

**Alleged discovery of the use of the spleen, and of the thyroid gland; being a demonstration of the connections and the physical effects produced by those organs upon more important conmtiguous parts, and now submitted as the explanation of their respective offices / By Sir Anthony Carlisle.**

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From the Author

ALLEGED DISCOVERY, &c.

CARLISLE, Sir A.



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ALLEGED DISCOVERY  
OF THE  
USE OF THE SPLEEN, AND OF THE  
THYROID GLAND;

BEING  
A DEMONSTRATION OF THE CONNECTIONS AND THE PHYSICAL  
EFFECTS PRODUCED BY THOSE ORGANS UPON  
MORE IMPORTANT CONTIGUOUS PARTS,  
AND  
NOW SUBMITTED AS THE EXPLANATION OF THEIR  
RESPECTIVE OFFICES.

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BY  
SIR ANTHONY CARLISLE, F. R. S. &c.  
SURGEON EXTRAORDINARY TO HIS MAJESTY,  
PRESIDENT OF THE ROYAL COLLEGE OF SURGEONS, AND SURGEON  
TO THE WESTMINSTER HOSPITAL.

DEDICATED BY PERMISSION  
TO THE  
EARL OF EGREMONT.

LONDON :

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TO  
THE RIGHT HONOURABLE  
GEORGE O'BRIEN WYNDHAM,  
EARL OF EGREMONT,

&c. &c. &c.

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MY LORD,

THE Dedication of this Memoir is but a respectful payment of homage eminently due to a Nobleman, who generously maintained through life Mr. André, a helpless man of genius of my profession.

The Nobility of England in former times were the munificent protectors of Literature and Science, and the same patronage is wanted in the passing age ; because forward and rapacious writers now address their crude productions to an encreasing multitude of superficial readers, leaving the more profound labours of studious men to a market glutted with frivolous books.

If this short Treatise should appear too scanty to deserve your Lordship's notice, permit me to say, that it comprises some of the condensed results of long continued and diversified research, and that it is addressed to Philosophers.

Be pleased, my Lord, to accept my unfeigned wish, that your Lordship may long continue to enjoy the solace of that self-approval which magnanimous deeds never fail to assure.

Your Lordship's  
very obedient and obliged Servant,

ANTHONY CARLISLE.



## PREFATORY OBSERVATIONS.

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THE following Memoir was read at a General Meeting holden at the Royal College of Physicians of London, on the 6th of April, 1829, and it has been thought most eligible to retain the form and language in which it was then presented.

Some apology may be expected for the brevity of a publication announced under such a Title, but it was originally composed for Scholars and Men of Science, to whom common place details would have been superfluous.

A more extensive dissertation upon the structure and offices of glandular parts, is preparing under the same physical views which have governed the author in the present instance ; he being compelled to regard many of the mystical reasonings of the healing Art,



as far behind the other Sciences, and contrary to the maxims of philosophy.

The talent for scenting discoveries before they become apparent to the vulgar, is not a worldly advantage; it excites the hatred of ordinary persons, and occasions the jealous opposition of rivals. I do not look for a favourable reception of my doctrines until they have been submitted to the more competent physiologists of the Continent, and on their disinterested judgment I confidently rely, not only for a due estimation of the explanation here given of the uses of the Spleen and Thyroid Gland, but also for a just valuation of all the collateral illustrations which are here adduced.

## THE AUTHOR.

6, *Langham-place*,  
*April 21st. 1289.*

## MEMOIR, &c.

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THE liberal establishment of professional meetings, under the auspices of this learned College, affords a pleasing instance of the decline of unworthy jealousies among the superior members of the healing art.

As the temporary officer of a kindred Institution, I feel much satisfaction in making this early attempt to associate the endeavours of scholars and gentlemen to promote the science of organic physiology.

On addressing your highly distinguished body upon subjects which have interested Medical Philosophers during more than twenty centuries, some introductory apology may be deemed proper, and I accordingly submit, that my pretensions to this honor, rest upon zealous studies and practical researches in comparative Anatomy during youth, and upon unceasing



physiological meditations throughout a long professional life.

All medical men must concur in desiring more satisfactory elucidations of the different parts of the human body ; for while the offices of several distinct structures remain undetermined, neither the knowledge of the aggregated living functions, nor the respective influence of particular organs can be rationally estimated ; indeed these are the prime elements of medical science, and they have been accordingly anxiously explored by the cultivators of physiology in all ages.

The necessary connection between natural events in living bodies, considered as causes and effects, is in some instances obvious ; in others perplexed, and consequently dubious ; and the subjects of this Memoir are well known to be of the most intricate kind ; and although Medical Physiologists often fail in logical analyses, it does not follow that synthetical reasoning should be rejected.

Being persuaded that scientific men have now attained to greater exactness in every branch of physics than their predecessors ; and



that the augmented evidences derived from human, and comparative anatomy, are at this time sufficient to warrant many new assumptions; I shall proceed to offer the assignable uses of the SPLEEN, and of the THYROID GLAND. I have classed these two organs together, because they resemble each other in many parts of their structures, and because their offices appear to be similar.

The anatomy of the spleen has been elaborately and faithfully described by your very learned predecessor, Dr. Stukely, in his *History of the Spleen*.\* That great scholar and physician has recited all the classical and succeeding observations upon the spleen, and its supposed uses down to his own time, and he records the various opinions of physiological writers with impartiality. Dr. Stukely insists upon the same physical influence of the spleen as that which I am about to present, but we differ as to the parts on which that influence is especially bestowed, and the effects produced.

After the unavailing endeavours of so many justly renowned medical Philosophers, it may

\* Published in 1723.



appear hopeless to seek for direct proofs of the use of the spleen, but the impediments to a positive demonstration do not exclude circumstantial evidence, and I now offer those concurring evidences to show the obvious influence of the spleen upon the stomach as affording a rational solution of its principal, if not of its only function.

The sanguiferous structures of the spleen and of the thyroid gland resemble each other; they are alike extraordinarily supplied with red blood, neither of them possess excretory or discharging ducts, such as belong to the liver and to the secerning glands; in neither of them is there any parenchymatous pulp to lodge and dispose the minute secerning capillaries; a substance so remarkably embracing the pennicilli of the liver, the cryptæ of the kidney, and the ultimate secerning vessels of the pancreas and other similar glands.

The deficiencies of excretory ducts, and of a parenchymatous matrix, occur without exception in the spleens and thyroid glands of all the animals hitherto investigated. Another striking coincidence between the sanguiferous



vessels of the spleen and of the thyroid gland, appears in their most common morbid states. Enlargements of the spleen happening after inveterate agues, as well as the bronchocele, seldom exhibit any deviation from natural structure beyond an augmented laxity and extension of their respective blood vessels and membranous tissues. There is also a remarkable paucity of nerves assigned to the spleen and to the thyroid gland when compared with the nerves sent to the secerning glands; but as I would not rest this assertion upon my own recollection of the facts, I have applied to Mr. Joseph Swan, of Lincoln, whose recent assiduous and accurate tracings of the nerves, surpasses the merits of his contemporaries. Mr. Swan informs me, that the relative proportions of nerves sent to glands are placed in the following order. I. The testicle. II. The kidney. III. The liver. IV. The pancreas and the salivary glands. V. The absorbent glands; and lowest of all the spleen and the thyroid gland.

The influence of the sensorium over the secerning glands is sufficiently proved in the sudden and excessive production of the tears



by the passions, for the lachrymal glands having no reservoirs, their temporary rapid discharges must be imputed to the immediate agency of the brain and nerves. The urinary excretion is also affected by the mind, and perhaps all the other secerning glands are more or less governed by the sensorium, whose physical agency seems to pervade all the living functions, especially those where organic changes in the composition of elementary materials are the most evinced.

Since no sensible or chemical alteration has been detected in the venous blood, returned either from the spleen or the thyroid gland, and their nervous supplies are manifestly less than those of the secerning glands, we may reasonably infer that no other change happens to the blood in those organs but that of becoming venous.

A similar venous change, however, occurs in the arterial blood, poured into the cavernous and spongy bodies of the penis, for their temporary distension: and with the vascular arrangements of those parts, the structure of the spleen singularly agrees.

In the spleen of the common turtle “tes-



tudo Mydas," the intervening cellular spaces between the arteries and veins, constitute its main bulk, and they may be easily shown by injecting the splenic blood vessels with hardened wax, afterwards corroding away the animal parts.

Before I ask further concessions, I will adduce a few general statements to denote the intimate connection between a given temperature, muscular motion, and sensation; for whether the requisite heat be derived from the living functions of the animal, or from an ambient medium, it is alike essential. Discretionary motion and sensation appear to be exclusively the attributes of living animals. Those muscles of the human body which are placed under the dominion of the will, and those belonging to a class not under the direction of the mind, have their contractile offices severally dependent on a given temperature. In like manner all the sensations of living structures are either connected with the brain by an homogenous continuity of similar substance, as in the ordinary nerves, or by an interrupted chain, as it occurs in the gangliated nerves;



yet in both instances a given temperature is wanted for the first impression, as well as for its transmission to the seat of consciousness.

That the functions of the spleen and of the thyroid gland are not essential to animal life, is shown by the instances of whole tribes of creatures utterly destitute of those parts. The spleen has also been often extirpated by experimentors, without noticeable damage to any of the animal functions, and the thyroid gland has been removed by surgical operation without any observable consequences.

The spleen and the thyroid gland may be therefore regarded as auxiliaries to more important organs; such subsidiary aids being very frequent in all complicated examples of animal organization; and in the structures of the human body, many of those appointments have been made for the accommodation, or for the more convenient performance of especial offices; in fact, the greatest proportion of animal structures are subsidiary; and mere accessories to the principal offices of life.

I will not trespass upon this enlightened assembly with discussions on the vague and



unphilosophical opinions of some modern anatomists respecting the use of the spleen ; those opinions being too often illogical or incompetent.

Under enlarged views derived from general nature, from the improved state of animal chemistry, and from the other physical sciences, we may now venture to form new inductions from organic evidences, and safely attempt to simplify and illumine those obscure recesses of medical science, which still darken our profession, and expose our noble vocation to the mischievous adventures of unscientific men.

The contiguity and vascular connections between the spleen and the stomach are sufficiently known, and the notoriety of those attachments has produced many theories upon the uses of the spleen.

The extreme supplies of red blood to the spleen, and its necessary consequent high temperature, when compared with the scantiness of red blood allotted to the stomach and to the intestines, has occasioned a generally admitted inference, that the spleen transmits heat to the



stomach above the rate of its own capacity to furnish heat ; and hence it has been concluded by many persons, that the heat derived to the stomach from the spleen is conducive to digestion. To a certain extent this opinion is reasonable, for heat liquifies many alimentary substances, and aids in their maceration, but heat is inadequate to produce those animating changes which the stomach is known to effect.

The temperatures of the entire bodies of whole tribes of animals are regulated by their respective proportions of red blood, and the different structures of man and quadrupeds possess more or less of power to maintain the ordinary heat of the whole body, as they are respectively supplied with red blood.

This unequal dispensation of animal heat exposes many parts to a passive reduction of temperature ; the effects of which are, a diminution of sensibility, and an abatement of muscular power ; and to those effects induced upon the stomach by cold drinks and food, I solicit your attention ; since I regard the compensating



heat of the spleen to be the natural provision against the TORPORIZING influence of low temperature suddenly applied to the nervous and muscular structures of the stomach.

The human stomach on its front, upper, and right aspects, is contiguous to that highly sanguinous organ the liver, but the great *cardiac* portion into which the food and drink first descend, would be exposed to temporary suspensions of the sensorial and muscular functions whenever cold aliments are taken, had it not been for the ready communication of heat from the moving mass of red blood contained in the spleen, and whose transmitted temperature together with the copious supply of arterial blood, sent directly through the *vasa brevia* and the *gastrica sinistra* unequivocally prove, that heat must be largely yielded by an organ gifted with high temperature, to a contiguous part of less calorific power.

Before I advance to the ultimate objects of this Memoir, I will adduce some general statements to show the constant alliance between temperature and the sensorial functions and



muscular motions, assuming the relative supplies of red blood to be the visible indications of animal heat.

I cannot support or illustrate these points so strongly by my own feeble efforts, as by quoting the eloquent language of Dr. Harvey, the unrivalled glory of your College, who says in the History of the incubated Egg—"Expose  
 " an egg too long to the colder air and the  
 " punctum saliens beats slower, and hath a languishing motion, but lay your finger warm  
 " upon it, and it presently gaineth strength and  
 " vigour. And after the punctum hath declined  
 " by degrees, and being full of blood, hath  
 " ceased from all motion, exhibiting no specimen of life at all, and given up for lost and  
 " dead; upon laying my finger warm upon it,  
 " for the space of only twenty pulses, the poor  
 " heart awakened and recovered again, and as  
 " it were rescued from the grave, proceeded to  
 " to its former harmony afresh—and this has  
 " been done again and again by me and others,  
 " and by any other receiving heat, were it of  
 " the fire or warm water: as if it were in our



“ dispose to condemn the little soul to the  
 “ shades, or to reprieve it to life at pleasure.”

17th Excercitation on Generation.

The excessive accumulation of red blood vessels in the structures of certain parts of the organs of the senses has been often noticed; and the choroid coat of the eye, the extreme redness of the internal nostrils, and of the mouth, lips and tongue, are not accounted for by any rationale hitherto recorded—I will therefore venture to assume the uses of those peculiar appointments.

The sensibility of all nerves is intimately connected with temperature, and hence the parts assigned to receive sensible impressions, are carefully secured against the casual loss of their standard heat. The ends of the fingers possess a singular complexus of nerves and red blood vessels, the latter being in remarkable excess with regard to the other parts of the skin, and as the tips of the fingers are the chief seats of the sense of touch, this high vascularity may be deemed a protection against cold.

Numbness of the fingers from external cold



is not however the only instance of their occasional loss of sensation and motion; the state vulgarly called dead fingers, arising from a morbid stoppage of the blood, producing similar effects.

In the eyes of albinos and white rabbits, the red colour of the choroid coat is visible through the pupil, and the tremulous motions of the iris in those instances, point out the use of the opaque pigment as a screen to the ciliary nerves. If it be objected that the high red vascularity of the nostrils is as likely to be given for the secretion of mucus as to supply heat; that opinion may be put down by the evidence of the colourless state of the purer mucous membranes which form the interior of the urinary bladder, of the intestines, and of the synovial surfaces.

An objection to the heat-producing-office of the choroid coat of the eye, so remarkably placed between the white sclerotic coat and the bloodless vitreous humour, (and thus kept in contact with the retina,) may seem to exist in the pale linings of the labyrinth of the ear; but those organs are lodged in the middle of



the bottom of the cranium, and far removed from the access of cold; a circumstance rather favorable to the alleged design of high red vascularity, and consequent high temperature connected with the sentient nerves of all the other seats of the senses.

The muscular fibres of the stomach, and of the intestines, have far less red blood than the common voluntary muscles, and their irritability, as well as their sensibility, appear to be proportionally reduced. It is a curious incident, that the latent sensibility of the stomach and intestines is awakened by inflammation, a state which invariably displays an unnatural congestion of the red blood, together with increase of temperature; it appearing, as if the unconscious functions of the stomach and intestines were consigned to the passive aids of the sensorium, until some morbid affection forces the barriers of the gangliated spinal nerves. This chain of nerves links the spinal cord with the brain, and thus secures a communication between the functions of the brain, and those of its subordinate parts. The consequences of injuries done to the brain or to the spinal cord, display an equal deterioration in the voluntary



muscular powers, and in the sensations and motions of parts supplied by the gangliated nerves ; but this branch of anatomy is undergoing critical enquiries which may afford more satisfactory explanations of the especial uses of the ganglions. Perhaps they will be found to be appointments to repress the free transmission of the nervous stimulus so readily directed to the voluntary muscles, and also to arrest the progress of the more feeble impressions of ordinary sensation. That violent degree of sensation termed pain, being common to all living structures, is mercifully bestowed to point out the infirmities of parts which are seldom called before the mind.

I might extend these observations to the structure of the red blooded muscles of animals showing their superior capacity to maintain the definite temperature required for their active exertions, and contrast those facts with negative evidences derived from reptiles, fishes, insects, worms, and other pale blooded creatures, whose motions and apparent sensations, are more obedient to temperature, but this occasion is unsuitable.

Many years ago, being engaged in galvanic



researches, I had occasion to keep a living frog for two months at a temperature below 40 degrees, it had been taken out of a frozen well and was confined in a covered glass vessel, it's motions were languid and crawling, and when finally destroyed, two shelled snails were found in its stomach alive and unimpaired.

It is well known, that muscular irritability does not depend on renovated supplies of blood after each contraction and relaxation ; for the limbs of man and of all other creatures are capable of reiterated actions after a total separation from their respective bodies, and hence the excessive quantity of red blood bestowed on our voluntary muscles, cannot be for the purpose of their sanguineous constitution. May not this ordination be for the better security of that vital temperature which is essential to muscular irritability, the failure of which, under the effects of cold, is so notorious? Enough however has been said to incite enquiries, promising a speedy improvement in this part of physiology, and eventually in the practical knowledge of the healing art.

In the general scheme of living nature, there



is a manifest and designed fitness imposed upon each species of organized creature, by which the varied living beings are maintained in their respective spheres, and accommodated to their temporary and local destinies; in some instances the forms and structures of the species are nearly permanent, in others the least essential parts are changeable under the influences of climate, food, &c. Remarkable examples of such vicissitudes occur in the temporary augmentation of the muscles of the stomach of the gillaroo, or gizzard trout, accommodated to its crushing shelled snails during one season of the year, when no other food is to be obtained;\* in the changes of the feathers and hairs of creatures compelled to abide severe winters, and in the singular massive surtout of fat bestowed upon whales and animals inhabiting the coldest regions of the globe; the last fact seeming to point out the use of that coverlet of fat called the omentum, which is thrown between the naturally frigid intestines and their thin coverings in the front of the belly; the

\* These facts have been narrated in the Transactions of the Royal Society by Mr. John Hunter.



omentum is not to be found in cetaceous animals.

The whale tribes are indued with the highest animal temperature, it being more than ten degrees above that assigned to birds and land quadrupeds: they have also the largest proportion of deeply coloured blood. There is a singular mass of cylindrical convoluted blood vessels placed on each side of the spine within the bodies of porpoises and whales; and it has excited the wonder of physiologists, since its notification by Dr. Tyson. This congeries of large red blood vessels covers, and is in contact with, the intercostal and splanchnic nerves; and it appears to be an especial provision to afford heat to those nerves; so immediately exposed to cold air during respiration: for, without this interposition of hot blood, the vital nerves of whales would have been nearly in contact with the lungs, receiving an atmosphere often below zero.

The hairy covering of the human scalp has been inconsiderately and childishly deemed a mere ornament, but pathological anatomy proves it to be of real use. The upper masses



of the brain are the most exposed to the vicissitudes of temperature ; and the stroke of the sun in hot climates as well as the torpor or fatal sleep which befalls persons when exposed to intense cold, evince the protecting services of a bad conducting cap of hair, placed directly over the most exposed parts of the brain ; indeed the experience of mankind, whether civilized or rude, has led them to wear turbans and other coverings for the head in addition to the natural appendage. Perhaps also, the axillary tuft of hair is intended as a defence against cold to that most exposed plexus of nerves, which supplies the arm ; while the close entanglement of the axillary nerves with the contiguous blood vessels may be for the same end.

The fat and hair especially bestowed upon the pudendal organs, seems to be for similar purposes, and the temporary sanguineous distensions of the genital parts, may be designed to give increased heat and sensibility during the sexual orgasm. The clinging and intertwining among the splanchnic nerves, their ganglions, and the arteries in the human abdomen, seem to corroborate this view of a designed



connection between the heat-giving arteries, and those important nervous arrangements. Perhaps the recurrent nerves turn round the great arteries of the aorta, and the intercostal nerves are similarly turned behind the adjacent arteries for the same purpose.

Many birds hide their beaks among their feathers while at rest; and as the horn and bone of beaks have but a scanty supply of blood, this habit seems to be an accommodation for warmth like the use of muffs. Certain birds also alternately rest upon one foot, and conceal the other among their body feathers, a custom most noticeable among web footed birds in cold weather.

If it should be conceded by this learned assembly, that a given temperature is essential to the vital functions of the sensorial structures, and to muscular action; and that the position and the organization of the spleen, manifestly supply heat to that portion of the stomach where heat is most needed; where there is often a sudden and paramount demand for it; and where no other adjacent part is capable of doing that service; then the intended use of



the spleen may be justly regarded as auxiliary to the functions of the nervous and muscular structures of the stomach ; and although the heat conveyed from the spleen to the stomach is in this way subsidiary to digestion, it cannot be considered the immediate agent of that complicated process.

The foregoing reflections have induced me to assign a heat-giving power to the thyroid gland similar to that of the spleen, because the local adaptations of the thyroid gland to the trachea and larynx must necessarily furnish heat to the nerves and muscles of the organ of voice, whose bloodless cartilages are exposed both within and without to the effects of atmospheric changes, and perhaps the goitre is no more than a natural effort to uphold the temperature of those parts under certain influences of climate ; but this occasion does not permit an extension of these observations, I will therefore reserve for a future time, a more general review of the physiology of glands and other structures, now rendered apparent dependencies on the physical adaptations of the blood vessels.

In this country, and at the present time,



there is no part of medical science so much behind the average rate of current knowledge, as the physiology of glands ; structures which induce changes in the elementary fluids of living bodies, little understood by vulgar teachers, from deficiencies in their education and habits, and which continually lead to the exhibition of their crude opinions in opposition to the first principles of philosophical induction.

I am not ambitious to become the sponsor of additional technical words, seeing that our profession is already clogged with a superabundance, yet I am strongly tempted to propose a generic name for the thyroid gland and for the spleen, since they do not perform the discerning offices of real glands—and if at any future period, this suggestion should be adopted, some term derived from the Greek verb ΘΕΡΜΑΙΝΩ, may probably be thought the most eligible by professional scholars.



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