which to perform their public demonstrations, there would remain to be obtained a still more necessary provision, namely, for the dissections to be performed by students individually. The lectures and demonstrations of teachers of anatomy ought to be regarded as merely preparatory to the examination of the dead body by each student, serving to lay before him a general and rapid survey of what he ought to study with pains and minuteness for himself, exciting his curiosity for more particular information, and pointing out to him, amidst the multiplicity of parts, those which being the most important, ought to fix his deepest attention.

Which, even, of the easiest of the common arts could we expect a person to acquire, were he taught by the sense of sight only? Could we expect a man to become a tolerable carpenter, by having heard some courses of lectures on carpentry, illustrated by specimens of that art? However minutely these specimens were described, and however dextrously the lecturer himself might perform the manipulations by which they were fashioned,

unless the scholar had actual opportunities of working, and of educating his hands to his business, by repeated trials upon the materials of his trade, his productions would be clumsy and imperfect. And shall we expect one of the most difficult of all the arts to be attainable without the like opportunities of practical improvement? Shall those who are to practise the most important of all the arts, be left to follow a plan of education so palpably imperfect?

Many of the common arts are extremely difficult to be acquired: yet all of them are founded upon the laws of the phenomena of inanimate matter. Surgery, on the other hand, whilst its operations are partly founded on these laws, and are attended by the same kind of difficulties as those of the common arts, presents a new set of difficulties, the nature and the amount of which are scarcely at all appreciable by any other than the surgeon himself. These new difficulties arise from this, that surgery is founded not only on the laws which regulate the phenomena of inanimate matter, but also on the peculiar laws of organized or living bodies. How easy would it be to cut down upon an artery, were not caution forced upon the surgeon, by the consideration, that it is with a tube conveying a tide of living blood that he has to do, and that if in exposing that tube, he cuts across a muscle, or divides any considerable nerve, he may leave his patient lame for life; or if unwarily he opens the tube itself, in a few seconds his patient may expire from loss of blood!

It must be evident, that it would be a very great advantage in acquiring a knowledge of operative surgery, if its peculiar difficulties could be set aside for a time, and a certain practice and dexterity acquired, without having the dangers and the complication of obstacles to encounter, which meet the surgeon when he attempts the exercise of this art upon moving and sensible matter. This great advantage can be gained, only by repeating the operations of surgery on the dead subject. If opportunities were permitted for doing so, the performance of every operation *once* upon the dead body, before attempting it on the living, could be regarded as no more than a pitiful precaution against the self-accusation which would rise in the surgeon's mind, when he considered, that to do upon the living, what he had not previously tried upon the dead, must be unjustifiable temerity and cruelty. Yet to repeat the chief operations of surgery even once on the dead body, is what has fallen to the lot of comparatively few who have become surgeons in this country for many years back, and is at present still more than ever beyond reach.

To derive improvement from exercises of this kind, they would require to be repeated frequently and methodically. The parts to be operated on, ought first of all to be dissected on one subject, or on one side of the body, then the operation ought to be performed on another subject, or on the other side, and lastly, the parts operated upon ought to be dissected, that the faults

which had been committed in the operation might be ascertained.

If no adequate opportunities are provided for exercises of this kind, only one other mode will remain, by which surgeons can acquire dexterity in their art, and it is one which I shudder to mention. It will be by practice on the living bodies of the poor. The rich will always have it in their power to select the surgeon who has enjoyed opportunities of studying his profession as it ought to be studied, or has already signalized himself by his success. But the poor, upon whom operations are rarely performed at their own houses, will find themselves placed on their admission into public hospitals, under the care of young men, who will be forced (it is to be feared) from the blind illiberality of the age, to learn upon them, what they ought to have learned upon the dead; and who will seek to become surgeons of such institutions, for the very purpose of acquiring that dexterity which will enable them to operate upon others with better success. No doubt there is a manual address in the performance of surgical operations, which actual practice only can give; but it is evident that practice on the living ought, from the very first, to be under the guidance of a clear and well-understood system of rules, which the surgeon has already put to the test, as far as it is possible, on the dead body.

Some surgical operations are no doubt simple enough, but those which are difficult, if attempted by one who

had not for a time associated with the dead, and on them repeated again and again, every operation which he ever meant to do upon the living, would probably be about as imperfect as the productions of a person, who, for the first time took the pencil in his hand, and whose whole knowledge of painting had been derived from hearing some courses of academical lectures. I can conceive nothing more cruel—nothing more truly unlawful, than to flatter on a sick man to that courage which is necessary for undergoing a severe and dangerous operation, and then to take up the knife, with the hand which never took it up by the side of the dead subject. Is it to be wondered at, if the surgeon's resolution is appalled, when the terrible thought rises before his mind, that his patient's life now depends on the mere chance of escaping from his unskilfulness, and that in the very operation which he has recommended as a means of relief, he is about to expose a fellow-creature to new and instant dangers, against which, a practical knowledge of anatomy only could have provided?

But upon whose head, let me ask, is the guilt of this horrid sacrifice to ignorance? The surgeon is but the officiator. The worshippers of ignorance, who surround him, and who force him on, are those who have impeded, and who would yet more impede the study of anatomy—those, who in order to give an idle *protection to the dead*, would not hesitate to render the healing art little better than a cruel mockery of the distressed. If it be true, that he who wilfully impedes assistance to

the wretch who is expiring from a draught of poison, is equally guilty with him who mingled it, and with him who gave it, then he who by the least unnecessary action, or by the least unnecessary word, opposes the study of anatomy, is neither more nor less than a murderer. By his opposition, he, as it were, poisons the balm of medicine, which promised to give a little ease to horrid suffering—he puts out his foot to make the surgeon stumble, who is running with help to the wounded and the dying.

Would to God that the eyes of the public were open to the consequences of their idolatry of the dead! They would then spurn with contempt, the plans of those ignorant men, who have vapoured over their midnight bowl, that they would put an end to anatomy, blind to the widely disastrous effects, which their plans, if carried on, must speedily produce on the best and dearest interests of humanity. Instead of seeking to degrade the anatomist, or to disturb him in his pursuits, the public, if they rightly understood the matter, and could for a moment listen to reason, not to passion, would be eager to honour and to assist a man, who for the sake of relieving the sufferings of his fellow-creatures, can take up his abode with death and corruption, make the most loathsome objects on which eye can ever look his familiar associates, and even risk his life in acquiring that knowledge which is to enable him to preserve and restore the health of those who hate and persecute him.

The schools of anatomy in Great Britain have never been supplied with a sufficient number of dead bodies to fulfil or nearly to fulfil the important purposes already explained. The number of murderers, whose dead bodies have been given for dissection, has never been sufficient to supply even the public professors of anatomy, much less the private teachers; and upon the whole, the making of dissection a punishment has been much more injurious to the interests of anatomy than beneficial. This practice has naturally excited in the minds of the vulgar, a horror at the examination of the body after death, under any circumstances; and for this reason, if any thing is to be done by the legislature for the promotion of anatomy, the clause of our criminal code by which dissection is made a punishment, and the anatomist degraded below the common executioner, ought in the first place to be repealed.

The only other means by which the schools of anatomy have been supplied with dead bodies, has been by exhumation. Against this practice, there has of late years arisen such a clamour, and such means have been adopted to prevent it from being continued, that dissection for students is now altogether unattainable, and even the teachers of anatomy find it very difficult to continue their public lectures.

An increasing desire on the part of medical students to be acquainted with anatomy, has of late years naturally increased the number of teachers, and the demand for

dead bodies. Unfortunately some of these teachers have been careless with regard to the modes which they adopted for procuring subjects. Exposures have consequently taken place, and by these the public attention has been roused. The newspapers have lent themselves, with a few honourable exceptions, to be vehicles of the most foul and perfidious defamation of anatomists. Even judges on the bench have descended to use a vindictive and vituperative language, ill becoming their place, and their supposed knowledge of human affairs. All these causes have conspired to create a jealousy of anatomy, which it never merited; and ultimately to produce associations for guarding the places of interment, and even avowedly for putting the study of anatomy down.

Exhumation, it is true, was quite insufficient to answer the purpose for which it was had recourse to. Yet I am afraid that those who have attempted to abolish it, have considered the subject but on one side, weighing the disadvantages of the practice, without thinking of its uses.

To discover whether any human action be right or wrong, we have to inquire into its tendency to promote or diminish the general happiness. If the question be, whether the exhumation of dead bodies be right or wrong, we inquire into the tendency of such a practice to the public advantage or inconvenience. If the question be, whether a man who removes dead bodies from the place of interment, ought to be punished or protected, we inquire into his design, whether his conduct

sprang from a desire to do a wanton outrage, or from a wish to qualify himself and others for the practice of a useful and honourable profession. The *whole* of the tendency of any action must, as far as it is possible, be investigated; for there are few human actions which are not followed both by good and by bad consequences; and in order to discover whether such actions are right or wrong, the whole of the good consequences must be fairly weighed against the whole of the bad consequences. Carelessness and feebleness of mind would, no doubt, gladly escape from the tiresome discussion of opposing and entangled interests, but unless the key of moral actions just explained be put to use, there is a danger that simplicity will be imposed on in its judgments, and industry and virtue in many cases discouraged and trampled on by the prejudiced and the interested.

The bad consequences of exhumation are,

1. The distress undergone by the friends of the dead person taken away.

2. The violation of property, in disturbing the grave and the apparatus of burial.

3. The shock given to the feelings of the public, by the discovery that a dead body has been torn from the place of sepulture, to which it had been solemnly consigned, and by the suspicion that the same has happened, or may happen to others.

4. The apology which this discovery affords to the mob for riots, by which lives and property are indiscriminately exposed to danger.

5. The additional expenses incident to protecting the places of burial, which in many cases will be called for, when they can be but ill afforded.

6. The dangers to which those are exposed who remove dead bodies for the purposes of anatomy. They are frequently students of medicine; and have often been seriously injured, and sometimes murdered by grave-watchers.

7. The dangers to which teachers and students of anatomy are exposed by this system, from dissecting bodies in a putrid state.

8. The frequent and inconvenient interruptions to the studies of anatomists from detections of exhumation, and the harassments and expenses to which they are thereby exposed.

9. The indifference towards the adoption of legal and sufficient means for supplying the schools of anatomy, which is produced by the general belief that the system of exhumation, even under every mode of interruption, is still sufficient for that purpose.

These are evil consequences of the system of exhuma-

tion which are undeniable; and which could find their palliation, only in an overwhelming counter-weight of advantages, attainable only by that laborious investigation which is termed dissection, and which presumes to the dissector the possession of the dead body. The system of exhumation was altogether inadequate for the complete supply of the schools of anatomy, yet as every dead body stolen and dissected, by the instruction which it became the means of affording, carried with it the health and the lives of thousands, I judge that those who have associated for the purpose of depriving teachers and students of the scanty supply of dead bodies which this practice afforded, without attempting, or previouly proposing any substitute, have acted precipitately and unjustly, and especially that those of the better ranks are to blame, who have sanctioned such associations, which, when first proposed, would, but for their patronage and pecuniary support, have in all probability sunk into the nothingness of a mere drunken exasperation.

It is well known that in London, the procuring of dead bodies is still more difficult than it is in Scotland; so that it has become, beyond contradiction, impossible for students of medicine to acquire a sufficient practical knowledge of anatomy, in any part of Great Britain, except at an expense of time and money amounting to a prohibition. The LEGISLATURE, then, is loudly called upon by the circumstances of the times, to bring forward a measure by which the schools of anatomy shall be sup-

plied at a reasonable rate, without having longer to encounter the perplexities, dangers, and insufficiencies, under which they have laboured for so great a length of time.

Before proceeding to explain the only public measure which appears capable of answering this important object, it may be proper to state, in a general way, the number of dead bodies which would be annually required for the practical teaching of anatomy, in Great Britain and Ireland.

I shall suppose the period of study to be three years, and that in each of these years, a careful dissection is to be made of all the most important parts of the body. This will require one dead body for the muscles, a second for the blood-vessels, and a third for the nerves. The viscera may be studied partly in one, and partly in the other two of these three dead bodies. Now, in the course of three years, two students will require nine dead bodies, to which we shall add a tenth for the repetition of the principal surgical operations. Such I consider as the most moderate computation which ought to be admitted; although it cannot be denied, that comparatively few surgeons of the present day, have enjoyed opportunities of carrying their anatomical studies even to the length here proposed. Double the number of dead bodies I have here stated would, I think, be little enough for the acquirement even of a moderate knowledge of anatomy; but, at least, evidence of the student's having

carefully dissected five dead bodies should be produced, before the granting of any diploma in medicine or surgery.

Supposing the number of students in London to be 400, the number of dead bodies required annually in the metropolis would be 600. Add dead bodies for 200 students at Edinburgh, 200 at Dublin, and 100 at Glasgow, the total number of dead bodies required annually in the empire for preliminary anatomical instruction, would be 1350, to which must still be added 300 dead bodies annually, for the repetition of surgical operations, making a total of 1650 dead bodies annually, for the use of students alone. Supposing farther that there are 30 teachers of anatomy in the empire, each of them will require for his public demonstrations, on an average, 10 dead bodies annually, making an addition of 300, or a total of 1950. By the dedication then of 2000 dead bodies annually to the purposes of anatomy, the health and happiness of twenty-one millions of men may be very materially promoted. And though from the novelty of such a calculation, the number of dead bodies here stated may sound as if immense, yet when compared with an annual mortality of 500,000, it will appear as almost nothing.*

Nor will the hospitals, infirmaries, work-houses, poor-

* The above calculation, along with the following plan, and most of the reasonings in the preceding pages, I published in 1820, in the Quarterly Journal of Foreign Medicine and Surgery.

houses, foundling-houses, houses of correction and prisons, find any difficulty in furnishing the number of dead bodies required; and that without any extraordinary sacrifice of feeling on the part of the friends and relatives of the deceased. The annual number required, according to our calculation, is in London, 766; in Edinburgh, 383; in Dublin, 383; and in Glasgow, 191. Now, granting that Edinburgh and Glasgow could with difficulty supply their respective numbers, they could be furnished from Dublin and London, or even from either of these towns alone.* There is no reason to suppose that the number of dead bodies appropriated to anatomical purposes in Great Britain and Ireland, has ever amounted to 300 annually. How easily could this small number be supplied! How much good could be effected even by this small provision, furnished with regularity!

As the dead bodies for anatomical purposes can be derived in sufficient numbers only from public institutions, it is necessary that the schools of anatomy be in large towns; yet these schools should be in some measure removed from public view, and ought never to be suffered within the walls of an hospital. Where life has come to seek for preservation, the neighbourhood of corrupting corpses must ever be highly offensive, both morally and physically prejudicial to the recovery of the sick, and hurtful to the usefulness of charitable institutions. The greatest decency, and even a certain secresy

* The annual mortality of London, is about 30,000.

ought to be employed in conveying the dead bodies from the hospitals to the schools of anatomy. No dead body ought to be allowed to remain in the schools of anatomy beyond a certain number of days, after which, the remains of the dead ought to be decently interred.

All this, it is evident, can be effected only by the interference of the legislature; and as for many years it has been carried on with regularity in most of the other countries of Europe, it is to be hoped that the same advantages will soon be afforded to the profession in Britain. Let it not be supposed for an instant, that by what the members of the medical profession would judge a sufficient and just liberty of dissecting dead bodies, any thing should be proposed which could outrage public decency, or even the respect due to the dead. Dead bodies must be procured, or anatomy must cease, and medicine be deprived of its only true foundation; and the only question is, how are dead bodies to be obtained, so as to give the least possible offence to the public feelings, and to the rights of individuals? The anatomist has indeed been exposed to the calumnies of those miserable hirelings, who for a paltry shilling, to be won by pleasing the palates of the mob, would sell the last lingering spark of truth. But while he is a stranger to those superstitious fears which haunt the common mind, the anatomist approaches the dead body of his fellow-man with the feeling, that he himself must one day be stretched out in the same attitude of insensibility. His office too, consists in no common action either of the mind or of

the hand. In scrutinizing the fabric of organization, he meets at every step of his intimate and toilsome search, the proofs of design and of wisdom; nor can this thought ever quit his mind, that his inquiries are not those of a vain and speculative curiosity, but that the end of them all is THE RELIEF OF SUFFERING HUMANITY. Whatever may be the feelings or motives of those who impede the study of anatomy, the unavoidable consequence of their interference is THE INCREASE OF HUMAN PAIN AND MISERY.

France, and the different governments of Italy and Germany have long since known and acknowledged it to be their duty, to give a dignified and definite support to the study of anatomy. Britain has winked at its exercise. The cultivators of anatomy are furnished over the whole continent, with safe asylums at the public expense, where they may pursue their investigations on the dead bodies furnished to them by legal and exact regulations. In Britain alone, anatomy must be carried on by stealth, and its cultivators render themselves amenable to the laws of their country, by robbing the sepulchres of the dead.

Perhaps some may be disposed to reply to this appeal, that notwithstanding the opportunities of dissecting dead bodies being more limited in Britain than in any other civilized country, yet we have to boast of some of the most skilful anatomists and surgeons who have appeared in the world. The names of the Monroes, of the Hunters, of Baillie, of Abernethy, of Cooper, of the

Bells, of Barclay, are cited as proofs, not of a mere equality, but of a superiority in anatomical skill, above every other nation in Europe. But to what cause, I would ask, is the professional excellence of these celebrated men to be attributed, unless to this, that from peculiar circumstances, they have been enabled to engage more freely than others in anatomical researches? All those whose names are above enumerated, have been employed in the teaching of anatomy, and have thus had opportunities of prosecuting that science to a degree which is at present totally beyond the reach even of teachers. But it is not the teachers of anatomy only who ought to be intimately acquainted with the structure of the body. Every one whose intention it is to practise medicine, and especially surgery, ought to possess a thorough anatomical knowledge. Those who teach anatomy, are forced indeed to take the only right method of acquiring a knowledge of that science; that is to say, they make it their first object to see and handle the things with which they require to be acquainted, and their second object to know them. To begin by affecting to know these same things, by having read about them, and heard them described, and then to try to see and touch them, which has been the common method of pursuing the study of anatomy, is palpably absurd, and can never be attended with success.

The following are the heads of a PLAN FOR PROMOTING THE PRACTICAL STUDY OF ANATOMY, which I have already communicated to several distinguished members of the

legislature, and which I would earnestly press on the consideration of my professional brethren, and of all the friends of science and humanity.

I. That the clause of our criminal code, by which the examination of the dead body is made part of the punishment for murder, be repealed.

II. That the exhumation of dead bodies be punishable as felony.

III. That no diploma in medicine or surgery be granted by any Faculty, College, or University, except to those persons who shall produce undoubted evidence, of their having carefully dissected, at least five human bodies.

IV. That in each of the hospitals, infirmaries, work-houses, poor-houses, foundling-houses, houses of correction, and prisons of London, Edinburgh, Glasgow, and Dublin, and, if need be, of all other towns in Great Britain and Ireland, an apartment be appointed for the reception of the bodies of all persons dying in the said hospitals, infirmaries, work-houses, poor-houses, foundling-houses, houses of correction, and prisons, unclaimable by immediate relatives, or whose relatives decline to defray the expenses of interment, which expenses shall be estimated at the rate of twenty shillings.

V. That the bodies of all persons dying in the said

towns, and, if need be, in all other towns, and also in country parishes, unclaimable by immediate relatives, or whose relatives decline to defray the expenses of interment, shall be conveyed to a mort-house appointed in the said towns for their reception.

VI. That no dead body shall be delivered from any hospital, infirmary, work-house, poor-house, foundling-house, house of correction, prison, or mort-house, for anatomical purposes, except upon the requisition of a Member of the Royal College of Physicians, or of Surgeons, of London, Edinburgh, or Dublin, or of the Faculty of Physicians and Surgeons of Glasgow, and upon the payment of twenty shillings into the hands of the Treasurer of the hospital, infirmary, work-house, poor-house, house of correction, or prison, or other officer appointed to receive the same.

VII. That no dead body shall be conveyed from an hospital, infirmary, work-house, poor-house, foundling-house, house of correction, prison, or mort-house, to a school of anatomy, except in a covered bier, and between the hours of four and six, *a. m.*

VIII. That after the expiration of twenty-eight days, an officer appointed for this purpose, in each of the four towns above-mentioned, shall cause the remains of the dead to be placed in a coffin, removed from the school of anatomy, where the dead body has been examined, to the mort-house of the town, and decently interred.

IX. That the expenses attending the execution of these regulations, be defrayed out of the fees paid by teachers and students of anatomy, on receiving dead bodies from the hospitals, infirmaries, work-houses, poor-houses, foundling-houses, houses of correction, prisons, and mort-houses, which fees, according to the calculation already given, will amount to £2000 annually.

It is evident that this plan can be authorised only by act of parliament. Whatever objections it may be liable to, I am fully persuaded, that it is the only plan capable of accomplishing the desired object; and I am happy to find that it has already met with so able an advocate as Mr. Abernethy.

"If, however, we are disposed thus to labour for the public good, some concession, co-operation, and encouragement on the part of the public, may be by us reasonably expected. Anatomical knowledge is the only foundation on which the structure of medical science can be built. Without this, we should but increase the sufferings of those afflicted with diseases, and endanger their lives. Opportunities of dissection should therefore be afforded to us. The bodies of persons dying in the hospitals abroad, are given to the surgeons for dissection, and even with the acquiescence of the public. In other countries, it is considered that those who are supported by the public, when unable to support themselves, die in its debt, and that their remains may therefore, with justice, be converted to the public use. In England,

however, the indigent who suffer from illness and injury, are supported and relieved chiefly by the liberality of that benevolence which is so creditable to our national character; and much as I wish for the promotion of medical knowledge, I should be sorry if the bodies of the poor were to be considered as public property, without reserve, in our own country." "Yet, if the directors of hospitals, poor-houses, and prisons, were to establish it as a regulation, that the body of any person dying in those institutions, unclaimable by immediate relatives, should be given to the surgeon of the establishment for dissection, upon his signing an obligation so to dispose of it, as to give no offence to decency or humanity, I am convinced that it would greatly tend to the increase of anatomical knowledge amongst the members of our profession in general, and consequently to the public good."*

It has been objected to the plan for supplying the schools of anatomy already explained, that it would be the means of emptying the hospitals. This, however, it has not done in other countries; and even should it have that effect in any degree, it would send from the hospitals only those who ought not to be there, those who are able to pay for medical attendance at their own houses, and who notoriously occupy many of the beds of our hospitals, to the exclusion of those whose indigence and distress prevent them from acquiring that

* Hunterian Oration for 1819. By John Abernethy, F. R. S. page 33.

degree of interest with the contributors to our hospitals, which is necessary for obtaining recommendations. It is well known to those who are conversant with the state of the poor in our large towns, that the cases of greatest abjectness and disease are not to be found in the hospitals, but in their own hovels. To such friendless objects of charity, the doors of our hospitals would probably be opened more effectually than ever by the adoption of the proposed plan, and disease alone would be made the passport for admission.

Are there any who would reject the present appeal, on the ground that the truly civilized and polished state of this humane and religious nation forbids such cruel butchery of the human body, as anatomists would wish to be permitted to perpetrate; and that the humane prejudices and natural feelings of the people ought not to be violated? Allow me, in imagination, to convey these persons from the dissecting room, where a single dead body lies under the minute knife of the anatomist, who in his hidden and silent retreat, is making out every little vessel and moving thread which it contains, and out of its very corruption is preparing to instruct perhaps a hundred young and ardent minds, in a knowledge of those facts which are to prove in their hands, the salvation of innumerable lives—let me convey them from a scene which they loath so much and know so ill, to one which they have heard more of, and have loved better—to the battle-field, where thousands of living men, armed with every instrument of cruel death, encounter-

ing thousands, the red and living blood is pouring in torrents, the air is rent with agonizing cries, and in a little hour the ground is covered with weltering corpses. We have seen the day, when Britain, reckoning up the slain, coolly subtracted the number of her own sons whose blood had drenched a foreign soil, and whose bones, stript by the hungry vulture, were left to bleach in the storm. The humane and feeling public received the estimate of slaughter with rapture. It was the estimate of what they had won. The youth, the vigour, and the beauty of the fallen were forgotten. The loud lamentations of the widow, the mother, and the sister, refusing to be comforted, were lost in the deafening cry of victory. The hour was given to madness, and midnight's darkness could not hide the wantonness of mirth and triumph.

Propose the question of the propriety of dedicating to the humane purposes of anatomical instruction, a few, and only a few of the dead bodies of those individuals who expire in the hospitals, changed and worn out by disease, without a relative or a friend to carry them out to the grave, and whose very names are perhaps forgotten; the feeling public slip on the ready mask of tender-heartedness, and raising their hands in well-affected horror at the proposal, threaten with condign punishment, the poor foolish anatomist, who is cursed with an enthusiasm for the relief of human woe, and who foresees, in the researches which he is forbidden to institute, the discovery of a new or a better means of curing or assuaging some excruciating, or some mortal disease.

Thus it is, that men can swallow a camel, but strain most conscientiously at a gnat.

If the end of war, which is the defence of our country, is sufficient once to justify the adoption of a mean so terrible as the destruction of hosts of living men, surely the end of anatomical study, which is the assuagment of human suffering, is ten times sufficient to justify the dissection of the dead!

Could the public and the legislature be but brought duly to appreciate the protracted inconveniences, the painful sufferings, the imperfect cures, too often attended with irremoveable lameness or want of useful power, nay, the undeniable loss of lives, to which particularly those in humble life are doomed, by being obliged to submit the management of their diseases to those who have enjoyed no adequate opportunities of acquiring a knowledge of the human structure, how widely different would be their feelings and conduct towards teachers and students of anatomy! Can it at all compensate even one humble individual, doomed to long-continued suffering or incurable lameness, that he is not so much the victim of his surgeon's ignorance, as of an idolatrous respect for the dead, which barred that surgeon from acquiring a knowledge of his profession? Who is there, who for a moment would seriously counter-weigh all the advantages which the system of protecting the dead and interrupting anatomical study, can ever produce, were it continued even for ages, against the

loss of a single father of a family, from the ignorance of his surgeon—much less counter-weigh those advantages against the vast increase of human misery, which the world must suffer, from the inadequate attainments of the next race of surgeons, unless legislative interference produce a prompt and sufficient remedy?

The subject is of the deepest interest to humanity—it is almost too deep indeed to admit of personal feelings; but I am persuaded that it requires only to be dispassionately considered by those who have the power of remedying the evil, to produce a thorough conviction, that the system of avowed proscription of anatomy, is a system teeming with the most deplorable consequences to society; and that, though some struggles of natural feeling must be encountered, and many prejudices overcome, yet the advantages to be obtained are so vast, or rather the necessity of the case is so imperative, that ANY UNNECESSARY DELAY IN MAKING THE SUPPLY OF THE SCHOOLS OF ANATOMY A MATTER OF LEGISLATIVE ENACTMENT, WOULD BE A VITAL INJURY TO THE BEST INTERESTS OF THIS COUNTRY, AND OF MANKIND AT LARGE.

END.

ERRATUM.

Page 22, line 14, *for* previouly, *read* previously.

THE USE

OF THE

CHLORATE OF SODA,

AND THE

CHLORATE OF LIME.

By A. G. LABARRAQUE,

Pharmacien of Paris, Member of the Society of Medicine, of the Free Society of Pharmaciens, Resident Assistant Member of the Royal Academy of Medicine, &c.

TRANSLATED

By JAMES SCOTT, Surgeon.

London:

Printed for J. Scott, by W. Glendinning, 25, Hatton Garden;
and Published by S. Highley, 174, Fleet Street.

1826.

TO

H. P. HOPE, Esquire,

WHO

Under a genuine Philanthrophy, that marks his intercourse with mankind,

URGED THIS UNDERTAKING,

conferring honour on the individual, selected for its execution,

THIS TRANSLATION

Is Respectfully Inscribed,

BY

His Devoted

AND

Obedient Humble Servant,

The TRANSLATOR.

OF THE USE OF

CHLORATE OF SODA

AND

CHLORATE OF LIME,

THE discredit which deservedly accompanies those who abuse public credulity, by extolling, through the medium of the Press, some wonderful Nostrum, prevented me from publishing my first experiments on the medicinal use of the Chlorates, at the time when they were instituted, notwithstanding the most satisfactory results. I limited myself, therefore, in the execution of my wishes: communicating my experience merely verbally or by writing to the most eminent men in the profession. This not being considered sufficiently explicit, added to the interest excited by the constant success of my experiments, I became solicited on all sides for information on the use of the Chlorates, and was therefore, under the necessity of giving some instruction on the manner of using them: this instruction subsequently became indispensable to the employment of these powerful antiseptics in the Antilles, and other parts so frequently desolated by serious and contagious affections.

The most useful inventions frequently experience the greatest opposition in their adoption. This, however, was not the case with the Chlorates; for shortly after making known the result of my general experiments on putrefaction (which was corroborated by the Members of the Council of Health, and by other learned men in the capital) the Counsellor of State and Prefect of Police approved of the method which I directed for the disinfection of dead bodies placed in the Morgue, and charged me, by his order of the 19th of October, 1823, to furnish the Chlorate proper for this operation.

To give greater confidence, I thought it right previously, to forward the directions that I had before promulgated upon the use of this powerful therapeutical agent, and I added to this, the opinion bestowed on my labours by the Society for the Encouragement of National Industry. All the cases of medical applications related in my instructions are but an exposition of what had previously been published by eminent physicians, who had experimented with the application, either conjointly with me, or according to my method.

After three years of uninterrupted clinical success, corroborated by observations published in different scientific journals, and above all, a considerable number of experiments on animal matter in a state of putrefaction, the Royal Institute of France declared, in its turn, its conviction of the utility of the application of the Chlorates of Lime, and of Soda, by giving me the first prize in the public sitting of the 20th of JUNE, 1825.

My first instructions being entirely out of print, I have

republished them here verbatim, with the addition only of some new facts, the issue of numerous experiments.

PREFECTURE OF POLICE.

Paris, 19th of October, 1823.

We, the Counsellor of State and Prefect of Police, considering the report of the council of health, from which it appears that the numerous experiments successively made at different places, especially at the Morgue,* have demonstrated the efficacy of the employment of the Chlorate of Lime, as a means of disinfection, according to the method of M. Labarraque, Pharmacien of Paris, Rue St. Martin, No. 69.

Have ordered as follows:

Article I.

The Disinfecting Preparation, invented by M. Labarraque, shall be established at the Morgue, and at each of the Commissaries of Police hereafter described, &c. &c.

DIRECTIONS

For employing the Chlorate of Lime, after the manner of *M. Labarraque.*

Reiterated experience has shewn that the Chlorate

* A dead-house in Paris, where the bodies of Persons drowned or found dead, are exposed for recognition.—*Trans.*

of Lime mixed with water has the property of disinfecting the atmosphere, and of impeding putrefaction in a sensible manner.

The employment of this process may be useful in numerous circumstances; we shall limit ourselves in the present Instruction to its application in *two* cases of the most frequent occurrence.

It will be easy, by analogy, to employ the same means at any time, that it may be thought proper to have recourse to it.

Disinterment and Inspection of Dead Bodies.

Before approaching a dead body, in a state of putrefaction, it is necessary to procure a vessel, into which a quantity of water (24 litres*) is to be put, and into this about 18 ounces (demi-kilogramme) of the Chlorate of Lime is to be poured, and the mixture well agitated.

A piece of linen cloth is to be put into the vessel containing the fluid, in such a manner that it can be withdrawn easily and quickly—for this purpose two persons open the cloth, and holding it by the corners, immerse it in the liquid, which is to be placed close to the putrid body, and at the same instant the wet cloth is withdrawn from the vessel and spread on the subject, and soon after the putrid odour ceases.

If there should be any blood or other fluid issuing from the body, a glass or two of the *chlorated water*

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* About Six Gallons.

should be poured on it. It should then be rubbed with a brush, and the fœtid odour will disappear.

This operation ought not always to be prosecuted exactly in the manner above described, as it is necessary, in cases where the surface of the body is uncleanly, that it should be cleansed as thoroughly as possible before the disinfecting process is commenced.

If the taint has extended into the surrounding apartments, galleries, stair-cases, &c. the places infected should be sprinkled with one or two glasses of the liquid, and the stench will cease.

Care should be taken that the cloth covering the body be constantly sprinkled with the liquid contained in the vessel; thus the reproduction of the fœtid odour is prevented.

As soon as the body has been carried away, the cloth used for disinfection should be well washed in water; dried and folded.

Disinfection of Water Closets, Urinary Cisterns, &c.

Three or four pints of water must be poured on two ounces of Chlorate of Lime, the whole well mixed and strained, and the solution thrown into and over the tainted places.

If the unpleasant smell be not promptly destroyed, the operation may be repeated in eight or ten minutes.

If the effluvium proceeds entirely or partly from urine or fœcal matter, this must be sprinkled in like manner.

Considered and approved by us, Counsellor of State and Prefect.

(Signed) G. DELAVAU.

EXTRACT of the "*Proces Verbal*" of the Society for the Encouragement of National Industry, at a general sitting, 30th October, 1822.

The Society for the Encouragement of National Industry in approving my memoir at the general sitting of the 30th of October, 1822, thus expresses itself.

"1mo. Seeing that the first and principal question which was proposed by the Counsellor of State and to which the prize was declared, is completely answered by M. Labarraque, Author of the Memoir, No. 1. The Commission declares that the entire prize shall be adjudged to him, on one condition, to which he shall willingly submit, which is, that of publishing a summary of his experiments, submitting it to the public at large, pursuing with zeal the execution of it in the necessary places. This measure, if the discovery of M. Labarraque is to be rendered profitable, seems indispensable."

OBSERVATIONS

ON THE USE OF THE CHLORATE OF LIME AND OF SODA

BY A. G. LABARRAQUE, "PHARMACIEN."

I was willing to fulfil the condition proposed by the Society of Encouragement, and in the Memoir published

the following month, I related cases where these powerful antiseptics (which I am about to describe in this work) received useful and extended application. I, therefore, expressed my wish that dissecting rooms, "the Morgue," and other places corrupted by animal matter, should be disinfected by these means, and the directing authorities, after numerous experiments which were always attended with the most flattering success, gave the requisite orders for its application. I recommended, as particularly indispensable, the use of the Chlorates in cases of disinterment, for judicial examination, of bodies which had been many weeks buried. The propriety of this has been verified by Professor *Orfila*, on a body that had been interred thirty-two days, at the warmest season of the year.*

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* Report of a post-mortem examination made, at the request of the "*Procureur du Roi,*" 1st August, 1823, by Messrs. *Orfila*, *Hennelle*, *Gerdy*, and *Lesueur;* prepared by M. *Hennelle.*

"On the 1st August, 1823, at the request of the "*Procureur du Roi,*" Messrs. Orfila, Lesueur, Gerdy, and myself, went to the Cemetery of Père-là-Chaise, to examine the body of a person named B***, who had been dead a month. At half-past 7 in the morning we proceeded to exhumate the body, which exhaled an infectious odour. It remained till half-past 10 on the ground out of its coffin, the persons who were to identify it not having arrived. The temperature was from 17 to 18 degrees of the centigrade thermometer. The body was taken to an open and airy place, that the examination might be made as conveniently and publicly as possible. The odour had become still more insupportable, and the body swollen very considerably since its disinterment. It was therefore important to make the examination as speedily as possible. We began by sprinkling the body with Chlorate of Lime dissolved in water. This solution introduced by M. Labarraque, "Pharmacien," produced a wonderful effect, for scarcely had it been applied, than the infectious odour was instantly destroyed, and we could begin the operation."

This remarkable examination, in which the sudden destruction of putrid miasm was effected, elicited the publication of similar performances which had been exhibited before the Savans.

It is, without doubt, a fortunate occurrence to arrest animal decomposition, and to annihilate, as it were, many causes of death; for who is not aware of the fatal influence of putrid animal matter diffused in the air which we breathe, carrying with it the germ of mortal diseases? There was something even more desirable than this, it was to find the means of correcting decomposition in the *living* subject. I have had the satisfaction of seeing this prodigy by the employment of Chlorate of Soda on wounds; thus, *Carbuncle* has been stopped in its ravages and cured; the most intense *Hospital Gangrene;** ill-conditioned *Venereal Ulcers;* and, in short, *Gangrenous Sores* of the worst characters have been

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* "P——, a corporal in the 16th regiment of the line, went into the Military Hospital of *Picpus*, 29th of *January*, 1822, for a chancre on the prepuce and a bubo in the right groin. He was treated by frictions; the bubo suppurated at the expiration of a few days, and was opened with a *bistoury*. The chancre healed well, but the opening of the bubo, which was but little extended, remained stationary for more than six months, notwithstanding the best local and general treatment.

"About this time the digestive and pulmonary organs became the seat of great irritation. The opening of the bubo changed to a spreading ulcer, which became inflamed and painful, the discharge was fœtid and abundant, and Hospital gangrene made its appearance in a few days: the ulcer extended over a great part of the skin of the abdomen. The patient was now separated from the others.

"The gastric symptoms soon yielded to judicious treatment,

speedily brought to cicatrization. The fœtid discharge of *Cancer* is corrected by this preparation, and its good

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but the gangrene continued its ravages; the usual means, however, being resorted to, the ulcer assumed a better aspect.

"The mercurial treatment, which had been suppressed, was again tried, and every thing went on well for some time; soon after, the unfavourable symptoms returned with redoubled vigour, and brought the patient to the verge of the grave. The same means were again used, and again successful, but some time after, an unfavourable change occurred, which was, however, again subdued. In a word the patient remained for nearly twelve months in a state between life and death.

"On the 16th of May, 1823, on which day the application of the Chlorate of Soda was first made, the man was in the following state; thinness and extreme debility; inflammation of the gastric and pulmonary organs; gums swelled and fungoid; skin dry and hot; continued constipation and watchfulness; the ulcer extended from the anterior and superior spine of the illium, across the abdomen, two inches and a half from the umbilicus, reaching to the opposite os illium, descending on each side between the scrotum and thigh. The aspect was horrible, and it occasioned excruciating pain; the edges were swollen, jagged, and here and there hanging over in loose flaps; the discharge, very copious and fœtid, was mixed with blood issuing from the corroded vessels. He was dressed three times a day with pledgets dipped in the Chlorate of Soda, in the proportion of two ounces to four ounces of water; the following day the odour of the preparation extinguished that of the disease; the quantity of Chlorate was increased one ounce, and the dressing continued, and the next day there was no fœtid smell, and scarcely any suppuration,—the surface of the ulcer took a favourable appearance; the edges sunk down; cicatrization proceeded from the circumference to the centre in numerous points, and the inflammatory symptoms disappeared.

"The fifth day, the Chlorate was applied pure, cicatrization continuing rapidly. On the 9th day, inflammation supervened; the use of the Chlorate was discontinued and the ulcer dressed

effects upon this frightful malady as well as upon *Herpes ulceratia,* continue to be experienced. Observations on the cure of *Porrigo favosa* have also been communicated to the Royal Academy of Medicine.

In fine, we may deduce from all that has been observed on the use of the Chlorate of Soda upon man, that this liquid is capable of removing the fœtor of sores, of changing their nature, and making them pass into a state of simple ulceration. That it is, above all, efficacious in *atonic ulcers, hospital gangrene, mortification,* &c. &c. It is used pure, or mixed with one, two, or as far as eight parts of water in the form of lotion, and care should be taken that the wounds are covered with lint moistened with this liquid. The dressing should be removed twice a day, and its use suspended when the sore becomes red and inflamed. The applications then necessary, being such as are usually directed in Surgical books.

For *ulcers of the uterus* the Chlorate of Soda should be diluted with twelve or fifteen or even thirty times its weight of pure water, and used as an injection. Prudence recommends that its use should be directed by a professional man, who will increase or moderate its action, or even suspend it if requisite.

The Chlorate of *Soda* is that which I have used on

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with lint. The fungoid granulations were cauterised with a solution of Nitrate of silver; the Chlorate was again resorted to about the 14th day, and on the 18th nothing remained but small ulcerated points. The patient recovered his appetite and was able to walk with crutches, his strength gradually returned, and he is at this time radically cured." *Memoir, read at the division of Surgery, of the Royal Academy of Medicine, 24th July,* 1823.

man; the action of Chlorate of Lime is not equally efficacious, though its disinfecting property is the same; for example, it is certain of destroying the miasm which developes itself in the apartments of persons affected by diseases of a bad character, if the chambers be sprinkled with either of the liquid Chlorates well diluted with pure water, or by putting it on a plate which is to be placed in the chamber of the sick person; the Chlorate is to be renewed morning and evening, or whenever it shall have lost its peculiar fumigating character.

Physicians or others, attending persons affected with contagious disorders, will derive great advantage if they are attentive to breathe it when approaching their patients, moistening their hands with it, causing it to be sprinkled on the floor, particularly round the bed.

The Chlorate may be of great use for disinfecting the interior of a ship, and for this purpose about a spoonful may be put into a bottle of water, and this liquid sprinkled about; the proportion ought to be stronger if the fœtor is considerable; the operation should be repeated twice a day.

Royal Institute of France.

Royal Academy of Sciences.

Extract of the Programme of Prizes adjudged at the Public Sitting, on *Monday, 20th June,* 1825.

Prize founded by the will of Baron Montyon.

"A prize of 3000 francs is awarded to M. Labarraque, Pharmacien of Paris, for having shewn by numerous

successful experiments, that the solutions of the Chlorates of Lime and of Soda, mixed with water, may be employed with economy and facility for speedily destroying the infectious effluvia of animal matter used by catgut makers, and of bodies in a state of putrefaction, and for purifying places where the air is corrupted.

*On certain Uses of the Chlorate of Soda.**

After reading the preceding observations, every judicious practitioner will perceive in what cases the application of the Chlorate of Soda may be expected to be successful, and determine the degree of credit to which the inventor is intitled, by ascertaining the disorders which claim its use. It would be fastidious to name all the celebrated Physicians and Surgeons who have studied the action of the Alkaline and Earthy Chlorates, but I cannot dispense with shewing my gratitude to those friends of humanity, *M. Biett*, Physician of St. Louis, for his numerous applications upon Herpetic eruptions; to *M. Jules Cloquet*, Chief Surgeon of the same hospital, for his applications to gangrenous ulcers. In many of these formidable affections, the skilful surgeon bathed the mortified limb in the Chlorate, diluted with 10 or 15 parts of water, and directed from 25 to 30 drops of the Chlorate of Soda, to be taken in a pint of "Tisane." His observations will be published.

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* The Formula for the preparation of the Chlorate of Soda which I published in my Memoir, should be *followed exactly*, for if not strictly adhered to, the properties are so changed, that the preparation may be good for nothing; but if the Chlorate be properly prepared, the effects related in this paper are always certain of being obtained.

Professor *Marjolin,* Chief Surgeon at Beaujon Hospital, used the same preparation in gangrenous affections, whether it succeeded amputation of a limb or any other cause. He observed that the slough was quickly detached and the disease checked in the greater number of cases.

Dr. *Sègalas,* one of the Professors of the Faculty of Medicine, after a course of experiments, remarked, more than two years since, that "the application of the Chlorate upon denuded tissues, especially its injection into the genitals, requires great caution. Diluted with water it is less irritating, and does not lose any of those valuable qualities which place it among our energetic medicines." He has lately said, "I rest this last proposition on the report of two cases of gangrenous diseases, recently cured by the use of this agent, commonly called "*Labarraque's Liquid.*"

"One of these facts was observed in a man affected with gangrene, the consequence of infiltration of urine; the scrotum was distended with urine to five times its natural size; at the lower part sphacelation extended elliptically four inches in the course of the raphe, and from two to two inches and a half in breadth. I incised deeply the slough, leaving it projecting from the edges of the wound, and passed a small sound into the uretha. I then applied to the dead parts a lotion of the Chlorate of Soda in its pure state. The place, the bed, and the chamber were purified (desinfectés) in an instant. I finished with a dressing of lint impregnated with the same liquor diluted in four parts of water. The next morning, to my great satisfaction, I found many sloughs detached, and the patient in an improved condition. I repeated the dressing of the preceding day,

and in the evening the wound was sensible (vive) over the whole surface. I therefore discontinued the use of the Chlorate, and ten days after, the sore was completely healed." The second observation related to a horse treated by *M. Bouley*, Junior, Veterinary Surgeon, of which I shall speak by and by.

M. Samson, Surgeon, *(Ordinaire)* at the Hotel Dieu, has disinfected ulcerations of the mouth with caries of the palate, and suspended for some time the ravages of this frightful disorder. The same surgeon, after having in the presence of Dr. Lefevre put a ligature upon a large uterine polypus, discovered that putrefaction had commenced in it; he accomplished its disinfection by the application of Chlorated water, and the mortified part was detached. The operation was attended with success.

Dr. Lagneau has used the Chlorates as an injection for spongy and ulcerated gums exhaling much fœtor. The state of the patient was improved, and after each injection the fœtor was destroyed. *M. Regnard*, Dentist, was anxious to apply the Chlorate of Soda in stopping caries of the teeth and removing fœtid breath, but observed that this medicine disagreeably excited the salivary glands, from which he thought it could not be admitted to the toilette as an application for the mouth.

Dr. Chantourelle treated two cases of Cynanche maligna with the Chlorate of Soda diluted in ten parts of water, and the fœtor, so dangerous to the attendants and physician, was destroyed. These cases were communicated to the Society of Medicin at Paris. More recently he has been again successful in administering

the Chlorate in the dose of twenty-five drops in a glass of water, for removing the Hydro-sulphuric gas, which severely affected a person who had been poisoned by the Hydro-sulphuret of potass, after the latter had been expelled by vomiting. His memoir, read at the Royal Academy of Medicine, gave rise to a learned report.

A very remarkable fact was observed in a case of Asphyxia presenting the most serious tetanic symptoms, the patient was restored by breathing the Chlorate of Soda.

M. Lisfranc, Chief Surgeon to La Pitié, treated his successful cases of burns and common ulcers, by means of the Chlorates; the memoir which he intends publishing on the subject, and which was announced to the Royal Academy of Medicine, will be highly interesting.

Ulcer of the nose (L'ozène) has been disinfected by Injections used twice a day, of the Chlorate of Soda diluted with, from 2 to 10 parts of water, and this fœtid ulcer cured.

In certain disorders of the bladder, the urine becomes offensive and disgusts the patient; the disinfection is accomplished by placing a few drops of the concentrated Chlorate of Soda in the chamber pot. The same result may be produced on urine scented by eating asparagus; in this case it is necessary to use a greater quantity of the Chlorate.

I am indebted to *M. Sègalas,* who devoted himself particularly to the diseases of the urinary organs, for the knowledge of a remarkable fact connected with the correction of urine *while in* the bladder, from the use of the

Chlorate, and I introduce it here, to draw the attention of Professional men to analagous cases.

M. G. aged 69, affected with paralysis of the bladder, and unable to pass his urine by voluntary efforts, had suffered for several days the painful effects of distension of the bladder. The hypogastric region was swollen and painful; the urine, turbid and smelling of ammonia, deposited a thick, brown and fœtid pus; the tongue dry; the skin hot; the breathing oppressed; the voice hoarse and feeble; there was much nervous irritation accompanied at times by delirium. *M. Sègalas* was called in; this physician obtained by an examination with the catheter, a confirmation of the diagnostic established by the symptoms. A sound of elastic gum, introduced with the greatest facility, discharged a large quantity of purulent urine of an insupportable odour. The instrument was suffered to remain for two days, but became often obstructed. Injections were frequently used, but with little success; this, at length, determined *M. Sègalas* to use a catheter with a double barrel, and to wash the bladder copiously with water, after the ingenious method of *M. Jules Cloquet.*

This treatment, which occupied several days, had the desired effect; the bladder was relieved of the putrid matter which occupied it, the urine being easily withdrawn by the aid of a catheter, and the general state of the patient was sensibly improved; but the urine continued to deposit a fœtid pus, which sometimes completely encrusted the catheter.

M. Sègalas therefore had recourse to the Chlorate of Soda diluted in sixty parts of water, throwing it into the bladder by means of the double catheter. The first in-

jection produced *a diminution very remarkable in the secretion and odour of the pus;* a second, performed forty-eight hours after, was followed by a similar success, and two more injections, performed at an interval of two days, placed the patient in a state to attend his occupation, by using the catheter for drawing off the water. He did not experience the slightest ill effects during the use of the Chlorate thus diluted. The destruction of other noxious principles is effected by the application of the Chlorate, but my experience does not yet allow me to assert it as a fact.

The linen and pledgets of lint, which have been used for the dressing of fœtid sores, retain their odour for a long time, and contribute to the insalubrity of the room where they are placed. By pouring a glass of the concentrated Chlorate into ten pints of water, and soaking the linen in this liquid, they may be withdrawn immediately, for they will have lost their odour.

The disinfection of the market-places in *August*, 1824, by order of authority, with the facts reported in the notice issued on this occasion, proves to how many useful purposes the alkaline and earthy Chlorates may be applied, if employed for the destruction of the causes of noxious effluvia, and these investigations will terminate by bringing the remedy into habitual and domestic use.

By the foregoing detail, I have complied with the conditions into which I was forced to enter. Public salubrity shews the necessity of sprinkling dead bodies, (which begin to give evident signs of decomposition) with the disinfecting Chlorate, before the time prescribed by usage and by law for their interment. In this case a bottle of the concentrated Chlorate must be put

into three gallons of water; a linen cloth is to be dipped into this mixture and the corpse covered with it, the same liquid being frequently carefully sprinkled over it during the time it is watched. The necessity for this operation is daily perceived at Paris, and considerably more so in hot climates. Also professional men, when examining or embalming dead bodies, preserve themselves from all unwholesome emanation, by using the Chlorate in the manner just described.*

The Chlorate of Soda diluted in 25 or 30 parts of water, has been employed with success in disinfecting and preserving subjects in dissecting rooms; this operation is performed by means of a tin watering pot containing about six quarts, which is to be filled with Chlorated water; the fœtid body is to be sprinkled twice a day, and the surface afterwards brushed and washed with clear water. The moment the chemical preparation comes in contact with the body, the effluvium is destroyed, and the impregnated air instantly corrected.

It is here that we should speak of the sanitary operations at the Lazaret at Marseilles, which I recommended to his Excellency the Minister of the Interior, and which the superior council of public health has adopted for some time past, the execution of it being entrusted to the enlightened zeal of the professional men who are charged with the care of this useful establishment; but these views will have more interest after experience has confirmed them. It will not be out of place here, to report the experiments made during two nights at Bicêtre,

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* Those who are appointed to attest the death of persons, and others engaged with the sick, may secure themselves from fœtid emanation by smelling the Chlorate, carried in a bottle for that purpose.

in eight crowded and unwholesome apartments. These rooms, to the great satisfaction both of the patients, and the physician who attends, have been completely purified by one sprinkling with a bottle of concentrated Chlorate, diluted in thirty parts of water; the rest of the liquid served to disinfect the cisterns, water closets, &c.

It may easily be conceived that this mode of purifying places, inhabited by a vast number of individuals, is very simple and but little expensive, and may therefore be rendered of important utility in being used in barracks, military hospitals, &c.

His Excellency, the Minister of War, addressed a very flattering letter to me on the *7th August*, 1824, and the "*Recueil de Memoires*," published by his orders, contains many remarks relative to the use of the Chlorates.

L'Epizootie Meurtrière,* which has been prevalent among horses for several months, furnished occasion for trying the effects of the Chlorate of Soda on carbunculous affections, to which these animals are subject; we may judge of its effects by a note which M. Bouley, Junior, Veterinary Surgeon, has inserted in the "*Receuils de Medicine Veterinaire*," June, 1825, which I think it may be useful to insert without abridgement.

Remarks on the Use of the Chlorate of Soda in the treatment of Gangrenous Tumours, by M. Bouley, Jun.

"All veterinary surgeons who have used setons in the treatment of horses with Epizootic disease, must have

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* A disease of Cows and Horses.

remarked that these means were almost always useless and oftentimes dangerous. I have, in particular, observed eight carbunculous tumours which had been the result of their application; five of the animals affected died; the other three were cured. The five first were treated by cauterization and by the administration of antiseptics, and the other three by the same means with the addition of the Chlorate of Soda of *M. Labarraque.*

"The happy effects which I obtained from this medicine, determined me to make known, with certain details, the cases in which I used it, and the results which were produced.

"1mo. Case.—On the 31st March last, a bay horse, five years old, belonging to Count D'Yssy, was attacked with the prevailing disorder; a rational treatment was adopted to combat this affection, which presented no alarming symptom until the fifth day, at which time a considerable tumour, rather painful, appeared at the chest, at the very place where two setons had been made some days previously, and which took, in a short time, all the characters of carbuncle.

"I was anxious, therefore, to suppress the two setons, and instantly ordered the actual cautery (douze à quinze pointes de feu) to be applied to the swelling, and prescribed the Extract of Gentian with Camphor in proper proportions. These means did not produce the effect which I expected, and in the night, between the fifth and sixth day, the disease made rapid progress (*the cautery was reapplied and the medicine repeated.*) At length, on the seventh day, the tumour which had enlarged considerably, began to discharge a sanious humour, fœtid and of a particular odour, which left no doubt of the

existence of gangrene; the prostration of strength was at its height, and every thing announced a fatal and speedy termination. Such was the hopeless state of the animal, when Dr. Sègalas saw him, and advised me to use the Chlorate of Soda of *M. Labarraque*, assuring me, that he had observed the most miraculous effects on men, in a similar case. I was eager to profit by the advice of this able physician, and I instantly ordered injections of the Chlorate into the openings made by the cautery. These injections were repeated every hour, and the sores dressed immediately with tow. I also ordered frequent sprinklings in the stable, with the same liquid diluted with five or six parts of water. From the time I first used the Chlorate of Soda, the tumour made no sensible progress, and the disagreable odour which it exhaled, partly ceased. From the fourth to the fifth day tho sloughs began to separate, suppuration commenced and all danger ceased. At last, the large sore which was the result of gangrene, quickly healed, and in less than a month, the animal was in a state to resume his usual labour.

"*2do. and 3tio. Case.*—Two old horses belonging, one to M. Ingé, Butcher, at Paris, the other to Mr. Renoult, Farmer, at Yvry, were affected with the prevailing disease in the month of May, and both experienced the same effects as the former, from the application of setons. These two animals were treated and cured by the same process in the space of twenty or twenty-five days.

"I do not pretend to say that the Chlorate of Soda will be a panacea against gangrenous tumours, nor do I imagine that this medicine alone will suffice; nevertheless I think that it is a most powerful auxiliary; and I am authorized by facts thus to judge of it, since, five

horses which I treated only by cauterization and tonics died, whilst those which were submitted to the influence of the Chlorate, were cured."

M. Chanas, Veterinary Surgeon of the Gendarmerie of Paris, made a deep and extended incision (on each side of the neck of a horse) into a carbunculous tumour which in a few hours had assumed an extraordinary appearance, without apparently producing the least pain: he then placed pledgets of tow, moistened in the concentrated Chlorate, on the incision; at the end of four hours the animal experienced pain; the dressings were continued morning and night, for five days, with the same liquid; the tumefaction progressively diminished; a cicatrix formed in a short time, and the horse recovered.

Messrs. Dupuy, Giraud, Jun. and Vatel, professors at "L'Ecole D'Alfort," and Berger, Veterinary Surgeon, of the "Garde du Corps," have equally proved the properties of the Chlorate in these affections.

Instructions for disinfecting and purifying the stables of the King's Guards, and of the Gendarmerie at Paris, have been printed, and there is good reason for congratulation, that these directions have been implicitly followed, for death, from this time, ceased its ravages. A great number of proprietors have equally experienced the good effects of the use of the Chlorate of Soda in stables, cow-houses, sheep stalls, &c. *M. Girard,* Senior professor, and director of "l'Ecole D'Alfort," in the third edition of his "*Notice Sur la Maladie qui regne Epizoatiquement sur les Chevaux,*" prefixes the following remarks:

"This liquid, employed with advantage by *Messrs. Bouley, Junior, and Vatel,* speedily destroys the fœtid odour exhaled from tumours, facilitates the separation of eschars, and appears to be a powerful antiseptic. We ought to acknowledge here, *M. Labarraque,* as the first who proposed the use of this Medicine now so generally well known."

M. Labarraque on the use of the Chlorate of Soda for disinfecting and purifying Stables.

The Chlorate of Soda may be of great use for purifying and disinfecting unhealthy stables and those which have been inhabited by sick horses. It should be used in the following manner: A bottle of concentrated Chlorate of Soda is to be put into a pail of clear water, and the mixture stirred; a strong brush, or a birch broom, is to be dipped into the Chlorated water and immediately rubbed, with force, over the walls, manger, rack, and generally throughout the whole stable: this done, all the parts which have been brushed with the Chlorate are to be washed with clean water; lastly, finish the operation by brushing the parts again with the Chlorate, in the same manner as painters give a second coat. A stable of forty feet in length by twelve in width and ten in height, requires four bottles of concentrated Chlorate; each bottle should be diluted in ten or twelve quarts of soft water; from this we can judge that one bottle will be sufficient for a stable of three or four horses.

The disinfection of the stable being accomplished, the doors and windows should be left open for it to dry; healthy horses may then reside in the stable without fear of being infected; yet, in a case of "*Epizootia,*" we ought,

as a prophylactic means, to sprinkle the stable, night and morning with Chlorated water, prepared in the following manner: A concentrated bottle of Chlorate is to be mixed in four or five pails of water, and the stable to be well sprinkled with this mixture; neither horses nor men will experience the least inconvenience from this mode of disinfection, and great advantages will be derived from the salubrity of the place.

For washing horses, as is the custom when they are cured, and before placing them with healthy horses, it would be well to substitute for vinegar and water, a small quantity of Chlorate and water, prepared in the same manner as recommended for sprinkling.

This instruction is too brief to meet every circumstance that may occur, but the distinct directions given by the Veterinary Surgeons, will supply every thing which may be found incomplete, and the modifications they adopt to different cases and circumstances, will make this mode of disinfection completely efficacious.

On the Use of the Chlorate of Lime as a disinfectant.

The honorable assent which has been given to the value of my method of disinfection, by legislative authority, through the recommendation of competent persons, appears to have decided a preference in favour of the Chlorate of Lime to that of the Chlorate of Soda. These two Chlorates are equally proper for checking putrefaction, yet have not both the same secondary properties. I will explain myself.—In the act of disinfecting putrid animal matter, the Chlorate passes into a state of *Hydro*-Chlorate, and the *Hydro-Chlorate of*

Lime having the property of absorbing humidity, combines with the moisture of the disinfected body. Now, one of the conditions of putrefaction being moisture, it follows, that when once the disinfecting action is in operation, the Chlorate, after a longer or shorter time, according to the quantity, changes it state, and furnishes materials for reproducing the fœtidness. On the contrary, the Chlorate of Soda, in passing to the state of an *Hydro*-Chlorate, produces the formation of a *very dry salt*, that absorbs the moisture, which is the principle of putrefaction. This is what I term a secondary property. The Chlorate of Soda, therefore, when used for disinfection, prevents, at all times, the reproduction of putrefaction. It is particularly suitable for application to sores of bad character, from the property which it possesses of detaching the disorganized tissue from that which preserves its vital qualities; whilst the Chlorate of Lime, if it is well saturated, can be used only for simple disinfection, such as in the exhumation of bodies which are to be immediately examined. It is also suitable for the disinfection of the bodies lying at the Morgue, because the sprinklings of the Chlorated water are there frequently renewed.* The Chlorate of

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* *M. Idt*, a distinguished "Pharmacien" at Lyons, writes to me from that town, under the date of 5th. August, 1825.

"During the whole of the month of July, the Themometer "was constantly at 34 degrees, and bodies, a very few hours after "their death, exhaled an odour of such an infectious nature, that "whilst mass was performing for the repose of their souls, the "Priests and Mourners forgot their duty, (the one, resignation to "their ministry, the other, their grief) to complain and hold their "noses. The Surgeon Major of the Hotel Dieu, *M. Gensaul*, justly "fearing that such mephitic emanations might occasion an epidemic "disorder, proposed to the Major, to have a glass of your solution

Lime is eligible for disinfecting water closets, and for this purpose, gentle sprinklings only are necessary, renewed from time to time as required. The solution of the Chlorate to be prepared as directed at page 9.

In emptying places of night soil, Mephitic gas escapes in abundance, and fills the Apartments of the house from whence it is removed; we are able to secure ourselves from this loathsome effluvium by placing under the doors, on a piece of paper, a train of dry Chlorate of Lime, spreading linen dipped in an aqueous solution of the Chlorate behind the same doors. The windows and other openings require the same precautions. In this manner the effluvium is prevented from penetrating into the Apartments.

By thus operating in one part of a house, and neglecting it in another, it is found that those chambers which have been *Chlorated* remain free from smell, whilst those parts of the house in which it has been neglected are contaminated. The same effects may be obtained with the Chlorate of Soda.

The Chlorate of Lime will be found equally advantageous for purifying corrupted water, and to effect this, one or two ounces is required to a hogshead of the impure water; what I now advance was demonstrated

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" poured on the shroud, by the Commissary of Police, as soon as
' the coffin lid was removed to prove the presence of the body.
' The Mayor immediately adopted the proposition of the young
' doctor, and its success could not have been more satisfactory.
" The *Journal du Commerce* of Lyons, in noticing this fact, expresses
" a wish that a process so simple and useful should be generally
" employed."

at the beginning of the year 1824, to M. Keraudren, Inspector general of the Health of Seamen, who, at this time, was charged by the Minister of Marine, to make a report of my propositions, the subject of which was the purification of his Majesty's Navy, propositions which were adopted, and which I shall make known elsewhere. *Dr. Marc*, member of the Royal Academy of Medicine, who in 1823, was appointed by the Council of Health to assist at my experiments on Animal matter, Water Closets, &c. and was one of the first who saw the whole, of the applications, desired much to be present at this experiment of disinfecting water. The Chlorate of Lime is previously dissolved in water, and added, a little at a time, stirring the impure water until the disinfection is complete. If the Chlorate predominates it is merely necessary to expose the water, thus purified, for a few minutes to the air, and then filter it or let it subside, when it is potable. It may easily be conceived of what utility this process must be, either at Sea or in marshy Countries where the water is unwholesome, or in places where persons are reduced to the necesity of drinking water from Cisterns, which is frequently impure.

I could multiply examples without end, either in narrating facts of the medicinal applications of the Chlorates observed in France and in the Colonies, or in reporting authentic operations amongst ourselves; also that which was performed at St. Domingo by order of the Government of that Country the proceedings of which were inserted in the official gazette of the 20th February 1825; but this would be leading me beyond the limits allowed for this treatise, which I consider as the mere Epitome of a more extended work, in which I shall endeavour to show the causes and Phenomena of putre-

faction in Animal matter with the means of checking, in many circumstances, the process of disorganization.

Just as these pages were going to press, a new fact presented itself, which I think worthy of being reported. *M. Caulin, "Regisseur de l'Administration generale du Canal St. Martin,"* called on me 11th August 1825, to request (on the part of *M. Berard*, vice President of the Council of Health) some Chlorate of Lime, with the manner of using it, for the purpose of disinfecting a sewer, where several workmen had fallen into Asphyxia the preceeding day. I offered my services for the intended operation. The labourers were ordered to empty about twelve or fourteen feet, which was to be finished the next day at eight o'clock. The mud and dirt to be thrown out, was four feet and a half in thickness. I ordered a vessel containing about Sixty quarts of water, and a pound of the Chlorate of Lime to be placed near the sewer. A pail of this liquid was placed also close to the workmen occupied in removing the wall, who were directed to wash their hands and arms with the Chlorated water, wetting their nostrils with the same. The men employed in emptying the sewer, took the same precaution whilst raising the mud, which having been thrown several feet over their heads and mine, was sprinkled over its surface with the solution of the Chlorate by one of the workmen. By repeated sprinkling every fresh quantity of mud was thus disinfected; the operation lasted more than four hours without a single accident occuring. Either out of deference to me, or that I succeeded in convincing them of the efficacy of the disinfecting agent, the workmen were perfectly obedient to my directions; the security in which they saw me during the whole time of their labour, merely holding a bottle of Chlorate in my hand, applying it sometimes to the nose,

might, perhaps, have contributed to this confidence. We were in an infected sewer, which had not been cleaned for more than forty years, eight workmen had been seized with asphyxia shortly after entering it. This occurence happened in 1782, and was the subject of a paper written by *M. Cadet de Vaux*, which gave rise to the enquiries of the celebrated *Hallé* and may have contributed more recently to those of *Thénard, Dupuytren, Baruel, &c.*

This sewer, neglected in consequence of the terror with which it inspired the workmen and the authorities, having collected a considerable quantity of filth, which increased daily, seemed likely to become obstructed altogether. Would it not be possible to empty this sewer without the occurence of accidents? Such was the question I proposed to myself, at a time when I was surrounded by fatal exhalations, and to which question, I thought myself justified in giving an affirmative answer. But to obtain this object it will be necessary to employ the Stove of *Darcet*, (one of the most useful inventions with which I am acquainted,) with an abundant use of the Chlorate, together with other hygienic means, which might be directed by the local Authorities.

As I was about descending into the sewer, a woman in tears came to solicit the assistance of the superintendant of the workmen; her husband was one of the suffocated men, and was affected in a most serious manner. He had lost all perceptibility and was carried senseless to the "*Rue des Tournelle,*" where a vomit was given him. The physician seeing the formidable condition of his patient, recommended that he should be taken to an Hospital, and thought that his advice had been followed: the man, however, preferred remaining at home. He vomited for forty eight hours the weak tea which was

repeatedly administered, and frequently during this time became comatose. I prescribed four drops of lemon juice in half a glass of cold mucilage with a table-spoonful of the "*anti-emetie*" of *Rivière* every hour. The physician of the "*Bureau de Charité,*" who then came to see the patient, approved of this treatment.

The emptying of the sewer being just finished, I went to see the sick man, the vomiting had ceased after the first cup of acidulated mucilage; but, though only 41 years of age, he appeard in a situation extremely decrepid; Pierre Aimé (the patient's name) was lying on a truckle bed; his pulse was feeble; he complained of great heaviness and violent pains in the head, and of difficulty in breathing, with a sense of an unpleasant taste, "*which,*" he said, "*resembled the flavour of lead, causing him to loose his senses.*" His voice was low and he thought himself dying, I relieved his mind by assuring him that he would soon be well, and that he would be paid as though he were at work, at the same time I made him respire the concentrated Chlorate, which he seemed to breathe with great satisfaction. His countenance now appeared less shrivelled, he assured me, that he breathed more freely, and that he had no longer the unpleasant taste in his mouth. The following day I learned that the patient had slept for five hours, he again took the medicine *which had relieved him of heaviness and head ache*; I ordered the room to be sprinkled with the weak Chlorate. On the 14th of August, Pierre Aimé was well, and was able to go out. I enquired into the circumstances of his accident, "*A rough stone,*" he said, "*having fallen into the mud of the sewer, and sinking, I raised it a little with my pick axe, and bending with my arms forward, to seize and lift it, I fell insensible as if struck with death.*"

The effect of the Chlorate will, berhaps, appear surprising in this case, considering the time that had elapsed since the accident (48 hours). Persons who have breathed gases, exhaled from animal matter in a state of putrefaction, must have remarked, that the fœtid condition of some of the excretions produced by the inhalation of the gas, continues for a long time afterwards.

It appears to me very desirable to recommend patients to breathe the Chlorate of Soda, and of Lime, in all cases of asphyxia, occasioned by sewers and privies, even long after the occurrence of the accident, should they still find themselves under the influence of the deleterious gas.

Extract from M. Labarraque's Directions for preparing the Chlorate of Soda.

CHLORATE OF SODA.

Pure Carbonate of Soda, 2½* Kilogrammes,
Distilled Water, 10 Killogrammes.

Mix in a Bottle that will be about one quarter empty—then into a Glass Balloon Bottle (of about Two Quarts) with a long neck and a large mouth, put the following mixture.

Hydro-Chlorate of Soda, 576† Grammes,
Peroxide of Manganese, powdered, 448 Grammes.

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* A Kilogramme is 2lb. 3oz. 5dr. Avoirdupois.

† A Gramme is about 15 ½ Grains.

In the mouth of the Balloon Bottle, lute a large curved tube, and one also in the shape of an S; the first tube is inserted into a bottle containing a small quantity of water, a similar tube passing from this into the Bottle containing the saline solution. The lutes being dry, a mixture of 576 Grammes Sulphuric Acid, and 448 Grammes water, is to be poured into the Balloon through the curved tube S, heat is next applied and gradually regulated until the disengagement of Chlorine gas ceases.

Test.

Powdered Bengal Indigo, one part,
Concentrated Sulphuric Acid, six parts,

Mix, and add Nine Hundred and Ninety-three parts of distilled water—one part of the Chlorate of Soda, mixed with Eighteen parts of this liquid, should deprive it of colour.

The saline solution should be of the specific gravity of 12^0 * by Baumè's hydrometer—if the liquid be too concentrated, add the requisite quantity of water; if, on the contrary, the solution is too weak, add as much of the carbonate of Soda as will bring it to the proper strength.

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* 1,089 of common standard; tempertatur 55, Fah.

FINIS.

W. Glendinning, Printer, 25 Hatton Garden, London.