

On the expediency of instituting an academy of medicine in England : illustrated by the prevailing opinions and practice respecting the use of chloroform in operations / by James Arnott.

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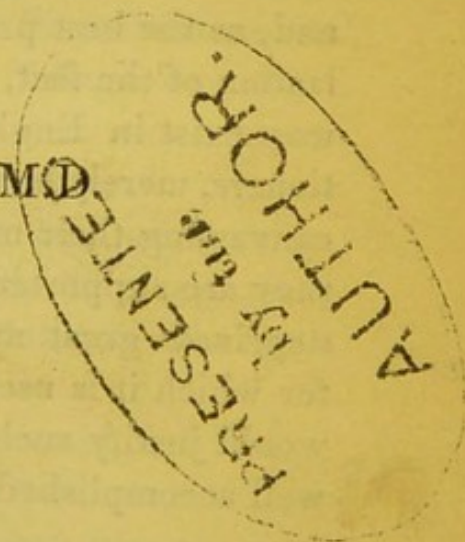




ON THE
EXPEDIENCY OF INSTITUTING
AN
ACADEMY OF MEDICINE
IN ENGLAND ;

ILLUSTRATED BY
THE PREVAILING OPINIONS AND PRACTICE
RESPECTING
The Use of Chloroform in Operations.

BY
JAMES ARNOTT, MD



LONDON :
JOHN CHURCHILL, NEW BURLINGTON STREET.

ON THE EXPEDIENCY OF INSTITUTING AN ACADEMY OF MEDICINE IN ENGLAND,

ETC.

At present, when the question of the reform of our medical institutions is before the Legislature, it appears opportune to consider whether a beneficial addition might not be made to those that have for their object the promotion of medical science, as well as an alteration effected in those that relate to the qualifications and well being of the members of the profession.

Amongst the former, there is much need of an Academy of Medicine, similar to that in France and other countries; and, as the best proof of this, I shall bring forward an illustration of the fact, that the most pernicious medical practices may exist in England, even amongst well informed practitioners, merely because there is no opportunity of thoroughly canvassing their merits, and exposing the fallacies by which they are supported. I shall adduce a proceeding which has deprived great numbers of their lives, while the purpose for which it is used (a purpose that under no circumstances would justify such a sacrifice), can in many instances be as well accomplished, and with perfect safety, by other means.

An Academy of Medicine, instituted for the promotion of medical science, should consist of a limited and selected number of the most talented and experienced members of the profession: and amongst its offices would be the correc-

tion of prominent errors in medical practice ; the encouragement of investigation by prizes and other means ; the rendering of assistance to practical inquirers, by gaining access for them to the records of cases in the public hospitals ; the reception of, and reporting upon, proposals of improvements in the treatment of disease, and, when these improvements are verified, the introduction of them into practice, and particularly into the practice of hospitals. Its duties as the counsellor of Government on subjects relating to the health of the community would be of no less importance ; but, being of a different aspect, need not at present engage our attention.

Of English medical improvements or inventions, it is probable that the greater part sink into oblivion, or die with their authors, because there is no opportunity of making them known and appreciated. If they are published in monographs or journals, they are lost amidst the mass of useless projects constantly issuing from the press ; and if their authors bring them before the existing medical societies, they experience no better fate. We are told in the life of Jenner, that, in consequence of his persevering endeavours in some medical societies to obtain a due appreciation of vaccination, he was threatened with expulsion from them, as an "insufferable bore". These associations, though on other accounts exceedingly useful, hardly aim at, and certainly do not fulfil, the purposes of such an academy as has been contemplated. Few of those whose talents and experience would give weight to their opinions, though they very properly countenance and support such institutions, take any part in their proceedings.

Had such an academy as is now proposed existed in Britain, many inventions would not have been lost, and many, which have survived neglect, would have sooner been brought into use. The excision of joints in lieu of amputation, for example, and the compression of aneurismal arteries in lieu of their closure by a ligature, would not have required half a century to become established operations in surgery.

Many other important points in therapeutics remain in-

volved in some degree of doubt, principally because the statistics are not accessible by which they can be best determined. Amongst practical improvements, I may be excused for mentioning one of great value, which, from want of that aid which an academy would have afforded, has, as respects its principal uses, remained almost unknown. Had there been such an institution in this country, the plan only now introduced into Germany by Langenbeck, of accurately regulating the temperature of amputation and other severe wounds, and excluding the air from them, whereby the mortality from operations and compound fractures has in his practice been much reduced, would, from the urgent necessity of such an expedient, have doubtless been in use ten years ago; for a longer period than this has elapsed since the "water muff" for encircling diseased or injured joints and limbs, with its gutta percha "supporter" and long caoutchouc tubes to effect a continuous current, was described in my essay *On the Present State of Therapeutical Inquiry*.*

But of practical questions at present before the profession, and requiring for their decision the investigation and authority of an academy, there is none of more importance than that respecting the use of chloroform in operations; and to its consideration the remaining part of this paper will be given. One example of such questions, fully stated, will be enough to show the necessity of such an institution.

More than a hundred years have elapsed since a minute account was given, in the *Philosophical Transactions*, of the insensibility caused in dogs by immersing them in the me-

* That this apparatus is not wholly unknown here, is mainly to be ascribed to the accident of its being profitable to the manufacturer. Every surgeon must have seen the representation of a patient, to whom what I have termed the "intermitting current apparatus" is being applied, with which one of its makers (the first in whose hands I placed it) has illustrated his advertisement in all the English medical journals for the last six years. The most complete account of the current apparatus and its various uses is given in a treatise *On Indigestion*, 1847. It is briefly described in Dr. Watson's *Lectures on the Practice of Physic*, 3rd edit., vol. i, page 388.

phitic vapour of the Grotto del Cane, near Naples. Dr. Hickman recommended the inhalation of this vapour, in order to render operations painless, about seventy years afterwards, but not until Sir H. Davy had suggested nitrous oxide gas for the same purpose. The fear, however, of injurious consequences, appears to have long prevented surgeons from endeavouring to revive by such inhalations the ancient practice (alluded to by Shakespeare and Boccaccio) of preventing pain in operations; and it was not until ten years ago that they were actually brought into use by an adventurous American dentist, Mr. Horace Wells. A number of inhalable substances, of similar properties, have since been employed; but the vapour which has been principally resorted to in this country is that of chloroform. Although several instances of sudden death occurred from these agents soon after their introduction, it was supposed that this fatality might arise from the faulty mode of administering them; and the dread of more remote evils was completely dispelled by the publication of statistics professing to prove that it had no foundation. After no great length of time, recourse was unhesitatingly had to chloroform on every trifling occasion, notwithstanding that sudden deaths continued to occur. Familiarity with danger put an end to the apprehension of it. We had in the indiscriminate and fearless use of the new drug an instance of what Celsus calls "*audacia usu ipso confirmata*". Large doses were recommended in preference to the small ones originally used; and extreme debility or disease of the heart, instead of being deemed objections to the administration of chloroform, were at length spoken of as conditions in which it might be given with peculiar advantage!

Never has there existed in the practice of medicine a more pernicious error than this common and indiscriminate use of chloroform. Its advantage in preventing pain is palpable and immediate; its disadvantage or danger is, in most instances, latent and remote, and hence, until lately, it has been undiscovered. It certainly is not unaccompanied with the perils which caused the expulsion from surgery of the operation narcotics of former times.

The deaths caused by chloroform may be divided, first, into those which take place during its administration; secondly, those occurring some hours afterwards, but which, as is evident from the symptoms, are certainly the consequences of chloroform; and thirdly, those that happen long after its exhibition, and as the result probably of its having predisposed to pyæmia and other morbid affections, well known as proving fatal after the severer operations. These last, which are by far the most numerous, can only be discovered to be the consequences of chloroform with any certainty, by instituting comparisons between the amount of mortality in similar cases before and after the time of its introduction.

About a hundred instances of *sudden* death from this new practice have been reported; but there cannot be a doubt that the greater number have been concealed. Amongst other proofs of this, it may be mentioned that six times more deaths have been published as happening in the hospitals of London, than in its private practice; and scarcely half a dozen such accidents have become generally known in France. This evident concealment, of which every medical man must know instances, is not extraordinary; nor can it now be deemed more reprehensible than the concealment of fatal accidents from other drugs. For what family is there that would not shrink from the horrors of a coroner's inquest, where, as happens in these cases, there can be no suspicion of foul play?*

* Although few cases of sudden death from chloroform have been published in France, and although its ulterior effects have scarcely been adverted to by continental practitioners, we find one of the leading surgeons in Paris—M. Ricord—speaking of it in the following terms, in the interesting debate on the subject now proceeding at the Academy of Medicine:—"I refrain as much as possible from the use of etherization. Etherization, in my view, is a hazard which complicates operations. It is doubtless a great discovery, and has rendered much service; but it must not be concealed that it is also a great danger. Accordingly, I never have recourse to it but under extreme necessity, or when I am strongly importuned; and, in minor operations, I refuse to employ it." (*Gazette des Hôpitaux*, July 9th.)

I am inclined to think, however, that sudden deaths from chloroform have not been so frequent in France as in England. More attention is there paid

The second class consists of those deaths, from the direct effects of chloroform, which have been attributed to other causes. Of these, Mr. Mouat, who had charge of the field hospital at the Redan, has given us examples in the cases of soldiers who never rallied after its administration, but sank "from exhaustion in from twelve to twenty-four hours";* and M. Chassaignac, of the Hôpital Laborisère in Paris, has recently described similar occurrences.† Indeed, whoever reads attentively the circumstantial hospital reports of amputations, etc., in the *Medical Times and Gazette*, during the last four years, will meet with many deaths which are unquestionably of this description.

The more remote effects of chloroform, though they may be guessed at by analogy, can only be satisfactorily ascertained by statistics. Dr. Simpson endeavoured, by returns from various hospitals, to make it appear that these effects are beneficial; and that chloroform, though proving immediately fatal in some instances, lessens the general mortality from operations by promoting, on other occasions, the healing of the wound. We must not, he argued, prohibit bathing because a few persons are drowned, for many more lives are saved by its salutary effects than are lost by such accidents. But the truth is, there can be no comparison between the exhibition of chloroform and ordinary bathing. Instead of compensation, there is much additional destruction. The administration of chloroform resembles, in this respect, bathing in a dangerous river, and the long continued stay of an invalid in very cold water. Nor can any comparison be made, in this respect, between chloroform and other powerful drugs. These very rarely prove fatal in the hands of skilful practitioners; and when they do so, it has not been for so comparatively small a purpose as the prevention of short pain that they have been administered. The tables which Dr. Simpson published in proof of the opinion

to the circumstances which prohibit its use in particular cases; and the employment of "inhalers" in its administration has been generally condemned.

* *Medical Times and Gazette*, August 31, 1856.

† *Lancet*, February 23, 1857.

of ultimate advantage from chloroform, and which have unfortunately been as authoritative with many surgeons as the Northampton Life Tables are with assurance companies, involve the greatest fallacies. I have elsewhere shown, that when the data on which they were founded (and which are, no doubt, authentic and accurate) are properly used, the very reverse of his proposition is proved by them.

I have renewed the investigation of this subject by statistics, and have discovered that the destruction of life by chloroform has been very great. Besides the data which Dr. Simpson had collected, a subsequent series of accurate returns of amputation and lithotomy cases from the London and provincial hospitals, have been made use of; and from these collectively, the clearest evidence is afforded that the mortality since the introduction of chloroform has increased more than 10 per cent. after amputation, and more than 20 per cent. after lithotomy on the adult. In other words, instead of one patient dying in four or five after amputation as formerly, one now dies in three; and instead of one adult dying in four after lithotomy (which is rather more than the former ratio), one now dies in two. These facts may be better understood from the following tables, which are abridgments of several published in the *Medical Times and Gazette*, Oct. 25 and April 25, and, partially, in *Ranking's Retrospect* for the last year. The authorities for the data are there given, and the principles on which the tables were constructed are explained, both in the observations accompanying them and in several controversial letters on the subject which have subsequently appeared in the same journal.

Attempts have been made to account for the great increase of mortality after the severer operations, by assigning other causes than chloroform; but while this has all the evidence of the real cause, the others, such as a decay of surgical skill, an epidemic pyæmia, the cholera, etc., have not the slightest plausible foundation. Hospitals are better ventilated than they used to be; pyæmia, though better known and more frequently detected than formerly, has not in-

TABLE I.

Shewing the recent increase of Mortality after Amputation of the Thigh, Leg, and Arm, in Four London and Fourteen Provincial Hospitals.

Hospitals.	Authorities.	Period of Observation.	Before Chloroform.		Period of Observation.	Authorities.	After Chloroform.		Increase of mortality since the introduction of Chloroform.
			Cases.	Deaths.			Cases.	Deaths.	
St. Bartholomew's	Mr. Haig	1846	22	4	1855-56	Med. Times & Gaz.	31	9	10.9 per cent.
University College	Mr. Potter.	1835-46	103	24	1855-56	"	21	7	10 per cent.
St. Thomas's	Mr. South.	1842-47	49	13	1855-56	"	23	9	12 per cent.
Guy's	Hosp. reports.	1843-46	68	18	1854-56	"	85	27	5.7 per cent.
Oxford	Mr. Hussey.	1838-47	69	5	1848-56	Mr. Hassey.	76	18	Average increase of mor-
Liverpool Royal	Mr. Halton.	1835-36	43	3	1855-56	Med. Times & Gaz.	16	3	tality (equal
Gloucester	Mr. Charleton.	1842-44	32	7	1855-56	"	13	6	tality) (equal
Glasgow	Dr. M'Ghie.	1840-46	137	54	1853	Dr. M'Ghie.	38	13	periods being
Penarth provincial hos- pitals	Dr. Simpson's statistical table.	...	100	21	1855-56	Med. Times & Gaz.	112	36	taken) 12.5 per cent.

TABLE II.

Shewing the recent increase of Mortality from Lithotomy in the Adult.

	Per Cent.
Former rate of mortality, calculated from 775 cases of various operators (see Mr. Coulson's work on Lithotomy)	22.4
Rate of mortality since the introduction of chloroform, calculated from 81 cases in London and Provincial Hospitals	48
(see <i>Medical Times and Gazette</i>)	

creased independently of chloroform ; and surgery, with this solitary exception, has advanced. On the other hand, chloroform has proved itself a virulent poison by the numerous sudden deaths that have happened during its administration, and by the suffocations, faintings, etc., bordering on death that have still more frequently been produced by it. That its agency is not of that transient character which has been represented, is evident from the extreme and long continued prostration that so often follows it, as well as from the persisting vomiting, headache, shivering, and other symptoms, denoting severe constitutional disturbance. But the fact that, in many cases, death has happened hours or days after its administration, and without any intermission of the unfavourable symptoms produced by it, sets this question at rest. "It would seem," to use the words of M. Chassaignac, "that the injury done in these cases to the vital forces by the chloroform has been so profound that the patient could not recover from it." Besides, it is well known that a fatal influence is often excited by causes that produce no discernible symptoms. Hæmorrhage, foul air, and intoxication, are of this description. Like chloroform, the two last are secret poisoners ; for one who is suddenly cut off by these (as in drinking for a wager, or as when, on a late occasion, the passengers of an Irish steamboat were, during a storm, crowded under hatches), thousands die from the predisposition to fatal disease which is caused by their debilitating effects. Would a surgeon have no fear of excessive alcoholic intoxication interfering with the healing of the wound in a patient undergoing amputation of the leg ?

Now, when we reflect that agents so powerful and dangerous as the intoxicating vapours have been universally employed in every important operation for the last six years, we cannot be surprised to find that operations so severe as themselves to place the patient in danger, should during that period have proved much less successful than formerly. On the contrary, a different result would be the strangest anomaly ; and there is, perhaps, no other instance in medicine where the influence of authority and

example, the bold denials of mischief by interested parties, the hopes and fears of both practitioners and patients, and other misleading influences, have so prevailed against a truth which, to the unprejudiced, must appear so palpable. The obstinate resistance of the "hot and sweating regimen" in fevers, against the facts and arguments of Sydenham, was not nearly so extraordinary. It would not be more extraordinary if the pain caused by disease, like that from operations, had on all occasions, and with utter disregard to the patient's life, been repressed by opium. Narcotism or stupefaction, whether produced by chloroform or Godfrey's cordial, is a certain preventive of pain however originating; but it is surely an important question on what occasions it ought to be had recourse to, and whether the patient's safety ought always to be sacrificed to his ease.

It is necessary, however, to advert to a great misapprehension that has existed in respect to this inquiry. Although statistics do not constitute the only proof of the great ultimate mortality from chloroform, they are assuredly the most convincing; but as there are some persons so unacquainted with the principles of statistical investigation as not to place any confidence in its results, it is proper to state that the question of the propriety of using chloroform in operations by no means depends upon this proposition of an *ulterior* mortality. Had they been all reported or made generally known, it would have been universally acknowledged that the deaths forming the other two classes mentioned above, or those occurring at an earlier period, would alone constitute an amount of mortality which it is perfectly unjustifiable to produce for the prevention of the transient pain of ordinary operations.

"Are we, then, again to have our operating theatres filled with shrieks, and the unpractised surgeon unnerved by the sufferings of his patient?" By this question, it has by some, been strangely supposed that a satisfactory refutation is given to every objection against the use of chloro-

form; and there is implied in it a charge of cruelty against those to whom it is directed, as if cruelty is not more manifest in recklessness about a patient's life than about his ease. Fortunately, however, if their dangerous nature obliges us to abandon the use of intoxicating vapours in the great majority of operations, we should not, in our humane endeavours to prevent pain, be left without a resource. Insensibility can in most instances (and in almost all to a great and very useful extent) be perfectly produced, and with complete safety, by applications made to the part itself which is to be operated upon, and without the suspension of the patient's consciousness.

It is a singular circumstance, that both the general and local modes of preventing pain in operations should long have been familiarly known as capable of producing insensibility, and both avoided, on account, probably, of their supposed danger. I have already spoken of the mephitic vapour of the Grotto del Cane. Still better known was the numbing effect of intense cold on parts exposed to it. But while the fears of the inhalation of vapours have unhappily been verified, those respecting cold have been proved to be groundless. For several years the local application of intense cold has been employed in surgical operations, not only without a single untoward occurrence, but with the immense additional advantage over chloroform of warding off that excess of inflammation from operation wounds which so often prevents their healing. It had not occurred previously to my investigation of the subject, that although long continued congelation, such as accidentally occurs in very cold climates, will injure the more isolated parts of the body, it may, when short and regulated, be a very different process; a process perfectly free from danger, yet so powerful, as not only to produce insensibility in operations, but to constitute a prompt and unfailing remedy in many inflammatory and painful diseases.*

* A minute is a sufficient period for congelation in operations, though a longer application may sometimes be desirable to secure its antiphlogistic as well as its anæsthetic powers. Some time ago, with a view to destroy painlessly

The only reason which can be assigned for the fact that cold has not yet generally superseded chloroform in many operations is, that its proper application requires a little more skill and involves a little more trouble. Nothing can be easier than to pour chloroform on a handkerchief and hold it under the patient's nose; but it requires some practice to congeal a part properly, and some pains to prepare the frigorific materials suitable for the degree of cold required. Yet surely these reasons would have formed no barrier to its adoption had surgeons been aware of the true character of the proceeding for which cold was proposed as a substitute. A conscientious practitioner thinks not of trouble when the life of his patient is at stake, and he is anxious to learn to do that perfectly which may be of service to him.*

the outer part of an occult cancerous tumour in the breast, I kept up congelation for nearly an hour, without causing the least permanent injury of the skin.

I am glad to mention this decisive fact, as it utterly demolishes the prejudice which still tends to delay that extensive use of the remedial agency of intense cold which is required to supply a great desideratum in therapeutics; for though cold has been used and much esteemed since the origin of medicine, its most efficient dose was unknown. Yet the medical journals furnish evidence that new and valuable applications of it are every now and then occurring. Even in deep seated disease of the viscera, it has been found an effectual resource when other remedies have failed. In the *Liverpool Medical Journal* for this month, there is a report of the use of congelation as a means of immediately and permanently suppressing phthisical vomiting; and, in a recent French medical journal, several cases of obstinate obstruction of the bowels are related, which were cured at the Hôtel Dieu by cold, after other means had been used in vain. It is true that the degree of cold in the latter instance was not so intense as that produced by frigorific mixtures; but, as the reporter justly states, the now well established innocuousness of this greater degree, has emboldened physicians to employ ice with a degree of freedom which formerly would have been avoided. Under different circumstances, however, as when the part does not possess much vitality, a prolonged remedial congelation will destroy it, and may be usefully employed for such a purpose. In an interesting history of the various remedies adopted of late years in cancer, contained in the *Medical Times and Gazette* of this week, there is an account of the speedy removal by congelation of "a large flabby convex growth"; and M. Velpeau, in his *Treatise on Cancer*, speaks of its advantages in similar cases.

* Exaggerated notions, however, of this "trouble" are entertained. At a

It has not proceeded from want of sufficient evidence of its excellence that local insensibility from cold has not as yet been generally adopted. There are a great many reports of its successful use in the medical journals of Europe and America, and in works written by the respective operators. It has been employed in the excision of tumours by M. Velpeau, Mr. Paget, Mr. Bellingham, Mr. Erichsen, Mr. Ward, Mr. A. Johnson, Mr. Fleming, and others. Various surgeons have reported their successful use of it in the operation for hernia, in tracheotomy, amputation of the fingers, evulsion of the nails, breaking down nævi, opening abscesses, carbuncles, and whitlows, the extraction of foreign bodies, the removal of cicatrix, and operations on the eye. Half-a-dozen treatises by English and foreign dentists have described the use of congelation in operations on the teeth. Mr. Lawrence and M. Nelaton have prevented the pain of the actual cautery by it; and Mr. Langston Parker, the pain from caustics employed for the enucleation of cancer. One of the last reports referring to congelation which I have seen, mentions another employment of it in this disease by Mr. Stanley at St. Bartholomew's Hospital, namely, for the painless removal of the skin covering two scirrhus tumours previously to the application of chloride of zinc.*

In reference to the use of congelation in cancer, I may mention that this is by no means confined to these combinations of it with caustic; but it would be foreign to the pur-

recent inquest on a death from chloroform at St. Thomas's Hospital, it was stated that there was a difficulty experienced in placing the patient, who was about to have his finger amputated, under its influence. Would it not have been less troublesome to have dipped the finger for a few seconds into a glass of dissolving ice and salt, as was done with perfect success in a similar amputation, related at a late meeting of the Harveian Society? In estimating the comparative trouble of the two methods, we must not forget the various instrumental means of averting sudden death, with which every conscientious practitioner must be provided before administering chloroform; nor the hours spent in attempts at resuscitation by artificial respiration, galvanism, suspending the body by the feet, etc.

* A highly refrigerated mineral acid might, by means of an open cup or flat ring fitted to and pressed upon the part, be employed for the purpose of simultaneously benumbing and destroying.

pose of this paper to enter upon the consideration of the curative properties of intense cold, unless so far as they illustrate its utility in operations.

I shall only now remark in reference to its antiphlogistic properties, which are of the highest importance in this respect, that the fact of an adequate degree and continuance of cold so altering the functions of the vessels and nerves of the part subjected to it, as not only to arrest inflammation instantly, but to render the part incapable of this morbid affection some time afterwards, constitutes, from the extensive applicability of the remedial principle, one of the most important medical truths which have yet come to light.

The only defect in congelation, as a mode of producing insensibility in operations, is the small extent which its influence can penetrate from the surface. But in the greatest number of cases this objection does not hold. Even in amputation of limbs, the principal portion of the pain may be thus avoided, for that is produced by the incision of the skin and its dissection from the underlying flesh; and the separation of the skin from the surface of large tumours is, also, the most painful part of their excision. Congelation, however, might be conjoined with pressure, and either so long continued or produced by such powerful frigorific mixtures, as to remove this objection; or the mixture may be applied after the first incision, as has been practised with excellent effect in America. The mode of applying this agent is probably yet far from perfection, but the principles to be attended to in the procedure, are, I think, fully pointed out in my writings on the subject.*

* I have minutely described the mode of applying intense cold in operations in several papers in the *Medical Times and Gazette*, Nov. 11th, 1854; Nov. 24th, 1855; Feb. 14th, 1857; and, incidentally, in Treatises on its curative agency in Headache, Neuralgia, Rheumatism, and Cancer.

It were needless to notice another objection to congelation, that it is itself a cause of pain, as this has long since been declared groundless, but the following ludicrous artifice of an opponent deserves a remark in passing. In a popular article on Chloroform, by Dr. Simpson, in the *Encyclopedia Britannica*, congelation is called "frost-biting." As no one is better aware than

I think it would be difficult to bring forward a question connected with medicine on which the investigation and authority of an "Academy" is more required than that which I have now briefly and imperfectly stated; and which, it appears to me, cannot be otherwise speedily determined. A single death produced by a practice for which there is a complete and safe substitute is a lamentable and discreditable occurrence, for such a practice is condemned alike by the moral and statute law; but if great numbers are cut off by the use of intoxicating vapours for the avoidance of transient pain, even though this could not be otherwise prevented, the fact demands immediate notice and correction. The evidence which has been adduced proves that many die from the immediate effects of chloroform; others, within a few hours of its administration; and a very large number at more advanced periods, notwithstanding that the object for which it is administered might, in most instances, be fully attained without the slightest hazard. Yet, as respects the last class of deaths, or those caused by the ulterior agency of chloroform, it is proper to mention, that this disastrous error can hardly be said to reflect discredit on any one; for it was only discoverable by statistical investigation, and this, necessarily, could not be instituted until after a considerable lapse of time.

London, July 12th, 1857.

Dr. Simpson (who has often employed congelation remedially) that there is no resemblance between its effects and those of what is usually termed frost-bite, his knowledge of the power of names to excite prejudice, is as clearly shewn here, as when the significant phrase "excessive inebriation," originally used in America to express the effect of ether and chloroform, was so adroitly changed by him into the unsuggestive term, "anæsthesia."

NOTE.

SINCE writing the above, the opportunity has been afforded me by the Board of Management of the Middlesex Hospital, of publicly demonstrating the momentous surgical fact, that congelation, properly employed in conjunction with caustic, enables us to remove cancerous growths without pain, and, if not absolutely without danger, with much less danger than any other means. The case which I shall briefly relate, will illustrate and confirm the statement I have already made on this subject. Henceforth, or as soon, at least, as this case becomes generally known, surgeons who have taken the pains to become acquainted with the proper manner of using congelation, will, it is to be hoped, no longer hesitate to lay aside, as a rule, the dangerous expedient of the knife for the extirpation of cancer. Henceforth, also, will those afflicted with this disease be saved from the health-destroying torture which has been produced by caustic, whatever kind has been chosen, or however applied. It might be difficult, indeed, to render benumbing cold very available when incisions are made for the insertion of caustic, as practised by M. Maisonneuve and other French surgeons; but even in this plan of treatment, the first and hitherto most painful part of it can be thereby rendered perfectly painless. With so certain a preventive of suffering and inflammation as efficient congelation, more than one kind of caustic can often be used in the same case with benefit; and even the actual cautery may, perhaps, under certain circumstances, be found of advantage.

On Saturday the 28th of November, at noon, Sarah H., No. 1, Laffan Ward, had a circular portion of her right breast, three and a half inches in diameter, and enclosing a large occult scirrhus tumour, congealed for two hours by a temperature eight to twelve degrees below zero Fahr.; and a mineral acid succeeded by chloride of zinc was afterwards applied, the latter remaining on the breast for twenty-three hours. There was no expression of pain made during or after these proceedings; but, being questioned on the subject, the patient stated that, for four or five minutes, while the congelation was being effected, there was a feeling of tingling like that produced by a mustard plaster. This was the only disagreeable sensation experienced during the day. She took her usual dinner while the congelation continued, and slept well during the night. By next day, a large white slough or eschar had been produced by the combined measures, of exactly the same dimensions as the lower opening of the gutta percha cup which had stuck for many hours to the breast. For the purpose of ascertaining the extent of the insensibility or disorganization, this was cut in the presence of the resident medical officers, to the depth of an inch, without causing the least sensation. No inflammation followed; nor did any redness appear at the margin of the slough till the third day, when its separation had probably commenced. Notwithstanding the continued action of the caustic, the patient's general health has until now (Dec. 12th) been undisturbed. Her appetite is good; she sleeps soundly at night; and, when the weather permits, walks in the Hospital garden. There has been no necessity for the application of intense cold since the first day, when, as a preventive measure, it was continued for about eight hours by several renewals of a frigorific mixture, separated from the caustic by a very thin membrane lining the gutta percha cup. I have found in other cases that such a precaution is very necessary; but when the uneasy sensation of heat, sometimes accompanying the separation of the slough, is all that is to

be obviated, this can be more conveniently done by the use of the current apparatus already referred to.

This, with two other Middlesex Hospital cases, in which long continued or disorganizing congelation is being employed alone, will be more minutely described on another occasion; but I am unwilling that there should be the least delay in furnishing an account of the public exhibition of a fact of so much importance, which, as stated above, I had already, in private practice, fully ascertained. That the case has not yet terminated, is of no importance. For, as the principal purpose was to show that the dreadful pain hitherto produced by caustic can be certainly prevented, and the hazardous and less effectual operation by the knife superseded by a comparatively safe measure, a report restricted to that part of the treatment in which the suffering has always been the most acute and the inflammation greatest, is sufficient. If further proof were required of the very valuable quality of intense cold in warding off danger from inflammation, I would refer to a statement just published by Dr. V. Pettigrew (Medical Times and Gazette, Dec. 5th, 1857), that of ninety-three operations performed by him under congelation, and of which ninety were perfectly painless, only one did not heal by the first intention.

POSTSCRIPT.

AN accidental delay in publication enables me to notice a few important facts bearing on topics discussed in the foregoing pages, which have occurred since they were printed.

During the month which succeeded, there were reported three sudden deaths from intoxicating vapours administered for minor operations. These consisted of chloroform, amylene, and a mixture of four parts of sulphuric ether and one of chloroform. Experience has shewn, on this and other occasions, that the powerful affection of the nervous centres produced by etherization is dangerous, whatever agent be employed; and perhaps chloroform is deemed more dangerous than the others, only because, from being more frequently used, it has caused more mischief.

Within the same period also a remarkable confirmation was afforded of an opinion expressed in the paper, that we should be much deceived were we to estimate the amount of the immediate mischief from etherization by the number of sudden deaths from it which have been published, and particularly those occurring in France. I allude to a statement of Professor Berrier, in the *Gazette Médicale de Lyon*, that five deaths from chloroform have, to his knowledge, taken place at Lyons, and that only one has been reported. This statement is similar to one made some time ago by Dr. T. W. Gairdner of Edinburgh, that, "within the three preceding weeks he had been informed of three distinct cases of reputed deaths from chloroform in Scotland, but which would probably never be noticed." (*Edinburgh Journal of Medical Science*, 1856.)

But the deaths occurring suddenly from chloroform, although much more numerous than is commonly supposed, are of small amount compared with those which happen days or weeks after its administration. In the edition of his excellent *System of Surgery*, just published, Mr. Erichsen, while admitting that the increase of mortality after operations since the introduction of chloroform, may partly be accounted for by its deleterious agency, thinks, nevertheless, that another part is due to the absence of pain inciting the surgeon to operate in cases on which, from the little chance of success, he would have formerly declined operating. But any effect of this kind would probably have been more than counterbalanced by the fact that, since chloroform has been in use, many cases in which operations have been performed have been more favourable than they otherwise would have been. The constitution of the patient has not suffered from a long continued dread of pain; nor have operations been delayed, and the chances of recovery lessened, by this dread. Notwithstanding these advantages, the injurious properties of chloroform have so greatly preponderated, as fearfully to increase the mortality from operations.

In the preceding part of this tract, congelation was mentioned as a means of preventing the severe pain that is produced by caustic employed for the removal of cancerous growths. As some important statements in confirmation of its value in this respect have been lately published, and as the prevailing opinions on the treatment of cancer constitute as good evidence of the necessity for the regulating influence of an Academy of Medicine, as those respecting chloroform, it will both illustrate the properties of congelation, and strengthen my argument for such an institution, briefly to advert to these statements and opinions.

Although experience in the treatment of cancerous affections has convinced me (as is stated at length in my recent publication on the subject) that, as a general rule, they are best treated by other and milder measures than ablation, it

must be admitted that there are exceptions to this rule.* Cancers will occasionally be found of so active a nature, or such quick growth, as to render remedial measures of slow operation of little avail; and the disappearance of more torpid growths under such measures is sometimes so slow as to raise a doubt whether an expedient of more speedy operation should not be substituted for them.

Two such means have hitherto been used: extirpation by the knife, and destruction by caustic.

The great objection to excision, as compared with caustic, when this is properly guarded, is the much greater danger to which it exposes the life of the patient. Mr. Paget has inquired into the results of two hundred and thirty-five excisions of tumours in the breast, and ascertained that, at an average, ten in every hundred died solely from the consequences of the operation; and M. Lebert, after a similar investigation, has estimated the mortality from this cause, in the hospitals at Paris, at one-sixth of those operated upon. Of the very few deaths that have quickly followed the application of caustic, erysipelas has been the common cause; but with so excellent a preventive and remedy for this affection as intense cold, we need not fear such a result. The deaths from caustic which take place at a more distant period, may also, as we shall afterwards see, be generally prevented.

The great objection to caustic has been the severe pain produced by it; and this objection is applicable to the various kinds of caustic and the various manners of employing them. Mr. Erichsen, in the work to which I have already

* The measures alluded to, are, the short and regulated application of congelation, alone, or in combination with equal pressure; and such internal and hygienic remedies as are adapted for the improvement of the general system. Mr. Spencer Wells, in his able lecture on cancer (*Medical Times and Gazette* of the 11th of July), speaks of the first of these measures in the following terms: "The freezing process allays pain, checks growth, and has reduced many large adherent tumours to a small, moveable, indolent condition." But these terms, though they do ample justice to its powers as a palliative, hardly imply that congelation can eradicate local cancer. My own experience has induced me to form a higher opinion of its powers when properly exercised under favourable circumstances.

referred, describes this pain as "lasting not only for hours but for days : more intense than that occasioned by the knife ; and as it is usually necessary to repeat the application several times, the suffering is greater than the most resolute patient can submit to." It is stated in the valuable report of the treatment of cancer by caustic, just published by the surgeons of the Middlesex Hospital, that the plan lately adopted or revived, of applying chloride of zinc by scarifying the slough, does not cause so much suffering as other plans ; but it is admitted that, though less painful than these, it is often very painful. We are told that the destruction of the skin by nitric acid (the first part of this plan) "was in almost all the cases acutely painful"; and that some patients affected with epithelial cancer were obliged, on account of the severity of the suffering, "to give up the treatment, and leave the hospital unrelieved". In the only case treated in this manner, which I have had the opportunity of observing, the pain from the slow separation of the large and peculiar slough was much complained of, even a week after the caustic had been desisted from ; and the patient, who, from perfect general health, had been reduced to a state of great debility by hectic fever, was unable to make the least change of her supine posture in bed, on account of the aggravation which it caused of the continuous suffering. Pain of this degree and duration is not only a great present evil, but must often act injuriously on the constitution, and predispose to other disease.

Now it cannot be disputed that if either of these two great objections could be removed, the mode of extirpating cancerous growths from which it is removed, ought at once to be preferred by the surgeon. It is impossible to remove danger from the knife ; but the pain produced by caustic has already, in a great degree, been prevented by congelation, and may be farther prevented by employing this agent in a different and more perfect manner. The long continuance of the pain renders chloroform inapplicable, even were there no other objection to it.

That congelation has not been generally used for this pur-

pose since its power of producing insensibility has been known, is a fact not less extraordinary than that it should not have been generally substituted for chloroform in the operations which are rendered completely painless by it. The prejudice, that it might destroy the vitality of the textures, which has retarded its use on other occasions, ought to have encouraged this application of it, as such destruction is the very effect desired. But though the power of congelation to prevent the most acute portion of the suffering from caustic has been amply proved by reports from various hospitals, it has nevertheless happened that, while life has been repeatedly lost by the exhibition of chloroform to save the momentary pang from cutting off a wart, or the extraction of a tooth or toe-nail, patients labouring under cancer have either been permitted to endure an acute and continued pain, which can only be subdued by intense cold, or, in order to avoid such suffering, have, at the greater peril of their lives, been subjected to the operation of excision. May not the accusation of cruelty which has been preferred against the surgeons who, on account of its hazards, refuse to use chloroform in operations, be more justly brought against those who thus inflict needless torture, and expose the constitution of their patients to the dangerous effects of long continued suffering?

These observations refer chiefly to the very painful proceeding of destroying the skin by caustic; but to afford immunity from pain during the whole process of the destruction of cancerous growths, it is necessary to use a mode of applying congelation different from the common one. A deeper and more lasting insensibility is required than what this can produce, even when employed in the most perfect manner; and the duration of the congelation must be made proportionate to the required duration of insensibility. Of the several methods of extending the benumbing action of cold, which have occurred to me, the simplest is to apply the frigorific mixture by means of a gutta percha cup with open ends, fitted to, and kept firmly pressed upon, the part by an elastic band surrounding the body. By this contriv-

ance, also, the cold can be gradually increased and decreased, in order to prevent the smarting sensation that would otherwise be caused. But when it is necessary that the insensibility and other effects of intense cold should penetrate deeply, such a degree of pressure ought to be combined with it as will arrest the circulation through the part; and this may be produced either by condensing the air in a close cup, or by using mercury for the congealing material, kept at the required low temperature by dipping into it a cylindrical vessel filled with a powerful frigorific mixture. In order to facilitate the penetration of the cold, certain measures must be adopted for thinning or removing the eschar produced by the caustic; but that which is formed by particular kinds of caustic is, or can be rendered, so soft, as almost to admit of being removed by the sponge.

It must be confessed that the proper management of the apparatus described is amongst the most difficult and troublesome processes in surgery; but this will not be deemed a valid objection to it by surgeons solicitous for their patients' welfare. Fortunately it is only the surgeon who experiences trouble; the patient lies on a couch perfectly at ease during the whole proceeding.

By a simpler apparatus than this, however, much relief may be obtained. Mr. Langston Parker informs us, that in a case where the chloride of zinc paste was kept in contact with the skin for six hours, by merely placing a bladder containing ice and salt on the part from time to time, "the pain experienced was of the most trivial character"; and he states that he has "tried the same plan with other cases with almost an uniform amount of success".* It is desirable, however, that the relief should be as complete as possible.

* "The Address in Surgery," for 1856, delivered before the Provincial Medical Association. When the congelation has not been continued long enough, it ought to be repeated, as in the case just alluded to. In the Report from the Middlesex Hospital, a case is mentioned in which, after the breast and axilla had been congealed and the nitric acid applied, "feeling returned in the skin before the acid had effectually destroyed it". One short re-application of the frigorific mixture would probably have rendered the remaining part of the process painless.

And it is not only the relief from the pain caused by the caustic that may be obtained by a more efficient plan of proceeding, but of that likewise which arises from the disease itself; nor can the allaying of the excessive irritation that occasionally follows the use of caustics be reckoned a trifling advantage of well conducted congelation.

An application of intense cold, continued for a very long period, is of itself sufficient to destroy the vitality of the part; and perhaps this devitalizing effect of congelation, either alone or in combination with caustic, will, when limited and controlled by a proper apparatus, eventually prove the easiest and best mode of rapidly removing cancerous growths. Congelation so employed, would, in fact, constitute a painless and antiphlogistic caustic. It may also be found that the principle of the ligature, as a means of removing tumours, might, in certain cases, be usefully employed in conjunction with congelation. I hope, at no very distant period, to be able to lay important information on these subjects before the profession.

50, Baker Street, Oct. 10, 1857.

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20, Essex Street, Oct. 10, 1877.



