

The preservation and prolongation of life to 100 years / by Protheroe Smith.

Contributors

Smith, Protheroe, 1809-1889.
Royal College of Surgeons of England

Publication/Creation

Aberdeen : John Avery, 1885.

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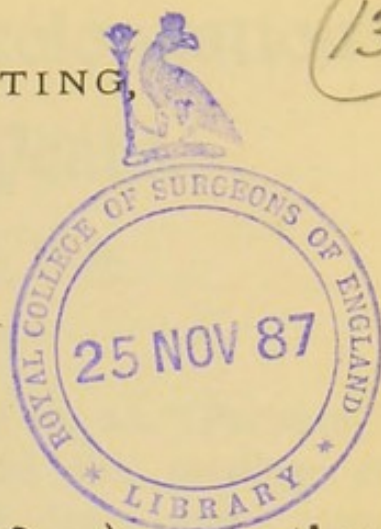
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BRITISH ASSOCIATION
FOR THE ADVANCEMENT OF SCIENCE.

ABERDEEN MEETING,
1885.



The Preservation and Prolongation
of Life to 100 Years.

BY PROTHEROE SMITH, M.D.,

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and of the Medical Society of
St. Petersburg, etc.*

ABERDEEN :
JOHN AVERY & CO. LIMITED.

1885.

BRITISH ASSOCIATION

FOR THE ADVANCEMENT OF SCIENCE

THE ANNUAL MEETING

AT THE UNIVERSITY OF CAMBRIDGE

IN THE YEAR 1894

AT THE HOUSE OF COMMONS

ON THURSDAY, 14th SEPTEMBER

OF THE YEAR 1894

THE PRESIDENT OF THE ASSOCIATION

THE VICE-PRESIDENTS

THE SECRETARIES

THE TREASURER

THE CHAIRMAN OF THE COMMITTEE

THE CHAIRMAN OF THE SUB-COMMITTEE

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BY PROTHEROE SMITH, M.D.

HAST autumn, when on board the s.s. "Parisian," bound for Canada, I had the privilege of accompanying the President and some members of this Association during their inspection of the ship's machinery. Whilst there was much to engage my attention in the intimate and accurate relation of every part of that great moving mass, and in the extreme care to prevent any hindrance of its action by friction or otherwise, I was struck with the rapidity of the ceaseless and smooth motion of the complex engine, with, what seemed to me, absence of wear and tear. The mechanist had thus secured efficiency of continued motion, and, at the same time, great immunity from deterioration. The analogy between this masterpiece of human ingenuity and that organic being, "made in the image of Him who created him," was so evident that I was led to conclude that, as the pristine form of the one, with its perfect relative position of every part, preserved and secured its lasting condition, uninfluenced, apparently, by long-continued constant use, so the living human being, by keeping his various organs in their primordial size and position, and by avoiding undue pressure from displacement, or partial increase in bulk, might, in like manner, be benefited and long preserved from decay.

This idea will serve to introduce the principle on which my scheme for sustaining and prolonging the life of man will be explained; and I venture to affirm that if you

allow my views in regard to the steam engine, you will not hesitate to admit the truth of my conclusions with respect to the longevity of man. With the wish to claim your attention on the present occasion, I will at once observe that my subject will consist chiefly of an answer in the affirmative to the question—Can we men and women attain to the age of 100 years, and live happily so long, and even longer? The personal interest felt in longevity is almost universal, and consequently the demand for information on this subject has called forth numerous publications, with a view to suggest the most eligible means of attaining this desirable end. It would, however, require more time than is now allotted to me to offer any critical comment on, or even to enumerate, them. Let it suffice to say, that they all contain interesting matter bearing on this question. I believe, however, that the views I am about to enunciate, though of paramount importance, have never been before advanced. As a preliminary step, I must endeavour to remove a popular objection to my subject, since it is raised, as it is affirmed, on the authority of Scripture. Whilst bowing unreservedly to that authority, I beg to observe, though originally formed capable of living for ever, that man, having forfeited this title through Adam's transgression, only retains the mortal body, with which we physicians specially have to do. We are still interested in the inquiry—What is the extent of the lease of life granted to the natural man? The popular answer to this question is found in the 10th verse of the 90th Psalm, viz.—that “the days of his years are threescore years and ten; and if by reason of strength they be fourscore years, yet is their strength labour and sorrow: for it is soon cut off, and we fly away.” Let us critically examine this statement and the context. We find, in the first place, that Moses was the author of this psalm; and, secondly, that it was written by him (1500 years B.C.), during his wandering in the Arabian desert with the people of Israel, all of whom above the age of 20, with the exception of himself and Caleb and Joshua, were judicially condemned to die within 40 years in the wilderness, a consummation greatly favoured by the

untoward circumstances of their nomadic life with such ungenial environments. This psalm, therefore, should not be regarded as prophetic, but as historical, and applicable only to the time and to the people for whom it was specially written. In confirmation of this, I would draw attention to the facts that Moses, the writer of the 90th Psalm, lived to 120 years, and did not die of decay or old age, as then "his eye was not dim, neither was his natural force abated," whilst Caleb and Joshua respectively lived 110 years. Though the assertion contained in the 10th verse of this psalm is to be accepted as unquestionably true, yet, looking at the context, it could only be intended for those to whom the language of the 7th and 8th verses was suitable, viz. :—"We are consumed by Thine anger, and by Thy wrath are we troubled; all our days are passed away in Thy wrath"—the grievous lamentation naturally of those under the Divine condemnation. "Forty years long was I grieved with this generation." "Unto whom I swore in my wrath that they should not enter into My Rest."—Ps. xcv. "Your carcasses shall fall in this wilderness."—Numbers xiv., 32. Whilst on the other hand, it cannot be true of Believers in the present Dispensation, who are the objects of the Father's love. Thus it is evident that no precise limit is enjoined by Scripture to man, as to the grant of his physical life. According to M. Flouren's belief, animals have the capacity generally of living five times longer than their growing time. Assuming this, as regards man, on an average, to be twenty-one years (and excluding accidents, diseases of heredity, and unhealthy and unfavourable surroundings and habits), our term of life should be at least 100 years. In support of this hypothesis, Haller has enumerated more than 1000 instances of individuals of modern times who have attained to an age varying from 100 to 110 years. I think, therefore, I am within the mark in stating that, as a rule, we ought, by conformity to the moral and physical laws of God, to attain to the age of 100 years.

Having disposed of this difficulty, I will now bring the special subject of my address before you ; but in order better to follow and appreciate it, I must ask you, in the first place, to bear in mind five physiological facts, bearing specially upon human existence, viz.:—that, in addition to other considerations, the persistence of psychical, or natural life is, to a great extent, dependent on, 1st, the healthy condition of the brain and nervous systems, which supply force and energy to the heart and its afferent and efferent vessels ; 2nd, that the blood it circulates, constitutes the very life of the flesh, inasmuch as “the blood is the life thereof;” whilst, therefore, the brain and nerve tissues are dependent on the blood for their vitality, so the blood can only quicken or vitalize the body when it is supplied with power by brain, spinal marrow, and nerves ; 3rd, by the constant efforts of respiration to supply oxygen in place of carbon, so removing the effete condition of the blood resulting from circulation, it becomes the active means of conveying “the breath of life” to all the body ; this incessant recurrence of inspiration and expiration constitutes the invariable alternation between life and death which marks our being—life always commencing with inspiration, and terminating by expiration ; 4th, digestion and assimilation produce that pabulum which, when transformed into blood, supplies nourishment and material to counteract the loss of tissue to which the living frame is ever subject ; and, 5th, those emunctories, whose office is to expel the refuse resulting from decay of tissue, together with the unused remnants of ingesta, both solid and fluid. It necessarily follows that animal life mainly relies for its continuance on the normal functions of, 1st, the brain and nervous systems ; 2nd, of the blood ; 3rd, of the respiratory organs ; 4th, of digestion and assimilation ; and 5th, of the emunctories of the body. Thus the brain and nervous system, the heart, the lungs, the chylopoetic and emunctory organs in the animal economy should claim our chief attention with a view to the preservation and extension of our being. Bearing these physiological facts in

mind, I would mention, as the result of a practical investigation for many years on the subject of senile decrepitude, that almost all the concomitants which gradually mark the decline of life (in the way of functional disease and disturbance of the balance of the mental and physical powers) may be seen to be associated *pari passu* with certain alterations in the bony structure of the body—in a word, that with the symptoms which augur the approach of death, spino-pelvic deformity is commonly present.

Although partial hyperæmia or vascular congestion of certain organs is at times seen to accompany this condition, a common cause of such not unfrequently exists in the distortions of the bony structure, as when from debility and loss of muscular power, or from structural disease, deflections of the spine occur. Thus an abnormal position of the pelvis almost invariably results; the natural oblique plane of the pelvis is then changed to one more horizontal, so that, when the lumbo-spinal curve is thus lost, the pelvic contents become subject to a depressing and deranging force, from the weight of the abdominal viscera, causing displacements and disorders inimical to life, and explicable by reference to the principles regulating mechanical force. To this end, the points primarily to be considered are, first, the direction of the centre of gravity of the body, when normal and erect; secondly, the angle formed by the spine and pelvis. The first is proved to be, for all practical purposes, at the sacro-vertebral articulation. The second is an angle of 140 degrees. In the healthy condition, this angle is invariable, when the body is erect and in repose. When the muscular power which effects this is diminished, the pelvis loses its true oblique plane, and is tilted forwards and upwards owing to the trochanteric axis upon which it rests being in advance of the centre of pelvic movement, viz., the spinal column. Thus a backward displacement of the pelvic viscera occurs, with a disturbance of those forces which have hitherto served to keep them in place. When the pelvis is thus tilted upward a redistribution of

balance occurs in these parts, with a considerable augmentation of intestinal weight in relation to them. To redirect this weight and rebalance the oppressed organs, and to restore the pelvis to its natural oblique plane, is the intention of the "Pelvic Band"—the instrument that has been used by me for many years for this purpose. By this the pelvic plane is easily restored to the normal angle of 140 degrees, and the lumbo-spinal arch recovered when lost. Mechanically, it is a lever of the first order—the upper part of the thorax used as the power, the lumbo-spine being the fulcrum, and the pelvis the weight to be moved.

By depressing the pubic portion of the pelvic basin, the abdominal walls are made tense, becoming a valuable means of parietal sustentation, thus effectually preventing or removing the protruding and pendulous abdomen which so often marks advanced age. The majority of those abnormal displacements are found to increase, *pari passu*, as the spino-pelvic deformity increases, the gait being a stooping one, and the pelvis much in advance of the normal standard position. In this abnormal position of the parts, when of long standing, whilst the muscles at the back of the thigh bone are atrophied, those in front are found increased in bulk and strength, in order to sustain the increased burden abnormally imposed on them, a fact which, I believe, has not before been noticed, though it fully explains the unsteady gait which attends this state. When, however, these deformities and displacements are mechanically redressed, health and youthful vigour are often restored without any other aids.

I shall now, by a process of analysis, endeavour to exhibit to you the successive gradations which, in the aggregate, form the decline of life, in order as effectually, on the other hand, to show, as by a process of synthesis, how to reproduce the former state of health. This process which I shall here describe does not rest upon hypothesis, but is substantiated by experiments which have been successfully tried by me for nearly twenty years. I have before observed that health and longevity depend upon

the normal functions of those organs above referred to, and that, in addition to the brain and nervous systems, the viscera of the thorax, abdomen, and pelvis are, in the erect position, essentially held in their proper places by their suspensory attachments to the bony structure of the body. When thus kept, the various organs are so disposed as not to incommode each other; but when, from any cause, this harmony of parts is interrupted or destroyed, the displaced viscera become so deranged, that not only are adjacent organs distressed and secondarily indisposed, but, through the nervous system, the health generally suffers. It is found that, though the vigour of visceral life, as of the brain, the heart, and the lungs, at times, may outlive that of the muscular and articular structures, the pelvic and the renal organs often give out first in the final struggle to avert the termination of life. The order in which this takes place is that, first, consequent on muscular debility, the spine loses its true sigmoid figure, and becomes straightened and then bowed; second, the spino-pelvic curve is lost; and third, as a result, the pelvis is projected in front, carrying its trochanteric axis beyond a plummet-line drawn from the longitudinal plane of the sternum; fourth, to counterbalance this weight inferiorly, the head falls forwards and droops, and the dorsal portion of the spine bends in a bow to accommodate these derangements. What follows will be seen in the following picture of one in the decline of life, as illustrated by the diagrams:—

1. The head is bent, the neck approaches more and more the sternum, and the return of venous blood from the brain is thus hindered by pressure of the jugular veins against the collar bones; therefore the individual becomes stupid, sleepy, and the memory is impaired, &c.
2. The chest falls in, and is contracted, so that the base, the strongest part of the lungs, is compressed and prevented from taking its part in respiration, and the apices, or weakest portions, are chiefly

used, the breathing is consequently impeded, and so old age is often attended by wheezing, coughing, expectoration, &c. The heart's action too is incommoded by the same contraction of the base of the thorax; hence palpitations, intermissions, and faintness supervene.

3. By the sinking of the head and thorax, and the uplifting of the advanced pelvis, a force is produced the direction of which impinges on the renal organs (also affecting the stomach, liver, and other chylopoetic viscera) sufficiently explaining most of the physical ills of which old persons complain. In addition to this increased weight thus brought to bear on these important organs, attention should specially be paid to what takes place in the pelvis. In consequence of this change of position the pelvic basin, normally oblique, becomes horizontal, no longer describing, as it should, with the spinal column, an angle of 140° . The effect of this is to throw the weight of the abdominal viscera, &c., upon the pelvic organs (in place of the pubic bone and abdominal parietes) which, without further details, sufficiently explains why the latter period of human existence is often "labour and sorrow."

I should not have ventured to bring before this learned assembly such a category of ills as noting the decline of life, seeing there are others here, besides myself, who might be said to be bordering on the traditional close of human existence, were I not also prepared to show that the decrepitude of old age can be postponed, and life considerably extended by a simple and painless process—in a word by restoring the normal form of the bony structure of our frame by means of the "Pelvic Band," so as to put in their proper places the various organs, whose functions may have been disturbed and hindered as above described, and thus affording a fair prospect of living comfortably and happily to at least 100 years. This

instrument which I now exhibit was used in my own case some seven or eight years ago, and after wearing it for three and a-half years, I was restored to my normal figure and the vigorous health I have since enjoyed.

NOTE.—Dr. Protheroe Smith, after reading his paper, exhibited in his own person the gradual alteration in posture which marks the decline of life, and afterwards the restored form, showing, by contrast, in a striking manner, the symmetrical figure of one in vigorous health. By means of a *papier maché* figure he also exhibited the Pelvic Band as applied to the human form, consisting of covered steel springs, surrounding the pelvis, below the crista ilii, fastened in front by a pubic pad, and secured by a simple fastening; thus forming a point d'appui, from which costal springs, accurately adapted to the sides of the chest, impinge just below the acromion process of the scapula, where they are retained in place by shoulder straps attached behind to the costal springs, the whole apparatus being held in place by a nicely-fitting and light abdominal belt.



