

The Hunterian Oration : delivered in the theatre of the Royal College of Surgeons ... 1823 / [Sir William Blizard].

Contributors

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THE
HUNTERIAN ORATION:

Delivered in the Theatre

OF THE
ROYAL COLLEGE OF SURGEONS IN LONDON,

On the 14th Day of FEBRUARY, 1823:

BY

SIR WILLIAM BLIZARD, KNT.

PRESIDENT OF THE COLLEGE;

F. R. S.; F. A. S.; F. R. S. ED.; SOC. R. SC. GOTTING. CORRESP.;

HON. PROF. OF ANAT. AND SURG. OF THE

ROYAL COLL. OF SURGEONS IN LONDON;

AND

SURGEON to HIS ROYAL HIGHNESS the DUKE of GLOUCESTER,

AND TO

THE LONDON HOSPITAL.



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1823.

THE
HUNTERIAN ORATION

DELIVERED IN THE CHURCH

OF THE

ROYAL COLLEGE OF SURGEONS IN LONDON

ON THE 11th DAY OF FEBRUARY 1844

SIR WILLIAM BLISSARD, KNT.

PRESIDENT OF THE COLLEGE

READ BY THE SECRETARY

HON. PROF. OF ANAT. AND SURG. OF THE

ROYAL COLLEGE OF SURGEONS IN LONDON

AND

SURGEON TO HIS ROYAL HIGHNESS THE DUC DE CANTERBURY

1844



TO

BARON GEORGE CUVIER,

AND

SIR HUMPHRY DAVY, BAR^T,

HONORARY MEMBERS

OF THE

ROYAL COLLEGE OF SURGEONS IN LONDON,

WITH A PROFOUND SENSE

OF THEIR

SCIENTIFIC BENEFITS TO THE WORLD,

THIS ORATION IS INSCRIBED

BY

THE AUTHOR.

(C O P Y)

At a quarterly Meeting of the COUNCIL of the
ROYAL COLLEGE of SURGEONS in LONDON,
holden on Friday, the 11th Day of April,
1823.

The senior Vice-President, Mr. CLINE, reported, that the
HUNTERIAN ORATION had been duly delivered, by the
President, SIR WILLIAM BLIZARD, on the 14th Day of
February last.

RESOLVED UNANIMOUSLY:

That the President be requested to publish such
ORATION.

PREFACE.

***T**HE Opinion, that Subjects for the HUNTERIAN ORATION would soon be exhausted, is, in the Judgment of the Author, unfounded.*

If Inquiry were made for Topics of Discourse for the 14th of February, the HUNTERIAN Collection would afford a boundless Choice of Subjects, in the Illustrations there displayed of the simple Laws of the animal Economy, in the Formation and Functions of Organs; and in the Signs of Aberration of Actions, from Injury or Disease. And if Inquiry were extended to the Nature, and the Order of Advancement of anatomical, physiological, and pathological Knowledge; and to Improvements in the Art and Science of Surgery, since the HUNTERIAN Era; such a Field of Objects would be presented as would embarrass Endeavours for Selection.

To modify and embody the interesting Truths drawn from these Sources, without trespassing on the Provinces of the Professors, but with enlivening Influence on their Exertions, would prove a pleasant Exercise in the Hours of Abstraction from professional Toil.

These Sentiments would have guided the Author in the Adoption of Subjects for the late Occasion; had he not been seriously impressed with the Propriety of making an Effort, or at least of recording his Protest, against Practices, daily increasing, which, while they dishonour Surgery, retard the Progress of Improvement, and the Diffusion of chirurgical Knowledge for the general Benefit of the Community.

DEVONSHIRE SQUARE:

1 May, 1823.

HUNTERIAN ORATION

This College is dedicated - under an humble
Sense of the ordained Limitation of human
Faculties - to the Education of the Young in
Infinite Power, manifested in animal Creation;
to the Investigation of the Laws of Action,
which Infinite Wisdom has impressed on the
Organs of Animals, for their Preservation, and
the various Purposes of their Existence; and,
to the Improvement of the beneficial Appli-



HEZTERIAN ORATION

This Oration is dedicated - under an humble
Sense of the ordained Limitation of human
Faculties - to the elucidation of the Works of
Infinite Power manifested in animal Creation;
to the Investigation of the Laws of Action,
which Infinite Wisdom has impressed on the
Organs of Animals for their Preservation, and
the various Purposes of their Existence; and
to the Improvement of that beneficial Appli-



HUNTERIAN ORATION

THIS COLLEGE is dedicated—under an humble Sense of the ordained Limitation of human Faculties—to the Elucidation of the Works of Infinite Power, manifested in animal Creation: to the Investigation of the Laws of Action, which Infinite Wisdom has impressed on the Organs of Animals, for their Preservation, and the various Purposes of their Existence: and, to the Improvement of that beneficial Appli-

cation of natural Knowledge, which Infinite Goodness has provided by the Healing Art.

A Commemorative Address, suggested by amiable Feeling, and instituted by public Spirit, for the Promotion of these Objects, annually enlivens the Energies of Members, and crowns the preceptive Exercises in this Theatre.

Accustomed to Obedience, on every Call of the College; and encouraged by the Experience of your liberal Indulgence; I have again ventured on the Task of celebrating the Honour of Surgery; and the Memory of Men, by whose Labours it has been advanced.

What is “the Honour of Surgery?”—Benefit to Mankind: and Distinctions, founded on this well-defined Basis, are its legitimate Expressions.

Upon this Principle, the Alterations in the titular Style of the College, were allowed; and

this Token* of Royal Patronage, was vouchsafed, from a Conviction, as it was graciously declared, of the successful Endeavours of the College, for the common Weal.

Were the Eulogy of living Characters admissible in the Hunterian Oration; Flattery might, at some Period, assume the Place of Sincerity; and, thus, defeat the primary and pure Intention of the Founders. I must not, therefore, indulge your Feelings, and my own, by offering the Tribute of Praise due to those distinguished Persons, whose Representation of

* INSCRIPTION:
engraven on the Mace.

*Ex Munificentia
Augustissimi Monarchæ*

Georgii IV.

Dei Gra: Britanniarum Regis &c.

Collegii Regalis Chirurgorum

Patroni Optimi

An: Dom: MDCCCXXII

Everardo Home Baronetto Primo Præside.

the Labours of this College, conciliated the Favour, and Munificence, of our just, beneficent, and sagacious, Sovereign.

Waving, then, every Expression of that Sense of Gratitude which is entertained of the Advancers of these Honours; we will proceed to the Consideration of the Benefits which they have signalized, and of the Way in which they are calculated to promote the best Interests of Mankind.

Causes, affecting, in any Manner, or Degree, the Progress of the Arts, and Sciences, in national Communities, if they comprehend in their Influence, the Healing Art, must be within the Scope of preliminary Examination, on this Occasion; especially if they have been dwelt upon, by commanding Abilities, in this Theatre.

It is necessary to plead these Considerations in Justification of myself: for the Authorities of this College are bound to maintain, that not any

Subject, foreign to, or unconnected with, its Objects, can, properly, be introduced in this Theatre.

Accordingly as a **Person** is swayed, from whatever **Cause**, in **Favour** of any **Mode** of **Government**, **Occasions** are taken to impress the **Minds** of others with a **Belief**, that the **Form** preferred is the best for the **Promotion** of the **Arts**, and **Sciences**: and thus the **Healing Art** has been presented, combined with other **Distinctions** of **Knowledge**, in **Exaltation** of **Republican Establishments**.

But unbiassed **Reflection** on the associated **Circumstances** of **Discoveries**, and **Improvements**, in **Anatomy**, and **Surgery**, through a long **Series** of **Ages**, would incline the **Mind** to **Conclusions**, very different from some which have been drawn from uncertain **Premises**.

The Fabric of **Brain**; the innate **Disposition** of **Mind**; and the corporeal **Aptitudes**; of **Men**;

are various as the **Distinctions** of human **Knowledge**.

Inquiry into the constitutional **Frames**, and **Dispositions**; and their correspondent **Effects** in the **Actions** of **Men**; will produce more **Light** on the **Causes** of important scientific **Events**, than can be derived from hypothetical **Reasoning** on the **Influence** of **Governments**.

Numerous **Causes**, affecting the **Functions** of **Organs**, may weaken the **Expression** of natural **Disposition**; and may, even, in some **Degree**, vary its **Inclination**: but, when possessed with strong impelling **Power**, not any **Kind** of **Government**, or external **Influence**, will move the **Mind** against its **Spring** of **Action**.—What extraneous **Impulse** could have diverted **JOHN HUNTER** from the **Track** of his scientific **Career**?

In Support of this **Opinion**, of the **Force** of

innate **Disposition**, **Examples** might be adduced from the **Histories of People**, of every **Nation**, every **Form of Government**, in every **Age**.

Independently, however, of that **Disposition** which may be pronounced uncontrollable, and which shines, principally, in the **Walks of Science**; there are **Motives of Action** which exert a general **Influence on Mankind**.

Avarice, and **Desire of Distinction**; are amongst the ruling **Principles of Action**. The former may exist under any **System of Government**: but the latter is, almost, peculiar to the monarchical **Form**; and is the **Source of Energies** which dignify human **Nature**.—The gracious **Disposition** of a **Monarch** is conspicuous, by the liberal **Encouragement** which he affords to the **Exertions** of his **Subjects**, in the various **Departments of Art**, and **Science**, and in the **Cause of Humanity**.

The generalizing **Influence of Republics** is

repulsive to the **Force of Disposition**; damps aspiring **Spirit**; and reduces the loftiest **Conceptions** to the **Standard of Equality**.

On the contrary, **Governments**, comprehending constitutional **Monarchy**, are productive of lofty **Ideas**, of emulative **Energy**: whence the **Developement of Disposition**; the various **Distinctions** in **Society**, acquired by **Learning**, **Talent**, and **Improvement of the Arts, and Sciences**: or conferred by the **Sovereign**, as expressive of national **Benefit**, and **Honour**; and such, we are assured, are the **Grounds of that Distinction**, which this **College** owes to the discriminating **Bounty of its Royal Patron**.

FRANCE had the **Credit** of bearing the **Palm of Surgery**, under her most despotic **Dynasty**.

HUNTER, unmoved by national **Vicissitudes**, calmly drew aside the **Veil** spread over animal **Creation**; expounded the **Laws of organic**

Structure, and Function; and that Doctrine of morbid Action, which has the Seal of Nature: and thus, raised, and fixed, in these Realms, the rational Character, and Rank, of Surgery.

But let the improved State of Surgery, in this Country, be contemplated without Exultation; as ministering to Humanity.

And may Generosity, Urbanity, and Truth, continue to characterize all the Acts of this College; without Distinction of Nation, or Government!

The magnificent Displays of Fruits of Learning, Science, and Industry, of an illustrious Philosopher in FRANCE, stimulate to Research, and determine the Pursuits of Naturalists, in every Part of the World.*

* **BARON GEORGE CUVIER** was elected *Honorary Member* of the Royal College of Surgeons in London, in 1818.

And Writings, with interesting graphical Illustrations, which have been eloquently extolled in this Theatre, prove, that in FRANCE, and other Countries, are Men diffusing Light in every Path of chirurgical Science; and exciting, with powerful Effect, the Energies of congenial Spirits.

But say, Candid Observers of the Progress of Natural Knowledge; who kindled this Spirit of Research; and gave correct Direction to its pervading Influence? Who instituted, in this Place, Tests of the Truth of Opinions, on the Structures, and Functions, of Organs; and the Effects of morbid Action?

Respected be the Memory of a distinguished French Anatomist, BICHAT; who, actuated by the Spirit of HUNTER, has been a successful Labourer in the Field of his Cultivation.

The Works of BICHAT exemplify the Force

of **Disposition**; the zealous **Application** of great **Abilities**, to the **Objects** of **Pursuit**; and the **Exercise** of a **Mind**, fruitful of **Ideas**, together with the **Faculty** of arranging them with felicitous **Effect**.

This **Topic** of the **Influence** of **Governments** on the **Progress** of scientific **Knowledge**, may be fitly closed—by invoking continued **Blessings** on this **Land**; and **Perpetuity** to its **Constitution**, and legal **System** of **Government**: protected by which, every **Man** may securely cultivate his **Talents**; whether in the ancient **Seats** of **Learning**, and **Science**, hallowed by **NEWTON**, **BACON**, and other **Sages**; or in the **Metropolis**, amidst the **Works** of **HUNTER**, and **Scenes** of **Experiment**, and **Inquiry**; or, remote from busy **Enterprise**, and the **Calls** of **Distress**, in quiet **Meditation** on the **Pages** in which he has illustrated the **Laws** of the animal **Economy**: and,

under the high Authorities of which constitutional System, this College, and the various other Institutions in this Kingdom, stand firmly in their legally established Rights, and Privileges.

From the Period of the Foundation of this College for the Reception of the HUNTERIAN COLLECTION,* Improvement in anatomical and chirurgical Science, has proceeded with a Rapidity, so much surpassing its former Progress, as to merit the special Consideration of Men, devoted to the Prosecution of Endeavours for the future Honour and Advancement of Surgery.

The Exercise of Intellect, as of the physical Powers, depends upon appropriate Excitement: and Action, when excited, is, in each Case, governed by inherent Disposition.

* Vested in the College, in the Year 1799.

HUNTER awakened latent **Faculties of Mind**, by his demonstrative **Energies**: and **Disposition** impelled **Pupils** into his **Paths of Knowledge**.

What were the **Collections** of animal **Productions**, in the various **Depositories** of this **Kingdom**, before the **Elucidation** of such **Objects** by **HUNTER**? **Gazing Stocks**, for **Admiration**! Or at best **Sources of Information**, relating only to external discriminative **Characters**.

From the capacious **Mind** of one **Man**, principally, sprang the **Benefits**, and **Honour**, which we this **Day** celebrate.

Mr. HUNTER conceived the **Plan** of his **Collection**; with ardent **Anticipation** of the **Benefits** which it was to confer upon **Mankind**; by the **Promotion** of natural **Knowledge**, in **Subservience** to the **Healing Art**: and every **Day** more and more unfolds the **Nature**, **Extent**, and **Importance**, of the unexampled, and noble **Design**.

But to appreciate duly the Contents of the Museum of the College, they must be considered, not only as conducing to the direct Purposes of the Collection; but, also, as extending the Sphere of human Knowledge to all such Objects of this Globe, as are produced by animal Agency; or by extraneous Influence on animal Substances. Thus, the vast Assemblage of organic Remains; and the Specimens of testaceous, and various other animal Conversions, will be contemplated by Geologists, with philosophical Interest, and Delight.

Nor will Inquirers into the elementary Constituents of animal Matter, under its various Modifications, be here disappointed. The Results of accurate Analyses, directed, by Judgment and Experience, of vesical Calculi, of other animal Concretes, and Substances of numerous Distinctions, will illustrate Subjects, under

Inspection; and gratify the scientific Promoters of animal Chemistry.

Surgery, being founded on anatomical, physiological, and pathological, Knowledge, must necessarily, at all Times, have Relation, as to its Degree of Improvement, to the Extent of that Knowledge.

Until the Ideas of HUNTER were explained, by tangible Objects, comparative Anatomy had been little cultivated. The Light of Analogy had, consequently, been but faintly cast on the Organs of the human Machine: and, as the Knowledge of healthy Structure, and Function, was very defective; so, also, was that of Deviations, arising from external Violence, or morbid Action.

By Reference to the Hunterian Collection, these Imperfections became manifest: but, happily, Chasms of Ignorance were no sooner

discovered, than they were supplied by unerring Truths.

Explanatory Exhibitions of the Contents of the **Museum**, to **Visitors**, excited the **Desire** of **Research**: and thus the **Hunterian Collection** became a grand **Conductor** of the **Spirit** of **HUNTER**.

The **Professors** of the **College** felt its animating **Influence**; and, with increased **Ardour**, exercised their **Talents**.

Preceptors, in private **Schools** of **Anatomy**, and **Surgery**; and the **Surgeons** to the **Hospitals** in the **Metropolis**, with correspondent **Zeal** and **Labour**; pursued **Experiment**, and **Inquiry**, and with brilliant **Success**.

Thus did **JOHN HUNTER** lay the **Foundation** of a **Design**; destined to be a **Monument** of his own **Excellence**, and a **Source** of increasing **Benefit**, and **Honour**, to this **Nation**.

He did more: having prepared **Demonstrations** of the **Elements** of the **Structure** which he contemplated; he illustrated, by **Writings** and **Lectures**, their **Accuracy** and **Truth**.

The **Superstructure** is still rising, in due **Proportion** and **Harmony**; obediently to the **Mind** which conceived, and the **Hand** which began, the **Work**.

Although, for the **Reasons** assigned, the **Eulogium** of any living, individual **Character**, be inadmissible on this **Occasion**; yet in an **Exposition** of the **Causes** which have contributed to the **Improvement** of **Surgery** in this **Country**, to pass over without respectful **Notice**, the **Exertions** of those **Members**, who fill the executive **Departments** of the **College**, would be inconsistent with the governing **Intention** of the **Oration**; and unjust to the **Feelings** of faithful **Observers** of the **Exercise** of their pure **Principles**, and public **Spirit**.

What Tribunal can be more interesting in its Judgments, than that which decides upon the Qualifications of those, who are to be instrumental, in the Restoration of the right Functions of Organs, and the Preservation of Life, to Human Beings? Such is the Authority which is vested in the Court of Examiners; under which they direct the Stamp of Approval of Men, as fit, and capable, to exercise the Art and Science of Surgery.

The Court of Examiners have manifested a Conviction of their Responsibility to their Country, to the World! In various Ways they sustain the Labours of Preceptors, in their proper Spheres of Instruction: and, as the Advancement of elementary Knowledge, and Improvement in the Art and Science of Surgery, may indicate, they require of Students, proportional Time, Diligence, and Research, in the Acquisition of that Knowledge,

the useful Application of which will be the principal Employment of their Lives.

The able and humane Members of the College, in every Part of the British Empire, on Sea and Land, afford a gratifying Testimony of the beneficial Consequences, of well-directed Labours, and judicious Exercise of Authority on the Part of this College.

The favourable Effects of a zealous Devotion of Time, and Talent, by the Curators of the Museum, are variously expressed.

The Condition, and Order, of the Contents of the Museum, declare conservative Diligence: the Rules of Visitation, and Style of Explanation of its Objects, express a serious Sense of final Intention: the Ardour of Professors, and the instructive Influence of their Demonstrations, and Doctrines, proclaim superintending Solitude: the daily Augmentation of the Contents of the Museum, are Signs of successful

Invitation to scientific Munificence: the important Addition of Books, appropriate to the Intention of an unfailing Library of Reference, opens prospective Views of Benefit from that Source of Information: the Prize-Subjects manifest Attention to Desiderata, in Anatomy, Physiology, Pathology, and Surgery—and the Publication of Transactions, consisting of interesting Observations, communicated by Anatomists, and Surgeons, from all Parts of the World; of Explanations, and graphical Illustrations, of Specimens in the Museum; and the Accomplishment of the elaborate Work of a descriptive Catalogue, not only of the HUNTERIAN COLLECTION, but also of the other numerous Contents of the Museum;* will complete the systematic Efforts which this College is making for the Maintenance, and Improvement, of chirurgical Knowledge.

* Vide Appendix. 1.

The Honorary Medal, as the highest Expression of Respect for scientific Merit, which the College can confer on any Individual, will naturally suggest to the Council the Necessity of constant and accurate Attention to every Discovery, and Improvement, which may occur in the wide Field of anatomical and surgical Cultivation; with a View to the just Estimation of comparative Merit and Pretension. And if the future Adjudications of the Medal be made, as doubtless they will, with the same Judgment which has marked the first Award,* they cannot fail of awakening generous and emulative Sentiments, in all the Members of the College.

In the Consideration of the Causes which have contributed to the Advancement and Honour of Surgery, the ANATOMICAL SOCIETY, con-

* Voted to JAMES PARKINSON, on the 10th Day of January, 1823.

stituted of Persons who are, or have been, Teachers of Anatomy, is entitled to distinguished Regard.

By Communication, and Assimilation, of liberal and scientific Sentiments, it has greatly promoted anatomical and chirurgical Knowledge.

An Appeal of this Society to the good Sense of the Nation, on the Importance of anatomical Science to the Community; and, on the Difficulty of effectually promoting its Cultivation, and Improvement; has a particular Claim to the Attention of the Managers of public Hospitals, and other eleemosynary Institutions; and of the sagacious Magistrates of this Kingdom.*

The continual Accessions to the Fund of general natural Knowledge, and consequently of anatomical and physiological, Science, from

* Vide Appendix. 2.

the **ROYAL SOCIETY** :* the liberal **Acts** of the **Trustees** of the **BRITISH MUSEUM**; of the **Principals** in high **Departments** of **Government**; and of the **Directors** of the **Honourable EAST-INDIA COMPANY**; towards this **College**—are **Contributions** to the **Advancement** of **Surgery**, and consequently to the **Comfort** of **Mankind**, above my **Praise**.

Thus far we have breathed only **Congratulations**, on the **State** of **Surgery**, and on the just **Estimation** of the **chirurgic Character**, in this **Country**.

But the **commemorative Design** would be **imperfect**, were it confined to the **Consideration** of **Occasions** of the **Improvement** and **Honour** of **Surgery**; and not to comprehend a **Review** of **Causes** of opposite **Tendency**, and **Effect**.

* **SIR HUMPHRY DAVY**, Bart. Pr. R. S. was elected **Honorary Member** of the **Royal College of Surgeons** in **London**, in **1821**.

Humanity claims the special Regard of Men professionally devoted to her Service; and the Advocacy of all who sympathize with the Sufferings of their Fellow-Men.

The British Philanthropist has at Length prevailed: and the inhuman Traffic in Slaves is abolished!

If Congruity of Sentiment be expressive of just Principles of Action, in Assemblies of Men; why are not the numerous, uninformed, People of this Country protected against the Arts, the Cruelties, the sordid Wiles, of Impostors who assume the Title of Surgeon?

Whence this Apathy in Men in whom have shone forth, Sentiments, and Feelings, most honourable to human Nature?

Can any Condition of Man present him a stronger Claimant to Commiseration, and Protection, than when he is weakened in Body, and

Mind, and bereft of Judgment, by Anguish, from Injury, or Disease?

Yet Men, destitute of Pity, of moral Principle, and of surgical Knowledge, are suffered to prey, with barbarous Indifference, on the Lives, and the Property, of their afflicted Fellow-Creatures.

The Council of this College, from certain Knowledge, and correct Judgment of these Facts, respectfully represented them to the Legislature, with Propositions for the Removal of the national Disgrace. Their Motives, individually, and collectively, were pure, and disinterested; the Provisions which they respectfully proposed were, consequently, simple and liberal.*

This College, of ancient Origin, was incorporated, for the Common Weal, under its present Title and Character, by our late revered Sove-

* Vide Appendix. 3.

reign; and, his present excellent Majesty has been graciously pleased, to stamp, with his Royal Approbation, the Success of its Exertions. Under the Auspices of the College, Resort may be had, in every Town and Village, to Surgeons, examined, and approved, for their Fitness and Capability. But these Provisions, daily Experience proves, are insufficient to protect Weakness and Credulity against the Arts of Imposture.

Frequently is the College censured for not exercising Powers—supposed to be possessed—for the Suppression of a Grievance, most adverse to the Improvement, and to the Honour, of Surgery.

Say, then, generous Senators, prompt Instruments of Succour to distressed Human Beings in the remotest Parts of the Globe; say, shall such Disgrace remain a Cloud on the Character of this Land of Charity?

The Analogy of all Nature sanctions the practical Application of the Principle, of a Centre of Union for Minds engaged in similar Pursuits; producing an harmonious Movement of Ideas for the common Benefit.

If this College be the Vinculum of the Hospitals in the Metropolis, connecting them, by its various Functions, into systematic Pillars of the useful Fabric of Surgery; whatever Conduct may affect such established Order, must be injurious to the Designs of the College; consequently, to the regular Arrangement of Hospital-Education, and to the Interests of the Community.

Have Teachers, and Surgeons to Hospitals, meditated the Separation of the Art, from the Science, of Surgery? Have they gravely considered the Acts which tend to it; the Consequences to Society of such a Disunion? Have they reflected on the limited Benefit

which accrued to the Community from Surgery, and its low Degree, in the Scale of popular Estimation, at a Period, when the Jargon, called Science, was assigned to one Order of Men; and the irrational, operative, Part, to another, of uninformed, and dependent Minds? Have Teachers, and Surgeons to Hospitals, at this Day, less Knowledge of the Structures, Functions, Diseases, and Imperfections, of the Organs of Sense, and of other important Parts of the human Fabric, than Surgeons of former Times? Or are they less endued with proper Faculties, than Men of little Experience, and of circumscribed Information? Are local Benefits to be put in Competition with the liberal System of Education of Pupils in Hospitals, and consequent general Advantages to the Public? Shall not the scientific Principles, and the manual Exercise of them, in Surgery, continue to be united in the same Person? Can

the combined **Qualities of Judgment**, and operative **Skill**, be employed, so efficaciously for the **Improvement of chirurgical Knowledge**, as by **Surgeons**, surrounded by **Pupils**, in the **Wards** and **Theatres of Hospitals**? Should not the public **Hospitals** be adequate to all the humane, and preceptive **Purposes**, for which they were established?

Is there any **Doubt** as to the **Intentions** of those benevolent, and pious, **Persons**, who founded **Infirmaries**, as **Asylums** for indigent **People**, disabled by **Injury**, or **Disease**; and as **Schools of Instruction** in the **Healing Art**? Are these **Institutions** maintained and regulated, in the liberal **Spirit** of the **Founders**, with a due **Regard** to the **Advancements of Science**?

What would have been the **Sentiments**, on these **Subjects**, of the illustrious **Dead**, who had just **Notions** of the extensive **Utility** of **Hospitals** in the **Metropolis**; and of the genuine

Dignity which belongs to them, and to the **Administrators** of the **Benefits**, for which they were designed? Of **CHESELDEN**, **SHARPE**, **ELSE**, **WARNER**, **WATSON**, **HAWKINS**, **POTT**, and **HUNTER**?

The **Economy** of **Hospitals**, especially of those in the **Metropolis**, has such interesting **Relation** to the **Design** of this **Ceremony**, that a further **Remark** on the **Subject** of them may not be improper.

The **Credit** of an **Hospital**, in the **Minds** of enlightened **People**, consists in a small degree only in its **Riches**: for these may be abundant, and managed with **Fidelity**, yet the **Institution** may be low in the **Estimation** of **Men** of **Science**, and comprehensive **Benevolence**.

That **Character** of an **Hospital**, which should be the **Object** of **Attainment** and **Maintenance**, because expressive of its extensive **Utility**, is derived, principally, from the scientific **Exer-**

tions in a regular **Line of Succession** of its learned, humane, and honourable professional **Officers**. Their **Endeavours** should, therefore, be supported by **Persons** of liberal **Sentiments**, whose **Education** enables them to judge correctly of all which relates to the **Cultivation and Improvement of the Healing Art**.

Such is human **Nature**, that from **Amiability** of **Disposition** may proceed **Acts**, not consistent with strict exemplary **Propriety**. Whence appears the **Importance** of considering the **Influence**, which the **Actions** of one **Man** may produce on the **Conduct** of others.

Mr. HUNTER possessed a **Heart** so susceptible of grateful and generous **Impressions**, that he was sometimes induced to allow the **Sanction** of his illustrious **Name**, without due **Consideration** of its **Weight** with professional **Characters**, and in the public **Estimation**; and thus he became, an unconscious **Promoter** of the

Designs of interested and artful Persons; and a dangerous Exemplar.

The Interest of Science, the Honour of Surgery, and the general Good, require, that Men, who, from Vanity, Avarice, or other base Motive, artfully endeavour to produce on the public Mind an Impression of extraordinary, and exclusive chirurgical Knowledge, and of wonderful Skill in the Exercise of it; far from receiving Sanction and Encouragement, to their own immediate Advantage and Promotion; or to any Scheme, which, for their own Ends, they desire to advance; should meet, from honourable Men, repulsive Contempt.

Having, with painful Feeling, performed the Duty of Animadversion on such Proceedings, and Conduct, as are calculated, in their Consequences, to dishonour Surgery; let us turn to the Celebration of the Examples of Men, whose

Labours have been successfully directed to its **Advancement**, and eventual **Honour**.

The **Retrospect** of **Benefits** is darkened by **Regret**, when we recollect, that the principal **Authors** of them, were, as **Yesterday**, living **Ornaments** of this **College**; warmly engaged in its useful **Designs**; amiably conducing to mutual **Comfort**; reciprocally communicating and cultivating the most honorable **Feelings**, and **Sentiments** of our **Nature**; and always, with perfect **Union** and **Harmony**, joining in **Resolutions**, the **Result** of deliberative and disinterested **Judgment**: nor can, nor should the **Reflection** be suppressed, that, within a short **Time**, in uncertain **Succession**, we shall be numbered with our **Friends** in the **Grave**.

Let us then employ the remaining **Moments** in this **Place**, in the most useful and gratifying **Manner** in our **Power**; by presenting, for Imi-

tation, the excellent **Examples** of our departed **Brethren** ; and by rendering to their **Memory**, the **Tribute** of **Gratitude** and **Respect**.

The **Labours**, and **Acts**, conducive to the **Advancement** of **Surgery**, for which **Men** are entitled to honourable **Record** in the **Annals** of the **College**, and to **Memorials** of **Respect** on this **Occasion**, are various.

Diligent Research ; judicious **Experiment** ; accurate **Observation** ; and unreserved **Promulgation** of **Discovery**, or **Improvement** ; constitute a **Character** in **Surgery** worthy of exalted **Eulogy**.

Benefactors to the **Museum**, to the **Library**, or to the general **Purposes** of the **College**, will ever be commemorated, by the faithful **Analyst**, in **Terms** of **Gratitude** and **Respect**.

The **Memory** of **Contributors** to the **Transactions** of the **College**, will necessarily be hand-

ed down, with the Accession of due Honour, by the Works of their own Skill and Research.

The Duties of the College are multifarious, and toilsome; and Men, who have zealously employed their Powers and Faculties in its administrative Departments, will be remembered by the Fruits of their meritorious Services.

And, if ever a Person, beloved for his Disposition, Endowments, and Learning, shall decline a Station of Distinction in this College, from conscientious Feeling, relating to some corporeal Faculty; let him be honoured, as possessing a Delicacy of Principle, and a Rectitude of Sentiment, which do not always actuate the Conduct of public Men.

Before we offer our Tribute of Respect to the Memory of Persons, whose Pursuits immediately connected them with the College, we

naturally turn to a **Benefactor**, who, in his extraordinary **Ardour of Research**, knew not any **Distinction**; but embraced the **Interests** of all **Institutions**, intended for the **Promotion of Science**, and useful **Knowledge**.

The **Eagerness**, with which the **Friends of Science and Humanity** have stepped forward, to commemorate the **Virtues and Talents** of **SIR JOSEPH BANKS**, suggests to us the only **Offering** which grateful **Minds** can now make to his **Memory** — the silent **Homage of Respect**! The **Extent and Universality** of his **Labours**, directed to the **Elucidation** of every **Department of natural Knowledge**, have been expressed, in **Terms of generous Praise**, by the brightest **Ornaments of the Sciences** which he so richly **Adorned**.

The illustrious **HUMBOLDT**, after reviewing the **Difficulties and Losses**, which he had sus-

tained, relieves his **Mind**, by the noble **Consideration** of the essential **Services** rendered to him by **SIR JOSEPH BANKS**; who, he says, “amidst the political **Agitations** of **Europe**, laboured, without **Relaxation**, to confirm those **Bonds**, by which the **Learned** of all **Nations** are **United**.” *

We pass from him, who thus moved the scientific **World**, to the **Celebration** of **Persons**, whose **Labours** and **Benefits**, although confined immediately to **Objects** of the **College**, are, in their **Consequences**, interesting to all **Mankind**.

Regularity, and general **Agreement**, in the **Rules** of **Administration**, of the numerous **Corporations** in this **Kingdom**, necessarily contribute to the **Preservation** of **Order** in the national **Community**.

* “ Voyage au Nouveau Continent.” Introduction, Page 11.

Accordance is especially necessary, in the Government of Establishments, intended for the Cultivation and Improvement of natural Knowledge, and of its Application to the Healing Art. The Proceedings of such Bodies should so harmonize, as constantly to conduce to the common Object; yet not interfering with distinct Functions, or the Scale of accustomed Precedence.

These Observations were suggested by the Recollection of the Names of some late Members of the Council of this College, who were diligent in framing, and strenuous in supporting, its Statutes and Ordinances.

SIR CHARLES BLICKE regularly attended the Calls of Duty, at the College. He possessed a quick and accurate perceptive Faculty; whence his Opinion was highly valued, and it was given with independent Spirit.

SIR CHARLES was a consistent **Benefactor**. Although, from the **Beginning** of the collegial **Establishment**, a **Library of Reference** was a declared **Part** of the **System** adopted for the **Communication** of scientific **Knowledge**; and notwithstanding **Invitations** to **Members** of the **College** and other **Persons**, to promote that **Object**; until **SIR CHARLES** became a liberal **Donor of Books**, the **Appearance** of the **Library** was poor indeed! **SIR CHARLES** manifested to the last his uniform **Disposition** to keep alive **Attention** to the **Library**; by the **Bequest** of a **Sum**, towards a **Fund**, intended solely for the **Purchase of Books**.*

The **Records** of the **College**, particularly the **Reports** of the **Boards of Curators**, declare the noble **Additions of Books**, which have since been made to the **Library**. **Reflection** on the

* **SIR CHARLES Blicke**, Knt, was elected Assistant, in 1791.

Benefits thence accruing to **Learning, Science,** and the **Labours of Humanity,** will cheer the **Hearts of the Donors** all their **Days:** and the **Memory** of them will be handed down, and ever gratefully cherished in the **Minds** of those, who value and would promote useful **Knowledge.**

SIR JAMES EARLE was prepared, by natural **Endowment,** and literary **Attainments,** to pursue the **Path** of his illustrious **Master, PERCIVAL POTT;** and to examine, with useful **Effect,** the **Sources** of that **Light,** by which he had been guided.

The **Principle,** of inducing inflammatory **Action,** and its **Consequences,** by various **Fluids,** established, by **SIR JAMES,** in its **Application** to one **Description** of **Case,** proves of practical **Utility** on other **Occasions.**

SIR JAMES has faithfully expounded the

Doctrines of his **Preceptor**; and enriched the **Text** with divers valuable **Observations**, from his own **Experience**.*

Mr. LONG possessed great natural **Gifts**, high **Attainments**; and a **Disposition**, meditative, and patient in the **Pursuit** of **Knowledge**: fit **Qualifications** in a **Legislator** of **Statutes** for the **Government** of the **College**! And he exerted all his powerful **Faculties**, in the joint **Labour** of constructing a **Code**, which is characterized by its **Simplicity**, liberal **Spirit**, and experienced **Efficiency**. A **Consideration** which should ever guard it from the **Evils** of **Precedent**; whether introduced by **Infraction**, or **Relaxation**, or **Vacillation** of **Judgment**.

The **Annals** of the **College** commemorate his **Munificence**, to the **Museum**, and to the **Library**; in his **Life**, and by testamentary **Remembrance**.

* **SIR JAMES EARLE**, Knt. was elected Assistant, in 1789.

The constant, and warm Support of the College, by a Man of such Understanding, and Integrity, is its highest Panegyric, and most rational, and persuasive Recommendation, to sagacious and beneficent Persons, who may have the Power of promoting its public Objects.*

The correct Performance of the laborious Duties, confided to Mr. KEATE by the SOVEREIGN; and the public Benefits derived from them, are not Subjects of Eulogy on this Occasion. But his Abilities were successfully employed in every Department of the College; and Mr. KEATE ranks highly in the Catalogue of its Benefactors.

The Library expresses his Acumen, and Taste, by the Manifestation of Utility, combined with Grandeur of Effect.

* WILLIAM LONG was elected Assistant, in 1789.

The Memory of Mr. KEATE will be holden in grateful **Recollection**.*

Professor WILSON possessed great **Talent**; and extensive **Knowledge**, acquired by exemplary **Diligence** and **Labour**. His **Abilities** were signally displayed in this **Theatre**. He bore modestly his truly deserved **Honours**: and, had his **Mind** been less susceptible, and had he been decreed **Length of Days**, his unassuming **Merit** would, doubtless, have been more and more conspicuous.†

The Recollection of Mr. CHANDLER awakens **Sentiments**, and **Feelings**, most honourable to his **Memory**.

A Mind, fraught with every **Advantage** of **Education**, and **Study**; and a **Disposition** most

* **THOMAS KEATE** was elected **Assistant**, in 1793.

† **JAMES WILSON** was elected **Assistant**, in 1817. The excellent **Lectures**, delivered by him in the **Theatre** of the **College**, and since published, should be attentively read by every **Student** in **Surgery**.

amiable, constituted his exemplary Character.

His Abilities, and Suavity in the Exercise of them, must have made a lasting Impression on the Mind of every Member of the Council.

Mr. CHANDLER constantly, and most beneficially, attended his Duty, in the Committee for framing a System of Bye-Laws, and Standing Orders: the strict Observance of which, he, afterwards, invariably supported. Upon every Occasion, he conscientiously maintained the Dignity and Welfare of the College.*

Mr. HEY was an active, successful, and, thence, a distinguished Cultivator of the Art and Science of Surgery. His able and interesting Biographer has explained his scientific Character and Merits; and has rendered that Honour to his Memory, which, otherwise, would, on this Day, have been attempted; with

* GEORGE CHANDLER was elected Assistant, in 1791.

equal Sentiments of Esteem, and Feelings of Respect; but by very inadequate Abilities.*

† The Design of OMNISCIENCE in the Allotment to Men of different Spans of Life, is beyond human Comprehension.

Let us then, resignedly, devote a Moment to the Contemplation of those preceptive Faculties which were eminently displayed by a brief Sojourner on Earth.

The intelligent Pupils of that ancient School, where CHESELDEN, and SHARPE, advanced the Honour of Surgery, will bear feeling Testimony to the ample Fund of anatomical and physiological Knowledge, the accurate Skill, the demonstrative Perspicuity, the placid and persuasive Manners of their late beloved Preceptor.

His acknowledged chirurgical Abilities, and Zeal in scientific Researches, impressed the

* Mr. HEY was admitted a Member of the Corporation of Surgeons, in 1768.

† Omitted in the Delivery of the Oration.

Board of Curators, and the other Departments of the College, with the Hope and Expectation, that in him Surgery would long experience a diligent Promoter, and distinguished Ornament—honoured be his Memory!*

The Death of Dr. JENNER will be lamented by all the **World**. His **Memory** will be eulogised to the **End of Time**. The **Extent of the Benefits of his Discovery** is yet only in **Anticipation**. The influential **Principle of Vaccination** may lead to a **Knowledge of analogous Changes in the human System**. It has opened a new **Field for Discovery, to Investigators of morbid Actions, and prophylactic Agencies**.

Dr. JENNER was educated to **Surgery**; and was a diligent **Pupil of Mr. HUNTER**. He enriched natural **Knowledge** with many curious **Facts, and Observations**: several of which were the **Results of Experiments, performed at**

* **HENRY CLINE** was admitted a Member of the College, in 1804; and died in 1820.

the Suggestion of his Friend, Mr. HUNTER; as recited in his Work on the Animal Economy.*

Whoever shall contemplate the Force of the Example of Mr. HUNTER, in his unwearied Devotion to Experiment, and Inquiry; and the friendly Intercourse which subsisted between Dr. JENNER and him; will be led to admit, that Mr. HUNTER awakened, and sustained, in his Pupil a Disposition to active Research, after Facts relating to extraneous Influence on the Organs of the Human Body; and, by a natural Chain of Reasoning, that his inestimable Discovery was probably a Consequence of Energies, from a Disposition thus excited, which, otherwise, might ever have been dormant.

The Dejection of Science, on this Occasion, may be diminished, and the Hopes of Humanity may be cherished and maintained, by the

*. Vide Appendix 4.

Declaration, that the **C**ouncil of this **C**ollege, are unshaken in their **C**onfidence of the **E**fficacy of **V**accination, in exterminating **S**mall **P**ox : and, by the **A**nnouncement of their **O**pinion, that the **M**an who should keep alive **S**mall **P**ox by **I**noculation, would be a guilty **C**ause of **M**isery, and **D**eath, to human **B**eings; and, that he would, consequently, be a **D**isgrace to that **P**rofession, the primary **O**bjects of which are, **P**revention of **D**isease, and **P**reservation of **L**ife.*

Having congratulated this honourable **A**ssembly on **C**auses which have favoured the **A**d-
vancement of **S**urgery; having lamented **E**vents
adverse to its **I**mprovement, and general **U**tility;
and having expressed the **H**omage due to the
Memory of many departed **C**ultivators of those
Fields of **S**cience, which are the proper **D**o-
mains of the **M**embers of this **C**ollege: your
Attention is, finally, claimed, to a few general

* Vide Appendix 5.

Remarks, on the Labours of that Philosopher, the Light of whose Discoveries is reflected by the Pages of every modern, and esteemed Work, on the Healing Art.

And what can be more laudable in the professional Character, than a **Disposition** to derive, and acknowledge, Information from his unfailing **Sources**? To what other **Founts** of **Knowledge**, indeed, can **Inquirers** so properly resort for elementary **Truths**? For, what **Subject** of **Injury**, or **Disease**, has not some **Relation** to the circulating **Blood**; to absorbent **Function**; to muscular **Agency**; to the **Offices** of the **Stomach**, and other **Organs** of **Digestion**, and **Assimilation**; to the electric **Principle** in **Animals**; to animal **Heat**; to the vital **Energy** of **Brain**, and **Nerves**; to sympathetic **Movements**; to original **Disposition**; to morbid **Derangement**; and to harmonizing **Energies**?

Presumptuous, indeed, would be the **Man**, who should maintain a positive **Opinion** on any **Principle** in **Surgery**, without the **Knowledge** of the **Facts**, relating to it, which have been recorded by **HUNTER**: without an **Acquaintance** with all his **Writings**, and **Demonstrations**, since the various **Subjects** of them reflect **Light** on each other; expressed by his **Facts** and **Observations**, on **Wounds**; on **Resuscitation**; on the **Communication** of **Variola**; on **Inflammation** in the venous **System**; on syphilitic **Action**; on **Aneurism**; and by his **Remarks** on various other **Topics**, explanatory of animal **Processes**, under morbid **Influence**, or extraordinary **Excitement**.

And what **Naturalist**, who should exalt his **Mind** to the **Comprehension** of general animal **Existence**, and its **Connexion** with other **Productions** of the terraqueous **Globe**; would advance on such a wide **Range** of **Inquiry**, without the

Acquisition of those Truths, which would illuminate every Step in his arduous Journey of Discovery? without previous Meditation upon the Series of Demonstrations in the HUNTERIAN Collection; which exemplify the Formation of animal Solids, and Fluids; the Agencies exerted in the Support of Life; the Organs which connect Animals, by different Relations, with external Objects; the organic Provisions for the Continuance of the Species of Animals; and without a Knowledge of the numerous other Illustrations, spread through the Museum, of the Structure and Economy of Animals, which, under their various Changes of Condition, conduce to the Ends for which they were created.

Informed from these Sources, and moved by the genuine Spirit of Inquiry, he would proceed, with Confidence and Delight, in his philosophical Career.

Were the **Laws** of the animal **Economy**, as expounded by **HUNTER**, and his **Doctrines**, studied, as primary **Exercises**; the **Works** of ancient, and even of late, **Writers**, would be understood to more general and useful **Effect**.

“ These **Laws**, and **Doctrines**, extended
 “ through voluminous **Pages**, if reduced into
 “ aphoristical **Form**, would instantly impress
 “ the **Mind** with their **Simplicity**, natural
 “ **Dependence**, **Beauty**, and **Truth**.”*

The **HUNTERIAN** Collection; the other **Contents** of the **Museum**, in correspondent **Arrangement**; the **Care**, and **Application**, of the **Whole**, by **Means** the most conducive to the **Objects** of the **College**; are amongst our immediate, and imperative, **Duties**.

But this **Edifice**, erected with the utmost

* Oration 1815, Page 77.

architectural **Adaptation** to its **Purposes**, is not sufficiently capacious for the useful **Display** of all its interesting **Contents**. The unarranged **Stores**, if disposed for useful **Observation**, would nearly equal the **Preparations** now exhibited to the **Sight**, and **Mind**.

But the **Attention** of the **Council** is directed to this **Object**: and the **Energies** and **Resources** of the **College** will on this, as on every other **Occasion**, be guided by public **Spirit**.

In the planetary **System**; and in the physical **World**; a **Principle** is ordained, to prevent **Aberration**; and thus, to maintain **Regularity**, and **Order**.

May the **Influence** of **Hunterian Orations**, be so directed, as to prove corrective of rising **Error**, in the **Pursuit** of natural **Knowledge**, and in the **Exercise** of the **Healing Art**!

Mr. HUNTER, by his unequalled **Collection** has been a forcible **Instrument**, of elevating **Minds**, in **Search** of physical **Truths**, to the sublime **Contemplation** of the **CREATOR** of the **Universe!**

The principal **Endeavour**, this **Day**, has been, to concentrate, and direct to your **Minds**, some of the widely spread **Rays** of the **Luminary**, **HUNTER**: to you, respected **Brethren**, belongs the more important **Work**, of multiplying, and reflecting them, by **Labours** of **Science**, to the **Honour** of **Surgery**, and to the **Lustre** of his **Memory!**

Gentlemen:

The **Theme** of the **Hunterian Oration** is, “**The Honour**, and **Advancement** of **Surgery.**” Its **Honour** has been defined; its **Advancement**, thence, understood: and highly

have they been expressed, and promoted, by **Royal Patronage, and Munificence.**

What Act will satisfy expectant Gratitude, on this memorable Occasion? What is decorous on the part of Subjects, in Token of their Sense of Benefits conferred upon Science, and upon Mankind?—Consonantly with the Practice of Men of noble Sentiments, from an early Period, to place a Bust of the Sovereign whom they venerate, appropriately for grateful Contemplation. The Council have, accordingly, by gracious Permission, obtained a Bust of the most illustrious Patron of this College; executed by that Artist, who penetrates the very Recesses of Heart, and Mind, and embodies their Expressions: and it does Justice to the Benignity of the most august Monarch, GEORGE the FOURTH; whose bounteous Encouragement, of Learning, of the

Arts and Sciences, and of Works of Humanity,
is conspicuous, in the successful Labours, and
the Happiness of his Subjects, and in the Glory
of the Nation !



.....

APPENDIX.

.....

(1.)

THE Contents of the Museum of the College, with Reference to the Subject of a descriptive Catalogue of them, may be classed, generally, under the Heads of Hunterian Collection, and of Donations from Members of the College and from other scientific Persons.

The Preparations in both these Classes, are illustrative of the animal Economy, in the perfect Condition of Organs for the Performance of their ordinary Functions; and in their Structures and Actions altered by morbid Excitement.

To harmonize the Preparations of the Hunterian Collection with those from munificent Individuals, and to render the whole as conducive as possible to the Ends for which the College was founded, have been and are Objects of the incessant Attention of its executive Departments.

All the Duties of the College, relating to the Hunterian Collection, might soon be fulfilled: but the Boards of Curators have toiled, in the Spirit which suggested the Obligations, with Views far beyond what they require.

The Board of Curators are pursuing the Object of a comprehensive Catalogue, under a due Sense of its Importance; since, with other great Benefits, it will for ever secure those which result from the present Accuracy of explanatory Exhibition, and which no Catalogue should be allowed to supersede.

(2.)

(Copy.)

The undersigned, who are or have been **TEACHERS of ANATOMY**, *respectfully represent to the* **ROYAL COLLEGES of PHYSICIANS and SURGEONS**, *that, in their opinion, the following subjects should be submitted for consideration to the* **GOVERNMENT of the COUNTRY**, *its* **MAGISTRATES**, *and the* **DIRECTORS of ELEEMOSYNARY INSTITUTIONS**.

1. **MEDICAL** or **chirurgical** knowledge has never been acquired and augmented, but in proportion as **Anatomy** has been practically taught and studied.

2. The importance of medical and chirurgical knowledge, although universally admitted, is never clearly understood, nor strongly felt by individuals, until such knowledge be urgently required. A few instances will sufficiently illustrate this truth.

The industrious parent of a numerous and happy family may, even in the vigour of life, in consequence of neglecting the faulty actions of some important organ of his body, suffer disease to become established, and may thence prematurely perish, leaving the individuals of his family a burthen to society, and an affliction to each other: whereas, an intelligent Physician could have warned him of the dangers of such neglect, and have shewn him how these errors, the precursors of incurable disease, might have been corrected and their fatal consequence prevented; yet no Physician could do this without a knowledge of the structures and offices of the several organs which compose the human frame; for the knowledge of the healthy actions of organs can alone enable him to distinguish and correct those which are unhealthy, and which, if continued, must prove fatal.

A man having that common infirmity, a rupture, might revile those who dissect the dead body; but, when the protruded bowel shall be strangulated, his rupture, if left to itself, must bring him to a certain and most painful death: yet he might be relieved from agony and destruction by a simple and secure operation, when performed by a person conversant with Anatomy; though dangerous in the extreme when attempted by hands not sufficiently practised in dissection.

3. From conviction of the importance of anatomical knowledge to health, maintenance of life, and the happiness of the community, the legislature or police of almost every other civilized country has provided means for teaching Anatomy; whilst in this, the Teachers of so important a science are obliged to depend upon persons of doubtful character for the necessary supply.

The Colleges of Physicians and Surgeons properly require, that candidates for admission, as members, should have frequently dissected, and should be perfectly acquainted with the situation, structure, connexions, and functions of every part of the human body; and must, therefore, as they regard the "common weal" for which they were instituted, deeply regret that the opportunities of obtaining such requisite information are very deficient.

4. There are in this, and in every country, many persons who die without relatives or friends surviving them; and, if the Public could be reconciled to their remains being

made the subjects of anatomical investigation, the disinterment of those of others, for this purpose, would never be necessary.

5. Whilst, however, this necessity exists, it is surely wise and benevolent to suppress the Publication of the discovery of an act which may painfully agitate the minds of individuals, but which, in the present state of society, is indispensably necessary to the general good.

The disinterment of a body cannot, it is presumed, be considered legally as more than a trespass; and in a trial for this offence, in which its necessity was argued before LORD KENYON, in the Court of King's Bench, his Lordship sentenced the offender merely to a small fine without any imprisonment; yet some magistrates, influenced by a natural feeling, and without reflecting on the necessity of the deed, have punished persons convicted of this offence with the utmost rigour of the law.

[Signed.] WILLIAM BLIZARD (*Chairman of the Anatomical Society.*)

MATTHEW BAILLIE

JOHN ABERNETHY

T. J. ARMIGER

CHARLES BELL

B. C. BRODIE

HENRY CLINE

EDWARD COLEMAN

ASTLEY COOPER

H. T. FRAMPTON

JOSEPH HENRY GREEN

JOHN HAVILAND

R. C. HEADINGTON

EVERARD HOME

CHRISTOPHER PEGGE

JOHN SHAW

EDWARD STANLEY

H. L. THOMAS

JAMES WILSON

Members of the Society.

(3.)

(*Egyp.*)

The COMMITTEE, appointed by the COURT of ASSISTANTS, on the 7th Day of April, 1813, to take into Consideration, and direct an Application to the LEGISLATURE, for preventing ignorant and unqualified Persons from practising as SURGEONS.

SIR JAMES EARLE, KNT.

MR. LONG,

MR. CHANDLER,

SIR CHARLES BLICKE, KNT.

SIR WILLIAM BLIZARD, KNT.

MR. CLINE,

MR. NORRIS, and

SIR EVERARD HOME, BART.

Final REPORT of the COMMITTEE to the COURT of ASSISTANTS.

THE COMMITTEE, deeply impressed with the deplorable Truth, that ignorant and unqualified Persons are not restrained by Law from practising as Surgeons; and that, from the Want of such Restraint, the Health of His Majesty's Subjects is greatly injured, and the Lives of many are destroyed: influenced, at the Time, by Considerations of the Fitness and Propriety of the Propositions contained in the former Bill: convinced of the complete Adequateness to the Ends designed, of the Provisions in the Bill lately submitted to the Legislature: and undismayed by timid Suggestions of Danger to the Finances of the College, while Benefit to all the Inhabitants of the United Kingdom was the grand Object in View: the Committee entered upon, and proceeded in, the Discharge of the Duties of their important Trust with Alacrity and favourable Expectation.

The Minutes of their Proceedings have been regularly presented to the Court; and may at any Time be resorted to for Information, with entire Dependence upon their Accuracy.

The Occurrences on the Occasion of the former Bill extended the Views of the Committee, and directed their Judgment in the framing of that lately introduced.

The Principle of this Bill, the Committee maintain, is simple, dignified, and obvious, *the Rescue, of the People from the Ravages of ignorant and unprincipled Pretenders to surgical Knowledge*; and, consequently, *the due Encouragement of qualified Surgeons*: that the Clause, relating to examined Surgeons practising in Ireland, is founded in Justice: and that the Provision concerning Men-Midwives is defensible, as the only Expedient, for the good Purpose intended, admissible by the College; and to the Adoption of which the Committee were urged by competent Judges on the Subject, and by Motives of Humanity.

The pure, liberal, and public Design of the Committee, according to the Intention of the Court, has, however, been met by Opposition originating in contracted and interested Considerations. But, although this be an incontestable Fact, it cannot be dwelt upon without implicating Men, who, notwithstanding Appearances, may have been deceived, and may have acted from fair Intention.

The Committee were not ignorant of the Sources, nor of the Motives, of the intended Opposition; but, as the former were generally known, and the latter were plainly unworthy, little Doubt could be entertained, that it would be successfully combated by the Penetration and Abilities of those Persons who had undertaken to explain and advocate the Principle, and Provisions of the Bill.

The Fate of the Bill is before the Public; but the Merits of it have not been explained. The proper Judges of the Nature and Magnitude of the Evils actually suffered by the Community, and of the simple Remedy proposed for the future Prevention thereof, have not been heard. Upon this Occasion, Ignorance, Misrepresentation, Prejudice, and the Influence of private Interest, have swayed against public Spirit, Truth, and Humanity.

The Committee are happy in the Reflection, that the Cause confided to them by the Court has been just and honourable; that it has been prosecuted with liberal and unreserved Communication; and they confidently hope, while the Functions in the several Departments of the College shall continue to be performed with Energy, and Correctness; that, in Proportion as the late Proceedings shall obtain Publicity, and be properly understood, the College will necessarily rise higher and higher in Dignity and general Estimation.

The Committee were desirous that, with the Record of their Proceedings, should be handed down their governing Sentiments upon the Subject of their Trust.

They gratefully acknowledge the Authority and Support which they have constantly derived from the Court, and now respectfully resign their Trust; with perfect Consciousness of having always employed the Powers vested in them, in Endeavours to promote the Object of the Charter of Incorporation, "*the Common Weal of the Kingdom,*" and thereby the Honour, Dignity, and Welfare of the College.

LINCOLN'S-INN FIELDS:

APRIL 16th, 1818.

(4.)

Sir EVERARD HOME, in his Life of Mr. HUNTER, prefixed to Mr. HUNTER's "TREATISE ON THE BLOOD, &c." Page 21, says —

"Dr. EDWARD JENNER, of Berkeley, boarded in the House of Mr. HUNTER, in 1770 and 1771; and lived in Habits of Intimacy with him till his Death."

Mr. HUNTER in his Work of "OBSERVATIONS ON CERTAIN PARTS OF THE ANIMAL ECONOMY," Page 112, says —

"As I was unable to procure Hedge-hogs in the torpid State, to ascertain their Heat during that Period, I got my Friend, Mr. JENNER, Surgeon at Berkeley, to make the same Experiments on that Animal, that I might compare them with those in the Dormouse; and his Account is as follows, &c."

Page 156, "*Observations on the Wolf, Jackal, and Dog.*"

"The following Account from Mr. JENNER, of Berkeley, to whom I gave a second Remove, viz. three Parts Dog, is very descriptive of this Propensity, &c."

Page 195, "*Observations on Digestion in the Hedge-Hog.*"

"The Subject of Mr. JENNER's third Experiment on the Heat of that Animal, &c."

Page 233, "*Intestine of a Hog, with pellucid Cysts.*"

"It was sent to me by my Friend Mr. JENNER, Surgeon at Berkeley, who informed me, that this Appearance is found very frequently upon the Intestines of Hogs that are killed in the Summer Months."

(Copy.)

WE, the PRESIDENT, VICE-PRESIDENTS, and COUNCIL, of the ROYAL COLLEGE of SURGEONS in LONDON; deeply impressed with the many fatal Instances of Small Pox which daily occur in the Metropolis, and in various Parts of the Kingdom; assured that such Events are, in a great Degree, Consequences of the Support and Propagation of that Disease by Inoculation; and, unshaken in our Confidence of the Efficacy of Vaccination in exterminating Small Pox: from a Sense of Duty to the Community, hereby renew the Engagement, entered into by the Court of Assistants in the Year 1813—not to inoculate Small Pox; but to pursue, and to the utmost of our Power promote, the Practice of Vaccination.

And we earnestly recommend, to all the Members of the College, similar Engagements; convinced, that the entire Extinction of Small Pox would be the happy Result of the Suppression of Inoculation of that Disease, and the universal Adoption of Vaccination.

EVERARD HOME

PRESIDENT.

WILLIAM BLIZARD

HENRY CLINE

} VICE-PRESIDENTS.

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H. LEIGH THOMAS

R. C. HEADINGTON

ROB. KEATE.

LINCOLN'S-INN FIELDS:
the 12th Day of April, 1822.



THE
HUNTERIAN ORATION:
Orally
Delivered in the Theatre
of the
Royal College of Surgeons in London,
On the 14th Day of February,
1824:
By

HENRY CLINE Esq^R.

President of the College.

&c. &c. &c.



HUNTERIAN ORATION.

1824.

On Saturday the 14th of February, Mr. Cline delivered at the Royal College of Surgeons the Anniversary Oration in commemoration of the birth of that distinguished ornament of our profession, JOHN HUNTER. At three o'clock the doors of the College were thrown open, and in a few minutes after, all that part of the theatre usually appropriated to members, was filled. The theatre continued to fill rapidly, and long before four o'clock, the hour fixed for the commencement of the Oration, every part of it was crowded.

Upwards of three hundred gentlemen were present, among whom were most of the distinguished members of the profession. Several barristers, and a number of other visitors

of distinction were also present on this occasion, which is generally supposed to afford the best opportunity, not only of displaying the triumph of English Surgery in the attainments and discoveries of the extraordinary individual to whose memory the Oration is devoted; but also of attracting in some measure, the public attention to the talents and attainments of the living members of the Profession.

At four o'clock, M^r. Cline entered the theatre, and proceeded to address the College to the following effect :

Hunterian Oration.

Gentlemen,

This anniversary Oration was founded to commemorate the Birth of John Hunter, a man whose superior mental powers have contributed more to elevate the profession of Surgery than those of any other individual. Such, indeed was the superiority of his Talents, that he is justly entitled to be distinguished as a man of Genius. This is a title which should be applied only to men of transcendant abilities, on whom mankind in general have agreed to confer it; such men for instance as Locke, as Newton, or Harvey, of the superiority of whose powers there can be no dispute. Genius, however, is a term which has been vaguely and generally used, and as there will be frequent occasion to introduce it in the course of this Oration, it may seem

may seem proper that it should be defined. To explain it adequately might be difficult; but it fortunately happens, that one of the greatest geniuses which this or any other country has produced, has given a description of it. This description is indeed given in the figurative language of Poetry, and on that account may not be so immediately obvious as it might have been, if delivered in more simple and unadorned language. I will, however, take the liberty of reciting his words, —

"The Poet's eye, in a fine frenzy rolling,
 " Doth glance from heaven to earth, from earth to heaven;
 " And as imagination bodies forth
 " The forms of things unknown, the Poet's pen
 " Turns them to shapes, and gives to airy nothing
 " A local habitation; and a name." —

This passage of Shakespeare is not more poetically beautiful, than philosophically just. It accurately describes the progress of thought in the mind of the man of genius during his most sublime conceptions; it delineates all the great qualities of mind which constitute genius, — enthusiasm — expansion of thought — fertility of invention, combined with accurate judgement — the capacity of comparing, selecting, arranging, and combining those ideas, which, when embodied, form a work that excites the admiration of mankind. This description may appear to be better adapted to poetry than to other arts or sciences, but, if it is properly considered, it will be found to be equally applicable to all; for the same powers of mind are equally

required in painting, or sculpture, or architecture, as in poetry; and they who excel in any of these arts must possess the powers which constitute genius. This is not only true with respect to those arts which are called imitative, but it equally applies to the sciences; for in these the same powers of mind are exerted, though in a different direction. As an illustration of what I have just said, as to the ^{same} powers of mind being applicable to the arts of poetry and painting, I need only direct your attention to the Picture behind me. (The Orator pointed to the admirable portrait of John Hunter by Sir Joshua Reynolds, which adorned the wall of the Theatre.) That picture presents to you an excellent representation of the man to whose memory

this Oration is chiefly devoted. Those who
 had the happiness of knowing him cannot
 but be struck with the fidelity with which
 his features have been transferred to the
 canvass. He is represented as sitting in
 the easy attitude in which he usually sat,
 when thinking; and the painter has not
 only accurately exhibited his features, but
 the expression of his eyes and countenance
 shews that he is thinking; the painting
 conveys to us the idea of a man absorbed
 in thought. The genius of the Painter
 is particularly seen in the general expres-
 -sion of the countenance — in the elevation
 of the eye-brows, and the direction of the
 eyes, which the poet has so beautifully de-
 -scribed as the attributes of genius. The
 artist who was capable of producing a

picture like this, must have long & deeply studied human nature; he must have been well acquainted with its laws, or he would have been unable so completely to express the character of the man.

That M.^r Hunter is entitled to the character of a man of Genius will be shewn by taking a short review of his life; the progress of his professional career will strongly mark how well he was entitled to the character so admirably described by Shakespeare.

John Hunter began to study his profession at a mature period of life, being twenty years of age when he commenced his Studies in the School of his brother D.^r William Hunter, who excelled as a teacher of anatomy and physiology. —

He soon shewed in that School the superiority of his talents, and in a very short time excelled in dissecting and making anatomical preparations, in doing which he greatly assisted his brother D^r William Hunter, in the formation of his Museum. In these employments, and also in assisting his brother in the task of anatomical tuition, he continued ten years; during which period he was constantly engaged in procuring every animal within his reach for the purpose of dissecting and comparing it with the human subject; and forming that vast collection of preparations in illustration of Comparative anatomy which is now in the Museum of the College. In making these preparations he was at the same time prosecuting his inquiries into the Animal-

Animal economy; many parts of which, that were before, very imperfectly understood, he clearly explained. Of the extent of his researches an idea may be formed from the accumulation of specimens amounting to more than 17,000 which he left at his death, and which he had arranged according to a system peculiar to himself. He divided this vast Collection into four classes; the first of which contained those specimens which were to explain the parts of animals immediately necessary to the preservation of life; the fluids & vessels by which life is immediately supported. The second class consists of all those organs which supply the waste of the body, by means of nourishment; in the investigation of which he explained the process of digestion in a far more satisfactory manner than it

had ever been before explained. In the third division he formed a large collection of specimens illustrating a still more difficult part of the animal economy; namely, the nervous system; shewing the distribution of the Nerves from the brain, the comparative arrangement of these parts in different animals, and by what means every part of the animal economy was connected one with the other, so that a general intelligence was kept up throughout the whole. In this Class he also introduced all the organs of sense and the variety of these in different species of Animals, by which a communication was kept up between the whole animal economy of nature. The last

class illustrated the means by which every species of animals is reproduced; and was devoted to the organs of generation. —

The extent of his mind was not however confined to the animal economy; it embraced also the vegetable economy of nature, and in the investigation of this subject he made a great number of experiments, illustrating the vital power in vegetables as well as in animals; for although there is so great a disproportion between the powers of different species of animals, and between those of animals and vegetables, yet in some respects they are uniform in all: that is, they have all certain powers by which life is supported, and by which the species is re-produced.

But, Gentlemen, great as the work of

of forming this immense collection may appear to be — great as was that expansion of mind which enabled him to explain the Animal economy in so superior a manner, these labours were only preparatory to still greater exertions which he had in contemplation for the advancement of his Profession. Having carefully watched for so great a length of time the functions of the animal economy, and being so thoroughly acquainted with the structure of the Human Body, he was enabled to distinguish with a great degree of accuracy, every change which the body undergoes in a state of disease, which before his time was very imperfectly or not at all understood.

Those who are acquainted with the ideas of Surgery which prevailed before John

Hunter instructed mankind are aware how very crude and imperfect those views were with respect to all these circumstances. — After he had prosecuted his inquiries for a considerable length of time, having had the advantage of attending the Hospitals in London, as well as of dissecting with his brother, he at length formed a course of Lectures on the practice of Surgery. — It is to be observed, however, that he did not begin to deliver these Lectures until he was Forty-seven years of age, so that he was twenty-seven years employed in preparing the materials of the Course. —

Extraordinary as it may appear, his professional reputation was so inconsiderable at this time, that although he issued advertisements to give a public Course of Lectures,

the number of Pupils who assembled at that first course did not amount to twenty. Of that number he who has now the honour of addressing you was one. I had the happiness of hearing the first Course of Lectures which he delivered. I had been at that time for some years in the Profession, and was tollerably well acquainted with the opinions held by the Surgeons then resident in the metropolis who were most distinguished for their Talents; but having heard M^r Hunter's lectures on the subject of disease, I found them so far superior to every thing I had conceived or heard before, that there seemed no comparison between the mind of the man who delivered them, and all the individuals whether antient or modern who had ever

gone before him; for although the profession of Surgery has been cultivated Two Thousand years, this single individual has probably done more towards establishing Surgery as a Science, than all who preceded him. —

He commenced this course of Lectures by establishing the principle of the changes which take place in different parts of the body in consequence of violence, and afterwards explaining the means by which such injuries may be repaired. This was the foundation of the treatise which was afterwards published on the blood, inflammation, and gun-shot wounds; to which subject he particularly directed his attention when he was engaged as a Surgeon in the army at the Siege of Belleisle, where a great number of wounded men, after a

very severe action were placed under his immediate care. Although this part of the Course of lectures was digested at an early period of his professional life, he had not the confidence to bring it under the notice of the public; and though it was printed at the time of his sudden death, it had not yet appeared.

Large and excellent as this work is, it is proper for me to observe, Gentlemen, that it formed but a small part of the Lectures which he delivered. There were other parts of the Course of the highest importance in a professional point of view, and the publication of which would have been extremely desirable. The Lectures which he delivered on Morbid Poisons, on

on Scrofula, and on the diseases of the bones deserved particular attention; the Ideas of Surgery which prevailed with respect to diseases of the bones were so exceedingly imperfect until he explained in what manner the morbid changes in those parts were produced, that all the knowledge of that subject preceding his time, may be regarded as of little value. —

By his accurate knowledge of all the functions of the Animal economy, he was enabled clearly to explain all the changes which take place in these parts in a state of disease, and to lay down a rational foundation of Cure.

Such were the great discoveries and improvements in Surgery made by this extraordinary man, that since his opinions have been promulgated, it may be truly said that

no work can be published on the Science of Surgery, and no lecture can be delivered without being greatly indebted to him, if the work be worth the trouble of reading, or the Lecture the time of attending. —

He has laid the foundations of Surgery in truth and nature, and his principles will last as long as Nature herself exists; the truths are eternal!

The complete revolution produced in the minds of professional men by the discoveries which the great mind of Hunter was capable of effecting, affords one of the strongest proofs of his title to the Character of a Man of Genius. The distinguishing characteristic of his mind was undoubtedly enthusiasm — it was the enthusiasm of Genius which prompted him to apply his

his mind with so much ardour to the pursuits which led to these important discoveries. In these pursuits he was engaged early and late to the last day of his life. He died at the age of Sixty-five; and these uninterrupted exertions were continued, therefore, during a period of forty-five years. —

From an early hour in the morning until midnight, or later, he was constantly employed either in dissecting or writing, or reflecting on the various subjects to which his attention was directed. His ardent enthusiasm, his unbounded expansion of mind are seen in his arrangement of the Preparations illustrating the animal and vegetable economy — in the comprehensive view which he took of all living nature. His fertility of invention is demonstrated in his works, in

in which we find a great number and variety of ingenious experiments which he contrived, in the course of his inquiries into the complicated actions of the living powers. His investigations of Comparative anatomy shew the great power which he possessed, of selecting, arranging, and combining his materials for the purpose of explaining the whole of the animal economy of nature.

Thus we find the exertion of his extraordinary powers of mind exactly corresponding with that which the poet describes as directing the operations of Genius; for these effects are produced by the same powers which constitute poetical excellence, but directed to a different channel. Genius, then, consists in that combination of powers, which is capable of producing effects which by common minds

cannot be well conceived. But this term is often applied to men possessed of no such powers; that is, men who are only possessed of Talent, are frequently described as possessing the gift of genius. But talent, Gentlemen, is merely the power of expressing well that which another has conceived; it is the power of representing and explaining that which has been discovered by others.' — The man of Genius shines by a light emanating from his own mind; but the man of talent shines by the reflection of the light which he has received from the man of genius; so that ⁱⁿ comparing the minds of men with the formation of the universe, the man of Genius may be considered as a fixed star, from which light is constantly emanating, and the man of talent as a

planet revolving round around it, and receiving the light which is reflected from the fixed star of genius. The beneficent Author of nature has thus justly distributed the powers of mankind in such proportions as are fitted to the wisdom of his purposes. The operations of genius may be regarded as the light emanating from the fixed stars in the universe, which is more extensively diffused to mankind by the reflection of Talent. The dissemination of good arising from this cause is not merely confined to arts and sciences; it may be seen also in the more extensive operations arising out of the institutions of government.

Of this truth our own Country affords a most striking example, for the greatness of this nation may justly be ascribed to the Ge-

Genius of one man. I allude to that extraordinary man Alfred the Great; it was he who first framed the English constitution; and from whom all the power, and all the greatness of this nation originated: to the great powers of his mind England is indebted for all its prosperity.

When Alfred ascended the throne, this nation was in a most disorganised state. So severely indeed was that Monarch harassed by an active enterprizing enemy whose principal object was plunder, that he was driven from his Throne, and under the necessity of seeking a retreat; but to a mind like his, such adverse fortune served only to develope his extraordinary powers, and during his retreat he had time to form those plans which he at length so wisely

and energetically executed, that he succeeded in expelling the enemies of his Country, and re-conquering his Throne. When he had thus established his power, his greatness of mind began to discover itself in the formation of a system of government; and hence emanated the English Constitution. —

Great minds always move on simple principles. It has been observed that they possess the power of unravelling what is difficult, and of reducing what is complicated to first principles. Accordingly, the genius of Alfred in the formation of a system of government discovered that fundamental principle, which though apparently simple is the most powerful and energetic in its effects, which it is possible for the mind to conceive. This was the principle of go-

governing all, by the energies of all - the principle which constitutes the foundation of the English Constitution. In the prosecution of this object, Alfred fixed upon a firm basis the meetings of the Wittenagemote where the laws were enacted. He distributed the administration of justice among the people, by one of the wisest and most excellent institutions that was ever conceived - the formation of Juries. But, as the persons forming the juries, from want of education and other causes were not always themselves competent to decide, he appointed judges to regulate the principles and practice of Courts of Justice. These institutions - formed a mutual check upon each other; for Alfred perceived that if the power of deciding had been left to judges, such

was the weakness of human nature, that corruption might have been expected to creep into the administration of Justice; he therefore allotted to juries the power of pronouncing a decision, subject to a superintending power in the judges to explain the laws, and regulate their practice. The limits of these powers were not, however, at first so well understood or defined, but that Judges in some instances, attempted to exceed them by controlling the verdicts of Juries. When these instances of corruption were detected, Alfred made severe examples, and several judges of that day were executed with a view of deterring others from similar practices. This may be considered as a harsh measure, but it was necessary for the security of the lives and property of the subject. It is

the continuance of these institutions and the principles of Government acted upon by Alfred which have rendered the benefits of the English Constitution superior to those of any other in the world. We find, however, in the history of this Country, that frequent attempts have at different times been made to destroy these institutions. Thus the Norman Conqueror endeavoured to eradicate the English constitution, but it was so strongly implanted in the hearts and affections of the people, that no power was capable of effecting its destruction; and so general a resistance was made to the attempt, that the Sovereign was under the necessity of desisting from his purpose. A memorable instance of the same kind occurred in the reign of King John, when a similar attempt

met with such general resistance, that the King was under the necessity of signing Magna Charta, to appease the indignation of the people. At a later period, the attempt which was made by one of the Stuarts to establish despotism in the country, terminated in the expulsion of that misguided monarch from the throne.

The origin of all the blessings which this nation enjoys, may thus be traced to the fundamental principles of Government established by the great mind of Alfred. The advantages which we have reaped from those invaluable institutions for more than nine hundred years, are likely to be still farther extended, by the propagation of the same principles over a great part of the world: for we find the light of Alfred

making its way into the western hemisphere, and illumining ten millions of people who have hitherto been kept in a state of darkness under the thralldom of Priestcraft and despotism, but who are now breaking their chains asunder, and proving, by the benefits in which the light of Genius enables them to participate, that it is boundless both in extent and duration. The character of Alfred is therefore regarded by the British nation with veneration and gratitude; all Historians agree in the tribute which is due to his extraordinary powers of mind, and his name has descended to posterity justly exalted above all Roman — above all Grecian fame.

Gentlemen, — Since the last Anniversary Oration was delivered in this Theatre,

by Sir William Blizard, the profession and the public have suffered a great loss, in the death of Dr. Baillie; — a man whose moral virtues, and whose great abilities have induced general lamentation; especially among those who had the happiness of knowing him. His character has been drawn with considerable ability in several of the periodical publications of the day; it has also been drawn by the masterly hand of Sir Henry Hallford, at the Royal College of Physicians, and it is to be hoped that the picture, portrayed by one who was so intimately acquainted with him, will descend to posterity and form a part of the history of the country. I had frequently the happiness of meeting him, for in the discharge of our professional du-

duties we were often called upon to act together. During more than the last thirty years I have been frequently in the habit of attending consultations with him, in which, after making the necessary inquiries as to the symptoms, and the state of the disease to which his attention was drawn, he formed the clearest opinions, which he delivered with a perspicuity and ability peculiar to himself; opinions which almost always met the approbation of those who were joined with him in consultation; and which were always calculated as far as possible to prove beneficial to the patient. His great worth, his moral rectitude, made so strong an impression on all who were acquainted with him, that his death was attended

with general and deep regret. —

Gratitude, respect, and esteem, require that my testimony should also be given to his worth. In my own person I am particularly indebted to him; for during a severe and dangerous illness with which I was attacked in the last summer, his friendship and kindness caused him to visit me when he was himself in such a state of health, that he could with great difficulty ascend the staircase. After such an instance of friendship, it is but simple gratitude in me to express my Opinion of the worth of this distinguished man.

The end.

*Lady Campbell
with the author's best respects*

(4)

THE
HUNTERIAN ORATION,

DELIVERED BEFORE

The Royal College of Surgeons

IN LONDON,

ON TUESDAY, FEBRUARY 14th, 1826,

BY SIR ANTHONY CARLISLE, K^T. F. R. S.

SURGEON EXTRAORDINARY TO HIS MAJESTY,
AND TO HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER;
SURGEON TO THE WESTMINSTER HOSPITAL, &c.

DEDICATED BY PERMISSION

TO

MR. SECRETARY PEEL.

LONDON:

PRINTED FOR JOHN BOOTH, DUKE STREET,
PORTLAND PLACE.

Price Seven Shillings.

1826.

HUNTERIAN ORATION,

The Royal College of Surgeons

IN LONDON,

ON TUESDAY, FEBRUARY 14th, 1886,

BY SIR ANTHONY CARLISLE, Kt. F.R.S.

SURGEON EXTRAORDINARY TO HIS MAJESTY,
AND TO HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER;
SURGEON TO THE WESTMINSTER HOSPITAL, &c.



PRINTED FOR JOHN BOOTH, DUKE STREET,

PORTLAND PLACE.

PRINTED BY WILLIAM NICOL,

Shakespeare Press,

CLEVELAND ROW, ST. JAMES'S.

TO

THE RIGHT HONOURABLE
ROBERT PEEL,
HIS MAJESTY'S
PRINCIPAL SECRETARY FOR THE HOME DEPARTMENT.

SIR,

THE Cultivators of Science have cause to rejoice that a Statesman has publicly acknowledged his obligations to the Writings of our greatest Philosopher, Lord BACON.—As the multitude are incapable of estimating the value of abstruse studies, and mediocrity is prone to oppose them, it has always been needful to solicit Patronage for the promotion of such researches.

To a Parliamentary Trustee of Mr. HUNTER's Collection, I most respectfully submit this attempt to extend it's usefulness, by an endeavour to connect some of the laws of inanimate matter with the more complicated operations of living bodies; my intention being to elucidate the nature of several animal processes, and gradually to introduce more

satisfactory views of the manner in which Medical remedies produce their effects.

To you, Sir, it may be suitable to know, that the Healing Art is daily acquiring greater certainty, from accessions of auxiliary Knowledge, and from the judicious introduction of discoveries in Physical Science; and, that the superior attainments of it's Practitioners are, by the liberality of their communications, extending so widely, as to promise in their progress an amelioration in Medicine to which no limit can reasonably be assigned.

I have the honour to subscribe myself,

With great respect,

SIR,

Your most obedient and humble Servant,

ANTHONY CARLISLE.

Langham Place,

25th May, 1826.

THE

HUNTERIAN ORATION.

HONOURED PRESIDENT,

THE TRANSCENDENT MERITS of JOHN HUNTER have been so often, so variously, and so eloquently represented in THIS THEATRE, that THE ANNIVERSARY of his Birth may, possibly, now be more beneficially celebrated by our endeavours to promote and complete his valuable Studies.

With this impression I shall venture to assume, that the Members of THE COLLEGE OF SURGEONS regard ANATOMY as the grand Source of MEDICAL KNOWLEDGE, and the HEALING ART as altogether *empirical*, unless it be founded on the Inductions of PHYSIOLOGY.

If the bodily construction of Man were simple, and each part obviously formed for a single purpose, it would be needless to examine the diversities of structure in other Creatures, in order to discover the purposes and functions of our animal Mechanism. In many instances, however, the Human organs are deeply obscured by complication in their tissues, connections, or composition,—for every par-

ticular Portion is more or less blended with vessels and parts not essential to it's special office, but appointed for subordinate uses, for union, and for communication with the living whole,—hence, then, it is often difficult to discern the affinity between the texture of the instrument and it's destined operations.

These perplexities have always beset the studies of Human Anatomy, and of Human Physiology,—but an additional obstruction accompanied the first steps of Medical Science among the Greeks, arising from Superstition,—for the Pagan Religion deemed the human likeness of it's Deities to be an hallowed subject, and only permitted this leading branch of Medical and Surgical Knowledge to be acquired through the medium of analogous Creatures, such as Apes.

On the restoration of useful Learning, and of intellectual Liberty, in the Fifteenth Century, the writings of the Classic Sages were eagerly and critically examined,—and in this zeal for information it was discovered, that the Anatomical descriptions of GALEN were unfit for Surgical guidance. Since that period, the knowledge of the Human mechanism has increased with the frequency of Dissections, and all English Surgeons are now expected to possess a more exact and complete acquaintance with the structure, position, and offices of every part of our Natural body, than was formerly known to the most celebrated Professors.

We may fairly congratulate our Brotherhood upon this creditable Progress, and upon the flattering hope of higher deserts, when the union of allied Sciences shall have rendered Surgery more rational, more safe, and more efficacious.

The operative Practice of Surgery is a mere mechanick art, when it is solely established upon a gross topical knowledge of Anatomy,—and if it be exercised with daring temerity, unchecked by moral or by scientific reflections, it becomes a desperate, if not a mischievous Profession.

A superficial knowledge of the Human body is sometimes imposed upon the Multitude, as an extraordinary attainment,—and when this assumption is further obtruded, by arrogating a superior degree of operative Skill, and an Infallibility which is not attainable, the vain Pretender, brandishing his knife over the terrified victims of his violence, may become a popular Surgeon, and by early good fortune he may force his way to vulgar fame, and wealth,—but his career is most dangerous, and the results are unenviable.

Young Surgeons, deluded by the evidences of practical Anatomy, are too apt to consider the transit from the dissecting to the operating Table, as a continuation of the same Scene. It is my duty, therefore, to state from long experience, that even a comprehensive and ready acquaintance with our natural Structure is an inadequate preparation for those vicissitudes, which diseased organizations, and casual displacements present in many operations. I am also free to confess, that I never yet performed, or assisted at a Surgical operation, which might not have been better done, if all the incidents could have been foreseen,—and, that I never witnessed an operation without some occurrence, which demanded the immediate judgement and moral courage of experienced thought, in addition to the views of Anatomy.

Young men have personal advantages, and when those

are cultivated by frequent attendance as Assistants, they may acquire the moral fortitude and presence of mind, which dangerous operations always demand.

The *superior* glory of Surgery depends upon the correction, or the cure of bodily infirmities, by scientific ministrations,—When those fail, and an incorrigible disease remains,—or, when an injury threatens the loss of life,—then the judicial sentence, which gives the Sufferer the choice of two dreadful evils, may be required,—and the arbiter of his fate must abide the consequences.

I am induced to dwell with more earnestness upon these cautionary remarks, from a conviction that a false confidence, arising out of Anatomical Pedantry, is very prevalent,—And, unless it be restrained, some of our Members may become liable to the severe, and, perhaps, the undeserved blame of legal Authorities.

A much safer, a more appropriate, and, ultimately, a more honourable Condition, awaits the Cultivators and the Improvers of the essential elements of Medical Science,—Nature having assigned no limits to the useful Discoveries, which the improvable Mind of Man has yet to make. The wide scope of general ZOOTOMY, commonly, but improperly termed “*Comparative Anatomy*,” is open to diligence, genius, and youthful ambition,—and, THE HUNTERIAN COLLECTION displays examples both of curious isolated facts, and of Physiological series, sufficiently apposite for it's useful extension.

SURGERY claims the designation of a SCIENCE, from several antient and modern Charters specially granted to THIS COLLEGE,—and the Gentlemen appointed to deliver

THE HUNTERIAN ORATION, are particularly called upon to support that just distinction. But, if any person should question the practical uses of such refinement, we are ready to show it's value, by pointing out the enlarged Capacity and the superior Tact of Scientific men.

Intellectual cultivation, by exciting more than ordinary attention, produces an exact and circumstantial vision, far beyond that which is purely natural,—and manual skill is increased by a true confidence of the mind, when it arises from expanded judgement,—the Mind and the Hand being alike capable of nearer approaches to mathematical precision, from scientific exercise.

To neglect, or to undervalue these important considerations,—or, to deny the necessity for Scientific Skill and Moral Judgement in our terrible Duties, would be basely disgraceful to our Profession, and injurious to Humanity. We are individually answerable for all the consequences of our Advice and Works,—and we should compromise the safety of the Afflicted, and betray the rights of our Station, by unworthy Submission to any other Authority. The Qualifications for determining the Propriety of our dangerous duties belong, of necessity, to Persons expressly educated to judge of their expediency or moral fitness,—and we cannot honestly, or with advantage to the Public, either delegate or divide our Responsibilities. The pretensions of modern English Surgeons to the entire control of their own Practice, rest upon a superior knowledge of Human Anatomy,—and the honoured labours of Mr. HUNTER have *introduced* the genuine elements of organic Physiology.

From the precious remains of the Writings of ARISTOTLE

it appears, that he deemed the Anatomical Analysis of the whole Living Creation to be the only way to obtain rational views of the Laws of Animal Nature,—and Lord BACON, Dr. HARVEY, Baron HALLER, and our HUNTER, entertaining similarly enlarged sentiments, have since rivetted the attention of Medical Philosophers to that subject,—and they have shown, that circumstantial, minute, and particular details of facts must precede all rational inductions. Those great Men, observing the Complex structure of the Human body, and the occasional Singleness of texture in many simple Animals, wisely sought to reveal the obscurities of Human Anatomy, by inspecting the detached parts of organic mechanism, in an unravelled state as they often occur, in more humble Creatures.

In the present age, all Naturalists have adopted a similar course of Generalization,—and, although our Countrymen have lately been surpassed in neighbouring Nations, as to the Systematic arrangements of ZOOLOGY and ZOOTOLOGY,—yet, I trust, we stand unequalled in the Practical applications of Natural Knowledge to the duties of our Faculty.

The several distinguishing Characters, and the numerous Affinities visible among the Creatures of this Orb, are not always essentially connected with Physiological views of their inward structure, but they afford to the Zoological Naturalist and to Scholars the means for classing and naming a multitude of distinct objects, without which our Anatomical records would be unintelligible. Hence it is, that the knowledge of ZOOLOGY and of ZOOTOLOGY is inseparable,—for, like MINERALOGY and CHYMISTRY, they reciprocally support each other. The advancement and the diffusion of organic

Physiology depend upon the general adoption of an exact and permanent Language, whose descriptive definitions shall circumscribe and denote every Species of Living form.

This desirable consummation may, perhaps, be regarded as not far distant, when we estimate the liberal assistance of Learned Men,—the improved Accesses to useful Knowledge,—and the increasing Intelligence of Mankind. Whenever such stability of Nomenclature shall arrive, Scholars will have less cause to lament those Losses to Literature and Science, which have followed the Destruction of Antient Manuscripts,—or, to regret the difficulties which now attend the meaning of obscure or abstruse passages, hitherto ill understood from the verbal remains of Classic pages.

The Physical Sciences are now rapidly dispelling the unworthy mysteries of the Healing Art. And we may soon expect the Doctrines of PHYSIOLOGY, of PATHOLOGY, and of SURGICAL THERAPEUTICS, to be established upon the clear evidences of Anatomical Structure, and of Chymical agencies,—neither of them singly being adequate to explain the workings of Life, the errors of Disease, or the manner in which our Remedies become efficacious.

I will now submit, as suitable to this occasion, a specimen of Natural History and of Zootomy, which is far removed in it's character from the organic constitution of Man,—and, yet, I hope to trace it's practical applications to the Healing Art,—confidently relying upon this belief, that, to those who understand the Philosophical purposes of THE HUNTERIAN COLLECTION, it will be superfluous to urge any excuse for this deviation from the routine of former Eulogies.

My first design embraced a review of all the recorded Incidents, connected with the selected Object,—but I found the undertaking would extend beyond the limits of a single Discourse, and that it would introduce many irrelevant Topics. I have, therefore, decided to abandon several parts of the Zoological History, and to direct my observations to some facts in Zootomy, and in Chymistry, which promise to extend the Sciences of organic Physiology, of Pathology, and of Surgical Therapeutics.

The Creature which I have fixed upon, as an example for comparison in the succeeding Treatise, is the common eatable OYSTER,—an Animal, which to passive observers presents nothing remarkable, or, it may be thought, is sufficiently known,—but to my judgement, the various facts of it's structure and many of it's detached offices are analogous to several occurrences in the Human body,—while those simple indications of Nature tend to illustrate and to declare some of the more elaborate and obscure operations of Health, of Disease, and of our remedial Art. It will, however, be obvious that the shortness of my time must limit this analytical exposition, to a few leading particulars respecting the Anatomy and the Physiology of the OYSTER,—and I am satisfied that I shall receive your indulgence, for the apparent inconsistency of mingling general assumptions with especial details.

Our English proper name OYSTER,—as well as the antient Saxon, *Ostre*, and *Ostra*,—are obviously borrowed from the Greek and Roman words, "ΟΣΤΡΕΟΝ, and *Ostreum*, which appear to have been given to these Shells, because of their resemblance in several properties to *Bones*;

—for the Classic terms, 'ΟΣΤΕΟΝ, and *Os*, (*ossis*), were probably first imposed, because *Bones* would attract earlier notice than *Shells*; and words of similar sounds would afterwards become eligible to denote analogous objects;—such coincidence among substantives being in the natural order of human thought, and, consequently, of frequent occurrence.

In all the modern Languages of Europe the Classic root prevails, and it has been invariably used by Naturalists,—hence it would be superfluous to cite the *synonyms* of the Oyster.

The Russian, *Ustreetsa*,—the Armenian, *Ostrighe*,—the Persian, *Istiridia*,—and the Hindustanee, *Kustoora*, are kindred sounds. Arabic and Hebrew names for the Oyster bear no affinity to those of Classic origin,—neither do the appellatives of the Chinese, who use three differently sounding words, to denote a large, a small, and a round Oyster.

Modern Zoologists derive their distinctions and descriptive definitions of Creatures of this kind from their Shells; for a numerous tribe of soft-bodied Animals, which are denominated *Mollusca*, are protected by earthy Shells, and they are arranged together under the Title of *Mollusca testacea*, to separate them from another Series of similar Animals which are without Shells, and consequently termed *Mollusca nuda*.

A subordinate division of the *Testacea* collects together those which possess two shells, and such are termed *Bivalves*. Under this denomination the Oyster forms a Genus or Family, comprising many distinct sorts, called *Species*;

—and, in the tables of Classification, the species to be hereafter described, is termed “*Edulis*.”

The leading features of the Shells, or those parts of them which are common to every species of Oyster, have been employed by Naturalists to define the Genus, while particular characteristics have served to discriminate the Species. The neat technical method of LINNEUS has been improved by LAMARCK, but his descriptive definitions are still unsatisfactory, and, in some instances, incorrect;—as it appears in the following account of the genus *Ostrea*.

“ Testa foliacea, irregularis, inequivalvis; Umbonibus
 “ subdivaricatis, ætate inæqualissimis. Valva inferior major,
 “ concava, *adhærens*; superior minor, planiuscula. Cardo
 “ edentulus. Ligamentum semiinternum, disco sub trigono,
 “ tripartito, in utrâque valvâ affixum. Impressiones mus-
 “ culares in utraque valva *duæ*, altera magna, suborbicu-
 “ laris, subcentralis; *altera* minutissima, infra cardinem
 “ *posita*.”

It is to be regretted that many undefined technical words are here presented to the general reader,—such as the *umbones* or *knobs* above and below the hinge, the *dentes* or *tooth-like* projections, and the *discs*, or spaces to which the hinge ligament is affixed. Also, in this short description many errors appear,—*viz.* 1st. The inferior valve is not always *adhering* to some other body;—2d. The hinge does exhibit *denticulated processes* on the sides of the discs;—and, 3d. There is not any other *muscular attachment* to the shells, than that of their central parts.

The species of Oyster, termed “*Edulis*,” is thus insufficiently defined—

“ Testa ovato-retundata, foliacea, squamosa; valva superiore minore, planata; margine interno integerrimo.”

Each of these distinctive marks are so liable to change, and thence to form individual varieties, that it is difficult to establish any brief specific description of the *Ostrea edulis*; —for every bay, estuary, harbour, or space in the sea has it's local vicissitudes, as to the supplies of food, depth of water, currents, tides, or other influential causes; and these manifestly affect the figure or thickness of the shells of this species of Oyster:—Organic varieties appear to be natural compliances, adapted to accommodate individuals when their proper habitudes are disturbed; and such deviations occur alike to Animals and to Plants, causing differences which are too often regarded as distinct species.

Persons not versed in modern Zoology might hastily conclude, that the genus *Ostrea* is now exactly determined, and the boundaries of it's species finally settled; but Nature presents so many delusive *semblances* among creatures of *different* kinds, and occasionally adds such *incongruous* features to members of the *same* family, that the task of assortment is extremely difficult. Artificial systems of classification being only generalizations of those objects, which approach nearest to each other in their forms and constitution.

The ordinations of Infinite power are not, however, limited to any series within the scope of human arrangement; but they extend into endless diversity, — each species being appointed to it's allotted share of existence, and to promote the harmonious maintenance of the whole Creation.—Thus it happens, that the substances and the creatures of this

globe are severally designed for their respective stations, and each of them made to subsist under the general dominion of physical laws,—occasioning many reciprocities between animals, vegetables, and minerals; for the unceasing operations of Nature are every where engaged in converting the elementary materials set free by dissolution, into new compounds, or into rising generations.

Under the powerful sway of the Seasons, and of other general concurring influences, the smaller destinies of Nature are assured: Vegetables being the purveyors to Animals, by drinking up gross solutions of decaying mortuary remains, mingled with liquid minerals; and thus re-elaborating the food of Animals from the crude elements of the three Kingdoms. Each organized *Automaton* is imbued with a power to model itself after the fashion of it's species, to continue it's vital term, and to reproduce it's kind; after which it's bodily materials are ordained to pass back again through incalculable revolutions.

The sublime and mathematically proved theories of the Cœlestial bodies encourage our researches into the *more* concealed operations of Life,—for if we estimate the possible elevation of our Science, by the divine advances in Astronomy, we may justly expect that the Art of Healing will attain to degrees of precision and power, in future ages, which it would now be rash to conjecture.

Many kinds of Testaceous animals have existed in those early stages of the Creation which were antecedent to the human race, and among organic fossils the shells of Oysters are often found in situations far removed from the present levels of neighbouring Seas. Every distinct *species*

of living Testaceous *animal* possesses some characteristic structure corresponding with the peculiar forms of it's shells; and the several species of Oysters are subject to all those deviations; but Anatomists have not yet collated such minute distinctions in any of the lower classes. By the united systems of Arrangement and of Nomenclature, now adopted among Zoologists and Zootomists, the animal which inhabits the shells of the Oyster, is placed in a Tribe denominated "*Acephala*;" that being one of six subdivisions, given to the Testaceous *Mollusca*.

The body of the Oyster is without a head; and it has no *distinct* limb analogous to that of the Cockle and Muscle, which is called a *Foot*. Not having any especial organs for seeing, hearing, or smelling, the creature is limited to perceive no other impressions but those of immediate contact: and yet every part of it's exterior seems to be sensible to light, sounds, odours, and liquid stimulants, in consequence of the privation of cuticle.

It is asserted by the Fishermen, that Oysters in confined beds, may be seen, if the water is clear, *to close their shells*, whenever the shadow of a boat passes over them.

The shelly case of the Oyster is it's sole security,—and a superior delicacy of touch, diffused over the whole of the living surfaces, warns the creature of every danger, and bids the closing of the senseless valves.

The inward organization is equally simple with the exterior forms, and both are suited to a passive life; for, *locomotive* beings demand evidences of distant things,—sometimes to supply their wants, and on other occasions to inform them of danger;—but a stationary creature, being

doomed to rely on it's fixed resources, would only be tantalized by evidences placed beyond it's control.

The Oyster animal is attached to it's shells by a very conspicuous mass of muscle and tendinous ligament, which adheres to the centres of the insides of the shells; and around this middle substance, all the other living parts are affixed. Between the muscular ligament and the hinge of the shells, the chief bulk of the body is situate; it occupies the great concavity of the under valve, presenting a squared margin opposite to the hinge, and a projecting margin along it's two sides,—the surfaces of the body which are placed in contact with the shells, present a lacework of fat, when the animal is in good condition, resembling that of the *omentum* in quadrupeds. The marginal borders, proceeding alike from the upper and the under surfaces of the body, are gradually extended as they advance toward the edges of the shells,—and they form the outline of those expanded membranes, called the *Pallium* or *Coverlet*, which occupy the flatted and larger portions of the shells, and fold over the water lungs, termed *Branchiæ* or *Gills*.

As there are some parts of the animal, and of it's shells, which differ on the two sides or borders, it becomes necessary to define a *right* and a *left side*. If an Oyster be placed with it's concave shell downward, and having the hinge next to the observer, the right and left sides will be then determined. The loose folds of the *Pallium* become united on the right side, nearly opposite to the muscular ligament,—and they form an entrance to the interior of the *Branchiæ*, which may be named the *Branchial Porch*. When the shells are expanded, the cavity of the Branchial

tube becomes necessarily dilated, and this occasions a rush of water into all the internal proper Branchial vessels,—while the outer surfaces of those gills are floated in fresh supplies of water at each opening and closing of the shells. This simple and effective mechanism of these water bellows is like the other all-wise providings of Omnipotence.

At the upper squared end of the body, the marginal borders appear to be glandular,—and these, together with a middle follicle, seem appointed to form the elastic ligament or spring of the hinge. The two angles of this end of the Oyster are slightly attached to both the upper and under shells, by the upper and under surfaces of these angular extremities; but those adhesions are not muscular,—they are merely close contacts, and only occasionally used to make the glandular parts touch the elastic ligament of the hinge.

At the upper end of the body and on it's left side, the marginal borders are more extended than upon the opposite or right side,—and the top of this border forms a hood over the mouth, where two pairs of leaf-like lips are placed, so as to direct the casually presented food into the throat. The marginal borders on the left sides descend to form the *Pallium*, and they meet and coalesce with those from the right sides at the *Branchial porch*. In the middle, between the folds of the pallium on the right side, and in contact with the central muscle, the terminal intestine descends,—and it's opening or anus is situate at the entrance of the Branchial porch.

The Branchiæ or proper gills consist of four equal sized folds inclosed by the pallium. These Branchiæ extend from

between the palpi or lips of the mouth, on the left side, to the junctions of the pallium, on the right side, where it forms the Branchial Porch. The roots of these gills are joined to the insertions of the pallium, where it's two folds adhere to the central tendon,—and by this structure a large branchial cavity is formed, into which the smaller branchial tubes open by four distinct rows of holes, each of them allotted to one plait of the gills. When any liquid is forced into the branchial cavity, it spirts out at numerous distinct pores along the convex edges of the gills, and these pores severally correspond with the single tubes assigned to each plait of the Branchiæ,—so that the inspired water passes from the branchial cavity straight through the tubes of the gills into the open space between the folds of the pallium, without returning.

This water respiration is probably a chymical action upon the elements of the water itself, and not an abstraction of air,—because Oysters, and such like animals, often reside at extreme depths in the sea, where the pressure upon gaseous matter would be a physical obstacle.

The *Heart* of the Oyster is seated within a free space, which is bounded by an arch of the body formed between the great valvular muscle and the mass which is occupied by the liver and stomach. Two remarkable circumstances belong to this heart:—it's contained fluid, or blood, does not coagulate spontaneously,—and it holds in solution the same proportion of sea salt with the surrounding water. The muscular flesh of the ventricle of the heart is soft and tender, like that of an incubated chick in it's first stage. The auricles are of a black colour throughout their tissue,—

a peculiarity not easy to be explained. The arterial and venous systems resemble those of the whole tribe of molluscs *Acephala*; but the singularities of each species are difficult to be traced, because the vessels are too delicate to admit gross injections, and those of more refined composition are apt to pass out of the vascular tubes, and by extravasations to spoil their distinctness.

Within the body, are the Stomach and Liver, occupying it's principal bulk. The Stomach consists of a sinuous cavity, subdivided by alternate projections and clefts adapted to each other,—and in those spaces I have generally found a detached piece of cartilage, whose office may be that of assisting in the trituration of the food, because the interior of the Stomach itself presents similar cartilaginous projections.

The Intestine is a simple tube coiled round the Stomach and the Liver,—it begins at the lower and left end of the Stomach, and terminates at the Branchial porch,—it is tinged with umber-coloured bile throughout it's course.

The Liver is the most conspicuous, and the largest of all the glandular organs assigned to this tribe of animals,—it every where surrounds the Stomach, and by obvious pores discharges it's bile into every space of that cavity, colouring the contents of an umber brown hue. Externally, the Liver exhibits a regular series of equal sized granules, which may be shown by boiling the animal, and then tearing off it's loosened exterior covering. The inward structure presents arborescent vessels, which converge into the excretory ducts as they approach the Stomach.—It is worthy of notice, that the minute vessels of the Liver, in all these creatures,

assume an *acinated* or *grape-like* figure, similar to that which is common to all the higher orders of animals.

Both the surface of the animal in contact with the concave, and that in contact with the flat shell, present similar parts,—and the cavity for lodging the heart is equally exposed to the inner surface of each shell.

A cone-shaped extension of the body winds along the left side of the muscular ligament,—it has a tubular cavity, which communicates with the alimentary passages,—it resembles the reproductive parts in the Scollop, and is an obscure likeness of the *Foot* in some other *Acephala*.

Oysters are considered to be perfectly androgynous; but it is questionable, whether any animal possesses the capability of impregnating itself,—because, in all the known instances of hermaphrodites, such as those of earth worms and garden snails, the mutual intercourse of two individuals is required, notwithstanding the equal possession of both male and female organs by each. Throughout the animal and vegetable kingdoms, the sexual appointments are *obviously* intended to insure the crossing of breeds, in order to *check* the propagation of varieties, which are always growing encroachments upon the standard models of species; indeed, the breeding among near kindred soon terminates any particular race, by inducing such deviations from the essential structure of the creature as must stop the continuance of that line.

Sexual crossings from different individuals (perhaps each of them inclined to deviate into opposite varieties,) are the natural means for preserving the right line of definite species,—and the offspring of creatures destitute of locomotion

may be presumed to share in that protection, although animals possessed of the greatest complexity of parts are necessarily liable to the most numerous alterations.

Oysters are viviparous,—and their young are found within the Tracheal passages, and between the folds of the Coverlet, during the months of June and July, in this climate. In it's first state, the Oyster exhibits two semiorbicular films of transparent shell, which are continually opening and closing at regular intervals. The whole brood are associated together, by being involved in a viscid slime, and in that state called, “*The Spat.*”—It being common among viviparous animals of this kind to have their spawn posited in contact with the lungs, the involving slime serves as the first nutriment,—and we may infer, that the foetal food, so influenced by the Gills, is at the same time a respiratory supply to the imperfectly formed young.

The *Brain*, or substance principally concerned with sensibility, is small in proportion to the bulk of an Oyster. It consists of two minute detached nodules or ganglions, each having a few slender nervous fibrils passing in radii to the neighbouring parts; the largest ganglion is affixed to the gullet,—showing, that the chief self-preserving sense is given to test the articles of food.

The terminal extremities of all the nerves are inconspicuous, from gradually losing their distinguishing opacity, and from blending their brainy substance with other parts, as they recede from the ganglions.

A similar termination happens to all the nerves of the Human body, with the exception of the Optic and the proper Auditory nerves, whose final distribution, in their

respective organs, is a web of brain,—this being an ordination for receiving miniature impressions of complicated distant phænomena, through those microscopes and microphones of the mind, the *Eye* and the *Ear*.

At some future time, the comparative analogies of the brains and nerves, in different classes of animals, may be subjected to a copious analysis, and an estimate formed of the number and kinds of sensations allotted to the different grades of intellect. Such a method of comparative Psychology was begun by the learned and pious Dr. THOMAS WILLIS, one of the Founders of The Royal Society of London. His Anatomical Treatise on the Souls of Brutes was dedicated to GILBERT SHELDON, then Archbishop of Canterbury, after having been read as THE SEDLEAN LECTURE, and printed at Oxford, in 1672.

The body of the Oyster is entirely covered by one continuous membrane, which extends to the margins of the pallium, and embraces within it's folds all the vessels and parts belonging to that apparatus. Several transparent arborescing blood-vessels are placed between this outer membrane and the substances of the body, and on the palpi or lips,—these being visible to the unaided eye, from their contiguity with the opaque fat.

The most satisfactory process for obtaining animal oils or fat from their states of combination with other animal substances, is,—First, to coagulate the mass, if a solid, in boiling water,—and, if a liquid, to evaporate the water,—then bruise the pulp, and allow it to digest in sulphuric ether; decant the solution, and permit the ether to evaporate at the atmospheric temperature in a shallow glass

vessel, when the oil or fat will remain. In this manner I have obtained all the colouring materials from the yolk of a bird's egg, from the red flesh of salmon, and from the ova and colouring of the shells of lobsters,—each of them consisting of fat oil, in which the colouring matter is dissolved. In a similar way I have been successful in obtaining the colour from many other animal substances, and from several kinds of vegetables; for by first coagulating the albuminous and extractive parts, the menstruum of ether detaches all the oils and resins which are so generally combined with the dense particles of colourization. If, however, the chymical experimentor, after having obtained these coloured compounds, should next proceed to deflagrate or burn them, he will lose the object of his pursuit,—for the flame of combustion carries away all finely comminuted particles, even to those of the metals and earths,—and watery vaporizations or distillations, contrary to vulgar opinion, have similar capabilities,—this being evinced by a smell of brass when it is moistened, and by the earthy effluvia from wetted clay and chalk when recently employed in cleaning a stone staircase. The most eligible process for separating the colours in question is, to decompose the oily compound by nitric acid, and then to search for the residuary elements in the nitric solution.

The marginal borders of the Pallium are not attached to the shells, but they occupy the whole range of their inner circumferences, and are moveable towards the edges of the shells or retractable at discretion. Two arrangements of muscle appear along the loose borders of the pallium: one set of muscular fibres forms a longitudinal band of several lines

in breadth, and this serves to gather up and shorten the outline of the pallium, when it is retracted,—the other is a series of muscles passing from the margin in radii toward the central or great muscular ligament. The muscular parts of these radiated muscles extend a few lines within those of the longitudinal bands; they are obviously retractors, or opponents to the marginal protrusions of the pallium,—and each bundle of their muscles is attached to a small tendon. These tendons form a lace-work by lateral junctions with each other, until the whole are collected into two principal cords, which are converged together, and finally inserted into the left sides of the central muscular ligament. This plexus of tendons resembles that of the extensors of the human Fingers,—but their subdivisions in the Oyster consist of several series, and those which are joined to the muscles are exceedingly multiplied. From observing the living Oyster, it is evident that these radiated muscles are excited to contract when touched, and that each stimulated part hauls up a tuck of the border of the pallium,—and by a continuity with adjacent tendons, every touched point moves and excites similar neighbouring and allied muscles, so as to withdraw a larger portion of the pallium from annoyance.

The use of all these arrangements appears to be for the protection of the living animal,—since the irritable muscular borders of the pallium are not only adapted to withdraw *themselves* from hurtful impressions, but by pulling the associated tendons against the central muscle, *it* becomes likewise excited, and immediately closes the valves.

Along the borders of each fold of the Pallium, and pro-

jecting from both edges of their margins, are two rows of *Papillæ*, which are sometimes to be seen distended with water, and at other times they are collapsed into a fringe-like substance. In the distended state, these papillæ, or nipples, often eject water from a pore at the point of each, and then collapse.

The *Mesenterick portions* of the pallium are fixed to the central muscle and tendon; they each consist of two plates of the general investing membrane, and they embrace the tendons of the radiated marginal muscles. Between these membranous plates there are non-adhering spaces, like those between the *pia* and *dura maters* of the Human brain, and from being occasionally found distended with water, they have been, as *I believe, falsely* called "*Absorbing Vessels.*" These spaces appear to be truly cellular, and not continuous tubes,—for they communicate with each other laterally, and thus resemble the tubular cells of the *corpus spongiosum penis*, just before they are converted into veins.

The use of the cellular structure of these mesenterick membranes is, to protrude the margins of the pallium by the force and direction of injected water,—for, when the mesentery of the pallium is so distended, the fringed borders are pushed to the margins of the shells. This action is more directly manifested in the syphon of the *Pholas dactylis*. A dingy green colouring matter appears irregularly dispersed through the larger convex ranges of the *fimbriæ*,—and it appears to be the same as the tinging substance of the scales belonging to the upper or flat shell.

Papillæ, exactly similar to those of the Oyster, may be seen in the syphons of *Pholades*, in the *fresh-water Muscle*,

in *Actiniæ*, and in several other *Mollusca*. The outer surfaces of the pallium are occasionally found adhering, at uncertain places, to the insides of the shells,—but this cohesion depends wholly upon close contact,—and it only happens where the shell is undergoing repair, or where it is augmenting: in no instance does the substance of the pallium mingle with the shelly materials.

Having now adduced the general facts which Anatomy discovers in the OYSTER, and also a selection from the particulars exhibited in the structure of the *Coverlet*, I proceed to show the kind of connection subsisting between the living animal and it's earthy case or shells.

From the first state of existence as a pair of semiorbicular minute shells, onward to it's final growth, the Oyster has no other fixed connection with it's two shells except that of a central defined oval surface in each valve, where the great closing muscle and an accompanying tendinous ligament are attached.

During every stage of the growth of the Oyster, an exact fitting of parts is maintained between the living animal and it's exuvial shells. The progress of growing is always from those points of the hinge, which had constituted the original pair of foetal valves,—and, in each succeeding augmentation, the great valvular muscle and it's ligament are constantly placed in the centres of the shells,—so that each advance from the hinge necessarily removes this muscle and ligament straight forward, causing them to quit their former seats of adhesion, and leaving the vacated impressions to be covered and obliterated by succeeding deposited plates of shell. At no period is there any trace of vascular, fibrous,

or membranous continuity between the parts of this muscle or ligament and the substances of the shells; and if the calcareous matter of an entire Oyster be dissolved in a sufficiently diluted acid, the animal structures of the valvular muscle and ligament continue unaltered,—but their junctions with the shells are entirely detached, and not a single fibre or shred of membrane remains in continuity with the testaceous parts.

The valves are bound together at the hinge by a peculiar springy substance, termed “*Elastic ligament*,”—and it’s elasticity is limited to a moderate degree of re-action or expansion after any compressing force is removed. This elastic substance is not extensile, like the India elastic gum,—for it’s cohesion is broken by attempting to draw it out beyond it’s passive limits. It does not hold any continuity with either the materials of the shells, or with the living structures of the animal,—and it becomes wholly detached from the discs, when the shells have been steeped in a weak acid.

This springy ligament of the Oyster is of a wedge shape, having it’s thickest part inward. It consists of three portions, fitted to the three triangular partitions in the discs: the middle portion is of equal thickness on it’s inward aspect, and it is there of a semi-pellucid, iridescent green and yellow hue,—as the wedge passes outward, and toward the points of the hinge, it becomes darker coloured, less pellucid, and gradually presents more of decay, until,—finally, the parts in contact with the sea water consist of an inky black mud.*

* It may be of future use to note, that the natural decomposition of dead shell fish is, first into a black pulp, which stains their shells,—and afterwards,

The two side portions of the spring are thinned off toward their edges,—they are continuous with the inner films of the valves,—and they appear to possess some of the properties of a binding ligament, similar to that of the hinge in the Scollop, and in many other bivalves.

When the springy ligament is broken or torn by extension, or if suffered to dry and crack, it divides into rectangular portions, which are fibrous in their perpendicular directions.

The elasticity of this substance is not materially affected by boiling in water,—and it is not soluble in alcohol, in ether, or in oil of turpentine,—but it dissolves in liquid potash. In the fire it softens, swells into bubbles, and yields an inflammable gas, of a peculiar smell: it appears to consist of albumen, mingled with oil,—and it is nearly free from the calcareous matter of shell.

The elastic ligaments of bivalves partake of the properties of cartilage, and of horn in quadrupeds,—an excess of oil is perhaps given to resist the action of water, seeing that they do not possess the vascular regenerating supplies of living structures,—and the mechanical disposition of the materials depends upon their manner of deposit.

The testaceous coverings of different animals are various in their composition, structure, and appearance. Some of them consist entirely of a dull opaque earthy substance, possessing but a small proportion of animal matter,—others are semi-transparent, and finely laminated with films of

at a distant time, the stains assume an ochry red colour. These facts are remarkably observable in the different stages of decomposition of the *Pholas dactylis*, when deeply imbedded in chalk rocks.

albumen, constituting *Naker*, or *Mother of Pearl*. Many shells are partly constructed of half crystallized *Lime* and of *Naker*,—while others exhibit epidermoid coverings, or semi-epidermoid scales, with occasional patches of carbonate of lime, free from animal matter. These several diversities of composition and structure are not limited to one kind of shells, but they extend through the univalves, bivalves, and multivalves,—and the eatable Oyster presents an instance of all those vicissitudes.

In order to establish some physiological inductions, which are the principal intent of this Discourse, it is essential, first, to show an unquestionable distinction between animal structures that are constantly maintained by vessels which bring renovating supplies from the living system, and those extraneous deposits which are either wholly detached from the vascular and sensitive parts, or only hold partial communications with them.

The coexistence of living substances, which are continually changing their materials,—with fixed deposits, not pervaded by vessels, or endowed with sensibility,—is common to the whole organized creation; and as the Physiological and Pathological considerations of this subject lead to many important practical views in the Healing Art, I shall now request your patient attention to some minute incidents, respecting the formation of the *Shells* of the OYSTER.

All the solid parts of living bodies have been previously held in solution by their nutritious fluids,—and the liquid state of those elementary materials depends upon water. In the digestion of food, it does not seem that the constituent elements of water are disturbed,—and many other materials

pass from the stomachs of animals into their circulating vessels without suffering any change, such as muriate of Soda, the colouring part of Rhubarb, &c. But, in the secretory productions of vegetable essential oils, it is probable that *Hydrogen* is detached, and it's former associate, *Oxygen*, enters into new combinations.

The proportions of water to the dissolved materials in the juices of plants, and in the blood of animals, are continually varying,—so that the condition of the fluid elements of living creatures is neither exactly defined, nor the same at different times; but all the crude materials for growth, renovation, or repair, are invariably presented at the required points, in a state of watery solution; while the selection of especial matter, it's new combinations, or changes of composition, depend on vital and other agencies, which are not sufficiently understood.

In the present state of Anatomical knowledge, it might prove an useful distinction, to name those parts of animals which have no continuity by vessels with the unquestionable living structures, *Extra-vascular*, or *Extra-vital deposits*; and we are justified in making this division, by observing crystallized carbonates and phosphates of lime as constituent substances in shells, bones, and teeth.

These mineral compounds, as well as various kinds of exuvial productions, made for the defence of living and sensitive parts, are shut out from the self-modelling organization of vascular and sensitive structures. Some extra-vital parts retain a limited intercourse with blood vessels at the surfaces of their growth,—and this occurs to the roots and under surfaces of the Human Nails, and to the Hoofs

of Cattle. The roots or attachments of hairs, spines, scales, cuticle, and feathers, are similarly circumstanced,—only that hairs, spines, cuticle, and feathers are periodically cast off, and replaced by new successions,—while nails, scales,* and hoofs are permanent, and their worn or damaged surfaces are replaced by fresh advances of substance, in which the living vessels are gradually obliterated as the parts proceed to become external.

The tusks of the Elephant, and the cutting teeth of the Beaver, Squirrel, and other *Rodentia*, which are destined to wear away, resemble our nails; for they are organized, and grow from their roots,—but lose both vascularity and sensibility at their exposed surfaces. The shells of the Crab tribes, termed “*Crustacea*,” are periodically cast off, to accommodate the creature to successive augmentations of its bulk.

From the water, which gives fluidity to all the elementary materials of animals and vegetables, up to the substances of the human brain, there are evidences of partial vitality, constituting mixtures of organic matter with inorganic,—and until these are severally and exactly distinguished, we cannot fix upon the natural causes, or the agencies under which each compound is formed or maintained.

Having assumed that Shells are altogether destitute of

* The distinct pieces of horny shell in Tortoises are augmented while the animal is growing, by a succession of white lines around the margin of each,—and these new growths are at first soft, like cheese curd; they continue to be highly sensible to the touch for many days, and then gradually assume the hardness, colour, and insensibility of the older shell. Human nails, the hoofs and claws of animals, and the scales of fishes, are formed in a similar manner.

vascular connection with the living animal, and consequently insensible and incapable of self repair,—it becomes fit to adduce the proofs of their extra-vital condition.

The shells of Oysters present three different substances, in more or less detached states,—and, in many instances, all the three substances are blended together. The first distinct kind of substance is purely *Animal*, and it occurs in the form of thin membranes or films, whose structure is neither fibrous nor reticular; whereas the vascular and vital membranes of animals are invariably fibrous. These testaceous membranes are insoluble in boiling water,—contrary to the animal portion of bones yielding glue; but from the former possessing many properties analogous to the White of an Egg, it is termed, by modern chymists, “*Albumen*.”

It must be understood, that I do not insist upon the exactness of chymical statements respecting the composition of Animal or Vegetable substances, because small portions of both Gelatine and of Albumen are often mingled with excesses of each other,—and the same want of absolute distinctness occurs among the Carbonates and Phosphates of Lime. General results, however, fix the limits of our imperfect researches,—while universals remain the attribute of Infinity.

Carbonate of Lime is the next constituent of Shells,—and when this mineral compound is minutely interspersed among the purer films, it forms *Naker*, or *Mother of Pearl*. The baubles, called “*Pearls*,” consist of concentric layers of these two substances, alternately deposited upon a rounded extraneous nucleus,—and the animals which produce them, may be induced artificially to make Pearls of any desired form or size.

The shells of different kinds of testaceous animals exhibit various proportions of mixture between the *animal* membranes and the *calcareous* deposits,—affording to some an entire pearly appearance, and to others a marble or stone-like condition.

The shells of the *Chama gigas* have no pearly structure, and they have an equal density with *Carara* marble,—suffering a similar fracture, and bearing an equal polish.

When the growth of shells proceeds wholly from their margins, without any augmentation in their thickness, as happens in the *Paper Nautilus*, and in the *Pholas dactylis*, there is none of that alternate lamination which constitutes *Mother of Pearl*.

Many shells have a temporary or a local epidermis, thrown out as a defence to the soft elaborating parts, while they form the shell; and along the margin of the flat valve in the Oyster, this epidermoid production consists of a mixture of albumen and of carbonate of lime, coloured like the fimbriæ of the pallium. While moist, these epidermoid shelving scales are elastic,—but when dry, they are brittle; showing that the property of flexibility in them depends upon a temporary softening of the albumen, unconnected with the living functions. The squamous projections of the under or concave valve are not at all flexible.

After having devoted many years to the study of Animal productions, by observing the processes of local growth, and the reparation of damages in their most permanent solids, I now venture to draw a line of distinction between organic parts constantly amenable to the vital domination, and parts which are either wholly or in some degree

extraneous to the vascular and nervous systems. I might expect to extend this doctrine with more success, if the present occasion had afforded opportunity for adducing all the comparative evidences of my past experience;—but several conclusive experiments, made upon living Oysters at Faversham by Mr. GIRAUD, may suffice to establish the extra-vascular formation of Oysters' shells.

During the Summer and Autumn of 1825, Mr. GIRAUD conducted numerous experiments, at my suggestion, upon Oysters, in one of the Oyster-beds at Faversham. They were confined in suitable cages, and a buoy-rope enabled him to inspect them at pleasure. Many important details have resulted from these accurate experiments; but, as their prolixity is unsuited to this Discourse, I shall deposit his Letters in the Archives of THE MUSEUM, together with his Specimens.

It appears that the Oyster has a discretionary power to repair breaches in it's shells, to stop holes drilled through them in any part, or to coat extraneous objects when obtruded between it's valves,—and that the animal begins to fence it's tender body as soon as any breach occurs in it's shells, by spreading a film of insoluble membrane over the damaged surfaces. In no instance is there any exudation from the bored or broken edges, whether they are of recent or of old date; and it also invariably happens, that the films of repairing membrane are confined to the inner surfaces of the shells, and they adhere solely to parts opposed to or contiguous with the living body.

From a wish to ascertain what the Oyster would do, after a total division of it's elastic ligament at the hinge, Mr.

GIRAUD was desired to cut the ligament through, without injuring the animal,—and it appears, from several trials, that a membranous screen was immediately formed, so as to exclude any entrance by the hinge into the cavity of the shells,—the Oyster continuing to live for many days without apparent inconvenience; but no effort was made to restore the elastic ligament,—indeed, the membranous screen, formed for immediate security, prevented the contact between the living secreting surfaces and the damaged parts.

All the valuable facts ascertained by Mr. GIRAUD correspond with the manner of growth and of reparation in other shells,—while they exhibit direct proofs of coherence between the self-modelling, organized structures of living parts, and extra-vascular deposits.

Many shells are liable to borings from predatory worms and other creatures, and some of the larger and more durable kinds of shells are penetrated by other testaceous animals; but none of these bored surfaces are ever filled by exudation from the shell itself,—for the repair or stopping is never attempted, unless the invader penetrates the domicile, and then a plaster or plug of albumen and carbonate of lime is thrown out from the opposite surface of the living animal. A close contact between the living parts and the surface where new shell is to be deposited, seems to be the first step; but whether this be done merely to exclude external things, or to adapt the forming plate to its shape and thickness, is not obvious.

Every portion of the external membrane of the Oyster is capable of making shell, under any of its combinations,—as may be seen at the borings, augmentations, and repa-

ration of these shells in every part; so that neither any especial organ, nor any particular instrument, is appointed for the secretion of the materials of shells.

When Oysters are dredged from their natural situations, and placed in beds more favourable to feeding, they rapidly augment the circumference of their shells, even to the extent of an inch during the first two months,—but in such cases the concavity within the valves is shallow; while Oysters bred in places where food is most abundant, have their shelly concavities deeper, and their valves of a more equable thickness and form.

When the Oyster animal becomes reduced in bulk, and it's body does not fill the hollow in the concave valve, seawater passes into the vacant space, and the creature immediately covers it with a dome of thin *Naker*. The water thus inclosed afterwards yields sulphureted Hydrogen gas,—and it appears often to remain in those cells for many years. Other occasional vacancies within the valves, situate between the valvular muscle and the margins of both shells, are generally filled with patches of Carbonate of Lime, free from membranous films. From these and similar evidences it appears, that the Oyster exercises a discretion in producing the materials for augmenting, repairing, and adapting it's shells,—and also, that it selects the appropriate materials for each occasion.

The natural history of organic substances is necessarily perplexed,—because the compounds being ordered for temporary purposes, they chiefly consist of elementary materials in a gross state of *mixture*; and while these materials continue parts of living fabricks, they are subjected to various changes.

The primary element of all organic compounds, *the blood*, undergoes continual changes from the secretions and excretions, each of them altering the proportions of it's constituent materials; while the more solid and more durable substances, which are under the control of the vascular system, are undergoing renovations after decays or waste, repairs of damages, or augmentation.

Unquestionably, the governing and directing powers which order all the offices of living creatures, are distinct from the laws of inanimate bodies; but I am anxious to show, that the concurrence of vital and physical causes is not incompatible,—and that they act together in living structures, reciprocally affecting each other's products,—rendering the several parts of our bodies more or less amenable to the agencies of life, and to those of unorganized matter. This doctrine may perhaps be tolerated by those who bear in mind the intimate connection of physical causes with all the ministrations of the Healing Art,—and who also reflect, that the surest reasonings upon the manner in which our remedies act, are those which best accord with the known affections of inanimate matter. Under the ill-defined and the supposed exclusive domination of Life, our systems of Physiology and Pathology remain little better than *Mysteries*, illogically constructed, and often contrary to the inductions of Science; for the nature and qualities of Life are so blended with organized matter, and the changeable materials of animals are so differently circumstanced in many compounds, that Naturalists cannot arrange their truly fixed mineral compounds with the transitory mixtures peculiar to living vascular parts,—and hence it becomes more philosophical to consider them separately.

If the raw materials of animal and vegetable sustenance had obviously contained the simple elements of all organic formations, it would have been more easy to account for the products elaborated by living structures; but since it is otherwise, the best method for improving this part of Physiology appears to be,—that of beginning with the examination of those fixed compounds, which either belong to the mineral kingdom,—such as the calcareous portions of shells, teeth, and bones,—or, those exuvial productions which clothe and protect sensitive parts,—as our cuticle, nails, and hair, and the varied apparel of birds, beasts, reptiles, fishes, and insects.

The shells of the eatable OYSTER exhibit examples of both mineral and animal extraneous deposits. The gross proportions of those two kinds of material were found, from an average of trials, to be, twenty parts of carbonate of lime, to one part of animal albuminous membrane; but this analysis is taken from the whole of the shells,—and, as I before stated, the different parts of the shells vary in composition, and even the same shells under some circumstances possess a greater or lesser proportion of mineral matter.

In a pair of fresh Oysters' shells, weighing 3488 grains, the entire elastic ligament or spring of the hinge weighed three grains and a half; the elastic power of this spring was equal to the pressure of three pounds fifteen ounces avoirdupois, when placed upon the centre of the flat valve, and confined to the area of the insertion of the valvular muscle.

There is one general fact respecting the composition of bones, teeth, and shells, which may prove available in the future advances of Physiological science: it is, the occurrence of *animal gelatine*, where the earthy solid proves to

be phosphate of lime,—and the occurrence of *albumen*, where carbonate of lime forms the hardening material.—These general coincidences seem to indicate some intimate connection between those animal and mineral products; but chymical knowledge is not yet equal to show the origin of any of the *earths*,—or to demonstrate the conversion of *albumen* into *gelatine*, or *vice versa*,—events, which seem to be readily effected by organic elaborations.

The immense beds of calcareous corals in the Pacific Ocean cannot have derived their lime from the sea-water under it's present composition,—and there is no reason for considering the *coral polyps* less active now than at any former time.

During the incubation of the eggs of birds much of the *albumen* disappears, and *gelatine*, in proportions not before existing, is to be found in the chick; it also seems, that the *sulphur*, so abundant in the original albumen of the egg, is changed into *phosphoric acid* by the organic processes, during incubation.

Perhaps Physiologists have proceeded in error, when they sought for the explanation of those seeming transmutations, by tracing the minute vessels of glands; and again, more recently, in ascribing them to electrical agencies; since the chymical powers of electricity have been discovered, and since electrical batteries have been found in the nervous systems of the *Torpedo* and *Gymnotus*; but the latter hypothesis fails, when we consider the chymical elaborations of vegetables to be entirely free from brain or nerves.

Much logical confusion prevails in the language of Medical Physiology, from a slovenly use of terms: Anatomists

being in the habit of employing the word *infinite*, when they can only mean *indefinite*; thus, in speaking of the extension of tubular vessels, it is often assumed that they are *infinitely* subdivided,—a position which is physically absurd. The tubular vessels of animals are, in all cases, merely the gross conduits of supply; and their proportion to the parts, their forms of ramification, and even their ultimate smallness, are subordinate accommodations.

The anastomosing continuity between the arteries and veins at the extremities of the human fingers, freely admits the passage of quicksilver; but the terminal branches, which carry the materials for growth, replenishment, or secretion, are impervious to our injections, and also *generally* to the red particles of blood. The several peculiarities in the distribution of minute vessels in *glands*, appear to be solely adapted to retard or to accelerate the flow of the elementary liquid, from whence the secretion is to be derived; indeed, the structure of all vegetables, and the scantiness of vessels in many simple animals, show that there is not any *necessary* connection between tubular vessels and organic secretions, of the most remarkable kind; while the notion of secretory changes effected in continuous tubes carrying fluids in a circle, leaves no opportunity for augmentations or deposits, beyond the confines or cavities of those vessels.

Persons, unacquainted with the purposes of Mr. HUNTER'S Collection, have complained, that it is deficient as to illustrations of Human structure; but they should recollect, that He was not an Anatomical Schoolmaster,—his Works were directed to establish a general system of Organic

Philosophy, and to form a series of Physiological and Pathological evidences, which were designed to comprehend ALL NATURE;—and this GREAT DEPOSITORY of ZOOLOGY and of ZOOTOLOGY cannot be otherwise properly employed.

Having stated that the exterior of the living Oyster does not exhibit any especial *gland-like* structure, and that the creature possesses a capability to form shell at every surface, I am thence led to conclude, that the modes of depositing both the animal and the mineral portions of their shells are mere exudations, governed by the discretion of the living animal.

A question of great importance arises out of the consideration of chymical changes effected in living bodies,—for, by a reasonable license, all the growths and reparations of parts, as well as the secretions, and even muscular contraction, may be ascribed to the agency of vital powers, whose manner of operating is like some of the artificial processes of chymistry. When, however, the transitory mixtures, and the temporary compounds of animal or vegetable elaboration, are subjected to the destroying effects of fire, these peculiar properties, which had been ordained for the uses of living creatures, are totally lost. The formative processes of life are all conducted (according to chymical phraseology) in the moist way; and, I apprehend, that their nearest artificial imitations, whether they be analytical or synthetic, will be those which most closely resemble the natural workings of organic structures.

An interesting discovery of this kind was lately made by MR. BERZELIUS, who, from a slow maceration of *Starch* in diluted Sulphuric Acid, has actually produced *Sugar*,—a

vegetable substance, heretofore considered to be of organic secretion. This extraordinary discovery seems to show the way to many others in our Physiological Chymistry.

The remarkable changes effected upon the crude materials of animal and vegetable *sustenance*, may be regarded as the products of *Organic* Chymistry,—a power which unites the mysterious agency of life with the better known agencies which govern inanimate matter.

Mr. HUNTER has, with his usual rare acuteness and accuracy, shown the manner of depositing the *Enamel of Teeth*,—and he remarks, that it is always conducted within a membranous case or inclosure, where the lime is abstracted from a liquid, and then attached to the bone of the tooth in a crystallized state,—but he doubts the possibility of advancing the inquiry any further. I have, however, ventured to think, that the present state of natural knowledge, aided by chymistry, is adequate to advance this inquiry several stages higher.

The calcareous crust of a bird's egg is formed under similar circumstances to the enamel of teeth, and to the enamel-like auditory bones of fishes,—they each consist of crystallized prisms placed in radii, forming regular secants to the curved surfaces on which they are fixed,—and the crystallizations of each are slowly effected in a watery medium, and within especial inclosures. A similar order of proceeding also obtains, when local repairs or augmentations happen to the shells of Oysters.

The eggs of domestic pullets often exhibit a cluster of equal-sized calcareous spherules adhering to some part of the previously finished shells, and these spherules mark two

important facts,—first, the size of the maternal vessels, from whose openings the minute drops of concentrated calcareous solution had issued,—and, secondly, that the *precipitant* of the lime was contained in the ambient liquid, which is interposed between the putaminous membrane of the egg and the uterine surfaces.

I have deposited in THE MUSEUM of THIS COLLEGE, an extensive collection of Crustaceous and Testaceous Specimens, to illustrate and prove the doctrines now advanced; and, I trust, they will be found sufficient to establish this attempted addition to organic Physiology and Pathology.

The manner of growth and the final structure of the internal bones of man show, that their calcareous portions have not been deposited within arborescing vessels,—as the linear directions of the calcareous deposits in the bones of the skull, and in the shafts of the limbs, unequivocally prove.

The modelling of vascular bones is principally governed by the direction of the fibrous structure of the animal gelatine; an organic formation, which must have existed before the solution of lime had been presented to the phosphoric *precipitant* within the *interstices* of the gelatine,—else the vessels conveying the lime would have been choked up, and their solidified arborescing tubes would have remained to announce the circumstance.

The organic portions of the human teeth were, in their first stage, vascular gelatinous pulps, into which mass the concretable lime is infiltrated, and it gradually fills their interstices. This exception to fibrous texture, in the animal basis of teeth, has a parallel in the petrous or auditory

portions of the temporal bones. When the structure of human teeth is completed, their exposed surfaces are coated with inorganic crystallized enamel, which does not possess either the vascular animal basis of bones, their capacity for sensation, or capability of self-repair. Damages to the protecting enamel of teeth expose the organic vascular bone, which then falls into a state of disease, called “*Inflammation* ;” acquiring sensibility, apparently from increased vascular connections with the living system, and hence it decays like other exposed bones.

From regarding the chief causes of decay in teeth to be the corrosive action of substances externally applied to them, and that attacks of the tooth-ache are generally produced by the temporary effects of acrimonious things, such as saccharine and sharply acid fruits, we obtain the indications for preserving our teeth, and for avoiding the ordinary causes of tooth-ache. That denuding erosion which often affects the necks of teeth when the external periosteum and gums recede, may be abated by frequent ablutions of lime-water, after careful picking and brushing.

In the plastic operation of making extra-vital shells, the work is differently conducted from that of vascular modelling,—and the extravasations of both calcareous solutions and of solidifiable albumen, are *released* from the *dominion* of life when they quit the vascular system; hence it is, that shells do not possess the capability of self-repair, like bones,—neither do their albuminous membranes show any fibrous or reticular structure; while the carbonate of lime, undisturbed by the vascular and vital *commotions*, falls (under mineral affinities) into a state of imperfect crystallization.

The source from whence the lime of shells and bones is obtained, still remains unknown; but from two experiments made upon living Oysters, confined in a given quantity of sea water, it appeared to me, that the proportion of muriate of soda was daily diminished,—and when we add the fact of the notorious thickness of marine shells beyond those of fresh water, it becomes worthy of inquiry, *Whether the soda may not be convertible into lime?*

Numerous and various evidences, arising from observing the structure and the offices of animal and vegetable organization, and which I have for more than twenty years occasionally communicated to scientific men, have led me to consider the most remarkable changes effected upon matter by living bodies, as far more potent and more extensive than the narrow scope of our science.

If, however, the cultivators of Natural knowledge do in any instance, either by any series of observations, or by the inquiries of experiments, detect the manner of change or of seeming transmutation, which is so common and so facile in the functions of living animals and vegetables,—they will supply more rational views to the Healing Art, and contribute to remove those oscillations in opinion and in practice, which disgrace the Profession.

SURGEONS possess the great advantage of *seeing* those different kinds of outward diseases or injuries, which are only known by circumstantial evidence when concealed *within* the body; and SURGEONS have the best opportunities for judging of the good or harm of their ministrations, because they can inspect the damaged parts at discretion, during every stage of malady and its treatment.

The promotion and the diffusion of general Zootomy by THIS COLLEGE, is of the highest public utility,—and I have no doubt of the superior value of confronting the various facts of COMPARATIVE ANATOMY, for establishing clear and simple doctrines in organic Physiology, above the endless and often frivolous minutiae of the human structure; but ANATOMY, even when carried to it's widest extent, is not sufficient to explain *any* of the chymical functions of living bodies.

Fastidious dissections, and microscopic displays of vessels, may show the limits of continuity, and the several communications among organized structures; but such views are merely topographic, and only exhibit the gross mechanical framework of a living creature.*

We now require a corresponding advancement in the knowledge of the respective influences, which different kinds of organic substances exert upon each other, in order to elucidate the physical causes of secretion, of assimilation, and of particular deposits of especial matter,—all of which appear to belong to organic chymistry.

The tubular vessels of animals are but gross conduits of supply, and nothing analogous occurs in the vegetable structures; yet, the chymical changes effected in each kingdom, are equally remarkable, and even more diversified in

* A beautiful series of vegetable leaves, deprived of their membranous and parenchymatous parts, have been lately added to THE MUSEUM. The endless variety in the modes of the lace-work exhibited in the woody fibres which constitute the skeleton or solid frame-work of these leaves, affords a striking exemplification of the equally unimportant diversities which occur in the distribution of the minute vessels and fibres of animals.

vegetables. Our researches must, therefore, be carried beyond the tracings of vessels and the connections of fibres, before we can approach the causes which influence organic and vital elaborations. It is obvious, that, while the restorative fluids of animals and vegetables are flowing through tubes, or continue to move within reticular or cellular tissues, the appropriate materials for growth, renewal, or repair, can neither be compounded nor selected; but, as every solid part has it's peculiar parenchyma, in addition to it's vessels and fibres, we must look to the constitution of that substance as a potent auxiliary in all organic formations.*

These varied parenchymatous compounds pervade all organized structures, extending from the *Tuber* of the *Potato*, up to the medullary substance of the *Human Brain*. They constitute the entire mass of some apparently homogeneous animals and vegetables,—such as the *Medusæ*, and the *Tremella nostoc*; and they form the principal bulk of many organs in complicated animals.

A more exact inquiry into the respective offices of vessels, and of these differently compounded parenchymatous deposits, must advance the knowledge of vital operations; while the contemplation of extra-vascular parts, holding a dependence upon the preserving agencies of life, will importantly aid in explaining the tenure of existence bestowed upon many passive substances, whose mineral condition, or want of self-replenishing vessels, gives them an equivocal character.

Both in the states of Health and of Disease, we observe many extravasated liquids and solids within the human body,

* The state of comparative rest assigned to this material, is an interesting fact.

or attached to parts of it, which resist spontaneous decomposition far beyond their physical capacities when removed from the living influence. Instances of this sort occur in the solid detached substances produced by disease within the knee joint,—in the cataract of the eye, which is the *death* of the crystalline lens, following the loss of it's *single* supporting artery,—in dropsical deposits, which remain uncorrupted for many years,—and in those concentric flakes of coagulated lymph, which form the bodies, called “*Globular Hydatids.*”

A more profound acquaintance with these highly interesting phenomena, and a better knowledge of the manner in which medicinal substances act upon living matter, must tend to *rectify* the doctrines of Pathology and of Therapeutics,—give the Healing Art a just claim to the rank of a Science,—assure the confidence of enlightened men,—and afford incalculable advantages in our Practice.

HONOURED PRESIDENT,

I have considered it inexpedient to quote from any of the learned or ingenious Authors who have written upon the structure and physiology of Testaceous Animals,—because, to do justice to such Works, I should have been compelled to occupy the full time allotted to a single Discourse.

Finally, it devolves upon me to speak of our deservedly lamented Colleague, Sir DAVID DUNDAS, who died on the 10th day of January last, at the venerable age of 77 years.

This honoured Gentleman became a Member of the ruling body of THIS COLLEGE in the year 1791, as a consequence of being appointed by our late Sovereign to be one of His SERJEANT SURGEONS; and His present Majesty,

whose gracious patronage of the Healing Art surpasses that of all former Kings, created him a Baronet in the year 1814.

During a residence of fifty-six years at Richmond, in Surrey, Sir DAVID DUNDAS was constantly engaged in the joint duties of a Surgeon and Physician. To a benevolent nature he united a manly firmness, graced by modesty, urbanity, and charity.

In the various and highest offices of this College, his conduct was always distinguished by ability, integrity, candour, and good manners. He was a classical and a professional Scholar,—and his scientific attainments were rendered applicable to practice by extensive medical knowledge, derived from experience.

The Profession have sustained a great loss by the death of this virtuous public man; for in every Institution where power is to be exercised, there will be strong temptations among the least worthy, to grasp a brief authority, and to pervert the most sacred public obligations to the narrow ends of vanity or selfishness,—verifying the wise words of the Poet,

“And Fools rush in, where Angels fear to tread.”

THE END.

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