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LIFE AND DISEASE.

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ALTHOUGH the records of mortality not unfrequently present instances of marked longevity, it is, nevertheless, safe to assert that the majority of deaths do not occur in obedience to the inexorable law of self-limitation, which puts a period to the greatest possible length of human life. The results accruing from a more exact appreciation and a better application of the principles of science, both medical and sanitary, prove that in the past, at least, even if it be not true of the present, although individual existence cannot be indefinitely prolonged, the average duration of life has fallen considerably short of what might have been attained.

On the one hand, then, life implies death, and that in two senses; constantly, in that every organic effort disturbs the vital connections of a certain quantity of tissue material; ultimately, in a mode that needs no description. The time at which death takes place may be accidental—and I wish the word to suggest something besides mechanical violence or active poison; it is often premature, through some one of the numerous forms of disease; it is rarely, if ever, natural from simple senility. I say rarely, if ever, natural, for we have ceased to expect in the structure of the human frame such uniform perfection of all its parts that death shall not be a process involving a series of consecutive changes, but a rapid and simultaneous abolition of all those functions whose integrity is essential to the phenomena of healthy life.

On the other hand, fatal disease, with its diversity of character and location, and its infinity of phases with nominal identity, stands in a very close relation to life, giving that word a broad and comprehensive definition.

I believe that every act which an individual performs, though it be as simple as eating, sleeping, or any ordinary form of exercise; every effort which he makes, be it mental or physical, and every variation in the time and manner of performing that act or making that effort, constitutes an influence or agency which modifies his whole subsequent existence. And his relation to health or disease

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at any instant involves no small degree of personal responsibility, and is the product of two factors, of which one is his congenital condition, and the other the combined result of all those influences which have successively affected him. Those influences may be such as he has created or selected for himself, or may originate in agencies beyond his control. Modes of life play a most important part in the determination of the quality or degree of health, and the quality of health underlies the duration of life. Fatal disease is often not simply the termination but the result of life, as parturition is the result as well as the termination of utero-gestation. This comparison I use simply for the illustration of an idea, and not for the purpose of furnishing arguments from analogy in support of it. But to give it all possible force I will insist upon two points. Whatever it is that initiates the parturient movement, it is something connected with the process of gestation. There is also something else in that process, acting perhaps at and from the instant of conception, which decides what in loose language we are disposed to regard as the accidents of the fœtus, its sex, weight, proportions, presentation, position. The most limited obstetric experience recognizes the intimate connection between these elements and the character and results of labor.

The broad proposition here laid down may seem bold and untenable to those who claim that the system is intended to resist all impressions of moderate force. But the view that men may live themselves to death, although the expression has a paradoxical sound, is in complete harmony with the simple theory which has not yet been invalidated or superseded by a more acceptable one, the theory which declares that disease forms a part of the plan of creation, and intimates that some provision for its development has been incorporated into the very nature of man's constitution.

The position assumed stands upon some of the simplest and strongest facts of the human economy. For instance, disease induces atrophy; insufficient use interferes with growth and invigoration; over-use leads to exhaustion. Proper use not only increases strength and enlarges capacity, but is indispensable to all high development, as tension is essential to the manifestation of elasticity in materials which possess that property. Fortunately, what constitutes proper use is not judged by the standard of a geometrical line, but the terms can be applied with no small latitude of meaning. The same numeral does not always represent the specific gravity of the urine in health, and this is true also of the frequency of the pulse. As every voluntary act implies some degree of use, it follows with logical necessity that such act must cause some change in the system, favorable or unfavorable, with reference to its susceptibility to morbid influences, and its reactive power under existing disease. When we consider that the system is in such unstable condition of perpetual change that even the exact weight of the body cannot be a

constant quantity, and that there is such unceasing variation in the balance between constructive agencies and destructive processes that the antagonistic forces which play within and upon the body are in apparent equilibrium only, we realize a state of things which affords the best possible opportunity for the influential action of trivial agents.

We may seem to invest with undue importance things which are commonly adjudged to be insignificant and of no account. But the law of gravitation assigns a part in the exhibition of force to every atom in the universe, and attributes the same quality alike to invisible particles and gross masses. Repetition, like the longer arm of a lever, can give visible efficacy to the slightest manifestations of power of which the single expressions seem as nothing, and the results of daily observation abundantly illustrate the rule of cumulative influence. The decisive character of the last ounce, the last blow, or the finally successful effort, is largely derivative. A single gluttonous indulgence does not suffice to establish a chronic dyspepsia. A single excess will not explain an attack of delirium tremens, and one alcoholic draught will not, with an ordinary predisposition, excite a paroxysm of gout. What I would call an artificial phthisis, in contra-distinction to one that is natural and inevitable, does not come from a brief exposure to those causes which undermine nutrition and determine physical deterioration. It may be remarked that the magnitude of the element of personal accountability, which enters into the matter of the time and mode of decease, converts a considerable portion of mankind into suicides; and so it is. The intrinsic nature of crime has no reference to rapidity of commission. Suicide does not necessarily imply violent or speedily effective measures; but it does properly include every voluntary act of the individual which shortens his life by the space of a single moment. The exigencies of any age may demand the sacrifice of men, and it seems to be ordained that the world's life and progress shall be sustained at the expense of individual wear. But outside and beyond all this, as physicians well know through the testimony of professional experience, large numbers, by honest, earnest and indiscreet exertions, are making themselves irrevocably bankrupt in health and recuperative power, and are hastening dissolution by means less gross and repulsive, but not less effectual than the Japanese section of the abdomen. They die prematurely in the name of some reputable disease which excites no suspicion, and does not suggest to the world the idea of self-destruction. In common phrase, they pay the debt of nature; but it is nature provoked and thwarted by human folly or human misfortune.

Following this train of thought a little further, it is obvious that whatever is suicidal in its effects upon one generation, is, by the law of hereditary descent, homicidal for those who follow. The degeneration and extinction of families, once strong in vigor and num-

bers, are well attested facts. But offspring derives its character through as well as from parents. Witness the occurrences which are catalogued as instances of atavism. Congenital condition, which really is so important a part of one's stock in life and health, is not simple, but extremely complex in the elements of its composition; and, in its production, looks back to manifold influences, which, appearing at various ancestral points, move, with inevitable and innumerable modifications, along converging lines of transmission, and by their final union in each individual combine to form what we designate by the comprehensive term constitution.

There are competent persons who hold the opinion that, with all due allowance for numerical growth of population, there is an increase of insanity and of other disorders of the nervous system. This greater prevalence of these affections may, I think, be traced to the circumstances under which procreation takes place, and may be adduced as an instructive example of the influence which modes of parental life exert upon offspring. Active brains do not necessarily render an age thoroughly and truly intellectual, but they surely make it a busy one. In our own day, the wider and still expanding scope of general information, the elevated standard of education and the methods of attaining to it, the sub-division and multiplication of details in all scientific studies, the anxieties and competitions of business, the ambitions of political life, all tend to beget a permanent state of mental tension and nervous excitement, such as formerly were only known in times which seriously disturbed the public tranquillity. Out of this condition of over-exertion and partial exhaustion children are born, with antecedents and prospects which no thinking man would select as favorable to the stability and durability of the nervous system. If daughters are often disparaged by the comparison which is made between their infirmities and the overwhelming energy of their mothers, it may be that the former are only bearing a burden of debt increased by an extravagant expenditure of force on the maternal part.

The question of the definite, specific causation of disease has long attracted an earnest attention from both scientific and popular sources. By the extent of its discussions, every text-book confesses the interest attaching to the subject, and rarely a patient who fails to demand the reason of his illness. Curiosity constantly propounds a problem for which philosophy is unable to furnish an exact, complete and satisfactory solution.

In answer to a question which inexperience only would ask, the late Dr. James Jackson replied, "I should be glad to know all the causes of disease, but during a long and diligent life I have looked for them in vain." We may acquire some positive information concerning the immediate associations and connections of disease, but many of its causes stand in such intimate relation with the habitual and exceptional acts of daily life in more than a single generation,

that these causes escape detection by all available means of analysis. The thoughtless deed of some remote progenitor may participate in the origination of the malady which terminates fatally to-day.

The customs of society, often found in effective opposition to the interests of good health, are but the aggregate of the habits of its members. And if these customs sometimes engender disease, the sufferer is only exposed to the reversion of his own improprieties, and is forced to accept consequences in the responsibility for which he has his just share.

The common notions of disease convey to the mind the idea of what endangers or destroys life. But as this impression is not capable of universal application, I wish to invert my subject, and making disease the first term in the series, recall a few facts which show that it may sometimes perform a salutary and protective office. And, in this connection, two or three brief suggestions will suffice. Certain contagious diseases, almost universal in their visitations, capable of running a thorough and complete course, without apparent detriment, afford a protection which is absolute for the majority of those whom they attack. Oftentimes, a safe disease may anticipate and prevent one that is probably or surely destructive of life. This conservative morbid process may be of artificial origin, as from the introduction of vaccine virus, or may arise spontaneously, as in those cases where an adhesive inflammation of limited extent saves one from a general and dangerous peritonitis.

With obvious limitations, disease comes as a benefaction to those who, with some mistaken ideas of necessity or propriety, defy natural law and ignore the relations which have been established between the intensity and duration of effort and the subsequent repose which the expressions of that law require. An illness of a severity just sufficient to produce complete disability and to secure unreversed surrender to the condition and course of disease, may, by the state of inaction and rest thus imposed, bring a long-needed adjustment to any man who has assumed, or had thrust upon him, burdens in excess of his strength. There is a popular impression, vaguely conceived but with some small foundation, that disease may be wholesome and conducive to health; and many a patient has found himself, at the completion of his convalescence, not simply restored to the point at which the disease made its invasion, but literally refreshed and renewed.

No elaborate machine is complete unless it is provided with some self-acting apparatus which shall take cognizance of anything which threatens the perfection of its product, or the safety of some of its parts. Many people are not superior to inanimate objects in the intelligence and discretion which they exhibit with reference to the care of themselves. For them, it is a piece of enviable good fortune when disease comes to their rescue, as a regulating and restraining agent, like the automatic contrivance in mechanics, and saves

them from transgressions of which the results may be without remedy. Such good fortune is the portion of but few; for the average human system is rich in self-protective power, and the determination with which it instinctively seeks to maintain its integrity to the last is strikingly shown in two instances. The appearance of unusual health which frequently precedes a seizure, seems to be the final effort which the system makes, under the stimulus of some premonition, to resist the approach of disease. In close analogy with this, is the improvement often noticed in symptoms just before death; a delusive change, which is simply the evidence of one last attempt to rally before yielding in a hopeless struggle.

A CASE OF POISONING BY FIVE GRAINS OF STRYCHNINE
TREATED BY CHLOROFORM INHALATIONS. RECOVERY.

By G. W. COPELAND, M.D.

As the following case may be of some interest, I will submit it to the profession.

Mr. B., shop-keeper, a middle-aged man of temperate habits, while suffering from depression of spirits, obtained, on Sept. 1st, ten grains of strychnine, representing his intentions were to poison a dog. He secured a room at a hotel, took a dose of laudanum as a preparatory step, and went to bed, intending to swallow the drug as soon as the effects of the opiate were apparent. It appears he fell asleep, and did not awake till half past four in the morning, when he took half the quantity previously mentioned. Some time after, he was seized with convulsions. The occupants of the adjoining rooms, awakened and alarmed by his screams, at length came to his relief. I was called and saw him at 6, A.M. I found him lying in bed; legs and arms extended, his hands firmly clenching the sides of the mattress; intellect clear. He confessed he had taken strychnine. The clothing, by his request, had all been removed, as the slightest touch produced a spasm. I administered twenty grains of sulphate of zinc as soon as it could be obtained. This he swallowed with great difficulty, the contact of the solution with his mouth producing trismus and constriction of the throat. The paroxysms came on every three or four minutes. He was conscious of their approach, and entreated us to hold him, to raise him up, or lift him out of bed, till his body became fixed, his head drawn back and articulation impossible. In this condition of complete opisthotonos, he remained for about a minute, his face livid, and death apparently inevitable. I now resorted to chloroform inhalations, with the happy result of preventing each paroxysm from lasting over a few seconds, or subduing it before the muscles of the back became rigid. So soon as he felt one coming on, I applied the vapor to his mouth;