THE

HUNTERIAN ORATION,

DELIVERED AT THE

ROYAL COLLEGE OF SURGEONS,

ON THE

14th OF FEBRUARY, 1834,

BY W. LAWRENCE, F.R.S.

SURGEON TO ST. BARTHOLOMEW'S HOSPITAL.

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ADVERTISEMENT.

Being aware that a production, which might answer its intended purpose as an oral address, might not be calculated to bear the ordeal of criticism, I did not originally intend to print the following pages. I have changed my intention, from the wish to remedy, as far as lies in my power, the disappointment experienced by many members of the college, students, and other gentlemen, who could not obtain admission to the college theatre on the 14th of February.

I take this opportunity of returning to the numerous audience then assembled my warmest thanks for the very cordial reception with which they honoured me.

Two or three paragraphs appear in the printed oration, which were omitted in the delivery from the fear of making too large a demand on the patience of the audience.

W. L.

Whitehall Place, March 18, 1834.

HUNTERIAN ORATION.

Mr. President and Gentlemen;

The enlightened and public-spirited individuals, who instituted this anniversary—Dr. Baillie, the nephew, and Sir Everard Home, the brother-in-law, of John Hunter—could not have supposed such a meeting necessary to perpetuate the memory and fame of their departed friend; the greatest man whom this country has produced in medical science, without excepting even the immortal discoverer of the circulation; perhaps the greatest man in the combined characters of physiologist and surgeon that the whole annals of medicine can furnish. His genius and his labours wrought such a change in the sciences, to which his life was devoted, that his name is familiar wherever they are cultivated; it is pronounced with as much veneration in other countries, as in that which gave him birth, and which proudly points to him as one of her most gifted sons.

This anniversary, then, is not for the dead, but for the living. It is designed to hold up, both to students and to proficients in surgery, a bright example of ardent thirst after knowledge, of unremitting industry, of disinterested pursuit of science; and thus to afford an incentive to the cultivation of those peaceful arts, which are a source of unmixed benefit to mankind, and of unalloyed satisfaction and reputation to their honourable professors.

When we reflect on the vast extent of research which Mr. Hunter executed, as disclosed to us by his museum, and his writings, manuscript and printed; when we consider that he was a surgeon, and that his aim was to elucidate and improve surgery, we shall be able to collect the opinion he must have entertained on a point much debated and hitherto unsettled, viz. the nature and extent of this branch of the profession. No other individual, either in ancient or modern times, has attempted, to say nothing of performing, so wide a range of investigation. He examined with minuteness the anatomy and physiology of man; he studied the structure and functions of living beings in all their varieties, and extended his researches to the vegetable kingdom, as being endowed with life though in an inferior degree; he observed the phenomena and traced the effects of disease in all organs. Proceeding on the golden rule of taking nothing upon trust, of examining every thing for himself, he

constantly interrogated nature by experiment, his inquiries embracing all the principal processes of the animal economy, both in health and disease. He collected the lights issuing from these various sources, and threw them in full force on one grand object, the science and art of surgery. Such was his conception of our profession, and of the means by which it ought to be studied and improved.

He did not limit his notion of surgery by the etymological import of the word, which means *manual operation*. Surgery, it is true, often employs the hands; but it provides much more important occupation for the head. Had it been, as its Greek original implies, a species of handicraft, *quod in therapeia mechanicum*, as some learned blockhead has defined it, the genius of a HUNTER would not have been required to unfold its principles; such minds as those of POTT and ABERNETHY, of DESAULT and BICHAT, of RICHTER and SCARPA, would not have delighted in its cultivation and illustration.

So far was Mr. HUNTER from considering operations and manual proceedings as the sole or even principal business of a surgeon, that he seems to have held this department of the profession, comparatively, in low estimation. "Operations," says he, "by which we mutilate a patient whom we cannot cure, are an acknowledgment of the imperfection of our art." The author of such a sentiment was not likely to seek for occasions of display

as an operator; he would have disdained the false and ephemeral reputation which could be built on bold and bloody undertakings of this kind.

Although practising surgery, Mr. Hunter would not have thought it possible to separate the study and investigation of internal and external diseases. He knew that the exterior and interior of our frame obey the same pathological laws, and that they are bound together by mutual influences so numerous and powerful, that we cannot stir a step in the investigation of either without reference to the other. Neither would he have admitted that the several parts of the human body can be so insulated in their sufferings and treatment, as to allow the establishment of a class of local diseases as the special department of the surgeon.

In order to estimate rightly the distinction between physic and surgery, we must advert shortly to the nature of the medical profession generally.

To preserve health, to remedy injury, to cure or alleviate disease, and to apply the information we possess on these subjects to the elucidation of various questions in legislation, jurisprudence, criminal proceedings, police, and in other matters affecting the health of individuals and societies, are the objects of a comprehensive science, which may be designated by the name of medicine. Considered thus generally, it embraces the natural history of man; it investigates the formation of the human body and its living actions; it observes the human

organisation under all the modifications impressed on it by surrounding influences of all kinds, and studies the nature and mode of action of those influences; drawing from these sources the rules for preserving health and removing or palliating disease. The practical application of these rules constitutes the art of medicine, sometimes called the art of healing, but more properly the *art of treating diseases;* while the assemblage of facts and reasonings, on which the practical proceedings are grounded, is the *science of medicine.*

When we consider that the human body is composed of numerous separate parts, that these execute distinct offices, and that they are variously acted upon by external agencies and internal causes, we might be inclined to suppose that any of them might be studied separately; that we might learn the nature and treatment of one or of some few organs, without attending to the rest. A little further reflection will convince us that the knowledge thus gained would be very imperfect. The numerous individual organs which make up the human body, although various in structure and office, are all intimately connected, and mutually dependent. They are merely subordinate parts of one machine; and they all concur, each in its own way, in producing one general result, the life of the individual. All the leading arrangements are calculated to give a character of unity to the organisation and living actions of our frame. There

is a common source of nutrition for the whole body; a single centre of circulation. Hence all parts are immediately dependent, for the means of their nutrition and growth, and for the materials of their various exertions, on the digestive organs and the circulating system. There is a common point, to which all sensations proceed, and from which volitions emanate; the seat of the inferior propensities, of the moral feelings, and of intellect; the source of nervous energy. The nervous system, of which the central portion executes these important offices, associates the actions of the various apparently distinct organs, and combines them for the common purposes of the economy. It regulates the combination and succession of movements, making them orderly and harmonious, so that, although the multiplicity and intricacy of parts seem endless, the machinery works silently and imperceptibly. This system is the great instrument of *co-operation* and *sympathy;* by means of it the various parts *work together* in health, and *suffer together* in disease. Hence the expression of Hippocrates, in reference to the human body, is strictly correct, "*Labor unus, consentientia omnia.*"

Again, although individual organs are numerous, the elements of organic structure are few. The various proportions, in which they are combined, make the difference; as the various combinations of a few letters produce the infinite variety of

words. The basis of nearly all parts consists of the cellular, vascular, absorbent, and nervous structures; and the phenomena of life are alike in all their leading features. Hence the changes of structure and the derangements of function which constitute disease, must be fundamentally similar, differing only in modification. Since, then, the component tissues of our frame are the same throughout, and since the various organs are closely linked together in the execution of a common purpose, the nature of disease and of treatment is every where essentially the same. Thus the principles of pathology are general; they are the same for all parts of the body, and must, therefore, be common to the physician and the surgeon.

Although medicine, as thus explained, is one subject, and although all its parts are connected by numerous and intimate relations, the field which it embraces is too extensive for one person to cultivate the whole; and it has been found convenient, for practical purposes, to subdivide the art into distinct branches. Hence have arisen the separate callings of the physician, surgeon, accoucheur, &c. The distinction of physic and surgery has thus taken place naturally in the progress of society, like other subdivisions of labour: it accords with the notion commonly entertained, and in some respects well founded, that the confinement of attention and exertion to one object produces increase

of skill; and it exists wherever medicine is cultivated as a science. Although altogether arbitrary, and dependent on usage, it is in many respects convenient and advantageous. There is no doubt that a person who has studied medicine generally may improve a particular department, if he should be wholly occupied with it; we must not, however, lose sight of the truth, that the scientific principles are common to the two branches of the profession; that the practical proceedings are nearly alike; and that the mode of study is the same. I feel convinced that no branch of the profession, however limited, can be thoroughly understood, except by him who has studied the structure and functions of the body generally, and then cast his view over the whole field of disease; and, consequently, that the scientific character of surgery will be lowered, unless its practical ministrations rest on the broad and secure foundation laid by Mr. Hunter in anatomy, physiology, general pathology, and therapeutics.

Thus we find, at last, that the difference between physic and surgery is a distinction not in science but in practice. Since it depends on differences of taste, or on circumstances of convenience, age, or situation, as regards the practitioner, and on opinion, confidence or caprice, in the public, it cannot be strictly defined. Nor is it necessary for us to take the trouble of settling the boundary accurately between the two departments considered

as practical arts. Our patients cut the knot which we are unable to untie. When ill, they do not look into our nosologies and our systems, to see whether they are suffering surgically or medically; they do not trouble themselves about the respective attributes of our colleges; they resort to those, in whose talents and knowledge they place the greatest confidence, whatever may be the designation under which they practise, or the fraternity to which they belong.

John Hunter (he preferred being addressed by this or the more simple appellation, John) was the youngest of ten children, and born in 1728, when his father had nearly completed his seventieth year. He was younger by ten years than his brother, Dr. William Hunter. If any proofs of superior talent were exhibited in his early years, they have escaped the notice of his biographers, from whom we merely learn, that, from the indulgence of a fond mother for her youngest offspring, his education was neglected, that he showed a dislike to the restraints and pursuits of school, particularly to the study of languages, and that he led an idle life, without exhibiting any unusual mental activity, until he had completed his twentieth year. At this time, probably impelled by that love of natural knowledge which must have been innate in him, or by a consciousness of those powers which were so soon to shine forth in their

full splendour, he came to London, by his own desire, to make trial of anatomy, under the auspices of his brother, then in high reputation as an anatomical teacher, and hoping to become his assistant, if he should prove himself competent to the task. This was in the autumn of 1748. The Doctor gave him an arm to dissect for the muscles, and finding the task performed particularly well, immediately predicted he would soon be a good anatomist. So rapid was his progress in anatomy, that he presided in the dissecting-room in the following season of 1749, and was admitted by his brother a partner in the anatomical lectures in 1755. He studied surgery at Chelsea Hospital, under Cheselden, in 1749, and became a pupil at St. Bartholomew's Hospital in 1751, two years after Pott had been elected surgeon. He began to attend St. George's Hospital in 1754, and was house-surgeon in 1756. He was appointed staff-surgeon in 1761, and was in actual service till 1763, when he quitted the army and settled in London. In 1768 he was chosen surgeon to St. George's Hospital, and held the situation till his death in 1793, being then sixty-five; the same age at which his brother, Dr. William Hunter, had died.

It thus appears that Mr. Hunter enjoyed such opportunities of gaining information as have fallen to the lot of few. He learned anatomy under the most consummate anatomist of the age; one who, according to the unanimous report of his cotempo-

raries, has never been surpassed in the art of communicating knowledge, and of exciting in the minds of others that enthusiastic ardour which was so conspicuous in himself. Cheselden and Pott were his masters in surgery, which he studied at Chelsea, St. Bartholomew's, and St. George's Hospitals.

It has been a trite, but, I believe, most unfounded complaint, that genius is neglected, and that men of talent and information are precluded from opportunities of exertion and display by favouritism, monopoly, or other obstacles. Within my own experience, the difficulty has always been to find talent for the place, not opportunity for the talent. This indeed is natural; genius being rare, while fit occasions for its exercise are of constant occurrence. Genius will never be neglected by the public, unless it neglects itself: it must not disdain the humble alliance of industry: how can it expect encouragement, unless its existence be manifested by performances? The chemist can apply tests for latent heat, but what criterion is there for latent ability? The surest evidence of superior talent is, that it forces itself into notice in spite of adverse circumstances; that it makes a road where it finds none. Such, no doubt, would have been the case with John Hunter, even if he had not enjoyed the advantages already specified. He had that insatiable thirst for knowledge which is the surest mark of a master-mind; which, in such

minds, supplies the want of external stimulus and opportunity. When we see him coming from the north, at the age of twenty, a raw uneducated youth, and entering into competition with the well-trained and superior minds whom the prizes of a great metropolis never fail to attract, we must ascribe his brilliant success, not to his external advantages, which were certainly considerable, but to his superior mental endowments and the extraordinary industry with which he employed them; to that indefatigable industry, which would have brought distinction and fame to the possessor of even moderate talents. Consider the state of medical science when JOHN HUNTER appeared on the stage. There were giants on the earth in those days; ALBINUS, HALLER, CAMPER, DR. W. HUNTER, MONRO, CULLEN, POTT, and the members of the French Academy of Surgery. MR. HUNTER was pre-eminent among such men. He appeared grand even when those around him were great.

Some have lamented MR. HUNTER's deficient education, his ignorance of languages and books: I think unreasonably. From his brother, who was intimately versed in the literature of his profession, ancient and modern, and from other well-informed men, his cotemporaries and fellow-labourers, he could learn in the easiest way all that had been done and thought in other times and countries. His whole life was spent in dissection, observation,

experiment, and reflection: how could he have been better occupied? So precious are the fruits of his inquiries into all the actions and sufferings of organised beings, that we should not be willing to part with the least of them for a whole load of scholastic erudition and book-learning.

It is instructive to observe the course which Mr. Hunter pursued in his early studies, and which he followed throughout life with undeviating constancy. Without wasting time on the opinions of lecturers and writers, he resorted at once to nature; to the source from which the masters of our art have derived their knowledge, from which lecturers and writers must draw their information, unless they should be contented, as too often happens, with copying from others. Having reached London at the beginning of the anatomical season, he immediately entered the dissecting room; and we find him in the following spring at Chelsea Hospital with Cheselden. He would not take his knowledge at second-hand, but was determined to see with his own eyes, and to examine every thing for himself. He was incessantly occupied with the great volume of nature; appealing ever to those pure springs of knowledge which she pours out with unsparing hand at the bidding of her industrious worshippers. No one could have said with greater truth, *Juvat integros accedere fontes atque haurire.*

Had he been a learned man, we might suppose

him to have conducted his researches according to the method and rules laid down by the great expounder of the inductive philosophy, and that he had kept steadily before his eyes that golden precept of Lord Bacon, "*Non fingendum aut excogitandum quid natura faciat aut ferat, sed observandum et experiendum.*" He did not attempt, like Stahl, Boerhaave, Cullen, Brown, and a host of others, to find out the secrets of nature by some lucky guess; to discover some single principle from which all the animal movements might be deduced; or to explain them by the laws of mechanics or chemistry. He examined every organ and investigated every structure, tracing them through their successive stages of development, and pursuing their varieties in all classes of animals. He observed the action of each part, both in its natural and its pathological states, and continued his inquiries, when simple observation failed, by means of well-contrived experiments. When he had proceeded as far as he could, under the guidance of observation and experiment, he chose to stand still, rather than enter the dark region of conjecture and hypothesis. He was contented with finding out how living beings are constructed; how their organs act; how the various processes in the animal economy are accomplished; how the species is continued. The nature of life he left to the speculators. "Life," he says, "is a simple property of animal matter, of which we can form no adequate

idea." Such was the modest confession of one who had examined the structure and actions of living beings more extensively than any other who has ever existed. Aware that memory cannot be trusted for retaining the endless details of researches so numerous and various, he invariably reduced every thing to writing. Thus he left behind him an immense mass of manuscripts, exhibiting an amount of mental and mechanical labour only less surprising than his museum. Among these were nine folio volumes, containing dissections of animals, and many minor bundles of papers on the same subject; a folio volume on the structure of vegetables; several volumes and other papers containing records of cases and dissections, with references to the preparations in his museum; and eighty-six lectures on surgery, which had been written out at full length, improved by various additions and corrections from time to time. Of these precious documents, so important in the illustration of the museum, and so essential to the full display of Mr. Hunter's labours and claims, in comparative anatomy, physiology, and pathology, unfortunately a large portion has been destroyed, including all the surgical lectures.

Thus his whole life was a series of incessant labour, or rather of delightful occupation; for it was spent in pursuits to which he was devoted, heart and soul; the only relaxation was that afforded by change of employment. When we con-

template his museum, and see the extent and variety of its treasures, the beautiful dissection and display of each specimen in reference to its intended object; when we consider his multifarious researches into so many parts of physiology and pathology, and the numerous volumes of his manuscripts, as well as his printed works; when we take into the account his occupations as a teacher of anatomy and surgery, as an hospital surgeon, and in private practice, we shall see clearly, that whether or no we choose to designate him as a man of genius, he was pre-eminently a man of industry. He is said to have allowed himself only five hours rest in the day, four at night, and one after dinner. It is in the power of us all to emulate the unwearied exertions of our great master; to imitate him in the judicious employment of time, the stuff that life is made of. There is none, however humble in talent, who may not signalize himself by means of similar laborious exertion; who may not make some contribution to the stock of knowledge by dint of close observation and patient industry.

Conspicuous as Mr. Hunter was for active exertion, he was equally remarkable, if not more so, for his powers of reflection. The great artist who painted his portrait could not fail to seize this characteristic trait; and he has accordingly represented the philosophic interpreter of nature in the attitude of meditation. He said that he delighted

in thinking. His writings teem with thought. His powers of intellect modify every subject that passes through his mind, and discover in it new relations and applications. Hence his works possess the highest kind of utility; that of rousing and awakening the mind of the reader.

He may, I think, be most justly termed a man of genius, in reference both to his active and his intellectual powers; to his spirit of research, his untired application, and his capacity for reflection. He possessed at least, in their highest degree, those powers which collect, compare, combine, enlarge, and vivify; without which industry is unavailing, and even knowledge is inert.

Like other truly great men, he laboured, not for his own fame, but for the advancement of science. Instead of hastening before the public with his discoveries, which were so numerous, he was anxious to complete his researches, to examine his subjects in all their bearings, before he communicated his thoughts to the world. In prosecuting his investigations, which were always directed to some important end, he met with many new things, which he put aside, unless they had reference to his main object. Thus his museum, his manuscripts, and the drawings executed under his direction, afford evidence of numerous incidental discoveries, of physiological conclusions, and of inquiries more or less advanced, but not sufficiently matured to satisfy his mind: there were enough of these, which

he had never thought of bringing before the public, to have established many minor reputations.

It has sometimes happened to men of superior minds to extend their researches and views so far beyond the existing state of knowledge, that they may be said to live and labour for posterity, rather than for their own time. Lord Bacon must have felt this, when he framed the celebrated passage in his will,—" My name and memory I leave to foreign nations ; and to mine own countrymen, after some time be passed over." This was the case in some respects with Mr. Hunter : many of his cotemporaries could not perceive the full extent and application of those labours, which form a new era in physiology and surgery. Some of the common minds who were about this great man, could not even comprehend why he should spend his time in the dissection of animals, and in physiological experiments ; they could not see how the researches of comparative anatomy, and the making of preparations, could contribute to the improvement of surgery. The admiration of posterity makes up in these cases for the indifference and the sneers of cotemporaries. Thus the reputation of Mr. Hunter has been constantly increasing since the time of his death. Indeed the vigour and originality of his genius, his comprehension and depth of thought, could not be appreciated, until the contents of his museum were well understood, and until it was rendered generally useful by proper arrangement and good catalogues.

The opinions and doctrines of Mr. Hunter having been carefully deduced from an extensive survey of facts and mature reflection, have generally been confirmed by subsequent inquiries. He was not however infallible : we must not surrender, even in respect to him, that right of free examination, and ultimate appeal to nature, which he claimed and exercised with so much success for himself; we must still adhere to the maxim of the Royal Society,—"*nullius in verba.*" He occasionally fell into errors, which may serve to inculcate the necessity of caution and diffidence in those less highly favoured. His speculations on the life of the blood led him to ascribe to that fluid, on grounds which now appear insufficient, a direct share in many important processes of the animal economy. He conceived that blood extravasated and coagulated in the living body becomes organised, and thus converted into a living medium, by which the sides of wounds are united. He explained in the same way the repair of fractured bones, the formation of tumors, and that of loose cartilages in the joints. I believe that no unequivocal example can be produced of a clot of blood becoming organised and endowed with life in the way that Mr. Hunter supposed; and, in the case of wounds, coagula obstruct adhesion instead of favouring its accomplishment.

In investigating the venereal disease, Mr. Hunter abandoned the course of proceeding which he

had pursued so safely in other departments of pathology. Instead of taking up the subject *de novo,* and examining the facts for himself, he adopted the current notions respecting the progressive and destructive nature of syphilis, and the specific powers of mercury in arresting the disorder. He made the influence of that remedy a test of the nature of the disease; maintaining that affections, which admit of cure without the use of mercury are not venereal. Hence his treatise, instead of representing faithfully the course of nature, is chiefly occupied in the endeavour to make facts accord with these preconceived notions. As the latter are unfounded, the structure built upon them falls to the ground. The high authority of Mr. Hunter confirmed and extended these pernicious mistakes; giving origin to the imaginary distinction between venereal diseases, and those resembling them, to the fanciful creation of pseudo syphilis, and syphiloid diseases; by which so much confusion, uncertainty, and embarrassment, have been introduced into an important department of surgical pathology and practice.

So completely was Mr. Hunter engrossed by his favourite pursuits, that the feelings and objects which sway common minds were either inoperative in him, or absorbed by the ruling passion. He valued wealth merely as the means of aiding his scientific undertakings: as fast as he acquired money, he spent it in his museum, in purchasing

animals, in employing dissectors and draftsmen, in physiological researches. Thus, at last, he left to his family little except the glory of his name, and that invaluable collection, which is not merely the boast of this college, and a distinguished ornament of the metropolis, but an intellectual treasure so completely unrivalled, that it exalts all over the world the scientific character of the country which gave birth to its author.

The same exemption from all sordid feelings; the same sensibility to the higher motives of action; the same disinterested love of knowledge, were seen in Dr. William Hunter, who, like his brother, moved by the

> Spur that the clear spirit doth raise,
> (That last infirmity of noble minds,)
> To scorn delights, and live laborious days,

lavished the earnings of his profession in erecting a museum, in accumulating books, medals and other objects, and then offered his collection to the public, undertaking, at his own expence, to erect suitable buildings, and to endow a professorship of anatomy, on the sole condition of having a piece of ground granted to him for the purpose. The rare generosity of such an offer could only have been equalled by the singularity of its refusal.

The collection formed by Mr. Hunter, having been purchased of his executors by a parliamentary grant, was given to this college, in trust for the use

of the public, and the advancement of science. The council have not been satisfied with the mere literal fulfilment of their important trust, as guardians of the museum. They have indeed preserved it with religious care ; but they have also steadily and constantly enlarged it, following out as nearly as possible the views of its great founder. The collection has thus become enlarged in the proportion of one-half of its original extent. According to the statement lately published by the council, the Hunterian preparations are in number 7,833 ; the additions amount to 3,951.

The museum has been opened in the most liberal manner, not only to members of the college, but to medical persons generally, to scientific characters, and to all foreigners desirous of admission. Visitors enjoy advantages, in the way of explanation and information, which are not so effectively and liberally supplied in any similar institution that I am acquainted with. They are accompanied by the conservator or assistant conservator, who add to a familiarity with the contents of the museum, extensive acquaintance with the various branches of knowledge, to which they refer, and the greatest readiness to impart information.

The college has expended large sums of money in providing for the reception of the collection, for its preservation and augmentation, for rendering it accessible and useful to visitors, and for the formation of catalogues. The same objects require a

heavy annual expenditure entirely defrayed from the college funds.

As the present buildings are inadequate to the proper display of the museum in its enlarged state, and to the suitable accommodation of the ample and increasing library, the council have determined on an extensive alteration and repair, which indeed will nearly involve a rebuilding of the college. The alterations will require that the lectures and the exhibition of the museum shall be suspended for a time. This temporary inconvenience will be amply compensated by the advantageous result of the proposed change. When it is completed, I am confident that the museum and the library will be placed on a footing worthy of the college, of the profession, and of the country.

The council have considered it more advisable to print parts of the catalogue, as they have been finished from time to time, than to wait for the completion of the whole. The following portions of this important work have already appeared ; viz.

1. Series of Pathological Preparations in spirit.
2. Series of Pathological Preparations in a dry state.
3. Series of Comparative Osteology.
4. Series of dry Preparations in Comparative Anatomy, not osteological.
5. Series of exterior Natural History in Spirit ; viz. the invertebral Division of the animal Kingdom.
6. Series of Monstrosities and Malformations.

7. Donations by Sir William Blizard.

8. Physiological Series of Comparative Anatomy, Vol. I.— *Organs of Motion and Digestion.*

These form an aggregate of 1,015 pages in quarto.

The catalogue of the remaining parts of the collection is in active progress: they are, the Vertebral Portion of the exterior Natural History, Fossils, Calculi, and the rest of the Physiological Series.

The greatest care has naturally been bestowed on the physiological series, of which the catalogue is not only more descriptive and elaborate, being illustrated by extracts from the Hunterian manuscripts and from the printed works of Mr. Hunter and others, but also embellished by engravings from some of the beautiful original drawings belonging to the collection.

This series, placed in its present order by Mr. Hunter himself, embraces all structures and organs, and is arranged, in each subdivision, in an ascending scale from the most simple to the most complicated. It is an epitome of general anatomy and physiology. It contains the philosophy of life; and by disclosing the grounds on which all the principal divisions of natural history must be founded, it affords the basis of systematic zoology.

The originality and force of Mr. Hunter's mind are fully displayed in this part of the collection. We here see how far he outstripped his contemporaries, and we learn from unequivocal testi-

mony that much of what has been done by succeeding physiologists and naturalists was familiar to him. Can there be a more convincing homage to the justice of his method than the fact, that the great naturalist, whose recent loss is deplored by the whole world of science, pursued exactly the same path in laying the foundations of that philosophical arrangement which he has brought so near to perfection in his work on the animal kingdom? Much of the ground which CUVIER went over for this purpose, had been already trodden by MR. HUNTER.

In estimating the public services of such a man as JOHN HUNTER, we are not to regard merely the direct accessions to knowledge, which have resulted from his individual labours: we must consider the influence he exerted over the minds of those around him; and the effect of his writings and his example in stimulating others to enter the new and delightful paths of science, which he laid open to their view. Hence new eras in the progress of intellect are dated from the lives and labours of such men. The actions, the writings, and the conversation of MR. HUNTER operated powerfully on a kindred genius among his own countrymen. I mean MR. ABERNETHY, whose bust, by the greatest living sculptor, now appears in this theatre for the first time. The superiority of intellect that distinguished this great teacher, was shown in the very commencement of his career.

He began to teach his profession at an age, when others are occupied in learning it, that is, immediately on the expiration of his pupillage; a circumstance which, however honourable to his talents and acquirements, was not equally favourable to that slow process of mental culture, to that long course of observation and reflection so indispensably necessary for the solid improvement of surgery. His surgical and physiological essays, published at an early age, display an original turn of thinking and talent for observation, which have seldom been surpassed. He may justly claim the great merit of having excited and exemplified, by his writings and lectures, a more scientific investigation and treatment of surgical diseases. He learned from Mr. Hunter, of whom he was a devoted admirer, to bring the lights of physiology to bear on surgical practice. Hence he was one of the first in this country to vindicate the natural rank of surgery as a branch of general pathology. He taught us to extend our views beyond the narrow limits of local causes and remedies: he pointed out the more general influences to which diseases of parts owe their origin, and hence he deduced the general means of treating those affections. He saw clearly that there is only one kind of pathology; that there is no distinction in source, nature, and treatment, between medical and surgical diseases; and consequently that surgeons ought to study general pathology and therapeutics. On this account he has been regarded as an in-

truder on the territory of physic; and has been accused of wishing to make surgeons physicians. If it is meant to charge him with wishing that we should add to our surgical knowledge that of medicine, the accusation is well founded, and does him great honour. By thus exciting surgeons to cultivate medical science generally, he has at the same time benefited the public, and increased the respectability of his own profession.

Under some roughness of exterior, as regards manner, Mr. Abernethy possessed warm feelings, benevolent disposition, and a generous spirit. He freely bestowed professional and pecuniary assistance on the needy and deserving. He had remarkable quickness of perception and reasoning, and a lively fancy. Hence he did not always make sufficient allowance for dulness and ignorance. He was sometimes betrayed into impatience, and resorted too quickly to the use of wit, of which he possessed a large share. He always retained the complete command of this weapon, even in his angriest moods. I once saw him in warm altercation with a gentleman: high words passed between them. The gentleman, irritated by something that fell from Mr. Abernethy, said, "How, Sir—do you say so?—you will be made to swallow your words." "Ah!" said Mr. Abernethy, with one of his knowing looks, "there would be no use in that; they would be sure to come up again." A great many anecdotes are still current in the profession,

founded on curious dialogues, sharp sallies, and lively repartees, which occurred in his consultation room, or in other intercourse with his patients. The authority of some may be dubious; but I can assert that he is justly entitled to the credit of all the best.

In tracing the history of any science, we are naturally led to compare the merits of those, who, in different ages or countries, have contributed to its advancement. Little interest can be attached to such comparisons, unless we bring together men, who are nearly equal in talents and public services.

Mr. Hunter has been compared to the French surgeon Desault. When Alexander the Great was asked whether he would contend in the Olympic games, he said that he would, if kings were to be the competitors. In the spirit of that reply, I should decline, on the part of Mr. Hunter, any competition, except with a mind of the first class: it must be one pre-eminent in physiology and surgery. Desault certainly is not the man. We admire his enthusiasm and his disinterested spirit. He possessed the current knowledge of his time, and was a good practical surgeon. Enjoying vast opportunities of observation, as surgeon to the Hôtel Dieu of Paris, he suggested those slighter improvements, which must have occurred under such circumstances even to an ordinary mind.

Desault might with more propriety be compared to Mr. Pott, who has always been justly

regarded as one of the great modern improvers of surgery. His works, describing in clear and elegant language, and with sound judgment, the results of his own observation, are still read with pleasure and instruction. Although he was born thirty years before DESAULT, he is quite able to sustain competition with him, both in doctrine and practice.

We cannot, however, as some have done, compare POTT to HUNTER. The one improved the art: the other gave a new form to the science of surgery. The physiological principles of our profession, totally unknown to the one, were created, or at least brought to light, by the other. MR. POTT enumerated popliteal aneurism among the cases requiring amputation. MR. HUNTER's knowledge of the absorbents, and of the share which they take in various processes of health and disease, led him to propose and practise a simple operation, by which the disease is cured with little pain and less danger. Enlightened by his physiological researches, MR. HUNTER had formed practical conclusions respecting this affection, in which he anticipated, by many years, the results of experience. In the report of his lectures, as taken in 1785, by our late highly respected member, MR. PARKINSON, recently published under the title of HUNTERIAN REMINISCENCES, by his son, we find the following statements:—

"That we ought to operate as soon as the disease is discovered, without waiting for the enlargement

of collateral channels: that we may tie the carotid, the subclavian, and the common femoral trunks. He says the carotid would be tied in a case of injury; why not then for aneurism?" *

Bichat, a favourite pupil of Desault, is much better able to sustain a competition with John Hunter, than his master. He may not have been inferior to our countryman in natural endowments; and he must have nearly equalled him in industry. His works, which place him in the first rank of physiologists, astonish us by the extent of research which they disclose, both in anatomy and physiology. His premature death, at the age of thirty, was the greatest loss which medical science has sustained in modern times. Had he, like Mr. Hunter, come near to the scriptural term of three score and ten, there would have been a fair opportunity of comparing them together.

Mr. Hunter may be compared, as a physiologist, to one of the greatest of his cotemporaries. Haller showed, from his earliest years, a fondness for study, and remarkable facility in the acquisition of languages. He became a prodigy of erudition. His mind was a vast storehouse of learning, ancient and modern. The labours and opinions of his predecessors, and of those who lived at the same time, were all known to him. He engaged zealously in the practical pursuit of anatomy and experimental physiology. His great physiological work contains

* Hunterian Reminiscences, p. 131.

a methodical and clear digest of all the known facts respecting the organisation and functions of man and animals, and an accurate register of opinions and doctrines. It is indispensable to the philosophical student of medicine, as a work of reference; and its value is greatly enhanced by the candour, the impartiality, and the love of science, which animate every page. The example of HALLER proves that MR. HUNTER lost nothing by the want of erudition, and that he had a great advantage in the wider scope of his researches, and in their important practical object. HALLER confined himself to the healthy state of the body; MR. HUNTER embraced all the phenomena of life, both in health and disease, and thus arrived at physiological conclusions much clearer and more satisfactory than those of his great cotemporary, thereby illustrating the important truth, that no natural phenomena can be properly studied in an insulated manner: to be thoroughly understood, they must be viewed in connexion with all the surrounding parts of nature.

A man of powerful intellect, of unwearied research, and immense learning, has pursued, in a neighbouring country, the same course of investigation, that MR. HUNTER did in reference to the anatomy of animals. It was probably this coincidence of pursuit that led the college to do itself the honour of enrolling the name of CUVIER in the list of its associates, and to decorate its apartments with his bust. A German by birth and education,* CUVIER

* See note A at the end of the Oration.

chose France as the country of his residence. His genius and the immense services he has rendered to science will shed an imperishable lustre both on the land of his birth, and that of his adoption.

He evinced, from his earliest years, a strong desire for knowledge, with an uncommon facility of acquisition, and a marked predilection for natural history. He came to Paris at the age of twenty-six, in 1795, a period when every encouragement was afforded to talents and activity. He was immediately appointed to important public situations,* which gave him leisure, with full command of all the means necessary in the prosecution of his favourite pursuits. He resided nearly forty years in the Jardin des Plantes; of which the magnificent collection in comparative anatomy and zoology is principally owing to his labours and his enlightened direction.† This quiet spot, in the immediate neighbourhood of a busy scene, was always respected as a peaceful asylum of science and contemplation. It was never violated even in the maddest excesses of revolutionary frenzy, the tumults of civil broils, and the disorders of foreign invasion. During a life not long in years—he died suddenly at the age of sixty-three—but of unusual duration, if measured by the variety and amount of successful labours,‡ which he crowded into it, he made a more extensive survey, and a more minute examination of animated creation, than has ever

* See note B. † See note C. ‡ See note D.

been executed by any other individual. His object, however, was not, like that of Mr. Hunter, to illustrate physiology or medicine, but to arrange all living things in their proper places. It was necessary for him to appreciate the mutual influence and relations of the various organs, and to determine the exact value of each in furnishing the basis of the various divisions necessary in a natural classification of animals.

He has produced an arrangement of the animal kingdom nearly approaching to perfection; grounded on principles so accurate, that the place which any animal occupies in this scheme already indicates the leading circumstances in its structure, economy, and habits. The *Regne Animal* of Cuvier is, in short, an abridged expression of the entire science.

He carried the lights derived from his zoological researches into kindred but obscure parts of nature. He undertook the examination of those fossil bony remains found in various regions of the globe, which had heretofore been merely objects of ignorant wonder, of vague surmise, or fabulous exaggeration: he demonstrated their real origin and nature. He succeeded, by a wonderful combination of minute and patient research, with the enlarged views deduced from an accurate knowledge of all living beings, in reconstructing, from these mutilated fragments, the antediluvian and extinct creatures, of which they are only the vestiges; and thus he deduced the most important conclusions

respecting the structure of the earth, and the revolutions which its surface has undergone. The work on fossil bones is a master-piece of patient research, of profound reflection, and extensive erudition. It would have sufficed to immortalize its author.

We cannot compare HUNTER and CUVIER; their mental endowments, their acquirements, and the scope of their labours were so widely different. The former is the greatest of surgical physiologists: no one, in ancient or modern times, can approach to the latter as a philosophic naturalist. The annals of science afford only three who can be mentioned in competition with him; ARISTOTLE, LINNEUS, and BUFFON. After the lapse of so many centuries, and in the imperfect state in which his works have descended to us, we have not the means of doing justice to the great genius of antiquity. We may however assert, without fear of contradiction, not only that CUVIER combined the separate excellencies of the two other naturalists, but that in most respects he far surpassed them. He equalled BUFFON in descriptive powers and in eloquence, but was never betrayed into the inaccuracies, the gratuitous hypotheses, and the bad taste, which sometimes disfigure the pages of that fascinating writer. LINNEUS, with an active mind and true devotion to science, had the great merit of introducing something like order into a chaos, and of supplying naturalists with an intelligible nomenclature; but he had hardly a glimpse of those scientific principles,

which pervade and illuminate the writings and the classifications of CUVIER. When shall we again see excellencies so numerous and various combined in one individual! The methodical spirit, the industry and ardour of LINNEUS; the eloquence of BUFFON; the learning, the candour, the impartiality of HALLER; the all-comprehensive intellect of ARISTOTLE!

The powerful mind of this great man embraced the whole range of science and literature. No one could develop so clearly as he did the history of human knowledge, and the relations of its various departments. These qualifications pointed him out as peculiarly fitted for the direction of education; hence he was employed by successive governments to organise schools, universities, and academies, to direct their mode of proceeding, and to superintend other branches of internal administration. He was thus called on to fill in succession, several high offices,* and introduced into the discharge of their important duties the same fulness of knowledge, the same clearness of perception and reasoning, the same exactness and method, which characterize his scientific labours.† There are many coincidences between him and his great prototype ARISTOTLE. NAPOLEON had determined to entrust him with the education of his son, and had already employed him to select a library for his use. In the year 1818, the ministry of the interior was offered to him, and refused. Shortly before his death, he had been

* See note E. † See note F.

created peer of France, and nominated president of the entire council of state, of which he had been for many years the most efficient and useful member. His premature death has been felt over the whole world of science, as a loss which can never be repaired, more particularly as it prevents the completion of that great work on the anatomy of animals, to which the *Regne Animal* was designed as an introduction, and to which his other scientific labours were preliminary and preparatory.

The gigantic intellect and immense acquirements of CUVIER were adorned by a most amiable private character; while his lectures and public discourses, especially those addressed to younger audiences, were pervaded by an exalted tone of religious and moral feeling, which adds the last and highest ornament to literature and science. In illustration of this point, I read an extract of a letter sent by him to the director of a country school, in the establishment and prosperity of which he had taken interest. It will show that the weighty matters of science, and the cares of administration, which might be supposed to have engrossed his whole time, did not divert his active benevolence from humbler objects; and that he neglected no occasion, however apparently trivial, of making himself useful to his fellow-creatures.

"Do not, Monsieur le Recteur, lose sight of our school at Arnières les Bourges. I recommend the scholars of it to you as my brothers, as my best

friends. Instil into them submission to their parents, respect for the property of others, candour and justice. These are the virtues and duties of all religions. Let benevolence and affection reign between them and the children who inhabit the same village, and who, like them, live by their labours in the fields. God loves and protects them all with equal goodness; he blesses impartially the sweat of their brow, and their harvests; let them therefore behave towards each other as children of the same father." *

I feel great satisfaction that the scientific study of our profession leads us into those departments of knowledge, which have been opened and enlightened by the genius and labours of this great and good man. His writings may be regarded as models of research and reasoning; as inexhaustible stores of knowledge, and calculated to call forth and strengthen the best feelings of our nature. †

In conclusion, Gentlemen, let me express to you my conviction, that as a physiologist and surgeon, John Hunter has had no equal in any age or country;—that he was one of those powerful minds, appearing only at long intervals, of which this island, small as it is, has produced so great a number;—that his name must be inscribed on that bright constellation of genius, which already bears those of Harvey and Sydenham, of Bacon, Locke, and Newton, of Shakspeare, Milton, Scott and

* *Memoirs* of Baron Cuvier *by* Mrs. Lee, p. 252.

† See note G.

Byron. These gifted mortals, with kindred spirits, who have drawn inspiration from their example and works, shed over our land an intellectual glory, equal to its renown in arts and in arms. The bosom of every Englishman glows with an emotion of conscious pride at the enumeration of these revered names. If, Gentlemen, the time should ever come, when the institutions and the power of our beloved country shall have passed away, their memory would linger round the spots consecrated by their earthly labours; the land on which they trod would still be a watchword to the earth; it would be peopled with the glorious recollections of its departed sages, as the sight of Greece recalled to the truly noble poet, who yielded up his life on her classic soil, the heroes who had fallen in her defence:

They fell, (he says,) devoted but undying;
The very gale their names seemed sighing:
The waters murmured of their name;
The woods were peopled with their fame;
The silent pillar, lone and gray,
Claimed kindred with their sacred clay;
Their spirit wrapped the dusky mountain,
Their memory sparkled o'er the fountain;
The meanest rill, the mightiest river
Rolled mingling with their fame for ever.

NOTES.

Note A.

George Cuvier was born in August 1769, at Montbéliard, a town now belonging to France, but then forming a part of the kingdom of Wurtemberg. His mother had three children. "The eldest died while she was pregnant with her second son, which event preyed so much upon her health, that her infant, George, came into the world with a constitution so feeble, that his youth scarcely promised manhood. The cares of this excellent mother, during the extreme delicacy of his health, left an impression on M. Cuvier which was never effaced, even in his latest years, and amid the absorbing occupations of his active life. He cherished every circumstance connected with her memory; he loved to recall her kindnesses, and to dwell upon objects, however trifling, which reminded him of her. Among other things, he delighted in being surrounded by the flowers she had preferred, and whoever placed a bouquet of red stocks in his study, was sure to be rewarded by his most affectionate thanks, for bringing him what he called his "favourite flower." But this well-judging parent did not confine her cares to his health alone, she devoted herself equally to the formation of his mind, and was ano-

ther proof of the influence that a mother's early attentions frequently shed over the future career of her son. She guided him in his religious duties, taught him to read fluently at the age of four years, took him every morning to an elementary school, and although herself ignorant of Latin, so scrupulously made him repeat his lessons to her, that he was always better prepared with his tasks than any other boy in the school. She made him draw under her own inspection; and by constantly furnishing him with the best works on history and general literature, nurtured that passion for reading, that ardent desire for knowledge, which became the principal spring of his intellectual existence." "At ten years of age, he was placed in a higher school, called the Gymnase, where, in the space of four years, he profited by every branch of education there taught, even including rhetoric. He had no difficulty in acquiring Latin and Greek; and he was constantly at the head of the classes of history, geography, and mathematics. The history of mankind was, from the earliest period of his life, a subject of the most indefatigable application; and long lists of sovereigns, princes, and the driest chronological facts, once arranged in his memory, were never forgotten. He also delighted in reducing maps to a very small scale, which, when done, were given to his companions; and his love of reading was so great, that his mother, fearing the effect of so much application to sedentary pursuits, frequently forced him to seek other employments. When thus driven, as it were, from study, he entered into boyish sports with equal ardour, and was foremost in all youthful recreations. It was at this age that his taste for natural history was brought to light by the sight of a GESNER, with coloured plates, in the library of the Gymnase, and by the frequent visits which he paid at the house of a relation who possessed a complete copy of BUFFON. Blessed with a memory that retained every thing he saw and read, and which never failed him in any part of his career, when twelve years old he was as familiar with quadrupeds and birds as a first-

rate naturalist. He copied the plates of the above work, and coloured them according to the printed descriptions, either with paint or pieces of silk."

"At the age of fourteen, we find the dawning talents of the legislator manifesting themselves; and the young CUVIER then chose a certain number of his school-fellows, and constituted them into an academy, of which he was appointed president. He gave the regulations, and fixed the meetings for every Thursday, at a stated hour, and, seated on a bed, and placing his companions round a table, he ordered that some work should be read, which treated either of natural history, philosophy, history, or travels. The merits of the book were then discussed, after which, the youthful president summed up the whole, and pronounced a sort of judgment on the matter contained in it; which judgment was always strictly adopted by his disciples. He was, even then, remarkable for his declamatory powers, and on the anniversary fête of the Sovereign of Montbéliard, Duke Charles of Wurtemberg, he composed an oration in verse, on the prosperous state of the principality; and delivered it fresh from his pen, in a firm manly tone, which astonished the whole audience."

The duke having heard of his talents and progress, took him under his special protection, and sent him to the University of Stuttgard free of expense. "During the four years that he passed there, he studied all that was taught in the highest classes, mathematics, law, medicine, administration, tactics, commerce, &c. After applying himself for one year to philosophy, as his particular object, he then chose the study of administration, which, in Germany, embraces the practical and elementary parts of law, finance, police, agriculture, technology, &c.; and was principally led to this preference, because it also afforded him many opportunities of pursuing natural history, of herborising, and of visiting collections."

"In his walks he collected a very considerable herbarium; and, during his hours of recreation, he drew

and coloured an immense number of insects, birds, and plants, with the most surprising correctness and fidelity. It was the same in every thing; for that versatility of talent, which made him the wonder of all who knew him as a man, seems to have distinguished him in early years. He obtained various prizes, and the order of Chevalerie, an honour which was only granted to five or six out of four hundred pupils; and nine months after his arrival at Stuttgard, he bore off the prize for the German language."

Disappointed in his views of advancement in his native country, he took the situation of tutor in a Protestant family, at Caen in Normandy. He entered on the task in his nineteenth year, "in possession of that variety and depth of knowledge which was so soon to ripen into the great savant, bringing with him from Germany that love of labour, that depth of reflection, that perseverance, that uprightness of character, from which he never swerved. To these admirable foundations for glory, he afterwards added that remarkable clearness of system, that perfection of method, that tact of giving only what is necessary; in short, that elegant manner of summing up the whole, which particularly distinguishes the French writers: the whole superstructure was completed by the most perfect modesty, and that respect for his own esteem, without which talents become the medium of traffic for the acquirement of sordid possessions." *

Note B.

In the year 1795, he was appointed a member of the *Commission des Arts*, and professor at the central school of the Pantheon, for which he composed his *Tableau élémentaire de l'Histoire naturelle des Animaux.* He was asso-

* *Memoirs of Baron* Cuvier, by Mrs. Lee, p. 8—19.

ciated, in the same year, with M. Mertrud, then very old, in the newly created chair of comparative anatomy, at the Jardin des Plantes, took up his residence in that institution, and opened his first course of lectures on comparative anatomy. At the organisation of the National Institute, in 1796, he was made one of its first members.

In 1800, he was appointed professor at the College de France, and resigned the chair at the central school of the Pantheon; he was also elected secretary to the class of physical and mathematical sciences of the institution. In 1803 he was made perpetual Secretary to that class.

Note C.

"From the moment of his installation in this new office, (that of professor at the Jardin des Plantes,) M. Cuvier commenced that magnificent collection of comparative anatomy, which is now so generally celebrated. In the lumber-room of the museum were four or five old skeletons, collected by M. Daubenton, and piled up there by M. de Buffon. Taking these, as it were, for the foundation, he unceasingly pursued his object; and, aided by some professors, opposed by others, he soon gave it such a degree of importance, that no farther obstacle could be raised against its progress. No other pursuit, no relaxation, no absence, no legislative duties, no sorrow, no illness, ever turned him from this great purpose, and, created by him, it now remains one of the noblest monuments to his memory." *

Note D.

The larger works of Cuvier are the *Tableau élémentaire de l'histoire naturelle des animaux,* 8vo. 1798. *Leçons*

* *Memoirs, &c.* p. 24.

d'anatomie comparée, 5 tom. 8vo. 1800—1805. *Recherches sur les ossemens fossiles*, 4 tom. 4to. 1811. The second edition, in five large quarto volumes, with an almost endless number of figures, was published in 1817. *Le Regne animal*, 4 tom. 8vo. 1817; second edition, in five vols. 8vo. 1829. *Mémoires pour servir à l'histoire et l'anatomie des mollusques;* a large volume in 4to. with thirty-five plates, containing an immense number of figures. *Histoire des progrés des sciences naturelles depuis* 1789, *jusqu'à ce jour*, 4 tom. 8vo 1829. *Eloges historiques des membres de l'académie des sciences*, 3 tom. 8vo. 1789—1827. *Histoire des Poissons*, in quarto, with numerous coloured plates, of most beautiful execution; 8 vols. According to its original plan, the work was expected to extend to twenty volumes.

Mrs. Lee has appended to her memoir a chronological list of the published works of Baron Cuvier, which occupies more than ten closely printed pages. Including those already enumerated, it consists of about two hundred articles, many of which are long and elaborate; while nearly the whole of them detail the results of original and important researches in zoology. Whether we consider their number, their originality, or their intrinsic importance, such accessions to the stock of zoological knowledge have not proceeded from any other individual. It must be remembered also, that he began, in 1802, and continued to the time of his death, an analysis of all the proceedings of the National Institute.

Note E.

In 1802, he was named one of the six inspectors-general of education, and went to Marseilles, Nice, and Bordeaux, to establish Lyceums, which are now called royal colleges.

When the Imperial University was created by Napo-

LEON in 1808, CUVIER was made one of the counsellors for life, to this body. In this capacity he was commissioned, in the two following years, to organise the academies of those Italian states which were then annexed to the empire. The arrangements which he made at Turin, Genoa, and Pisa, were afterwards maintained by the sovereigns of those countries on their restoration.

In 1811, he was ordered to form academies in Holland and the Hanseatic towns. He went to Rome in 1813, to organise an university there. In the same year, NAPOLEON appointed him maître des requêtes in the council of state; the duty of the place being to examine all questions about to be brought forward, and to report upon them to the council. It belongs to this latter body to "prepare laws, to examine ordinances, and to decide whether the complaints brought against the authorized agents of government require judicial proceedings." He was made counsellor of state in 1814, and began to act as commissaire du roi, the office of which is, to defend all bills brought into either house by the ministry. In the same year he was appointed chancellor of the university; in 1819, president of the comité de l'interieur of the council of state; in 1822, grand master of the faculties of Protestant theology in the university; he had twice filled the situation of grand master of the university, for about a year on each occasion.

The comité de l'intérieur of the council of state is appointed to advise with the minister of the interior on all administrative questions, to draw up the ordinances issued from that body, to prepare the plans of various laws, and to examine numerous matters of internal administration.

A combination of the most weighty duties devolved on CUVIER, as president of this committee, and chancellor of the university. "Called," says Mrs. LEE, "to those important charges, when all required to be revived and reorganised, it is scarcely possible for us to conceive the diffi-

culties that were presented to him: but with what vigour and talent did he put all into action!

Public instruction being attached to the presidency, he was obliged to draw out the plans for study; to regulate the discipline of the schools; to decide according to the actual necessities of a new order of society; and, nevertheless only to obey these necessities so long as they did not interfere with those principles of public or domestic order, without which, there is no repose either in a family or a state; in short, to give the rising generation the knowledge and habits most calculated to preserve the great ties of society, and to select those who were most worthy of disseminating such knowledge into every part of the kingdom. How vast then must have been that capacity, which, besides these duties, embraced every branch of science and literature! I dare not dispute that others may have been equally gifted by a beneficent Creator, but I dare affirm that the one ruling principle of order was the human agency by which M. Cuvier brought his heaven-born faculties into full force. He greatly occupied himself with municipal and provincial laws, and those relating to public instruction; every branch of which was the object of his exertions. Not contented with issuing ordonnances from the department of the interior, he composed a great many memoirs to accompany them, which exposed their motives, and formed so many precious commentaries, as they explained with the greatest perspicuity the reasons of every article. He thought it as useful to spread every where the reasons of the laws as to disseminate the laws themselves; thinking that the latter are often attacked and mistaken by the public for want of a proper comprehension of the motives which caused them to be framed." *

* *Memoirs*, p. 232—234.

Note F.

"For the last thirteen years of his life did M. Cuvier preside over the Comité de l'Intérieur, and the number of affairs which passed through his hands in this office alone is almost frightful to the imagination: I ought not, perhaps, to say passed through, but that they were examined, deeply considered, and forwarded by him. I should speak much within the limits of the truth, if I were to state them at ten thousand every year. 'The art of properly distributing the work among his colleagues; his talent in directing discussion; his unfailing and prodigious memory, supplying antecedent decisions at the desired moment; his profound knowledge of the principles which ought to regulate each affair, the best method of applying these principles at the best opportunity;—these qualities all rendered his presidency the most remarkable of the present age, and have indelibly impressed it on the recollection of all who had the advantage of labouring with him. To see him at one of these meetings, was perhaps to see him in his greatest perfection as a legislator. Rarely eager to give his advice, he even appeared to be thinking of subjects wholly irrelevant to the matter in discussion; but he was often, at that very moment, writing the judgment or regulation which must necessarily follow the deliberation. His turn to speak only came when all others had stated their reasons, when useless words were expended. Then a new light burst upon the whole; facts assumed their proper position, confused and mingled ideas were arranged in order, the inevitable consequences appeared, and when he ceased to speak, the discussion was terminated."*

* Mrs. Lee's *Memoirs*, p. 242. The marked passage is taken from the éloge delivered in the Chamber of Peers, by Baron Pasquier, the president of that chamber.

Note G.

The following extracts from Mrs. Lee's very interesting memoirs of this true philosopher, will show how science became in his hands an instrument of practical utility, as well as the means of illustrating matters of higher concern and deeper interest. "He believed that instruction would lead to civilization, and civilization to morality; and therefore that primary instruction should give to the people every means of fully exercising their industry without disgusting them with their condition; that secondary instruction should expand the mind without rendering it false or presumptuous; and that special instruction should give to France, magistrates, physicians, generals, clergy, and professors, all distinguished for their enlightened views; in fact, that succession of elevated characters which make the real and imperishable glory of the country in which they act their part. But here it may be interesting again to introduce M. Cuvier's own words, as expressing his sentiments, and which have been supplied to me by M. Laurillard:—'Give schools before political rights; make citizens comprehend the duties that the state of society imposes on them; teach them what are political rights before you offer them for their enjoyment. Then all ameliorations will be made without causing a shock; then each new idea thrown upon good ground, will have time to germinate, to grow and to ripen, without convulsing the social body. Imitate nature, who, in the development of beings, acts by gradation, and gives time to every member of her most powerful elements. The infant remains nine months in the body of its mother; man's physical perfection only takes place at twenty or thirty, and his moral completion from thirty to forty. Institutions must have ages to produce their fruits—witness Christianity; the effects of which are not yet accomplished, notwithstanding a thousand years of existence.'"*

Page 245—247.

In 1830, CUVIER began a course of lectures at the College de France, on the history and progress of science in all ages. On the 8th May, 1832, he opened the third and concluding part of these lectures, "when he pointed out what remained for him to say respecting the earth and its changes, and announced his intention of unfolding his own manner of viewing the present state of creation; a sublime task which was to lead us, independent of narrow systems, back to that supreme intelligence which rules, enlightens, and vivifies, which gives to every creature the especial conditions of its existence, to that intelligence, in short, which reveals all, and which all reveals—which contains every thing, and which every thing contains. In the last part of this discourse, there was a calmness, a clearness of perception, an unaffected and unrestrained manifestation of the contemplative and religious observer, which greatly added to its force, and which involuntarily recalled that book which speaks of the creation of the earth and the human race. The similarity was avoided rather than sought—it was not to be found in the words but the ideas; and at once flashed across the minds of his auditors, when the great professor declared, that each being contains in itself an infinite variety, an admirable arrangement for the purposes for which it is intended, that each being is good, perfect, and capable of life, each according to its order and its species, and its individuality. In the whole of this lecture there was an omnipresence of the omnipotent and supreme cause. The examination of the visible world seemed to touch upon the invisible, the search into creation necessarily invoked the presence of the Creator; it seemed as if the veil were to be torn from before us, and science was about to reveal eternal wisdom. Great then was the effect produced by the concluding sentences, which seemed to bear a prophetic sense, and which were the last he ever addressed to his audience. 'These,' said he, 'will be the objects of our future investigations, if time, health, and strength, are

given to me, to continue and to finish them with you.' Those who were versed in human destiny, seemed to feel that his sphere of action was even then placed out of this world, and that he had pronounced his farewell. So near the great and awful tribunal, what other words, what other thoughts than those contained in this lecture could have so plainly shown the preparations already made for his journey thither?"*

Page 317—319.

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