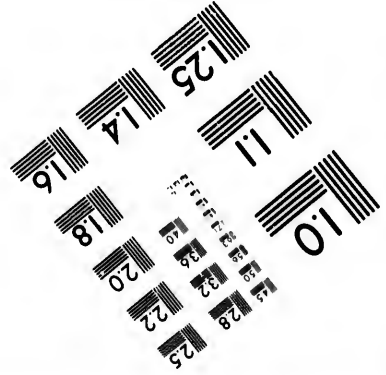
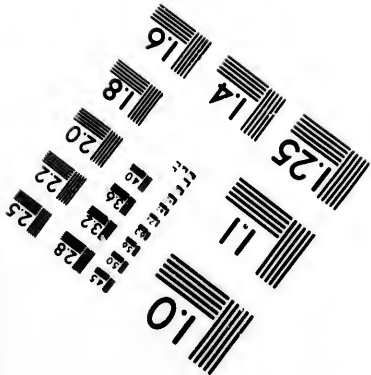
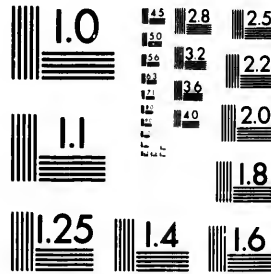


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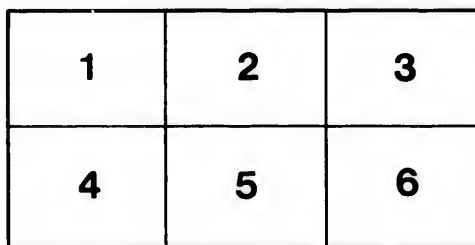
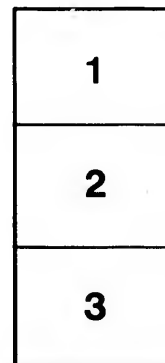
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*President
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David Russell Jack

ADDRESS

UPON THE

Jan. 12.

PROGRESS OF MEDICAL SCIENCE,

READ BEFORE THE

NEW BRUNSWICK MEDICAL SOCIETY,

BY

WILLIAM BAYARD, M.D., EDIN.

President of the Society, Vice-President of the Canadian Medical Association, Corresponding Member of the Gynecological Society of Boston, Chairman of the Board of Health, and President of the Hospital Board of St. John, N. B.

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1871.

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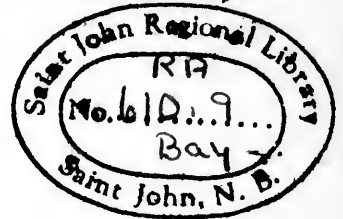
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David Russell Jack Bequest.
ADDRESS

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ST. JOHN, N.B., February 5th, 1871.

MY DEAR SIR.—I have to inform you that, at a meeting of the Medical Society in this city held on the 1st of February, a resolution was unanimously passed to secure the publication of the address upon "The progress of medical science" read by you before the Society on the 18th of January; and that 500 copies be obtained.

I am Sir, yours &c.,

CHAS. HOLDEN,
Secretary.

Dr. W. Bayard, President N. B. Medical Society.

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PROGRESS OF MEDICAL SCIENCE.

GENTLEMEN.—The By-Laws of our Society direct that the president shall be elected annually; the rule is a good one, placing, as it does, the “honourable situation” into the hands of those who gave it, perhaps to be bestowed upon a more worthy member: and my term of office having expired, I must this evening call upon you to select another in my stead.

In retiring from the chair in which you have so kindly placed me, I would do injustice to my feelings, did I not avail myself of this opportunity to thank you for the courtesy that has been universally exhibited towards me, and let me add, that our meetings and debates have been conducted in a spirit of fraternity and kindness highly pleasing to reflect upon; illustrating the fact that associations like this tend to cultivate the heart, as well as the head, and to promote professional good-will, and genuine brotherhood among their constituent members.

That the study of medicine is vastly promoted by such associations must be acknowledged. For the stimulus of mind upon mind, invigorates and sharpens the intellectual faculties, and produces a kind of intellectual contagion stimulating members to exertion. Our mutual intercourse, criticisms, and discussions, form “at once a school and an ordeal,” teaching us to become more rigid observers of the medical phenomena occurring in our practice, more careful in our classification of these phenomena, and more perfect in our deductions from them.

Few of us leave this room without having heard some new professional fact, or idea, calculated to arrest our attention, and perhaps destined to give us a new and increased interest in some particular disease. And we are justified in assuming that the progress made in the healing art during the present century, may be attributed, in a great measure, to the stimulating and regulating influence of medical association.

Most of us have heard it broadly asserted that the healing art has remained comparatively stationary during the present century, while other departments of science and art have, during the same period, advanced with great rapidity.

It is true the marvellous applications of steam are creations of the present century. Watt and others have taught mankind to subdue and harness that "docile monster" to different kinds of machinery. By the steamboat we are safely wafted from shore to shore independent of wind or tide, and with the swift rush of the "iron horse" we are conveyed from place to place with the speed of the bird. It is also within the memory of most of us, that a greater feat has been achieved; the Electric Telegraph, that "railway of the mind," has annihilated space, and enabled us, instantly, to whisper our very thoughts from one extremity of the world to the other. And the "science of chemistry has taught the artist to convert that sun himself into a matchless painter," who, with wonderful rapidity, can elaborate the most difficult portraits and complex landscapes, with a degree of perfection unattainable by the human hand.

Yet it may be confidently maintained, that during the period in which these brilliant discoveries have been taking place, medicine has advanced in various directions and forms, by strides as marked and as great as those belonging to any other department of art.

To prove this statement let me endeavour to recall to your recollections some of the *principal* advances and changes that have been produced during the present century. Time will not permit, even were I able to discuss in detail, however briefly, the alterations that have occurred in some of the branches of medical study. As for example, in chemistry, a science, the very language of which has become revolutionized under the guidance of the atomic theory. Physiology has greatly improved, and is daily gaining additions to its domain. And anatomy itself has advanced in modern days, as is evidenced by the discovery that almost all, if not all the component elements and tissues of the human body, and of the bodies of other organized beings, do either consist, or have originally consisted, of nucleated cells.

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I need not tell you that *Pathological Anatomy* was known and in some degree appreciated in olden times. But it is within the present century, that, by its light, the nature of diseases previously all but unknown have been explained, such as Bright's disease, morbus Addisonii endocarditis, ramollisement of the brain, phlebitis, œdema glottidis, emphysema of the lungs &c., &c. It has enabled us to separate into specific diseases, affections formerly confounded together; as, for instance, the different diseases of the heart, various kinds of tumours, inflammatory affections of the lungs, pleurisy, pneumonia and bronchitis, &c., &c., and it has corrected our ideas respecting the nature of some maladies, by teaching us, for example, that delirium tremens is not to be confounded with inflammation of the brain and treated as such; that hydrocephalus, which was formerly recognised as pure dropsy, is the result of inflammatory or acute tubercular disease; that gangrena senilis is caused by obstruction and arterial inflammation, and not the result of weakness; and that cirrhosis should not be confounded with pleurisy. It has also taught us that in hysterical subjects, affections strangely resembling destructive disease of the synovial membrane of the joints, may occur, without the existence of such disease, and it has enlarged our knowledge of the causes and consequences of pyæmia. By it we have recently learned that the parasites infesting some of the brute creation used as the food of man, when taken into the human stomach alive, will produce a parasite of a different character, namely the tape-worm. For example, the bladder-worms growing between the fibres of the lean flesh of a measly pig constitute a preparatory stage of the common human tape-worm, the "tœnia solium," and in systematic zoology are described under the name of cysticerci cellulossæ, when eaten by man, are transformed into tape-worms. It is stated by Küchenmeister that on the 24th of November, 1859, he gave a prisoner 20 measles, and 20 more on the 18th of January 1860, in sandwiches made with sausage. The prisoner was executed on March 31st, 1860, that is, four months after the first, and two months and a half after the second eating of the measles. A, the post-mortem examination 19 tape-worms, 11 of them 5 feet long

were found in the small intestines. If the meat containing the parasite is thoroughly well salted or cooked, no injurious consequences will result from eating it.

The microscope has changed and corrected our ideas respecting certain maladies, by proving the vegetable or cryptogamic structure of various eruptions upon the cutaneous and mucous surfaces of the body. It has revealed to us affections, the existence of which was previously unknown, as leucocythæmia, sarcinæ ventriculi, &c. It enables us to ascertain the malignant character of certain tumours and discharges. By it we learn that most of the entozoa found in the interior of the human system, enter it in the form of ova, along with our food and drink, thereby enabling us to modify our sanitary system, and it has greatly enlarged and will doubtless continue to enlarge our knowledge respecting the different morbid states of the urinary secretions. Indeed the microscope in the hands of the modern practitioner, answers in a moment questions unanswerable without it.

The department of *Pathological Chemistry* has advanced much within the present century. It is advancing daily, and a herculean amount of work and information may be expected from it. We have reason to believe that if we knew the pathological chemistry of the blood and fluids as well as we know the pathological anatomy of the solids of the body, then medicine as a science and an art would make advances of the greatest moment.

Pathological chemistry and pathological anatomy together, enabled Dr. Bright to establish the great importance of albumen in the urine, as connected often, though not always, with organic changes in the kidney, but always indicating change in the pathological chemistry of the blood itself. And the recent researches of Dr. Richardson and others, have established that in very many inflammatory diseases, the fibrine of the blood is increased in quantity, and that the change of the fibrine from a fluid to a solid state is caused by increment of heat. Pathological chemistry has also proved to us that the fibrine in the blood is increased in cholera, while it is decreased in malarial and typhus fevers. And recent experiments have demonstrated the fact that the white corpuscles escape from the blood-vessels in inflammation.

A higher and more refined organic chemistry may yet enable us to detect the presence of special toxicological or morbid states of the blood as producing the characteristic inflammations of the skin in eruptive diseases, puerperal and other fevers. May it not be a blood poison which gives rise to the numerous local, serous and other inflammations so often observed in patients suffering under albuminuria, and by it that vexed question may be settled, as to whether rheumatic fever is due to a *materies morbi*, and whether such *materies morbi* is lactic or acetic acid; and a higher chemistry may perhaps enable us to neutralize these pathological poisons in the system, or eject them from it.

The recent beautiful theory of Liebreich suggesting the adoption of the hydrate of chloral as a therapeutic agent, when he says that "the hydrate treated with an alkali is resolved into chloroform and a formate, The blood being an alkaline fluid, therefore when the hydrate is introduced into the organism, every particle of it will consume the surrounding quantity of alkali, and the decomposition will be completed only after the required amount of alkali has been furnished by the blood. Immediately a minimum quantity of chloroform is formed, and passes to the first place of action, viz., the ganglionic cells of the cerebrum. The action with the increase of chloroform in the blood extends to the ganglia of the spinal cord, lastly, it extends to the ganglia cells of the heart. The researches of Dr. Richardson, based upon the suggestion of Liebreich, and the practical experience of the medical profession respecting its use, illustrate what may be expected from a higher pathological chemistry.

When we contrast medical practice at the present day with what it was sixty years ago, it must be acknowledged that the modern practitioner is greatly assisted by the late improvements in the means of *physical diagnosis*. By it he endeavours to discover during life, that which was formerly revealed only by the scalpel after death.

A *perfect* diagnosis cannot be arrived at, till we have an exhaustive pathology—for without a knowledge of what is *possible* in disease, diagnosis must be defective. Moreover, that which might be considered a pathological fact to-day, by changing circumstances may be proved

erroneous to-morrow. Therefore, in the present state of our knowledge, we must be guided by the *probable* in disease. That experience which is able to anticipate causes, and from causes their effects, often enables the practitioner, as by prophetic insight, to diagnosticate conditions which neither direct physical examination nor the most systematic arrangement of symptoms would explain.

But, as already stated, modern invention and research have greatly contributed towards determining the true nature, and consequently in fixing more accurately the true treatment in different diseases; as, for example, Laennec and a host of subsequent observers have taught us how to map out the condition of internal parts, the action of which we hear, but cannot see. Czermak and others, by the application of optical instruments, have exposed to view organs of the body before inscrutable; the pharynx, the vocal cords, the trachea, the vagina, the uterus, the bladder, &c.; so that many of the hidden causes of disease are no longer a matter of conjecture, but of sight and demonstration.

The ingenuity of Helmholtz has disclosed the secrets of the eye; and it is not asserting too much to say that the *ophthalmoscope* has done more to increase our knowledge of diseases of that organ than has been accomplished during a century by all other means; and that the oculist can point to brilliant triumphs over diseases hitherto deemed incurable; and he is not now obliged to class a number of deep-seated diseases of the eye under the head of amaurosis—to which the remark of Walther is so applicable—"a condition where the patient sees nothing, and the doctor also—nothing." The ophthalmoscope also teaches us that some states of the eye are pathognomonic of suspected conditions of other parts of the body.

The *Sphygmograph* of "Marey" has so supplemented the sense of touch that the wave phenomena of the pulse and heart are registered by which we can fathom the secrets of the circulatory apparatus.

The *thermometer* has been brought to our aid with good practical results illustrating the temperature in different diseases.

And the *test tube* ably assists us in diagnostivating morbid conditions of the urine, &c.

Materia medica has greatly improved during the present century. Many new medicines have been added to the Pharmacopœia, and some have properly been expunged from it. The modern discovery of the active principles in our vegetable medicines under the form of the alkaloids, as quinine, morphia, ~~salicine~~, atropine, &c., &c., has given the practitioner of the present day the means of exhibiting some of the most powerful and useful medicines in a concentrated form; not in the shape of large powders and nauseous tinctures, infusions and decoctions. And we have reason to hope that the work has only commenced, and that the chemist may further assist us by disarming most of our drugs of their revolting and disagreeable taste—a boon to both practitioner and patient.

Possibly most of the indications in therapeutics may yet be attained by the administration of medicines in other and less repulsive modes than through the stomach. While *inhalation* has been practised since the time of Galen, still modern chemistry and ingenuity have done much towards establishing it as *one* of the methods of exhibiting medicine. The method of *subcutaneous* injection is of modern creation,—daily experience proves its value,—by it we obtain a more rapid and certain effect from the remedy employed.

The practitioner of the present day can point with pride and satisfaction to the late improvements in *Practical Surgery*, without comparing its present state with the period at which the chafing-dish and the searing-iron were as indispensable to arrest hæmorrhage as is now the ligature; and when the cries of the sufferer were smothered only “by the hissing of the heated cauterics against the surface of the bleeding wound.”

Appreciating the wonderful powers of nature in the cure of disease, his treatment of wounds and injuries is more simple and rational. He now allows the bleeding to cease, washes away all coagula, closes the wound and applies light water-dressings instead of the complex ointments, compresses, pledgets of carded tow, rollers, straps, &c., in use forty or fifty years ago. Nor has he the same dread of the appliance of stitches as his forefathers had. In fact, some of the greatest triumphs of modern surgery are associated with this simple mechanical process, as for example, the operations for cleft-palate, vesico-vaginal fistula, ovariectomy, &c.

The antiseptic system of treating wounds, recently suggested and put in practise by Lister, commends itself to the consideration of every surgeon; though a difference of opinion exists as to its merits, still experience may establish it as superior to all other modes of treatment.

There has been a great improvement in the treatment of sores "tending to heal," by the substitution of moist applications, instead of the ointments formerly employed, and in the "callous or indolent" ulcer by the application of blisters to the surface of the swollen part. I must also mention a very recent practice of M. Riverden, of Paris, that of transplanting portions of the skin for the closure of large granulating surfaces of ulcers, following burns, &c.

The substitution of effectual drainage in sinuses that remain after the evacuation of abscesses, for stimulating injections, sponge tents and pressure, is an improvement. And the drill, in deep-seated abscesses of bone, has, of late years, saved many a limb.

In few matters has surgery more improved than in the treatment of diseased joints; formerly recovery was considered almost hopeless, under the use of caustic-issues, &c.; whereas we now confidently look for recovery under perfect rest and extension. And should bony ankylosis take place, an artificial hip-joint may now be produced, by an ingenious operation suggested and recently performed successfully by Professor Sayre, of New York.

Since the commencement of the present century, many new operations have come into practice, as ovariectomy, the operation for vesico-vaginal fistula, cleft palate, removal of the tongue, the radical cure of hernia, excision of the upper and lower jaw, perineal incision in aggravated urethral stricture, delegation of the carotid, subclavian and other large arteries; in ophthalmic surgery, iridectomy, &c., and lithotrity, an operation characterised as one of the greatest additions to modern surgery, and one that must largely supersede the cutting operation of lithotomy, for, while the mortality from lithotomy ranges from one in six to one in ten, that from lithotrity, according to Sir H. Thompson, is about one in thirteen, and from present experience, it may be assumed that all stones weighing less than one ounce, in grown persons, should be removed with the lithotrite.

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Increased knowledge of anatomy, physiology, and pathology, has enabled surgeons, within the same period, to remedy distortions and deformities arising from cutaneous and joint contractions. by subcutaneous incision and plastic operations.

Prior to 1809, when MacDowell, of Kentucky, first performed the operation of ovariotomy, every woman labouring under ovarian dropsy was looked upon as doomed. And when Lizars, of Edinburgh, first operated in Great Britain, he was assailed by a certain amount of ridicule I need not say to you that it is now one of the established operations and for one of such magnitude marvellously successful, with a mortality of less than thirty-five per cent.

The experience of the practical surgeon teaches him to rely upon the powers of nature, and that it is his duty to assist and oftentimes to guide her; in other words, he is the pilot who can steer the ship, but who cannot make the wind blow. Knowing the wonderful assistance that nature will afford him, it is his boast that, in the present day, he can treat diseases without operative interference, where formerly the knife was considered indispensable; that he can substitute minor operations for more severe ones; that he can often save limbs by the removal of diseased joints, where years ago amputation was deemed inevitable; for example I need only mention excision of the hip, knee, ankle, shoulder, elbow and wrist joints, to prove the wonderful benefits of conservative surgery of late years. Removal of the ends of the bones in compound dislocations and fractures, instead of the limb, are examples of modern conservative surgery. I may also mention the treatment of aneurism by compression, acupressure, flexion, manipulation, galvanico-puncture, &c.

Improvements in individual operations have taken place, as in amputations, in the operation for hernia, that of removing cartilaginous bodies from the knee-joint, that of opening the canal from the inferior punctum, so as to obtain room for the passage of probes large enough to remove the obstruction in fistula lachrymalis, instead of styles permanently retained.

Acupressure, a new mode of restraining hæmorrhage, as recommended by Professor Simpson, is well worthy of practical application by the sur-

geon, for by experience alone, its value can be tested; it has its advocates and its opponents, so had the discovery of John Hunter; and who can say that it may not, at some future day, supersede the use of the ligature.

The most brilliant discovery in modern medicine, and one of the greatest boons ever conferred upon mankind, is the power the surgeon possesses of wrapping the patient in a painless sleep, while he is subjected to the horrors of the operating table. Yet, while accepting immunity from suffering, the patient incurs a certain amount of risk—statistics having proved that death has resulted from anæsthæsia, regardless of the agent used, once in between 2,000 and 2,500 cases. The mortality is small, but let us hope that a substance may yet be discovered that will produce the effect required with impunity. Local anæsthæsia, by freezing the part, is of modern origin, and is suitable for minor operations.

Practical Medicine advances by the discovery of new facts, and by the application of such facts to the treatment of disease. During the present century its advance has been quite as great as that of surgery.

The means of diagnosis at the command of the modern practitioners—his increased knowledge of the nature of disease,—and the improvements in chemistry and materia medica, enable him to apply his remedies with greater judgment, and to combat disease with more confidence of success than did his forefathers.

It would be hard to find a medical man in the present day recommending "*Lizards*" for the cure of cancer and venereal disease, as did Dr. Lettsom—a practitioner of standing in London—who read a paper to the medical society of that city in 1783 recommending them. Well may the following lines be attributed to him. He is made to say :

When patients come to I,
I physics, bleeds and sweats 'em,
And if they choose to die,
What's that to I, I let's 'em.

I. LETTSOM.

Let us glance at the treatment of disease by *bleeding*. It is not many years since the lancet was in the hands of every practitioner, in daily, and I might say almost hourly use, whereas now it is one of the rarest operations; and instead of the loss of blood, we have the exhibition

of stimulants;—and in place of almost starvation, we have the abundant use of nutriment. Now the question may be asked, what is the cause of this great change? It has certainly brought upon our predecessors,—by some,—the charge that they were ignorant and blind followers of error. But the reflecting man cannot bring his mind to believe that the fathers of British medicine were always bad observers and mistaken practitioners, consequently he is forced to look for the cause, in the “*change of type of disease.*” There are many strong arguments in favour of this doctrine,—arguments difficult to controvert, and when such men as Allison, Christison, Stokes, Graves, and Watson, give their strong adhesion to such belief, we may readily pause before denying it.

Many of us can call to mind the time when cold water was forbidden to a person with fever, and as for milk, he who gave it would have been accused of “feeding the fever” and thereby endangering the life of his patient. I need not say to you that such notions exist no longer, both being freely used.

In proof of the progress in practical medicine I may refer to improvements in relation to particular diseases. Consumption,—for example—a disease in which the physician’s duty consisted in watching the slow “gradations of decay,”—making a prognosis of two years duration,—and alleviating suffering as best he could. But now, under the use of cod-liver-oil, mineral acids, bitters and supporting nourishment, he no longer regards the disease as hopeless, and treats it looking for a cure; failing that, he confidently expects to prolong life. The experience and calculations of Dr. Williams justify the expectation, for he informs us that the average duration of life of phthisical patients has been extended from two years, the limit assigned by Laennec and Louis, to eight years. And he adds, that “in not very few cases, the disease is so permanently “arrested, that it may be called *cured.*” I may mention the treatment of oxaluria, phosphatic, and other diatheses indicated by the state of the urine, the use of iodine in goitre and other affections, iodide of potass in syphilis, gout, &c., bromide of potass in epilepsy, &c., arsenic in many affections of the skin, the alkaline treatment of rheumatism, the successful use of nitrite of amyl in tetanus, and in angina pectoris, of

hydrate of chloral as a narcotic, of quinine in acute lumbago, of drachm doses of tincture of henbane, with a little sulphate of magnesia three times a day in orchitis, of large doses of quinine in military surgery as a remedy for pyæmia; the banishment of scorbutus from our ships, &c. &c., also the vast improvement that has taken place of late years in the treatment of diseases of the womb and its appendages, and in diseases of the eye, I may refer to the use of atropia as a substitute for belladonna, and the calabar bean as a local application to contract the pupil.

Formerly all infantile diseases were considered by some as the results of febrile action, and treated as such, by others, as the results of weakness and treated with tonics and stimulants, and by a third class as the results of the irritation of worms and treated with anthelmintics. Modern investigators have proved that the different organs of the child are liable to nearly the same diseases as the adult, and should be treated accordingly.

The mortality of infants is still very large, but of late years it has greatly decreased. Towards the middle of the last century, 60 out of every 100 children born in London, died before they had reached their ~~first~~ first year of age; but the mortality has steadily diminished, so that now, about 35 in every 100 die at that period. About 600,000 are born annually in Great Britain; of these 300,000 would have perished. Now about 200,000 die, thus showing a saving of at least 100,000 human beings a year. In New York the mortality is still very large; *one-third* of the children born, die in the first year, and one half before they have attained their fifth year of age. In Geneva, records have been kept since 1590, and it has been ascertained that a child has now five times greater chance of living to the age of twenty-one years than it had three centuries ago.

About the middle of the seventeenth century, one in every forty or fifty women delivered in London, died of child-birth and its consequences; but as medical science has advanced, that mortality has decreased, till now about 1 in 150 or 200 die. There are about 600,000 accouchments yearly in Great Britain, still about 3000 mothers perish. If the old mortality held good, not less than 11,000 or 12,000 maternal lives

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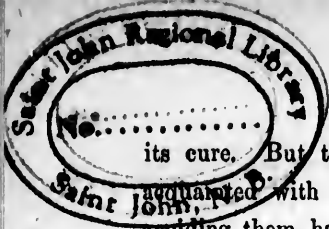
would now be lost. Consequently we may proudly point to this modern advancement in medical science, effecting, as it does, in this item alone, a saving of the lives of 7000 or 8000 mothers a year.

The mortality in the army, years ago, was immense. It was a disgrace to those in authority who positively refused to listen to the repeated appeals of the medical staff. And it was not till after the Crimean War, when Miss Nightingale brought the fact before the nation, that the laws which preventive medicine had established and applied in civil life were put in force. The result was that since the period named, the mortality in the Guards has fallen from 20 to 9, and in the infantry from 18 to 8. And the improvement in war is still more striking. In the Crimean war the sick in hospital were nearly seven times the number of the killed, while in the Chinese war they were nearly equal. The relative proportions of zymotic sickness in the two campaigns were as 6 to 60.

The present death-rate of fever in England amounts to 385 per 10,000 of population, while a century ago, its death-rate was nearly 539, and at the middle of the last century the annual death-rate from all causes in London, was 355 per 10,000 of population, but in the middle of the present century, it was only 249. In Sweden, in the period from 1755 to 1775, the death-rate was 289 per 10,000 of population, while from 1841 to 1850 it was reduced to 205.

In pursuing this subject let us contrast the state of the unfortunate fanatic of the present day with what it was sixty years ago, when deemed incapable of human feelings he was incarcerated in a dungeon, bound with chains, surrounded by filth, cut off from the friendship and charity of his fellow mortals, and treated with contumely, scorn, and stripes, a man being buried, yet living. Need I say to you how changed all this is now, and with what happy results? With the knowledge that the sufferer possesses the feelings, impulses, and affections of man, he is surrounded by comfort, all restraint is, or should be removed; and he is put under proper medical and moral management.

The preservation of human health, and the prolongation of human life, are two of the great and noble objects of practical medicine. These objects are to be attained more by the prevention of disease than by



its cure. But to enable us to prevent diseases, we should be well acquainted with their causes. These causes and the best means of avoiding them, have in a special manner engaged the attention of the physician of modern days. By it he has learned the vast importance of sanitary measures. His investigations have taught him that the attacks of almost all diseases are increased in intensity and frequency, in our households and communities, by the want of sufficient air, light, water and drainage, as well as by the deleterious effects of decomposing animal and vegetable matters allowed to remain within and around our dwellings and by the human effluvia concentrated in small and stifling bed-rooms. They have taught him also that when the preceding causes of disease have been abated, in special localities, by proper sanitary arrangements human life as a consequence has been saved, misery avoided, and pauperism prevented.

We find the mortality in country districts always less than in towns. In the country districts of England, it is about 1 in 58, while in the towns it seldom falls below 1 in 45. In all large towns where proper sanitary measures have been adopted the mortality has decreased. For example in London, in 1840, the death rate was 1 in 40, it is now 1 in 45; so in Boston, in 1855, it was 1 in 39, it is now 1 in 41.

As a further proof of the influence of sanitary measures upon certain localities in towns, I may mention that St. Giles, in London, formerly a filthy parish, now since every street and court has been brought under control, the mortality has been reduced from 50 in the 1000 to 15 in the 1000.

Class and occupation exercise their influence upon mortality, for we are told by Dr. Lyon Playfair that in Liverpool the average age at death of the gentry was 43 years, tradesmen 19, and laborers 16, the average age of all classes being 22 years.

In pursuing this subject I may mention that it is estimated that there are 8000 preventable deaths in New York, yearly. It is further estimated that for every death there are 27 cases of sickness, which would give a total of 216,000 cases of preventable sickness to be treated. When we reflect upon the misery, wretchedness and pauperism produced

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by these 216,000 cases of sickness capable of being prevented, it affords ample occupation for the physician, the philanthropist and the statesman.

Let us look at one other advancement of practical medicine, one to which the physician may proudly point as the greatest discovery of the age, a victory of medicine over disease and death. I allude to the discovery of vaccination by Jenner, to whom Providence, as it were, entrusted the office of teaching the surgeon, with an almost invisible speck of matter upon the point of his lancet, to defy, in a measure, one of the most fatal diseases that ever afflicted the human race.

The vast importance of this discovery can only be appreciated when we take into consideration the ravages produced by small pox prior to the introduction of vaccination. We are told that this disease was a terror to mankind, "sweeping over the land like fire over the prairies, smiting down prince and peasant;" that about the year 1519 in Mexico, it suddenly carried off $3\frac{1}{2}$ millions of population; that in Brazil in the year 1563 it extirpated whole races of human beings; that about the same period in the single province of Quito, it destroyed 100,000 Indians; that in Iceland in 1707 it carried off 18,000 out of a population of 100,000; that in Greenland in 1737, nearly two thirds of the population were swept away by it; that in France it caused one-tenth of all the deaths, and in England one-fourteenth; that the annual mortality from it in Europe alone amounted to half a million; that one-third of those attacked died, and that it destroyed, maimed or disfigured one-fourth of 100 to 1500000 of mankind.

Let us now look at the pleasing side of the picture, and see what the mortality from this loathsome disease is at present. The following illustrations selected from various sources, give an approximative idea of the mortality from small-pox in each million of the population before and since the introduction of vaccination.

Sweden.....	2050	185	Copenhagen.....	3128	286
Westphalia..	2643	114	Berlin.....	3422	176
Moravia.....	5402	255	England.....	3000	200

Doctor Farr tells us that the combined mortality of small-pox, measles and scarlatina at present, is only half as great as the mortality occasioned by small-pox alone, before the introduction of vaccination.

Experience and statistics teach us that small-pox occasionally occurs among those who have been vaccinated; that if 1,000 persons who have been *well* vaccinated should be exposed to the contagion of the disease about twenty-six will take it; that among vaccinated persons infected with small-pox, the danger of the disease is chiefly determined by the badness and insufficiency of their vaccination; that the fatality of small-pox when it attacks the *unvaccinated* is 350 per 1,000; that its fatality to such *vaccinated* persons as it infects is, taking them indiscriminately, 70 per 1,000, but, distinguishing vaccinated persons into two classes—first, those who have been vaccinated in the best known manner, and second, those who have been badly vaccinated, the fatality of small-pox if it infects the former, will be 5 per 1,000, if it infects the latter, 13 per 1,000; and that the risk of the one is 30 times that of the other. Or, in other words, let an unvaccinated person contract small-pox, and the chances are more than *one in three* that he dies. Let a very badly vaccinated person—a person with one imperfect cicatrix—contract small-pox and the chances are not quite *one in eight* that he dies. Let a person with two good vaccine cicatrices have small-pox, and his chances of dying are less than *one in forty*. But persons who have been vaccinated in the best and most complete way, will, if they ever get small-pox afterwards, not die of it at the rate of much more than *one in a hundred*.

It may be safely asserted that the lancet of Jenner, armed with the cow-pox matter, has saved in the world more human lives than gunpowder and the sword were ever successful in slaying, during any century in the history of mankind. And let us say, honour to the man who found the way to arrest this dreadful scourge, and who taught us that the seeds of the disease transferred to another soil might be made to germinate with a healthy and saving influence—a glory to our art, and to the nation claiming him as a son. Yet that nation neglected to bestow any mark of distinction upon the doer of all this good. Such favours being reserved for the inventor of instruments for the destruction of human life—the user of them—the courtier, and the politician; the man whose life is spent in ministering to the suffering of his fellow-men—however successfully, being generally the last to receive such honours.

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It is to be regretted that notwithstanding the facts before us, men are to be found ignorant and weak-minded enough to deny the benefits of this wonderful agent. And we hear of "*anti-vaccination societies*," imposed, I am happy to say, with very few exceptions, of men not belonging to the profession; men whose prejudices must have destroyed by reasoning power they might have possessed.

According to Short's mortality bills of London, plague, dysentery, small-pox, ague, and child-birth were the most destructive diseases in the time of Sydenham. It is needless for me to say that they sustain their formidable and fatal character no longer. And does not the history of the past encourage us in the belief that perhaps in 60 or 70 years hence under the guidance of hygienic and medical means, the same may be said of those diseases that are at present the most destructive and deadly in their effects upon our population; namely, consumption, convulsions, typhus-fever, scarlet-fever, pneumonia, and bronchitis. We have the best of small-pox by vaccination as a stimulus to induce us to follow the footsteps of Jenner. And who can say that means may not shortly be devised to arrest the ravages of scarlet-fever, measles or whooping-cough? For the conquest of small-pox appeared to our fore-fathers—judging from the writings of Dr. Mead—as impossible as the conquest of these maladies appear to any one now.

While we contend that medicine has advanced we must also acknowledge the uncertainty of the art. The source of this uncertainty may be found partly in its imperfections, but more in the intractability of intense forms of disease, the ferments of which poison the system to such an extent that death must inevitably be the result. Take as an example, malignant scarlet-fever; observe the utter prostration, rigors, stupor, swollen throat, offensive breath, and thready, failing pulse, which indicate intense blood-poisoning. Here death is as certain as if the patient had taken a poisonous dose of prussic acid. Medicine is foiled by the overwhelming power of its antagonist.

In conclusion let us hope that enough has been shown in this paper, imperfect as I freely acknowledge it to be, to prove that the science of medicine has kept pace with other sciences in the march of improvement,

Yet, in the face of such facts, the workers in our noble profession are too often told that they are not advancing because they cannot conquer death, or triumph over all forms of disease. I do not allude to believers in "*isms*" or "*pathy's*," it is their interest to say so, and we can afford to treat them with silence. But, I grieve to say it is the fashion now-a-days to hold up the stumblings and uncertainties of medicine to the public gaze; to invoke ridicule and censure, and should a practitioner get into the hands of a jury, here again he has to contend against ignorance of medical power and responsibility, and expects to be told that if he does not save life or limb he must pay the penalty.

St. John, N. B., January 18th, 1871.

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