Old age and changes incidental to it : the annual oration delivered before the Medical Society of London, May 4th, 1885 / by George Murray Humphry.

OLD AGE

AND CHANGES INCIDENTAL TO IT

3

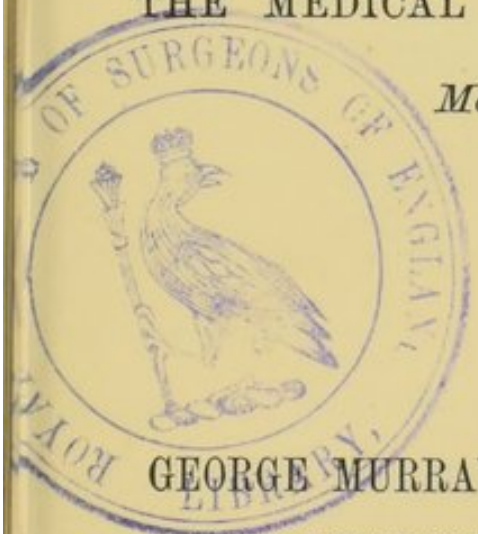
OLD AGE

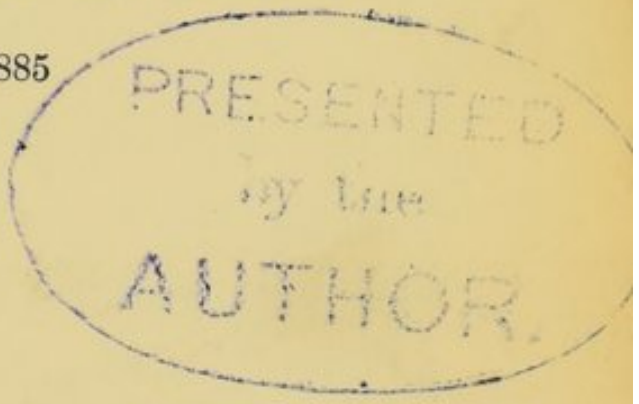
AND CHANGES INCIDENTAL TO IT

THE ANNUAL ORATION DELIVERED BEFORE

THE MEDICAL SOCIETY OF LONDON

May 4th, 1885





BY

GEORGE MURRAY HUMPHRY, M.D., F.R.S.

HONORARY FELLOW OF THE SOCIETY; PROFESSOR OF SURGERY IN THE UNIVERSITY OF CAMBRIDGE; FELLOW OF KING'S COLLEGE; HON. FELLOW OF DOWNING COLLEGE; AND SURGEON TO ADDENBROOKE'S HOSPITAL

Cambridge

MACMILLAN AND BOWES

1885

OLD AGE, AND CHANGES INCIDENTAL TO IT.

Mr. President and Gentlemen,

Old age acquires a gradually increasing interest as advancing civilisation enables a larger number of persons to attain to it, and affords them additional means of enjoying it and profiting by it. From the schoolboy-day, now full fifty years ago, when the *De Senectute* of the great Roman orator made a lasting impression upon me, the subject of old age has had some fascination for me, though multifarious avocations have prevented my giving much attention to it. In the past year, the Collective Investigation Committee of the British Medical Association, at my instance, commenced an inquiry respecting aged persons, and issued a form, with a memorandum, for

the purpose of collecting information of various kinds respecting the condition, habits, etc., past and present, of persons who had attained to advanced age. The minimum age for the subjects of inquiry was fixed at eighty. We are indebted to many members of the profession, and to some others, for the returns they have taken the trouble to make, which at the present exceed 500, the number of males and of females being nearly equal. These have been, in part, carefully tabulated and analysed by myself, with the aid of my friend and assistant, Mr. A. Francis. It is not to be supposed that from this, or other investigations of the like kind, any very novel results will be obtained; for the hill of knowledge is mounted with slow and laborious steps, and we must be content to advance little by little. I do not, however, propose to weary you with many of the details of this inquiry, which, I may observe, is not yet completed, but to make a few remarks upon the subject of old age, which will be, to some extent, based upon information derived from the inquiry just mentioned.

We are, I think, too much accustomed in our ideas to limit the work of development to the periods of adolescence and maturity; and, indeed, the surpassing wonders of that work—I say surpassing wonders, for, unquestionably, the processes of development of an animal body are the most marvellous, the most mysterious, and the most interesting in the whole range of the physical world—are most fully demonstrated in the early periods of life. But they do not end in them, or even when the body has been brought to its fully matured condition. They continue in a definite and orderly manner, though with lessened and lessening activity, to the termination of life, at whatever period that termination may occur. The march of changing events in the human body, from the age of 40 or 50 to 100, is as regular, as orderly, as developmental, though less quick, and therefore less apparent, as it is from birth to adolescence, or from conception to birth. It is one of the resultants of that inscrutable *vis*, call it what you will, and refer it to what you will, which makes all nature one, which determines

the course and end of each animate and inanimate object, and by which, in the well known words of Keble,

"To its funeral pile this aged world is borne."

A main feature of the "ascending" development, if we may so call it, namely, that which continues from birth to maturity, is an increase of material, an increase of activity, and an increase of strength, of passive or resisting, as well as of active, strength; and the main feature of the "descending" development—the development from maturity onwards—is a lessening of material, a lessening of activity, and a lessening of strength. In the normal "ascending" development, material and strength are added to the several parts of the body in due relation to their respective requirements, so that they may all grow on *pari passu* and the proper harmony of proportion may be maintained between them; and in the normal "descending" development the relative proportions of the several structures and organs are preserved, while weight,

force, and activity are being lowered by a gradual and well adjusted diminution of material and nutritive activity. During the time that the bones are becoming lighter and less capable of offering resistance, the muscles become, in like proportion, lighter and weaker and with a narrowing range of action; and the associated volitional and other nerve-apparatus exhibits a corresponding lowering of energy and force. The loss of will to run, jump, and indulge in athletic sports is, or should be, commensurate with the inability of the muscles to effect the requisite movements, and of the bones to bear the requisite shocks. There should not even be a sigh for what is gone, or a longing for its return, though great—perhaps greater than ever—may be the pleasure in beholding perfection of bodily form, and in witnessing the manifestations of strength and activity in the supple frames of the young. The weakening of the heart and the diminished elasticity of the arteries provide a proportionately feebler blood-current; and a lower digestive power and a lessened appetite provide a smaller supply of fuel,

enough to feed, but not enough to choke, the slowing fires. Thus the capacity for action is diminishing, and the demand for it and the material for it are diminishing also; and all are diminishing in due ratio to one another. It may be said, indeed, that at all periods of life the healthy and well working, and especially the enduring, quality of the body depends upon a good adjustment, a good balance, of the several parts; and it is upon the well ordered, proportionately or developmentally regulated, decline in the several organs that the stages which succeed to maturity are safely passed, and that crown of physical glory—a healthy old age—is attained.

A time comes at length when, in the course of the descending developmental processes, the several parts of the machine, slowly and much, though equally, weakened, fail to answer to one another's call which is also weakened, when the nervous, the circulatory, and the respiratory organs have not force enough to keep one another going. Then the wheels stop rather than are stopped, and a develop-

mental or physiological death terminates the developmental or physiological decay. The old man who had gone to bed, apparently much as usual, is found dead in the morning, as though life's engine had been unable to repair itself in sleep sufficiently to bear the withdrawal of the stimulus of wakefulness.—Or some exertion may be followed by too great exhaustion. Dr. Willis, the attendant upon King George III., in his ninetieth year, after a walk of four miles to see a friend, sat down in his chair and went to sleep, or was thought to be asleep, but he did not wake again.—Or some slight, unusual, scarcely noticed excitement may have the same result. A cattle-dealer, aged 98, who attended Norwich Cattle Market on a Saturday in December of last year, soon after talking and laughing somewhat heartily with a few friends on the following Tuesday was found to be dead.—Or a slight indisposition, further lowering the status and force of some organ, fatally disturbs the feebly maintained equilibrium. A lady, aged 94, attended the early service at church, to which she walked a distance of a quarter

of a mile, to and fro, caught a slight cold and died in the night.

How much may those who pass gently into this natural or physiological death be envied by the many sufferers under the protracted and painful pathological processes which too often induce a premature extinction of life. The most distressing part of medical duty is the being called upon to witness, with the inability to arrest, the onward course of disease, such, for instance, as that of a slowly but surely growing cancer boring its way into the strong and sturdily resisting frame; and the great hope and aim of medical study is to prevent such fatal interferences with the developmental processes, and to enable these processes to work out, in their own uninterrupted way, the quiet, easy, gradual method of dissolution.

Yet, strange and paradoxical as it may seem, this gradual natural decay and death, with the physiological processes which bring them about, do not appear to present themselves in the ordinary economy of Nature, but to be dependent upon the

sheltering influences of civilisation for the opportunity to manifest themselves, and to continue their work. For the needs of the first, or infantile, period of helplessness, Nature has made a sufficient provision in the parental instinct which protects and nurtures the young. But this lasts only so long as the requirement for it exists. It ceases as soon as the young has the ability to help itself; and it does not return, and is not supplemented by anything of its kind. It gives way before that struggle for existence which is the engenderer of selfishness, dominating over all other impulses and shutting out all heed for the worn and weary, for the feeble and the decaying. These, being unable to help themselves, are crushed out by the various provisions which Nature makes for their destruction. The good result of this great seeming evil being that all in the natural, or primitive, animal world is in the ascendant to, or in the enjoyment of, bodily perfection. All teems with budding life or full health and strength. To falter is to fall; forasmuch as the first evidences of weakness and the beginning

of decay arrest themselves by preventing the power of self-maintenance in the weak and the decaying.

The same with disease. It in like manner stops itself. Indeed, it scarcely can be said to be allowed to enter into the pure realm of Nature. Sick animals are not there provided for, have no abiding place there, and soon perish; so that there is no wasting and pining, no lingering fevers, no destroying cancers, no decrepid frames. Neither the bird that fails to elude the hawk, nor the hawk that fails to seize the bird, can long continue in existence. Each animal has its so-called enemy ready and watching to deliver it from feebleness and disease; and the sudden destruction which awaits them all, without fearful premonition, and with little pain—this killing in lieu of dying—instead of being, as it is sometimes regarded, a cruel feature in Nature's plan, is a happy provision for deliverance from the slower death which increasing failure or progressing disease would have involved.

Thus, in the economy of Nature, death is swift, and comes early, as soon, at least, as failure of

strength renders the animal unable to protect or provide for itself; and man, it would seem probable, had no exemption from this sharp though, on the whole, beneficent law of animal life. In early times, when the race was to the physically strongest, when health, and strength, and activity were necessary to provide the hand-to-mouth means of sustenance and to give defence, when men and animals were much on a par in this and many other respects, early death must have been the common fate, being brought about by climatic agencies, or by the tooth of the hungry beast, or by the hand of man himself. This, indeed, is said still to be the case among some of the rude races of mankind. But in man was the germ of a better order of things, the germ of sympathy with, of feeling and love for, others, which was besides and above the mere parental instinct, and which was calculated to counteract and over-ride the selfish bent, and to raise man in this, as in some other respects, above the mere animal. This has already done much, and it has still an ample field for future development. Through the growth of this

germ it was given to man to introduce a new factor into the economy of Nature, and by forethought, by mutual co-operation, and by care for others, which are the very essence, at any rate the very best feature, of civilisation, to prolong life when by this very forethought and sympathy life had become more valuable, and when the prolongation of it had consequently become more desirable; and scope was thus afforded for the carrying out of these descending or senile developmental processes which must have been nearly dormant in the earlier periods of human existence.

It is not to be expected that this good seed should be without a blending with tares; and the scope thus given for the fuller development of the physiological processes gave scope also for the development of the pathological processes, and enabled the various diseases to spring up and take their course, afflicting not man only but those animals also which come under his fostering or protecting influence.

It may therefore be said that the prolongation of

life into and through the periods of decay, and into and through the processes of disease—indeed almost, if not quite, the very existence of decay and disease—are the result of human forethought and sympathy. In other words, decay and disease are, by civilisation, substituted for quick and early death. Without attempting to balance the pros and cons of this, we know it to be a position from which there is not, and ought not to be, any disposition to recede; and if there were the wish there is not the possibility. The onward march of civilisation is a necessity, and the onward progress of disease will tend to go with it. But it does remain for forethought and sympathy to narrow the range of the evils they have themselves engendered, or which have sprung up with them; and it is pre-eminently the noble work of our profession to contribute to this—to weed out and check the growth of the morbid tares, and to help the good seed to grow on to its full harvest—to prevent, that is, the origin, and to arrest the advance, of disease, and to give to the body the best opportunities for health and

longevity. In this great physical work, let it be remembered, we shall not to any great extent succeed, unless our efforts are accompanied by equal efforts to carry out the higher and more important work of removing those impurities in the moral atmosphere, for which civilisation has so much to answer, and with which the sources and spread of disease are closely—more closely, perhaps, than we think—associated.

The first requisite for longevity must clearly be an inherent or inborn quality of endurance, of steady persistent nutritive force which includes reparative force and resistance to disturbing agencies, and a good proportion or balance between the several organs. Each organ must be sound in itself, and its strength must have a due relation to the strength of the other organs. If the heart and the digestive system be disproportionately strong, they will overload and oppress the other organs, one of which will soon give way; and as the strength of the human body, like that of a chain, is to be measured by its weakest link, one disproportionately feeble organ

endangers or destroys the whole. The second requisite is freedom from exposure to the various casualties, indiscretions, and other causes of disease to which illness and early death are so often due. Now, in both these requisites—notably in the second—woman has the advantage over man, and she consequently attains to greater age. In the Report of the Registrar-General for 1873, eighty-nine persons were returned as dying at or over the age of 100. Of these, ten only were males; and the superiority of female life is well known by insurance-offices to exist, notwithstanding the higher rate of mortality that has been observed during the child-bearing period, and which, there is reason to think, is now slowly disappearing. That this superiority is not entirely due to the comparative freedom from exposures and to the greater temperance in the woman, but is partly a result of a stronger or more enduring inherent vitality, is shewn by the fact that, even in the first year of life, when the conditions and exposures of male and female infants are the same, the mortality of girls is less than that of boys.

A somewhat larger number of boys are born, but they are more difficult to rear; so that the females soon gain the numerical lead, and they maintain it with almost steadily increasing ratio to the end.

This superiority may be, to some extent, associated with the less wear and tear in the smaller machinery of the woman's frame as compared with that of man; and one might expect that the small persons in both sexes would live longer than those of greater stature. This, however, scarcely seems to be the case. We find from our returns that the average height of the women above 80 is about 5 ft. 3 in., which, allowing an inch for the shortening incidental to age, makes it to fall little, if at all, short of the average middle-age stature. The men also we find to be 5 ft. 6 in., which, making a corresponding allowance, gives them a good average height. It may also be observed, which we should not have expected, that the rate both of the pulse and respiration is quicker in the longer-lived sex: the average pulse in the women over 80 being 78 to 79, while that in the men is 73; and the respiration

in the women is 22, while that in the men is 18 to 19.

It is a point of interest, in connexion with the inborn, or hereditary, quality, that phthisis is reported to have appeared in some of the immediate relatives—father, mother, brothers, or sisters—of 82 of the 500 aged persons, in 51 of the relations of the 250 females and in 31 of those of the 250 males. In the reports of some of these, it is stated to have occurred in several members of the family; and, in a few instances, the disease was manifested in both the father and the mother of the aged person. It is evident, therefore, that the delicacy, or peculiarity, whatever it be, of constitution, which is associated with the tendency to the development of tubercle, is not only not incompatible with longevity, but is not unfrequently associated with it.

No other special peculiarities have been shewn in sufficient numbers to deserve notice here. The greater proportion of the old people are reported to be of long-lived families, to have enjoyed good health throughout their lives, to have had good

appetite and good digestion, requiring little or no medicine, to have been moderate or small eaters, to have taken little alcohol and, commonly, not much meat, to have been good sleepers; and, with few exceptions, they shew no traces of gouty or rheumatic affection in the joints of the hands.

I have said that the main features in the downward, or senile, developmental process are a diminution of material and a diminution of force; and I apprehend that, in the normal state, it would be simply this—such a diminution, with, perhaps, a slight addition to the amount of oily matter naturally existing in the tissues—and that the other changes and degenerations that are incidental to age are no part of, but are rather to be regarded as deviations, or morbid departures, from the natural phenomena.

Let us consider the changes which take place in the skeleton, as they are the most appreciable, and in many respects, the most interesting of those which occur in advancing years. The bones which, up to maturity, had been gaining in weight and size,

now gradually lose weight, but do not ordinarily diminish in size, as they do in atrophy from paralysis; indeed, they not unfrequently rather increase in size from the continuance of a slow process of subperiosteal ossification. To this, in part, may be attributed the sharp outlines which the figure of old persons commonly acquires, except in the case of those who become corpulent. The absorption takes place first and chiefly in the more vascular and cancellous parts, the bony plates becoming thinned and removed, and the cancelli and the canals being enlarged and filled with marrow, while the bony tissue itself becomes often, though not always, more impregnated with oily matter. Hence, although the walls of the shaft are being gradually thinned from within, the ends of the bones are first and most affected, which explains the greater liability to fractures near the joints in old persons than in the middle-aged. This change, with the proportionate liability to fracture, is especially remarkable in the trochanteric and cervical parts of the thigh-bones, the strength of which

is so much dependent upon the strength and disposition of the cancellous plates.

This change takes place earlier in women than in men, which may be a consequence of the earlier cessation of active occupation in them, and the less amount of outdoor exercise they usually take, or it may be due to some natural predisposition in them, associated with a greater tendency to adipose degeneration in other parts, and evincing itself occasionally, in an exaggerated manner, in the production of osteomalacia. The greater frequency of fracture of the neck of the thigh-bone in them is to be attributed to the greater weakening which the part thus undergoes, as well as to the more near approach to a right angle which the neck naturally forms with the shaft in women than in men.

The vascular and cancellous character of the alveolary processes of the maxillary bones renders these parts peculiarly liable to undergo wasting or absorption, causing the loosening and falling out of the teeth. This takes place earlier in women than in men; the average number of teeth, according to

our returns, in men above 80 being six, and in women three. Of 221 males, 57 are reported to be edentulous; and of 234 females, 113 are said to be in that condition. The process of absorption and the loosening of the teeth also bears a relation to the sponginess of the alveolary processes, being greatest in the upper jaw, in which the teeth in 455 of our octogenarians, of whom an account of the teeth is given, are 736, those in the lower jaw amounting to 975. For the same reason, they are greater in the molar and premolar regions than in the incisor and canine, the numbers of teeth remaining being 559 molars and premolars, 409 canine, and 743 incisors.

This absorption of the alveolary processes, and consequent removal of a part of the bodily machine which is in full and daily use, is remarkable, though it has something of a parallel in the removal of another cuticular appendage, namely, the hair of the head. For the reasons I have given, it can scarcely take place during the condition of struggle for existence in the natural animal world, or in man in his

primitive state; and it is, accordingly, commonly observed that the unearthed skulls of our early ancestors are well provided with teeth. The loss of teeth would imply a decay which the early man could scarcely have survived. What effect in more modern life this loss has upon the general health and the duration of the body it is not easy to determine. It is often survived for many years; and it may be noted that, as before stated, it takes place more in women than in men, though they are the longer lived. Civilisation is doing something to supply the deficiency, which it thus brings in its train, by providing artificial substitutes; and they are at any rate free from some of the disadvantages, such as disease and decay, associated with the natural organs.

It is remarkable how completely the alveolary processes become cleared away, so that scarcely a trace of them remains above or below; and the whole framework of the face, which ministered with them to mastication, is attenuated, and the body of the lower jaw is reduced to the narrow bar of its

hard lower margin. At the same time, the resistance of the teeth being removed, the direction of the pull of the muscles upon the jaw is altered so as to open out the angle of the bone and bring the ramus and the body almost into a horizontal line. Thus the form of the lower jaw returns nearly to that of the infant. But there is this great difference, that, whereas in the infant the bone consists mainly of the tooth-bearing, or alveolary part, and the subalveolary portion scarcely exists; in the senile condition the latter only remains, the former having been cleared away.

A similiar alteration of form in a bone, from an alteration in the direction of muscular force, or from pressure by other cause, may, as we know, be produced in any part of the skeleton, and at any time of life; and, a very analogous change to this in the lower jaw may be observed to take place in the neck of a thigh-bone after amputation in the thigh; for the nearly horizontal pull of the muscles upon the trochanter, not being resisted by the vertical weight of the body upon the head and shaft of the

bone, will have the effect of widening, or opening out the angle. Some years ago I placed in the pathological museum at Cambridge two specimens illustrating this; and the fact is not without its interest in connexion with the often debated question, whether the converse of this change takes place in old age; that is, whether the angle between the neck and the shaft of the thigh-bone becomes lessened. A change of the kind certainly takes place in the ascending period of life, the angle being widest in infancy and lessening during growth; and this change is more marked in females than in males, the difference in the angle at the neck of the thigh-bone between the two sexes taking place in all probability about the time of puberty, when the pelvis is widening in the female and the hips are becoming more prominent. But does this alteration continue in the descending period? I have taken some pains to ascertain this, and have made several measurements of the angle at the junction of the neck with the shaft of the thigh-bone in old people; and though I have in some instances found it less than

in the adult, in the greater number of cases it was not so. I have not had the opportunity of making sufficient measurements to settle the question; but, so far as my observation goes, the change is the exception rather than the rule; and I am not aware that a change of the kind takes place in any other bone as a mere consequence of senility, without, that is to say, there being some alteration in the direction of the pressure or forces exerted upon the bone. In the bent back of old age, the vertebræ become modified in form; but this is a consequence of the stoop, from enfeebled action of the dorsal muscles, throwing the weight of the trunk too much upon the fore part of the spinal column.

The changes which take place in the skull during old age are interesting. Commonly they correspond with those in the facial part, and the whole cranium becomes lighter and thinner, and therefore smaller. In some cases, however, it acquires an increase of thickness by deposit of bone on the interior of the brain-case, and chiefly of the calvarial part, which seems to depend upon the

lessened pressure there, and the consequent greater afflux of blood, caused by the shrinking of the brain. The increase is usually most marked in the frontal region, which accords with the fact that the shrinking is most pronounced in the frontal lobes of the brain. In not a few instances I have found, as mentioned in my *Treatise on the Skeleton*, that there has also been an increase in the density and weight of the brain-case to such an extent that, in spite of the loss of the teeth and of the alveolary processes of the jaws and the atrophy of the face, the weight of the entire skull exceeded that of the average adult skull. In a woman reputed to be 103 whom I examined, the contrast between the thick, dense, heavy skull and the extremely attenuated light thigh-bone, both of which are in the Cambridge Museum of Anatomy, is very striking. In connexion with this change and the cause to which it is referred it may be observed that other parts of the osseous system, particularly the harder parts, are liable to undergo similar changes, leading to enlarged and sclerotic conditions, when, at any period

of life and from any cause, they are subject to an increase of blood-supply.

The cartilaginous parts of the skeleton become somewhat thinner, which accounts for the loss of height in the aged; but I do not think that they usually undergo any other perceptible change in ordinary healthy age. I have invariably found the costal cartilages soft in old people in whom I have had an opportunity of making an examination after death; the body of old Parr, as described by Harvey, therefore presenting in this respect, as I believe, no exception to the general rule. And I regard the calcification of these cartilages to be a morbid rather than a senile change,—a degenerative change to which the body is liable, as it is to cataract, bronchitis, and some other conditions, when it has passed maturity; and not one of the natural senile developmental processes. At whatever period of life it occurs—and it is not unfrequent about 60—it omens ill for the further prolonged wear of the fabric. It is not quite easy to put the condition of these cartilages to the test, especially in elderly persons. It may, perhaps,

be best done by estimating the elasticity perceived when gentle pressure is made upon the lower part of the sternum, though there are obvious difficulties and objections to this method; and of 274 returns in our inquiry upon this point, it is as much as can be expected that the elasticity should be stated to be distinct in 126; in the remaining 148 it is said to be indistinct.

It may, I think, in like manner be said, with regard to the calcification of the arteries, that it is the result of a morbid process intruding itself, interfering with and arresting the normal progress of senile development. That it is not, at any rate to a perceptible amount, a usual accompaniment of old age is shewn by the fact that in 362 returns respecting the condition of the arteries in persons over 80, these vessels are stated to be knotty in only 40, and to be even in 257. They are noted as being tortuous in only 71. Moreover, the pulse is reported as compressible in 311 and incompressible in 72 in the returns relating to it. In the great majority of cases, therefore, the arterial system appears to

present a healthy condition in those who attain to great age.

The rate of the heart's beats, according to our returns, does not vary much as age advances. Between the ages of 80 and 90 it averages 73 to 74 in men, and 78 to 79 in women. It is stated to be regular in 322 of the persons who were over 80 and irregular or intermitting in 85.

The respiration in 110 returns of men between 80 and 85 averages 17 per minute. In 47 returns of men between 85 and 90 it averages 19 to 20; and in 16 returns of men at and over 90 it averages 23. In women it is a little quicker: thus, in 86 returns of women between 80 and 85 it averages 22; in 54 returns between 85 and 90 it is also 22; and in 37 at and over 90 it is 23. It has to be borne in mind, however, that the not unfrequent occurrence of bronchitis in the aged raises somewhat the average rate of respiration in them.

The failure of nutritive force in the brain manifests itself in the lessening of that power of concentration and quickness of attention upon which the

sharp stamping of impressions and the ready recall of them depend; hence the memory for recent events is commonly impaired. The old man meanders on in his conversation, unconscious that he is repeating himself; he remembers the tales of long-past times, but forgets that he has just told them. This may go on to the condition of senile dementia. Happily it does not often do so; and it is satisfactory to note how many of the very aged are in good possession of their mental faculties, taking a keen interest in passing events, forming a clear judgment upon them, and full of thought for the present and future welfare of others. It is no less satisfactory to find that the active, even severe and long continued, functional activity of the matured brain seems in no way to impair its enduring qualities, and that good, earnest, useful employment of body and mind are not only compatible with, but even conducive to, longevity. A good example of this preservation of mental and bodily faculty to extreme old age was presented by Titian, who is related to have been engaged in painting a picture, which has its place in

the gallery at Venice, when, in his ninety-ninth year, he was cut off by the plague. The wasting of the cerebral hemispheres, which is the accompaniment of failure and feebleness of the intellectual powers, diminishes the pressure in the cranial cavity, and so causes an increase of fluid in the subarachnoid lymph-spaces between the convolutions, and sometimes, as I have already mentioned, an increase in the thickness of the skull. A similar effusion into the connective tissue of other parts of the body, especially the lower limbs, probably, also, from deficiency of pressure upon the vessels, or lowered tension of the several tissues, is liable to take place, constituting a "senile œdema." This is no uncommon thing in the aged; and it is sometimes induced in them by temporary causes, so that recoveries from it are not unfrequent.

Of the 157 males from 80 to 85, only six are stated to have, or to have had, disease of the prostate or bladder; and, of these, three had recovered from it, one at the age of 79, although the trouble had been of six years' duration. In one, the

difficulty of micturition had existed for thirty years. Thus far, the evidence was favourable, and gave rise to a hope that, when a certain period of life had been attained, this serious and painful malady would be escaped. I find, however, that of the 72 males between 85 and 90, 17 are reported to be more or less sufferers from urinary troubles. In four of these, micturition is stated simply to be slow. In others, there is more or less irritability, or incontinence, or retention. One gentleman of 88 has been entirely dependent upon the catheter for 40 years. In one only of the 30 returns of men above 90 is there any mention of affection of this kind. On the whole, therefore, although the prospect of escape from diseases of the bladder and prostate gland is not quite as good as I had anticipated from the returns of the men between 80 and 85, it is evident that the aged are, to considerable extent, free from this source of trouble. Indeed, the aged body does not seem to be, on the whole, prone to disease. Few of the returns indicate the presence of any special malady. We know that even cancers,

when they attack old persons, often make slow progress, and sometimes fail to make way at all, remaining stationary, or even withering; and the susceptibility to contagious diseases appears to decrease from infancy to old age. The nutritive processes seem to be most easily led astray in early life, when they are in greatest activity, when there is most receptivity and excitability, and most quick communication of impressions from part to part and from organ to organ.

In the *British Medical Journal* of the 12th July last, I offered some remarks on the repair of wounds and fractures in aged persons. I had frequently noticed that it, as well as the healing of ulcers, takes place as quickly as in middle-life—indeed, sometimes more quickly; and I gave the results of a collective investigation on a small scale, which were confirmatory of that view. Since then, many instances have been communicated to me by medical men which lead to the same conclusion.

I there remarked that the statement must be qualified in a manner which savours rather of the

paradoxical; namely, that wounds in old people heal quickly, provided they do not slough. That is to say, the apparently opposite tendencies exist at this time of life—namely, the tendency to slough and the tendency to heal quickly. Such, for instance, is the experience of oculists, whose testimony on the subject I have asked. They find that the cornea sometimes sloughs after the operation for cataract in old people; but that, when it does not slough, the wound heals quite as quickly as, or more quickly than, at an earlier time of life. So in other operations. The old person may sink, or the wound may slough or ulcerate; but if these eventualities be escaped a quick healing may be expected.

Certainly this would not have been anticipated. We should not have thought, when the nutritive forces are generally failing, when strength and weight are diminishing, when repair is each year less and less able to keep pace with wear, as evinced, among other things, by the fact that exhaustion is more quickly induced and less quickly recovered from, when the brain is shrinking, and

memory and other mental powers are lowering, and when the circulation is becoming weaker, that, under these circumstances, the nutritive or reparative processes concerned in the healing of wounds and ulcers should manifest an increase of energy, at any rate of rapidity, in carrying on their work. I do not know well how to explain it; but this exceptional phenomenon of nutrition is not peculiar to old age. It may be observed in some other lowered conditions. The wounds in patients exhausted by large losses of blood usually heal quickly, as they also do after operations for cancer and in many other debilitated conditions. I do not mean in persons of naturally strumous temperament, but in persons who have been weakened by illness in other ways. So do, commonly, the gaps caused by carbuncles and bed-sores; and very remarkable is the quick healing of the stump left by senile gangrene; that is to say, this evidence of vital energy is manifested in the part next above that which was unable to keep alive at all. An exception must be made of certain impaired conditions of the nervous system,

in which wounds and sores are sometimes very troublesome.

The fact that the fracture of the neck of the thigh-bone, which may be regarded as the old person's fracture, rarely unites by bone, especially when it takes place within the capsule, will be urged in support of the opposite and more generally accepted view on this point. It is well known, however (as I remarked in the paper before referred to), that this failure depends, not upon the age of the patient, or upon any peculiarity in the structure of the bone, or upon any changes that take place in it during the later periods of life, though those changes are such as to cause rarefaction of its cancelli and a greater liability to fracture, but upon other causes. Such causes, more particularly, are the separation of the broken surfaces which commonly occurs; the buried position of the inner fragment in the cavity of the acetabulum, which prevents any overlapping of the fragments and any throwing out of uniting matter round it; as well as the comparative absence, and, when the fibrous covering of the neck

is torn through all round, the complete absence of tissue in which that material can be produced; and also the bathing of the fractured surfaces by the synovial fluid. That these conditions, which are found to be more or less prejudicial to the bony union of fractures into other joints, and not senility, are the real causes of failure in the case of the neck of the thigh-bone, is proved by the fact that union by bone will take place at this part of the skeleton, as well as elsewhere, if the fractured surfaces be fixed in apposition either by any kind of impaction or by well adjusted appliances; and that this will occur in the aged there is ample evidence in our museums.

The same remark does not, I fear, apply to the repair after exhaustion from fatigue. The old person is soon tired, and does not recover quickly. The restorative processes of sleep are not so brisk in him as in the young. I have often, however, been surprised at the quick recovery of health and strength by old persons who have been depressed by indisposition and illness; and I have attributed this

rallying power to the general soundness of the system and the good working balance of the several organs which has brought them to old age. To what extent it is, as a general rule, shared by the aged and may be relied upon in them I must leave to wider experience to decide.

After all, length of life is to be really estimated not by number of years so much as by good work done, not by the amount of time spent in the tame, fruitless manner indicated by the pithy words of Cowper—

> "For fourscore years this life Cleora led;
> At morn she rose, at night she went to bed;"

nor by endeavours solely to advance our own fortunes, or reputation, or comfort, but by persevering efforts to promote the welfare of our fellow-men.

Thus considered, how long have been the lives which many of you have spent in long laborious days and watchful nights, with little present gain or prospect of future requital, in the out-patient and *post-mortem* rooms of our hospitals, by the midnight lamp or by the bedsides of the sick in this vast

metropolis where civilisation has worked out its best and its worst results. While wishing you yet many years of the like usefulness and its assured reward, I must express the feeling that it is not right or just that, in this, the wealthiest city the world has ever seen, and in this very wealthy land, so much of the time and energies—the best time and energies—of many of the younger members of our profession should be devoted to attendance upon out-patients of hospitals, and that so much of the time of a far larger number of the profession should be employed in the onerous and anxious duties of the poor-law service with such an inadequate pecuniary remuneration. For the sake of all concerned, reform is needed here.

I will only further add that there are many points in relation to longevity which I have alluded to briefly or not at all; that it will be evident, from the figures I have given, that we need more information; that the forms and memoranda issued by the Collective Investigation Committee can be obtained from the Secretary of the Committee at the

Office of the British Medical Association, 161A, Strand; and that we shall be obliged if any of those present or any other members of the profession will contribute to our store, especially by making returns of persons who have attained or exceeded the age of 90 years.

J. PALMER, PRINTER, JESUS LANE, CAMBRIDGE.