FACTS AND INFERENCES
RELATIVE TO THE
CONDITION OF THE VITAL ORGANS
AND
VISCERA IN GENERAL,
AS TO THEIR
NUTRITION IN CERTAIN CHRONIC DISEASES.

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READ APRIL 11TH, 1837.

TAKEN in its largest sense, the function of nutrition may, I think, be considered as the leading function of the animal body. With the exception of the brain, there is no viscus whose principal if not exclusive business is not the reception of the raw materials of nutrition ; or their subsequent elaboration ; or ultimate transport and distribution in the form of food, or of chyle, or of air, or of blood ; while the encephalon, skeleton, and muscular apparatus are all more or less subservient to nutrition as scouts and purveyors ; as hewers of wood, to use a familiar saying, and drawers of water. It is only in the higher animals that the predominance or supremacy of the nutritive function

becomes in any degree questionable, and more especially in man, in whom the wide range of influence, and the complicated relations of the sensorial forces, have apparently, to many enquirers, rendered unavoidable the hypothesis, that at a certain stage in the scale of organized beings, the nutritive function, previously supreme, becomes thereafter subordinate, and for every impulse necessary to the commencement, continuance, and completion of all its processes, dependent upon emanations from the nervous structures.

Viewed in its pathological aspect, the nutritive function is not less important as an object of study, than in its relations to normal organic structure and action. If we separate diseases into two groups, the first including all such as involve as a principal element some important lesion of the nutrient function, we shall have in the second group few leading acute diseases, and almost no dangerous chronic ones. This paramount importance of nutrition, or in other words of the proper formation, distribution, and disposal of blood, it appears to me, becomes every day more obvious. The humoral pathology of ancients and moderns alike, seem to be practical expressions of the conviction impressed in all ages upon physiologists and physicians, that health and disease depend greatly on conditions originating with the fluids; and in recent ages, experimental physiology, morbid anatomy, and chemistry have co-operated in establishing similar views on ample inductions and the most accurate data. Increased afflux and stasis of

blood are now known to be essential conditions, or elements, in one or more stages of almost every important vital action, whether healthy or morbid. Normal depositions and secretions, also, undoubtedly are for the most part contingent on a peculiar appropriate crisis of the fluids, while abnormal formations, solid and fluid, are to an equal extent dependent for their production on humoral disease.

There is probably, therefore, no function, or perhaps in deference to usage, I should say, no group of allied functions, respecting which every attainable illustration and elucidation is more important to the physician than nutrition; and this is probably peculiarly true as it regards a certain class of diseases, some slight contributions to the history of which it is the object of this paper to submit to the Society,—I mean diseases of the heart and lungs. Over-nutrition, or hypertrophy of the heart, is generally known to be one of the most frequent diseases of that organ, and one of the most common of fatal diseases; and inflammation, tuberculation, &c., of the lungs, and emphysema pulmonum, (to use Lænnec's name for hypertrophy, with dilatation of the air-passages and air-vesicles,) are diseases of notoriously daily or even hourly occurrence in certain walks of practice. But inflammation, and still more obviously hypertrophy, are, so far as the fluids are concerned, but deviations in plus of the afflux and stasis of blood that always attends active or excited nutrition; and tuberculation, &c., is as plainly a result, principally if not exclusively, of vitiated nutrient action.

Under such impressions, it has occurred to me that the following facts and inferences might be deemed not unworthy of the attention of the Society, as illustrations of the modifications of nutrition attending certain of the most frequent and fatal chronic diseases.

The facts which I am about to state have been collected with objects, in some measure, different from those for which they are now brought forward ; they constitute, in fact, part of an as yet incomplete, although already pretty numerous series or collection of facts, intended, at a later period, to be presented to the Society, in illustration of a class of diseases which, I suspect, destroys more adult male life than any other, pulmonary consumption not excepted—namely, diseases of the heart ; a class of diseases which, I imagine, is the main cause of the great bulk, if not of the whole, of the sufferings and mortality ascribed by authors to numerous chronic diseases ; viz., to asthma ; to chronic catarrh ; to dropsy, including anasarca, ascites, and hydrothorax ; to emphysema pulmonum ; to chronic hepatic diseases, and to various affections denominated *phthisis catarrhalis*, *catarrhus suffocativus*, *dyspncea chronica*, *tussis senilis*, winter cough of mature years, miliary tuberculation of the lungs, &c. ;—also of no small part of the gravity and fatality of acute diseases of all the great viscera in adult subjects, but more especially of those of the lungs, as well as of typhus and other continued fevers.

In proof of the positions just glanced at, and of

some others in the same department of pathology, the writer hopes, before long, to be provided with sufficient data from authors and from his own observation; and begs, meanwhile, for the indulgent consideration of the Society of an attempt made under some disadvantages of haste and imperfect preparation, to reply partially to a question to which the writer had not originally intended, at least in a direct manner, to address himself; viz., the question, What are the modifications impressed on the nutritive functions in the viscera in certain chronic diseases? Does (ex. gr.) the defect of supply or excess of waste proceed in the same manner amongst the external and internal parts in phthisis? Does hypertrophy of the heart beget or indicate a general or partial tendency to hypertrophy? &c., &c.

In answer to the questions just proposed, I proceed to offer some facts and observations. The facts I have to state consist principally of measurements by weight of nearly all the principal viscera in most cases, and of the person in many, of 249 subjects, of whose diseases and post mortem appearances I am in possession of memoranda, taken, with a few exceptions, by myself. They are arranged in tabular form as follows.

Table 1 contains, in separate columns, the weight of the encephalon, heart, liver, kidneys, spleen, and pancreas of each of 31 males, dead of various known diseases, not *phthisis* or *morbis cordis*, between 21 and 60 years of age.

Table 2 contains like particulars of 44 females, dead under like conditions as to disease and age.

Table 3 contains like particulars of 37 males dead, not of *phthisis* or *morbis cordis*, at ages above 60 years of age.

Table 4 contains the weights of the hearts of 33 females of various ages above 60, and dead of various diseases exclusive of *phthisis* and *morbis cordis*.

Table 5 includes particulars arranged as above, of 27 males, dead of *phthisis* between 21 and 60 years of age.

Table 6 gives like particulars of 16 females, dead under similar conditions of age and disease.

Table 7 contains particulars, tabulated as before, of each of 41 males, dead of *morbis cordis*, between 21 and 60 years of age.

Table 8 contains for 20 females, dead of the same disease, and between 21 and 60, the like particulars.

In most of those tables the weights, in more or fewer instances, are given for the person and the stomach, and of nearly all cases the diseases are recorded.

With respect to the mode of obtaining the weights, it is proper to explain, that where the weight of the person is given, it comprehends the whole person, the viscera included. It was ascertained by means of a steel-yard and must be accurate, although, I confess, that I often at first suspected important errors in the use of the instrument, owing to the instrumental weight differing so much, falling, in fact, so far

short of the apparent weight, judging by the eye. The visceral weights are all avoirdupois, and were all ascertained by means of a balance, and are generally correct to within half a drachm. With regard to the results of weighing by the balance also I may mention, that I have often been surprised at the errors of my visual and manual estimates; errors like the former with the steelyard, generally much in defect and rarely in excess, and so difficult to avoid, that I confess I should feel little confidence in any estimate of the organized contents, or in other words, of the quantity or density of any viscus not tried by some test less fallacious than visual or manual estimate, except, of course, in case of very great and obvious excess or defect of quantity, which must necessarily be readily detected, although it could not, I believe, be measured with pretensions to accuracy without instrumental aid.

I may further mention, that before placing the viscera in the balance they were carefully separated from their appendages—the brain or encephalon and heart from their outer coverings—the liver, spleen, pancreas, kidneys, and stomach from fat, cellular substance, peritoneum, and other extrinsic parts; in fact, from all parts that were not included within the *tunica propria*, or that might in any way materially affect the result. The brain or encephalon, heart, and stomach were usually sliced, washed, &c., and the other viscera were generally similarly treated when congested or otherwise open to just suspicion.

Now the inspection of those tables suggests more than one conclusion more or less at variance with prevailing opinion, and which, waiving for the present any reasoning pro or con, as to the materials or principles of construction of the tables, I shall proceed to specify.

Assuming for the present, that Tables 1, 2, 3, and 4, furnish averages not considerably different from the true average weights of the organs of males and females between 21 and 60 (Tables 1 and 2);—of those of males above 60 (Table 3);—and of those of the hearts of females above 60 (Table 4);—the subjects in every Table having been free from *phthisis* and *morbus cordis*; we shall then have the following normal average weights of the viscera.

In males between 21 and 60, and not labouring under consumption or disease of the heart, the average weight of the

Brain	will be	$46\frac{1}{4}$ oz.	or	20226	grains.
Heart		$9\frac{1}{10}$ „	or	3982	grs.
Liver		$53\frac{1}{2}$ „	or	23408	grs.
Kidneys		$9\frac{1}{2}$ „	or	4025	grs.
Spleen		5 „	or	2188	grs.
Pancreas		$2\frac{5}{8}$ „	or	1148	grs.
Stomach		5 „	or	2188	grs.
Lungs		46 „	or	20116	grs.
Person		$94\frac{1}{2}$ lbs.	or	661500	grs.

whereas the weights in phthisis, according to our 5th Table, are, for the

Brain	$46\frac{1}{2}$ oz. instead of $46\frac{1}{4}$	
Heart	$9\frac{1}{6}$	$9\frac{1}{10}$
Liver	$58\frac{1}{2}$	$53\frac{1}{2}$
Kidneys	$10\frac{1}{4}$	$9\frac{1}{2}$
Spleen.....	$7\frac{1}{2}$	5
Pancreas ...	3	$2\frac{5}{8}$
Stomach ...	$5\frac{1}{2}$	5

Yet the average of the phthisical subjects weighed, though adult males, was under 94 lbs. avoirdupois, or nearly 48 lbs. less than the average obtained for the healthy male of 40 years, by the great statist of Brussels, M. Quetelet; so that the defect of supply or excess of waste, popularly known to affect the external parts, does not, always at least, extend to the interior in like manner in phthisical subjects; but on the contrary, the viscera would appear to enjoy a singular exemption amid the apparently general ruin, and to be enabled to receive and assimilate the usual supplies of nutrient fluids.

This result is of some interest, inasmuch as it clashes with the conclusions of several most accurate observers and weighty authorities; such as (*ex. gr.*) Louis, of La Pitié, who in his admirable work on Phthisis, speaks only of the liver and stomach as frequently enlarged, and declares that in the majority of cases the heart is less than natural; while it does not appear that he, or indeed any other pathologist, with a few partial exceptions, has employed the steelyard or balance in any of his post mortem examinations. It also, I imagine, clashes with the general impression that the wasting is general—an impression

suggested, doubtless, by the havoc made by phthisis in the organs of locomotion and other tangible and visible parts. Similar conclusions follow from a comparison of the 2d and 6th tables, containing, the former, particulars of 44 females, dead of various diseases, not phthisis or heart disease, the latter containing like particulars of 16 females dead of phthisis, the subjects of both Tables being between the ages of 21 and 60. From those Tables it appears that, as in males, so in females, the viscera of phthisical subjects do not participate in the apparently general waste, but thrive as usual nearly, notwithstanding fever, colliquative discharges, and protracted suffering.

The average weight of the whole subject, in the former female Table was 82 lbs., that of the phthisical females was 66 lbs., or more than a stone less than the former : yet, in most of the organs, the average weight was higher in the phthisical than in the other subjects.

It would appear from the preceding facts, that in a most important class of diseases, whether as to frequency or fatality, and which are pre-eminently characterized in general estimation by excess in the processes of waste, namely, phthisical diseases ; such wasting is not general but partial ; that it falls upon the organs of locomotion and external parts principally, if not exclusively, and that the viscera, which as the seats of the principal vital actions might be supposed to be amongst the parts most nearly concerned, and most deeply and extensively injured, are still by no means sufferers to the extent or in the manner with so much apparent reason assumed ; that

none of the vital organs in fact suffer any abridgment of their usual supplies, and that, amid the apparently general denudation and dissolution, the great organs of life receive and assimilate even a larger than normal portion of the circulating nutriment. Nor is the immediate seat, and, so to speak, pabulum of phthisis, namely, the pulmonary structures, I have reason to think, any exception to the preceding general observation. From trials, as yet partial, I have little doubt, that in phthisis, the lungs receive and convert into their own substance not less, but much more than the regular quantum of blood; and that if they suffer loss in bulk or weight, it is from no want of nutriment supplied nor from any sluggishness in the business of assimilation, but from the preponderance of disintegrating processes peculiar to their structure, and which art will one day, I doubt not, know how more effectually than at present to restrain.

If fatal phthisis be, as waiving sympathetic functional disturbances, it would appear to be, essentially a local mischief; if with regard to its point of fatal attack, it be confined to the lungs, although indicating probably a constitutional propensity; if, amid all the waste of external non-vital organs and the vitiated nutrition of the pulmonary structures, the vital organs in general may, as they not unfrequently do, retain their normal structures and capacities; may we not hope that, in some future year, we shall learn to control the disintegrating processes, and correct the depraved nutrition, and heal the structural

lesions, and re-establish the functional capacities of the phthisical lung, with as much certainty and facility as we already experience in the cure of several diseases formerly very fatal, but now, in a large majority of cases, remediable by our still very imperfect therapeutical resources.

Dismissing now for the present Tables 5 and 6, or those of phthisis, and turning our attention to Tables 7 and 8, or those of morbus cordis, we find still greater deviations from the law of normal nutrition. If we compare Tables 7 and 1, the former containing average weights for males, and founded on forty-one observations; the latter often already referred to as our standard of health for males; we find that under every head, without exception, there is an excess in the former; the brain being in the morbus cordis Table about $\frac{1}{25}$ th heavier than our standard—the heart being $\frac{2}{5}$ ths heavier, the liver $\frac{1}{10}$ th, the kidneys $\frac{1}{4}$ th, the spleen $\frac{4}{5}$ ths of an ounce heavier; the pancreas $\frac{1}{5}$ th of an ounce; and the stomach also heavier than the standard.

When I first observed the superiority in bulk or density, but generally in both, of the organs of subjects dead of chronic diseases of the heart or *morbus cordis*, I attributed it to accident so far as it related to the brain and most of the abdominal viscera. Every one is aware that in the lottery of facts and observation, there occur from time to time trains of coinciding phenomena, that suggest conclusions which are falsified by subsequent larger and more varied experience. I had no doubt at first that something of that kind

was the source of the apparent superiority of weight of the viscera of the sufferers from chronic heart affections; however, I found that more ample experience confirmed, instead of invalidating the suspected results. On referring to the Table 8, that of morbus cordis in females, which is deduced from thirty observations, and comparing that Table with Table 2, our standard of health for females, results will be obtained almost the same as those from the male Tables. The brain of the female dead of morbus cordis was found heavier than the standard about $\frac{1}{14}$ th, the heart nearly $\frac{1}{2}$ heavier, the liver $\frac{1}{12}$ th, the kidneys $\frac{1}{8}$ th, the spleen about $\frac{1}{4}$ th, the pancreas $\frac{1}{5}$ th, the stomach more than $\frac{1}{4}$ th, and the person nearly $\frac{1}{5}$ th heavier. So that the female table fully confirms the male, and even with enlargement, as including the stomach and person, which are deficient in the first male table, or Table 1.

The conclusions to which the preceding Tables lead, are likewise confirmed to a certain degree by various incidental notices, to be found in writers on chronic pectoral diseases, especially those of the heart. In such diseases, the liver has often been found enlarged, and in many instances, the spleen. In a comparatively few cases, also, the kidneys have been observed larger than normal. It is true, that the writers have, in most instances, attributed such enlargement of the abdominal viscera as they have recorded to chronic inflammation, or to mere congestion and distention of the blood-vessels, owing to regurgitation or obstruction from the circulation in the lungs

or in the heart ; while, in a few cases, the pectoral disease has been attributed to the abdominal visceral enlargement. But independently of explanations or explanatory conjectures, the fact of the connexion or coincidence between morbus cordis and hepatic and splenic and renal enlargements is so far capable of verification from the writings of several distinguished authors. Amongst the writers, to whom especially I allude, I may mention Andral, Cruveilhier, Bouillaud, Abercrombie, Hastings, Copland, Hope, Latham, and Dr. Bright, amongst the more recent, and Morgagni, Lieutaud, Portal, Corvisart, Kreysig, Testa, and Bree, amongst authors of longer standing. Another circumstance often met with, or rather seldom wanting in the anatomical descriptions of writers on pectoral diseases and pathology, is this—that in subjects dead of chronic complaints marked by dyspnœa, chronic cough, asthma-like paroxysms, dropsy, &c., there have been, in a great majority of cases, traces observed of pulmonary or pleuritic inflammations and active congestions. And these indices of pulmonic disease occurred in numberless cases where no disease of valve or orifice seems to have existed, and where the left ventricle had been the principal seat of any alteration, usually hypertrophy, that was discovered in the heart. Now a heart deviating from normal structure merely by increase of power and capacity of its left ventricle, differs, it would seem, from the healthy heart, especially in this,—that it would supply blood to all the organs in larger quantity, and send it with more force than normal ;

and such a state of things would obviously favour as a predisposing or exciting cause, as circumstances might determine, the establishment of inflammatory processes in all the organs, and very especially in the lungs, and might further be expected under ordinary circumstances to predispose to plethora and hypertrophy of the viscera not less than of the whole body. Accordingly, I have found in the few trials I have had opportunity of making since I included the lungs in the number of viscera subjected to weighing, that the density of those organs also is usually greatly increased in morbus cordis, more especially in cases of great hypertrophy of the left ventricle.

In many cases, no doubt, much of the heavy, firm, non-collapsing condition of the lung in cardiac and asthmatic diseases, is owing to œdema, and may be much reduced by incision and pressure. But in many trials on the lungs of cardiac subjects, I have not succeeded in getting rid of unequivocal traces of hypertrophy, or restoring normal spongy softness and lightness to the organs. I have in almost every instance found in chronic diseases of the heart, more especially in adult males, that plethora had existed and hypertrophy taken place in the branches of the air-tube ; this is more particularly true of victims of heart disease that had survived the 40th year, among whom I do not know that I have met with a single satisfactory exception, amongst many scores, to the rule that chronic over-nutrition and enlargement of the left heart is attended by hypertrophy of the ramifications of the bronchus. Sometimes the hypertrophy, I have

observed, is accompanied by dilatation, and constitutes Lænnec's emphysema of the lungs. But sometimes, also, it is unattended by any expansion, or is accompanied by contraction, so that the air passage becomes nearly or wholly impervious; and this state of the bronchial twigs or branches seems to me to have been often mistaken for tuberculation, which it not a little resembles, and to have in consequence been called grey or miliary tuberculation. Into this, as it appears to me, erroneous view of the nature of a state of the lungs which is very common, and in adult males more common, I suspect, than true caseous tuberculation, have, in my judgment, fallen many of the first pathologists, amongst whom I would include the illustrious Lænnec.

Excessive supply of arterial fluids, therefore, by an enlarged left ventricle, may be supposed in numerous cases of heart disease to be the cause of much visceral disturbance and vitiation, not in the lungs merely, but also in the contents of the head and abdomen. But there is another element less obvious, but probably more extensively operative, and therefore more important than excess of arterial supplies, viz., a gradual alteration of the normal susceptibilities of the viscera, owing to which they become capable, without injury of sustaining habitual venous congestion, and at length are enabled to resume, so to speak, their fœtal conditions, so far as to assimilate indifferently venous blood or the imperfectly renovated fluid brought back from the unhealthy lungs by the arteries. This assimilation of venous blood is, I imagine, the principal cause of the

regular visceral enlargement and frequent inflammations attending morbus cordis chron., as appears from this, that it obtains, though not with equal frequency, —1. where the left ventricle only is affected; 2. where both sides of the heart are affected; 3. where, in addition to hypertrophy, there is dilatation; 4. in the opposite case of concentric hypertrophy; 5. where, in addition to hypertrophy, with or without contraction, there is valvular defect, and consequently, of mechanical necessity, constant regurgitation. In the case No. 5, assuming the assimilability of venous blood, there is no difficulty as to the mode of over supply; which, however, in the other cases of at least apparent valvular sufficiency, is less obvious, though, as I apprehend, not less real; and may, I imagine, be thus summarily stated:—the heart and lungs, with their increase of nutrition and substance, acquire no additional, or not any adequate additional vital or organic power; and the blood is less efficiently propelled by the one, and less completely aerated by the other, than in health; while the crude materials of the fluid are supplied in relative excess by an often very active digestion; and thus all the conditions of plethora and stasis of blood, both material and dynamic, are afforded, and visceral congestion becomes habitual, and visceral hypertrophies and inflammations result, as frequent and embarrassing complications.

Assuming for the present, that I am correct in my facts, and just in my reasoning, in the preceding pages, it may be asked—"How has it happened that

preceding inquirers have failed to arrive at similar results? more especially recent pathologists, whose attention has been much directed to the causes, characters, and consequences of diseases of the heart and lungs?"

To this question I would reply, in the first place, by stating, that the results in question have been, at least partially, attained by several preceding writers. I have already mentioned, that several authors have noticed the connexion between diseases of the respiratory organs, of an asthmatic and catarrhal kind, and chronic affections of the heart; also, that the coincidence of enlargement of the liver and spleen with heart disease, has been recorded by many observers. A tendency to cerebral disorder of a fluxionary, or at least hæmorrhagic kind, has been likewise observed, by several pathologists, to beset the subjects of hypertrophy of the left ventricle of the heart in advanced life; and one of the most recent writers on the heart (I mean Dr. Hope) has, more nearly than any other that I know, approached the results to which I have come, by stating generally that hypertrophy of the left ventricle predisposes to apoplexy, cerebral inflammation and irritation, and to inflammatory action in general; also, he adds, to headaches, brain fevers, and various inflammatory complaints and states of nervous irritability and excitation.

And I would reply, in the second place, that the means employed by post mortem inquirers have, as I apprehend, been usually insufficient for the detection

of any other than broad, large, and in a word, very obvious deviations from normal size or density in the viscera ; so that, in my judgment, a considerable proportion of the visceral hypertrophy, occurring within their spheres of observation, has unavoidably escaped their notice. Of this, in fact, I conceive there can be no well-founded doubt, as it respects those anatomists who have made no use of instrumental means of admeasurement, and have trusted wholly to their unaided touch and sight, as tests of normality of condition.

I would here say a few words as to the best means of measuring parts in pathological inquiries.—There are but three sorts of measures available for anatomical purposes ; viz. 1. linear measure, 2. measuring in water, and 3. by weight. Now, on the large scale, I apprehend, linear measurement will hardly apply. Indeed, the practical difficulty alone of fixing the linear limits of irregularly shaped bodies, as the pancreas, liver, stomach, lungs, &c., is of itself sufficient to make us pause—and if further the degree of hardness, elasticity, &c., is to be recorded, in the case of every organ, I apprehend, if linear measurement be the only one employed, some other tests than length and breadth, thickness and circumference, will be necessary to mark the degree of density and nutrition ;—then I see no means of insuring accuracy, but such as would be too troublesome for regular employment under almost any circumstances.

Measurement by volume in water I have not yet

sufficiently tried, so that at present the balance appears to me, as a means of measurement, very much the most easy of application, and at the same time practically the most accurate, especially in investigations conducted on a considerable scale, and yielding crude results in considerable masses, intended also, perhaps, for exposition in tabular forms. In this opinion, I have the pleasure to perceive that I have the sanction of one of the most distinguished pathologists of this country—I mean Dr. Carswell, of University College. In a recent number of that able writer's work on Morbid Anatomy, he declares it to be his opinion, that of hypertrophy of the brain, liver, kidneys, heart, and other hollow organs, the best test is the weight.

There is another result of the preceding measurements which I would notice before concluding these observations. It is the comparative states of nutrition, as indicated by weight, *at different ages*. If we compare Table 1 with Table 3, we shall find that, according to my observations, advanced life is accompanied by shrinking or loss of substance in the case of every organ examined, with the single exception of the heart. The brain of males above 60 years of age appears from those tables to be about $\frac{1}{15}$ th part lighter than that of adult males below 60 years of age; the liver about $\frac{1}{12}$ th lighter; the kidneys $\frac{1}{6}$ th lighter; the spleen $\frac{1}{2}$ lighter; the pancreas about $\frac{1}{3}$ d lighter; and the person generally of course, though not noticed in both tables, much diminished in bulk and weight. The heart, however, instead of diminishing with the person and the viscera, gene-

rally seems to increase, and in the instances occurring to myself as above stated, to have exceeded on the average the normal standard by about $\frac{1}{12}$ th part.

Now such a result I was not prepared for, and accordingly attributed to accident, or, more statistically speaking, to too great paucity of instances for a true average. I find myself, however, quite unexpectedly supported in the conclusion to which I was led, by one of the most unexceptionable guides to truth in physic, I mean figures, from perusing an Essay on the Heart and Arteries, contained in the *Mem. de la Soc. Med. d'Observation* of Paris, of which Dr. Bigot, of Geneva, is the author. From Dr. Bigot's researches, which seem to me the most accurate, and in some respects the most valuable extant, it appears that the nutrition of the heart increases steadily as life advances. His measurements were exclusively linear, which is perhaps unfortunate, but from the number of subjects examined, and the pains taken in examining, it is impossible, I think, to refuse our confidence to his results; for which, if I do not mistake, we have likewise in some measure the authentication of the cautious and accurate Louis, whose pupil the author seems to have been, and who is perpetual president of the association in whose Transactions the memoir is published. Dr. Bigot's Essay does not contain the measurements themselves, but gives averages of the length, breadth, thickness, and circumference, of the organ, its walls, cavities, and orifices, at six different intervals of age, in both sexes and in various diseases; and all ar-

ranged in tabular forms. The general result of his researches is, that the heart increases in both sexes, not uniformly indeed, but constantly, in all its linear dimensions, from birth to extreme age.

Having quoted Bigot's Researches, as confirming my own results, as respects the increase of the heart's nutrition with increasing years, I think it necessary to mention, that the same author has arrived at results different apparently from mine, with respect to the state of the heart in phthisis. According to his observations, the linear dimensions of the heart are, *cæteris paribus*, in every way less in that disease than under other circumstances, an opinion in which he is supported by Louis. Professor Andral, however, must have obtained results more nearly agreeing with those above stated, since he informs us that in two thirds of his cases of fatal phthisis, he found the heart more or less altered in dimensions, and exceeding the normal size.

I might also notice the preceding tables, Nos. 1, 2, 5, 6, 7, and 8, as illustrating the influence of sex, in modifying organic nutrition, as it appears from them, that whether in health or disease, there is in the male a greater development, arising of course from a more abundant nutrition, in the case of every organ examined, and that the excess on the side of the male, or, what is the same thing, the deficiency on the side of the female in disease of the heart, or phthisis, bears about the same proportion to the total weights of the encephalon of the other sex, that is found to exist in other diseases. This is

an inference that might reasonably have been anticipated, but yet needed experimental proof. The inferior dimensions of the female person do not by any means necessarily imply corresponding visceral differences. This appears from several facts: Bigot, for example, found that the linear dimensions of the heart of 30 males of 60 French inches in height and under, exceeded those of the hearts of 30 males of 60 inches in height and upwards; and he found the same rule nearly equally applicable to 18 females of 55 Paris inches stature and under, as compared with 34 females of 55 inches in height and upwards: and I have myself obtained similar results by a different method.

With respect to the influence of age upon organic development and nutrition, as measured by weight, I am as yet scarcely provided with a sufficient number of data, excluding cases of disease of the heart; and on account of the hypertrophous condition of the viscera attending, or, as I conceive, occasioned by heart diseases, I think that by including them I should obtain average weights erring so considerably in excess, as to have no pretensions to accuracy; and this holds more especially of mature years and declining life, which are so much more liable to simple hypertrophy of the left ventricle, and the consequent abnormal modifications of visceral nutrition.

The following general inferences might be deduced from the preceding facts, if their accuracy and number were considered sufficient.

1. That the healthy adult male heart averages,

for all ages under 60, nearly $8\frac{1}{2}$ ounces avoirdupois.

Note. This estimate agrees pretty well with the estimates of Senac, viz. 8 to 10 oz.; Bouillaud, 8 oz. and 3 grs. average; Cruveilhier, 7 to 8 oz. average; and Lobstein, 9 to 10 oz. average; considering that Senac and Lobstein made, as I recollect it, no distinctions as to age or sex; while Bouillaud included in his estimate several hearts of subjects under 21 years of age, and Cruveilhier included subjects of various ages above 16 or 18, and of both sexes.

2. The healthy female adult heart averages nearly $7\frac{1}{2}$ ounces, or, more exactly, $7\frac{2}{3}$ ounces.

3. In phthisical subjects, the heart, in a large proportion of cases, (according to my observation,) weighs considerably more than in health.

4. The weight of the heart increases with years, up to the end of life, contrary to the law of nutrition of the viscera in general.

5. Hypertrophy of the heart generally, or of the left ventricle alone, predisposes not only to visceral and general plethora and hypertrophy, but also to acute and chronic inflammations in general, and especially to bronchitis, pneumonia, and pleurisy,—and the tendency it produces to disease of the bronchial ramifications in particular, and of the air vesicles, is such that cases of long standing are usually, if not invariably, complicated with chronic catarrh and emphysema of the lungs.

6. The average weight of the brain of the healthy

adult male under 60 years of age is about 45·85 ounces: that of the healthy adult female under 60, about 41·25 ounces.

(*Note.* This is rather lower than the estimate of Dr. Sims, contained in his valuable paper in the 19th volume of the Transactions, which, for both sexes and all diseases, from 20 to 60 years of age, gives an average of about 45 ounces. But the estimate of Dr. Sims being founded on more than 100 observations of subjects between 20 and 60, is, in all probability, better entitled to confidence than mine, although taking no account of other difference than that of age.)

7. The weight and consequently nutrition of all the viscera exceed the normal standard in all cases of phthisis, in which the heart is increased in bulk or weight.

8. That in post mortem inspections, more especially of cases of diseased heart, but also in other cases of which hypertrophy of any viscus might be supposed an element or complication, it is advisable, in addition to manual and visual examination and linear measurement, to employ other means, such as weighing, to ascertain accurately the state of nutrition and density of the viscera, and perhaps of the person, in order to avoid the risk of overlooking important deviations from the normal condition, not otherwise so readily and surely to be detected.

To conclude. There are other inferences, and some too of a grave practical character, to which the facts stated or referred to in the preceding pages

would naturally lead me, if I felt myself at this moment provided sufficiently with materials for entering upon questions not to be decided on without the aid of more extensive reading and observation, and more mature reflection than are now at my disposal.

Such, for example, are the relations of the renal disease made known to us by our distinguished President; and the form of consumption, called hepatic phthisis by Dr. Wilson Philip, to hypertrophy of the heart. With regard to those and other questions, probably the Society may, on some future occasion, permit me to engage its attention.

TABLE I.—MALES, 21 to 60 years of age. Various diseases, exclusive of Phthisis and Morb. Cord. Chron.

No.	Age. Years.	Brain. oz. dr.	Heart. oz. dr.	Liver. oz.	Kidneys. oz. dr.	Spleen. oz. dr.	Pancreas. oz. dr.	Stom. oz.	Lungs. oz.	Stature. ft. in.	Weight. lbs.	Diseases fatal.—Remarks.
1	35	42½	9½	51	8½	3	3½	..	..	5	..	Mania.
2	35	48	7½	47	11½	8½	..	..	..	11	..	Disease of the thigh. Middle size; wasted by hectic.
3	30	50	8½	48	10½	5	3½	..	..	..	..	Cholera.
4	47	..	6½	55	12	10	3½	..	..	..	..	Pleuritis and Pericarditis.
5	28	47	8½	65	9	6	4	..	..	..	..	Pneumonia and Delirium.
6	35	47	9½	50	9	6	2	..	..	..	..	Maniac and Phthisical. Died of Pneumonia and [Arachnitis.
7	52	40½	8½	53½	72½	5	2	..	..	..	..	Cancer.
8	32	..	6	154½	11	42½	2	7	..	..	..	Ascites.
9	24	51½	10½	113*	..	ver. larg.	..	..	..	..	..	Pleuropneumonia.
10	46	47½	7½	51	9½	3½	2½	..	..	..	..	Pneumonia.
11	35	..	7½	40	4	4	..	..	..	..	..	Morb. Chron. Cerebri, Renum, &c.
12	58	45	10	65	9	5	..	..	..	..	..	Pneumonia 6 Delirio.
13	28	47	8½	74	12½	7½	3	..	..	5	9	Pneumonia 6 Delirio.
14	57	45	10	52½	12	4	1	..	..	5	10	Admitted moribund. Viscera sound.
15	60	52½	12	74	12½	6	1	..	..	5	10	Pleuropneumonia duplex.
16	52	43	3	57½	7½	2½	3	5	..	6	113	Influenza. Pneumonia.
17	36	48½	11½	70½	8	14	3	15	..	5	3	Mania.
18	44	48½	10½	45½	2½	2½	2	4	..	5	8	Mania.
19	33	44½	10½	44	9½	6½	3	5½	..	..	..	Bronch. Chron.
20	41	49½	6	38	7½	2	1½	6	44	5	8	Mania.
21	41	49½	6	38	7½	2	1½	6	44	..	78	Bronchitis chronica.
22	48	45	7	41½	9	6	2½	5	59	..	83	Bronch. Chron.
23	59	46½	10½	45	6	2½	2	15	3½	..	91	Uncertain.
24	50	39½	8½	51½	8	4½	2½	3½	52½	..	68	Apoplexy. Pneumonia.
25	22	47½	8½	52½	8½	7	2½	4	38½	..	93	Peripneumonia.
26	45	49	12	75½	12½	4	3	6½	86	..	126	Pleuritis. Peritonitis.
27	37	40½	7½	56	11½	6	3	6	40	..	85	Gangrena Pulmonum.
28	36	41½	8	41	8	3	2	4½	40	..	100	Typhomania.
29	24	50½	10½	76½	10	8½	3	2	36	..	69	Pneumonia.
30	33	41½	10	47½	7	2	1½	4½	49½	..	70	Typhus.
31	33	49	9	45½	7½	5½	2	5	34½	..	..	..
Totals.....		1300	281	1558	272	145	68	80	..	..	..	..
Averages...		46½	9½	54½	9½	5	2½	5	46	..	94½ lbs.	† Nearly.

The numbers marked with asterisks, in this and the next Table, are omitted in the total; since, being instances of unusual enlargement, they would disturb the average result.

TABLE II.
FEMALES, 21 to 60 years of age. Various diseases, exclusive of Phthisis and Morb. Cord. Chron.

Age.	Brain.		Heart.		Liver.		Kidneys.		Spleen.		Pancreas.		Stom.		Lungs.		Stature.		Weight.		Diseases fatal.—Remarks.	
Years.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	ft. in.	lbs.			
30	43	4	9		39		9½		6		1	14	4	12	..	..	5 1	84			Pneumonia & Delirio.	
26	46	3	10	2	74*		7½		7½		3½		7		..	..	5 2	110			Peritonitis Puerp ^m .	
36	..	..	8	4	40		9		3		2	12	4	4	..	..	5 3	70			Mania Fatuitas. Tumor cerebri.	
24	43½	9½	58½		..		10½		..		1	11	4½		..	..	5 1	90			Peritonitis Puerp ^m .	
40	43½	10	12½		51		7	12	4	14	1	14	4	2	..	..	5 8	90			Mania. Grey softening of left lobes, &c.	
41	43½	8	50½		..		5	15	2	8	2	4	4	8	..	..	..	..			Abscess axilla. Pleuritis. Arachnitis.	
28	44	4	8½	39½			8	15	3	6	2	4	4	7	..	..	4 11	82			Mania ferax.	
60	44½	7	439	12			8	15	2	12	2	10	2	6	..	..	5 5	78			Bronch. Chron. Pneumonia, &c.	
43	37½	7	144½		44½		9½		4½		2	10	..		..	..	4 9	78			Pneumonia duplex. Recently delivered.	
18	42½	8	1079*	12			12	4½	4½		1	14	5½		..	..	5	80			Puerperal hemorrhage.	
24	31	13	6½	42½			8½		3		..		..		..	..	..	..			Morb. Chron. Cerebri. Ulceration of Colon.	
52	37	6	33½	46½			6½		8½*		1½		..		..	..	4 6	65			Diarrhoea. Chronic Colitis.	
50	42½	7	46½		7		8	10	4	7	2	13	..		..	..	5 5	70			Carcinoma Uteri.	
50	41½	6½	37½				9		2	10	1	13	..		..	..	5 6	83			Paralysis.	
56	43	6½	36½				4	13	2	13	1	14	..		..	..	5	67			Erysipelas Faciei.	
49	42	10	6	231½			7		4½		2	7	..		..	..	4 6	56			Disease of the brain.	
20	43	5½	42½				6½		3		15		..		..	..	4 9	56			Typhus.	
22	..	8	11	41			7½		4		1	15	..		..	..	..	..			Drowned.	
43	44	7½	66				17½*		7½		3		..		..	..	..	..			Pneumonia. Pericarditis.	
31	..	5	50				8		5		1	2	..		..	..	..	..			Wasted; middle size. Bronch. Chron.	
40	42	6	25				8		10*		..		..		..	..	..	..			Apoplexy. Concentric hypertrophy of left ventricle apparently.	
45	34	8½	51½				9½		4½		3	2	..		..	..	..	..			Fatuitas. Gangræna Cerebri.	

TABLE II. CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Lungs.	Stature.	Weight.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz.	ft. in.	lbs.	
18	50	8	44	11½	..	..	..	..	..	..	Hydrops Ovarii.
60	36	8	36	6	1	2½	..	..	..	..	Apoplexy.
32	40	4½	36	6½	2	..	..	..	..	..	Epilepsy; wasted. Ulceration of small intestines.
23	40	9	64	10	6	..	..	..	..	..	Periton. Puerp. 10 days delivered; uterus 13½ oz.
24	31	6½	42½	8½	3	..	..	..	..	..	Morb. Chron. Cerebri. Ulceration of colon.
20	40	2	55	10½	5	4	4	..	..	68	Peritonitis Puerp.
67	49½	..	38	8	4	2	2	..	5	65	Apoplexy. Concentric thickening of left ventricle.
58	43½	6	847	7½	4½	2	12	38½	5	70	Cancer Uteri. Some bronchial disease, &c.
25	40½	8½	56½	9	2	1	3	29	5	98	Influenza. Erysipelas.
40	41½	10	64	12½	9½	3	15	48	4	117	Hysteritis.
26	40	11	58½	9½	5½	..	..	..	5	97	Pleuritis. Empyema.
32	45½	6½	53	8	3½	2½	4½	..	5	106	Pleuritis. Empyema.
27	43	8½	60	13½*	15*	2½	4½	46	5	90	Fever.
50	34	7½	34½	7½	3½	..	..	..	..	..	Hydrops. Diarrhea.
60	39½	8	41½	7½	3	*7	10	..	..	..	Dyspnea. Bronch. Chron.
25	..	10	50	..	4	2	..	..	..	..	Rubeola & Pneumonia.
58	..	7	29½	4	1	1	16	..	..	..	Tumor Cerebri.
55	39	11	..	8	8	..	..	..	..	..	Carcinoma Peritonei.
27	44	11½*	53½	2½	5	1½	..	..	..	..	Uterine hæmorrhage.
45	50½	9	1142	5	9	1	14	..	5	77	Apoplexy.
24	39	9	1461½	8	5	3	6	..	4	104	Influenza.
52	45	11½	48	8½	7½	..	..	..	5	..	Poison. Very fat and muscular.
Totals.	1624	334	1882	325	162	69	74	..	..	..	
Average.	41½	7	46	8½	4½	2½	4½	..	..	..	

Average of persons 82 lbs.

TABLE III.

MALES, from 60 years of age and upwards. All diseases except Morb. Chron. Cordis and Phthisis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases fatal.—Remarks.
Years.	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
70	35	10½	38	8½	2	..	..	..	..	..	Atrophia Cerebri. Pneumonia.
73	42½	13	38½	10½	5½	4½	..	..	..	..	Grey softening of right lung. Apoplexy.
70	46½	7½	30	6½	1½	..	..	..	..	..	Chronic diarrhoea and Anasarca.
84	35	11	57½	9½	3	1½	..	..	..	..	Abscess of right lung. Fever.
14	50	8½	32	9	4	3½	..	..	..	..	Extreme Emphysema Pulm. Hydrops. Right ventricle hypertrophous.
68	47	10½	46½	7½	2	10	3	..	..	..	Emphysema and Bronch. Chron. Coma and Delirium.
67	..	7½	30½	6	1	12	2	..	..	..	Bronch. Chron. Wasted.
..	48	9	..	11½	4½	2½	..	..	..	..	Middle sized. Pericarditis & Delirio.
68	44	7	45	11	2½	..	..	..	..	..	Cachexia Scrofulosa. Kidneys much diseased.
78	42	11	32	8½	2½	..	..	..	..	..	Double hernia. Senectus.
65	..	12½	32	6½	..	..	..	..	..	..	Very fat. Mania with pleurisy.
87	38	11½	31	7	4½	2½	..	..	..	..	Left ventricle hypertrophous. Aorta diseased.
69	49	12	51½	14	5½	4	..	..	5 11	..	Bronch. Chron. Fleishy.
63	49	9	46½	9	3	13	4	140	5 3	..	Pneumonia. Bronchitis.
75	..	16½	61	11½	4	3½	..	122	5 7	..	Pneumonia. Pericarditis.
68	38	8½	38½	..	3	15	4½	75	4 6	..	Influenza. Valves and Aorta diseased.
63	44½	11	53½	10½	2½	4	..	114	5 6	..	Pleuronpneumonia.
83	47	10	69½	10	4½	..	..	..	..	..	Cancer of Liver.
73	45	14½	51½	9½	3	..	..	..	..	..	Fever.
70	36	10½	38	8½	2	..	..	..	..	..	Convulsion and Coma.
73	42½	13	38½	10½	5½	4½	..	..	..	..	Apoplexy.

TABLE III. CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases fatal.—Remarks.
	oz. dr.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
Years.											
63	42	10	40½	7½	5½	2½	..	..	..	..	Ulceration of Bowels.
76	38	15½	46½	..	9	2½	..	..	..	..	Cholera.
73	45	13½	48	10½	4	2	14	..	..	..	Fever.
84	45	11	57½	9½	3	1½	..	..	..	..	Fever.
68	49	12	40	8	1½	1	14	..	..	..	Pleurpneumonia.
64	29	12½	17	8½	4½	..	..	..	..	..	Chronic Pleurisy.
78	42	11	32	8½	2½	2	3	..	..	..	Senectus.
63	50	15	58½	11	5½	1½	..	..	..	..	Phlebitis.
65	..	10½	32	6½	..	..	..	..	..	..	Mania and Pleuritis.
87	38	11½	31	7	4½	2½	..	..	..	..	Senectus.
63	42	11	72½	8	9	3	11	103	5 10	..	Suppurative Arachnitis.
63	44½	11½	53½	10½	2½	4	..	114	5 6	..	Pleurpneumonia.
63	49	11	46½	9	3	1	6	9 140	5 3	..	Pleurpneumonia.
66	..	11	68	11	5 14	3½	4 14	110	5 8	..	Influenza with Pneumonia.
68	45½	10 15	42½	6½	3½	1 14	5	88	5 3	51	Bronchitis Chron.
64	44½	10½	77	8	6½	1½	6 10	95	5 7	44	Bronch. Chron.
Totals.	1437	438	1732	331	138	75	..	..	..	..	
Average.	43½	11½	45½	9	3½	2½	..	..	..	..	

TABLE IV.

FEMALES. Above 60 Years of Age. Various Diseases, exclusive of Phthisis and Morb. Chron. Cord.

Weight of 33 Hearts.	Number of Hearts weighed.	Total weight.	Average.
Under 7 ounces weight..	6	35½ ounces	6 oz. nearly.
7 to 8 ounces	7	50½ „	7½ oz. nearly.
8 to 9 ounces	6	51½ „	8½ oz. nearly.
9 to 10 ounces	5	47 oz. 9 dr.	9½ oz. nearly.
10 to 11 ounces	2	21 ounces	10½ oz.
11 ounces and upwards..	7	96 oz. 2 dr.	14 oz. nearly.

Average, for all the 33 cases, 9½ oz.; or, leaving out the 7 hearts above 11 oz., 205 oz. 13 dr. ÷ 26 = 8 oz. nearly.

TABLE V.

MALES. 21 to 60 Years of Age.—Phthisis.

Age.	Brain.		Heart.		Liver.		Kidneys.		Spleen.		Pancreas.		Weight.	Stature.		Stom.
Years.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	lbs.	ft.	in.	oz. dr.
32	49		10	12	53		8	12	4	12	2	12	90	5	5	5 4
37	46		8½		41½		9½		..		..		..	..	..	..
33	40½		10½		66½		10	10	10½		3½		..	..	..	..
35	47		10		71		10½		7		3		..	..	..	..
56	42		8½		51		..		7	6	2	3	..	..	..	..
56	45		8½		55		7½		8		..		..	..	..	..
32	49		9½		60		8½		10½		4		..	..	..	..
23	..		12		57		16		10½		4½		..	..	..	..
25	..		10½		71		12		6		1	2	..	..	..	..
44	42		8		45		9		2		2½		..	..	..	..
25	50½		10½		75½		16		13½		2	6	..	..	..	..
31	46		8½		75½		3	14	11	6	2		..	..	..	..
44	42		13½		53		9		8½		2½		..	..	..	..
25	50½		10½		75½		16		13½		2	6	..	..	..	..
31	46		8½		75½		11	6	3	14	2		..	..	..	..
44	42		13½		53		9		8½		2½		..	..	..	..
48	43		8		46		14		12		2	3	..	..	..	..
57	42		9½		..		9		..		..		..	..	..	..
43	51½		6		48		8	14	4	10	2		..	..	..	..
30	47½		9½		47½		9½		7½		3½		102	5	4	..
33	47½		10½		65		12½		6½		3	10	100	5	6	..
32	49		10	12	53		8	12	4	12	2	12	90	5	5	5 4
50	50		8		52½		9		..		..		90	5	4	..
60	46	14	10		41½		9		5	8	3½		91	5	8	7 2
30	49		11	3	72		13		5½		2	3	..	..	..	..
36	43		10		68		6½		6		4½		..	..	..	..
59	47	5	11½		49		9		6		2		102	5	6	..
Totals...	1155		266		1520		267		183		63		665			
Average.	46½		9½		58½		10½		7½		3		94	nearly.		

TABLE VI.

FEMALES.—21 to 60 Years of Age.—Phthisis.

Age.	Brain.	Heart.	Liver.	Spleen.	Kidneys	Pancre.	Weight.	Stature.	Stomach
Years.	oz.	oz. dr.	oz.	oz. dr.	oz. dr.	oz. dr.	lbs.	f. in.	oz.
53	47	11½	45	..	11½	..	..	..	..
24	39	5½	47	9½	11½	2½	..	..	..
60	46	8½	41½	5 6	8 10	..	..	..	..
53	40	7	34	..	7 2	..	..	..	..
44	40	9½	45½	6	..	..	..	..	..
53	..	9½	40	4½	4	1½	..	..	..
55	37	7½	53	3 14	8	1½	..	..	..
40	42	8½	54	2½	9½	3½	..	..	..
21	45	7½	39½	2 10	12	1 14	..	..	..
26	37	5½	47½	11	8½	1½	..	..	..
46	43½	6 14	34½	..	6½	2	..	..	..
43	45	9	51	10½	13½	3	69	5 3	4
47	..	10	38½	6	9	1½	..	..	..
60	37	5 6	30	2½	6 13	1	..	..	..
25	46½	8½	48	4½	12½	3 15	75	5 3	6
49	43½	6 5	35½	2½	5 4	1	55	5 3	5
Totals ..	589	125	684	71	134	25	199	..	15
Averages	42½ nearly.	8 nearly.	42½	5½	9 nearly.	2½ 18	66	..	5

TABLE VII.
MALES, 21 to 60 years of age.—Morb. Chron. Cordis.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases.—Remarks.
Years.	oz.	dr.	oz.	oz.	dr.	oz.	dr.	lbs.	ft. in.	oz.	
47	44½	12½	59½	10½	4	15	5	105	5 9	..	Pleuropneumonia and Pericarditis.
54	44½	17½	51	8	5½	2	4½	88	5 4	..	Influenza.
57	42	14½	68	10½	7½	4	7	120	5 8	..	Pericarditis.
45	51	15	54	9½	4	15	5	150	6	..	Morb. Chron. Cerebri.
20	51	13½	49½	10½	2	8	4	90	5 2	..	
45	49	11	105½	30½	4	6	6½	135	5 10	..	Hydrops.
51	46	12	56½	13½	7½	2	14	101	5 7	93½	
56	42	19½	43½	9	3	13	4½	110	..	59½	
57	53½	16	49	5½	2	3	5	118	5 10	39½	
51	50	10½	52½	8½	3½	3	5½	101	5 6	60	Apoplexy. Pericarditis.
48	53½	24	39	12½	3½	3½	4½	109	5 6	80½	
37	44½	14½	86	13½	23½	5	5	117	5 7	79	
54	49½	9	49	9½	5½	2½	5	100	5 7	90½	Mitral diseased.
34	45½	24½	60½	11½	9½	2	14	123	5 8	44	
30	52½	20	57½	12½	5	3	5	102	5 5	59½	
32	48½	12	72	..	10½	..	..	..	..	..	Fleahy. Middle size.
46	51	immense.	55	15½	3½	2½	..	..	..	..	Spare. Tall.
59	50½	12½	53	8½	4½	..	..	..	5 10	..	
59	51	17	36	12½	6½	2½	..	..	..	..	Tall.
33	51	26	72	12½	8	4	..	..	..	..	Mania and Typhus. Tall.
54	43½	14	62½	11½	3	..	..	..	..	..	Typhomania. Tall.
56	37½	12½	55	10	5½	4	..	..	..	..	Negro.
60	50	15	36½	..	1	2½	..	..	..	..	

TABLE VII.—CONTINUED.

Age.	Brain.	Heart.	Liver.	Kidneys.	Spleen.	Pancreas.	Stom.	Weight.	Stature.	Lungs.	Diseases.—Remarks.
Years.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	lbs.	ft. in.	oz.	
60	51	10½	48	9	2½	2	..	..	6 3	..	*Aneurism of Aorta. Heart and Pericardium coherent with sac.
33	53	40½*	95½	16½	10½	3	10	..	..	..	Lungs and Aorta diseased.
51	..	17	50	14	7	5	..	..	..	..	
55	53½	13	67½	12½	large.	3½	5½	119	5 3	65½	Emphysema Pulm., &c.
38	..	20	52½	8½	16	3½	..	..	..	..	Pneumonia. Hydatids in the heart.
42	..	15½	81	15½	5½	3½	..	..	..	..	Gangrene Pulm., &c.
21	47	11½	51½	9	4	3	..	..	..	..	Bronch. Chron.
33	51	26	72	12½	8	4	..	..	..	..	Influenza.
47	47	14	72	11½	12½	3	4	117	5 3	..	Large person.
59	53	22 15	62½	18 11	9	4½	..	..	..	..	Good size.
60	53	13½	53	8	3½	..	..	..	..	..	Pulm. Apoplexy. Left kidney atrophied.
39	43	17½	64	8½ (rt.k.)	6	2	..	..	..	..	Pneumonia.
36	48	12	50½	9	7	3½	..	..	..	..	Pneumonia & Morb. Cord.
30	..	18½	73½	12½	16½	2½	..	..	..	..	Morb. Cord.
26	47	19	74½	12 10	13½	2	..	..	..	..	Aneurism.
30	42	11½	73	13½	8½	..	..	173	5 8	..	Pericarditis and Pleuritis.
27	50½	17½	77	11½	7½	1	..	106	5 2	..	Pneumonia and Pericarditis.
35	52 11	11	60	11½	3½	15	..	..	..	..	
Totals.	1795	616	2503	452	354	113	90	..	..	..	
Average.	48½	15½	61	12	9	3½	5½	..	..	..	
			nearly.	nearly.	nearly.	nearly.	nearly.				

TABLE VIII.
FEMALES, 21 to 60 years of age.—Morb. Chron. Cordis.

Age.	Brain.		Heart.		Liver.		Kidneys.		Spleen.		Pancreas.		Stom.		Weight.		Stature.		Lungs.		Person.—Disease.	
Years.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	lbs.	dr.	ft.	in.	oz.			
45	35	9	14	8	42		7	8	4		1	14	5	10	74		..	..	..	..	Foramen Ovale open; fleshy; middle.	
23	44		15½		55		10½		7		..	..	..	..	..	..	..	..	..	..	Communication between Pericard.	
31	41		enlarged.		enlarged.		12		4		..	..	..	..	..	..	..	..	..	..	A week confined.	
28	48½		11		64		11½		7		3	2	5½		133		5	4	..	..	Fleshy. Bronch. Chron.	
52	..		11½		60		7½		4	15	3	2	..	..	..	..	..	..	..	..	Hydrops.	
60	39½		8		41½		7½		3	6	2	10	..	..	115		5	1	30½	..	..	..
54	42		12½		36½		6		5	15	2	2	5½		..	..	..	..	..	..	..	..
50	42½		17½		49½		10½		7		3	3	..	..	..	..	..	..	..	..	..	..
60	40		11		50		9		3		3	2	..	..	..	..	..	..	..	..	..	..
57	..		15		44½		8½		4½		2	1	..	..	..	..	..	..	..	..	..	..
50	12		14	12	62		12	8	9	4	2	6	6	4	200		5	6	..	..	Pneumonia.	
33	48		15½		56		11½		5½		2	14	..	..	..	..	..	..	..	..	Pericarditis and Bronch. Chron.	
30	43	14	12		47½		8½		7½		2½	6	6½		90		5	2	42½	..	Sudden apoplectic death.	
59	43		11½		45		8½		8		2	17	..	..	..	..	..	..	..	..	Emphysema. Morb. Valv.	
43	44		11		50½		8½		9½		3	7	..	..	..	..	..	..	..	..	Hydrops.	
37	52		11½		55		10	6	5	2	3	6	..	..	..	..	..	..	..	..	Sudden death.	
54	57½		13		34½		9	9	8	2	3	4	..	..	..	5	2	..	..	..	Pneumonia duplex.	
52	39	6	12½		45		8½		1	10	4	2	..	..	99		4	9	..	..	Curved spine.	
52	43		14½		35½		7	5	3	15	2	5	4		102		5	..	..	..	Admitted moribund.	
34	44	4	13½		71½		14		5	15	4		5½		83		5	5	..	..	Influenza and Pericarditis.	
															99		5	3	..	..	Influenza.	
Totals.	794		245		946		189		108		49		38		..		..	..	73			
Aver ^o .	44½		13	nearly.	49½		9½	nearly.	5½	nearly.	2½	nearly.	5½	nearly.	97lbs.		..	..	36½			