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### LECTURE IX.

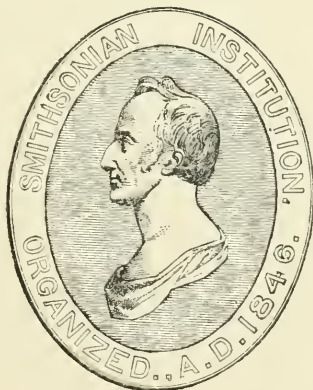
MENTAL OVER-WORK AND PREMATURE DISEASE  
AMONG PUBLIC AND PROFESSIONAL MEN.

BY

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## ADVERTISEMENT.

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THE "Toner Lectures" have been instituted at Washington, D. C., by JOSEPH M. TONER, M. D., of this city, for the promotion of medical science. With this object the founder has placed in charge of a Board of Trustees, consisting of the Secretary of the Smithsonian Institution, the Surgeon-General of the United States Army, the Surgeon-General of the United States Navy, and the President of the Medical Society of the District of Columbia, a fund, "the interest of which is to be applied for memoirs or essays relative to some branch of medical science, and containing some new truth fully established by experiment or observation."

The publication of these Lectures has been undertaken by the Smithsonian Institution, as falling legitimately within its fundamental purpose, "the increase and diffusion of knowledge among men." The series of "Toner Lectures," published by the Institution in pamphlet form, is as follows; and they are also included in the "Smithsonian Miscellaneous Collections."

I. "On the Structure of Cancerous Tumors and the mode in which adjacent parts are invaded." By Dr. J. J. WOODWARD. Delivered March 28, 1873. Published November, 1873. 8vo., 42 pp.

II. "Dual Character of the Brain." By Dr. C. E. BROWN-SÉQUARD. Delivered April 22, 1874. Published January, 1877. 8vo., 23 pp.

III. "On Strain and Over-Action of the Heart." By Dr. J. M. DA COSTA. Delivered May 14, 1874. Published August, 1874. 8vo., 30 pp.

IV. "A Study of the Nature and Mechanism of Fever." By Dr. H. C. WOOD. Delivered January 20, 1875. Published February, 1875. 8vo., 47 pp.

V. "On the Surgical Complications and Sequels of the Continued Fevers." By Dr. WILLIAM W. KEEN. Delivered February 17, 1876. Published March, 1877. 8vo., 70 pp.

VI. "Sub-cutaneous Surgery." By Dr. WILLIAM ADAMS. Delivered September 13, 1876. Published April, 1877. 8vo., 17 pp.

VII. "The Nature of Reparatory Inflammation in Arteries after Ligatures, Acupressure, and Torsion." By EDWARD O. SHAKESPEARE. Delivered June 27, 1878. Published March, 1879. 8vo., 70 pp. and 7 plates.

VIII. "Suggestions for the Sanitary Drainage of Washington City." By GEORGE E. WARING, Jr. Delivered May 26, 1880. Published June, 1880. 8vo., 24 pp.

IX. "Mental Over-Work and Premature Disease among Public and Professional Men." By Dr. CHARLES K. MILLS. Delivered March 19, 1884. Published January, 1885. 8vo., 36 pp.

As it has been found quite impossible to supply gratuitously the large demand from medical men and others for these Lectures, (in addition to the liberal grant to the leading public Libraries and other Institutions in this and foreign countries,) the uniform price of 25 cents has been fixed for each, by which probably their more equitable personal distribution is secured.

SPENCER F. BAIRD,

*Secretary Smithsonian Institution.*

SMITHSONIAN INSTITUTION,

WASHINGTON, *January, 1885*

## LECTURE IX.

Delivered March 19, 1834.

### MENTAL OVER-WORK AND PREMATURE DISEASE AMONG PUBLIC AND PROFESSIONAL MEN.

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By CHARLES K. MILLS, M. D.

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For my subject this evening I am indebted to the suggestion of the public-spirited founder of the "Toner Lectures," who, during his long residence in Washington, having seen many striking instances of break-down among public and professional men, had been led to feel that a study of the causes and the earliest indications of over brain work in these walks of life might prove an interesting investigation, and assist in the development of some new facts.

Extreme mental activity, overstrain, and excitement must be regarded as characteristics of American civilization. In this country every one feels that he is an important possibility in politics, law, medicine, theology, business, science, or literature, so that our very liberties and opportunities become sources of peril to health and life. From the cradle to the grave the American too often lives in an atmosphere of unnatural emulation, while, in other countries, the traditional usages and the more absolute divisions of society into grades and castes prevent so fierce a struggle among the many for high position.

Mr. Herbert Spencer, whom all admit to be entitled to consideration as a close observer of human nature, during his visit to this country, was everywhere struck with the number of faces he met which spoke in strong lines of the burdens that had to

be borne. In every circle he saw the sufferers from nervous collapse, or heard of the victims of over-work. Mitchell, Beard, Jewell, and others have dwelt upon the same fact, and have shown that brain work and brain strain are, in this country, the not infrequent cause of the downfall of health.

That intellectual work *per se* does not injure health or shorten life may, I think, at once be admitted. The longevity of intellectual workers is a subject that has frequently claimed the attention of statisticians, psychologists, and alienists. Madden<sup>1</sup> gives a series of tables showing the relative longevity of medical authors, philologists, authors on revealed and natural religion, and on law and jurisprudence, miscellaneous and novel writers, moral philosophers, dramatists, natural philosophers, poets, artists, and musical composers. The general average age at death for the whole list is 66 years.

Tuke<sup>2</sup> has collected from various sources the ages at death of fifty-four men who were distinguished for intellectual achievements. These ages gave an average of 80 years.

Caspar (quoted by Tuke) gives the average age of clergymen at 65; merchants, 62; clerks and farmers, 61 each; military men, 59; lawyers, 58; artists, 57; medical men, 56.

Beard<sup>3</sup> ascertained the longevity of five hundred of the greatest men of history—poets, philosophers, authors, scientists, lawyers, statesmen, generals, physicians, inventors, musicians, actors, orators, and philanthropists. His list was prepared impartially, and included those who, like Byron, Raphael, Pascal, Mozart, Keats, etc., died young. The average age was found to be 64.20 years. Sherwood (quoted by Beard) ascertained at great labor the ages at death of ten thousand clergymen, the average being 64 years. The average

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<sup>1</sup> Infirmities of Genius.

<sup>2</sup> Illustrations of the Influence of the Mind upon the Body in Health and Disease. By Daniel Hack Tuke, M. D., etc. Second Edition. 1884.

<sup>3</sup> A Practical Treatise on Nervous Exhaustion (Neurasthenia). By George M. Beard, A. M., M. D. Second and Revised Edition. 1880.

age at death of all classes of those who live over twenty is about 50 years.

Statistics of this kind, which could be multiplied without limit, are decisive as to the beneficial rather than injurious effects of pure mental labor, conducted upon a proper basis, upon longevity. In our public and professional classes, nevertheless, every physician of experience has seen instances of premature break-down from causes peculiar to these largely intellectual vocations. Even if the instances were few, as claimed by some, their discussion would still be of interest, because any sources of peril to those in the front ranks of society must always demand earnest attention.

In all I have collected a series of sixty cases in which loss of health or life has been largely attributable to excessive brain work and brain strain incident to the callings of those considered. These cases may be arranged into two classes: (1.) Men in political and official life, including cabinet officers, senators, representatives, department officials, governors, and candidates for office; (2.) Professional men, including physicians, lawyers, clergymen, journalists, scientists, and teachers. I have drawn not alone from my own experience, but have obtained the records of cases and corroborative facts from professional friends.<sup>1</sup> The inferences and conclusions of this paper are largely based upon a study of these cases, although time will permit details to be given in but a few instances.

With a subject so wide in scope, limitations must be set, in order to arrive at any practical conclusions in a single lecture. In the first place, then, will be considered some of the causes which lead to mental over-work and break-down in American public and professional life; and, secondly, the early warnings of such over-work, and the forms of disease most likely to result.

Men engaged in commerce and speculation have not been included in the present study, although, by including them, the list

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<sup>1</sup> Especial obligations are due to Drs. S. Weir Mitchell, W. A. Hammond, J. M. Toner, A. Y. P. Garnett, D. L. Huntington, J. H. Baxter, H. C. Yarrow, and J. T. Johnson.

of cases could have been largely increased. Premature failure of health, and especially sudden and severe collapse are quite as likely to occur in business life as in any other sphere of action, owing to the protracted labors, and great anxieties and excitements attendant upon pursuits involving the getting and losing of wealth. Brain work and brain strain of a peculiarly destructive kind attend upon the devotees of the counting-house and the exchange; but our present design is to deal only with those whose vocations are in major part intellectual, in the higher meaning which is given to the word intellectual—the men of affairs, of books, and of the laboratory.

The actual occupations embraced within my study were cabinet officer, 1; senators, 8; representatives in Congress, 10; department officials, 5; governors, 2; candidates for important offices, 2; physicians, 6; lawyers, 7; clergymen, 2; journalists, 4; scientists, 6; teachers, 7.

Twenty-eight of the sixty, therefore, were men in political and official life, and eighteen of these were members of Congress.

The average longevity of men in the higher walks of political life in this country is, I am inclined to believe, considerably below the average of those who occupy similar positions in England. Comparing, so far as information was available, the ages at death of United States Congressmen and members of the English Parliament, who have died since 1860, I obtained the following results:<sup>1</sup>

Fifty-nine United States Senators gave an average of 61 years; one hundred and forty-six United States Representatives an average of 55 years; the average for both being, therefore, 58 years. One hundred and twenty-one members of Parliament gave the remarkable average age at death of 68 years.

Taking twenty-five of those that might be regarded as the most eminent American statesmen of the last one hundred years and

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<sup>1</sup>The sources of information for these statistics were chiefly, as follows: Lannan's Biographical Annals of the United States Civil Government; Ben Perley Poore's Registry of the United States Government; the Congressional Directories; Foster's Collectanea Genealogica; the British Almanac and Companion; and the Statesman's Year Book.



comparing their ages at death with those of the same number of the most distinguished English statesmen, the United States gave an average of 69 years, and Great Britain of 70—no practical difference. It is noticeable, however, that much of the best work of the great English statesmen—of Palmerston, Derby, and Beaconsfield, for instance—has been done at an advanced age, when most of our American public men have ceased to do anything important.

A little searching will show, in the first place, some *general* causes for these differences. While politics in America may, in the spoilsman's sense, be regarded by many as a business, it is not, as in England, a true vocation followed in the main by those prepared by inheritance, education, and training.

In England we not infrequently see men entering on public careers, usually by a seat in the House of Commons, shortly after attaining their majority, or, at least, at a comparatively early age. Pitt, the elder, for instance, came into Parliament at 27, Pitt, the younger, at 21, Palmerston and Gladstone at 23, and Disraeli, after several attempts, at 32. They come, however, at these early ages to Parliament, usually well-endowed mentally, and as to a training school for their life work. By a gradual process they become accustomed to their duties and their labors, and their responsibilities increase with their years and mental strength. Great responsibilities are not, as a rule, entrusted to them until their powers are matured. In the few instances in which English statesmen have assumed the highest positions early in life, as in the cases, for example, of the younger Pitt, and of Fox, they have usually paid the penalty of premature death. An American, because of constitutional restrictions, cannot reach the lower house of Congress until twenty-five years old, and the Senate until thirty. This ought to be to our advantage, but there are many counterbalancing drawbacks. Many Americans who enter the public arena comparatively young have made and finished their public careers at an age when the British statesman is beginning to reap his reward.

Others come to high political and official position at or after the

meridian of life, and find themselves confronted with brain work, and with duties and responsibilities to which they are unequal, because for them they have had no preparation at all.

The occupations of the members of the Forty-Eighth Congress, as given by the Congressional Directory, were as follows: Lawyers, 197; manufacturers, 24; journalists, 22; farmers or planters, 19; merchants, 16; bankers, 11; physicians, 6; mining capitalists, 5; mining engineers, 3; railroad managers, 3; clergymen, 2; army officers, 2; stenographers, 2; architect, 1; pharmacist, 1; railroad ticket agent, 1; hatter, 1; zoologist, 1; and unclassified, 8.

The legal profession furnishes by far the largest number of Senators and Representatives, and of others holding public places; and among these are to be found our brightest political luminaries. Even legal studies, however, do not necessarily fit men for public position; in special instances, they rather unfit them. It must be borne in mind also that the term "lawyer," as applied to those in political station, is often a mere fiction, those holding it often being men half-trained, or not trained at all, who have assumed the legal role by the easy methods which prevail throughout our land. A lawyer or editor, a banker or merchant, a farmer or planter, a manufacturer or railway magnate, a physician or preacher, finds himself in Congressional halls by virtue of wealth, or local fame, or fortuitous circumstances, and absolutely without any appreciation of or fitness for the labors and responsibilities of his new calling. Ambition, self-esteem, and the instinct for praise impel him to strenuous exertion to compensate for his deficiencies, an effort which leaves him sometimes a mental and physical wreck.

Whether they have entered public life in youth or middle age, and whether prepared or not, mental overwork is particularly dangerous to men beyond the prime of life. Of the sixty cases, breakdown occurred between twenty-five and thirty years in 2 cases; between thirty and forty in 14 cases; between forty and fifty in 18 cases; between fifty and sixty in 17 cases; between sixty and seventy in 9 cases.

Thirteen of the seventeen cases between fifty and sixty, and eight of the nine cases between sixty and seventy, were in political or official life. It is premature decay for the man who should live to eighty or ninety to die at seventy, or for one who should die at seventy to pass away at fifty-five or sixty. It is a question of potential longevity. In the cases before us, sudden or unusual brain work or strain terminated the careers of those destined apparently to live from five to twenty years longer.

Vice-President Wilson died prematurely at sixty-three, without doubt the victim of extreme over-work. The death of a distinguished Senator at the same age was precipitated by overwork both inside and outside of the Senate, and by worry and excitement growing out of the opposition and censure of the Legislature of the State which he represented. A Representative in Congress, and one high in judicial position, subjected to special causes of work and worry, died at sixty-five of cerebral hæmorrhage. Another Representative, overwhelmed with labors and anxieties of a peculiarly harassing character, contracted diabetes, of which he eventually died between sixty and seventy.

Men may live for many years in comparative comfort, and able to do a reasonable amount of work, with organic disease of the kidneys, liver, heart, or other organs, as long as they are not subjected to any unusual physical or mental strain. One of America's most distinguished physicians died a few years ago at the age of eighty-two, and was found after death to have advanced disease of the kidneys which had not been suspected; but the last twenty years of his life were free from strain.

The history of many old hemiplegies is confirmative of this point. At the Philadelphia Hospital, I usually have under observation a score or more of hemiplegies, the victims of thrombosis, embolism, or hæmorrhage. These cases, some advanced in years, with brittle, atheromatous vessels, and (as numerous autopsies show) with disease in almost every organ of the body, live on year after year without

change, because their absolute pauperism has its compensation in that they are no longer subjected to the strain and friction of life.

The contrast to such cases is found in the histories of some of those who form the subject of the present study.

One died at the age of sixty-six, holding a position of high rank and responsibility at the time of his death. He was of good heredity and physique, and had been thoroughly educated. In early life his habits of eating and drinking had been irregular, and at one period he suffered from gouty symptoms. For fifteen or twenty years before his death, however, he had been careful and systematic in his habits, mental and physical, and enjoyed fair health, when suddenly he was subjected to unusual labor and anxiety, because of a great public catastrophe. He could not escape the suddenly-imposed strain. His health failed rapidly in a few months, and he died of Bright's disease.

Another, also in high official position, died at fifty-eight. He also was of good heredity, used alcohol moderately, and tobacco freely. Mentally he had been through life a fair but not unusual worker. Twenty-seven years before his decease he had suffered severely from scurvy. After this he was not sick until his fatal illness. Mental work, and cares and anxieties, to which he was unaccustomed, crowded upon him during the last three years of his life. Worn out, he took a sudden cold, was attacked with a local inflammatory trouble, and died.

Some of those who have been lifted from the ordinary walks of life into high official position by appointment, find themselves entirely unfitted for the tasks before them, and yet from these tasks they are unable to escape. If too old, or without sufficient fundamental education to learn, and if unable to do their work by proxy, failure in health, as well as in reputation, is sometimes the result. In England, so severe are some of the competitive examinations for positions in the public service that many are injured in health by the strain which they undergo in preparing for these examinations. With us, it is often the other way;

the strain and pressure come afterward. The positions acquired solely by favor are themselves the hard examiners. In one case, reported to me by a Washington physician, temporary glycosuria was developed in a man fifty-nine years old, largely as the result of anxiety induced by the fact that he was mentally unfit to make the annual report called for by his high position.

If ambitious and conscientious, the real mental labor connected with the position of a man high in public position is often very great. Pressing and perplexing committee work, attention to a large correspondence, the preparation of reports, bills, speeches, and points for debate, make incessant demands upon the time and strength of the Senator or Representative. A well-educated lawyer, coming to Congress at thirty-four, rapidly rose to prominence. He did a prodigious amount of work on the floor of the House of Representatives, and by correspondence, but especially on committees. He was taken seriously ill at the close of a session during which his labors had been unusually great even for him, because of the excessive extra work thrown on him by the sickness of another member of one of the important committees on which he was serving. He died at the beginning of the next session of Congress. Another reached the speakership of the House of Representatives, only to succumb at forty-nine to the brain work and multifarious cares of his high position. An abstemious New England Senator, an indefatigable worker, after suffering for long time from dyspepsia, and from insomnia and other nervous symptoms, was suddenly taken down with enteritis, of which he died.

A special cause of sudden failure in health among public men is the mental over-work, physical fatigue, and excessive emotional excitement attendant upon our political campaigns. In recent years a presidential aspirant was suddenly and seriously stricken during the meeting of the nominating convention. Horace Greeley died insane from brain disease at the conclusion of his unsuccessful campaign. A successful candidate for a high public position de-

veloped pneumonia after a campaign of toil and excitement. Similar instances could be given were it worth while.

Although perhaps not as important a factor in the causation of disease in political as in commercial life, the emotional element plays a large part. It is, as has just been shown, often a life of clamor and excitement. It is one too often of uncertainty, disappointment, and vain longing. Even to the man who is comparatively well fitted for his work, the political vocation in this country is never assured. The new Representative, for instance, feels that it is imperative for him to speedily make a career. Others aspire to his place, which can only be held by hard work, and too often also by low arts. The faults and foibles of a public man are laid bare, his mistakes are magnified, and his best efforts are sometimes misinterpreted by a thoughtless or merciless press. The tremendous sense of responsibility which important positions impose is a constant strain, particularly upon the higher orders of mind. This burden of responsibility, conjoined with Herculean labors, mental and physical, destroyed some of our greatest statesmen during the Civil War.

To such causes as these must be added the lack of recreation, and the excesses, excitements, and irregularities of social life at the National Capital, although it does not come within my purpose to consider either these, or the abuse of alcohol and tobacco, in the present paper.

Leaving the political and official circles, let us next glance at some of the conditions which lead to mental over-work and its consequences among the professional classes.

Defects in our system both of medical and legal education are at the root of failure in health, no less than of professional failure, in many cases. The physician or lawyer, half-educated and half-trained in youth, and yet ambitious and naturally able, is compelled to put forth efforts doubly tasking and straining because his mind has not been systematically developed for his life-work.

Physicians ordinarily do not afford many illustrations of pre-

mature disease from mental overstrain and over-work. Some lose their health from broken rest, irregular meals, physical fatigue, and the continual incurrence of the responsibilities of life and death; but the variety in their lives, the alternation between in-door and out-door existence, and the knowledge of health and disease which they are able to apply for their own behoof, serve in some measure to counterbalance these injurious influences. The physicians who succumb to mental over-work are usually those who, not content with the ordinary labors and rewards of an arduous profession, strive, in addition, for literary, scientific, or professorial honors. In this country it is the rule, rather than the exception, to find the professorships and the subordinate teaching positions in our medical colleges filled by men actively engaged in practice. We have not here, as abroad, scientific physicians in well-endowed professorships, or comfortably quartered on the Government in positions, the routine duties of which can be performed by deputy. The young American physician who, without means, influence, or friends, sets out for the high places of his profession, has before him a prospect which only fails to appall, because it is veiled by his ambition. Intellectual labor must be prolonged, encroaching upon intervals which should be given to rest or recreation; special appointments must be kept, no matter what the cost; the brain must be forced to constantly augmenting and multiplying tasks. Besides all this, he has, to a greater or less extent, the responsibility, the physical fatigue, and the irregularity in eating and sleeping, which belong to medical practice. Science and literature may be made instruments of health and happiness to the working physician; but when turned to for the purposes of ambition by those already sufficiently taxed by practical work, great care must be taken, or they will assist in sowing the seeds of disease and death. Five of six physicians in my list were engaged both in teaching and in literary or scientific work, besides attending to private and hospital practice. In the case of two of them, valuable contributions, the result of much labor, appeared about the time their health gave way.

Many lawyers are among the cases collected from those in political and official life; but, in addition, three judges and four lawyers in active practice, and not in political careers, are included in my notes. The temporary but severe break-down of two judges was attributable to the habit long persisted in of examining papers, comparing authorities, and preparing opinions at night—a form of mental labor taxing to the highest powers. Successful lawyers are often subjected to sudden, prolonged, and severe mental work and strain. Cases must be prepared with great rapidity, important principles of law must be mastered in a short time, and exhausting efforts must be made in courts under conditions of excitement and bad hygiene. With lawyers, as with physicians, self-imposed tasks, in addition to their necessary labors, are sometimes the cause of their downfall in health. A young lawyer, with a decided taste for philosophical pursuits, wrote an able scientific monograph, and developed insanity directly as the result of continuous mental work, legal and scientific. Another succumbed while editing a legal work.

Before success is assured the mental effects of pecuniary pressure are often felt with great force and intensity by men in the professions of medicine and law. Such men, waiting for business until reputation is acquired, and, in the meantime, often doing unrequited work that calls for an immense output of mental energy, have both their intellectual and emotional natures under constant tension. Both work and worry do their parts.

In attributing impairment of health to worry rather than to work, it is sometimes forgotten that a man with an over-worked brain often worries about small matters which would otherwise be met with fortitude. Worry, in such cases, is begotten of over-work. "When," says Blaikie,<sup>1</sup> "a celebrated editor complained of being—

Over-worked, over-worried,

Over-Croker'd, over-Murray'd,

the first word of his lamentation explained all the rest." Worry,

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<sup>1</sup> Macmillan's Magazine.



moreover, is in itself a form of brain work; to worry means to cerebrate intensely.

Two clergymen, both of whom were compelled to do severe mental work, and at the same time sustain grave responsibilities, were the only representatives of theology in my list of cases. Chance may not have thrown a fair proportion of mentally over-worked clergymen within my reach, but this small number is probably not entirely accidental. Many clergymen suffer from the symptoms of a mild but annoying form of neurasthenia, but comparatively few succumb completely to mental over-work. Their unusual longevity is well known. Sherwood's statistics have already been quoted. Their variety of toil, their comparative freedom from financial anxiety, their superior mental endowments, and their temperance and morality are the reasons assigned by Beard, and I believe correctly, for the greater longevity of clergymen than of other brain workers.

Of the four journalists, three were engaged upon the highest order of journalistic work. The work done by editors and leader-writers often calls for the severest intellectual effort under pressure. The writer of leading articles will probably average two or more columns daily. His matter must be interesting and forcible; facts must be rapidly obtained and marshalled; judgments on important topics must be formed instantaneously. Often the brain must be goaded to do work against the mental grain. The work must be done, and must be done on time; there is no putting off to a more convenient season. Editors, moreover, often do their work under bad hygienic conditions—at night, in the glare and heat of gas, sometimes in badly ventilated rooms. One of my patients suffered so much from insomnia, cervico-occipital pain, nervous dyspepsia, and other symptoms, distinctly traceable to his work and mode of life, that he finally left journalism entirely. Two others were forced temporarily to quit their labors.

Scientific work is, as a rule, conservative rather than destructive of health. The scientist, unlike the journalist, is not usually com-

pelled to do severe intellectual work under pressure for time. His danger, as noted in the six cases that have come under observation in the preparation of the present paper, is from sedentary habits, and from intense and prolonged activity of the mind in certain limited grooves. To some minds scientific work has a fascination which becomes a source of peril; the worker becomes a willing slave to tasks which are often of his own making. The six cases were all men who labored beyond the requirements of the positions held by them. Assiduous work with the microscope, steady concentration upon mathematical and engineering problems, and the laborious collection and comparison of data, produced, after a time, states of mental and nervous hyperæsthesia and exhaustion, which led to albuminuria in one case, to insanity in two, and to temporary nervous collapse in three cases.

One of these cases, a man highly distinguished in the professional and scientific world, devoted himself with rare enthusiasm to scientific work under Governmental auspices. His method was simply one of intense and incessant application by day and by night, Sunday and week-day. Warnings in the shape of insomnia, great irritability, mental and physical weariness, oxaluria, and marked loss of weight came and went unheeded. Melancholia developed. Rest and travel twice restored him to mental health, but only to have the same history repeated, and to end with a third and complete mental collapse. Another, a young man who had educated himself scientifically, at the same time earning a living, frequently worked fourteen hours a day at tasks requiring close mental concentration. The tendency to over-work is greater among men who have, without the training of schools, raised themselves to honorable rank in science and literature than among those who have had the advantage of a systematic education.

The teachers that have fallen under my notice have been, with one exception (a college professor), principals of male grammar schools in Philadelphia. Five of them broke down completely from mental over-work, and the worry which went with and grew

out of this over-work. These cases were observed a few years ago when the system of competitive examinations prevailed in its worst form in Philadelphia public schools. The Boys' High School and Girls' Normal School had accommodations only for a fixed number of pupils. Any school of a certain grade could send pupils to the examinations; but those to be admitted were selected from the competitors absolutely in the order of the averages obtained. Twenty-five might be accepted from the grammar school of one section, and only five, or perhaps not one, from another school of an equal grade. Cramming was at the highest premium. A teacher's reputation, and even his position sometimes, depended upon the success of his pupils at these examinations. Teachers and pupils both frequently gave way under the terrible mental pressure to which they were subjected. One grammar school principal, just before his last illness, succeeded by extraordinary efforts in getting the highest general average of any school in the city, and also had in his successful class the boy who attained the highest average among all who competed. These were dearly bought honors. It was no uncommon thing for teacher and pupil to begin work at seven o'clock in the morning, to invade the dinner hour, and to continue their labors until ten or later in the evening. Happily, a quota system has taken the place of the murderous method here outlined—a method to which, I trust, Philadelphia will never return.

Not long since, in some of our newspapers, was noted the case of a colored girl who was in attendance at the same school with white children, and who died from "brain fever" brought on by over-work, in her efforts to compete with her more favored schoolmates. Scores of children whose skins are fair, differ as widely from each other in capacity and helpful surroundings as she differed from those with whom she vainly endeavored to compete.

Our children are too largely in the hands of those educationalists to whom Clouston<sup>1</sup> refers, who go on the theory that there is an un-

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<sup>1</sup> Clinical Lectures on Mental Diseases.

limited capacity in every individual brain for education to any extent, in any direction, and that after you have strained the power of the mental medium to its utmost there is plenty of energy left for growth, nutrition, and reproduction, while nothing is more certain than that every brain has at starting just a certain potentiality of education in any one direction and of power generally, and that it is far better not to exhaust that potentiality.

Children varying in age and original capacity, in previous preparation and in home surroundings, are forced to the same molds and grooves. The slow must keep pace with the fleet, the frail with the sturdy, the children of toil and deprivation with the sons and daughters of wealth and luxury.

A child is always liable to suffer from mental over-work when the effort is made to force its education beyond its receptive powers. Education is not individualized enough. The mind of the child is often confused by a multitude of ill-assorted studies. Recreation is neglected and unhealthy emulation is too much cultivated. Some account has been given of the method in vogue at one time in Philadelphia, and which some are unwise enough to wish to revive. In many communities, outside of Philadelphia, admissions to the various grades of public schools are regulated entirely by the averages obtained at examinations, instead of on the general record of the pupils in connection with proper, but not too severe, examinations. In consequence, often after the campaign of over-work and confusion, called an examination, we see children developing serious disturbances of health, or even organic disease—paroxysmal fever, loss of appetite, headache or neckache, disturbed sleep, temporary albuminuria, chorea, hysteria, and hystero-epilepsy.

Premature disease, even in the medical profession, sometimes has its origin in student days. Such education as medical students receive is often obtained under the most trying circumstances. In some of our most celebrated medical schools many of the students are expected to attend lectures or do laboratory work for seven hours in the day-time, and in addition to dissect in the evening.

When to this is superadded attendance upon private examining associations and text-book cramming, the only wonder is that so many survive. Young men finish with credit and honor their medical course not unfrequently only to become invalids or to pass to their graves in a few months, victims of the mental over-work and bad hygiene of the colleges where they sought instruction in health and healing.

The symptom-groups and diseases represented by the series of sixty cases may be summarized as follows: Acute neurasthenia, 18 cases; insanity, 10; phthisis, 9; diabetes, 4; cerebral hæmorrhage, 4; Bright's disease, 3; posterior spinal sclerosis, 3; pneumonia, 3; bulbar paralysis, 1; angina pectoris, 1; erysipelas, 1; hepatitis, 1; enteritis, 1; glossitis, 1.

Beard<sup>1</sup> makes the sweeping assertion that neurasthenia "is at once the most frequent, most interesting, and most neglected nervous disease of modern times." He holds that it is a chronic functional disease of the nervous system, the basis of which is impoverishment of nervous force and waste of nerve-tissue in excess of repair. Professor Bartholow<sup>2</sup> denies that neurasthenia is a primary nervous affection or a substantive disease, holding that it is always symptomatic and secondary, and defining it as "a disease usually functional, situated in one or more organs, during the course of which reflex disturbances of the brain occur, and numerous subjective sensations in all parts of the body are realized by consciousness."

With reference to this difference of opinion, it may be said that, on the one hand, there is nothing either impossible or improbable in the assumption of a primary exhaustion of nerve-centres from over-work; but, on the other hand, cause and effect are doubtless often confounded by those who fall back on "neurasthenia" to clear up the mystery of every half-understood nervous case. A chronic condition, known properly as neurasthenia, is often met with among

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<sup>1</sup> *Op. cit.*

<sup>2</sup> The Polyclinic, January 15, 1884. A paper read before the Philadelphia County Medical Society.

Americans in all walks of life, among women as often, or perhaps oftener, than men. These neurasthenics are commonly individuals who are careful rather than careless in their habits of living and working, although sometimes the reverse is the case. They may be, and frequently are, of the nervous diathesis. If men, they are not those who come to the front in politics and in the professions, and who form the subject of our study. They may be statesmen, or physicians, or lawyers, or journalists, but they do not represent the aggressive and successful elements in such careers. They are men who, having wet their feet in the ripples of endeavor, imagine that they have buffeted with great waves.

Those who form the subject of this lecture, on the other hand, are, as a rule, men of great natural vigor, who have worked with more energy than discretion. They are the swift and strong, the fit intended to survive. Sadly enough they often live only to teach the truth that the race is not always to the swift, nor the battle to the strong. While scarcely ever belonging to the class of chronic neurasthenics, these men are sometimes the victims of a nervous prostration, which comes on acutely, or so insidiously that its early warnings are overlooked or brushed aside. This condition may be followed quickly by some serious organic disease, or, under fortunate circumstances, it may be recovered from by rest and proper treatment. The cases classed as acute neurasthenia were of this character.

The condition of half-gout, or suppressed gout, named *lithæmia* by Murchison<sup>1</sup>, and also sometimes spoken of as lithuria or lithiasis, has attracted much attention during the last few years. In addition to Murchison, the nervous symptoms of lithæmia have been ably discussed by Draper<sup>2</sup>, Russell Reynolds<sup>3</sup>, Dyce Duckworth<sup>4</sup>,

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<sup>1</sup> The Croonian Lectures on Functional Derangements of the Liver. By Charles Murchison, M. D., LL. D., etc.

<sup>2</sup> Series of American Clinical Lectures, edited by E. C. Seguin, M. D., 1875, and New York Medical Record, February 24, 1883

<sup>3</sup> British Medical Journal, December 15, 1877.

<sup>4</sup> Brain, April, 1880.

Da Costa<sup>1</sup>, and Putnam<sup>2</sup>, among others. A tendency is seen in some quarters to refer all the symptoms and disorders commonly classed as neurasthenic, and apparently resulting from mental strain and over-work, to a lithæmic state of the blood. Such symptoms are certainly sometimes thus best explained. For several years, and particularly since the appearance of Dr. Da Costa's paper. I have been on the alert for cases of lithæmia, and in a few instances I have had brilliant successes from anti-lithæmic treatment. Lithæmia and neurasthenia, however, are not interchangeable terms. Such symptoms as mental distress, insomnia, head and neck pains, neuralgias, etc., are present when neither gout nor half-gout can be demonstrated by examinations of the urine or blood, or by any other known means. When lithæmia is present and can be demonstrated by treatment or otherwise, the disorders of assimilation which have led to it are often of primary nervous origin. While it may be entirely the result of inheritance, or errors of diet, in other cases it would seem to be induced by nervous strain, and is, therefore, likely to occur in those with whom we are now concerned. My experience coincides with that of Da Costa, who says: "Lithæmia is much more common in men than in women. Its chief sufferers are men in the prime of life. It comes on in some who live luxuriously, eat largely, drink freely, take little exercise in the open air, and are indolent in their habits. But it is quite as often, or oftener, seen in the active brain workers of good habits, in the marked men in the community in which they live, and it is in them, too, that the nervous symptoms of lithæmia are most obvious. My list of lithæmic patients embraces many a name distinguished at the bar, in medicine, in the pulpit, in literature, and in the world of finance. And it is not only brain work and all the habits this implies, but strain and worry which induce it."

When vertigo is complained of by over-worked patients, I am particularly inclined to look into the question of lithæmia.

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<sup>1</sup> American Journal of the Medical Sciences, October, 1881.

<sup>2</sup> Boston Medical and Surgical Journal, December 13, 1883.

It is almost impossible to present in orderly array all the symptoms which may be regarded as the indications of nervous exhaustion, and the probable precursors of premature disease from brain strain and over-work. These symptoms, indeed, will vary somewhat with the individual—with his hereditary tendencies, his habits, and his surroundings. There are, however, certain common and positive evidences of existing or coming evil which are present in many cases. The most prominent of these early warnings, which are, at the same time, the symptoms of the affection or condition most conveniently termed acute neurasthenia, are as follows: 1. Certain psychical symptoms, such as excessive irritability of temper; depression of spirits; morbid impulses and fears; constantly recurring thoughts, phrases, or suspicions; sense of effort; impairment of memory and attention; and change in habits and methods of mental work. 2. Laxity or immobility of countenance. 3. A diminution or loss of physical resisting power. 4. Heart failure. 5. Sleeplessness. 6. Pain or distress in the back of the head and neck. 7. Nervous dyspepsia.

Excessive irritability of temper, a state of mental hyperæsthesia, is certainly one of the earliest indications of brain over-work. This irritability is apt to alternate with feelings of exhaustion and depression, and is occasionally the only marked precursor of serious disease. The account given by one of my patients, a professional man thirty-seven years old, is practically that of many. With a large amount of work on hand, with exacting literary and teaching engagements, with financial anxieties, he was the victim of mental over-work and worry to an extreme degree. The veriest trifles began to annoy him. He could scarcely endure the presence of his own children; their simple play and noise disquieted him and caused unwonted ebullitions of temper. He was abrupt and impatient in his business. He believed that his best friends were turning against him. He became unable attentively to follow a conversation. He would sit down at his desk to take up some professional or literary work, only before long to sink listlessly in his



chair unable to arouse either memory or attention. He had frequent spells of profound depression ; and tinnitus aurium, a sense of weight in the head, disturbed sleep, and partial insomnia were symptoms that came and went. After this condition had lasted for three or four months his urine was tested, and, to his surprise, was found to contain sugar.

In this case, as in many, mental irritability was an evidence of impairment of power. Weakening of the inhibitory mechanism of the brain is likely to be one of the first effects of mental over-work. Perfect inhibition is the sign of perfect mental health. Owing to the sapping of inhibition, the man whose brain has been over-worked or overstrained sometimes shows a tendency to morbid impulses and morbid fears. One of my staid but greatly over-worked patients felt himself moved by a strange impulse to shout on the streets, another was impelled to steal umbrellas from a rack, another to hurl his child over a stairway, another to commit suicide. Again, a man who has steadily over-worked himself may find himself developing a state of general timidity, and, along with this, a tendency to perform foolish and indiscreet acts. Special morbid fears sometimes arise ; but Beard, I think, makes neurasthenia play too important a role in the causation of these fears—fears of open spaces and fears of closed spaces, of lightning, of disease, of defilement, and the like. These cases usually represent peculiar forms of inherited mental perversion rather than conditions of nervous exhaustion from brain work or strain. They are rather emotional monomanias, as held by Hammond and Ball. They are more likely to occur in those who never use their mental powers energetically than in the active brain-workers.

The inability in waking hours to banish some phrase, or thought, or suspicion, that has somehow gained a foothold in the mind, has been experienced by many who have suffered simply from temporary nervous depression. When mental conditions of this kind often recur, and increase in intensity, when associated with other morbid impressions and states, they are warning signs that ought

not to be overlooked. The unfortunate possessor of these feelings and emotions is already on the danger line.

A peculiar and unusual laxity or immobility of countenance is one of the minor and yet important early indications that a man's account of physical and mental vigor is being overdrawn. This takes the place of the firm lines and the quick and varied play of features so indicative of mental strength and acuteness. It is due to a loss of muscular tone which, in its turn, is dependent upon impairment of central nervous control. It is often present in the early stages of dementia of any form.

Brain-fag shows itself again in the want of zest and sense of effort which goes with every task. The desk-worker expects to accomplish some hours of useful labor; but, instead of his interest and enthusiasm awakening, as formerly happened, he becomes absent-minded, ideas fail to come to him, and he is unable to concentrate his attention. By persistence he may be able to arouse for a short time some of his former energy, but long, continued effort becomes impossible. The life has gone out of his work. His habits and methods of work change almost without his knowing it. He is obliged to get more time than he may, to some extent, compensate for lessened powers. Minutes are stolen from his meals, hours from his family and from sleep, and Sunday's rest is invaded and violated. He ceases to know the meaning of recreation, and becomes an abject slave to tasks which become every day more irksome and impossible of completion.

A diminution or loss of power to resist exposure, fatigue, or slight deprivation of food and rest is one of the surest evidences of nervous decline. The man in this case is showing prematurely that lessened power of resistance which comes on physiologically with advancing years. His nerve-centres are exhausted, they are wearing out, and are no longer capable of sending forth those nerve-stimuli which are necessary to assimilation and repair.

Heart failure was particularly observed in two cases—both physicians. In one, signs of a weak heart, with slow and sometimes

intermittent pulse, and anginal attacks preceded the development of phthisis. In the other, a similar condition of heart and pulse was present, with cardiac dyspnoea and vertiginous seizures.

The fact that sleeplessness is one of the effects and early indications of mental over-work is so well known that it is almost unnecessary to dwell upon it. It was present in some degree in almost every one of my cases in which the trouble from over-work did not come on suddenly. The progress towards complete insomnia is usually gradual; at first it is likely to be fitful slumber broken by dreams. What sleep is had is not refreshing. Soon the patient may not be able to sleep for hours. The brain is harassed by the thoughts of the day, which can neither be downed nor dismissed. They sometimes almost madden by their sameness. Finally, if not remedied, the insomnia becomes as absolute as that present in some forms of insanity, which perchance it presages, and which yields not to

——— “poppy, mandragora,  
Nor all the drowsy syrups of the world.”

Pain, or a feeling of intolerable distress in the back of the head or neck, was complained of in twelve cases. It is undoubtedly a frequent symptom of acute neurasthenia, and also not rarely a prodrome of coming organic trouble. A judge resigned his position on the bench because of this distress, coupled with insomnia; and because of it also an over-worked young physician seriously considered abandoning his profession. Pain in the back of the head, as well as other forms of headache, may be due to eye-strain; a cervico-occipital myalgia of rheumatic or lithæmic origin is often met with; and chronic neurasthenics suffer from nape-aches which their habits of self-inspection and self-analysis magnify to undue proportions; but over and above all these are cases in which this symptom can only be explained by extreme nervous exhaustion. Each patient complaining of this sensation should be carefully studied in order to determine whether it is a matter of trifling or serious import.

One form of occipito-cervical pain is indicative of serious disease of the kidneys. Seguin<sup>1</sup> has reported two cases of occipito-cervical pain of a severe type. Both patients were adults and had suffered from chronic headache more or less of the migraine type. At a certain period this headache became transformed into a localized occipital pain, very different from that of the former attacks. The pain in one case extended down the cervical spine, and was much aggravated by movement. The peculiar headache was distinctly paroxysmal and accompanied by nausea. In both cases evidences of chronic Bright's disease, in the form of urine of low specific gravity, and containing albumen and hyaline and granular casts. Convulsions were present in one case. One of the patients died, and the autopsy showed extensive disease of the kidney but none of the brain.

That disorders of digestion are sometimes early results of brain strain and over-work needs only to be recalled. A true nervous dyspepsia, associated with heart palpitations and coming and going diarrhœa, is often one of the first and most annoying evidences of nervous strain. A distinguished physician, when financially embarrassed and working with great energy for recognition, suffered so severely with dyspeptic symptoms that cancer of the stomach was suspected by himself and by some of his professional friends. With professional success came relief to his gastric symptoms.

Digestive disorders come early and late in the history of nervous break-down, but their true significance is often overlooked, and treatment is directed to the stomach when the over-worked brain is the organ really at fault.

In not a few cases which are supposed to be the result of over-work, and which are at first conveniently labelled as neurasthenia, the break-down in health is really due to some special physical conditions which may or may not be serious. Headache, vertigo, and mental distress may arise from the eye-strain which is caused by optical defect; and tinnitus and vertigo, which are regarded

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<sup>1</sup>Archives of Medicine, August, 1880.

with alarm, may be dependent on some easily remediable ear-affection. Our discussion would not be complete without a reference to such cases, which have received the fuller attention which they deserve from Mitchell, Thompson, Risley, and others.

In five cases of cerebral syphilis, not included in the sixty cases, the symptoms were at first attributed to worry and mental over-work. Two were men engaged in scientific work, one was in official position, one was a physician, and one a merchant. All were actively engaged intellectually, and were under pressure. The brain symptoms were relieved in four cases by potassium iodide; the fifth, after three attacks of paralysis, died. Worry and brain work played an added part in this last case.

Insanity in some form was developed or precipitated, apparently as the result of mental strain and over-work, in ten cases. In those cases in which the patient's condition could be traced for some time prior to the outbreak of recognizable insanity, indications of coming evil were present, but went unheeded. Investigation revealed a family history of insanity in three cases, and some transmitted neurotic vice may have been in existence in other cases, but this was not ascertained. The forms of insanity were melancholia in six cases, parietic dementia in three, and acute mania in one case. From the cases studied in the present connection, as well as from general observation, I should say that melancholia is the type of mental disease most apt to result from pure intellectual over-work; that is, from tasking the highest cerebral centres beyond their inherited or acquired powers.

Paretic dementia is likely to occur among public and professional men when to intellectual labor are added emotional strain or excesses. It is undoubtedly seen more frequently among men in business careers. My note-books contain many cases fairly attributable to business worry and excitement. Dr. H. M. Hurd<sup>1</sup> believes that the disease has a direct relation to business reverses. He shows that since 1883, and the financial reverses which fol-

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<sup>1</sup> Report of the Pontiac Michigan Hospital for the Insane, 1881-82.

lowed, there has been an increasing number admitted to the asylums until the present biennial period. He believes that the cases will decrease until a fresh financial revulsion occurs. Spitzka<sup>1</sup> holds that parietic dementia is primarily a disease of the medulla oblongata, ultimately due to overstrain of the encephalic vaso-motor centre. The same author points out the striking analogies between this disease and posterior spinal sclerosis, of which latter affection my series furnishes three cases in terribly over-worked and greatly worried public men, without histories of syphilis, or of sexual or other excesses.

Of the nine cases of phthisis three were members of the lower house of Congress, three were teachers, two were physicians, and one was a lawyer. In each case the history of mental over-work was clear, and in each to a large amount of real intellectual labor was added more or less emotional strain. Next to the possessors of the neurotic or insane diathesis, men of superior brain power in whose families phthisis is hereditary would seem to be most likely to over-work themselves mentally.

The four cases of glycosuria furnish additional evidence of the correctness of the now generally conceded opinion that mental over-work and emotional strain are frequent causes of this disease. The influence of the nervous system in the production of saccharine urine has been shown by Bernard, Schiff, Pavy, Cyon and Aladoff, Eckhard, Brunton, and others.<sup>2</sup> In the four cases studied the disease came on insidiously, and not as the result of any sudden shock or emotion.

That either mental over-work or mental anxiety may lead to some forms of Bright's disease, by impairing vaso-motor control, is highly probable. In two of three instances of this disorder the habits of the patient with reference to alcohol and other abuses usu-

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<sup>1</sup> *Insanity: Its Classification, Diagnosis, and Treatment.* By E. C. Spitzka, M. D. New York. 1883.

<sup>2</sup> See Prof. James Tyson's *Treatise on Bright's Disease and Diabetes* for an admirable resumé of these researches.

ally assigned as causes were good, but both were hard intellectual workers. Temporary albuminuria was present in two other cases. Examinations of the urine were not made in many of the cases. In this connection, the report made by Dr. Andrew Clarke,<sup>1</sup> a physician connected with the Indian Civil Service, to Dr. Hack Tuke is interesting. He wrote that he was a witness to the grave, and sometimes irreparable, mischief done at schools and in working for competitive examinations. Of the young men passing the Civil Service examination for the Indian service, and afterwards sent to him for health certificates, ten per cent. had temporary albuminuria. Professor Tyson<sup>2</sup> says that it is certain that interstitial nephritis often exists for a long time undiscerned in business men who have lived under a state of constant mental tension. He quotes Dr Clifford (from an article by Dr. Edes), who attributed twenty-four out of thirty-two cases in private practice to some long-continued anxiety or grief. When interstitial nephritis or some other form of chronic Bright's disease is in existence, but practically dormant, mental strain may spur it into dangerous activity and thus lead to premature death. One case of this kind has already been detailed, and reference has already been made to another in which long-standing disease of the kidneys was not discovered until after death.

In the case of bulbar paralysis and of angina pectoris post mortem examinations showed degenerative disease of the blood vessels; and in four cases—the diagnosis in two confirmed by autopsy—cerebral hæmorrhage resulted from a combination of excessive mental work and great responsibility. Two of these patients, however, were between sixty and seventy, and two between fifty and sixty, but in all, a life and usefulness might have been prolonged if mental strain had been avoided. On the one hand, arterial degeneration may occur as the result of continued cerebral over-work and emotional strain, and on the other, such strain and over-work

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<sup>1</sup> The Journal of Mental Science, January, 1880.

<sup>2</sup> *Op. cit.*

are particularly dangerous in those whose vessels are atheromatous or otherwise diseased from age or special cause. Over-work of the brain, for a time, at least, flushes it with blood and distends its vessels. Even a pure intellectual act can be shown to notably influence the circulation, and change the temperature of the head.

Gley<sup>1</sup> has studied the influence of the intellectual act upon the circulation. He used a cardiographic tambour on his own carotid. A philosophical lecture, a geometric demonstration, and an arithmetical operation were used to excite the activity of the brain. He observed during the intellectual work, 1, augmentation of the number of beats of the heart, which appeared to be in direct ratio to the attention; 2, dilatation of the carotid artery and most marked dirotism of the carotid pulse; 3, these characteristics persisted after cerebral activity had ceased. He concluded that these effects were neither cardiac nor respiratory, but vaso-motor changes.

The experiments of Lombard on the effects of mental activity in increasing cerebral temperature are now well known.

Frequent congestions of the brain cause peculiar kinkings and tortuosities of the arteries, even of those of large calibre. I have seen many remarkable examples of this condition in the post-mortem room of the Philadelphia Hospital. The fact that the perivascular spaces in the brain allow these kinkings to take place is, to a certain extent, conservative of the coats of the vessels; but, in process of time, the arterial tunics will degenerate as the result of the strain to which they are frequently subjected. We speak sometimes of cerebral centres and zones, referring to collections of nerve-cells which are supposed to have certain special functions; but centres and zones are vascular as well as nervous. Instead of innervation preceding circulation, or circulation innervation, the two practically go hand in hand in brain activity. An area of blood supply was regarded by Laycock<sup>2</sup> as indicative of an

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<sup>1</sup> *Revue des Sciences Médicales*, quoted in the *Journal of Nervous and Mental Disease* for April, 1882.

<sup>2</sup> *Medical Times and Gazette*, August 19, 1871.



area of cells and tissues in functional relation with each other, and with a common source of blood, and of regulative *vis nervosa*, both vaso-motor and trophic. The correlation between the distribution of the arteries and the physiological regions of the brain has been demonstrated by Duret, Heubner, Charcot, and others.<sup>1</sup> The bearing of these and similar researches on the subject in hand is simply this, that it is certainly impossible to over-work any part of the brain without over-working the vessels going to that part; and it is equally impossible to subject vessels anywhere frequently and repeatedly to increased intravascular pressure without producing disease of these vessels, or exposing them to danger of rupture if already diseased.

The occurrence of such acute diseases as pneumonia, erysipelas, hepatitis, enteritis, and glossitis in those mentally over-worked, helps to emphasize still further the fact, which I wish to bring out, that overtaxing the nervous system may be the exciting cause of almost any serious disorder to which chance, accident, imprudence, or infection exposes the individual. One of the three cases of pneumonia occurred in a successful candidate after a campaign of mental and physical excitement and toil; the second came on after slight exposure in an overworked teacher; the third in one who had for a long time been engaged in laborious literary work. The case of erysipelas occurred in an official after a winter of toil and anxiety, in which his mental powers were strained to the utmost. The cases of hepatitis and enteritis were respectively an overdriven Representative and Senator; that of glossitis an overworked department official.

Just how mental over-work brings about its disastrous effects is not easily explained. We recognize the symptoms of brain tire and brain exhaustion; we see over-worked men falling by the wayside with this or with that well-known disease; but the exact process in the system

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<sup>1</sup> Lectures on Localization of Diseases of the Brain. By J. M. Charcot. Edited by Bourneville, and translated by E. P. Fowler, M. D. W. Wood & Co. New York. 1878.

by which these results are brought about must remain largely a matter of speculation. The effect of emotion and intellectual action upon circulation and temperature can be, and have been, directly studied, but the intimate molecular changes which accompany such functioning cannot be directly determined. We know that an over-worked muscle will sometimes atrophy, and not only so, but also that the supplying nerves and their central nuclei will, in extreme cases, undergo degeneration. Every mental act is associated with some molecular change in the gray matter of the cerebral convolutions. When mentalization proceeds beyond the limits which are practically fixed for every individual, exhaustion, defective nutrition, and sometimes cell-atrophy result. Too prolonged drains upon energy will exhaust and sap the nutrition of nerve-cells anywhere. In cases of mental over-work tissues fail to regenerate as fast as they break down. "A thought," says Dr. H. C. Wood,<sup>1</sup> "is the index-hand that marks the death of a protoplasmic molecule, or rather of protoplasmic molecules, for the production of a thought is usually a complex process involving many molecules. Normally, this molecule, or these molecules, are removed and replaced by the processes of nutrition as fast as they are destroyed. If, however, thought follows thought with such instant rapidity that no time is allowed for the reproduction of protoplasmic molecules, by and by so many molecules or working units will have been used up as to produce a constantly growing scarcity of those normal particles which are capable of building up the new working units that shall replace those which have been lost by continuous mental efforts."

Many of the symptoms of nervous break-down, and many of the diseases induced by mental overstrain, are symptoms and diseases referable to the organic nervous system. These are doubtless precipitated by exhaustion or direct lesion of the centres of the organic functions situated in the medulla oblongata. It is to the im-

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<sup>1</sup> Brain Work and Over-work.

pairment of the restraining and regulating influence of these centres that we must refer the origination of such serious organic diseases—not nervous in their manifestations, and yet evidently arising from primary nervous disturbance—as phthisis, diabetes, Bright's disease, pneumonia, erysipelas, etc. I have already spoken of the probable method of origin of parietic dementia and posterior spinal sclerosis. The occurrence of heart failure, cardiac palpitation, and digestive disorders through the involvement of the pneumogastric centres is readily explicable.

Even the cervico-occipital distress, which comes on as the result of over-work and overstrain, is probably to be attributed to exhaustion of the nerve-centres of the bulbar region. In some cases of organic disease with demonstrable involvement of these centres this symptom is present. It was prominent in the case of a man fifty years old, who was suddenly stricken in health as the result of overstrain in business, and died of acute bulbar paralysis. The succession of symptoms was facial paralysis, diplopia, difficulty in swallowing, muffled voice, laryngeal cough, oppressed breathing, nausea, vomiting, and fever with delirium. It was prominent also in the case of Vice-President Wilson, who had had a hemiplegic attack in 1874. When he last consulted Dr. Hammond,<sup>1</sup> in November, 1875, his marked symptoms were vertigo, thickness of speech, facial twitching, irregular respiration and heart action, slight difficulty of swallowing, extreme restlessness, sleeplessness, and intense pain in the back of the head and nape of the neck. His death was attributed by Hammond to plugging of one or more of the minute vessels of the nucleus of the pneumogastric.

The higher cerebral centres certainly exercise a certain amount of what might be termed unconscious control over the organic centres. Mental overstrain from excessive intellectual work weakens the inhibitory mechanism of the brain. The organic functions—respiration, cardiac and vaso-motor control, etc.—must be maintained

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<sup>1</sup> Boston Medical and Surgical Journal, December 16, 1875.

uniformly in order that the individual shall exist in good health. Their centres must be well nourished and their supply of blood must be even and regular in order that their tone shall be well-preserved. The initial lesion in cases of the kind considered in the present connection may sometimes be a molecular or protoplasmic alteration unrecognizable by our present means of research, or it may be a vascular disturbance or lesion.

Hyperæmias and even minute hæmorrhages into the pons Varolii and medulla oblongata doubtless sometimes occur after severe mental work greatly prolonged under pressure or excitement. Richardson<sup>1</sup> records the case of a well-known English statesman who had risen to fame by working early and late. At last his acquired reputation was at stake on a momentous question. While speaking in the great assembly of the nation he became faint, and was soon obliged to retire. From that moment he was stricken with diabetes, of which he died.

The cause of sudden disease in this instance, and the cause of sudden death in others, are to be looked for in extravasations, often minute, into vital regions of the medulla. In many cases of sclerosis, parietic dementia, and epilepsy, I have examined the medulla to discover the immediate cause of death, and have always found recent congestive and hæmorrhagic areas in the floor of the fourth ventricle. Widely dilated vessels are found containing freshly coagulated blood and surrounded sometimes by extravasated blood.

The most important conclusions to which our study has led may be summarized as follows :

1. Intellectual work does not of itself injure health or shorten life, but mental over-work, particularly when associated with emotional strain, is a frequent cause of nervous break-down and premature disease.
2. The average longevity of men in the higher walks of public

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<sup>1</sup>The Diseases of Modern Life.

life is less in this country than in England. Politics here is not, as there, in the best sense a vocation; and our public men in many cases succumb in health, or fail to attain long life, because they go into careers unprepared by inheritance, education, and training for the severe demands to be made upon their powers.

3. Health and life are sometimes lost through forgetfulness of the fact that mental strain and over-work are particularly dangerous to those in middle life or advanced in years who attempt brain work and responsibilities to which they have not been accustomed. The effects of suddenly-imposed mental strain upon these classes are especially disastrous.

4. If not subjected to unusual mental or physical strain, public and professional men, as well as those in other walks of life, although afflicted with organic diseases, may live in comparative comfort, and be able to do a moderate amount of work for many years.

5. Among special causes of premature disease in public life are onerous and perplexing duties on Congressional Committees, the uncertainties and disappointments attendant upon public positions, the great strain to which candidates are subjected during political campaigns, lack of recreation, and social excesses and abuses at the National Capital.

6. Among physicians, lawyers, and journalists the performance of brain work under pressure for time, and under bad hygienic conditions, is a common cause of ill health. Defective education and pecuniary harassments are also special causes of nervous breakdown and premature disease among physicians and lawyers.

7. Comparatively few clergymen succumb completely to mental over-work, although many suffer from a mild but annoying form of neurasthenia.

8. The danger to the scientific worker usually arises from too intense and too prolonged activity of the mind in one direction. It is a danger which springs largely from the fascination which such work has for its votaries.

9. The system of severe competitive examinations in vogue in

many communities saps the health both of teachers and pupils. In our schools generally educational methods are bad, recreation is too much neglected, and unhealthy emulation too much encouraged. Education is not properly individualized.

10. Chronic neurasthenia is not common among men prominent in public affairs and in the professions. Such men are, however, sometimes the victims of a severe acute nervous prostration, which may result in serious organic disease.

11. Nervous strain is one of the causes of lithæmia, which is of not infrequent occurrence among public and professional men, but lithæmia and neurasthenia are not interchangeable terms.

12. The warnings of mental over-work and over-strain vary with individuals and circumstances, but certain psychological symptoms, and such physical symptoms as laxity or immobility of countenance, diminished resisting power, heart failure, sleeplessness, cervico-occipital pain or distress, and dyspepsia, are of most frequent occurrence.

13. Insanity, particularly in the forms of melancholia and parietic dementia, is sometimes developed by brain strain and over-work. A family history of insanity is often present in such cases.

14. Phthisis, diabetes, and Bright's disease—next to insanity—are among the diseases most likely to be developed by mental over-work. Men in whose families phthisis is hereditary should carefully guard against such over-work.

15. Over-taxing the mind and nervous system may be the exciting cause of almost any serious disorder to which chance, accident, imprudence, or infection exposes the individual.

16. Many diseases, not nervous in their seat or manifestation, are developed directly or indirectly as the result of mental and nervous strain, through exhaustion, impairment, or lesion of the centres of the organic functions.