Allen (N.)

MEDICAL PROBLEMS OF THE DAY.

THE

ANNUAL DISCOURSE

BEFORE THE

MASSACHUSETTS MEDICAL SOCIETY,

JUNE 3, 1874.

BY

NATHAN ALLEN, M.D., LL.D.,
LOWELL, MASS.

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THE MEDICAL PROBLEMS OF THE DAY.

BY NATHAN ALLEN, M.D.,
OF LOWELL.

Read at the Annual Meeting of the MASSACHUSETTS MEDICAL SOCIETY, June 3, 1874.*

MR. PRESIDENT AND FELLOWS
OF THE MASSACHUSETTS MEDICAL SOCIETY:—

GENTLEMEN:

To be the mouth-piece of the largest and one of the oldest medical societies in this country is an honor and position of no ordinary character. In 1781, ninety-three years ago this very month, was organized the Massachusetts Medical Society. This occurred in the midst of the Revolutionary War, and its founders were among the leading surgeons in that war. The object of the Society, as specified in its charter and by-laws, was not only to foster and build up a skilful, learned and honorable profession, but to protect the community from imposition and quackery. Since its organization it has had enrolled in its fellowship over three

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* At an Adjourned Meeting of the Mass. Medical Society, held Oct. 3, 1860, it was

Resolved, "That the Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

thousand physicians, and has at the present time over thirteen hundred members. Its first President was the celebrated Dr. Edward A. Holyoke, and the first annual dissertation read before it was in 1784, by Dr. Isaac Rand. For over half a century an address has been given before the Society every year, except 1830 and 1831, when the appointees failed by reason of illness. To describe the usefulness of this organization, and its past and present influence in this commonwealth, would be no easy task.

One year ago I accepted with many misgivings a duty from its hands which I attempt this day to discharge, realizing in some measure, I trust, the importance of the occasion, and the favorable opportunity it affords to say something which may advance the interests of a noble profession. In entering upon this duty, I find the following sentiment of Lord Bacon most appropriate and expressive: "I hold," says he, "every man a debtor to his profession; from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavor themselves by way of amends to be a help and ornament thereunto. This is performed in some degree by the honest and liberal practice of a profession, where men shall carry a respect not to descend into any course that is corrupt and unworthy thereof, and preserve themselves from the abuses wherewith the same profession is noted to be infected; but much more is this performed, if a man be able to visit and

strengthen the roots and foundations of the science itself, thereby not only gracing it in reputation and dignity, but also amplifying it in profession and substance." The first sentiment expressed here, that is, an "honest and liberal practice of a profession," with honorable conduct and elevated motive, is far easier of attainment than that in the latter part of the quotation, viz., to "visit and strengthen the roots and foundations of the science itself."

This is not easy. The roots and foundations of medical science have their germs, their bases in the primary laws of nature. Her secrets must be carefully explored and closely scrutinized. Thus William Harvey, one of the most distinguished lights in medical history, in bequeathing a rich legacy to advance this science, exhorts his brethren above all things "to study and search out the secrets of nature by observation and experiment." Though we may be unable to follow in the footsteps of these illustrious expounders of nature's laws, we may, in some slight degree, catch their spirit and imitate their example in our earnest researches after truth. Fully endorsing the sentiment contained in these quotations, permit me to invite your attention upon the present occasion to what may properly be considered some of

THE MEDICAL PROBLEMS OF THE DAY.

All periods in history are marked by some particular events. These events may be trivial

in their character, or may involve interests of great magnitude. In the history of nations it may be a revolution in government, a signal victory in war, or the brilliant achievements of individuals. In the history of science it may be a new discovery, or a new application of a great principle. The whole history of civilization has been marked by changes of one character or another: but in no department of this history, perhaps, do we meet with changes more significant or striking than in that of medicine. Having its origin some three thousand years ago in Egypt, its earliest records are involved in much obscurity, and made up of fabulous statements. It was intimately blended with the mythology of the times; and as diseases then were supposed to be the visitations of evil spirits, or to be caused by some offended deity, their removal could be effected only by a propitiation of such deities. Among the Grecians possessing a higher degree of refinement and culture, more sensible views of medicine obtained. Hippocrates, one of the most remarkable men that ever lived, by introducing a more correct knowledge of the human body, as well as of the character of disease, was very justly styled the "Father of Medicine." Still, the philosophy, the mythology and superstition of the Greeks entered largely into all medical theories and practices. And even though the boundaries of medical knowledge were extended by experience and observation, and more rational views gradually

prevailed, speculation and empiricism shaped and controlled, in a measure, all investigations upon the subject.

The next great light in medicine was Galen, a man of commanding genius and profound learning. He made still further advances in medical knowledge and practice. As an illustration of the state of medicine and of the times, the opinions and the authority of Hippocrates and Galen directed and controlled the public mind in all such matters for over fifteen hundred years. Then came the pall of the Middle Ages, when the lights of civilization were more or less obscured. Nearly all medical knowledge was engrossed by the Priesthood, and was confined to the cloister and the monastery. But early in the 16th century a new era dawned upon medicine. For the first time, so far as we have any account, a careful dissection of the human body was made, and a description of it published. This honor belongs to Vesalius. From that period, new interest sprang up with reference to the construction and proper uses of the various parts of the body; and for three hundred years the science of Anatomy has been constantly progressing, so that the structure of every organ in the body has come to be very correctly understood.

About the middle of the 17th century, certain important discoveries were made respecting the true functions of particular organs in the body, so that the science of Physiology then took its start. As this science progressed, the evidences

became more and more marked, that alteration of structure, and also of function, constituted or followed a morbid and diseased state of the system. Hence we have the science of Pathology, which in the present century has made wonderful strides. There is still another science—new, comparatively, and more important, in some respects, than either of the others—that of *Hygiene.* Upon these four pillars must be reared the whole structure of medical science. Surgery and Therapeutics are distinct departments of medicine, and may be regarded in their practical application each as an art. But medicine as a science, strictly, is based upon Anatomy, Physiology, Pathology and Hygiene. These have their foundation in the primary and unchangeable laws of nature, and should be ranked among the sciences, as much so as those of Natural History, Geology, Chemistry, &c. And the principal reason why medicine in its early history made so little progress was because the facts and principles of these sciences were so imperfectly understood. The same reason still exists why its progress is so slow, and why there is such a diversity of opinions on most medical subjects. When the facts and laws of Pathology and Hygiene become thoroughly unfolded and applied, it will make a wonderful difference in all matters appertaining to medicine. In the opinion of some writers, it will make an entire revolution in its practice. Both these sciences are now in their infancy, but have a brilliant prospect before them.

Physiology, too, in some of its most important applications, may be regarded as also in its infancy. True, it may be said, that the functions of all, or nearly all, the organs in the body are correctly understood; but then they have been studied chiefly with reference to distinct diseases, and their treatment in individual cases. But the principles of this science have a far wider range, in their application to the laws of life and health as developed in the community at large. The *cure* of disease has hitherto been considered as almost the sole object of medicine; but when the principles of Physiology and Hygiene become generally understood, the means for the *prevention* of disease will be sought and demanded as well as those for its cure. The call will not, perhaps, come from individual cases, so much as where the health and lives of multitudes are involved. Here is a momentous work to be performed, in which the members of the medical profession must take a leading part. From their education and daily avocations they are presumed to understand these laws, and are the proper guardians of the public health. But these principles include other things besides mere health and disease. They extend to every department of society, and enter more or less into every subject which affects the physical or mental welfare of man. It is proposed here to notice some of the relations which these sciences sustain to the public. They embrace, it will be seen, many of the living questions of the day—problems yet to be solved. First in order is

STATE MEDICINE.

This phrase refers to the employment of measures for the promotion of public health and the prevention of disease by means of legislation. It is only about thirty years since any decided steps were taken in this direction, either in Europe or in this country. It is true that for a much longer period there had been legislation with reference to quarantine and the establishment of Boards of Health, but no decided and active legislative measures had been taken directly for the good of the people at large. In Great Britain much progress has already been made in sanitary reform. The reports of the Registrar General, of Royal Commissions, of local Boards of Health, papers read before scientific associations, together with discussions in Parliament, in Journals and books, have attracted very general attention to this subject. Parliament has scarcely held a session for twenty years without having had some discussion, or passed some act referring to health. The principal topics upon which legislation there has taken place are drainage, sewerage, water supplies, removal of nuisances, construction of lodging houses, hours of labor, public baths, epidemic and contagious diseases. In 1872, several of these laws were remodelled, making them more practical; and new acts were passed, providing for the appointment of health officers to see that these laws were more efficiently executed in all parts of

the kingdom. So general has been the interest created upon this subject, it was predicted by the present Prime Minister that the next great political agitation in England would be on Sanitary Reform.

In this country our own commonwealth has taken the lead in legislation. In 1841, acts were passed establishing throughout the State a uniform registration of births, marriages and deaths, which has been continued for over thirty years. These reports embody the most valuable documents upon vital statistics that can be found in the country. In 1849 an act was passed providing for a sanitary survey of the State, which brought together many valuable facts and statistics relating to health, especially in several of the leading cities of the commonwealth. In 1869 a State Board of Health was created by our legislature. In each step of this legislation it should be stated, that the project was first started in the Massachusetts Medical Society, memorializing the legislature upon the subject. To the credit of this Society it should also be stated, that for thirty years or more it has made repeatedly special efforts for the promotion of public health, either at its business meetings, or by addresses and papers published in its name. But a great work yet remains for the Society to do in this same direction. We should not omit to state that in 1850 two very important acts were passed by the legislature, requiring that physiology and hygiene should be taught in all the public schools of the commonwealth, and that

teachers should be examined in the elementary principles of these sciences; but as the enforcement of those acts was left discretionary with School Committees, the results have not been altogether satisfactory.

But the act creating a State Board of Health is the most important step taken in legislation. This Board has now published five reports, which are an honor to the profession and a credit to the commonwealth. It has a very difficult work to accomplish, and should be sustained by every member of this Society. New questions in sanitary science are coming up for consideration, which will require some positive legislation. The pecuniary interests of individuals and of the public are found to be in open conflict with the lives and health of the people. For instance—have individuals or companies a right to poison the air or the water, which may destroy the health or the lives of multitudes? Shall poisoned or adulterated food be offered in our markets and shops for sale? How long shall it be permitted to construct and rent tenement houses in such a manner as to breed disease and pestilence? Legislation has always placed great powers in Boards of Health; but either for the want of sufficient intelligence, or from some political motives, they are frequently very dilatory in enforcing the law. Within a few years we have had several marked illustrations of this character. In 1871 and '72 the small-pox prevailed as an epidemic in Lowell and Boston, which might easily have been checked

in its first stages. The Boards of Health in both cities shamefully neglected their duty; and, while they for months were contending about minor points, and shuffling for place and power, the epidemic raged with great violence. Public opinion finally compelled the formation of new Boards of Health, which, by introducing efficient measures, arrested at once the progress of the epidemics. But by this delay more than a thousand lives were sacrificed, a great amount of sickness was caused, and an immense bill of expense incurred. These two cases show the vast importance of having competent and efficient Boards of Health. Human life and public safety and interests should never be thus jeopardized. As extraordinary powers are conferred by legislation upon such Boards, placing in their hands the health and lives of the community, it becomes a matter of the highest moment that they be composed of men thoroughly qualified for the duties of the place. The medical profession should always be here represented by its best men, who, by advice and influence, should take the lead in all measures for preventing or arresting the progress of disease. The voice and influence of the profession, too, should be felt in the halls of legislation, and in the management of our public institutions. Medical knowledge should be brought into requisition in these high places of power and influence to a far greater extent than it has been hitherto. The chief cause of our defective and dependent classes may be found in the violation

of physiological laws. The causes of idiocy, blindness, mutism and insanity arise obviously from this source; and the causes of pauperism and crime may be traced, more or less, to the violation of physical laws. And the more thoroughly the primary causes of many other evils that afflict society and require legislation are investigated, it will be found that they arise from some violation or perversion of physiological laws. No radical or permanent reform can be reached without going back to the primary sources or causes of the evil. In aiding to accomplish this great work, the medical profession sustain a most intimate and important relation to what may be denominated

PUBLIC HYGIENE.

This includes not merely prevention of disease, but every agency that renders the growth and organization of the body more perfect, and its decay less rapid. By reference to the organization of the Massachusetts Medical Society it will be seen, that this was one of its principal objects. The very first sentence in its charter reads, "As health is essentially necessary to the happiness of society, and as its preservation or recovery is closely connected with the knowledge of the animal economy, and of the properties and effects of medicines, &c., Be it therefore enacted," &c. And then in specifying its objects in another place, it says, "to increase and diffuse medical knowledge." It would seem, therefore, that one

of the primary objects in the organization of this Society was to promote the health of the community, to prevent disease and diffuse medical knowledge. It is impossible to accomplish this object without making the public generally acquainted with the laws of physiology and hygiene. The objects intended by State Medicine cannot effectually be attained without a general understanding of those subjects. The practical application of legislation, and the execution of law in a republic, where especially personal rights and interests are involved, depend upon knowledge as well as a sense of justice. It has been repeatedly demonstrated that the ravages of small-pox, cholera and yellow fever can be prevented or checked by applying sanitary law; but in order to do this, the people themselves must be made acquainted with the means of doing it. They must become participators in the work; otherwise it cannot be accomplished. Without referring to facts and figures on the subject, it may be safely stated, we believe, that fully one-third of all the prevalent diseases of the day may be prevented by faithful application of hygienic laws; but the people themselves must first understand these facts. Once there might have been a difference of opinion among the members of the profession about the expediency of diffusing such information, alleging that a bad use was made of it—that a little learning, a smattering of such knowledge, was a dangerous thing. Illustrations of this character are constantly occurring; but if some abuse and per-

vert this knowledge, all do not—multitudes make a good use of it. The evils are only incidental to a higher good.

Besides, much depends upon the manner in which this information is communicated. The objects and agencies by which this has at times been attempted are of a very questionable character. Almanacs, circulars, advertisements and obscene publications have been scattered broadcast, professedly to promote health; but the leading motives and objects deserve the severest censure. It may be said that such a bountiful supply would not exist, if there was not a demand for knowledge of this sort—that the public are bound in *some way* to obtain it. Accordingly we find in newspapers and periodicals an increasing demand and supply of articles on health; also journals and books, that are devoted more exclusively to the subject, are constantly multiplying. It is very important, in communicating this information, that a proper direction be given to it, and that it should be tempered with the right spirit and motive. In diffusing a knowledge of hygiene it is not expected that every person will become familiar with the details of physiology, or with all the relations it sustains to the laws of life and health. If the more intelligent and influential members of society obtain this information, they will direct public opinion, and gradually enlighten the masses as to their duties and dangers.

Inasmuch as such knowledge properly applied is calculated to prevent a vast amount of suffering,

sickness and mortality, is it not clearly the duty of the profession and the press to use all suitable means for its diffusion? The more enlightened the community become, generally, upon this subject, the less exposed they will be to imposition and quackery. Instead of blind superstition and credulity, a rational faith will grow up in the study and observance of the laws of health and life. The demand in the use of remedial means will be directed to the best skill and experience which can be found, that grows out of a profound knowledge of physiology and hygiene. Let the principles of science and the exercise of good common sense direct and control in all these matters. For it is in this way, and by this means only, that all kinds of empiricism and quackery, root and branch, can be eradicated. The public have infinitely more at stake in attempting to effect such a reform than the medical profession. The visions of the Alchemist in search after the "elixir of life" or the "philosopher's stone," may yet in some measure be realized by the diffusion of hygienic knowledge. For whenever the laws of hygiene have been faithfully observed, it has greatly improved not only individual health, but diminished the amount of sickness as well as of mortality. In certain localities in Great Britain, where these laws have been tested for a series of years, the Registration reports show a diminution of mortality from one-third to one-half. Such a result we should naturally expect. The more thoroughly the causes of disease are understood, the more and more are they found

traceable to a violation of hygienic laws. If the ravages of cholera, of yellow fever and typhoid may be controlled in a great measure by the observance of such laws, why may not scarlet fever, measles and whooping cough — those scourges of infant life — be prevented, or very much limited? The prevailing sentiment that all children must necessarily have these diseases once, finds no support whatever in the nature of physiology or in the principles of hygiene. The fact is already well established, that the spread and violence of scarlet fever, by isolation, cleanliness and ventilation, are very much modified, and, in some instances, entirely prevented. We believe the time will come when scarlet fever, measles and whooping cough, which now destroy such multitudes of children, will become, in a measure, things of the past. It is not only the great amount of sickness and mortality occasioned directly by these diseases, but the impaired constitutions and other complaints consequent upon them, that may also be prevented. When the community realizes fully that the means of preserving health, especially in early life, are placed, in a great measure, in its own hands, a far higher estimate will be placed upon the value of human life, and the responsibility for its preservation will be found to depend in a great measure upon human efforts. For this sentiment of responsibility, which harmonizes with all the great principles of justice and accountability, increases just in proportion as the laws of physical organization are thus brought out and applied.

When disease, instead of being wrapt up, in its origin and progress, in a kind of mystery, can be traced to an intelligible source or cause; when it shall be clearly perceived that sickness and premature mortality are the results of violated law, then will our own interest in the subject be greatly enhanced; then will the responsibility be transferred from a "divine Providence" to human agency.

If the general diffusion of a knowledge of physiology, together with an application of hygienic laws, is to place in the hands of people themselves, to a far greater extent, the means of preserving health and thus diminishing disease, the problem arises, what is to be its effect upon

PRACTICAL MEDICINE.

This presents a question of particular interest to the medical profession, especially to its younger members. In the minds of some, doubts may arise whether any such changes will ever occur. But when we consider what great progress, within twenty or thirty years, has already been made in the diffusion of such knowledge, both in Great Britain and in our own country, that the interest is rapidly increasing in all matters pertaining to health, particularly with leading minds, and that there is a growing disposition on the part of people to take such matters into their own hands, it is very evident that it must result in important changes with reference to medicine. The seeming improbability of this statement vanishes when we take a retrospect of some points in the history of

medicine for the last forty or fifty years. What a surprising improvement has taken place in our knowledge of the nature and causes of disease! Pathology is comparatively a new science. The same may certainly be said of hygiene. It may safely be affirmed, we believe, that the nature, the causes, the laws or natural history of diseases, in all their forms and tendencies, cannot be thoroughly understood without a correct knowledge of these two sciences. It is not sufficient to understand the structure and function of an organ diseased, but what were all the agencies, internal and external, operating to produce this abnormal state; and the more thoroughly we understand these agencies, the more correct will be our diagnosis of disease. Such knowledge is, moreover, indispensable for its successful treatment.

The old theory that disease was some mysterious entity or unseen agency for evil, introduced into the body, has had a most pernicious influence. As one of its bad effects, it has tended to produce too much faith in the use of *drugs alone*. It has blinded inquiry as to the true nature of disease—has produced confused notions of its real causes, and led the mind to cast around every where, externally, to find some drug or compound for its cure. When the causes and the natural laws of disease were so imperfectly understood, not only the public demanded, but the profession inclined to depend too largely on drugs. As a result there was over-medication, and the evil has not altogether subsided. Some discriminating minds, see-

ing the evils of excessive drugging, have been inclined to go to the other extreme—to decry the use of medicine and the profession altogether. Some very prominent medical men have come to such a conclusion, and expressed opinions which in the estimation of others have done injury.* If physicians have erred in over-medication, and people have injured themselves by too much dosing, it affords no evidence that medicines are not, at this day, just as good and necessary in the treatment of disease as they ever were. This depends upon the manner in which they are used. The true character of disease should first be clearly apprehended, together with the recuperative powers of nature; then let medicines come in as aids and helpers in overcoming, checking or alleviating disease, and not to violate or interfere with natural

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* "I will venture to say this, that if every specific were to fail utterly, if the cinchona trees all died out, and the arsenic mines were exhausted, and the sulphur regions were burned up, if every drug from the vegetable, animal and mineral kingdom were to disappear from the market, a body of enlightened men, organized as a distinct profession, would be required just as much as now, and respected and trusted as now, whose province should be to guard against the causes of disease, to eliminate them, if possible, when still present, to order all the conditions of the patient so as to favor the efforts of the system to right itself, and to give those predictions of the course of the disease, which only experience can warrant, and which in so many cases relieve the exaggerated fears of sufferers, or warn them in season of impending danger."—Dr. O. W. Holmes.

"I sincerely believe that the unbiassed opinion of most medical men of sound judgment and long experience is made up, that the amount of death and disaster in the world would be less, if all disease were left to itself, than it now is under the multiform, reckless and contradictory modes of practice, good and bad, with which practitioners of adverse denominations carry on their differences at the expense of their patients."—Dr. Jacob Bigelow.

"As a physician advances in age, he generally, I think, places less confidence in the ordinary medical treatment than he did, not only during his early but even middle period of life."—Sir James Clarke.

"I declare as my conscientious opinion, founded on long experience and reflection, that if there was not a single physician, surgeon, apothecary, druggist nor drug on the face of the earth, there would be less sickness and less mortality than now prevails."—Dr. James Johnson.

laws. There should be the utmost harmony between all the restorative powers of nature and the administration of drugs. In no one thing is the skill of the physician exhibited so much as in the wise adaptation of the kind and quantity of medicine to the exact nature and state of disease.

For thirty years or more a warm discussion has been carried on by different writers, as to the relative powers of nature and art in the cure of disease. Great good has already resulted from this discussion; but when we come to understand more fully the nature and causes of disease as developed by pathology and hygiene, the recuperative powers of nature will be found far greater than has hitherto been conceded. Sanitary agencies will be brought to bear far more effectually upon the treatment as well as the prevention of disease. For illustration: what improvement has been made in the treatment of the "self-limited diseases," so styled, by a better knowledge of their nature, and of the laws by which they are governed! May there not be other diseases, or even classes of diseases in which similar changes will be required in the administration of medicine? When the laws of inheritance are more correctly and thoroughly understood, it will be found, we believe, to throw a flood of light on what are denominated "hereditary diseases." The constitutional or hereditary influences will be found to be very powerful, and to be governed by forces that do not yield readily to medical treatment. The constitutional or inherited tendencies must be taken into account far

more than they hitherto have been. The physical weaknesses and idiosyncrasies peculiar to patients will then be better and more readily perceived. This will lead to a more skilful adaptation of hygiene as well as medicine in the management of all such cases.

One of the boasted improvements of modern surgery is to "save limb and life." Why should not the public obtain a similar advantage, though on a much larger scale, in the improvement of practical medicine, viz., in the *prevention* as well as cure of disease? With the general diffusion of sanitary science, the inquiry will be for the best means not only for preserving health, but in case of disease, for such treatment as will, as far as possible, prevent its recurrence. If the tendency of a general diffusion of sanitary knowledge be to diminish faith in drugs alone, it will greatly increase confidence in the use of all those means based upon the laws of physiology and hygiene. It will be a rational faith for which a good reason can be given and exacted. It will be a faith that will grow stronger and brighter, in proportion as the great laws of health and disease are better understood. It may require somewhat different qualifications on the part of the medical attendant —a higher degree of intelligence upon all sanitary and hygienic agencies, and a more careful discrimination in the use of drugs. It will lead to the most effectual means to root out all kinds of empiricism and quackery, which find a congenial soil in ignorance and prejudice, credulity and super-

stition. It is because these qualities every where abound, that medical impostors and quack medicines find such support and patronage. A rational faith in the use of those remedies which harmonize with the laws of nature is altogether more desirable than a blind faith in the wonderful virtue of some drug or compound that only disturbs and deranges the whole system. Counsel and skill, based upon a profound knowledge of health and disease, will be considered, in the way of advice and medical treatment, of far more consequence than the long array and numerous mixtures of drugs. The object of medicine is three-fold, viz.: cure of disease, alleviation of disease, and the prevention of disease. This last is not only the safest and most momentous as regards the weal of the patient, but the surest index of skill, judgment and fidelity in his counsellor.

There is a most important physiological problem to be solved in

PHYSICAL DEVELOPMENT.

A gradual change is taking place in the organization of our New-England people, with which the members of the medical profession cannot but be conversant. This is very manifest from the change in the type and character of disease. Formerly there was relatively more acute disease and less chronic — more violence in the attacks, with a higher grade of inflammation. It required in its treatment frequent venesection and more powerful medicine. At the present day we have a larger

class of diseases arising from general debility, from indigestion, anæmia, scrofula, neuralgia, &c. This change indicates the existence of less muscle —more nerve—less physical vitality—more nervous energy—less power of endurance, but more mental activity. This same change is also indicated in the anatomy and physiology of the person. The framework of the body generally is not so large—is not so compact, nor so well proportioned; the countenance is paler, the features are more pointed and not so expressive of health, though more so of intelligence. The texture or quality of organization is more delicate and refined; the brain is becoming developed more and more relatively, and too frequently at the expense of the body; or, in other words, the nervous temperament, with all its advantages and disadvantages, is becoming too predominant for other parts of the body. As one of the consequences we have more diseases of the brain and nervous system, more sudden deaths from apoplexy, paralysis, and also from diseases of the heart. The average duration of life may as a whole be longer, but this arises from less exposure, better care and improved medical treatment.

This change of organization has occurred principally within the last two or three generations. Some of its causes are very obvious, while others are more obscure and complicated. Among the principal causes may be mentioned less exercise of the muscles out-doors, on the farm and in mechanical pursuits, but more exercise of the brain in the

school-room, in the shop, in the store, in the factory. The change in the construction and manner of heating our dwelling-houses, causing a much higher temperature — the increasing strife and competition in business, the general style of living and modes of dress, &c., have also had much to do in producing this change. These and other causes have exerted a pernicious influence upon the female constitution, and so upon the laws of inheritance. It is through this medium or channel especially, and by means of these laws, that, in the course of two or three generations, great physical changes are effected. The laws of heredity constitute the most important agency whereby the vital forces, the vigor and soundness of the physical system are changed for better or worse. Thus in the course of time is determined the peculiar type and character of a people.

There is nothing of such transcendent importance to a race or nation as *physical stamina* — strong, vigorous, healthy constitutions. How did the Germans, in the late war, gain such signal victories over the French? Why does that people now stand at the head of all the European nations in power and statesmanship? Why do the Germans take the lead at the present time in the cultivation of the sciences, and in almost every department of literature? Is it not owing to their grand *physique* more than to anything else?

MENTAL CULTURE.

In the advancing knowledge of physiology it has been discovered that all mental culture should be based upon the brain—that education should be pursued in harmony with the laws of life and health, and that where these are violated, the advantages of the former afford poor compensation. Formerly no attention, or scarcely any, was paid by School Boards and teachers, in the matter of education, to the condition of the body or the development of the brain, and even at the present day very little is paid them, compared with what should be given to those great physical laws which underlie all mental culture. The lives of a multitude of children and youth are sacrificed every year in this commonwealth by violating the laws of physiology and hygiene, through mistaken or wrong methods of mental training; besides, the constitution and health of a multitude of others are thus impaired or broken down for life. No where else in society is a radical reform needed more than in our educational systems. Inasmuch as the laws of the body lie at the foundation of all proper culture, they should receive the first consideration. But in educating the boy or girl, from the age of five to fifteen, how little attention is given to the growth and physical changes which necessarily occur at this most important period of life! The age of the child should be considered; the place of schooling, the hours of

confinement and recreation, the number and kinds of studies, together with the modes of teaching, should all harmonize with physical laws—especially those of the brain.

The system or mode of treating, in education, all children as though their *organizations were precisely alike*, is based upon a false and unnatural theory. Great injury, in a variety of ways, results from this wrong treatment; in fact, injuries are thus inflicted upon the sensitive organizations and susceptible minds of young children, from which they never recover. That many of our most independent and clear-headed educators themselves express so much dissatisfaction with the working and results of our schools, affords evidence that something is wrong in the present system. As we contemplate the great improvements made in education for the last thirty or forty years, and are surprised that educators were content to tolerate the state of things then existing, so will the next generation, when still greater and more radical changes shall have been introduced, look back with astonishment at this generation, and wonder that it was so well satisfied with its own methods. When our educators become thoroughly convinced that physical development as a part of education is an absolute necessity—that a strict observance of the laws of physiology and hygiene is indispensable to the highest mental culture, then we shall have vital and radical changes in our educational system; then the brain will not be cultivated so much

at the expense of the body, neither will the nervous temperament be so unduly developed in proportion to other parts of the system, now so often bringing on a train of neuralgic diseases which cannot easily be cured, and exposing the individual to the keenest and most intense suffering which all the advantages of mental culture fail, not unfrequently, to compensate.

The more this whole subject is investigated, the more reason we shall find for making allowances or some distinction in scholastic discipline with reference to the differences in organization of children, and for adapting the hours of confinement and recreation, the ventilation and temperature of school-rooms, the number and kinds of studies, the modes of teaching, &c., to the laws of the physical system. But another and still more important change must take place. Some time—may that time be not far distant—there will be a correct and established system of *mental science*, based upon physiological laws; and until this era arrives, the modes and methods of education must remain incomplete and unsatisfactory. The principles of this science, in the very nature of things, must rest upon a correct knowledge of the laws and functions of the brain; and until these are correctly understood and reduced to a general system, all education must be more or less *partial*, *imperfect* and *empirical*. While the old theories of metaphysicians are very generally discarded, they still have practically a powerful influence in directing and shaping our educational systems

and institutions. In the selection and arrangement of studies very little attention is paid to the peculiar nature or operations of the various faculties of the mind, or the distinct laws that govern their development and uses. For illustration—instead of educing, drawing out and training, all the mental faculties in their natural order and in harmony, each in proportion to its nature or importance, the memory is almost the only faculty appealed to in every stage of education; and this is so crammed and so stuffed that frequently but little of the knowledge obtained can be used advantageously. Instead of developing the observing faculties by "object teaching," appealing to the senses of sight and hearing, those two great avenues of knowledge, or giving much instruction *orally*, we require the scholar to spend most of his time in studying and poring over *books*, mere *books*. The mind is treated as a kind of general receptacle into which knowledge almost indiscriminately must be poured, yes, forced, without making that knowledge one's own, or creating that self-reliance which is indispensable to its proper use. In this way the brain does not work so naturally or healthily as it ought, and a vast amount of time, labor and expense is wasted—nay, worse than wasted. From this forced and unnatural process there often results not only a want of harmony and complete development of all parts of the brain, but an excessive development of the nervous temperament, and not unfrequently an irritability and morbidness which are

hard to bear and difficult to overcome. And not unfrequently it ends in a permanent disease of the brain, or confinement in a lunatic asylum.

When we take a careful survey of the various discussions and diverse theories on this subject, considered metaphysically, and then compare them with the great improvements and discoveries in the physical sciences for the last fifty years bearing upon the same subject, the change or progress looks mainly in one direction, viz., that all true mental science must ultimately be based upon physiology. Here is a great work to be performed, and when accomplished it will constitute one of the greatest, most valuable and most important achievements that was ever wrought in the history of science. A vast amount of positive knowledge has already been accumulated on this subject by various writers, but a great work, by way of analysis, observation and induction, and of further discoveries as to the functions of the brain, remains to be completed. This work must be performed in a great measure by persons profoundly versed in the physical sciences; and no small proportion of it must come from the observations, labors and contributions of medical men.*

There is another problem which for some time has agitated the public, and which intimately

* For illustration, such works may be mentioned as Dr. John Abercrombie on the Intellectual Powers; Dr. Andrew Combe on Physical and Mental Culture; Dr. Henry Maudsley's Lectures on Body and Mind, and Dr. W. E. Carpenter's Principles of Mental Pathology.

concerns the members of our profession. We refer to

THE TEMPERANCE QUESTION.

Probably there is no one subject agitating the public mind at the present day so important as that of temperance. Aside from its economical, political and moral bearings, it sustains a most vital relation to medicine. In some respects it is really a physiological question, the solution of which belongs to the experts in this science; but unfortunately there is not here a general agreement of opinion. Before this reform can be carried on very successfully, the exact relations of alcohol to health and disease must be better understood and positively settled. What is the physiological action of alcohol on the human system in health and disease? Does it increase or impart force in the process of digestion? Is alcohol in any of its forms absolutely necessary as a therapeutical agent? Is there such a love of stimulants implanted by nature among our instincts, that man cannot well resist temptation? Does health require as a common beverage, at meals, or other times, the use of a mild stimulant? These and kindred questions must be settled, not by mere authority, nor by individual opinions, but by such an accumulated amount of evidence derived from the study of physiology and pathology, that it cannot be disputed or resisted. How important that the members of the profession, who are the proper expounders of these sciences,

should become safe teachers and guides in settling these grave questions! But whatever differences of opinion may here exist, there are points of view in regard to this reform upon which there should and must be entire agreement, viz., its sanitary aspects. That intemperance is productive of a vast amount of disease, all will admit ; that it is one of the most powerful causes of physical degeneracy now in operation, no one will probably question. If to alcohol we add tobacco, opium and other stimulants and narcotics, no pen can describe the terrible injuries which they inflict upon the human race.

From a hygienic point of view, of what avail are the benefits of good air, pure water, wholesome food, healthy occupations and dwellings, when the laws of the physical system are being constantly violated by the poison of alcohol and tobacco? It is not alone the present or temporary effects of these agents, but the *permanent*, such as are incorporated into the organization itself and become a part and parcel of it—these are the seeds of evil tendencies and diseases, which are transmitted to successive generations. It is only when we take into account the power and extent of hereditary influences that we can fully appreciate the importance, the magnitude and the grandeur of the temperance reform.

This leads us to the consideration of another problem, namely, the laws of inheritance.

THE LAWS OF INHERITANCE.

In a hygienic point of view, no agency is so powerful in the prevention of disease as hereditary influences. To the experienced physician, it requires no array of facts or arguments to prove what a wonderful difference there is in the amount of disease in individuals and families, arising from the differences in original stamina or soundness of constitution. Then in the treatment of disease, it makes a surprising difference. In sound, healthy stock we have developed in a far higher degree the recuperative powers of nature, and generally one single disease at a time to combat ; whereas, in case the original constitution is feeble, and the respective parts of the body are ill-balanced, diseases of almost every kind become far more complicated, and their treatment more difficult as well as doubtful in result.

Besides, there is a large class of diseases which may be strictly considered hereditary, as the seeds or predispositions are transmitted. If these innate predisposing causes of disease could be obviated or removed, it would undoubtedly diminish the actual amount of sickness and of early mortality. But to effect any great improvement in this direction would require a favorable operation of the laws of inheritance through several generations. There are, if we mistake not, special reasons why these laws should receive more attention at the present day ; and who should take the lead

in their investigation if not the members of the medical profession? Within a few years several writers have discussed points or topics bearing directly on these laws, and others have made favorable references to them. Besides, the public at large are becoming more and more disposed to seek information and instruction on this subject. The increased attention to physiology and biology seems to prepare the way, and demand that such investigations should be more vigorously and thoroughly prosecuted. When we consider, too, that it is not the mere physical properties of the body alone that are transmitted, but the dispositions, the propensities, the mental capacity, the moral sentiments, &c., these laws assume an importance, a magnitude that can scarcely be over-estimated. In fact, the character of every individual, of every family and race depends very much upon the material or elements provided by these laws. For what can family training do, what can education accomplish, without favorable material for operation, or in other words the right developments of brain? We venture the assertion, that all permanent improvement or progress in the civilization of any people or nation is more dependent on these laws than upon any other agency whatever. If one fourth the attention or one tithe of the expense was given to the improvement of the human race in this direction, that is now expended on that of domestic animals, it would result in the most surprising changes.

It is impossible to estimate the value and im-

portance of the relation which these laws sustain to other improvements. Their application affords not only the most powerful assistance to all the improvements and advantages of civilization, but serves to render them more fixed and permanent. For unless the physical organization of a people or nation is kept good, or improved from generation to generation, there are bounds or limitations to all progress. In fact the whole structure of society, the advantages of education, the improvements in science, in arts, in literature—to say nothing of the foundations and advancement of morality and religion—are all powerfully affected by these laws. The subject is too vast, too complicated to be discussed in a brief essay, but it presents two or three phases to which I wish to call particular attention.

There are certain agencies operating at the present day, which in the course of time must produce marked effects upon the organization and character of our people. The removal of so large a proportion of the population from the country and rural life to cities and large towns; the change of employment from farm work—from out-door exercise and the more laborious mechanical pursuits—to lighter kinds of business, with increased exercise of the brain; add to this the greatly increased strife, excitement and competition in every department of business and society—all these changes must serve gradually to diminish muscular power and the general vitality of the system. No truth in vital statistics is better established than the

fact, that large cities and a dense population tend to diminish the physical energies of the body and shorten human life. Then, the increasing use of alcohol in its various forms, and especially of tobacco among young men, must have a most pernicious influence upon physical organization. But it is in the accumulated, the intensified effect produced by the law of inheritance, that the most striking and destructive results are to be witnessed. Could the evils of alcohol, tobacco and opium, as transmitted by hereditary influences, be fully realized, what more powerful motives could be presented for a reform in their use, or for their absolute prohibition? We believe the fact is generally admitted, that there is a constant increase in the use of stimulants and narcotics throughout the country; that this question is settled, beyond controversy, by the greatly increased manufacture and sale of these articles. No true physiologist, who understands the terrible effects of these poisons on the system and their transmission to the second, third and fourth generations, can look on such a state of things without apprehending the most serious results.

But there is another point of view whence these laws of inheritance may be considered, which sustains a most intimate and important relation to human welfare; we refer to the

POSITION OF WOMAN.

The question might naturally be asked, why discuss the position of woman more than that of

man? The answer is obvious: his rights and claims have not been agitated, or attracted the same attention as those of woman.

Within a short period new questions have sprung up for consideration in respect to the rights, the employments and position of woman. While her wrongs in the past are generally admitted, as well as the desirableness of some radical reform, there are certain physiological problems involved in the issue, which should not be overlooked or ignored. If we are not mistaken there are principles or laws involved, which underlie the very foundations of society. They are not the opinions of individuals or the resolves of public bodies, but the laws of the Almighty implanted in human beings for their highest welfare and happiness. Can these laws be understood—can they be correctly interpreted and properly applied? Most of the discussions upon this subject have been conducted with very little reference to physiological laws. A majority of the parties engaged in them do not seem to consider or realize what effect, if the points at issue are carried to the extent advocated, may be produced on the marriage institution, and the physical welfare of the race. Any changes or agencies that threaten in any way the security and permanency of the family, should be approached with all the care, intelligence and wisdom that are possible. That the marriage and parental relations constitute the groundwork, the main pillars of human society, requires here no argument to prove. The physiological law of *sex* is the corner-

stone of these relations, and has, we believe, a far more direct and powerful influence upon organization and character than is generally considered. Inasmuch as woman is so created that her own health is very much affected by this feature in her organization—inasmuch as the physical development of offspring is also very much dependent upon her constitution, these two considerations have an important bearing upon her education, employment and relations to the public. There is a normal and healthy standard for every organ in the human body; and whatever influences tend to change or violate the laws that govern any one of these should be carefully guarded against. Thus in the matter of education it has been very clearly demonstrated by a distinguished member* of our profession, that the boy and the girl cannot be educated just alike. No one but an experienced physician can realize or describe fully the powerful influences which the function of menstruation has upon the health of woman; and this effect, in extent and character, depends much upon the early stages of its development. For the period of some thirty years there is certainly a marked difference in the sexes, which must materially interfere with employments and public duties. Such is the relation, too, of this function to the nervous system, that any derangement or morbidness of action here may affect the disposition and character of the individual.

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* Dr. E. H. Clarke.

All writers on physiology agree that too much importance can scarcely be attached to the healthy action of the uterine functions; and when we present the testimony of one writer, it expresses, we believe, the opinion of all. Says Colombat: "The extreme sensibility of the uterus, its physiological importance, its peculiar irritability, and especially its more or less sympathetic connection with other parts of the body, render it a centre of action which in the sex seems in a measure *to domineer over the whole economy*, and form *the principal basis upon which the edifice of the whole organization rests.*"

In settling, then, the points involved in the question of "Woman's Rights," so called, the physiological bearings and tendencies should receive primary consideration. The immediate change produced, however, may not be so noticeable, but in the course of two or three generations its effects become very striking and powerful.

That in the present state of society there is need of some changes or reform looking to improvement in the health of woman, is evident. The very general ill-health of American women is often asserted. There should certainly be a reform in the fashion or style of dress; it should harmonize with the laws of the physical system. In the early training of girls the greatest care should be taken to secure the best possible development of the body; and in the whole course of their education, whatever interferes with healthy action or violates physiological laws, should be most scrupulously

avoided. As to the higher departments of education and a more extended range of employments, there are substantial reasons and arguments deduced from physiology itself why woman should have these advantages. Let her have the highest culture—physical and mental—consistent with her whole nature. But then, that she should share equally with man in all the strife and competition of business, in the excitement and rivalry connected with political and public life, including suffrage, is physiologically unnatural, abnormal, a violation of the laws of her physical system. In the language of the most distinguished writer on psychology in Great Britain, "she will then have lost her feminine attractions, and probably also her chief feminine functions." One of the cardinal points in attachment between the sexes is, that certain opposite qualities or traits of character attract each other and form the most happy unions. Now if the qualities and traits of character in woman are to be assimilated to those of man, what will be its effect upon matrimony and harmony in married life?

In all the situations and pursuits of life the Almighty has established bounds or limitations beyond which woman cannot go without defeating the primary objects of her creation. The reasons are obvious. It gradually changes her organization. By a physiological law of supply and demand, nature, in the case of woman, makes certain drafts monthly upon her constitution. That this law of periodicity be properly observed

is indispensable for good health and the highest development both of body and mind. Again, if the brain is relatively exercised too much, the body suffers; so of the brain alone, there cannot be a steady strain upon certain portions of it without impairing the functions of other parts. Maternity is a primary law in her creation. Physiology, pathology, records of health, disease and mortality establish the fact that this is her NORMAL state. In the observance of this law, certain physical conditions are indispensable; there must be a proper development of those portions of the body concerned in this function; neither can they answer the demands nature makes, if kept constantly impoverished.

For illustration: if that portion of the brain whose functions include attachment to the other sex, love of offspring and domestic life—those strong instincts that centre in the family and in the home—is not properly developed or trained, but other portions of the brain, embracing the selfish faculties, are continuously exercised, and strained to their utmost capacity, the result is that it changes organization and character. It tends to undermine the foundation of the marriage and maternal relation, which rests on the purest and most powerful instincts of nature, and transfer it to one of self-interest and convenience. The relation, in fact, is already coming to be viewed more and more in the light of a partnership, as a matter of business and necessity, or, in other words, to be based upon the supremely

selfish traits or elements of human nature. That such large numbers of our young married women should be so disinclined to assume the duties of maternity, indicates something wrong. However desirable or important may be the cultivation of any or all the mental faculties, the reason, the judgment, the imagination, and even the conscience and veneration, these alone never bind and cement society permanently in the home and in the family. In such cases children are a burden, confinement at home is irksome, domestic labors and relations are not the most agreeable. What is wanted, and what accords with the order of nature, is a *balance of organization—a harmony of action in all the functions of the brain*—not an excess of the mere animal, nor all intellect nor moral feeling. If a practical test of this law is demanded, what is the testimony of history and the experience of the present age? Let a careful investigation be made as to the productiveness in offspring, and the character of the family relation, of those who have been, or are, supremely devoted to intellectual and business pursuits. How often do we find difficulties and not unfrequently separations between married couples, where both are highly educated and strong-minded? And as for offspring, they certainly are not very abundant with this class of people. There may be found exceptions to the last remark, but the facts generally confirm it. It should be stated, that in order to make a fair trial, and witness its full effects, two or three generations must be taken

for the comparison. It is this *permanent* result in an intensified form, that makes these changes so important—so fundamental.

It may be said that the argument here employed, as to the position of woman in its relations to marriage and maternity, does not apply to that class who do not assume these relations. But this class composes only a small minority of the whole, and the course pursued by them is an exception to the general law of womanhood. Besides, they cannot change materially the physical functions of their nature without injury to their health, or without affecting, more or less, their character. The remark was made by one of the most distinguished female writers in this country, that the nature of woman was not fully developed without sustaining the relation of wife and mother. How then can the class alluded to, governed by their own consciousness, judge properly and correctly of all the relations referring to the family and domestic life? Can their teachings be safely followed?

Again, what effects would the reforms advocated by many have more directly upon the body itself? In some respects they would tend, undoubtedly, to improve the general health—to increase the muscular power, vigor and strength of the system. In some cases they would decidedly improve the organization, produce more harmony of action in all the organs—a better development of the great laws of life and health. But while they might increase the muscular power and strength, might

they not unduly develop the nervous temperament? If there is to be a constant strain upon the muscles and the brain, what will be the effect upon those organs connected with the functions of gestation and lactation? Would it not tend to prevent their proper development and healthy action, by withdrawing from them the nutrition which should go to their support? The better the laws of inheritance are understood, the more directly certain effects may be traced to the physical and mental state of the system at the time of conception and during the period of gestation. Now if all the energies of the body and brain of woman are to be incessantly taxed, what will be the effect upon offspring? It should be borne in mind that physical and mental habits, when fixed for many years, cannot be easily changed or modified. Then in the matter of furnishing proper nutrition to offspring — which can come from the human breast alone — it is vastly important that the organization should not be so exercised or changed that this provision cannot be counted upon. The community is suffering seriously from defects of this kind already, without having them increased or aggravated. This brings us to the consideration of another problem — intimately connected with the one under discussion, but far more important in its issues. It is what may be denominated a general law of increase or propagation, in discussing which the organization of woman will be further considered with reference to its bearing upon that law. It

will appear that there are certain physiological conditions in her constitution that are indispensable for the observance of this law in its highest or most healthy development.

THE LAW OF HUMAN INCREASE.*

The remark is frequently made that we live in an eventful period. Some events or occurrences make a great impression upon the public mind, and are being constantly discussed; others, far more important, are transpiring, that attract little attention, but will be noticed by the historian with intense interest, if not with surprise. In this latter class of events will be ranked the changes in our population, especially the decrease of numbers in our New England people, which, if continued another hundred years in the same proportion as in the past, will, in all probability, remove them from the stage. Their record will exist only in history. Here in this quiet, gradual decline of population is one of the gravest problems of this age. What is its solution? Must we lie supinely by, and leave that solution to the lapse of years, simply watching or aiding professionally the ebb and flow of life, as one generation after another rises and disappears? No persons can be more cognizant of the facts, or feel a deeper interest in

* Having been led to adopt some novel views upon the law of increase or population, and having published several papers upon the same in journals and pamphlet form, it seemed proper to present here a synopsis or summary of those views. If there is truth in them, they should certainly be made known; and no class in the community is better capable of judging of their correctness, or should be more interested in their diffusion, than the members of the medical profession.

their results, than medical men. Their professional duties are closely identified with the two greatest events in life — birth and death — that occur to any human being.

What, then, are the facts in the case, and what are the causes? On account of the rapid increase of a foreign element in our midst, this change going on in our population has not been so perceptible, nor created much interest. Had no such additions ever been made to our numbers, the change would have excited universal attention, and some explanation of the causes would certainly have been demanded. There are two methods of testing the character and extent of this change: first, by ascertaining the average number of children to each family in a community; second, by comparing the differences between the birth-rates and the death-rates of a people. Without attempting to solve these questions with mathematical accuracy, a task of difficulty, the facts stand very nearly as follows. The early parish and town records of New England show that the first settlers had large families, numbering on an average from seven to nine children; but soon after the first generation a slow decline commenced. For the last two or three generations this decrease has continued at a more rapid rate, so that from the best estimates that can be made, it is thought that the present average number of children to each married couple will certainly not exceed four, and may not be much over three. From statistics on mortality, it

is found that only about three-fifths of all infants born, live to adult age. After, then, making the necessary allowances for death, and the fraction who do not marry, it will be seen at once, that the original stock is scarcely kept good at the present time in numbers. It is safe, we believe, to state that the average number of children to each marriage has diminished nearly one-half since the present century commenced.

In respect to the birth-rate and death-rate of our New England people proper, it is difficult to obtain them exactly, inasmuch as all the foreign class born in this country are generally returned in the reports as *native* American. But in some places the reports of the two classes have been kept separate, while in others, by a careful analysis of the Registration Reports, and the nationality of the population, a very correct result can be reached of the birth-rate and death-rate of each. It is very evident that these two great points in vital statistics, viz., birth-rate and death-rate, have been approximating, with New Englanders, for the last half century, nearer and nearer each other. This statement is confirmed by the fact, that in towns peopled almost entirely by Americans, the deaths frequently exceed the births. This relative decrease in population is admitted by the highest authorities, the U. S. Census, the National Bureau of Vital Statistics, and the State Registration Reports.* Now,

* "The character of our population is undergoing a great change. Surely, and not very slowly, a mixed stock of Irish, German and

judging by the past, what are we to expect in the future? Should the same relative decrease continue two or three generations more, what will be the result? That there should be, in the course of two or three generations, so great a falling off in the birth-rate of our New England people, and that the Irish, English, Scotch, German and Canadian-French women living in our midst should have, to say the least, twice as many children, are curious facts which must in some way have a solution or explanation. That this wide difference arises wholly from violating the laws of nature in conception, and by abortion in pregnancy, we cannot believe; but other causes also exist in the peculiarities and changes in physical organization. All medical observation and experience teach that there is in women a wide difference in the matter of fertility, and that it must have its foundation in differences of constitution. That this difference exists in communities where, in order to prevent increase, the laws of nature are not in the least violated, all must admit. In what, then,

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Canadians is taking the place of the purely English stock which has possessed Massachusetts for more than two centuries. The tide of immigration flows the stronger with an increasing wealth and general prosperity. There is much hard work to be done, unskilled labor is in demand, and Americans are not ready or willing to supply it from their own ranks. These are facts for the statesman, the educator and the moralist."—*Massachusetts Registration Report*, 1870.

"No one can be familiar with life in the Eastern and Middle States generally, and in the Western cities, and not be aware that children are not born to American parents as they were in the early days of the country. Luxury, fashion, and the vice of 'boarding,' combine to limit the increase of families to a degree that in some sections has threatened the perpetuation of our native stock. This tendency is not one that requires to be brought out by statistical comparison. It is patent, palpable, and needs no proof."—*U. S. Census*, 1870.

does it consist? What is the peculiar type of organization most favorable to fertility? Is a particular temperament, or a predominance of a certain class of organs, requisite?

Some of the causes of this difference are very obvious in the ill health of women, particularly in the weaknesses and diseases connected with the reproductive organs. That these are very prevalent with American women, all will admit; but why should they exist to such an extent? What are their primary causes? Do not most of them arise from previous violations of law, from wrong habits and practices, from perverted and false notions? Besides, have not these agencies or primary causes prevailed so long and to such an extent as to change, in some measure, not only the form of body and type of organization, but to affect, in some degree, the disposition, the habits and the character of the individual.

Commencing medical practice more than thirty years ago, in a mixed population, embracing several distinct nationalities, my attention was early called to this difference in birth-rate. Careful comparisons were instituted in respect to the female organization of the Irish, the English, the Scotch, the German, the Canadian-French and the American, and then between those of each race who were prolific and those who were not. Then a thorough review of all books treating upon population was resorted to, together with investigation into all the principles of physiology that could throw any light upon this subject. In this inquiry

we were surprised to find, that among all the writers upon population, there was scarcely one who had been thoroughly educated in the science of physiology, or in the practical application of medicine to the laws of life. In all the discussions and theories of the early writers who attempted to account for the increase or decrease of population, the human body, the most important agent, received but little attention. The systems and theories they advocate are based upon causes or grounds entirely external to the body, and some of them sustain very slight relations to it. But within a few years new inquiries have started up as to physical agencies affecting different races and nations, and also in respect to origin of species, laws of life and health, &c. The principles of physiology, biology and anthropology are assuming every year greater and greater importance. In these new inquiries and discussions upon the laws of life, health and disease, and other changes that affect physical organization, the laws that govern its increase or decrease must ere long receive far more attention. For it stands to reason and common sense, that there must be, in the very nature of things, some great primary law of propagation, and that such a law must have its seat and foundation within the body itself.

After extensive observation and no small amount of reading and reflection, I became thoroughly convinced that there was a great primary law of propagation founded in nature. This conviction has been every year strengthened by new and

striking evidences from a variety of sources. This law, expressed in the fewest words possible, may be thus defined: It is based upon a perfect standard of organization, or consists in perfectionism of structure and harmony of function; or, in other words, that each organ in the human body should be perfect in structure, and that each should perform its legitimate functions in harmony with others. It presupposes that other conditions are favorable, such as the age, health, union and adaptation of the married parties — that no laws of nature are violated or interfered with — that there will be uniformly found, with such a standard of organization, not only the greatest number of births, but children endowed with the highest amount of physical vigor, strength and health. Taking this, then, as a standard, we have a general law or principle that furnishes a guide by which all deviations from this model, and the manifold changes that follow, may be explained and understood. While this law is subject to the influence of certain agencies, as those of food, climate, exercise, &c., all these act as secondary agents or factors. They may modify the operation of the law, but cannot change its nature or general character.

It is true we have no such perfect standards or models of human organization now existing, but only approximations towards them. Still the law may apply to such as we have, just as well as the general law of gravitation or attraction to the smallest sized bodies. We can readily conceive

of such standards, and how the same law that governs them may be applicable to their representatives of whatever grade or character. As the subject opens up so many new points of inquiry and observation — is so vast in extent and so complicated in all its parts — it would require a life-time to investigate and discuss it with any degree of justice or satisfaction. We can here only present a brief outline or synopsis of some of the evidences which may be adduced in the support of such a law, premising that it would take volumes to give the details. The facts and arguments in support of the theory must be derived mainly from physiology, pathology and psychology, while many proofs and illustrations may be obtained from history; still, these would be only the practical application of principles embraced in one or all of those sciences. From the past history of physiology and pathology, it is certainly reasonable to expect the discovery of new truths, or new applications of old ones.

The most distinguished writers on physiology speak of the science as being in its infancy, and of "the rich harvests that await the physiological laborer," and that "it is destined to attain proportions far more gigantic than it now presents." In taking a cursory survey of the subject, the first impression made upon the mind is, that there must be, in the very nature of things, some general law of propagation, of continuance, of existence; and that, whatever agencies or influences there are, extraneous to the body, which might in any way

affect its development, the most important law of all, the law that shapes its character, life and destiny, must have its seat and foundation in the body itself. Such would be the experience, or the common judgment, in case of other organic structures, as well as in science generally.

What, then, are the teachings of physiology and pathology? Unfortunately, in no medical books or journals have the principles of these sciences been very fully discussed, with any particular aim to account for the increase or changes in population. It is comparatively a new field of inquiry, and most difficult of investigation. The great object of the cultivators of these sciences has been to discover and point out the structure and functions, or the diseases and cure of every individual organ, rather than their normal and combined action in any one direction. Thus, in respect to the reproductive organs, the leading inquiry has been as to their particular diseases and treatment—not their healthy action, and the relations in a normal state which they sustain to all other parts of the body.

As far as any testimony from medical works can be gathered, it favors some such theory. The following expressions, quoting from Hippocrates downwards, may be given as a sample. "The want of fruitfulness arises from sedentary life, want of exercise, profuseness in living, fatness and muscular weakness." "The poorer and most laborious part of mankind are the fruitfullest, and the most voluptuous, idle, effeminate and luxurious are

the barrenest." "High refinement is an obstacle to propagation." "The condition most favorable to procreation is a habit of body inured to labor." "Low diet and moderate exercise are the best restorers of the breed." "The rate of increase of population is the slowest in the most opulent classes." "Repletion is an enemy to generation." Many more and longer testimonials, similar to the above, could be adduced, but these are a fair specimen. To the physiological inquirer, they are full of instruction. Each one has an application, and when analyzed physiologically, they all look towards some uniform type or general law of propagation.

One of the cardinal points in the theory of propagation here proposed is, that every organ in the system, in order to secure its proper development, as well as perform its appropriate functions, must receive its due proportion of nutrition and exercise. Dr. Carpenter, in his work on Physiology, says: "There is a certain antagonism between the nutritive and reproductive functions, the one being exercised at the expense of the other. The reproductive apparatus derives the materials of its operations through the nutritive system and its functions. If it is therefore in a state of excessive activity, it will necessarily draw off from the individual fabric some portion of the element destined for its maintenance. It may be universally observed that when the nutritive functions are particularly active in supporting the individual, the reproductive system is undeveloped, and *vice*

versa." Here is a strong argument from the highest physiological authority, and the principle set forth is susceptible of a wide application. Let any one organ or part of the body be unduly or excessively exercised, and it requires more nutrition to support it, thereby withdrawing what should naturally go to other organs. The general law which this principle goes to sustain is, that nature has established an equilibrium or balance of organization, wherein all the organs of the body should be harmoniously supported and exercised; and that such a standard is the most natural, most normal and perfect type which can be furnished by physiology. Such, we have good reason to believe, was the development of the human body at its creation, and in such a state it is found most exempt from disease, is capable of performing the greatest amount of labor, of receiving the greatest amount of enjoyment, as well as reaching the greatest longevity. The chief objects of existence are thus intended to be secured in the highest degree, and to the utmost extent.

Inasmuch as this theory of propagation is based upon a perfectly sound organization, all diseases, derangements and weaknesses of the system interfere more or less with its operation. Some diseases or certain weaknesses, such, for example, as sterility, impotence and barrenness, do this far more directly and effectively than others. All those diseases that have a decidedly hereditary tendency violate this law especially, as their transmission multiplies diseases, increases early mortality, and

shortens human life. If both the married parties possess this organization, the germs of disease are transmitted in an intensified form, and such families are sure to become extinct in the course of a few generations.

Closely allied to disease are unnatural structures and abnormal conditions of the body, which are found to become less and less productive the further they deviate from a perfect standard. A distinguished writer on Anthropology states, that giants and dwarfs are rarely prolific, and that persons of very large or small intellectual powers are generally deficient in fertility. The fact is pretty well established that the defective classes, such as the insane, the deaf and dumb, the feeble-minded, are not generally prolific, and if left to intermarry exclusively among themselves they would run out entirely. There may be apparent exceptions in these classes, but the general rule will, in the long course of events, hold good. It would seem as though infinite wisdom had intended that all such abnormal characters should not long or upon a large scale be propagated, and that they must, by the very conditions of their existence, tend to extinction.

The same general law holds good, too, when applied to the most vicious and abandoned, the notoriously intemperate and licentious, that, in the course of a few generations, their progeny become extinct. For a somewhat different illustration, upon a large scale, take a people or race whose native increase for many years has been

slight, or who, at times, have been declining in population, such as the French, the Spanish and the Italian nations; what is the present type of their physiology? Is there not a similarity of temperament, or are not their leading physical developments in some respects much alike? On the other hand, and in contrast, take a people or race, which, for several generations, has been rapidly increasing in numbers, such as the German, the English and the Irish. In certain features the physical organization of these nations is identical, and is certainly very different in its type from that of the three nations first mentioned.

In this same department of physiology is a class of facts which furnish most positive evidence in favor of some general law of increase, and cannot, we believe, be explained satisfactorily upon any other hypothesis. Some of these facts were noticed in the early history of the world, long before anything was known of this science. The sacred Scriptures clearly intimate that there is something wrong in the intermarrying of blood relations, and by the law of Moses it was forbidden "in the third degree." Both the Greeks and the Romans observed these facts, and proclaimed that such intermarriages were prejudicial to the healthy propagation of the species. The Catholic Church very early opposed it, and adopted a standing order or canon against all such alliances. The Mohammedans of the present day, and various other religious sects, have very positive opinions upon this subject. For several thousand years a

great store of facts has been accumulating, which go to show that there are some fixed laws in physical organization which should in some way receive a satisfactory solution. All the new discoveries and modern researches in physiology have only confirmed these phenomena, without explaining their rationale. But this fact has been discovered, and its truth is generally admitted, viz.: that there are exceptions in the intermarriage of relations where no evil effects have followed, as, for instance, in that of cousins. Why these exceptions occur, or why bad effects follow at all, are questions which cannot easily be explained upon any of the old theories of population.

Closely identified with this same topic, may be found a most fruitful field of inquiry, in which facts of the greatest interest and importance may be gathered bearing directly upon this subject. We refer to the laws of inheritance.

No truths in physiology are more patent or more generally admitted, than that certain physical and mental qualities are transmitted from parents to children. The fact that resemblance or likeness is thus communicated, is becoming more firmly established every year, not only in a general sense, but in its application to every organ and tissue in the body. All advances and new discoveries in physiology, pathology and psychology confirm and illustrate, more and more, this law of hereditary influences. It is true the operation or working of the law depends upon certain conditions, such as two distinct agents concerned in the union—their

adaptation, peculiarities, state of health, and other conditions of the system. If the organization of both parents were perfect, or very nearly alike, we should find the same or very similar qualities of organization exemplified in their offspring. On the other hand, if there are great differences or striking peculiarities in the parents, the same qualities, modified, perhaps, in some degree, will characterize their children. And the effects or qualities thus communicated will extend through successive generations, sometimes becoming more marked and significant.

Now, why this resemblance or relation between parent and child; why should certain sequences uniformly follow certain antecedents? The facts are admitted. We have certain effects traced directly to certain causes, implying that there are necessarily and invariably certain relations between them. The admission of one relation, the evidences to prove the existence of any laws here at all, go just so far to prove that there are more, and that there may be one general law covering the whole. In no other way can all these hereditary influences be explained or reconciled, as far as we can discover, except by a general law of propagation, and that, too, based upon a perfect organization.

Connected with hereditary influences, the question naturally arises as to man's free agency and responsibility. A very strong argument may be adduced from this source in favor of the theory here advocated. In a law of population, where

the agency and interests of man are so much concerned, the highest dictates of justice and wisdom would teach us to expect that, while he ought to act voluntarily and with perfect freedom, he should also be governed by a strong sense of responsibility, by high motives of improvement, and by regard for the increase of human happiness. If man is therefore a free moral agent, accountable for all his acts, the law providing for the propagation of the species should certainly be of such a character that he can clearly understand its nature and sanctions, a law which he can and should obey under the highest possible motives. Whereas, if the law of population is based upon food or climate, or upon outward circumstances over which the individual can have but little or no control, or if it is a law of which, in its character and application, he can have only vague and indefinite notions, what becomes of his responsibility in the matter? Where is any motive for improvement? It certainly could not have been the intention of the Almighty that man should be, morally, a mere passive agent in such a transaction, or should always remain ignorant of one of the most important laws relating to his being! But how different the theory or law of increase based upon physiology! Here the nature and character of this law are clearly made known, together with the conditions upon which its operation depends, as well as its effects, by hereditary influences. It explains how improvements may be made, not only in the family, but extended from generation to

generation, thus elevating and perfecting the race. Here in this law we have combined free agency, moral certainty of action, and the highest possible order of motives.

If there is a great law of human increase, what are the facts in the animal and vegetable kingdoms? The same general laws that govern all organic matter in these lower orders, it is believed, govern and control all the changes that take place in the human system. It is true, there are some points of variance, and some modifications that are not strictly analogous; but, in the main, the general principles operating in these several departments are the same. A little over one hundred years ago, the first systematic attempts were made in Great Britain to improve domestic animals, since which time, by a series of experiments and observations, the most surprising improvements and changes have been made. Certain results were uniformly found to follow certain conditions; and so sure have these relations been considered, that if there was any slight exception or variation in the result, some cause or explanation readily presented itself. To such an extent have these experiments been carried, that they have resulted in what may be considered as settled principles. Now, when these principles are all carefully analyzed and traced back to their primary sources, they will be found based upon the laws of physiology, and when summed up or reduced to a system, they all centre in one general law of propagation. Facts and arguments of the most positive char-

acter might here be adduced by way of proof and illustration, to show that it is the same law of increase which we have described as applying to the human race. And by such a law, and by no other theory, as we conceive, can these improvements and changes be satisfactorily explained.

Among vegetables and plants, similar principles prevail. All the improvements and changes here made are governed by the application of physiological laws; and these laws, when scientifically examined, will be found to be part and parcel of one general law.

The records of history strongly corroborate this theory in various ways; yet there is great difficulty in making here anything like a proper test or application of this law, inasmuch as history furnishes no formal account or description of what was the *physical organization* of any people where such changes were taking place. Even the various works treating expressly of population seldom make any reference to physical qualities or physiology, as though the great organic laws of the system had comparatively little agency in the matter. But let us gather up some facts from different points of view. As a general rule, families and communities have multiplied most where there was the greatest aggregate amount of health; and, on the other hand, the sickly and diseased, as a whole, have increased much less. It is an established fact that consanguineous marriages, if continued for some time, and also the intermarrying of certain orders, like that of the nobility or peer-

age, carried on through several generations, result in less and less offspring, and sometimes in entire extinction of families. Such unions, in fact, beget too much likeness or sameness of qualities in organization; and if there are weaknesses or predispositions to disease in the contracting parties, they are transmitted in a more serious and dangerous form. It is also an established fact, that all those families in which are found genius, great talents, and supreme devotion to intellectual pursuits, are not prolific; and if both the heads of such families are thus distinguished, the case is more marked, the offspring growing less in number, and the name soon becoming extinct. Such has been generally the family history of great scholars, authors, poets, of nearly all who have been eminent or distinguished in any department of science.

There are three points of view, referring to the present construction of society, as well as to its past history, from which important evidences bearing upon the subject may be obtained. It should be borne in mind that this law of increase, in its highest development, is based upon a perfectly well-balanced organization, sound in structure throughout, with every organ performing its appropriate function. If we take, then, this type of organization as a physiological standard, let us see what would be its practical application in the extreme deviations from this model. It is a fact no one will dispute, that there is a great difference in the number of children in different classes

and communities. It is found that just in proportion as we ascend the scale in refinement, education and all the higher elements of civilization, there will be, in about the same degree, a diminution of offspring. It is well known that the families in what are called the upper classes become, from generation to generation, less productive, and in the course of time extinct, unless replenished from the lower walks in life. Hence, in nations most highly civilized, those standing at the head of government, and occupying the highest positions in power and influence, have, in the course of time, few to represent them. If we admit the foregoing statement as a well-established historic fact, we naturally seek an explanation of it. The simple reason is, as we conceive, that their style of living taxes the brain altogether too much; it developes a great predominance of the nervous temperament at the sacrifice of other parts of the body, which by inheritance is increased from generation to generation. The balance of structure and harmony of function in organization is radically changed, and carried to an intense development of nervous tissue, which in its very nature is unfavorable to the procreation of offspring. It illustrates the principle of Fourier, that "just in proportion as individuals or a community become perfected in civilization, in the same proportion the race inclines to run out."

If now we pass to the other extreme of society and physical organization, what are the facts?

The first impression might be that the birth-rate here would be large, and that there might be from this source a steady and permanent increase of numbers. There may be individual cases of this character, and temporary increase of a race or community; but in the long run these are the exceptions. For nowhere do we find any account of a tribe or race, living in a purely savage, barbarous state, leading a coarse, low, sensual, animal life, that has been at all fruitful in children through several successive generations. It is true, such classes are always changing, and sometimes increasing in numbers by immigration; but seldom do they multiply extensively from their own resources. Such is the verdict, we believe, of all history, both ancient and modern. The laws of nature have wisely fixed limitations to the increase as well as to the prosperity of such a people. Illustrations of this may be found in certain portions of Asia and Africa, among the South Sea Islanders, and in the Indian tribes of our own country. It may, perhaps, be alleged, that the reason for this limitation is not in the birth-rate so much as in the manner of living. A careful examination of all the circumstances will show, we believe, that the primary and chief causes arise from violation of physiological laws. The nutrition here goes either to support the body of the individual alone, or is consumed in the mere gratification of the animal propensities. When the lower and grosser parts of the body become too predominant and active, they soon

become exhausted, and cannot propagate the healthy germs of life. It will be found, too, that where there is not a fair development of the nervous temperament, and a healthy exercise of the brain, such a people or race tend to die out.

The third point of view is that position in society and physiological standard half way between these two extremes—the golden mean; or, in other words, that type of organization the most healthy and best balanced that can be found. We may not find perfect specimens, but approximations in great numbers towards such standards. As history nowhere describes definitely the physiology of a people, and we cannot take an extensive view of that now existing, the facts cannot here be given with the precision and detail that are desirable.

According to the law of propagation proposed, the people included in this class will have the greatest number of children, combined with the highest degree of strength, vigor and health, provided the laws of nature are not interfered with. It will be found that classes or communities, possessing such an organization, increase the fastest in numbers, and so continue for several generations. As representatives of this class, may be mentioned the first settlers of New England, the better portion of the Irish race, whether living in Ireland or America, together with a middling class of the German, the Scotch and English, living either in Europe or in our country. And when any two of the races in

those classes are united, we find a more rapid multiplication of numbers; as, for instance, among what are called the Scotch-Irish or Canadian-French. A careful examination will, we believe, most conclusively confirm these statements. From a professional experience of over thirty years among some of these classes, with particular inquiries and observations in this direction, these facts have proved so clear and abundant, that we could arrive at no other conclusions. After making thorough investigation into particular cases and families, we never have found exceptions to this general statement without, at the same time, finding a satisfactory explanation of them. All doubts and questions can in this way, we believe, be decisively settled.

Closely connected with this point of view is another feature of the subject, challenging careful inquiry and investigation. This point must be of special interest to medical men. In the work of propagation, greater consideration is given to woman, inasmuch as her organization performs the more important agency, particularly in the matter of gestation and nursing. The physiology of woman, the history of her diseases and the rate of mortality, demonstrate that married life and the production of children are among the primary objects of her creation. Dr. James Stark, of Edinburgh, by a careful examination of over one hundred thousand cases in the Registration Reports of Scotland, for 1861 and

1862, showed most conclusively that the married women of that country, on an average, lived longer and enjoyed better health than the unmarried. The same fact has been confirmed by other writers, and by statistics in other countries. There can be no question that the fulfilment of this law is found necessary for the most complete development and perfection of woman's organization, for her longevity, and her greatest amount of health and happiness. Exceptions there may be to this general rule, but it is a law which God has made applicable to all races and nations; and whatever institutions, habits and practices interfere with its execution are abnormal, are deviations from the laws of nature and of God.

If the truth of these views as to the laws of life and health be admitted, or if their correctness should be deemed probable, the importance of their inculcation will be seen at once; for some moderns, in their teaching, insist upon widely different doctrines and practices. The physiological laws involved in the relations of marriage, of family, and of maternity, cannot very safely be trifled with or set aside. No permanent improvement or reform can be made in these relations, except as based upon and in harmony with the physical laws of the system.

If, then, this is a primary design in the organization of woman, upon what particular type of development, condition or feature of the system is this law found to operate best, or in its highest degree? That there is a difference, a wide differ-

ence, in the fecundity of women, must be admitted; a difference, physiologically, in the susceptibility to conception, in the effects of pregnancy, in the ease and safety of delivery, in the physical qualities for nursing, in the constitutional healthiness of offspring. In what, then, does this difference consist? To settle this question, we naturally seek some standard to which to appeal; and both nature and analogy would lead us to the conclusion, that such a standard or model exists somewhere, and that we shall not seek for it in vain. Reasoning *a priori*, we should naturally infer that it would be found in the highest type or most perfect organization in structure and function. For such is the nature, importance and complication of forces required in propagation, that for its successful results, it seems to demand the aid of every part of the system. This is certainly the first, the highest and most important law in the whole animal economy.

Again, we should infer from analogy that this law was based upon the most perfect development of the system. All primary laws or the fundamental principles of science take their start from, or are based upon, perfect standards or models. Nature in her primeval state is perfect, and all her laws must be tested by such standards. The laws that govern the human system cannot be an exception to this rule. If there is, then, such a general law of propagation, it is of the highest importance that it be known and understood. The knowledge of such a law would be fraught with

the greatest possible interest and benefit to the community at large, but especially to the medical profession it would prove of incalculable value. Let us, then, inquire briefly what are some of the evidences of the existence of such a law derived from this source, and what would be some of the advantages of understanding it. Our remarks will be confined to two or three points of view. As the field of inquiry is new, and nothing comparatively can be found in medical works bearing directly on the subject, we would bespeak the charitable consideration of our brethren.

Provided there is such a law (of which we ourselves entertain no doubt), what relation does it sustain to the pregnant state? Considering the change produced by pregnancy in the system, it might be expected to disturb somewhat the functions of certain organs; but the extent and danger attending this disturbance become sometimes very weighty considerations. If, in accordance with physiological laws and experience, parturition as a whole has proved favorable to the life and health of women, does not the existence of grave and dangerous diseases arising from the pregnant state indicate something wrong in those particular cases? In works treating of diseases of women, we have generally a long chapter under the head, "Diseases of Pregnancy," discussing from twenty to thirty distinct complaints. They are described as caused by, or incidental to, this state of the system, and occasionally some of them become very serious and dangerous. It is very evident that in certain

individuals, there is far greater liability or predisposition to some disturbance than in others, and that the type or character of the disease depends mainly upon the constitution and habits of the individual. It is well known that the health of some women is greatly benefited, too, by the pregnant state; and not unfrequently, after bearing several children, the constitution is actually strengthened, the general health is decidedly improved, and life prolonged. But in other instances the very first stage of this change operates unfavorably; it may induce a little nausea or a slight headache, or it may result in the most violent inflammation or convulsions. Sometimes the change may affect this organ, sometimes that, and again almost every organ in the system becomes more or less affected. The more nervous and sensitive the individual, the greater the effect. It would require a volume to describe in detail the multiplicity, the variety and the character of these changes. Now, why should there be this difference, why these disturbances? What are the causes, the constitutional weaknesses, the particular predispositions? What is there peculiar in structure, in function or in habit? Why should there be such sympathy between this change in the reproductive organs and other parts of the body? How can we account, physiologically or pathologically, for these changes? What laws have been violated? May there not be a great general law of propagation, whereby all these phenomena can receive a satisfactory explanation or solution?

Let us admit the existence of such a law, based upon the perfectionism of structure and harmony of function—in other words, the perfect anatomy and physiology of the system—and it may throw new light on all these intricate changes. The ill effects of pregnancy, in kind and extent, may be traced directly, in every case, to deviations from this standard. The nearer the organization approaches it, the less it is disturbed; and the further any one organ or class of organs have diverged from this model, the more marked and generally serious may be the consequences.

In some cases, where pregnancy causes a change in the circulation and in the action of the stomach, certain diseases may be essentially relieved, or at least their progress for a time be arrested; while in others, certain weaknesses may be permanently cured. Here nature attempts to improve the organization by bringing about a better balance or harmony of functions, which proves favorable both to the woman and her offspring. In other cases this change so increases all the nutritive forces, that the woman in this state gains in flesh and becomes corpulent to such an extent, that it operates injuriously at confinement; it may be in the shock or in the resistance of the muscular tissue, or in the increased danger of inflammation.

Again, in case the nervous system becomes intensely sensitive and the brain morbidly active, thus removing the system farther away from a normal well-balanced state, it is found to operate unfavorably in a variety of ways both upon the

woman and upon her offspring. The state of the mind has also a great influence upon pregnancy, and *vice versa*. If the hereditary influences exerted in all the stages of pregnancy upon the physical and mental condition of offspring could be fully traced, they would be found, we believe, far more positive and powerful than have usually been considered. A general law of propagation aids us essentially in understanding those agencies.

In making an application of this law to the matter of delivery, time will not allow us to enter into detail. But there must be some standard of organization, not only of the pelvis and the internal viscera, but of the whole system, wherein or whereby to account for differences in pain, ease and safety in this process. May not that standard consist in perfectionism of structure and harmony of function? While in lectures and works on obstetrics, great stress has been laid very properly upon the construction of the pelvis and the position of the fœtus, has not the relation which other parts of the body, and the constitution generally, sustain to parturition in point of effect and result, been altogether too much overlooked?

After delivery, a different relation arises between the mother and the infant—that is, the dependence of the latter upon the former for sustenance. It was evidently intended by the laws of nature, that the child, for months, should be chiefly, if not wholly, supported from this source. No fact in vital statistics is more firmly established than that, in order to promote health and save life, the infant

must be nursed at the mother's breast. The ingenuity of nurses and physicians has been taxed to the utmost, the principles of chemistry and the results of experiments have here been brought into frequent requisition; but no substitutes have been, or can be, provided equal to pure breast-milk. Accordingly, we find that nature, in its normal state or highest development, has made ample provision in the structure of the organization of woman for nursing her offspring. But in order to furnish this nourishment, pure in quality and abundant in quantity, she must possess a good development of the lymphatic and sanguine temperaments, together with vigorous and healthy digestive organs. The mammary glands should be large, and the powers of lactation, assimilation and digestion should be strong, or equal to the demands which nature makes upon them in this direction. Whatever other qualities, physical or mental, the mother may possess, these physiological conditions are indispensable. A careful examination into the organization of women who best nurse their offspring will confirm this statement. And if we extend our observation to women of different races and nationalities, who thus rear their children, the same type of organization will be found to prevail. The same observations hold good in the lower families or genera of the animal creation, so far as they admit of comparison, especially among the mammalia.

Probably in no country and at no former period, have these differences in the qualities for nursing

appeared more marked or striking than among our women at the present day. Formerly our New-England mothers, as a body, found but little difficulty in nursing their offspring. It was only occasionally, in case of some radical defect in organization, or where sickness of some kind had overtaken the mother, that it became necessary to resort to the wet nurse or to feeding by hand. But how widely different is the condition at the present day! It has been supposed by some, that all or nearly all our American women can nurse their offspring just as well as not; that the disposition only is wanting; and that they do not care about having the trouble or confinement necessarily attending it. But this is a great mistake. While there may be cases here and there of this indisposition (which in itself shows something wrong), it is a fact that large numbers are anxious to nurse their offspring, and make the attempt. They persevere for awhile, perhaps for weeks or months, and then fail. They find that their milk does not satisfy the child, or that it does not thrive; and they conclude there must be deficiency in the quantity, or defects in the quality, of the nourishment. In many cases, after repeated trials, it is decided to give up nursing entirely; while others, depending partially upon nursing, resort also to artificial feeding. There is still another class that cannot nurse at all, having neither the organs nor nourishment requisite to make even a beginning. The proportion of American mothers that have an abundance of good milk, and

can thus support the child well till the time of weaning, is not large. The statement has been made that not more than one half of our New-England women, particularly in cities, can properly nurse their offspring. What a contrast does this condition present to that of the English, the German, the Irish, and the Canadian-French women!

Why should there be such a difference between the women of our times and their mothers or grandmothers? Why should there be such a difference between our New-England women at the present day, and those of foreign origin residing in the same localities, and surrounded by the same external circumstances? The explanation is simple: they have not the right kind of organization; there is a want of proper development of the lymphatic and sanguine temperaments; or, in other words, there is a marked deficiency in the organs of lactation, nutrition and secretion. The brain and nervous system have, for a long time, made relatively too large a demand on the organs of digestion and assimilation, while the exercise and development of certain other tissues in the body have been sadly neglected. There are also other causes to account for this change of organization; among these are found the fashions of the day or style of dress, the neglect of physical exercise, and the want of proper attention to the great laws of health and life.

We have here presented two classes of facts: first, that our New-England women of the pre-

sent day cannot nurse their offspring as their mothers and grandmothers did; and, secondly, that there is a marked difference in this respect between them and women of a foreign origin. It is evident, that this change or difference must be accounted for in the physical organization. And the natural inference is, that the organization which is found best adapted to afford proper nutriment to the infant must be the best for its production; or, in other words, must be regarded as the physiological standard upon which the law of propagation would be engrafted. The conditions found indispensable to support life should exist in the organization that produces it. Such, we believe, is the provision or law of nature in her highest state of development.

That there has been a decided change in female organization in New England within fifty or a hundred years, there can be no question. Formerly, there was more muscle, a larger frame, greater fulness of form, and a better development of all those organs that are classed under the sanguine and lymphatic temperaments. The brain and nervous system, relatively, were not especially predominant; neither were they taxed continuously or excessively above any other class of organs. The German, English and Irish women at the present day possess, as a body, an organization similar to the one here described. There are, of course, exceptions; our reference to them is simply as a class.

Nearly forty years ago, Sir Astley Cooper made

this statement: "It is melancholy to reflect that a life of high civilization and refinement renders the female less able to bear the shocks of parturition; it has a tendency to lessen her attention to her offspring, and really diminishes her power of affording it nourishment; so that she is often a worse mother in these respects than the female of the middle ranks of life or even the meanest cottager." This remark was made undoubtedly as the result of extended observation and long experience; and it implies not merely a change in disposition, but also a change in organization, from the fact that such mothers could not properly nurse their offspring. Sir Astley Cooper observes, that the proper development of the mammary glands is often prevented by a constant pressure. We might go further, and say that continual compression of the chest and abdomen by the fashions of the day is such as greatly to impair the development and healthy action of the lungs, the heart, and digestive organs, as well as those in the pelvis. If we consider that this compression commences with the girl or young woman, when the system is in a state of growth and most susceptible of change, that it is continued for a series of years, and, by the laws of inheritance, intensified, it shows very clearly how such effects upon the system disqualify women for some of the more important duties of maternity. It would seem as though fashion and self-love had both conspired together to defeat as far as possible the objects of reproduction, both in number and quality.

Now, with an organization like that possessed by our mothers and grandmothers, or by the German, English and Irish women, we have all the physical conditions requisite for good nursing. And when we carefully analyze all its constituent parts, we find that it is a close approximation to a perfectly sound and healthy standard; that it is the same type or standard upon which is based the great fundamental law of propagation. It furnishes a certain amount of evidence, that these physiological conditions harmonize with the laws of nature, and when traced back to their fountain head, they all centre in one perfect standard or model. As above intimated, if we pursue our inquiries into the character and condition of American women, we shall find that condition marked by an excessive activity and predominance of the nervous system; that, with less physical stamina, they possess more brilliancy and excitability. This is what the science of physiology would lead us to expect, because it shows that those parts which are most exercised require the greatest amount of nutrition, and become, in some respects, abnormally developed. It is a law of physiology, also, that the brain and nervous tissue demand, relatively, a much larger proportion of nutrition than other parts of the system. So then, when there is coupled with this abnormal state a general deficiency or an impaired condition of the organs of lactation, assimilation, &c., the reasons why our American women cannot properly nurse their offspring become very obvious.

There is still another point of observation closely allied to the one just described, from which a most forcible argument may be deduced in favor of the theory of propagation here advocated. In all medical works treating of nursing, we have very minute directions as to the physical qualities for a good wet-nurse. The first thing indispensable is good milk, pure in quality, plenty in quantity. But to secure this, certain physical qualities or conditions are insisted upon. A good nurse must have well developed mammary glands, strong digestive organs, an even, uniform disposition; she must have good health, freedom from all disease, no particular weakness nor excessive nervousness. In fact, the nervous temperament is described by several writers as particularly unfavorable. The secretion of an abundance of healthy, nutritious milk is laid down as one of the best tests or indices of a good physical constitution. If we should quote the various descriptions given for selecting a suitable wet-nurse, from different writers, in their own language, we should find that they correspond almost precisely with that standard of organization upon which, we believe, is based the great physiological law of increase. Such evidence is the more valuable, for two reasons: first, the writers on the subject have given their descriptions from their own experience and observation, without any theory of their own to maintain, or any design of contributing evidence to establish a general law or principle; and secondly, these descriptions of what constitutes a good

nurse come from a large number of medical writers, of diverse character, living in different countries, and writing at different periods. And what is particularly noteworthy, there is a remarkable agreement or uniformity in all their statements, showing that the great facts or truths in nature, wherever carefully studied or collected, all harmonize one with another.

The laws of nature, when correctly interpreted, do not only always harmonize, but are also found complete in design—never disjointed or fragmentary. Wherever nature has made a demand, a natural supply has been provided. There are, then, two logical inferences from these facts: first, that the physiological conditions or standard found best or necessary for furnishing the proper nutriment for its productions, must also constitute the same standard of organization upon which nature in her normal state, or highest development, has established the law of production; secondly, as there is found such a general deficiency among our New-England women in the natural provisions for properly nursing their offspring, there must exist some radical deviations in their present organization from that normal, perfect standard upon which nature has placed her laws.

That this marked change from natural nursing to artificial feeding of infants, greatly endangers the health and the life of the child, requires here no proof. A great amount of disease and mortality can be traced, by every physician, directly to this source. But the injury does not stop with

the immediate effect on the body, but frequently extends through life. The early start of the infant in vigorous, healthy growth, with good blood, exerts a powerful influence upon its whole future health and constitution.

The profession and the public have had their attention of late called especially to the great mortality of infant life. That in a civilized, christian community there should be such a waste of human life—that one-third or more of all children should die under five years of age—suggests the idea that there must be in it something *wrong* and *unnatural*. Where, then, is the blame? What is the cause of the evil? Is it not traceable, in a great measure, to human agency? We apprehend the principal causes, upon careful investigation, will be found to arise from these sources: 1st, Inherited weaknesses and diseases; 2d, Want of suitable nourishment, or plenty of healthy milk from the mother's breast; and 3d, Violation of hygiene, with respect to food, ventilation, clothing, &c. If this is admitted, it is very apparent where the responsibility rests, and that this infant mortality cannot be materially diminished till the laws of inheritance, maternity and hygiene are better understood and obeyed.

The question naturally arises, can these evils be corrected or checked? We answer, not easily in the present state of society. The chances are, we fear, that they are to increase more and more. Great organic evils cannot be cured, any more than diseases, till their causes are fully understood and

the sufferers are disposed to apply the right remedies.

DUTIES OF THE MEDICAL PROFESSION.

This topic has so often been the theme of address upon similar occasions, that it has become hackneyed, and nothing new, perhaps, can be suggested. But here we need "line upon line, precept upon precept." Such is our position in the community, and such are our relations to it, that they impose upon us the most sacred duties and obligations. Inasmuch as our personal interests, as a profession, are so bound up and identified with those around us, it becomes us often to draw the line of demarcation, and look beyond and outside of ourselves.

Duties depend, both in nature and extent, upon the means or power possessed. The more valuable the possessions, and the more extensively they can be employed for human welfare, the greater the duty, and the more sacred the obligation. The medical profession are in possession of the most valuable knowledge and precious trusts with which human agency can be charged. Not only are the health and lives of individuals directly entrusted to their care, but the highest welfare of the public depends very much upon their agency and influence.

Once it was regarded as the chief duty of the physician to cure his patient, or to use the best means in his power for that purpose; and when that was done, his duty terminated. It was only

in relation to the sick, and while they were sick, that he was supposed to be charged with any responsibility. Very little interest was manifested for the *prevention of disease*, or the preservation of health. Nothing comparatively was then known of sanitary or hygienic laws. Seldom was any consideration given to the wide and practical application of the principles of physiology to every-day life. The fact that disease in all its diversified forms depended in a great measure upon human agency, was scarcely conceived or realized. But the more thoroughly we investigate the principles and laws which spring from physiology and hygiene, the more deeply are we impressed with the resources which God has placed in our hands for the prevention of disease, for the improvement of health and the increase of happiness. They permeate all the ramifications of society. They enter into the situation, the employment, and the circumstances of every individual and every family. Wherever there is food, or water, or air to be used, or exercise, or rest, or sleep required, their influence is felt. They should be a guide in all the social and domestic relations of life, as well as in the objects and modes of education. Upon certain departments of legislation they have a most important bearing; for in no other field or direction whatever can the legislator prove himself a greater benefactor to his constituents or the race, than in the enactment of wise sanitary laws.

These principles sustain, too, a most intimate

relation to sound morals and healthy religious development. In fact, till physical and mental laws are correctly expounded and observed, the teachings of divine revelation can never be fully carried out or properly applied. It is only when we take this broad and comprehensive view of the application of these sciences, that the duties and obligations of the members of our profession can be properly estimated. They should be the teachers of these sciences, the almoners of this knowledge, the guardians of public health. They are here emphatically the high priests of nature, having free access to all her inner shrines, and should prove themselves true to their calling, faithful to the trusts confided to them. To every individual and family that call upon them for advice and treatment in the *cure of disease*, they should give instructive hints as to the nature of their complaints. In all matters pertaining to hygiene and sanitary improvement, the members of our profession should make their influence felt in every village, town and city in the land. And wherever there are sources of disease in overcrowded tenements, in filthy localities, in badly ventilated dwellings and public buildings, in the use of poisoned food, water or air, the physician, of all others, should raise a warning voice. Whenever, too, the laws of life or health are violated by excessive labor or too close confinement, by false fashions, habits of dissipation, vice and crime, the physician should by all means prove himself a genuine reformer.

In the matter of education, great improvement is everywhere demanded in the proper development and culture of the body as well as of the mind; and no class of men can point out the way, or explain the principles whereby this can be accomplished so well as medical men. Then in the halls of legislation and in the management of public institutions, where the health and lives of multitudes are concerned, the voice and influence of our profession should always be recognized, and possess far greater power and authority than have been given them hitherto. Complaints have been made that unjust prejudices exist in some portions of the community against the regular profession of medicine, that it does not command the respect and influence in New-England that is found to exist in the West and South, and that in point of rank and character it falls much below the position assigned to it in Great Britain and other European nations. Whether there may be any just cause for this complaint or not, one thing is very certain—the time is approaching when the relations between the profession and the public must in some respects change. With the rapid increase of intelligence in the community, with a more general diffusion of physiological and sanitary knowledge, accompanied by a disposition on the part of the people to form their own opinions in all medical matters, a higher and broader education will be required. The demand will be for those means and qualifications, which can be applied directly for the prevention of disease as

well as for its cure; the physician must become the medical counsellor and teacher, as well as the adviser and administrator of drugs.

As a consequence, the services of men thus educated will be more highly appreciated and better compensated. The higher a people rise in true civilization, the greater the value attached to life; and the more clearly they understand that the means for preserving health and prolonging life depend upon human agency, the more readily will they seek, as well as appreciate, those means.

Is not the preservation of life as important and valuable as that of property? And can any reasons be given why services for protecting and saving the one should not be as well compensated as those for preserving the other?

Wherever in Great Britain the most interest has been awakened in reference to health and sanitary reform, such remedial services have been in demand. In 1872,* when certain new and important laws on sanitary reform were passed by Parliament, in which liberal provision was made for the employment of a large number of medical men to see that these laws were enforced in all parts of the kingdom, a singular fact became apparent that, in many localities, it was difficult to find physicians fully competent for the service. Should

* It seems, by recent intelligence, that some reaction is taking place in sanitary reform in Great Britain, in consequence of the Acts passed in 1872 undertaking to accomplish so much, together with changes of membership in the new Parliament. As the objects intended by this reform are so important, and have enlisted so many able advocates, this reaction can be only temporary.

our national or state government take similar steps in legislation, we fear the same fact would prove true in our own country.

Within a few years we have had very able and warm discussions upon the importance of a higher standard of education for admission into the profession. This is all well; but would not the influence and usefulness of men, who have been for a longer or shorter period engaged in medical practice, be more widely extended if they could generally take a still higher stand in all matters pertaining to education, to literature, to the sciences, to the arts, and in every department of culture and refinement? In an age and amidst a people very much devoted to worldliness and the accumulation of wealth, there is great danger of our prostituting the principles of a noble science to mere gain. Inasmuch as material interests and external display too often constitute at the present day the standard of influence and association, a strong temptation is presented to lower the aims and narrow the bounds of our professional duties. While following an avocation upon which we must depend for support, and in which there are powerful inducements to resort to such means and expedients as will afford the largest income, let us show that we can be governed by a nobler aim, a purer motive. In no way can this be so effectually exhibited as in diffusing such knowledge as is calculated to preserve health—to prevent disease. At no former period in the history of medicine has such a field for doing good been laid open to

the profession. The demand for useful knowledge, the increasing interest in science and the spirit of reform—all favor improvement in this direction. A review also of the past affords encouragement. For no class of men have ever done so much to promote the interests of humanity or of physical welfare as the medical profession. There is scarcely a practitioner of medicine any where, in city or country, who does not give, every day, more or less of his services to the poor. As a citizen, the physician is called upon to give his share of time and labor, either with others or alone, to promote in various ways the interests of the public—interests, perhaps, connected with some association, school or church. In cities, most valuable services are contributed gratuitously towards the support of dispensaries, infirmaries, hospitals, and other similar institutions. Besides, in all philanthropic and benevolent organizations, the profession has had its full share of representatives; and in the higher fields of education and literature, it has always had its earnest workers; while in the cultivation and advancement of the sciences generally, we may say, it has uniformly taken the lead. In fact, without disparagement to any other class or profession, we may safely state that our profession has been first and foremost in the promotion of every department of science, whether useful or ornamental. The public owe to it a debt of gratitude, which cannot be repaid or easily cancelled, for some of the most valuable discoveries and applications of science.

This work of discovery, of philanthropy and of benevolence, we trust, is not wholly done. If the happiness and welfare of man have thus been, to any extent, promoted, if the interests of civilization have been advanced by such discoveries and services in the past, richer and more inviting fields of usefulness await the profession in the future. Language cannot describe the value, the importance, the utility of the application of physiological, hygienic and sanitary laws. It is the special duty and privilege of the medical profession to expound these laws and take the lead in their promotion.

Mr. President and Fellows:

As we celebrate this Anniversary, we should not overlook the changes that death is making in our ranks. In the congratulations and festivities of the day, let us then call to mind the memories and services of our comrades, our brothers who have fallen! The names of twenty-five Fellows and three Honorary Members of the Society are reported as having deceased since our last annual meeting. That great Destroyer, whose power they had long and faithfully striven to avert from others, has at last triumphed in their own persons over all the art and skill which they or loving friends could command. In the case of several, death came suddenly, apparently without a moment's warning, while others were forewarned by pains so often repeated and long continued, that they prayed to be relieved from their sufferings.

Of the five who had passed their three score years and ten, one, an Honorary Member, Sir Henry Holland, reached the great age of eighty-five. He stood at the head of the profession in Great Britain for almost half a century, and was the author of many valuable papers on Medicine and other topics. Rarely is any one individual permitted to see so much of the world, and at the same time to possess so much of genius and learning, combined with the highest refinement and culture, as was Sir Henry Holland. Only four Fellows died under the age of forty, among whom was Dr. E. M. Johnson, the village physician of Williamsburg, who, being suddenly warned by the roar of the late freshet in that region, and while rushing with his children in his arms to a place of safety, was overtaken by the angry flood and found a watery grave with his whole family — his wife, his mother and his three children!

A majority of our departed brothers were called away in the meridian of life, with harness on, and at the height of their usefulness. Many of them were present at our last anniversary, buoyant with hope and flattered by success. So there may be those here to-day, full of life and bright anticipations, who, ere another revolution of the seasons, will in their turn have followed them! Let us be admonished by these providences! Thankful for whatever was bright and beautiful and honorable in the lives of those whose memories we revere, let us be incited to renewed zeal and efforts in the improvement of time, the cultivation of talent, and the discharge of duty.