Evil results of over-feeding cattle : a new inquiry, fully illustrated by colored engravings of the hearts, lungs, &c.; of the diseased prize cattle, lately exhibited by the Smithfield Cattle Club, 1857 / by Frederick James Gant.

EVIL RESULTS

OF

OVER-FEEDING CATTLE.

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A New Inquiry.

FULLY ILLUSTRATED BY COLORED ENGRAVINGS

OF THE

HEARTS, LUNGS, &c.

OF THE

DISEASED PRIZE CATTLE,

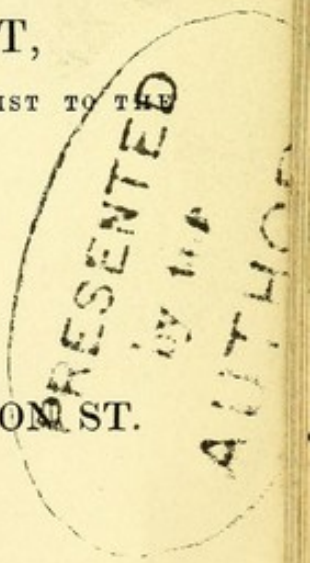
Lately Exhibited by the Smithfield Cattle Club,

1857.

BY FREDERICK JAMES GANT,

M.R.C.S. ENG., SURGEON AND PATHOLOGICAL ANATOMIST TO THE

Royal Free Hospital.



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TO THE AGRICULTURALISTS OF GREAT BRITAIN AND IRELAND,

AND FOR THE CONSIDERATION OF THE

SMITHFIELD CATTLE CLUB,

This New Inquiry

CONCERNING THE HEALTH OF CATTLE,

IS MOST RESPECTFULLY DEDICATED,

BY THE AUTHOR,

FREDERICK JAMES GANT.

PREFACE.

THE NEW INQUIRY to which the following pages are devoted, is one of NATIONAL interest and importance. I had long suspected that the English method of feeding cattle was based on a *vicious principle*, and I had read with much attention the denunciations repeatedly issued by the Press in respect of its folly and extravagance, but I at length determined to test the question more conclusively by the application of PATHOLOGICAL ANATOMY, to decide the merits of our present system of feeding cattle.

My Report on this subject lately appeared in the *Observer*, and was unanimously reiterated by

the general Press of the United Kingdom, besides many foreign journals, and received additional support by many able "leading articles."

The evil results of the English system of over-feeding cattle—now enlarged and fully illustrated by faithful copies of the original drawings—are addressed more especially to breeders, feeders, judges, and exhibitors of cattle, but they also demand the serious attention of the general public.

FREDERICK JAMES GANT.

Grenville Street, Brunswick Square.
February, 1858.

EVIL RESULTS

OF

OVER-FEEDING CATTLE.

BEING THE DISEASED CONDITIONS OF ANIMALS WHICH ARE KILLED IN SUPPOSED HEALTH, AND USED FOR FOOD.

It must be admitted by every one, that the maintenance of health is a question of higher interest than the removal of disease. Prevention is better than cure, and therefore the Hygienic art of preserving health surpasses the appliances of medicine and surgery. But the resources of Hygiene are not equally obvious to ordinary observers. Certain bodily wants, when ill-supplied, are soon discovered. The air we breathe

may contaminate, but we can often smell, and thereby avoid, an impure atmosphere. Our clothing may be insufficient, but the wintry wind will soon warn us of this deficiency; a bilious headache instinctively prompts more active exercise, while fatigue suggests the necessity of repose. Air, temperature, exercise, and sleep, are positive hygienic requirements which severally proclaim their own demand when defective, and thus the tide of life flows smoothly on, each bodily want being wisely suggested by an appropriate and almost unerring instinctive feeling. But it is otherwise with FOOD. True it is that we eat when hungry, but this sensation does not prove an infallible guide in our choice of food, still less a criterion of its *nutritive quality*. Hence, therefore, science has been directed to this question, and the *best method of rearing cattle used for food* has received especial attention. For this purpose the Smithfield Cattle Club was originally instituted in the year 1798, and it was with the view of ascertaining how far this intention had been fulfilled, by upwards of fifty years

experience, that I visited the prize animals and others lately exhibited at the Baker-street Bazaar. I took notes of my observations. I first observed the cattle, whether Devons, Herefords, or Short-horns. My limited opportunity for examining them enabled me to detect no external sign of disease, except in two Devon cows, class IV., Nos. 32 and 33, prize £5, each of which was suffering from *prolapsus vaginæ*. One of them looked very ill, and laid her head and neck flat on the ground, like a greyhound. I pointed out these animals to a man who was drawing water, and I asked him if their condition was one of common occurrence. He said, "I knows nothing of them beasties in p'ticler, but it's the case with many on 'em, I knows that." I passed on to the pigs. A pen of three pigs, belonging to His Royal Highness the Prince Consort, happened to be placed in a favourable light for observation, and I particularly noticed their condition. They lay helplessly on their sides, with their noses propped up against each other's backs, as if endeavouring to breathe more easily,

but their respiration was loud, suffocating, and at long intervals. Then you heard a short, catching snore, which shook the whole body of the animal, and passed with the motion of a wave over its fat surface, which, moreover, felt cold. I thought how much the heart, under such circumstances, must be labouring to propel the blood through the lungs, and throughout the body. The gold medal pigs of Mr. Morland were in a similar condition, if anything, worse, for they snored and *gasped* for breath, their mouths being opened, as well as their nostrils dilated, at each inspiration; yet these animals, only twelve months and ten days old, were marked "*improved* Chilton breed." They, with their fellows just mentioned, of eleven months and twenty-three days, had early come to grief. Three pigs of the black breed were in a similar state at seven months, three weeks, and five days, yet such animals "the judges highly commend."

Of the sheep I noticed more particularly those of the Duke of Richmond. A pen of three short-woolled South-downs, of one year old,

seemed to have rather heavy heads, one, more especially, looked crestfallen.

One circumstance throughout the exhibition particularly arrested my attention. *It was the size of the animals, compared with their respective ages.* The bullocks averaged from two to three years, the pigs and sheep were about one year old. When I contrasted the enormous bulk of each animal with the short period in which so much fat or flesh had been produced, I naturally indulged in a physiological reflection on the high-pressure work against time which certain vital internal organs, as the stomach, liver, heart, and lungs, must have undergone at a very early age. Now with the best method of rearing cattle, or that which is most conducive to their health, the medical profession are only indirectly concerned; but of the *dietetic value* of animals so reared for food, the profession are, or should be, the immediate overseers and arbitrators. I therefore resolved to follow up the animals in question to their several destinations, and inspect their conditions after death. And here I must

record my acknowledgments to Messrs. Jeffery, King, Gorton, Sack, Sinkler, and Smith, of Hampstead, for having courteously admitted me into their slaughter-houses. This was necessary, in order that I might identify those animals which I had selected for examination. These were those to which the judges had awarded the highest prizes, as *specimens* of healthy rearing and feeding, viz., *the gold and silver medal prize bullocks, heifers, pigs, and sheep* (which remained in London). I witnessed the death of most of these animals, and at once removed the heart, lungs, liver, &c., of each for further examination. I then made dissections of the organs mentioned, and procured faithful drawings of both their visible and microscopic appearances; the former are accurately depicted by Mr. C. D'Alton, and drawn on stone by Hulmandel and Co., the distinguished lithographers, the latter are traced by the pencil of Mr. Lens Aldous, who has been thus engaged, for upwards of twenty years, at the Royal College of Surgeons of England. I spared neither time, trouble, nor expense in my pursuit of the facts,

and the results will be best understood by keeping in view the appearances and structure of *healthy muscle.*

The muscular portions of an animal are readily recognised after death by their characteristic *red colour* and *firm crimp consistence.* The latter property, however, soon subsides, and the muscles become relaxed and *softened*, while their colour assumes a deeper tint on exposure to the air. Thus the flesh or *lean* of an animal has a bright red colour, while the heart is naturally somewhat paler.

Let a piece of the heart, or of the ordinary flesh, be selected for closer examination, and it is found to consist of bundles (*fasciculi*) of fibres, held together by a loose thread like (cellular) tissue, associated with more or less fat. If the heart of an ox has been well boiled, these *bundles* of fibres can easily be peeled off in layers. Let a very small portion of any one such collection of fibres, be moistened with water, and frayed out with a couple of needles, then laid between two pieces of thin clean glass, and ex-

amined with a microscope by a quarter inch power, we now observe the *fibres* themselves, each of which appears beautifully marked with transverse lines (cross striæ) disposed at regular

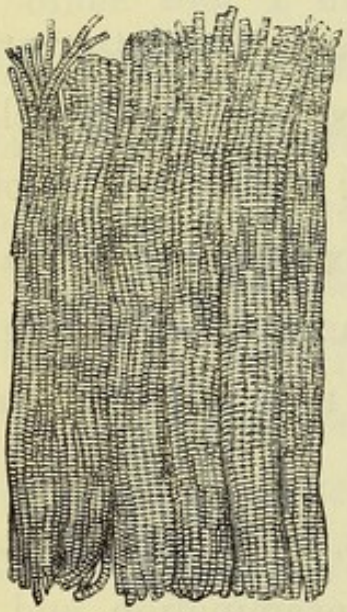


Fig. 1.

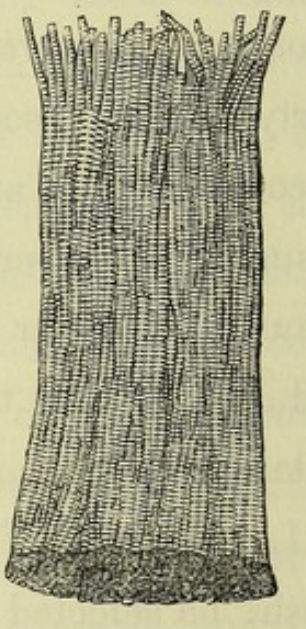


Fig. 2.

intervals. Perhaps the end of a single fibre may be seen apart from the rest, and then we may observe its thin membranous sheath, (*sarcolemma*) from which its contents may project in the form of a brush of fine filaments (*fibrillæ*). Figs. 1 and 2 each show a collection of *healthy* muscular fibres taken from hearts of a bullock

and sheep, supplied me by Mr. Cockburn, of Lamb's Conduit Street. Fig. 1 presents about half-a-dozen fibres of a bullock's heart. The transverse markings are well represented, and also the fibrillæ projecting from the end of each fibre. These, however, are better seen in fig 2.

The sheaths of the fibres are too delicate and transparent to be represented in the figures, but the boundary of each fibre is indicated by longitudinal lines, best seen in fig. 1.

A muscular fibre, therefore, consists of a membranous sheath or tube, enclosing a number of very fine filaments. The fibres themselves are collected into bundles, and these being held together by cellular tissue enclosing fat, form the muscular portions of the body.

I have purposely excluded from this brief description of muscle, all notice of its nerves and blood-vessels. These ramify as a fine net-work amid the cellular tissue and fat *between* the fibres, but do not penetrate their sheaths. *Nor is fat found within the fibres among the fibrillæ.* The fibrillæ themselves are the *essential* structural

element of muscle, and in these filaments reside both its contractile power and nutritive quality as *human food*. But the fibrillæ present a variable appearance and arrangement. The characters of the fibrillæ, as a test of the nutritive quality of meat, should, therefore, be carefully studied.

A single fibril viewed by itself appears to consist of a (linear) series of dark spots with light intervals. This arrangement is best seen when the fibrils occasionally split up *longitudinally* (figs. 1 and 2). The lateral apposition of these dark spots in adjacent fibrils, produces the appearance of transverse lines already mentioned. More frequently, however, after death, the fibrils break up *laterally*, and a number of little bright vesicles are seen, each with a dark centre. These vesicles represent the structural elements of the fibrils. The cross striæ are no longer seen, but the little bodies referred to are distributed irregularly, and the fibres have, therefore, a confused appearance, as represented in fig. 3.

This *disintegration* of the fibrillæ may be seen in meat which has been kept for some time after

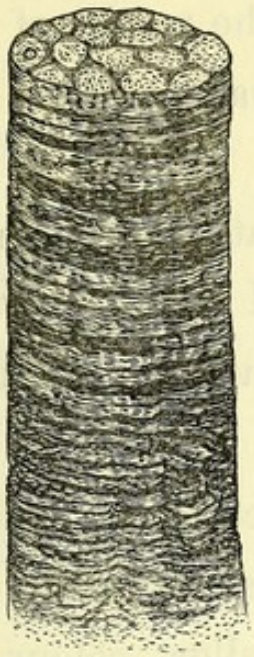


Fig. 3.

death, and no doubt implies the total destruction of muscular contractile power, but not necessarily the deterioration of such meat for food. The nutritious elements are still within the fibres, although broken up and disarranged; but they have not been removed and substituted by fat. The substitution of this less nutritive material may ensue, and this change, no less than the accompanying alterations of colour and consistence which the muscular texture then presents, contrast remarkably with its appearance and structure in health.

Subjoined are the results of my dissection of certain prize animals from the late Exhibition.

SHEEP I. Fat wether sheep—the *best* of any short woolled (South-down)—one year old. His Grace the Duke of Richmond, K.G., exhibitor and breeder.

No. 1. The heart weighed 10½oz.; its external surface was very soft, greasy, and of a dirty brownish yellow colour, here and there mottled with yellow spots of fat, imbedded in the *substance* of the heart. On its anterior surface (left ventricle) is a large opaque patch of a stone grey colour. These external appearances are beautifully represented by PLATE 1B, and contrast remarkably with the clear bright reddish colour, and firm crimp consistence of healthy hearts of sheep four years old (PLATE 1A). On opening the two ventricular cavities, their internal surface and substance were equally soft, greasy, and yellow throughout, an appearance due to the infusion of fat between and *within* the muscular fibres of which the heart should

Healthy Heart of a Sheep

A.

Diseased Heart of a Sheep by Conversion into Fat.
The Duke of Richmond, K.G. Exhibitor & Breeder.

B.

her D'Alton, del.

Hullmandel & Walton, lith.

chiefly consist. *This substitution of fat for muscle* is proved by the microscope to have ensued. For when thus examined, the muscular fibres no longer presented their characteristic cross markings, but the fibrillæ within the fibres were entirely broken up, and *replaced* by bright globules

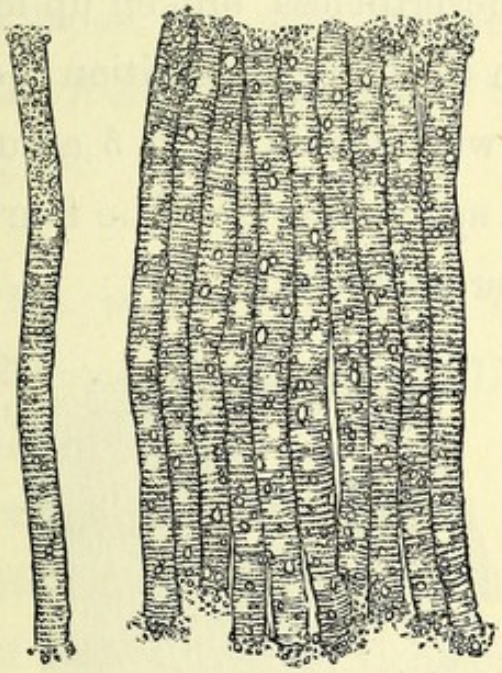


Fig. 4.

of *oily fat*. Fig. 4 shows a few of these fibres, and also a single one. Each fibre contains an abundance of fat particles, instead of fibrillæ, within the fibre. The healthy structure of this heart had, therefore, thoroughly *degenerated* by the *substitution* of *fat* for muscle. A chop taken from

the loin of this sheep is accurately delineated (PLATE 2B). The muscular fibres of this piece of meat were thickly intersected with fat, a few globules of which were actually seen (under the microscope) *within* the fibres themselves; and although their fibrillæ had not yet disappeared, they had nevertheless broken up longitudinally and were in the highest condition of development compatible with health. Fig. 5 accurately represents these appearances. The four large round bodies are ordinary fat cells.

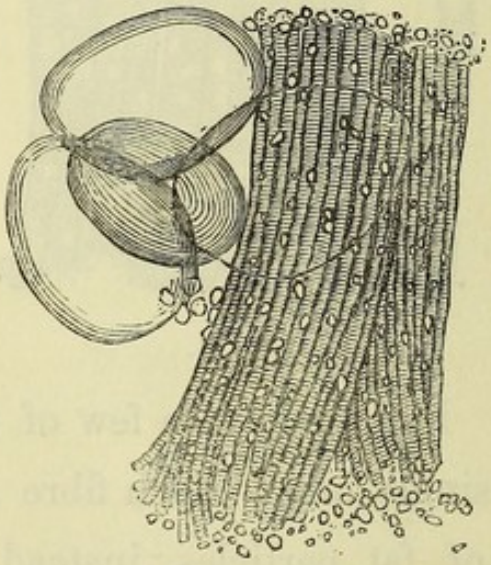


FIG. 5.

No. 2. A fat wether sheep, short woolled, South-down, from the same pen.

The heart was in a similar condition, but only certain portions of its substance had degenerated into fat. The liver weighed 2lbs. 10½oz., and its surface was thickly studded with large dark spots beneath its thin peritoneal coat. These spots are the extremities of the hepatic veins gorged with blood, and this hepatic congestion was due to the feeble contraction of the diseased heart during life.

No. 2. Fat wether sheep, *the best* of any long woolled breed, one year old. Lord Berners exhibitor and breeder.

The heart weighed 10½oz., and was partly converted into fat, but less so than that of No. 1, the sheep of the Duke of Richmond. Under the microscope the muscular fibres were found in the first stage of degeneration into fat (fig. 6). The liver weighed 2lb. 2oz., was of a dark purple colour, and showed marked congestion of the hepatic veins. The lungs were flabby, and did not crepitate with air on pressure between the fingers. Many nodules were seen, each of the size

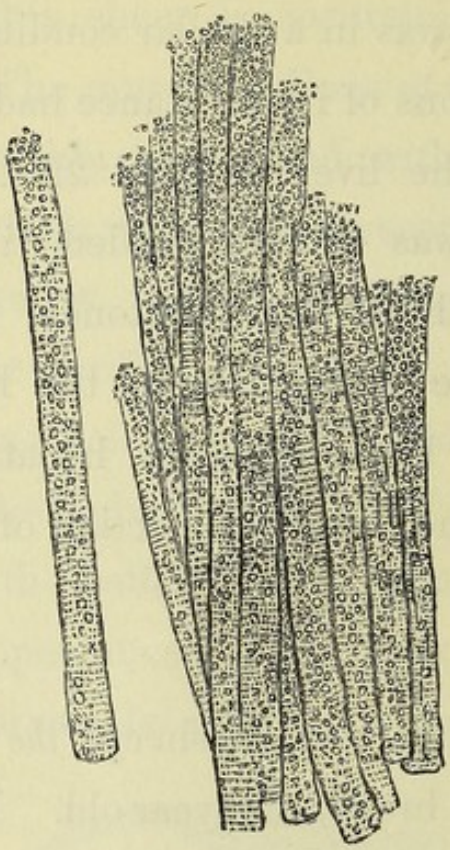


FIG. 6.

and shape of a kidney bean, imbedded in the substance of either lung (PLATE 2A). These lumps contained numerous worms *(filaria)* in various stages of development (fig. 7).

Numerous small hard tubercles were also scattered on the surface of the lungs, some grey and transparent, others consisting of a chalky matter, one of the latter having actually ruptured the pleura (enveloping membrane of the lungs). I

Diseased Lungs of a Sheep
Lord Berners Exhibitor & Breeder.

A.

Mutton Chop
The Duke of Richmond, K.G. Exhibitor & Breeder.

B

Christopher D'Alton, del. Hullmandel & Walton, lit

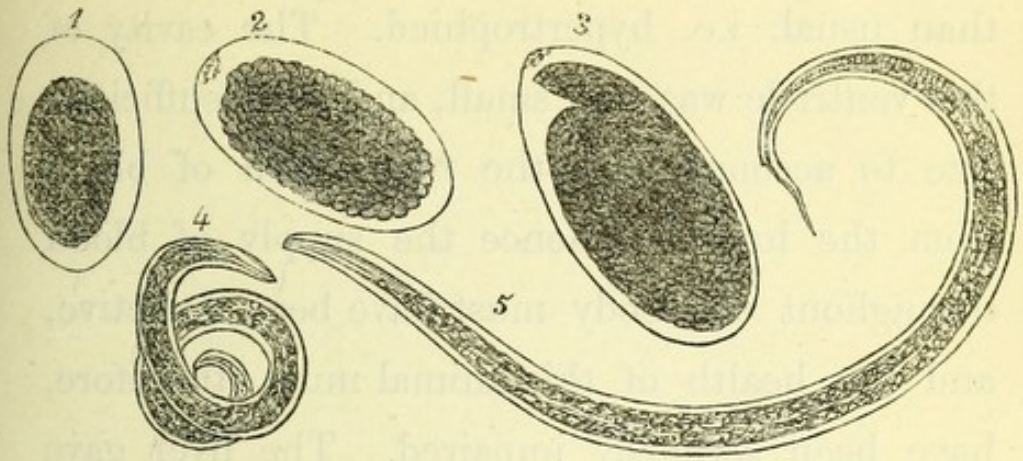


Fig. 7.

selected this animal for slaughter, and he appeared the fattest of the pen; but his breathing was distressed.

No. 4 was a fat wether sheep, *the best* of any long and short woolled, cross-breed, one year old; John Overman, Esq., exhibitor and breeder. The heart, lungs, and liver, were in a similar condition.

Pigs. The *best* of any breed above twelve and under eighteen months old. *Improved* Chilton breed. G. B. Morland, Esq., exhibitor and breeder.

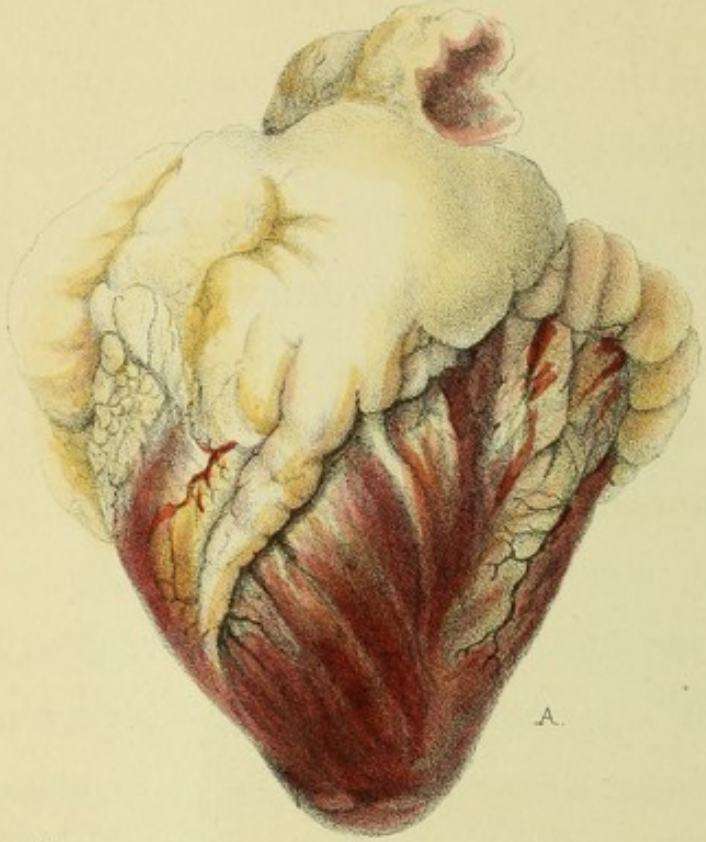
The heart weighed 15oz. 2drachms. The substance of the left ventricle was much thicker

than usual, i.e. hypertrophied. The cavity of this ventricle was very small, and of insufficient size to accommodate the free return of blood from the lungs. Thence the supply of blood throughout the body must have been defective, and the health of this animal must, therefore, have been seriously impaired. The liver gave proof of an obstructed circulation, being of a dark livid colour, while the hepatic veins of the left lobe more especially were congested. Their bloated extremities were easily seen on the surface of the liver, and they presented the appearance of numerous oblong livid spots, each of which was surrounded by a white circle, which marked the situation of the empty portal veins. Here and there the blood had actually escaped from the overloaded hepatic vessels.

Horned Cattle. Devon heifers, the *best*, not exceeding four years old. His Royal Highness the Prince Consort, exhibitor, James Hole, Esq. (Knowle House, Dunster, Somerset) breeder.

The heart weighed 6lb. 13oz. The substance

Healthy Heart of a Heifer.



A.

Diseased Heart of a Heifer by Conversion into Fat.
H.R.H. The Prince Consort, Exhibitor & Breeder.

B.

Christopher D'Alton, del.

Hullmandel & Walton, lith.

of both ventricles had undergone complete degeneration into fat. (PLATE 3B, which strongly constrasts with the appearance of a healthy heart, PLATE 3A.) The fat, under the microscope, consisted of bright shining globules within the muscular fibres, the *fibrillæ* of which had entirely disappeared. (Fig. 8.)

FIG. 8.

In the base of one papillary muscle (in the left ventricle) I observed that the muscular fibres were actually broken up, and that many large fat cells had replaced them. (Fig. 9.) Yet it is on the strength of these papillary muscles that the tension of the mitral valve depends during the contraction of the ventricle, and therefore the rupture of one such muscle would produce sudden death.

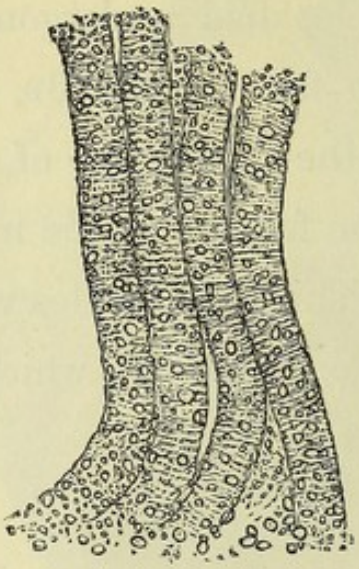


Fig. 9.

Oxen. The *best* Devon, above three years old. The Earl of Leicester exhibitor and breeder.

The heart weighed 6lb. 6oz. The muscular fibres of the left ventricle were converted into fat, which in other respects had the appearances last described. (Fig. 10.)

Short-horned oxen, above three years old. *The best steer or ox in any of the classes.* Edward Wortley, Esq. (Ridlington, Uppingham, Rutland), exhibitor and breeder.

The heart weighed 7lb. 13oz. The left ventricle had in this animal also undergone con-

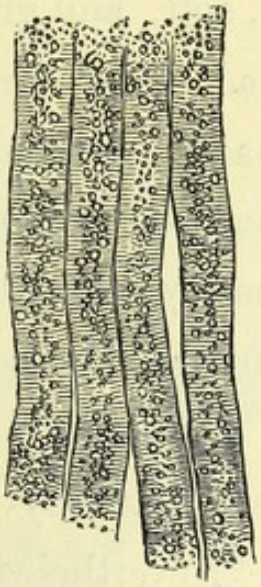


Fig. 10.

version into fat, but more so in certain portions of its substance. (Fig. 11.)

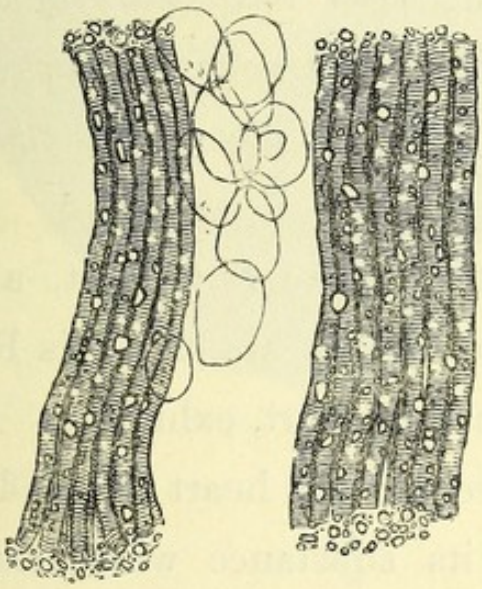


Fig. 11.

One spot near the apex of the ventricle was

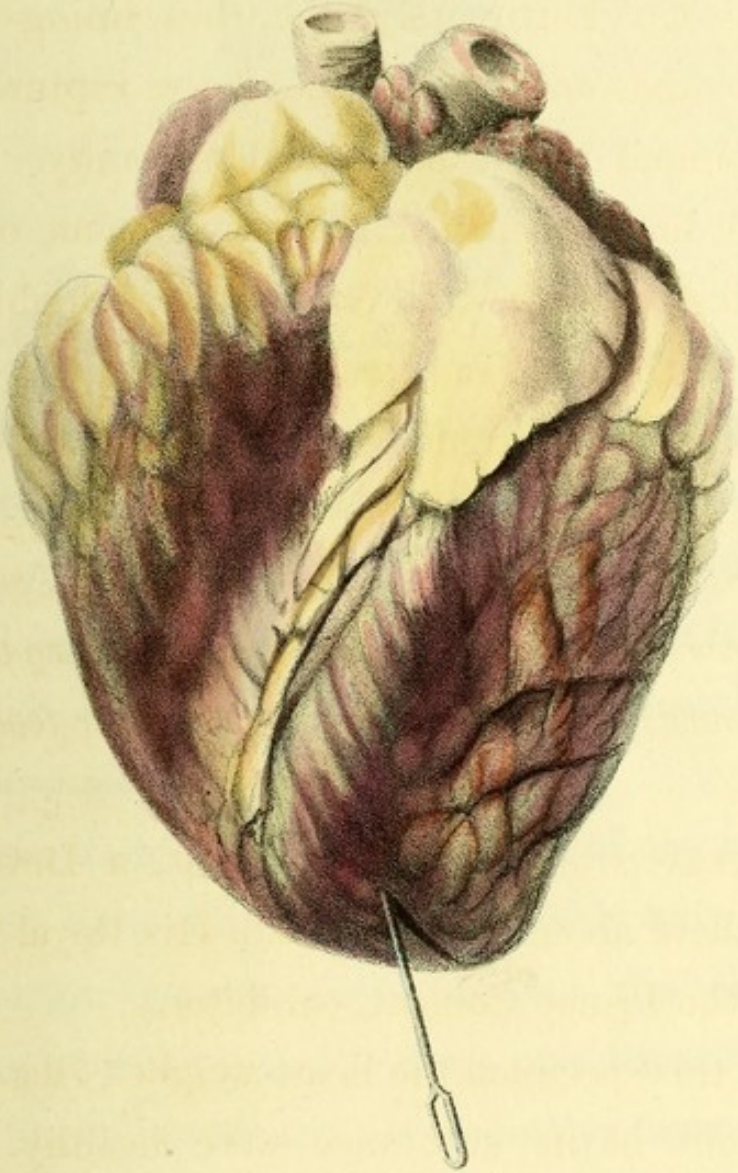
particularly yellow, soft, and greasy. Here the muscular fibres had given way, and a blunt probe could be readily introduced through the substance of the ventricle, almost into its cavity. (PLATE 4.) Fortunately, the thin lining membrane (*endocardium*) had not been ruptured, or the animal would have died instantly. This would have happened at any moment, on the slightest exertion. Nevertheless, so highly did Mr. Smith, of Hampstead, value his prize, that he charged half-a-guinea for this monstrous pathological specimen.

This animal, under three years of age, weighed upwards of two hundred stone, and was eating twenty-one pounds of oil cake a day, besides other food.

EXTRA STOCK. The *best* beast, a Devon ox (I believe about five years old), His Royal Highness the Prince Consort, exhibitor.

In this specimen the heart weighed 7lbs. 15oz. Portions of its substance were healthy. The muscular fibres of the left ventricle were here and there partially converted into fat. (Fig. 12.)

Diseased Heart of an Ox by Conversion into Fat
Edward Wortley Esq^re Exhibitor & Breeder



Christopher D'Alton del.

Hullmandel & Walton, lith.

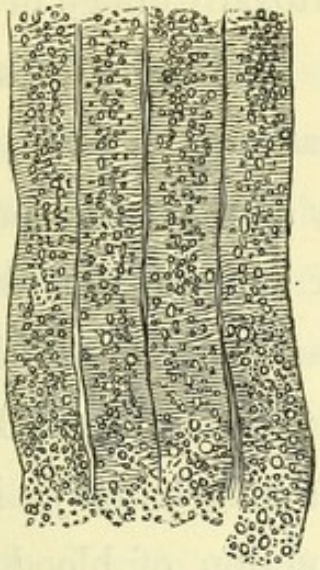


Fig. 12.

The Intestines. Within about a foot of the termination of the large bowel was a putty-like mass, one inch and a-half thick, and about one foot long, and which partially surrounded the intestine. The mass consisted apparently of *scrofulous matter.*

Such, then, are the chief results of my examinations, limited as they unavoidably have been to certain viscera only. Under the present system of rearing and feeding, one disease is of most frequent occurrence—namely, CONVERSION OF THE HEART INTO FAT. I am supported in this opinion by the invaluable testimony of Professor

Quekett, of the Royal College of Surgeons, who re-examined the hearts in question, and confirmed my observations.

I need scarcely advocate the special importance of this result, for no one can dispute the fatal tendency of a disease by which the structure of an organ most essential to life has degenerated into fat. The stomach may, indeed, prepare food for the production of blood, and the lungs and kidneys may purify it of excrementitious matter, but these departments of the blood-factory are only subsidiary to the heart, whose special duty it is to propel the vital fluid to the most distant recesses of the body, that every part may be nourished and renovated. Yet I found the great central organ more than any other damaged. In the sheep, particularly, the heart had lost its contractile and propelling power, and was converted into a flabby, inert lump of fat. This change had, moreover, ensued not through the mere accumulation of fat around the heart, whereby its contractile movements would be mechanically impeded. Such an accumulation

had, indeed, taken place in the bullocks and in the Devon heifer of the Prince Consort's more especially. Nor did the change in question imply the mere interstitial deposition of fat between the muscular fibres, of which the heart *should* chiefly consist, but the actual *substitution* of fat for fibrillæ *within* the fibres.

The fat referred to may itself be regarded as the superfluous food with which the animal had been gorged. It was first deposited in all *loose* parts of the body, these being most adapted for its accumulation,—beneath the skin, and around the kidneys, stomach, intestines, and heart. At length, such localities being overloaded, the fat invaded the muscles themselves, by passing in between the fibres. Thus it produced the *streaked* appearance of meat (PLATE 2B), a condition which, within the limits, in no way interferes with the health of the animal, nor impairs the nutritive quality of its flesh for food. On the contrary, fat itself is a necessary constituent of the most nutritious food; and by no provision can a due proportion of this ingredient be secured

so effectually as when it is thus intermixed with the substance of the muscles themselves. Thus each mouthful of meat contains a wholesome and agreeable proportion of fat, but beyond these limits an animal cannot be fattened without impairing its own health and also its nutritive value as human food. The two questions, of rearing cattle, and their dietetic value, must, therefore, alike be referred to their condition as discovered after death.

Here it is that my pathological observations open up a twofold inquiry of great public interest and importance.

Let an animal be fed beyond the limits compatible with health, and the superfluous fat is no longer confined to the interstices of muscular fibres, but actually invades and eventually *supersedes* them.

The diseased condition thus produced may be termed *conversion* into fat, as expressive of the *apparent* change which has ensued; but on closer examination with the microscope I would ascribe the change itself to the *substitution* of fat (in the

process of nutrition), for the proper structural elements—fibrillæ—of muscle, and not to the actual transformation of those elements into fat.* This is my explanation of so called fatty degeneration, and should other observers differ from me in this respect, still we must not overlook the *facts* themselves; namely, that in over-fed, corpulent animals of forced growth, the muscular substance of the most vital organ, the *heart*, is pallid, soft, and greasy; and that its fibres then contain fat instead of the fibrillæ, in which reside both the contractile power of muscle, and its nutritive value for human food. In the chop taken from the loin of one of the Duke of Richmond's sheep, the fibrillæ had already broken up longitudinally (a rare occurrence), and were in the most advanced condition of development compatible with health. We therefore say that such meat no longer retains its healthy structure

* *Vide* "What has Pathological Anatomy done for Medicine and Surgery?" a series of Papers, by the Author, in the *Lancet*, and now republishing by Mr. John Churchill, New Burlington Street, London.

and nutritive quality, although when degenerated into fat, it may still present the semblance of ordinary muscle, and thereby deceive both buyer and seller.

We should therefore expect in vain to replenish our own muscles by the use of such food, nor should animals thus overfed be regarded as prize specimens of rearing and feeding. The heart, being converted into fat, no longer retains its contractile power, but beats feebly and irregularly. The blood, therefore, now moves onward in a slow and feeble current. Hence the panting breathlessness due to stagnation of blood in the lungs, which the heart labours (in vain) to remove, while the skin and extremities are cold. Hence the stupid, heavy-headed expression of a congested brain, and the *blood-stained* appearance of meat after death. The slightest exertion to an animal under such circumstances, might suddenly prove fatal. Were a man, in this condition, to present himself at an assurance office, it would refuse to insure his life at any premium. *Yet, under similar circumstances, a*

sheep is awarded gold and silver medals, and its feeder a prize of 20*l.*!! We should not, therefore, rest satisfied with heaping fat on an animal, nor be content if he 'dies well,' with fat symmetrically distributed over the back and loins, and around his internal organs. I would observe well, during life, the *excretions*, and see if their condition gave proof of over-feeding, by the presence of undigested food in the *fæces*, or by a *heavy urine*, loaded with solid constituents. If so, I should consider that the stomach and kidneys were overworked. Nor would I neglect the less perceptible evidence afforded by the *skin*, the *respiration*, with the *state of the brain*, as indicated by the general expression of the animal, and the mode of carrying its head. Then, after death, I would pursue my inquiry further, and see whether my opinion of the animal formed during life, was corroborated or reversed by the appearance of its internal organs, the condition of the heart, lungs, stomach, intestines, liver, and kidneys, more especially.

All this kind of knowledge is required by phy-

sicians and surgeons in their estimate of health and disease, and is equally necessary to settle the question at issue. Instead, therefore, of pursuing the present system of rearing cattle, much as it may test the qualities of food, and other matters of minor importance, let breeders, feeders, exhibitors, and prize judges alike visit the slaughter-houses; let them do this with a due knowledge of diseased appearances, and let them thus discover that system of rearing which is most compatible with the health of cattle, and which produces the largest amount of the most nutritious food for man. Under the present system the public have no guarantee, and are not insured the best, if indeed the cheapest food. The bulky withers of a fat bullock are no criterion of health, and its flat tabular back may conceal the revolting ravages of disease. All this can alone be disclosed by an inspection of the animal's interior after death. The flesh of animals which has been produced by organs themselves diseased, is itself also necessarily *deteriorated*, and ought not to be regarded as prime

samples of human food. These facts will be best understood by pathologists, but they also come home to the understandings, and certainly to the stomachs of the people. Nor can their feelings fail to respond to the claims of sympathy. The suffocating sighs of those fat pigs are an appeal to humanity.

I, therefore, address the foregoing pages to the Public, and also to the Members of the Smithfield Cattle Club, whom they so directly concern. It behoves them to shake off the yoke of time-honoured prejudice—to accept the contributions of science, and conform to the social progress of the age.

" If offence come out of truth, it were better that the offence come, than the truth be concealed."

THE END.

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