

Introductory address delivered at the opening of the thirty-ninth session of the Medical Department of Georgetown University, on the recent advances in abdominal surgery / by Joseph Taber Johnson.

Contributors

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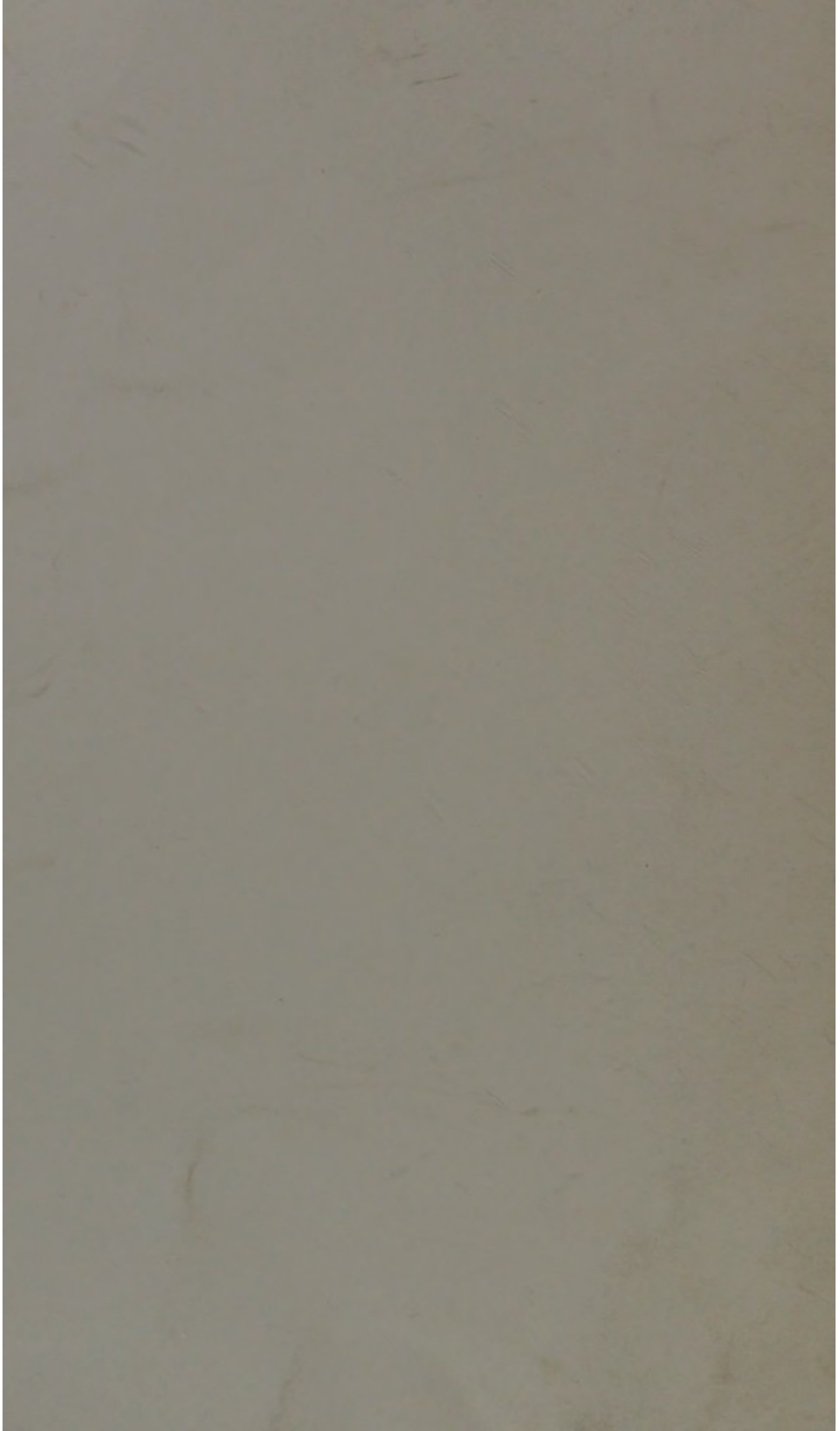
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INTRODUCTORY ADDRESS

DELIVERED AT THE

Opening of the Thirty-Ninth Session

OF THE

MEDICAL DEPARTMENT

OF

GEORGETOWN UNIVERSITY,

ON THE

Recent Advances in Abdominal Surgery,

BY

Prof. JOSEPH TABER JOHNSON, A. M., M. D.;

President of the Faculty and Professor of Obstetrics and Gynecology; also
President of the Medical Society of the District of Columbia, Gynecologist
to Providence Hospital, Fellow of the British Gynecological Society,
Fellow and Secretary of the American Gynecological Society, etc.

OCTOBER 3, 1887.

Published by request of the Students of the College.

MEDICAL DEPARTMENT, GEORGETOWN UNIVERSITY,
WASHINGTON, D. C., *October 9th, 1887.*

Prof. JOSEPH TABER JOHNSON, M. D.

MY DEAR SIR: At a Class Meeting of the Students of Georgetown Medical College, held on the 8th instant, I was directed to ascertain from you if there could not be some arrangement made for the publication, in pamphlet form, of your valuable Introductory Address upon the "RECENT ADVANCES IN ABDOMINAL SURGERY," delivered at the College on the evening of the 3d of October, 1887.

The Class also voted to request from you a statement of your own experience in Abdominal Section.

I am, my dear Professor, very truly yours,

J. H. M. BARBER,
Secretary of the Class.

926 FARRAGUT SQUARE,
WASHINGTON, D. C., *20 October, 1887.*

Mr. J. H. M. BARBER,
Secretary Class of 1887 and 1888,
Medical Department, Georgetown University.

MY DEAR SIR: I thank you and the Students of the College very much for their kind and complimentary resolutions asking "if some arrangement cannot be made for the publication, in pamphlet form, of my Introductory Address delivered at the College on the 3d instant," and, also, "for a statement of my own experience in Abdominal Section."

In reply, I beg to say that I have a vivid and painful recollection of the many and varied uses for funds, which make the life of a student of medicine unhappy, and that it will give me great pleasure to place in your hands pamphlet copies of the Address, which you honor me by requesting for publication.

I am, very faithfully yours,

JOS. TABER JOHNSON.

INTRODUCTORY ADDRESS.

MR. PRESIDENT, GENTLEMEN OF THE FACULTY,

LADIES AND GENTLEMEN :

It was at one time the custom in this College for the Faculty to elect the speaker at the opening and closing of the regular course of lectures, but as all the professorial orators craved the honor of delivering the Commencement Address to the crowds of admirers of the Graduating Class, and none of them cared to make the opening speech, it was finally decided that these honors should descend by a law of rotation upon one after the other of the Faculty. In order to make a beginning, it was decided that the Professor oldest in the service of the College should open the school by the usual public address, and the one next in length of service should deliver the valedictory, and so on through the list in this way, year after year.

A Professor has, then, seven years in which to gather himself together, and rack his exhausted brain to find something new to say on each occasion of the kind. It is quite certain, as this is a favorite day for the opening of the Medical Colleges throughout the country, that at this moment a hundred different professors are struggling with the momentous question of how to say something new, or different from that which is always said, in the usual opening address of Medical Schools. The occasion is always the same, whether it occurs in Washington, Chicago, St. Louis, or New Orleans. Occasionally a professor dies or resigns, and the usual monotony is varied by brief obituary remarks, in which it is generally lamented that the school and science has met with a loss which can never be fully repaired.

It is usual in an introductory lecture to remark upon the fact that young men are leaving home and friends, and are about to devote themselves to a noble profession, and to bid them a cordial and hearty welcome to the lecture halls of their future Alma Mater. In the name of the Faculty, I bid you, one and all, welcome—those who have partially completed their courses are welcomed back to the Graduating Class, and those who are beginning the study of medicine for the first time are doubly welcome.

It is hoped that our acquaintance, which begins to-night, may, during your three years' course of study, ripen into enduring friendship.

We shall meet frequently in this and other rooms throughout the College, and in the clinics at the various hospitals and dispensaries of the city.

Each Professor will undoubtedly do his best to lead your minds towards the belief that his Chair is the most important in the school, and that unless you thoroughly master and comprehend its teachings, as a foundation for your studies, that the lighter branches on your tree of knowledge may be blown hither and yon by every idle wind.

We all admit, however, that there are certain fundamental branches or roots to our tree which a student will do well to master before he battles with the more practical parts of his medical education. Thus, it would be unwise study important surgical operations before the anatomy of the parts involved was understood, or to prescribe for typhoid fever or pneumonia without having previously acquired a thorough knowledge of the therapeutic uses of the medicines required. So that while we advise you to begin your studies with Anatomy, Chemistry, Materia Medica, and Physiology, we, who lecture on the more practical branches of Practice, Surgery, and Obstetrics, will always be very glad to see you present at our lectures. Large audiences stimulate your teachers to better and more vigorous work.

Having said this much by way of a general introduction, I desire to still further vary the monotony of the usual opening address by calling your attention to some of the recent and very wonderful advances which have been made within the past few years in that department of our art known as "Abdominal Surgery."

While many surgeons operate within the abdominal cavity, and with great success, still it is now generally admitted that Abdominal Surgery is fast becoming a department by itself. So many special instruments are required, so much special preparation on the part of the surgeon, the patient and the environment, is necessary to secure the largest success, that in most cities and small countries this class of operative work is going very naturally into the hands of those who, by special study and practice, have become best fitted for its most successful performance. Not only do many unusual things have to be done to become a successful abdominal surgeon, but many things in the busy life of the general physician or surgeon must be left undone.

Thus it would, in this day, be considered in the nature of a crime for a surgeon to perform an ovariectomy when fresh from a *post-mortem* examination, or cases of erysipelas, or gangrene, or dressing foul-smelling wounds—which they are more or less constantly called upon to do; or for a physician to attend an abdominal section the same day he had visited cases of scarlet fever, puerperal septicæmia, or diphtheria. So likely are these subtle poisons to be conveyed to the absorbing surface of the peritoneum, where they set up diseased processes which quickly pass beyond control, that many abdominal surgeons now require that visitors at their operations shall sign a declaration that they “have been free from contact with any of the above-named contagious influences for a period of seven days.” Those who are most strict in these and other matters of “cleanly and antiseptic surgery” have the best results. Ovariectomy, from being one of the most fatal of the capital operations, has now grown to be the most successful. A few special abdominal surgeons have brought their mortality down to less than five per cent. There is no other surgical procedure of equal gravity which stands any comparison with the successful performance of ovariectomy to-day, even if we place its mortality at fifteen or twenty per cent.

This operation was first performed by our countryman, Dr. Ephraim McDowell, in December, 1809, in Danville, Ky., upon a Mrs. Crawford, who made a good recovery, and lived for thirty-two years afterwards. Dr. McDowell did not publish his success until he had performed three operations, and these were several years apart. His statements at first were not believed, as medical men and medical editors did not then think it possible that an ovarian tumor could be successfully removed through an opening in the abdominal walls. In the next twenty years few operations were performed in this country and none at all abroad. Those who had the courage and the necessary skill to undertake it were denounced and vilified, and by some adjudged guilty of malpractice, and the public warned against them as rash and dangerous surgeons.

It would be interesting and perhaps instructive to devote the entire evening to the history, and progress and improvements, and the present technique of ovariectomy alone, but I shall leave these particular points to be studied in our lectures during the winter. As I have so many other advances in Abdominal Surgery to refer to, I can only, in passing, make a general remark upon them all, or such of them as time and your patience will permit.

Referring again to ovariectomy, it was many years before opposition to it ceased and it became generally recognized as a justifiable surgical procedure. Surgeons here and there attempted it, and their opinions and that of their friends and associates were greatly influenced by their success. If they happened to fail in their first case, the operation, instead of the operator, was condemned, and it was not emancipated from the odium their lack of skill had cast upon it until some bolder and better man had rescued a few lives, when faith in it became re-established.

Dr. Charles Clay, in Manchester, in England, had some remarkable successes, which finally attracted the attention of Baker Brown and also of Mr. Spencer Wells, a surgeon of the Samaritan Hospital in London, who began to operate, and to write and speak favorably of ovariectomy. Their success emboldened others, and soon all opposition was abandoned, and the operation became an assured fact in Great Britain.

Nélaton, about this time, attracted by the success of Baker Brown, came over from Paris, and visited his "London Home," a small, private hospital, and witnessed several ovariectomies. Soon after his return he began to operate, and to earnestly advocate the operation with his pen and voice. Péan and others became ovariectomists, and their success disarmed all abuse and criticism.

In America the operation was almost lost sight of after the death of its great originator, which occurred on the 25th June, 1830.

On the 5th of July, 1821, however, Dr. Nathan Smith, of New Haven, Conn., performed ovariectomy successfully upon a lady thirty-three years of age. This was an original operation, as Dr. Smith had never heard of McDowel's cases. Two arteries in the omentum were ligated with narrow leather ligatures cut from the thin walls of a kid glove. The pedicle was ligatured and dropped, and the "three-inch incision completely closed," as is done at the present day by the best operators. Various attempts at ovariectomy were made from this time on to 1830, when Dr. Warren, of Boston, had an unsuccessful case. In 1835 Dr. Bellinger removed successfully an ovarian fibroma.

No ovariectomy was performed in this country from this time until 1843, when Dr. Dunlap, of Ohio, and Dr. John L. Atlee, of Pennsylvania, had their first cases. In 1844 Dr. Washington L. Atlee, who afterwards became the most famous American ovariectomist, did his first case. In 1855 Dr. Kimball, of Lowell, a great pioneer in this branch, had his first case. These men went through great persecution. They were scorned and denounced, but all lived to be honored and praised.

When Dr. Dunlap invited a number of the neighboring physicians to witness his first operation, they all, with one accord, declined, saying "they could see enough people die, without coming to see any one killed."

Dr. Dunlap is now about seventy years of age, and at the recent meeting of the International Medical Congress reported that he had performed ovariectomy 315 times since 1843, with a mortality, dating back from the beginning, of only 17 per cent. It was very interesting, also, to hear the voice of Dr. Kimball, who must now be nearly eighty, describing his early struggles, and the great opposition he encountered in his early career. He has performed about 500 operations in all.

Marion Sims, Thomas, Emmet, Goodell, Homans, Sutton, and a host of others, have since saved thousands of lives by this wonderful operation in America.

Improvements in its technique have been gradually introduced, new instruments for the prevention of hemorrhage invented, and an operation which, for many years, had a mortality of over 50 per cent., was reduced by Spencer Wells to 25 per cent. Since the substitution of the ligature for the clamp, however, and the adoption of the intra peritoneal treatment of the pedicle, its mortality has been still further reduced to a general average of 15 per cent., while a *few*, who, by constant and special practice, have acquired exceptional skill, have brought down their own mortality to the surprisingly low figures of 5 and 3 per cent.

Keith, of Edinboro', has reported a series of 79 cases without a death, and the most successful abdominal surgeon of modern times, Mr. Lawson Tait, of Birmingham, has reported 139 ovariectomies, with no mortality whatever.

By this one operation thousands of doomed women have been rescued from early graves, and tens of thousands of healthy and happy years have been added to their lives.

The removal of the uterine appendages for the relief of neurotic and chronic inflammatory diseases only dates back a few years. Battey, in this country, Hegar, in Germany, and Tait, in England, thought out the operation independently of each other in 1872, and successfully performed it in that year.

Battey operated largely for the premature establishment of the menopause, thus suspending and abolishing the periodic menses, which had so much to do in aggravating the conditions he wished to cure.

Hegar performed the same operation for the purpose of checking the hemorrhage and also the growth of uterine fibroids, while Lawson Tait added to Battey's operation the removal of the Fallopian tubes, and performed it chiefly for the cure of chronic inflammatory troubles incurable by other means.

Tait reported 50 cases a short time ago, done for the cure of uterine myoma, without a death, and a radical cure in every instance, but one, and she was greatly benefited.

Hysterectomy for cancer is a comparatively recent operation, although it is said to have been performed as far back as 1680.

Langenbeck successfully removed the whole uterus, for what was supposed to be cancer, in 1813. His patient lived nearly 30 years, and it was afterwards proven that the entire organ had been removed. Various attempts were made in later years, but with so little encouragement that the operation "fell into an *innocuous dissuetude*," until 1879, when Czerny, remembering Langenbeck's success, reintroduced hysterectomy with a successful case. Others soon followed his example, with such favorable results, that this operation has now "taken its place among the established proceedings in surgery."

Freund's method by abdominal section "has died out," having a "mortality of nearly 70 per cent. in 106 published cases," and kolpo-hysterectomy has become the preferred operation for the removal of the cancerous uterus. While this method is still condemned by some, the recent success which has attended its performance is so encouraging that there is much ground for the belief that, in properly-selected cases, it will soon find universal acceptance. In 350 recently published cases the combined mortality was under 27 per cent., and when it is remembered that this disease is always fatal, such statistics are very gratifying. No better results were at first attained by ovariologists. The most skilled operators have nearly as favorable results in kolpo-hysterectomy for cancer as do the "skilled ovariologists." Thus, according to Greig Smith, in Germany Brenneke has had 18 cases and Stande 16, all of which were successful. Fritsch only had two failures out of 24 operations, and Martin's mortality was only 9 per cent. out of 66 operations.

The argument, that the disease is liable to return to torment its victim, has no more force here than in other parts of the body, and the evidence is that, in cases of return, the patients' sufferings are greatly lessened. It has been lately asserted that cancer is less likely to recur after kolpo-hysterectomy than subsequent to its removal from any other part of the body. If then, the recent im-

provements in abdominal surgery can develop a method whereby a disease, which heretofore has successfully defied all therapeutic measures, can be totally extirpated, and the unfortunate victim rescued from the pangs of a terrible death, we should all rejoice and do our mite towards helping on the good work. The lives annually sacrificed by this dread destroyer of the human family must amount to thousands, and one success is a clear gain, as, without it, all would be hopelessly lost.

In a paper upon the Vaginal Total Exterpation of the Uterus for Cancer, read at the recent International Medical Congress, Dr. A. Martin of Berlin, said: "The total result accordingly shows, of vaginal total extirpation on account of cancer of the uterus, in 311 cases, 15.1 per cent. mortality. * * * Already, to date, this operation shows better results, so far as immediate mortality is concerned, than removal of the breast for cancer. For the latter Küster, at the twelfth meeting of the German Surgical Society in 1883, published 778 cases, with a mortality of 15.6 per cent., and who would hesitate to perform the amputation of the cancerous breast as soon as the diagnosis is established. * * * Is there any other mode of treating cancer which, with so small a mortality, can show equally good results? * * * According to Hofmeire, the high excision for epithelioma of the cervix has shown a mortality connected with the operation of 7.4 per cent., and a recovery of 53 per cent. for the first year and 33 per cent. after four years.

"That relapses are not prevented after this operation is expressly stated in Hoffmeire's communication, and, therefore, it cannot be maintained that high excision is a safe means of treating this form of epithelioma of the cervix. My own experience in 28 cases of high excision shows that 6 died under the influence of the operation, but all of the survivors relapsed in a short time; only a few lived to the end of the second year. * * * Therefore, I am convinced that it is much better to immediately perform vaginal total extirpation in these forms of epithelioma of the cervix. The sooner we operate the more surely we may hope to save our patients from the sad fate of death from cancer, and the earlier we operate the better are the chances in reference to the general state of health of the patient in regard to recovery from the operation. * * * There are no observations showing that after the removal of the uterus, with or without the tubes and ovaries, the patients lose their sexual feelings or their peculiar feminine form."

Dr. Martin closes his paper in the following words:

“I recommend the vaginal total extirpation of the uterus as the operation, as the means which we ought to apply in cases of cancerous diseases of the uterus, as long as the disease is limited to the uterus itself.”

Supra-Vaginal Hysterectomy is a term signifying more than is often intended. In some instances the removal of a large fibroid may not involve the uterus at all; in still another class of cases a portion only of the organ may be removed without entering its cavity; while in a third class the body of the uterus may be partially or entirely cut away with the tumor.

The first and second successful hysterectomies were performed in this country—one by Burnham, in 1853, and the other by Kimball, in 1855. Keith, Bantock, Tait, and Thornton have had the most remarkable successes of late years in Great Britain, while Schroeder, Martin, Hegar, and others in Germany have also had marvelous results.

In order to make any surgical procedure justifiable and a blessing to the human race its risk must be less than that of the diseased condition for which it is proposed. The natural tendency of uterine myoma in the great majority of cases is *not* toward a fatal issue.

There is scarcely any pathological process, however, which is capable of producing more suffering than a large and rapidly-growing fibroid tumor, but as pain rarely kills, it is argued by many that an operation for its relief which has a mortality attending it of over 5 per cent. is not to be encouraged.

The case is far different with ovarian tumors and malignant growths, where the sufferer is rapidly and relentlessly drifting towards certain and unavoidable death, in a hopeless and terrible form. In these cases any operation which presents 50, 30, or even 10 chances out of 100, would be gladly accepted by the victim as a possible and lucky escape from their surely impending doom. In many cases even an early death would be considered a fortunate release from pain already too great to endure longer.

While surgical interference may be demanded in only a small minority of cases of myomata, there will ever be found a few patients whose lives are rendered so burdensome by the growth and pressure these tumors that relief will be sought at any cost.

Other means, including ergot and electricity, sometimes fail, and the indications laid down by the great master, Keith, all being present and loudly crying out for relief, hysterectomy, partial or complete, may become a duty.

As abdominal surgery advances the mortality in these cases decreases. Keith, in 1885, reported 38 cases, with only 3 deaths, in which the average weight of the tumor was fourteen pounds. Guserow's statistics show a mortality of 33 per cent. in 359 operations; add to these 180 cases in Germany, and we have a total of 539 cases, with the mortality reduced to 30 per cent. More recently the results have greatly improved, so that in the hands of those especially trained and experienced it has been brought down to 15 per cent.

The two greatest difficulties to contend with have been the prevention of hemorrhage from numerous adhesions and the proper treatment of the pedicle. It is hoped and expected that as we advance in knowledge and experience these difficulties will be overcome, as others, apparently as insurmountable, have been, and that ere long suffering women, unrelieved by other means, will find in hysterectomy for uterine fibroids a source of relief from pain and death, which they will accept as readily and cheerfully as they do now ovariectomy or the obstetric forceps.

In a paper read before the American Gynecological Society last week by Dr. Bantock, of London, the following statement of his results in this operation was made by him:

"Supra Vaginal Hysterectomy by Extra Peritoneal Method.—57 cases; 45 recoveries, 12 deaths. Six of the deaths were from kidney disease, 1 from acute enteritis, 2 from hemorrhage, 1 from obstructed intestine, 1 from peritonitis and septicemia.

"Hysterectomy by Peritoneal Method.—13 cases; all recovered.

"Hysterectomy by Enucleation.—2 cases; recovered.

"Cases Treated Intra Peritoneally.—5 cases; 1 recovery, 4 deaths."

Among the recent advances in abdominal surgery none are more startling in their character than some which have been proposed and successfully carried out upon the human stomach and intestines. In past ages many a poor sufferer has come to an untimely end without the assistance which surgery is now able to afford. Special study of the topography of the abdominal viscera is a necessary prerequisite to successful manipulation and operation. Studious dissections and *post mortem* manipulations and operations should be an important mode of education in the manual and operative dexterity necessary to the surgeon who does this class of abdominal work. In those cases requiring surgical interference the visceral relations are rendered abnormal by the diseased condition demanding aid—requiring, therefore, a perfect knowledge of the normal, in order to fully understand and appreciate abnormal deviations.

Gastrostomy is defined "as the establishment, by operation, of a fistula through the abdominal and gastric walls, for the purpose of introducing nourishment," and its chief and sole "motive is for preventing death by starvation" in that distressing class of cases where some obstruction exists to the swallowing of food into the stomach.

In malignant diseases life is prolonged and rendered much more comfortable, while in most other forms of obstruction a permanent cure may result. The necessity would of course remain to introduce food through the fistulous opening artificially produced. Numerous instances are now on record of the saving of lives in this way, which otherwise would have been certainly lost by the slow and horrible process of starvation.

Gastrostomy was first performed with success by Sydney Jones in St. Thomas Hospital, in London, thirteen years ago. Previous to 1874 numerous unsuccessful efforts had been made to save life by thus passing nourishment into the stomach through an opening made by the surgeon, but after Jones' fortunate case "the operation rapidly advanced in success and repute," so that "there is no doubt that it has now an assured foothold among legitimate measures of surgical relief," and that "it would probably be no exaggeration to affirm that at the present day a skilled surgeon could operate on suitable cases with a mortality under 10 per cent."*

"In cancerous stricture and obstruction the relief would of course only continue until the fatal disease advanced sufficiently to otherwise exhaust and destroy the victim."

Gastrotomy is done by making an incision into the stomach, chiefly for the purpose of facilitating the removal of foreign bodies from that organ; but, as it has been performed for the last two hundred and fifty years, it can scarcely be referred to as among the recent advances of abdominal surgery.

It may be interesting to remark, however, in passing, that such articles as spoons, forks, tableknives, pencils, etc., have been safely removed from the stomach of those who have foolishly or accidentally swallowed them, and their lives saved in consequence. † Thornton, of London, and Schönborn, of Germany, have successfully removed large masses of hair swallowed by their patients.

Gastrorraphy consists in the closure of a fistulous or other accidental opening in the stomach. ‡ Billroth, of Vienna, is the only living

* Greig Smith, p. 310.

† Lancet, January 9, 1886. ‡ Langenbeck's Archiv., 1883, vol. XXIX, p. 609.

surgeon who has performed it, but it is hoped that by this means lives in future may be saved when the stomach has been perforated by gastric ulcer or by malignant disease.

Gratifying results have been reported from a few cases where the orifices of the stomach have been cut down upon and dilated, in the cases of non-malignant stricture, which prevented the ingestion of food. Professor Loreta, of Bologna, was the first to describe and successfully perform this surgical feat, in September, 1882. Within the next two years he operated nine times. McBurney, of New York, has dilated the pyloric orifice of the stomach twice.

Pylorectomy was first performed by Billroth in January, 1881, and consisted in the removal of the pylorus and portions of the stomach and duodenum involved in the malignant disease, for which he operated. While the mortality of this procedure is high, without it all those who suffer from cancerous disease perish, as do nearly all from other forms of obstruction. Mikulez, of Cracow, collected 32 cases, of which 8 recovered from the effects of the operation. Winslow, in April, 1885, collected, and published in the American Journal of Medical Sciences, a list of cases up to date, making 61 in all; of these 16 recovered and 44 died. Six cases of non-malignant stricture are reported; of this number one-half recovered. The risks, however, are so great that it should only be undertaken as a forlorn hope, and then at the urgent request of the patient who fully understood the hazardous risk he would have to undergo.

Gastro Enterostomy was first performed by Wölfler, of Vienna, in 1881.

Duodennostomy was first performed by Langenbeck, of Berlin, in 1879.

Jejunostomy was first done by Ogston, of England.

These operations are performed for the purpose of allowing the entrance of nourishment into the digestive track, when the ordinary mode of taking it is incurably obstructed.

Laparotomy is now successfully performed for intestinal obstruction and for injuries such as stabs, gun and pistol shot wounds, bayonet thrusts, strangulated hernia, etc.

Some of these operations have been discussed and performed for hundreds of years. Smith states, however, that "at the present day, in spite of the great advances in abdominal surgery and the increased certitude of diagnosis, there are many medical men who

would consider it no discredit to stand by with folded hands while a patient is dying of an unrelieved internal strangulation of the bowels." This is true of many of the otherwise fatal injuries which occur accidentally and suddenly to the abdominal viscera. But we hope for better things in the future. The long intestinal tube is subject to fatal strangulation by becoming twisted upon itself, by passing through, between, under, or over inflammatory bands, or through apertures in the omentum, or it may, by colic or spasm, be drawn into itself, producing what is known as intussusception. Recent authority sums up our duty and the chances of the sufferer as follows: "The indications to operate in any given case depend, in the first place, upon the chance which the patient has of getting well without operation, and, in the second place, upon the degree of probability with which success will follow the operation. To cases of acute obstruction there is practically but one termination—death. No case of volvulus, whether of large or small intestine, has been known to recover under treatment purely medical. Spontaneous recovery, in the numerous class of cases of strangulation by bands, is not to be looked for. In the case of intussusception, where we have been accustomed to look for favorable results without operation, it seems to me that Treves has made out a clear case against expectant treatment. Looked at from the side of causation or actual pathological condition, there is, practically, no expectation of recovery; certainly 95 per cent. of all such cases die. Here, then, the indication is clear enough—as clear as the indications to tie a bleeding carotid—operation." The great difficulty in these cases is to perfect a diagnosis, so that we can assure a patient of the exact nature of his case and what he has to expect.

Unfortunately, medicine is not an exact science, and our opinions have to be formed very much as the result of experience, and are matters of judgment, and vary with the nature, skill, wisdom, and courage of the surgeon. When we become convinced that the man has no chance medically, he is given over to the surgeon, who, frequently, has no chance left to succeed by operating. Greig Smith says (page 373): "If we are convinced that it is an acute obstruction, then operation should be performed at once; if we are convinced that it is not, another treatment, equally definite, ought to be pursued. From the beginning a definite plan of treatment ought to be laid down and this plan ought to be adhered to. Let it be either drugs *or* operation, and never that fatal compromise operation when drugs fail."

Enterotomy and *Colotomy*, while important, and result in prolonging life and adding greatly to the comfort of the patient, do not require discussion under the head of recent advances.

Resection of Intestine.—“Ill states that Randohr, in 1727, successfully removed two feet of gangrenous intestine from a hernia. Another similar case was done by Mr. Cookesley, in 1731. In 1833 a piece of the colon was intentionally removed. It was not, however, until 1875 that this operation became a recognized surgical procedure.” Since then it has made rapid strides in public estimation, and is now regarded as one of the most successful of heroic operations.” My friend, Dr. Sutton, of Pittsburg, a few years ago found it necessary to remove about five inches of intestine, which was included in a fibroid growth of the uterus. He had reached such a point in his operation for the removal of the tumor that to have abandoned it would have been fatal to his patient, and he boldly proceeded, cutting away both the tumor and intestine. He subsequently sewed together the divided intestinal walls, and his patient made a perfect recovery. Without this skillful and courageous treatment his patient would have most certainly lost her life.

Other operations on the intestines, not specially interesting to a mixed audience, and their modes of performance by the Lembert and other sutures, will be fully described during the lectures on abdominal surgery this winter.

It may be interesting, however, to refer to another class of operations for the relief of suppurative and puerperal peritonitis, perforative and gun-shot injuries to the abdominal viscera. In this class of cases there can be very little doubt, when the let-alone-policy prevails, of a fatal result. The medical history of our late war does not furnish a single instance of recovery where the small intestine was torn by gun-shot, or penetrating wounds from bayonets, swords, or otherwise. Similar injuries to the stomach and other hollow viscera are almost surely fatal, either from the damage done the organs themselves or from the extravasation of their contents. Conditions also arise as the result of perforations of abdominal viscera from ulceration or abscess, which tend to the same fatal termination and in about the same way. “Under the best palliative treatment death almost inevitably takes place. Therefore, if a desperate remedy is ever admissible in a desperate disease, it certainly is so in gun-shot wounds of the abdominal viscera. Operation by abdominal section is certainly a desperate remedy, but it has already been proved to be better than none.”

Morton, of Philadelphia, has collected 57 cases where abdominal section was performed for these injuries, with 21 recoveries. It is very certain that without the aid rendered by the recent advances in

abdominal surgery, these 21 unfortunates would have followed their fellow victims in suffering to the grave. I am proud to state that of these 57 operations 35 were performed by American surgeons. Morton considers "abdominal section clearly indicated in every case where penetration of the abdominal cavity is proven."

The first operation for gun-shot wound of the abdomen was done by Dr. Kinloch, of South Carolina, in 1881. Kocher, of Berne, operated successfully two years later; and in 1885 Dr. W. T. Bull, of New York, saved the life of a patient by boldly opening the abdomen, after a gun-shot injury, and successfully sewing up seven distinct and cruel perforations in the intestines.

Here is a glorious triumph of our art, which causes a man to feel proud of his countrymen and proud of the profession to which he belongs. Many recoveries occur in the course of the busy life and practice of the physician and surgeon. There are those who would sneer and try to rob the doctor of his honor, and ascribe the recovery of his patients to chance or a strong constitution. But when the bullet or stilleto of the assassin has torn from six to a dozen holes in a man's bowels, and these holes are discovered and stitched together, a triumph for surgery has been won, which the sneers, or carpings, or whisperings of all the cowardly back-biters and pretenders and mind-curiers on the face of the earth can never wipe out or gainsay.

Kocher sewed up a gun-shot wound in the stomach of a boy three hours after the receipt of the injury, and he made an excellent recovery.

A case in point occurred near home not long since. A man was brought into Providence Hospital who had, while carelessly handling a pistol, shot himself in the abdomen. There was evidence of serious internal hemorrhage and other injury. The visiting surgeon was at once sent for, and recognizing his deperate condition, late in the day—with Drs. Stoner, Irwin, the house physician, and nurses to assist him—cut open this man's abdomen, found and ligated the bleeding vessels, and safely stitched together not less than thirteen intestinal wounds, any one of which would surely have caused death. The man got completely well, and, to his shame I will say it, left the hospital and his rescuer without a word of thanks. But his life was saved; and though the doctor had no fee or reward with which to purchase any laurels to wear on his surgical brow, he had the proud consciousness of adding a very tall and solid block in the tower of fame which American surgeons have, by their skill, erected, to the surprise and wonder of the civilized world.

I would not mention this surgeon's name, for fear of shocking his well-known modesty, if I were not certain that the praises he has lately received, for so successfully managing, as Secretary General, the affairs of the late International Medical Congress in this city, had somewhat accustomed his ears to the sound of his fame; but I will say that we are glad to claim him as the Professor of Surgery in our College, and that his name is JOHN B. HAMILTON.

In cases of *suppurative peritonitis*, from whatever cause, I am just as sure that abdominal section is the best treatment as I am that it is the safest course in this class of cases just referred to. This disease should be regarded as a huge abscess, and opened, cleansed, and drained accordingly. More cases are likely to recover under this than any other treatment; indeed, I am persuaded that with many it is their only chance. Late authority says, upon this point, "that however induced and whenever diagnosed, suppurative peritonitis has but one treatment—abdominal section." Mr. Lawson Tait has gone so far as to say that he would not consider his duty performed in a grave case of puerperal peritonitis without proposing abdominal section, and performing it, if allowed to do so. I am inclined to believe that some valuable lives might be saved by this heroic treatment.

The surgical management of Diseases of the Kidney and Liver has made rapid strides within the past few years. While these advances are spoken of flippantly by some, the impression might be conveyed that, with our increased knowledge of these matters and skill acquired in actual practice, the incision of a kidney for the removal of a stone, or evacuation of an abscess, or, indeed, its entire removal in cases of otherwise incurable disease, was a trivial and every-day affair, whereas these are among the gravest operations in surgery, and are only undertaken after the most mature counsel and deliberation, and then only to save lives which a less formidable and heroic treatment could not save. Rather than let a man die unrelieved, operations are now performed upon the kidney, liver, spleen, and pancreas which, years ago, would have made our grandfathers turn over in their graves and raise their bony fingers in surgical horror at the rashness and temerity of their descendents. It would delay and fatigue an audience like this to describe these surgical procedures, and I will only mention in a general way two or three of them.

Nephrectomy, or the removal of the kidney, was first successfully planned and carried out by Simon, of Heidelberg, in April, 1869. Since that date the operation has been performed at least 250 times,

and statistics show results which give us great encouragement. While the mortality in cases of malignant disease is stated at about 70 per cent., that of the best operators for other causes is about 40 per cent.

Hepatotomy and aspiration of the liver for abscess is being performed with constantly improving results. Tait has published the histories of 10 hepatotomies—9 for hydatids and 1 for abscess, all of which were successful.

Cholecystotomy is an operation in which the gall bladder is opened and gall stones removed, which are too large or too numerous to permit of their removal in any other way consistent with the preservation of life. Dr. Bobbs, of Indianapolis, was the first to successfully do this operation in 1867, just twenty years ago. Marion Sims was the next operator, and notwithstanding the fact that his efforts were unsuccessful, his advocacy of the operation had remarkable influence in establishing it upon a justifiable basis. The name which he gave it has been generally adopted.

Mr. Lawson Tait has performed cholecystotomy over thirty times and has succeeded in every instance. In some cases many small gall stones were removed, in others only a few large ones. I had the pleasure of seeing him perform this operation in the summer of 1886, in his private hospital in Birmingham, England.

Surgeons have invaded the depths of the abdomen, and incised and removed the spleen and pancreas; with more success, however, with the spleen. Dr. Senn, of Milwaukee, has written a most learned and instructive paper upon the Surgery of the Pancreas.

Splenectomy is gradually taking its place among the operations for the relief of abdominal disorders, but much yet remains to be perfected in its technique before any remarkable degree of success will be reached, as its present mortality is stated by Kharkoff to be about 73 per cent. All the operations for the removal of the pancreas have proved fatal so far, with the exception of one performed by Dr. Bozeman, of New York.

The two points of greatest interest in obstetrics at the present time, and which still remain unsettled, are the management of extra uterine gestation and in regard to Cesarean Section. In reference to the first, the profession of the civilized world is divided between the indications for the use of electricity and the removal of the foetus and its coverings after laparotomy. In this country electricity is preferred. By its use the growth of the ovum is arrested, and its absorp-

tion or final liquifaction and discharge left to the powers and forces of nature. Thomas, Reeve, Mundē, and others prefer and recommend this course, and a number of remarkable successes have been reported by these surgeons. In some instances the fetus has been discharged months or even years subsequently by the slow process of ulceration and a perfect cure has *finally* resulted. In the meantime the patient has run a dangerous gauntlet between septicæmia, hemorrhage, peritonitis, and exhaustion.

On the other hand, it is recommended by Mr. Lawson Tait and a few others in Great Britain, by Martin, Leopold, and others in Germany, after the diagnosis has been perfected, to cut down and remove the ectopic gestation, ligate its vessels, to cleanse and close the abdominal cavity, as we do in ovariectomy. In the tubal variety less difficulty is experienced than in the abdominal, as in this form the growth is generally larger when diagnosed, and the proper management of the placenta becomes a very difficult and dangerous problem to solve. The danger of leaving it behind is only surpassed by that of taking it away. There being no tissue comparable to the uterine walls, at the site of its attachment, there is no muscular contraction which can be excited or depended upon to arrest hemorrhage. Martin, of Berlin, told me recently, while in attendance upon the Medical Congress, that he had successfully removed the placenta in these cases, ligating its site of attachment as he would the base of a tumor. Mr. Tait has recently operated over twenty times, with success, in cases of rupture of the tube and extravasation of its contents. I see no reason why this should not become the authorized mode of procedure in the future. The surgical law, that bleeding vessels should be cut down upon and securely tied, would thus be observed. The removal of foreign bodies from the peritoneal cavity would be conservative as well as heroic practice. Success in a sufficient number of cases, especially of rupture of the tube, should encourage us to operate, rather than to trust to the expectant plan or to the *vis medicatrix naturæ*.

It cannot for a moment be claimed that the Cesarean Section is a recent operation, but its successful revival by Säger has occurred within the past decade. The performance of this classic operation was for centuries attended with so little success that a number of alternatives have been gradually developed, until we have offered to us in its place at least half a dozen substitutes, any one of which offered, until recently, better results than the Cesarean Section itself. Some of these succeeded in rescuing the mother from certain death and the child was occasionally saved also.

In Vienna not a successful Section, however, occurred in a hundred years of effort, and about the same was true of Paris, while in Great Britain craniotomy was largely performed in its place, the Cesarean Section being considered too dangerous to undertake. Craniotomy sacrificed the child in the interest of its mother, who was not always rescued by this sacrificial act.

In *some* countries and in *some* communities the life of the mother is estimated to be of greater value to the State, to society, and to the family than that of the unborn child, and I think that estimate is correct; but still I think craniotomy is a horrible operation, and should always be avoided when possible. I would not agree never to perform it, for I can imagine circumstances under which it would appear to become an imperative duty, especially in cases where the parties most interested positively refused to allow Cesarean Section to be done, or where time and circumstances would not permit of delay for the necessary preparation or assistance. The office of the physician would be better and more humanely performed, it seems to me, to save the most valuable life in the emergency by the possible or very doubtful sacrifice of the other, than by useless delay to allow both to perish undelivered.

It is my very earnest hope and expectation, however, that the "recent advances in abdominal surgery" will soon enable us to abolish forever the sacrificial operation of craniotomy, and to gain the consent of the people to the early performance of the improved Cesarean Section, thereby saving mother *and* child. While in the past no distinct and positive promise could be honestly made that we could *certainly* save *either*, we are, thank God, rapidly approaching the day when the improvements in its technique will perhaps enable us to bid a final adieu to craniotomy, and to hail the improved Cesarean Section as the saviour of *both*.

In the clinics of Dresden and Liepsic Sanger and Leopold have recently operated 16 times, saving 15 mothers *and all the children*. If this has been done in Germany, I am sure it *can* and *ought* to be done in America. The failure in the future, if failure there be, will not rest so much with the surgeons as with the people. The two great secrets of German success are, first, they operate early, before the powers of their patients have been exhausted by fruitless efforts at an impossible delivery; and, second, the practice of antiseptic abdominal surgery while perfectly suturing the uterine and abdominal walls.

The previous discovery of an impassible barrier and the consent of the patient is more than half the battle. This accomplished, arrangements can be deliberately completed and the operation commenced as soon as labor begins, and, with a proper environment, we ought to be almost certain of success.

Thus the higher dictates of religion as well as medicine will be subserved. The crowning glory of *Abdominal Surgery* will then consist not in the successful performance of ovariectomy, hysterectomy, or intestinal resection, in which cases one threatened life only has been saved, but in the rescue of two lives at the same time, through the recently-improved and now glorified Cesarean Section.

I thank you all very much for your kind attention.

In response to the request contained in the kind resolutions of the "Class of '88," I append below a detailed statement of my own work in Abdominal Surgery. In this table is included every case in which I have opened the abdomen up to this date, (2 November, 1887,) with the result—marked "R" for recovered and "D" for died.

In this list might be properly mentioned also 2 cases of Kolpo-Hysterectomy, in which the uterus was removed for cancer. The first case died on the 6th day, of peritonitis, and the second recovered.

No.	RESIDENCE.	MEDICAL ATTENDANT.	AGE, M. or S.	DISEASE.	OPERATION.	RESULT.	DATE.
1	Shirmanstown, Pa.	Dr. Riley	29	Ovario-epilepsy	Ovaries and Tubes	R.	August 17, 1881.
2	Buffalo	J. T. J.	29	Chronic Inflammation	Right Ovary	R.	January 20, 1884
3	Chicago	Dr. Curtis	65	Cystoma	Right Ovary	D.	November 12, 1884
4	Fargo, Dakota	J. T. J.	40	Chronic Inflammation	Ovaries and Tubes	D.	February 20, 1885
5	Washington	Dr. Bromwell	24	Chronic Inflammation	Ovaries and Tubes	R.	February 21, 1885
6	Washington	Her Father	21	Cystoma	Right Ovary	D.	June 8, 1885.
7	Washington	Dr. Walter	28	Malignant Fibro Cyst of Uterus.	Supra Vaginal Hysterectomy	*R.	October 5, 1885.
8	Falls Church, Va.	Dr. Gott	23	Cystoma	Right Ovary	R.	October 12, 1885
9	Washington	Dr. Leach	21	Five years of Persistent Pain.	Ovaries and Tubes.	R.	November 1, 1885
10	Washington	Dr. Lincoln	32	Parovarian Cyst	Left Ovary	R.	April 21, 1886.
11	Washington	Dr. Cate	36	Cystoma	Both Ovaries	R.	May 7, 1886.
12	Potomac, Md	Dr. Kleinschmidt	19	Hystero-epilepsy	Ovaries and Tubes	R.	May 27, 1886
13	Washington	Dr. B. B. Adams	31	Parvarian Cyst	Both Ovaries	R.	October 23, 1886
14	Washington	Dr. Bayne	24	Ovario-epilepsy	Left Ovary	R.	November 17, 1886
15	Washington	Dr. B. B. Adams	50	Cystoma—twisted pedicle	Ovaries and Tubes.	R.	November 24, 1886
16	Washington	Dr. Leach	27	Dermoid Cyst	Both Ovaries	R.	February 14, 1887
17	Washington	Dr. Franzoni	32	Bleeding Myoma	Both Ovaries	R.	February 21, 1887.
18	Washington	J. T. J.	26	Chronic Inflammation	Both Ovaries	R.	March 7, 1887.
19	Columbus, Ga.	Providence Hospital	40	Bleeding Myoma	Ovaries and Tubes.	R.	April 27, 1887.
20	Washington	Dr. Bayne	35	Cesarean Section	Ovaries and Tubes.	R.	May 1, 1887.
21	Washington	Dr. Little	22	Chronic Inflammation	Died of Abscess	10th day.	June 15, 1887.
22	Dayton, Va	Dr. Andrews	38	Two large Fibroids	Ovaries and Tubes.	R.	June 20, 1887.
23	Madison, Wis.	J. T. J.	23	Infantile Uterus	Supra Vaginal Hysterectomy	R.	June 28, 1887.
24	Washington	Dr. Hazen	27	Dermoid Cyst—65 pounds	Left Ovary	R.	October 7, 1887.
25	Washington	Dr. Leach	26	Chronic Inflammation	Ovaries and Tubes.	R.	October 14, 1887.
26	Hillsboro', Va	Dr. Taylor	30	Cystoma	Left Ovary	R.	October 27, 1887.
27	Rappahannock, Va.	Dr. Quackenbush	51	Double Ovariectomy and Uterine	Myoma—54 pounds.	R.	November 7, 1887.
28	Washington	Dr. Frederick	32	Cystoma	Both Ovaries	†R.	November 21, 1887
29	Washington	Dr. Hughes	67	Cystoma	Right Ovary	†R.	November 21, 1887

Total, 29 cases of Abdominal Section, with 24 recoveries and 5 deaths. 1 of these 5 deaths was from Cesarean Section and 1 from removal of the uterus for large fibroid tumors. The last 21 ovarian operations have all recovered.

* Remained well for 5 months. Died 8 months and 21 days, from cancer in the stump. All the others, marked "R" are still living.
 †The last 2 operations are marked D.

(7)
THE FACTORY SYSTEM, IN ITS HYGIENIC RELATIONS.

AN ADDRESS,

DELIVERED AT BOSTON, AT THE ANNUAL MEETING OF THE
MASSACHUSETTS MEDICAL SOCIETY, MAY 27, 1846.

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BY JOHN O. GREEN, M. D., M. M. S. S.  
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Published by the Society.

BOSTON:

PRINTED BY WM. S. DAMRELL, NO. 11 CORNHILL.

1846.

AN ADDRESS

DELIVERED AT THE ANNUAL MEETING OF THE
SOCIETY OF THE FRIENDS OF THE AFRICAN

BY JOHN C. DOBSON, M. D. N. Y. &c.

Published by the Society

BOSTON:

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1844.

THE FACTORY SYSTEM,

IN

ITS HYGIENIC RELATIONS.

MR. PRESIDENT, AND GENTLEMEN OF THE SOCIETY,

THE silent lapse of time, wafting us swiftly onward to the ocean of Eternity has again brought us to this Anniversary. We have assembled from all parts of our cherished Commonwealth, to fill the honorable offices of this time-hallowed Society, to interchange our mutual congratulations on its achievements and prospects, and to gather from all the associations which cluster around it, fresh vigor and zeal and ability for the arduous duties, the solemn responsibilities, the unobtrusive, every day engagements of a Physician's life. I see, before me, the youthful student, flushed with college honors, just entering the arena of professional strife, the recent graduate, full of the responsibility of his first patient's fate, the middle-aged,

in the full tide of professional success, scarce able to lay aside his ceaseless toil for this brief hour: the gray-headed veteran, whose half century of honors and usefulness constitutes his smallest claim to rest and retirement where he is best known. Among the Fellows of this Society, I behold, around me, men high in the walks of science, in the offices of our country, in the confidence and respect of the community, the teachers of my youth, the counsellors of my riper years. I need not say, then, that I meet all of you with a distrust of my ability to do justice to this office and occasion, which would well nigh overwhelm me, unless I could rely with confidence on your utmost candor and kindness.

If there be any one entitled to indulge some self-gratulation on the discharge of high duties, or at liberty to express an honest pride in the accomplishment of his youthful hopes, it is the successful Physician. How few have any idea of the toils and privations to which he is subject, his constant witnessing of misery, his daily task, however arduous, yet never known to be finished: his nightly rides exchanged too often for a sleepless, anxious pillow. How few can imagine the amount of work he has to perform, and how extremely small is the number of those, who, during his professional life, are willing to take into consideration the exertions which it cost him to acquire the elements of his science. Among ourselves, then, who have a just appreciation and experience of all this, I appeal to you whether there is not a satisfaction derived from the consciousness that we have thus struggled to secure

knowledge, and expended time and health and money to prepare and afford relief to the sufferings of our fellow-men, which none of us would forego. There is no one who has thus acted and suffered, who does not feel pleasure in appealing to the manner in which he has discharged these high duties, as to an ample earnest of the steadiness and devotion of his future professional exertions, and as an evidence of his continuing stability and faithfulness in the trusts which may be confided to him.

I have alluded to the extent and comprehensive-ness of our association, with its representatives in every city, town and village in our Commonwealth, bearing with them, in their daily walks, the sound wisdom, the practical sagacity and strong conservatism which almost insensibly are imbibed from a State institution under such guidance as this has been for many years. Equally co-extensive must be the interests and tastes of its many members. If, then, in the character of these annual effusions have often shone forth, in bright relief, the thoughts and considerations with which the speaker has been most familiar, and if, on the present occasion, you are invited to accompany him to his own immediate home and neighborhood, with the eye of a Physician and Christian philanthropist, there to observe what is most interesting, I cannot feel that I have misunderstood your former sympathy, or miscalculated upon your present attention.

Within the last thirty years a new element has been introduced, engrafted and developed upon the

enterprise and resources of our own and the neighboring States of New England. We allude to the establishment of Cotton Manufactures, with a rapidity and to an extent truly surprising. That I have not misjudged the interest which must attach to all the considerations, social, political or economical, appertaining to this subject, will appear from the single fact that the capital invested in Cotton manufactures in Massachusetts alone amounts to \$17,739,000, and the actual number of persons employed in the cotton mills is 20,170.

In former times, when disease and death were supposed to be the work of an unchangeable and, perhaps, a capricious Providence, there was little motive to inquire into their causes, for no knowledge could avail to avert or modify them. In later days, however, we believe that there is much to be learned in this matter: that the study of the laws of life has claims upon the attention of Physicians that are neither to be postponed nor resisted. If the higher aim of Surgery be the preservation, rather than the amputation, of the diseased limb, then the efforts of the Physician in the prevention of disease, rather than in its cure, deserve the higher appreciation. The above are some of the considerations which have induced me to propose to you some reflections upon the *Factory system viewed in its hygienic relations*.

A vast deal of misapprehension and distrust has been created and fostered by assuming a similarity between this class of people in England and America. In all their hygienic aspects there could hardly be a

more striking contrast. But to render this intelligible, I must, in some detail, sketch the history of Factory labor on the other side of the Atlantic. While it shows the unrelenting inhumanity of avarice, it displays the difficulties with which philanthropy and benevolence must struggle, before they can effect their noble ends.

The system of employing children as factory laborers was the result of Arkwright's inventions. His looms took manufacturers out of the cottages and farm houses, and assembled them in Derbyshire, Nottinghamshire, and more particularly in Lancashire, where the machinery was used in large factories, built on the sides of streams capable of turning the water wheel. There was an immediate demand for hands, and children were found to be best adapted to the work. The custom instantly sprang up of procuring apprentices from the different parish work-houses of London, Birmingham and elsewhere. Many thousands of children between seven and fourteen were thus carried to the north. The horrors of this apprentice system appear to have been dreadful. It is said in one instance, an agreement was made between a London parish and a Lancashire manufacturer, stipulating that with every twenty sound children, one idiot should be taken!

The violations of nature's laws reached such a height that these outrages were taken in hand by Nature herself, and pestilential fevers became alarmingly destructive. The public was roused, and a board of health was instituted in Manchester, and made its

report in 1796. In 1802, the late Sir Robert Peel introduced and carried his first bill for the relief of the apprentices. It did relieve them, but steam being now applied to manufactures, the site of factories was removed from the sides of streams to towns and populous districts, where labor could be readily obtained and where apprentices were an useless incumbrance. The bill afforded no protection to the children now employed, and in 1815 Sir Robert Peel proposed a second measure which was not carried till 1819.

The actual nature of factory labor was as follows. I quote from the Medico Chirurgical Review.

It was in nearly all the cotton mills of Lancashire and its neighborhood, excepting Saturday, from thirteen to sixteen hours a day, inclusive of one hour or less, *nominally* for dinner. Many of those subjected to such labor were children of nine, eight, seven and six years of age, and some even under six. The children continued constantly at work so long as the machinery was in motion, during which time they were not permitted to sit down, or to leave the factory. They often complained (naturally enough one would think) of fatigue and aching limbs: in this state of exhaustion toward the close of the day, they were beaten by the overlookers, or even by their own parents, that blows might supply the deficiency of strength. In most cotton factories, during the greater part, and often during the whole of the time nominally allotted to dinner, the children were occupied in cleaning the machinery: no time was allowed for the breakfast or afternoon meals, which were snatched in

mouthfuls during the progress of uninterrupted labor. It appears, moreover, that the temperature in many mills was from 75° to 80° , in others from 80° to 85° or even 90° .

Such was the state of things when in 1819, the twelve hours bill was carried. In 1825, Sir John Hobhouse obtained an act which limited the labor of persons under sixteen, to sixty-nine hours in the week, twelve on five days and nine on Saturdays. In 1831, it was somewhat improved by the prohibition of night work for all under twenty-one, and by the advance of the ages entitled to protection from sixteen to eighteen years.

By the modern factory laws of England, no child under nine years of age is permitted to work at all: and before thirteen it can only be employed for nine hours a day. But here again, the necessities or the cupidity of parents, it would appear, are continually inducing them to misrepresent the ages of their children; so that it has therefore become desirable to discover some test by which the capability of the child may be determined without a knowledge of its age. A standard of height has been adopted by the legislature for the purpose, but upon grounds which physiologically considered, are very erroneous, as the tallest children are often the most weakly.

It is not to be concealed that a vast deal of angry discussion has taken place as to the reality of the mischief inflicted by the long hours and unremitting exertion required by the English factories and spinning mills, rendering the ascertainment of the

truth a matter of some difficulty. To enter deeply into this, however, would lead us into too great digression, and we must content ourselves with saying that the importance of this subject upon the other side of the water, and the weight of its accompanying evidence, may be estimated by my naming, as some of the witnesses before the commissions alluded to, Drs. Baillie, Pemberton, Tuthill, Farre, Blundell, Elliotson, Sir Gilbert Blane, Sir Astley Cooper, Sir Anthony Carlisle and others.

It would seem that a very satisfactory if not an unerring test might be found in the Sanitary Reports presented to the British Parliament, and by the inquiries of Messrs. Ure, Villerme, Noble and others. If those who contended that the hours of labor were not too long either for children or adults, could have produced evidence to show that among operatives, the average of life was equally high as among the apparently more favored classes, there would have been an end of all argument. While, had the result proved different, the system of labor might justly have been deemed oppressive in the precise ratio in which the mortality among the operatives exceeded that among the wealthier countrymen. Now in a most valuable contribution to Hygiene, made to both Houses of Parliament by direction of the Queen in 1842, it appears that while in Manchester, the average age of death among professional persons and gentry and their families was 38, that of mechanics, laborers and their families was only 17. A like difference is shown in the country district of Rutlandshire,

and so far as investigations have been made in our own country, the results seem to be analogous. In a very satisfactory Report, presented in 1844 to the Counsellors of the Massachusetts Medical Society, by Drs. Fisher, Jarvis and Holmes, it is stated that the Committee had obtained an analysis of the ages, and also of the domestic and social condition of 1767 persons, who had died in Dorchester, Massachusetts, within the preceding twenty-seven years; by which it appeared that the average duration of life in the families of laborers, journeymen, mechanics and factory operatives was 27 years 5 months, whilst that of the farmers who own and cultivate their lands was 45 years 8 months.

These truly startling results are, however, greatly modified by carrying our views a little farther. In England, a reference to tables of the mean annual mortality of females in twelve districts of the metropolis will show that the difference in mortality is dependent rather upon the locality, inasmuch as the greatest mortality is at times found to prevail where no factories exist. In Dorchester too, the Committee go on to show that this difference is not chargeable to occupation merely, for it was found most among the little children at their homes, and cannot be caused by the employment of the head of the family.

In the one country, there must be a cause, or causes, connected with the domestic condition or management, to produce this discrepancy:—and in the other, we must be constrained to conclude that the evils which have been presumed to appertain to manufacturing pursuits have been greatly exaggerated:

that no peculiar evils to health and life attach *necessarily* to manufacturing business: and that in so far as factories and other corresponding places of labor interfere with the right conditions of health, they of course lead to the production of disease and the shortening of life: but that these evils appertain rather to their domestic than to their industrial relations. In the prosecution of this subject, these conclusions will, we trust, be abundantly corroborated.

As the type and exemplification of what we mean by the Factory System of New England, we, of course, at once turn to Lowell.—At first view, it will be objected that we have selected by far too favorable a specimen by which to describe a class: that this city has grown up from its very infancy in a few years: that it is rather the result of associated power profiting by all the experience which individual enterprise had hardly and dearly bought in years of unsuccessful effort: with all the modern appliances of machinery and all the modern arts of civilization and comfort.—We grant all this. It is not quite twenty-five years since the first operative was attracted to this place. All the available science and experience of our own and other countries have been concentrated and systematized here under every advantage of combined wealth. But the organic laws of life and health are unchangeable. In this place have been congregated the largest number engaged in the same labor, and it is the only place in our own country where even an approximation can be made to an investigation and analysis of the diseases peculiar to a manufacturing city.

The Lowell system has peculiarities which modify its hygienic character. By far the most striking and conservative that has been superadded to that in other places, is a strict, ever-present, ever-active moral regime. That the strictest observance of the moral laws and the purest elevation of which human nature is capable, are insufficient to secure health to the body, without a simultaneous observance of the organic laws, is too clearly proved by the history of mankind. At the same time, the intimate and inseparable connection between health and morals in all communities calls here certainly for no argument or proof. By a recent writer,* it has been shown with equal clearness and truth, that the "sagacity of self-interest, as well as more disinterested considerations, has led to the adoption and enforcement of a strict moral code. The productiveness of the twelve millions here invested depends," says he, "upon one primary and indispensable condition—the existence of an industrious, sober, orderly and moral class of operatives. Without this, the mills in Lowell would be worthless. Profits would be absorbed by cases of irregularity, carelessness and neglect: while the existence of any great moral exposure would cut off the supply of help from the virtuous homesteads of the country. Public morals and private interests, identical in all places, are here seen to be linked together in indissoluble connection."

Another consideration bearing both upon the character and health of the community of which we are now speaking, is the fact that *we have no permanent factory population*. Careful statistical returns, ob-

* Rev. Henry A. Miles.

tained by the same gentleman, have established that the female operatives in Lowell do not work on an average more than four and a half years in the factories. If the nature of this labor in all countries be the same, and the dangers of moral and physical degradation be inherent in the nature of the employment, which however we deny, we see in the considerations just stated two elements of difference between the condition of the operatives here and abroad which must entirely change its results.

The child, in the one country, inheriting with its birth the constitutional defects developed in its parents, by years of toil and penury and vice, growing up to the age of nine perhaps, upon the scantiest fare, in the squalid cellar in the narrow lane of a crowded city, not only without education, but with scarcely sufficient parental care to attend upon its merely animal wants, then begins its life of constant service, and enters its *permanent dependent factory caste*.

In the other country, the child of parents of robust health and habits of virtuous industry, is trained from its earliest years to healthful exercise, upon abundant substantial food, in a rural home, in a climate perhaps as favorable to longevity as any in the known world, till its mental, moral and physical powers have attained their full development. It then leaves that home, a voluntary exile, with high hopes and bright visions of well requited labor and its sure reward, and spends a limited time, two, four, or six years, and returns again with a consciousness of well discharged duty and the means of promoting its own, and even its parents' future comfort and happiness.

Lest any one should suspect I am indulging in fancy, I must here quote that in 1844, of the 6320 female operatives in Lowell, Massachusetts furnished one eighth, Maine one fourth, New Hampshire one third, Vermont one fifth, Ireland one fourteenth, all other places, principally Canada, one seventeenth. At the same time, the number of operatives in our Cotton mills under fifteen years of age was only twenty-seven.

But we come now to another hygienic agent, in the fact that no persons are employed in these mills who are addicted to intemperance. "Absolute freedom from intoxicating liquors is understood throughout the city to be a pre-requisite to obtaining employment in the mills, and any person known to be addicted to their use is at once dismissed."

In whatever light we may be disposed to view the present state of public opinion upon the subject of temperance, the existence of such a regulation cannot but be regarded as conducing essentially to the public health. Too often, however, in their laudable enthusiasm, the writers on this subject have quitted the strong moral basis on which the abuse of ardent spirits rests. On the precise amount of deaths, produced by their indirect action, our data are especially defective. There is not a disease, so induced, but admits of other causes: and here is an insurmountable source of perplexity in forming any estimate other than mere guess work. The evil, says Dunglison, "resulting from the abuse of ardent spirit, and indeed of some of the simple fermented liquors, in which the spirit is in a state of combination with other substances, is of sufficient magnitude. It requires no amplification.

“To any point that demands correction or modification, the estimate or the language of hyperbole is injurious, inasmuch as it does not induce unhesitating assent. The temperance societies, throughout our land, have rendered important service. *Moderation*,—the never-failing attendant on good sense, has already modified, and will continue to modify, some of the asperities and impracticable parts of their original constitution: unnecessary self-privation and rigor will gain few proselytes, and so far defeat the praiseworthy intentions of many of their founders.” But especially is it to be regretted that it should ever assume a party character, than which no garb can worse become so heavenly a virtue. Already have we seen, in the violence of partizan warfare, the fair name of the most moral men and the best citizens wantonly assailed, because they had never seen fit to join in the unholy strife, which has disdained and rejected even the sanction of religion.

It is enough for our present purpose, that a more strictly and universally temperate class of persons cannot be found than the nine thousand operatives in the city of Lowell. No physician, however, in estimating the influence of intemperance from the bills of mortality, has a fair criterion of its real state. In the various forms of fevers, the inflammations and diseases of various organs, in convulsions, apoplexy, palsy, suicide, epilepsy, and even pulmonary consumption, he must often see its effects, if not in their production, certainly in their aggravation.

Much has been said with regard to the proper number of meals, and the interval that ought to elapse

between them. Regularity in their periods ought to be observed. They should be as nearly equi-distant as practicable, and at such intervals that one digestion may be completed before the materials are furnished for another. "Early breakfast," says Doctor Johnson, "dinner as near the middle of the day as fashion, folly, or pride will permit, a pretty hearty tea in the evening, about six o'clock, and no supper, will be found the most salutary code which a physician can lay down." Nothing in factory life could be more closely followed. So also of their plain, substantial and wholesome food. These epithets must of course demand some modification. All we mean to affirm would be, that the dietetic errors of these persons have been brought with them from their country homes. They are here perpetuated, and under their new habits of labor, are more or less prejudicial. Throughout the towns of New England, few physicians could be found ready to defend the disproportionate amount of fat, the bad cookery, and the many indigestible compounds which form the daily routine of common meals.

It has formed no part of my design to go into any minute examination of the various processes of the Cotton manufacture, involving every variety of muscular effort and posture, and every degree of intensity of muscular exertion. The female operatives are engaged universally in a kind of labor which demands a succession of light muscular movements, and are not called on to perform acts requiring undue exertion of particular parts or organs.

They are but little exposed to sudden vicissitudes of temperature, those most prolific causes of disease,

particularly of females in our own climate, owing perhaps to their in-door life and insufficient clothing. The rooms in which they work, are kept of a uniform temperature, and are lofty and well ventilated.

Lastly, their places of abode deserve a passing notice. The houses in which, with very few exceptions, these people live, belong to the capitalists who own the mills, many of whom have displayed a desire to ensure, as far as the state of the private residences can ensure, the comfort of those whom they employ, and they have accordingly built for them a superior description of tenements.

Very many, then, of the circumstances which surround and act upon our factory operatives, are of the most favorable character. They are the most obvious and simple considerations, but nevertheless, the most important, because always at work, and are precisely those common and universal influences which, after all, go to swell the grand aggregate of health or disease in communities.

I have cursorily glanced at the birth and parentage of these persons, their early education and habits, their temperance, their regular hours of rest and of taking meals, their plain, substantial food, their labor, neither too active nor too light, their little exposure to sudden vicissitudes of temperature, their well ventilated work-rooms and their comfortable abodes. These circumstances are by no means peculiar to Lowell. Throughout New England they constitute the influences which are to leave their impression, either for weal or woe: and if a long course of years be essential to the development of their effects, it is no part of a true philoso-

phy to overlook or underrate them. We repeat that we consider them as most important elements in the solution of this problem in our own country.

Like every other subject, identified or intimately mixed up with human interests and feelings, this one has proved itself the fertile occasion of very contradictory statements and opinions. One class of inquirers, guided more by overwrought sentiments of humanity, than by unbiassed judgment, have looked upon the introduction of extensive manufacturing establishments as little less than an unmitigated injury done to the bulk of society, "accumulating the fruits of labor within the possession of a comparatively small number of capitalists, to the utter destruction of all health and comfort, on the part of the actual producers of wealth:" whilst another class, regarding the matter under another point of view, and more under the influence of a cool, calculating and selfish political economy, maintain that the extension of manufactures in our country will carry with it the least possible amount of disadvantage to the masses engaged in them. Others, again, more in the desire and spirit of unprejudiced inquiry, have come to intermediate conclusions, believing that, like all other human institutions, more or less of evil may be discovered and foreseen in this, coincidently with very great advantages to mankind as a whole. To one of these classes we trace the assertion that the health of multitudes of these operatives is broken down by long confinement and excessive toil, who, finding their strength failing, return to their homes, leaving behind them no memorials of their sickness and death. To another class

we should attribute the attempt to show that their health is essentially and permanently improved by working in the mills.

While we maintain that many of the conditions of health are as little violated by manufacturing industry, as by an immense proportion of other pursuits, we still believe that factory labor is, on some accounts, injurious. How, indeed, can it be otherwise, when regarded as a whole? Individuals thus employed, do not spend in the open air, on an average, more than an hour or an hour and a half in the twenty-four: and work is resumed almost the moment the meal is swallowed, allowing scarcely any rest for the commencement of a healthy digestion. Causes like these must and do depress, more or less, the vital powers, and induce certainly, perhaps slowly, a lower state of the general health than would exist with the opposite state of things. In all this, however, we have nothing peculiar to the factory system. With the great majority of the working classes, these causes have a general operation. In the case of hundreds of females employed in various occupations with their needles, the same conditions of labor are applicable, and present almost the same exceptionable points as those of our manufactories.

Among the most prominent perhaps of the adverse influences, as must occur to every one, is the too long confinement by the protracted hours of labor, amounting in the case of the mills at Lowell, to an average per day, throughout the year, of twelve hours and eighteen minutes. It is in no spirit of sympathy with a certain class who are seeking to turn the public attention to this matter, that we

would declare ourselves in favor of abridging these hours. On the contrary, nothing can be more ill-judged than these attempts to create distrust and ill-will between the employers and employed, between whom, every thing should be designed to cherish the utmost kindness and consideration. It is an amount of undivided attention, however, which cannot be sustained, week after week, and month after month, without manifest and serious derangement of the general health, whether it be in the study of the clergyman, the counting-house, the court of justice, the halls of legislation, in the cotton mill, or any other work-shop. Sooner or later, in proportion to the powers of resistance, and adaptation of the individual, the citadel must yield and the enemy triumph. How shall we determine the precise amount of labor and exertion, which will prove safe and expedient in each? I apprehend the data which are advanced to establish ten hours are as defective as any. But of one point we may be certain, that as there can be shown to be no occupation which is so purely mechanical, such a complete repetition of the same minute procedures over and over again, with hardly the change of a thought in the mind, yet demanding close and steady attention, this may unravel the great secret of the wear and tear of factory life.

There is, in this business, too, such a nice sub-division of labor, and delicate adjustment of responsibility, from the superintendent in his counting-room, to the lowest laborer in his employ, all admitting of almost mathematical precision in the results of their work, and all under the stimulus of the rivalry of sim-

ilar establishments, and at the foundation of all, such a mighty spirit of commercial enterprise, that the limit of human powers is scarcely suffered to enter into the account. The acquisition of wealth becomes the universal, the all-absorbing concern, and taxes the powers of all to the utmost. No one pauses, or even seems disposed to pause, to ask by what means, or at what cost, are these results obtained? The consideration of the long hours of labor is by no means confined to our factory system. It is no local or peculiar incident, but an evil of great magnitude, if not a national sin.

The over-strenuous exertion of the faculties, mental and corporeal, must inevitably lead to the deterioration and destruction of the living machine. The same cause, to wit, hard work, or rather over-exertion, it is, which makes our fields better cultivated, our houses better furnished, our cottons better manufactured, our machinery more effective, our merchants more rich. Does not all this tell at last upon the constitution, intellectual and corporeal? Have not those of us who live in the midst of this excitement, seen striking proofs of it? I do not speak of mere labor of the body. The fatigue induced by the hardest day's toil may be dissipated by "tired nature's sweet restorer," but not so the fatigue of the mind. Thought and care cannot be discontinued or cast off, whenever we please, like exercise. The head may be laid upon the pillow, but a chaos of ideas will infest the anxious brain, and either prevent our slumbers, or render them a series of feverish, tumultuous or distressing dreams, from which we rise, more languid than when we laid down.

Just in proportion, too, as the operative classes are raised by general intelligence and education, in the same ratio grows the natural and almost universal aim of bettering their condition, that is, of rising a step above their present station, till it becomes an ever-active impulse. It prompts to the highest, yet perfectly voluntary, exertions: it operates insensibly. All the little discomforts of situation, the minor ails of life, and even the premonitory symptoms of the graver maladies, are unheeded: a series of carefully arranged queries (ay, and answered with all candor, too), may only elicit that their general health is improving. But granting that this super-excitement makes no appreciable difference in the bills of mortality, will it be inferred from thence that health and happiness are not sufferers by the collision? Are not whole tribes of maladies thus engendered, which may not materially shorten life, but must render it a burden? Most assuredly. The devastation which is worked in this way exceeds, far exceeds calculation or belief. It is true that overseers and others may be found that have spent their ten, fifteen or twenty years in this employment. May it not be found that toil and care of body and mind have forwarded each of them a step or two, *in advance*, on the path of human existence?

I have deferred, until now, any reference to individual diseases which have been charged to the effects of the cotton manufacture. To this I have been led by two considerations. Although now for many years intimately conversant with a large population of this character, I have left upon my mind only those general impressions which will be scarcely at all satisfactory to a phi-

losophical inquirer after the truth; and in the next place, my whole professional life has been confined to one residence, thus precluding any thing like a comparison of the pathology or mortality of my own city with those of others.

If we look back upon the testimony afforded by the medical witnesses in England upon this subject, we might quote a formidable catalogue. Diseases of the character and class ordinarily comprehended under the term scrofula, seem to constitute the sum of alleged consequences. Dyspeptic symptoms, nervous diseases, stunted growth, languors, lassitude, general debility, prompting to recourse to sensual stimulants, osseous deformities, glandular disease, asthma, consumption. Varicose veins and breaking down the plantar arch are charged to the long standing. The French physicians describe one class of their work people worse situated in a sanatory point of view than the rest, the batters of cotton in the fine mills, whose occupation obliges them to inhale much dust and *flue*. Whether it be the dust contained in the raw cotton, apart from the cotton flue, or this latter itself, which ruins the health of those engaged in the process, the decay of their health is ever certain and an established fact. They complain of dryness in the mouth and throat, and are seized sooner or later, with a cough gradually increasing in severity. The cough is the first symptom of a slow and formidable disease of the chest, which is always relieved on abandoning the work, and altogether cured at its commencement, if the employment be not resumed. The disease, in the progress of its development, assumes all the char-

acteristics of Phthisis, and the medical men in the manufacturing districts call it Cotton Phthisis, and some Cotton Pneumonia.

In contrast to this, I am enabled to append to these remarks a series of tables, deduced from the bills of mortality, for sixteen successive years, which have been kept with a very commendable degree of care. Any inferences from them, however, on many accounts, must be cautiously received, and any satisfactory comparison of the individual diseases is impossible, except with Boston, owing to defects in the registration. In a course of years, however, it is very easy to foresee that such a record will possess interest. The great experiment, which is on trial in Lowell, is to be repeated and extended throughout our country. The evils which will result (and everything human has its evils) are to be met and overcome by the sagacity and perseverance which characterize our countrymen.

It has been most truly said, "Man is not a mere producer; a mere machine. His life or death, his happiness or misery, is much too high an object upon which to place a pecuniary value. He is more nicely made, more wonderfully organized, requires to be guarded with more care from any influence that may surround him to produce disorganization and unfit him for use, is capable of higher and nobler purposes, and has a higher and nobler destiny, and in proportion as in each of these, he exceeds a mere machine, in such proportion ought we to regard his intellectual and moral nature, and the means used to preserve and develop his physical powers, to enable him best to accomplish the great purposes of his existence."

If improvements and changes are ever to be desired in our large manufacturing cities, let them be based, not upon the necessity of such municipal innovations to avert a pestilential havoc of human life, but upon the true merits of the question, the comforts, conveniences and elevation of taste and moral purity thence arising.

But amidst all the responsibilities and pressing duties, Gentlemen, of the profession which we have chosen, the revolution of each year brings with it solemn reflections in the death of our fellows and associates. Since our last anniversary, eight of our number have gone to their reward. To one of them, at the advanced age of ninety-nine, the summons must have been the welcome release, while all the others, save one, have been overtaken in the midst of years of activity and usefulness. With the circle of surviving friends, be it more or less extended, we would drop the tear of sympathy.

Our vocation, by the constant exhibition of human pain and weakness, tends to awaken the best emotions of our nature, to foster the benevolent affections, and to promote all the charities of social life. It affords us continued opportunities of showing kindness to our afflicted fellow-creatures, of manifesting love towards our neighbor. The high and the low, the rich and the poor, are embraced in its ministrations. Hallowed, as it ought to be, by religious motives, it holds out its unspeakable comforts and peculiar benefits, without stint or scruple, to all. "Suffering and danger are the only necessary passports to its kind offices."

Nor should the salutary lessons of its teachings be

lost upon ourselves. We, of all men, should learn how vast a proportion of all bodily pains and infirmities, directly or indirectly, spring from evil courses, the sins of our fathers, or our own unbridled passions. We, of all men, should learn the uses of such sufferings, mercifully designed to recall us from our sense of self-security, and the treacherous slumber of temporal prosperity. Above all, our daily walk, in the constant view of the sickness and deaths of our fellow-men, should remind us that our time is short and uncertain. Happy will be for us, when we are summoned to our last account, the consciousness that our high profession has been practised under the solemn sanctions of Christianity, and its last exercise closed with a reasonable, religious and holy hope.

OBITUARY.

The following members of this Society have died since the last Annual Meeting.

1845.		<i>Entered the Society.</i>		<i>Age.</i>
June 24,	HENRY TUCK, Barnstable,	-	1837	- - 40
" 9,	LEMUEL W. WASHBURN, White Oak Springs, Wisc., removed from New Bedford in 1842,	- - -	1840,	- - 33
Aug. 9,	PAUL O. KITTREDGE, Chelmsford,	1824,	- -	65
" 10,	JOSEPH O. OSGOOD, Kensington, N. H., removed from Amesbury in 1818,	- - -	1813,	- - 63
Oct.	JOSIAH KITTREDGE, Nashua, N. H., removed from Boston in 1837,	1833,	- -	60
Oct. 19,	†TIMOTHY L. JENNISON, Cambridge,	1803,	- -	84
1846.				
Jan. 15,	JASON C. AYER, Boston,	- -	1836,	- - 34
Feb. 18,	GEORGE ESTERBROOK, Rutland,	1822,	- -	51
May,	†JOHN WILLIAMS, Concord, N.H.,	1827,	- -	99

† Retired Members.

ERRATUM.—In the obituary, on page twenty-seven, an error has occurred in recording the death of Josiah Kittredge, of Nashua, N. H., who is now living.

TABLE I.

Statement of Deaths in Lowell, Mass., for a series of sixteen years, viz.: from January 1, 1830 to January 1, 1846; containing the amount and number which has occurred from the most prevailing diseases.

YEAR.	DISEASES OF LUNGS.				FEVERS.				INFLAMMATIONS.							DROPSY.				BOWEL COMP.								
	Whole No of Deaths.	Consumption.	Acute Affection.	Total.	Typhoid	Puerperal	Scarlet.	Bilious.	Infam'y.	Type not defined.	Total.	Lungs and Chest	Brain.	Heart.	Stomach & Bowels.	Bladder & Kidneys.	Liver.	No organ or type named.	Total.	Brain.	Chest.	Organ not named.	Total.	Cholera Inf.	Dysent'y.	Diarrhœa	Colic.	Total.
1830	114	13	4	17	5		14		3	22	5	4	2	5	5		1		17	5	2		7	3	6	6	1	16
1831	124	16	6	22	5		13		2	20	9	5		5	5				21	2	1	1	4	8	8	8	11	8
1832	184	15	28	43	21	1	7	1	4	44	21	7	1	5	13	1	3	2	36	4	2	1	7	24	8	6	38	
1833	223	18	22	40	34		17		2	60	15	5	8	8	1	1		1	46	4	2	1	7	18	12	4	34	
1834	225	20	27	47	30	4	12	1	7	54	18	3	1	7	1	1		7	32	7	3	4	10	12	3	1	24	
1835	236	23	22	45	22	2	16	1	4	46	14	4	1	4	7		4	4	32	4	5	1	8	8	6	6	26	
1836	293	22	26	48	27	3	8	1	3	42	12	3	1	4	4		1	5	36	4	2	3	7	16	4	4	23	
1837	329	45	11	56	26	4	38			68	19	1	5	10	1	1	3	5	66	10	2	3	15	34	2	1	49	
1838	438	65	37	102	32	3	31			86	37	9	2	9	1	1	3	5	54	8		5	13	15	3	11	30	
1839	362	62	29	91	44		12			56	29	11	2	12	2			5	75		3	6	12	12	7	7	66	
1840	426	40	32	72	26	5	7	1	2	41	29	35	3	8			1	4	55	15	3	3	18	34	18	8	60	
1841	456	54	35	89	16	1	43		7	68	35	11	1	7	1				82	23	1	1	25	37	17	29	83	
1842	473	70	43	113	43	3	32		5	83	43	8	8	18					65	20	3	1	20	35	11	5	51	
1843	398	73	34	107	38	2	6			50	34	8	5	17	1				61	31	3	1	35	28	2	5	35	
1844	362	77	43	120	26	3	3			31	42	4	6	9					61	31	2	7	30	28	2	5	28	
1845	363	71	33	104	40	6	12			57	33	6	2	7					702	21	2	7	30	28	2	5	28	
Tot.	5006	684	432	1116	435	55	271	3	5	39	828	398	124	45	144	9	9	27	702	159	25	35	219	312	152	114	4	602

TABLE I.—CONTINUED.

YEAR.	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840	1841	1842	1843	1844	1845	Tot.
Jaundice.					1	2	1	1	2	1	2	1	1	1	3	1	10
Anæmia.		1	1	1	2	2				1	3				3	1	15
Strang'd Hernia.					1		1	1			1			1			5
Ovareain Disease.					1		1							1			3
Caries of Spine.					1				1			1		1		1	5
Convulsions.	3	2	1	2	4	6	8	5	7	10	5	10	15	9	10	11	108
Croup.	1	3	6	5	2	5	4	4	14	5	6	4	4	3	6	2	74
Hooping Cough.	2	1		3	1	4	5		11	3	6	3	5	11	4	13	72
Measles.	2		12	2	4	3	2	7	13		4	12		10	4		75
Small Pox								7	1		1	2					11
Asthma.					1						1						2
Apoplexy	2	1	1	3	3	4	1		5	3	2	4	2	6	3	8	50
Palsy.						1				1			2			1	5
Del. Tremens.	1	2		2	1	1	1	1	5	2	3	2	7	4	2	2	35
Suicide.				3	2	1	1	2	1	4	2	1	2	1	2	4	24
Cancer.					1	1			1	1			2	2	2	1	11
Part. and Childbed.						1			1	1	1			1	2	2	8
Epilepsy.								1						1			8
Rupture of Uterus.					1				1					1	1	1	5
Old age.		1			2	3	2		4	2	3		2	4	1	2	26
Diabetes.																	
Abscess.					2				1				1	2			4
Scrofula.	1					1	1	1	1	1				5	1	3	16
Erysipels	1	1	2		4	3	2		3	2		1	3	2	5	3	34
Casualties.	9	8	12	10	17	9	8	7	19	27	12	12	8	14	16	19	207
Still Born	11	7	6	12	4	7	10	28	29	22	19	22	23	34	28	31	293

TABLE II.

This is designed to show the ages at which the Deaths in Lowell have occurred in each year of a series of sixteen years, viz.: from January 1, 1830, to January 1, 1846; commencing with the deaths which have taken place during the first year of life and ending with those between 90 and 100. The whole time is divided into thirteen periods—the mortality at each of which, in proportion to the whole amount, is as follows:

Under	1 year, as 1 in	4.9
Between	1 and 2, " 1 "	7.38
	2 " 5, " 1 "	10.01
	5 " 10, " 1 "	21.
	10 " 20, " 1 "	21.67
	20 " 30, " 1 "	9.91
	30 " 40, " 1 "	7.17
	40 " 50, " 1 "	13.3
	50 " 60, " 1 "	24.3
	60 " 70, " 1 "	45.8
	70 " 80, " 1 "	65.86
	80 " 90, " 1 "	139.1
	90 " 100, " 1 "	500.

Dividing the sum of the ages at which the deaths occurred, by the whole number of the deceased, we have 20.65 years as the mean duration.

TABLE III.

Showing the proportion of deaths in Lowell, by each of the most frequent diseases, to the whole number of deaths, in a series of sixteen years, forming a scale of mortality.

Order of Mortality.	DISEASES.	Whole number of Deaths.	Being to the whole amount of deaths as one in	Whole No of deaths from diseases of a similar class.	Proportion of deaths from diseases of a similar class to the whole No. of deaths as one in
1st.	Consumption,	684	7.30	828.	6.04
2nd.	<i>Fevers, viz:</i>				
	Typhoid,	435	11.4		
	Scarlet,	271	18.1		
	Puerperal,	55	90.1		
	Inflammatory,	5	1001.		
3rd.	Bilious,	3	1668.		
	Type not defined,	39	128.3		
	<i>Inflammations, viz.:</i>				
	Lungs and Chest,	398	12.5		
	Stomach and Bowels,	144	34.7		
	Brain,	124	40.5		
	Heart,	45	111.2		
	Liver,	9	556.2		
	Bladder and Kidneys,	9	556.2		
	Neither organ nor type named,	27	226.		
4th.	<i>Bowel Complaints:</i>			602.	83.1
	Cholera Infantum,	312	16.0		
	Dysentery,	152	32.9		
	Diarrhœa,	114	43.9		
5th.	Colic,	4	1251.5		
	<i>Dropsies:</i>				
	Brain,	159	31.4		
	Chest,	25	200.2		
6th.	Organ not named,	35	143.	219.	22.8
	Casualties,	207	24.1		
	7th. Convulsions,	108	46.3		
	8th. Measles,	75	66.7		
	9th. Croup,	74	67.6		
	10th. Hooping Cough,	72	69.5		
	11th. Apoplexy,	50	100.1		
	12th. Delirium tremens,	35	143.		
	13th. Erysipelas,	34	147.		
	14th. Old age,	26	192.5		
	15th. Suicide,	24	208.8		
	16th. Scrofula,	16	312.2		
	17th. Anæmia,	15	333.		
	18th. Small Pox,	11	455.		

TABLE III.—CONTINUED.

Order of Mortality.	DISEASES.	Whole number of Deaths.	Being to the whole amount of deaths as one in	Whole No of deaths from diseases of a similar class.	Proportion of deaths from diseases of a similar class to the whole No. of deaths as one in
19th.	Cancer,	11	455.		
20th.	Jaundice,	10	500.		
21st.	Parturition and Childbed,	8	625.		
22d.	Epilepsy,	8	625.		
23d.	Palsy,	5	1001.		
24th.	Rupture of Uterus,	5	1001.		
25th.	Strangulated Hernia,	5	1001.		
26th.	Ovareain Disease,	3	1668.		
27th.	Abscess,	3	1668.		
28th.	Caries of Spine,	3	1668.		
29th.	Asthma,	2	2503.		

TABLE IV.

The ages at which deaths in Lowell have occurred in each year of a series of sixteen years, viz. : from the 1st of January, 1830, to the 1st of January, 1846—still born excluded.

	Und 1 yr.	1 to 2.	2 to 5.	5 to 10.	10 to 20.	20 to 30.	30 to 40.	40 to 50.	50 to 60.	60 to 70.	70 to 80.	80 to 90.	90 to 100.	Age unk.	Wh. No. of deaths.	Aver. of life for each year.
1830	29	18	9	3	10	16	13	6	2	2	1	1		6	114	18.21
1831	26	18	10	4	7	21	17	12	2	2				5	124	19.89
1832	41	28	23	27	29	17	3	4	4	2	1			5	184	13.35
1833	21	30	24	16	16	36	43	13	2	3	2				223	17.80
1834	21	31	36	11	8	26	23	23	8	5	2	2			225	20.23
1835	31	31	25	13	15	20	35	27	15	8	5	1			236	20.91
1836	72	57	32	9	12	12	50	30	10	9	3	4	1		329	16.61
1837	70	59	30	7	18	11	47	35	7	4	2	1	1		331	17.45
1838	78	77	47	33	14	32	39	33	26	16	7	3	2		436	20.31
1839	73	32	30	9	3	50	65	33	18	15	6	3			362	25.04
1840	64	37	18	14	24	59	37	19	12	12	7	1			426	17.03
1841	99	67	69	22	5	29	49	27	25	14	8	5	3		456	19.62
1842	112	73	42	23	13	41	69	39	23	14	12	7	2	1	473	23.38
1843	92	29	26	19	15	27	59	41	25	10	5	5	1		364	25.10
1844	98	49	37	18	15	55	40	16	18	8	7	1			362	19.89
1845	84	42	42	10	23	53	53	19	10	7	8	2			363	20.68
Tot.	1011	678	500	238	231	505	642	377	206	131	76	36	10	12	5006	20.65

CENSUSES IN LOWELL.

Abstract from all the Censuses which have been taken in the town and city of Lowell, Mass.

MALES.		1828.	FEMALES.	
Under 7 years,		196	Under 7 years,	217
From 7 to 14,		138	From 7 to 14,	162
" 14 to 30,		723	" 14 to 30,	1496
" 30 to 50,		258	" 30 to 50,	277
Over 50,		27	Over 50,	38
Total,		1342	Total,	2190

Grand total, 3532.

MALES.		1830.	FEMALES.	
Under 5 years,		324	Under 5 years,	302
From 5 to 10,		171	From 5 to 10,	202
" 10 to 15,		189	" 10 to 15,	249
" 15 to 20,		216	" 15 to 20,	933
" 20 to 30,		958	" 20 to 30,	1792
" 30 to 40,		358	" 30 to 40,	353
" 40 to 50,		111	" 40 to 50,	164
" 50 to 60,		37	" 50 to 60,	57
" 60 to 70,		14	" 60 to 70,	20
" 70 to 80,		6	" 70 to 80,	8
" 80 to 90,		1	" 80 to 90,	1
Total,		2385	Total,	4081
Colored Males,		7	Colored Females,	4
Total,		2392	Total,	4085

Grand total, 6477.

MALES.		1832.	FEMALES.	
Under 10 years,		703	Under 10 years,	771
From 10 to 20,		563	From 10 to 20,	1464
" 20 to 30,		1996	" 20 to 30,	2713
" 30 to 40,		720	" 30 to 40,	633
" 40 to 50,		208	" 40 to 50,	238
" 50 to 60,		62	" 50 to 60,	83
Over 60,		27	Over 60,	52
Total,		4279	Total,	5955
Colored Males,		12	Colored Females,	8
Total,		4291	Total,	5963

Grand total, 10,254.

MALES.		1833.	FEMALES.	
Under 10 years,		905	Under 10 years,	968
From 10 to 20,		813	From 10 to 20,	2998
" 20 to 30,		1638	" 20 to 30,	2914
" 30 to 40,		792	" 30 to 40,	675
" 40 to 50,		202	" 40 to 50,	132
" 50 to 60,		64	" 50 to 60,	159
Over 60,		23	Over 60,	80
Total,		4437	Total,	7926

Grand total, 12,363. Total colored population included, 33.

CENSUSES IN LOWELL.

MALES.		June, 1836.	FEMALES.	
Under 10 years,		1489	Under 10 years,	1520
From 10 to 20,		1124	From 10 to 20,	2990
" 20 to 30,		2200	" 20 to 30,	4689
" 30 to 40,		966	" 30 to 40,	1296
" 40 to 50,		372	" 40 to 50,	475
" 50 to 60,		144	" 50 to 60,	122
Over 60,		60	Over 60,	96
Total,		6345	Total,	11,288
	Colored, 44.		Grand total, 17,633.	

MALES.		May, 1840.	FEMALES.	
Under 10 years,		1865	Under 10 years,	1865
From 10 to 20,		1369	From 10 to 20,	3464
" 20 to 30,		2143	" 20 to 30,	5568
" 30 to 40,		1128	" 30 to 40,	1605
" 40 to 50,		520	" 40 to 50,	650
" 50 to 60,		224	" 50 to 60,	318
Over 60,		92	Over 60,	170
Total,		7341	Total,	13,640
	Colored, 58.		Grand total, 20,981.	

MALES.		May, 1844.	FEMALES.	
Under 10 years,		2441	Under 10 years,	2391
From 10 to 20,		1621	From 10 to 20,	3642
" 20 to 30,		2565	" 20 to 30,	5945
" 30 to 40,		1559	" 30 to 40,	2098
" 40 to 50,		773	" 40 to 50,	946
" 50 to 60,		320	" 50 to 60,	431
Over 60,		153	Over 60,	244
Total,		9432	Total,	15,697
	Colored, 44.		Grand total, 25,163.	

The total population in May, 1846, is 28,841. The number between four and sixteen years, 5,280.

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