# LECTURES

ON

# PHYSIOLOGY, ZOOLOGY,

AND THE

# NATURAL HISTORY OF MAN,

DELIVERED AT

## The Royal College of Surgeons,

BY

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WITH SEVEN ENGRAVINGS.

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# LECTURES

ON

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AND THE

# Natural History of Man.

## LECTURE I.

### INTRODUCTORY TO THE COURSE DELIVERED IN 1817.

*Reply to the Charges of Mr. Abernethy.—Modern History and Progress of Comparative Anatomy.*

GENTLEMEN:—

I CANNOT presume to address you again in the character of Professor to this College, without first publicly clearing myself from a charge publicly made in this theatre;—the charge of having perverted the honorable office, intrusted to me by this Court, to the very unworthy design of propagating opinions detrimental to society, and of endeavoring to embase them for the purpose of loosening those restraints, on which the welfare of mankind depends.*

* *Physiological Lectures, exhibiting a General View of Mr. Hunter's Physiology, and of his Researches in Comparative Anatomy; delivered before the Royal College of Surgeons by* J. ABERNETHY, F. R. S. See particularly Lect. 1, 2, 6, and 7: the passages and pages are too numerous to be particularized. Had the author been content with pronouncing his attack from the chair of the College, I should have been satisfied with defending myself in the same place. The publication of his charge has made it necessary for me to publish my reply.

The apparent contradiction between the allotted subject of these *Physiological* Lectures,—*human* anatomy; the professed topic,—Mr. Hunter's know-

I feel obliged to call your attention to this subject;—not by the probability of the accusation, and still less by the arguments adduced in support of it;—but, because the character of the accuser may with some, supply the deficiency of proof;—because the silence of contempt, which the illiberality and weakness of the charge would so well justify, might be construed by others into an admission of guilt;—and, if I could appear before you

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ledge of *comparative* anatomy; and their actual contents, anatomical, physiological, ethical, controversial, abusive, &c. &c.; is only to be reconciled by a consideration of the real motives, which may be discovered without a very deep research. That the few remarks on life, published in my "Introduction to Comparative Anatomy and Physiology," should have been the sole occasion, and have furnished so much of the subject of these Lectures, was an honor altogether unexpected and unwished on my part. If it should be thought that I do not show a proper sense of so distinguished a compliment, by bestowing in return so short a notice on the "Physiological Lectures," more particularly when nearly all the opinions and facts they contain would afford ample matter for discussion, my apology must be want of room, and not being yet fully convinced that the pretended *Hunterian* theory of life is the most important subject that can be entertained by the human mind. This slowness of belief must be pardoned in a modern sceptic.

Not to fatigue his audience by too much of one thing, however good, the author judiciously interspersed his views of the so-called Hunterian doctrine, and his series of anathemas against the designs, principles, and character of the audacious sceptics who refuse to accept the gracious present, with other topics; and did not disdain to intermix the most elementary anatomical truths. Thus we learn that the head is placed on the top of a column of bones called vertebræ (p. 108); that the seven upper ribs are connected by *gristles* to the breast bone (121); that there are two bones of the fore-arm; and that the ulna sends backward a projection we name the elbow (126); that the wrist is composed of eight *little* bones (129); &c. &c. &c. When we consider that the audience, to whom these Lectures were delivered, comprised the venerable elders of our profession, appointed to guard the portals of the great edifice in Lincoln's-Inn-Fields; the general body of London surgeons, who having been admitted within the gates, must be deemed accomplished in all parts of anatomical and surgical science; and the students of the several schools of medicine, who, having devoted one winter at least to anatomical pursuits, must be presumed to possess the *a b c* of the science; and when we further reflect that the author would undoubtedly be governed in his selection of subjects by a deliberate view and sound estimate of the wants of his audience, we are naturally anxious to know for which of the three classes above mentioned these "Early Lessons" in anatomy were designed. Perhaps, however, like the water in a medical prescription, they were only meant as an innocent vehicle for the more active ingredients.



under the possibility of such an admission, you might reasonably suppose me indifferent to your approbation or blame, and therefore unworthy of the office which I now hold.

I am not going to drag you again over the field of controversy:—my opinions are published:—they were not brought forward secretly;—they have never shunned the light, and they never shall be concealed nor compromised. Without this freedom of inquiry and speech, the duty of your professors would be irksome and humiliating: they would be dishonored in their own eyes, and in the estimation of the public. These privileges, GENTLEMEN! shall never be surrendered by me: I will not be set down nor cried down by any person, in any place, or under any pretext. However flattering it may be to my vanity to wear this gown, if it involves any sacrifice of independence, the smallest dereliction of the right to examine freely the subjects on which I address you, and to express fearlessly the result of my investigations, I would strip it off instantly.

I willingly concede to every man what I claim for myself,—the freest range of thought and expression; and am perfectly indifferent whether the sentiments of others on speculative subjects coincide with or differ from my own. Instead of wishing or expecting that uniformity of opinion should be established, I am convinced that it is neither practicable nor desirable; that varieties of thought are as numerous, and as strongly marked, and as irreducible to one standard, as those of bodily form; and that to quarrel with one, who thinks differently from ourselves, would be no less unreasonable than to be angry with him for having features unlike our own.

To fair argument and free discussion I shall never object, even if they should completely destroy my own opinions; for my object is truth, not victory. But when argument is abandoned, and its place supplied by an inquiry into motives, designs, and tendencies, the case is altered. If vanquished in fair discussion, I should have yielded quietly; but it cannot have been expected that I would lie still, and be trampled on, lecture after lecture; cut and mangled with every weapon fair and foul; assailed with appeals to the passions and prejudices, to the fears of the timid, the alarms of the ignorant and the bigoted: and this too, when nothing is easier than to destroy the ill-constructed fabric; to

crumble its very fragments to dust, and scatter them before the wind.

It is alleged that there is a party of modern sceptics, co-operating in the diffusion of these noxious opinions with a no less terrible band of French physiologists, for the purpose of demoralizing mankind! Such is the general tenor of the accusation, independently of the modifications, by which it is worked up into separate counts, and of the rhetorical ornaments, by which it was embellished. Had the statement been general, I should not have appropriated it by entering on a defence;—but have left that service to any volunteer of the sceptical party, which I know no more of than I do of the man in the moon, and in whose existence I believe just as much. The quotation of my own words, however, rendered it impossible for me to shield myself under the pretext of uncertainty; indeed, it particularized and fixed the accusation, for which no other tangible object could be discovered.

The vague and indefinite expressions of sceptical party, modern sceptics, and other abusive terms, form too flimsy a veil to conceal the real object of this fierce attack; while the pretended concern for important truths and principles, and the loud imputation of bad designs and evil tendencies, instead of decently covering, rather expose the nakedness of the feelings, in which it originated.

Perhaps all the counts of this alarming indictment are not intended to apply to all the persons thus unexpectedly dragged to the bar of public opinion;—but, as the prosecutor made no distinction in the shades of guilt, I must plead to the whole accusation:—of propagating dangerous opinions,—and of doing so in concert with the French physiologists:—the French, who seem to be considered our natural enemies in science, as well as in politics.

I plead, not guilty; and enter on my defence with a confident reliance on the candor and impartiality of the tribunal, before whom the cause is brought;—a tribunal too enlightened to confound the angry feeling and exaggerated expressions of controversy with the calm deductions of reason; and well able to appreciate this attempt at enlisting religion and morality on the side of self-love; by which difference of opinion, at all times but



too irritating to the human mind, receives the double aggravation of real inability to persuade, and fancied right to condemn.

Where, GENTLEMEN! shall we find proofs of this heavy charge,—of this design so hostile to the very elements and foundation of civil union? What are the overt acts to prove this treason against society? this compassing and imagining the destruction of moral restraint, and the grounds of mutual confidence? What support can you discover for such imputations in the profession, pursuits, habits, and character of those who are accused? How will it promote their interests to endanger the very frame of society? By what latitude and artifice of construction, by what ingenuity of explanation, can the materials of such a charge be extracted from the discussion of an abstract physiological question? from discourses first delivered in this theatre to an assembly of the whole profession, and since openly published to the whole world? I need not remind you that such an accusation is repelled by every appearance, every probability, and every presumption; and that in opposition to these primâ-facie sources of distrust, it can only be established by the clearest and most unequivocal evidence; not by bold assertions and strained inferences—not by declamatory common-places on morals—nor by all the pangs and complaints of mortified self-love.

A party of modern sceptics!—A sceptic is one who doubts;—and if this party includes those who doubt,—or rather, who do not doubt at all,—about the electro-chemical doctrine of life, I can have no objection to belong to so numerous and respectable a body. The assent of the mind to any proposition cannot be forced;—it must depend on the weight of evidence and argument. I cannot adopt this hypothesis until some proof or reasoning of a very different nature from any hitherto produced shall be brought forward. I declare most sincerely, that I never met with even the shadow of a proof that the contraction of a muscle or the sensation of a nerve depended in any degree on electrical principles; or that reflection, judgment, memory, arise out of changes similar in their causes or order to those we call chemical. On the other hand, I see the animal functions inseparable from the animal organs;—first showing themselves, when they are first developed;—coming to perfection as they are perfected;—modified by their

various affections;—decaying as they decay; and finally ceasing, when they are destroyed.

Examine the mind, the grand prerogative of man. Where is the mind of the fetus? where that of the child just born? Do we not see it actually built up before our eyes by the actions of the five external senses, and of the gradually developed internal faculties? Do we not trace it advancing by a slow progress through infancy and childhood, to the perfect expansion of its faculties in the adult;—annihilated for a time by a blow on the head, or the shedding of a little blood in apoplexy;—decaying as the body declines in old age;—and finally reduced to an amount hardly perceptible, when the body, worn out by the mere exercise of the organs, reaches, by the simple operation of natural decay, that state of decrepitude most aptly termed second childhood?

Where then shall we find proofs of the mind's independence on the bodily structure? of that mind, which, like the corporeal frame, is infantile in the child, manly in the adult, sick and debilitated in disease, phrensied or melancholy in the madman, enfeebled in the decline of life, doting in decrepitude, and annihilated by death?

Take away from the mind of man, or from that of any other animal, the operations of the five external senses, and the functions of the brain, and what will be left behind?

That life then, or the assemblage of all the functions, is immediately dependent on organization, appears to me, physiologically speaking, as clear as that the presence of the sun above the horizon causes the light of day; and to suppose that we could have light without that luminary, would not be more unreasonable than to conceive that life is independent of the animal body, in which the vital phenomena are observed.

I say, *physiologically* speaking; and beg you to attend particularly to this qualification: because the theological doctrine of the soul, and its separate existence, has nothing to do with this physiological question, but rests on a species of proof altogether different. These sublime dogmas could never have been brought to light by the labours of the anatomist and physiologist. An immaterial and spiritual being could not have been discovered amid the blood and filth of the dissecting-room; and the very idea of



resorting to this low and dirty source for a proof of so exalted and refined a truth, is an illustration of what we daily see, the powerful bias that professional habits and the exclusive contemplation of a particular subject give even to the strongest minds,—an illustration of that esprit de métier, which led the honest currier in the threatened city to recommend a fortification of leather.

When we reflect that the immortality of the soul and a future state of rewards and punishments were fully recognised in all the religions of the ancient world, except the Jewish,—and that they are equally so in all those of more modern time;—when we consider, that this belief prevailed universally in the vast and populous regions of the East, for ages and ages before the period to which our remotest annals extend, and that it is firmly rooted in countries and nations on which the sun of science has never yet shone, the demonstration that the anatomical and physiological researches of the last half century have not the most remote connection with, or imaginable influence on, the proof of these great truths, will be completed beyond the possibility of doubt or denial, in the estimation of every unprejudiced person. I do not enlarge on this point, because it is too obvious, and because divinity and morals, however excellent in their own time and place, do not exactly suit the theatre, audience, or subject of these Lectures.

The greatest of the ancient philosophers said that the surest way of gaining admission into the temple of wisdom, was through the portal of doubts—and he declared that he knew only one thing—his own ignorance. Were Socrates to show his head above ground just now, he must conclude, either that he himself had completely mistaken the road to knowledge, or that his successors had accomplished the journey, and had penetrated into the sanctuary of the temple. For, in the modern philosophy, doubting is proscribed as the source of all mischief; and an overbearing dogmatism, even on the most abstruse and difficult questions, is held forth as a wiser course than the modest confession of ignorance.

When favorite speculations have been long indulged, and much pains have been bestowed on them, they are viewed with that parental partiality, which cannot bear to hear of faults in the object of its attachment. The mere doubt of an impartial observer is offensive; and the discovery of any thing like a blemish

in the darling is not only ascribed to an entire want of discrimination and judgment, but resented as an injury. The irritation rises higher, in proportion to the coolness of the object which excites it; as Sir Anthony Absolute in the play, while swelling with rage, and boiling over with abuse on the persons around him, begins to damn them again with tenfold energy because they cannot keep their tempers, because they cannot be as cool as he is.

By a curious inconsistency in the human mind, difference of opinion is more offensive and intolerable in proportion as the subject is of a more refined nature, and less susceptible of direct proof. Hence the rancorous intolerance excited by the minute and almost evanescent shades of opinion that distinguish many religious sects. The quarrels of the Homoousians and the Homoiousians filled the Roman empire for a long series of years with discord, faction, persecution, and civil war. Yet the point at issue, actually comprised in the variation of a single dipthong, is so minute as to be "scarcely visible, to the nicest theological eye,*" and certainly, in reference to either faith or practice, is not a jot more important than the controversy which divided the mighty empire of Lilliput, respecting the right end to break in eating an egg. 'Tis a pity we cannot find some convenient way of settling these *important* controversies; such as occurred to the traveller, who met with a people divided into two parties on the question whether they should walk into the temple of their deity with the right or the left leg foremost. Each side conceived the practice of the other to be impious: the traveller recommended the obvious expedient, which in the heat of their quarrel they had overlooked, of jumping in with both legs together.

The peculiar virulence of controversy, in all cases in which religion is supposed to be concerned, is so remarkable, as to have become proverbial:—the odium theologicum is the most concentrated essence of animosity and rancour. Let us not then open the fair garden of Science to this ugly fiend; let not her sweet cup be tainted by the most distant approach of his venomous breath.

Is the cause of truth to be promoted by affixing injurious and party names to those who differ from us in these points of nice

* Gibbon.



and curious speculation? who cannot pursue the same track with ourselves through the airy regions of immaterial being, of which the only utility seems to consist in affording occupation to the organs of ideality, and mysticism? Is not this kind of abuse more likely, by moving the passions, to disturb the operation of the judgment?

The practice of calling names in argument has been chiefly resorted to by the fair sex, and in religious discussions; in both cases, apparently, from a common cause—the weakness of the other means of attack and defence. The priests of former times used to rain a torrent of abusive epithets, as heretic, infidel, atheist, and the Lord knows what, on all who had the audacity to differ from them in opinion. This ecclesiastical artillery has been so much used, as to have become in great measure unserviceable: it is now found more noisy than destructive; and the general discovery of its harmlessness has assisted with the progress of liberal ideas, to discountenance its employment in controversy, as poisoned weapons and other unfair advantages have been banished from honorable warfare. Sometimes, however, it frightens and stuns, if it does not dangerously wound; and thus it silences antagonists, who could not easily have been overcome by weight of argument.

It would have been praise enough to any doctrine, that it should explain the great mystery of life; that it should solve the enigma, which has puzzled the ablest heads of all ages;—but this subtile and mobile vital fluid is brought forward with more ambitious pretensions; and it is not only designed to show the nature and operation of the cause, by which the vital phenomena are produced, but to add a new sanction to the great principles of morals and religion, and to eradicate all the selfish and bad passions of our nature. An obscure hypothesis, which few have ever heard of, and fewer can comprehend, is to make us all good and virtuous, to impose a restraint upon vice stronger than Bow Street or the Old Bailey can apply; and in all probability to convert the offices of Mr. Recorder and his assistant Mr. Ketch into sinecures.*

* Let us suppose for a moment that the adoption of this hypothesis would really have all the efficacy that is pretended, it would then be desirable that it should turn out to be true: but would that afford any proof of the hypothesis? If, in a disputed question, you tell me that I shall have a large estate, if I am convinced that you are in the right; undoubtedly I shall desire with all my heart to find that you are right; but I cannot be convinced of it, unless you

What has been the effect of this great discovery on its author?—What are the first-fruits of this new ethical power?—A series of Quixotic attacks on conspirators and parties, as purely imaginary as the giants and castles encountered by the Knight of La Mancha; of unfounded charges and angry invective, undisguised and glaring national partiality, unreasonable national antipathy, unmerited and unprovoked abuse of the writers of a whole nation, afford an overwhelming proof of its complete moral inefficacy.

These magnificent designs are interrupted by a conspiring band of sceptics and French physiologists,—by a nest of plotters brought forth all at once on this green table, and threatening, in the noise and alarm which preceded their discovery, as well as in their utter insignificancy and harmlessness when discovered, to eclipse even the green-bag conspiracy of another place. The foundations of morality undermined, and religion endangered by a little discussion, and a little ridicule of the electro-chemical hypothesis of life! Thus the possessor of a specific endeavors to frighten people by the most lively pictures of their danger; that they may receive, with a higher opinion of its virtues and importance, his pretended infallible remedy.

I shall not insult your understandings by formally proving that this physiological doctrine never has afforded, and never can afford, any support to religion or morals: and that the great truths, so important to mankind, rest on a perfectly different, and far more solid foundation. If they could be endangered at all by the discussions, with which we amuse ourselves, it would be by unsettling them from their natural and firm establishment in the natural feelings and propensities, in the common sense, in the mutual wants and relations of mankind, and erecting them anew on the artificial and rotten foundation of these unsubstantial speculations, or on the equally unsafe ground of abstruse metaphysical researches.*

arguments should be found satisfactory. In the same way, in tossing up for heads and tails, if I am to receive a guinea provided tails turn up, and a hundred if it should be heads, this difference does not at all increase the chances of the latter event, however it may operate on my wishes.

*The profound, the virtuous, and fervently pious PASCAL acknowledged, what all sound theologians maintain, that the immortality of the soul, the great truths of religion, and the fundamental principles of morals, cannot be demonstrably proved by mere reason; and that revelation alone is capable of dissipating the uncertainties, which perplex those who inquire too curiously into the sources of these important principles. All will acknowledge, that, as no other remedy can be so perfect and satisfactory as this, no other can be necessary, if we resort to this with firm faith. How many persons could be found whose belief in a Deity rests on the chain of reasoning in CLARK's *Demonstration of the Being and Attributes of God*; or in KANT's *Einzig mögliche Beweisgrund zu einer Demonstration dəs Daseyn Gottes*? How many are there who have had perseverance enough to go through the chain of argument in these works? If the close and profound reasoning and the metaphysical acuteness of CLARK and KANT have been employed to little purpose on such a subject, what are we to expect from this pretended Hunterian theory of life?

*The author of the *Physiological Lectures* entertains some peculiar views concerning the evidence, on which we are to rely in our physical researches, which probably furnish a clue to the peculiar results at which he has arrived. He "confides more in the eye of reason than in that of sense; and would rather form opinions from analogy, than from the imperfect evidence of sight;" p. 203, where the expression is employed in discussing a question of fact. The same statement, in nearly the same words, occurs in several other places.—From a comparison of these passages with each other, and wtih the leading doctrines of the lectures, I consider their meaning to be, that when the evidence of the senses is at variance with preconceived notions, or the constructions, combinations, or other operations of the mental faculties, the author rejects the former and adheres to the latter. As the author must be the best judge of the relative value belonging to the evidence of his own senses and that of his fancy, imagination, and other internal powers, it is fair to presume



As to the charge itself, of bringing forward doctrines with any *design* hostile to the principles or opinions, on which the welfare of society depends: or with any other *intention*, except that of displaying to you the impartial result of my own reflections and researches; I reply in one word,—that it is false. I beg you, indeed, to observe, that I have only remarked on the opinions of others; I have adduced none of my own. I profess an entire ignorance of the nature of the vital properties, except in so far as they are disclosed by experience; and find my knowledge on this subject reduced to the simple result of observation, that certain phenomena occur in certain organic textures.* To the question, what opinions I would substitute in place of those to which I object, I answer none. Ignorance is preferable to error: he is nearer to truth, who believes nothing, than he who believes what is wrong.

And here I take the opportunity of protesting, in the strongest

terms,—in behalf of the interests of science, and of that free discussion, which is essential to its successful cultivation,—against the attempt to stifle impartial inquiry by an outcry of pernicious tendency; and against perverting science and literature, which naturally tend to bring mankind acquainted with each other, to the anti social purpose of inflaming and prolonging national prejudice and animosity. Letters have been called the tongue of the world; and science may be regarded in the same light. They supply common objects of interest, in which the selfish unsocial feelings are not called into action, and thus they promote new friendships among nations. Through them, distant people become capable of conversing; and losing by degrees the awkwardness of strangers, and the moroseness of suspicion, they learn to know and understand each other. Science, the partisan of no country, but the beneficent patroness of all, has liberally opened a temple where all may meet. She never inquires about the country or sect of those who seek admission;—she never allots a higher or a lower place from exaggerated national claims, or unfounded national antipathies. Her influence on the mind, like that of the sun on the chilled earth, has long been preparing it for higher cultivation, and further improvement. The philosopher of one country should not see an enemy in the philosopher of another: he should take his seat in the temple of Science, and ask not who sits beside him. The savage notion of a natural enemy should be banished from this sanctuary, where all, from whatever quarter, should be regarded as of one great family; and being engaged in pursuits calculated to increase the general sum of happiness, should never exercise intolerance towards each other, no assume that right of arraigning the motives and designs of others, which belongs only to the Being who can penetrate the recesses of the human heart;—an assumption which is so well reprobated by our great poet:

> Let not this weak unknowing hand
> Presume thy bolts to throw;
> And deal damnation round the land
> On each I judge thy foe.

that he has exercised a sound discretion in this very important determination. It is however rather unreasonable for him to expect that others should rely on the workings of his fancy in preference to the evidence of their own senses.



In the Introductory Lecture* of last year, I attempted to sketch out to you the history of Comparative Anatomy; to select the names of those who had been principally concerned in establishing and advancing the science; and to assign to each his proper share of praise. At the same time that I found it a pleasing task to review the successive steps in the progress of so interesting a science, and to award the just tribute of our gratitude to so many useful labors, I thought it would be interesting and profitable to you to know to whose talents and to whose exertions zoology had been indebted.

The space allotted to this historical review having been necessarily short, the names of many were omitted; and others were noticed more briefly than the number, extent, and importance of their contributions to science would have deserved. This was particularly the case with many illustrious foreigners, towards some of whom I shall now make up for that neglect.

The temple of science has not been raised to its present commanding height, or decorated with its beautiful proportions and embellishments, by the exertions of any one country. If we obstinately shut our eyes to all that other nations have contributed, we shall survey only a few columns of the majestic fabric, and never rise to an adequate conception of the grandeur and beauty of the whole. Our insular situation, by restricting intercourse, has contributed to generate a contempt of foreigners, and an unreasonable notion of our own importance, which is often ludicrous; always to be regretted; and in many cases strong enough to resist all the weapons of reason and ridicule. We should consider what we think of these national prejudices, when we observe them in others: when we see the Turks summing up all their contempt for their more polished neighbors, in the short but expressive phrase of Christian dogs; and the Emperor of China acccepting presents from the King of England, because it is a principle of the celestial empire to show indulgence and condescension towards pettty states.

Science requires an expanded mind, a view that embraces the

* See *Introduction to Comparative Anatomy and Physiology.*