THE SCOTS MAGAZINE,

For NOVEMBER 1803.

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GODEY'S MAGAZINE.

THE

SCOTS MAGAZINE,

For NOVEMBER 1803.

SKETCH OF THE

LIFE, TRAVELS, STUDIES, AND CHARACTER,

OF

SIR ANDREW BALFOUR, M. D.

SIR ANDREW BALFOUR was born at the family eſtate of Denmiln*, near Abdie, in Fifeſhire, on the 18th day of January 1630. After acquiring at ſchools the elementary branches of learning, he was ſent to St Andrews, with indications of a riſing genius, and a remarkable attachment to letters. He there ſtudied philoſophy, under Thomas Gleig, D. D. afterwards a celebrated phyſician, and had conferred on him, the degree of M. A. having publiſhed as uſual, a ſpecimen of his abilities.

WHEN he had made ſome progreſs in the ſtudy of Botany, and Natural Hiſtory, he reſolved to embrace the medical profeſſion, but in order to improve himſelf by travel, ſpent fifteen years abroad, before venturing to practiſe. The acquiſition of medical knowledge, was then, a taſk of extreme difficulty and labour; and Balfour held in contempt the ſuperficial information with which many of his contemporaries were ſatisfied.

AT London he commenced his ſtudies under Sir John Wedderburne, a celebrated practitioner, and phyſician to the King. He enjoyed alſo the acquaintance of the principal medical characters in that city, and eaſy acceſs to the beſt books. Thoroughly inſtructed in the ancients, he ſoon became familiar with modern writers; and eagerly cultivated an acquaintance with every author who had advanced medical ſcience, by ſtudying his works. At firſt he was directed in his choice of books, by men of learning and experience; but as he advanced in years, he became maſter of all the catalogues printed in Europe, from which he ſelected ſuch as ſuited his purpoſe, and began the formation of a very valuable and uſeful library.

BALFOUR attended upwards of twelve

* An account of the ancient and reſpectable family of Denmiln, is prefixed to the memoirs of Sir James Balfour of Kinaird. Scots Mag. Oct.

twelve months, at each of the principal Univerſities in Europe, viz. Oxford, Montpelier, Caen, and Pavia; at Paris he remained ſeveral years, and proceeded through a regular courſe of education. That metropolis he found peculiarly inviting, from its containing a numerous aſſemblage of learned men; anatomical diſſections, the various hoſpitals, and the collection of valuable plants in the royal garden; and from the ſimple and approved method of practice, which was adopted, and to be learned there.

Besides the lectures of eminent teachers, he frequented the hoſpitals, and the ſhops of the ſurgeons and apothecaries. He attended the laboratory of the chemiſt Bartlet; performed under Cayant a celebrated ſurgeon, with whom he had frequent diſſections of the human body; and to the country he made excurſions in ſearch of Botanical ſpecimens. Theſe objects, however, important and multifarious as they were, did not wholly engage his comprehenſive mind; he devoted a ſhare of his attention to the ſtudy of antiquities, in which his acceſs to the cabinets and libraries of the learned, afforded him many facilities. He alſo ſtudied cloſely the practice of medicine at London, under the celebrated teachers of that city, viz. Harvey, De Mayerne, Claſon, Wharton, Bate, Scarbrugh, Wedderburne, and Charleton. For Botany, he repaired to Blois, where he became acquainted with his very ingenious countryman Moriſon, and laid the foundation of an intimacy which increaſed with years, producing many reciprocal acts of friendſhip. At this place alſo he firſt ſaw Marchant, who was afterwards manager of the Botanical Garden at Paris, and continued one of Balfour's moſt valuable correſpondents.

At different times he performed what was called the *grand tour* of France, having chiefly in view the inveſtigation of Natural Hiſtory. But, beſides noticing every remarkable production of the animal, vegetable and mineral Kingdoms; he ſtudied the geography and antiquities of the country, and the manners and cuſtoms of the people, of which he gives an accurate deſcription, in an uſeful and entertaining account of his travels.* Of the intereſting natural curioſities that engaged his attention, the following is a ſketch.†

In the neighbourhood of Blois, near Orchaiſe, formerly called Cæſar's granary, he diſcoverd in the vaults a kind of earth, reſembling in quality *Terra Sigillata*.

In the country of Orleans, he deſcribes a ſpring of water, ſo abundant, that it forms a river navigable to its ſource.

Near Tours, a cave cut in a rock, in which the drops of water become petrified.

In the ſlave quarries‡ at Saumur, a quantity of ſtones, com-

* Printed at Edinburgh, in the year 1700.

† In theſe and the ſubſequent accounts of Balfour's travels, the deſcriptions of Sir Robert Sibbald, his biographer, are chiefly followed. Moſt of the objects here mentioned, are known to the ſtudent, and to the reader of modern travels, by more recent and familiar names; which might have been given in illuſtration, but would have ſwelled this part of the ſubject to an unreaſonable length.

From this account of the diſcoveries and obſervations of Dr Balfour, ſome idea may be formed of the ſtate of knowledge towards the cloſe of the 17th century, and of his zeal and activity in the promotion of ſcience and letters.

‡ Public quarries, in which offenders were condemned by the ſtate to labour.

monly called ſerpents' tongues, but which he deſcribes as rather reſembling human tongues.

At Puzzoli, ſprings ſuppoſed to be impregnated with alum, appearing where they iſſue, as if mixed with flour.

The fields in the country round Avignon, covered with ſaffron; and the lake in the ſecluded valley of *Vaucluſe*, not more copious in its fall of water, than the cave, celebrated in the loves of Petrarch and Laura. At Avignon, he alſo remarks, that the fruit of the French Boxthorn is ſold in a ſolution, for the purpoſe of producing a brown complexion.

He ſaw, and particularly deſcribes the ſtupendous work of the Romans, called Pons Guardonis, a bridge conſiſting of three rows of arches. At Thouloufe, a ſingular quality in the earth, of preſerving from putrefaction the dead bodies interred under the church.

In the neighbourhood of Bourdeaux, Baſtard Muſhrooms, a wild plant, which is torn up by ſwine, for its ſtrong ſmell.

At Bruges he deſcribes the ſalt pits, and method of preparing ſalt.

The ſcarce and curious plants, however, which he found at theſe places, were the principal objects of his attention. He preſerved theſe in paper books, of which ſeveral volumes, were transferred with the Balfourian Muſeum to the univerſity of Edinburgh.

On one of theſe journies, Balfour accompanied Mr Watkinſon, an Engliſhman of rank, to whom his knowledge and experience were of eſſential ſervice. He returned with this gentleman to England, and reſided for ſome time at his houſe in Yorkſhire. Having revifited France with the view of obtaining a degree, he excluſively devoted his attention to the ſtudy of medicine. After a public diſputation at Caen, on Veneſection in Dyſentery, and the uſual private examinations before the profeſſors, he became a Bachelor and Licentiate, and on the 20th of September, 1661, received the degree of Doctor of Medicine, from the celebrated Stephen Cathagneſus, preſident and profeſſor of medicine in the univerſity of Caen.

After receiving his degree, Dr Balfour, repaired to England, where he was received into favour by King Charles the ſecond, and was appointed Governor to the Earl of Rocheſter. He continued in this office four years, during which, he travelled through France and Italy, directing the ſtudies and purſuits of his pupil. And it may be mentioned here that, after his death that ingenious and accompliſhed nobleman in an elegant eulogium written by himſelf, paid an honourable tribute to the memory of his preceptor.

In the progreſs of his tour with the Earl of Rocheſter, Dr Balfour made ſeveral additions to his obſervations in Natural Hiſtory, &c.

At Milan he viſited Manfred Septalius, ſon of the celebrated Lewis Septalius, and carefully inſpected his muſeum. In the vicinity of this city he remarked a ſingular echo, by which the voice is repeated in forty changes.

At Florence he particularly noticed the model of the city of Leghorn, compoſed of ſmall pieces of marble of various colours, but ſo exactly fitted to each other, as to reſemble one ſtone; containing imitations of the gates, caſtle and turrets, with other prominent objects nicely cut in an improved ſtile. The ancient ſpecimens of this art, our traveller obſerves, are compoſed of quadrangular pieces, wherefore the new method is decidedly ſuperior, the parts being ſhaped in imitation

of the natural colour and figure of the object repreſented, ſo exactly joined, and diſtributed ſo judiciouſly with regard to light and ſhade, that the pencil of the painter ſcarce equals this effort of maſonry in imitating nature. In the neighbourhood of Florence he deſcribes other two devices in ſtone, one repreſenting the towns and the adjacent country, the ſecond which is of a lighter colour and interſected by dark lines, trees and groves. At Piſa he takes notice of a pyramidal tower, inclining or hanging to one ſide, agreeably, it was ſuppoſed, to the deſign of the architect. But Dr Balfour aſcribes its appearance to the giving way of the earth, one of the ſeveral rows of pillars by which the building is ſurrounded, appearing alſo to bend towards the ground.

At Bologna he viſited the Naturaliſt Zanoni, and viewed his engravings of plants, which were afterwards publiſhed. When in Venice, he found that Antony Donatus had left many engravings of plants, unaccompanied by deſcriptions; this deficiency he ſupplied, and having arranged the whole for publication, the volume appeared ſoon afterwards.

At Pavia he added to the number of his friends M. Torres, profeſſor of Botany, whoſe Medical garden is commended for the ſcarcity more than the number of plants contained in it. At this place the friendſhip between Dr B. and his countryman Kennedy, celebrated as an author and public lecturer on Logic, commenced.

He next remarks a houſe through which the air was circulated by means of pipes or canals, and ſo ſkilfully contrived that it could be cooled at pleaſure. There alſo he ſaw a ſubterraneous apartment, in which the water dropping from the roof petrified wood and ſtraw, although the liquid itſelf did not congeal.

While at Rome, he contracted an acquaintance with Leo Alatius, one of the moſt learned men of his age, and keeper of the Vatican library, to which he thus obtained eaſy acceſs. Among the numerous manuſcripts in that collection, he was chiefly delighted with a copy of Dioſcorides, illuſtrated by beautiful drawings of plants and animals, and with a deſcription of ancient Latium, containing all the old and new names of places. Here alſo our traveller, and his countryman William Leſlie, contracted a friendſhip which they cheriſhed afterwards through life. This perſon was ſecretary to the ſociety for propagating the faith, and freely ſhewed to his friends, or others of an inquiſitive turn, all the curioſities of nature and art, which the miſſionaries had met with in different parts of the world. Robert Pendrich, a learned Scotchman, is alſo mentioned among his friends at Rome, Obadiah Walker, an Engliſhman, a celebrated antiquary, who conducted Balfour to all the public works, and pointed out to him whatever was worthy of notice, and Walter Pope, M. D. a diſtinguiſhed naturaliſt, afterwards one of his moſt uſeful correſpondents. From Father Barilier, a religious Frenchman then at Rome, he received great aſſiſtance. Barilier was an excellent naturaliſt, and ſhewed Dr Balfour a work on his favourite ſcience, (of which he formed a very high opinion) preparing for the preſs, but which was prematurely ſtopped by the death of the author.

To the ſacred monuments of antiquity in this place, Dr Balfour gave particular attention, and made himſelf eminently maſter of the ſubject.

He was an attentive obſerver of the habits and manners of eminent men,

men, and quick in discovering their natural disposition, which he made it his study to indulge, while he acquired in their company much useful information and solid wisdom. He at length quitted Rome, highly pleased with the customs and mode of living in that renowned city, and resumed the functions of a philosophical traveller.

In the country of Naples he visited the natural caverns called St Germains; a number of small cells, yielding a warm vapour from the earth, which brings on perspiration, and is beneficial in several diseases. Near this is the Dog's Grotto, a cavern in the side of a hill, which scarce admits two or three men standing upright. It contains a moist, dirty soil, from which a poisonous vapour arises, but continues at about the height of a foot from the ground. It extinguishes a lighted torch immediately when applied to it, and may be dispersed by dust violently scattered amongst it.

A DOG, when introduced into this cavern, is observed immediately to breathe with difficulty, and soon appears to be in a state of suffocation; if longer detained from the pure air his death is inevitable, but he recovers when thrown into the lake as soon as he faints. Dr Balfour conjectured this air to be of the same description with the noxious vapours, or *damps*, which frequently occur in our coal pits. Those, however, are easily dispersed, whereas this continues perpetually, altho' exposed to the action of pure air. Our author found, that one of the dogs with which experiments on this subject were made, recovered without dipping in the lake, altho' he continued paralytic and deprived of motion in his hind parts for two hours. Thus he ascertained that animation suspended from the effects of this vapour, might be restored with certainty and expedition, by immersion in the lake, or by the inspiration of pure air only, altho' the efficiency of the last mentioned was not so fully ascertained. He concluded from his investigation of this matter, that the vapour described confines the breath, so as to put a stop to the animal functions.

He next describes a level spot of the figure of an amphitheatre, 1200 feet long and 1000 broad, enclosed by lofty mountains. In various parts, clouds of smoke of a sulphureous smell, emitted from apertures of the earth, ascend with a hissing noise, and expand in the air as they rise. At first the smoke ascends in straight lines like small canes, and the whole appearance is represented to be extremely beautiful. About the vents or apertures here, he found sublimate flour of sulphur, of the internal use of which Dr Balfour is suspicious, on account of its mixture with other hurtful minerals, but is of opinion that in external applications it may be beneficial. The spirit of sulphur may be obtained in great abundance from these vents, by means of glass tubes. The earth from the horses' feet at this place appeared calcareous, and the hollow cavities under ground resounded, as if they had been riding along a wooden pavement. The mountains adjoining are said by Dr Balfour to contain blue vitriol, sal ammoniac, sulphur, nitre, alum, &c.

He observed of a lake in this country, that it contains but little water, owing to the position of a mountain, supposed to have been extruded from the bowels of the earth. From observing birds to swim on the lake *Avernus*, he concludes that the atmosphere in that quarter must have been more salubrious than formerly represented.

THE buildings here supposed to have anciently belonged to the Sybil, he was rather of opinion had been

baths. He found them to contain warm water which produced perſpiration on the ſkin, and the rows of windows and vents, for the emiſſion of vapour, appeared to be of a conſtruction ſimilar to the baths at Bayonne.

In the harbour of Puzzoli he inſpected the remains of an ancient mole, conſiſting of twelve or thirteen piles of building reſembling turrets, and connected with each other by vaults, a form which he repreſents to be more ſecure for mooring veſſels, and not ſo much expoſed to the impetuoſity of the tide as a ſolid wall.

He examined Mount Veſuvius, of which his Travels contain an excellent deſcription. He alſo accurately deſcribes ſeveral other curioſities, and concludes with the paſſage of the Alps.

After fifteen years thus employed in travelling, and in the great object of travel, the cultivation of his mind and underſtanding, his friends induced him to think of fixing his reſidence at home. Returning to Scotland with this view, he ſettled at St Andrews, and commenced practice as a phyſician. He perſevered, however, in his former ſtudies, particularly in enquiries reſpecting indigenous plants. He alſo eſtabliſhed diſſections of the human body, at one of which he took from a pregnant woman a male fœtus of a ſingular appearance, which was preſerved, and remained after his death among the *Kariora Musei Balfouriani.*

The circle of St Andrews was too limited for the exerciſe of his extraordinary endowments and qualifications. He therefore removed to Edinburgh, and with an ardour peculiar to himſelf commenced practice in the metropolis. Nor was his public ſpirit leſs conſpicuous than his profeſſional zeal, for in the attention and encouragement which he continued to beſtow on natural hiſtory and the uſeful ſciences, while he promoted his own intereſt and reputation, he contributed to the honour and ornament of his country.

Here he arranged his very valuable Library, and formed a Muſeum of his numerous rarities. In lieu of tapeſtry he adorned the hall with pictures which he had brought from Italy, of men who had been uſeful to Literature by their writings or diſcoveries. Among theſe he poſſeſſed excellent pictures of Prince Mirandola, Petrarch and Laura, Columbus, Jovianus Pontanus, Fulvius Urſinus, Thomas Aquinas, John Duns Scotus, Raphael Volateranus, Ambroſe Calepin, Angelo Politian, Lewis Vivis, Charles Segonius, Jo. Baptiſt Porta, N. F. Pericius, G. Galileus, Leo Alatius, Dyonyſius Petavius, and others.

Dr Balfour was an indefatigable collector of coins and medals, of which he accumulated a great number, and from which he made himſelf perfectly acquainted with ancient mythology; with the likeneſſes of celebrated perſonages of antiquity, and with ornaments whether of a religious, warlike or civil deſcription.

He was particularly anxious to preſerve the unpubliſhed writings which he purchaſed from their reſpective authors or their heirs, and he reſcued from deſtruction a number of manuſcripts which were after his death found in his Muſeum.

His collection was alſo enriched by books from China and the Eaſt Indies, Geographical Tables, plans of Ancient Edifices, Portraits, Mathematical, Optical and Chirurgical Inſtruments of curious workmanſhip, pieces of exquiſite mechaniſm, and other remarkable productions of Nature and Art. The liſt of his natural curioſities alone would form a volume; the following are the

the claſſes in which they were arranged.

1. Preparations of different parts of the Human body.

2. Animals, viz. Quadrupeds, Birds, Reptiles, Fiſhes, and their remarkable parts, ſuch as claws, teeth, horns and eggs.

3. Minerals and Metals, viz. Salts, Sulphur, Stones, &c.

4. Marine Minerals, viz. white, red and ſparkled Coral, &c.

5. Vegetables, rare Plants, Timber, Fruits and Gums.

In diſtinct claſſes he alſo kept the Materia Medica. The Arms and Warlike Inſtruments of various Nations, Ornaments, Robes, and domeſtic Utenſils.

His Library was formed with great judgement, taſte and liberality. It comprehended books in every department of Science, particularly on Medicine; every work then extant, on the Natural Hiſtory of Animals, Plants, Minerals and Marine productions; ſcarce works on Mathematics and Natural Philoſophy; the beſt writers on Hiſtory and Antiquities; and Scots Authors on whatever ſubject they had written. The beſt editions of the Greek and Latin Claſſics, all the Scholiaſts on the Greek Poets and the moſt eſteemed works in the French and Italian languages, in ſhort his library formed an ample repoſitory of valuable, elegant and ſcarce Books.

He kept always an accurate regiſter of ſuch works, as his judgement or information led him to believe were worthy of notice, and it was his firſt buſineſs, in every town he entered when travelling, to enquire for theſe at the Bookſellers ſhops and buy them at whatever price they were charged. After his return home he received frequent and regular intelligence from his friends abroad reſpecting new publications; and of very ſcarce books, he was often poſſeſſed of ſuperfluous copies which he gave to his friends. By theſe and ſimilar meaſures he acquired a moſt extenſive and general knowledge of Literature.

The Duke of Lauderdale, was induced by its fame to viſit Dr Balfour's Library, with which he was highly delighted. The Scholiaſts on the Greek Poets particularly attracted his notice, and received his commendation, wherefore Dr Balfour preſented his grace with a number of them. He alſo gave to his Colleagues many books which he knew would be uſeful to them.

Every lover of learning, or of the Arts, was politely admitted to his Library and Muſeum. To perſons of a literary turn who were about to travel, he gave introductory letters addreſſed to his friends abroad. He alſo gave to ſuch as were fond of Natural Hiſtory, liſts of curious plants, arranged in proper claſſes, with directions calculated to facilitate their enquiries. In return for theſe civilities he was conſtantly receiving from abroad, rarities of every deſcription. He maintained alſo a regular and permanent foreign correſpondence with literary characters, among whom were Moriſon the Profeſſor of botany at Oxford; Dr Mill diſtinguiſhed by his travels through Europe; Mr Marchant of the royal garden at Paris; and Dr Pope. The gentleman laſt mentioned ſent him the ſeeds of uncommon plants, which Dr Balfour raiſed in his own garden, and of which ſeveral were then for the firſt time introduced into this country, ſuch as the Mareus Syriacus, Scammoneus Monſpeliacus, and Centumgranæ Ciſalpinæ.

He was introduced by Sir R. Sibbald to the acquaintance of Patrick Murray of Livingſton, whoſe habits and manners were ſo congenial with Balfour's, that they contracted a warm and laſting friend-

ſhip

ſhip towards each other. Murray was of a generous and obliging diſpoſition, and unremitting in his exertions for the encouragement of the Sciences, and of Natural Hiſtory in particular, on which he expended an ample income. His garden upon his own eſtate contained a thouſand plants, and he was rich in the poſſeſſion of curioſities of Art, as well as of Nature.

This Gentleman and Dr Sibbald were in the practice of exchanging with each other uncommon plants from their reſpective gardens, which ſuggeſted to them in concert with Dr Balfour the idea, ſince, ſo extenſively acted upon, of forming a Botanical Garden at Edinburgh. Having framed a plan for the management of this undertaking, James Sutherland, an experienced and ſkilful Botaniſt, was engaged as Gardener, and all the plants in their poſſeſſion were transferred to the infant inſtitution. It was alſo enriched by the ſupplies from Dr Balfour's foreign correſpondents, and Murray having gone abroad became a moſt active contributor. To the loſs of Literature and Science this gentleman was, in the midſt of his exertion, ſeized with a fever at Avignon, of which he died, in the 43d year of his age. His death was deeply regretted by Dr Balfour, and his memory was conſecrated by the Scottiſh Muſe.

In the firſt inſtance, the expences of the Edinburgh Botanical Garden were defrayed by Drs Balfour and Sibbald, they were afterwards aided by the Phyſicians, and principal perſons of the town, and by a liberal donation from the faculty of Advocates. But when a permanent income became neceſſary for its ſupport, the inſtitution met with a violent and powerful oppoſition, which the zeal and addreſs of Balfour were ſcarce able to overcome. An agreement was however concluded, by which the ſupport of the garden devolved upon the revenues of the Univerſity. The ſpot which had been fixed upon, called Trinity Garden was now granted by the city for nineteen years to James Sutherland, with ſeveral advantages and privileges in favour of the undertaking.

The Botanical Garden, although thus happily eſtabliſhed, continued to furniſh Dr Balfour with opportunities of diſplaying his taſte, and with demands upon his liberality. For ſeveral years he beſtowed large ſums of money upon its improvement, beſides the great number of ſeeds and plants, which he procured from abroad, through the means of his friends, Moriſon, Marchant, Herman a famous Botaniſt at Leyden, and Watts, manager of the Druggiſt's garden at London. Mr Spottiſwood his countryman, who was ſurgeon to the garriſon of Tangiers ſent him African ſeeds, the firſt of the kind that had been ſeen in Europe. Theſe, with other uncommon plants, ſucceeded ſo well in the Edinburgh Botanical Garden, that Dr Balfour was ſoon enabled to preſent his acquaintances with ſeveral of them. Fifty of theſe productions, were, at the requeſt of M. Marchant, ſent to the royal garden at Paris, which he repaid with ample uſury. He had now the ſatisfaction, of beholding the Botanical Garden, the offſpring of his indefatigable exertion, ſo enriched by the productions of nature, that the catalogue which Sutherland publiſhed, containing nearly two thouſand plants, was celebrated throughout Europe. Thus, diligent in procuring Botanical ſpecimens, he was not leſs attentive to their arrangement and cultivation. For, under his direction, ſuch as were uſeful in the Materia Medica were alphabetically

arranged

arranged, for the uſe of ſtudents, in the eaſtern part of the garden. The reſt, with their names marked on a board after the plan of Caſpar Bauhinus, were arranged in diſtinct claſſes, and in a more accurate manner, by Sutherland.

These particulars reſpecting the garden, may be conſidered in ſome meaſure connected with the ſubject of the preſent memoir, from the warm intereſt with which Dr Balfour eſpouſed its eſtabliſhment, and the honour which accrues to its founder and patron, from the final ſucceſs and utility of the inſtitution.

Another opportunity ſoon occurred to Dr Balfour, of promoting the ſtudy of Botany, which he eagerly embraced, not leſs from his love of the ſcience and attachment to letters, than from motives of private friendſhip.

The inconvenience and uncertainty of the ancient claſſification of plants, induced many Botaniſts to propoſe alterations and improvements. But the method adopted by his friend Moriſon, was evidently the beſt in point of clearneſs, accuracy and ſimplicity. When it was propoſed to publiſh this plan for the benefit of ſcience, a ſubſcription was found neceſſary to defray the expence, to which, Dr Balfour largely conbributed and induced many of his learned countrymen, to follow his example.

Extensive and intereſting as his Botanical purſuits had now become, they by no means engroſſed his attention; he continued the proſecution of his other reſearches, particularly of ſuch as related to his profeſſion, in which he was perſevering and indefatigable. Aided by his knowledge of the vegetable kingdom, he became eaſily proficient in Pharmacy, which he found of eſſential importance to a phyſician; the mode of preparing medicines, being at that time ſo imperfectly known, that it was difficult to obtain remedies in unexpected and ſudden caſes. He was aware of the divine bounty, which grants to every country, remedies for it's own peculiar diſeaſes, he alſo knew that it required much and patient inveſtigation to learn the hidden qualities of theſe, and their relative virtues and efficacy in medicine.

He ſtudied this matter carefully in the muſeums of the philoſophers of Italy and France, and for his own benefit, as well as the information of others, he formed a collection for himſelf, of ſuch exotics and indigenous plants as were uſeful in medicine, or any way beneficial to mankind. He was diligent in procuring ſuch of theſe as were ſcarce, and wrote to whoever he conſidered likely to ſupply his wants. In his letters, he alſo earneſtly inculcated the utility of examining natural productions and curioſities, which he repreſented as an agreeable and rational amuſement, and as the duty of men of talents towards their fellow creatures. From this correſpondence he obtained much intereſting information.

He aſcertained the bones which were found in one of the Weſtern Iſles, to have belonged to Birds; not as formerly ſuppoſed to Men, who were deſcribed to have been a race of *Pygmys*.

At the requeſt of ſome friends abroad, he made a careful inveſtigation into the origin of the Barnacle birds, which all writers on the ſubject, had deſcribed as the offſpring of a ſhell fiſh, called *Anatifera*.* He found a number of

* The animal that inhabits theſe little ſhells, is furniſhed with a feathered beard, whence it was univerſally believed, that it became at maturity, the Barnacle Goose.

theſe

theſe ſhells adhering to a piece of timber, which had been brought into a harbour of Fife. Of theſe he boiled ſome, that they might be preſerved entire and in proper ſhape; the reſt he brought alive, in ſea water to Edinburgh, for the inſpection of the curious. After an examination both by the naked eye and the microſcope, and having made drawings of the animal and of its ſeparate parts, he began to write a deſcription and hiſtory of the ſubject, which, from his other engagements, was unfortunately never brought to completion. This deſcription of the animal, however, is extremely accurate and minute.

The Tubule or Trunk, by which the animal adheres to ſhips or floating pieces of timber, conſiſts of two coats. The interior of theſe is of a glutinous viſcous ſubſtance, and has fibres ſtretched along, by which the body is expanded or contracted. The other, or external coat, is calculated, by fibres of a circular form, to give it a ſteady motion. But what he conſidered moſt remarkable, as overthrowing the ſtory of the doubtful generation of this animal, was a quantity of very ſmall eggs, contained within the trunk, which were in the living animal, of an ultramarine colour, and aſſumed a fleſhy appearance when boiled. The body of the animal is defended by five ſmall ſhells, two on each ſide, of which the largeſt is near the trunk; another proceeding underneath from the back, of the form of a ſhip's keel, opens and ſhuts at an angle, in the lower extremity, and the whole of theſe ſhells are connected by ſtrong membranes. Having aſcertained that this was an oviparous fiſh, breeding from it's own eggs, he inveſtigated the generation of the Barnacles, which was alſo found to be regularly produced from its eggs, and claſſed it among the Duck Tribe, to which it belongs.

Balfour never neglected the opportunity, which viſits to country patients afforded him, of examining the appearances of nature. In a ſtone quarry near the town of Linton, he found a kind of marble embelliſhed by the hand of nature, with reſemblances of fruits. Among the hills near Bathgate, he diſcovered ſhell-fiſh, both ſtony limpkins, and others of a globular form. On the coaſt of Fife, he found the *Mola Salviani*.* (called by Schoneveld the greater ſun fiſh,) which is rarely met with in our ſea, and of which a drawing may be ſeen in *Scotia Illuſtrata*, under the deſignation of the Yellow Spotted Fiſh. By his recommendation, the fiſh called Sea-Cat was firſt introduced on our tables, which has been found very palatable, having the flavour of ſhell-fiſh, on which it preys.

He proceeded in the deſcription of plants, which had not formerly been known to Botaniſts. Among the moſt remarkable were, one which he called Sea Buglaſs, of a very beautiful appearance, a native of the ſea coaſt, with leaves of a greyiſh colour, and of the ſhape of a heart: And another denominated *Paronichia*, which was recommended by Boileau, for its ſingular efficacy in the cure of Wens and Scrophula. He ſent to Mr Marchant, both the plant and fruit of the Vaccinia Nubis, which was extolled by ſome, as a remedy in ſcurvy; with many more of our indigenous plants.

* The Sun-fiſh. It is now caught in conſiderable numbers in the weſt coaſt of Scotland; on account of the oil which its liver affords. The Board of Truſtees give an annual premium to the moſt ſucceſsful adventurers in this fiſhery.

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He made experiments with the plant, named by Bauhinus, Maritime Ivy with chickweed leaf, and by Mathiolus, another ſpecies of Paronichia, which he found an excellent cure in every kind of flux and dyſentery, whether prepared in decoction, powder, or in mixtures. By this remedy a Scots ſervant who laboured under a ſevere fever at Rome, in the dog days 1664, and who paſſed blood fifty times a day, was completely cured after the third doſe.

He gave immediate attention to every project for the improvement of medicine. The transfuſion of blood being much ſpoken of, he procured from Paris a ſilver inſtrument, with which he made experiments of that invention, upon dogs. He alſo ſent for ſuch foreign medicines, as were recommended by medical writers, and by every other poſſible means, he laboured to enrich the healing art.

His many intereſting epiſtles, conſultations, and medical caſes, were bequeathed by the author to his ſon, along with his preparations from the diſſections of dead bodies; the Itinerary through England, France, and Italy, written for the uſe of his accompliſhed friend Murray, was highly eſteemed, and was found ſingularly uſeful to travellers. It contained, beſides an account of curious objects, of which ſome have been already enumerated here, ample and valuable directions for travelling with ſafety, pleaſure, and advantage; obſervations on the manners of the people, and on the public edifices of theſe countries, and an intelligent guide to their ſpecimens of Botany and Natural Hiſtory.

Justly conceiving that the ſtudy of natural philoſophy, was greatly facilitated by the method peculiar to mathematics, he was anxious that the mathematical chair, ſhould be filled by men of merit and abilities. He therefore exerted his influence in favour of that point, with the Miniſters of State for Scotland, the King's Council, and the Magiſtracy of Edinburgh; and he obtained the ſucceſſive appointments of James Gregory and his two nephews, David, (afterwards profeſſor of aſtronomy at Oxford) and James. He laboured to encourage men of genius and information, in whatever branch of ſcience, convinced that he thereby promoted the intereſts of literature. Thus James, Sutherland from the Edinburgh garden, obtained the appointment of gardener to the King, and through the influence of Dr Balfour, in whoſe opinion he ſtood high, he was otherwiſe amply provided for.

But in repreſſing Empirics, who oppoſed Phyſicians of a regular education; in the erection of the College of Phyſicians, and in defending their privileges, he was zealous and vigilant.

When a Pharmacopœia, to be compoſed from the joint labours of the fellows, was firſt agreed upon by the College, the department of Materia Medica was entruſted to Dr Balfour, that its ſkilful execution might be enſured. He rejected the farrage of compound medicines, which taſted more of the curious diſpoſition of the age, than they afforded any aſſiſtance to the phyſician; and adopted the moſt ſelect and efficacious remedies, with the proper mode of preparing them, that were ſuitable for this country. He corrected the nomenclature, and arranged all the ſimple ſubſtances by their proper titles and in diſtinct claſſes. His colleagues in this work, performed their undertaking with eminent ſucceſs; and the Edinburgh Pharmacopœia was not only completed and publiſhed, with the ſanction of the College of

Phyſicians, under the preſidency of Sir Robert Sibbald, but has been frequently reviſed and reprinted, with all the improvements which the progreſs of ſcience has ſuggeſted.

From his practice as a Phyſician, he enjoyed honour and proſperity. His preſcriptions were regulated by the ſymptoms of diſeaſe, but the medicines which he ordered were uniformly wholeſome and pleaſant. He never permitted his patients to uſe ſtrong evacuants, unleſs in obſtinate diſeaſes; and he was very cautious in the uſe of mercurials, having obſerved the injury that ariſes from a promiſcuous or too free exhibition of them. He was one of the moſt ſucceſsful Phyſicians of the age, although he deſpiſed the diſhoneſt practices of ſome of his contempories, and always conſidered the ſafety of the ſick an object paramount to his own intereſt and profit. He was not ſo much prejudiced in favour of any author as to deſpiſe his own judgement, but he courted and embraced truth from whatever quarter it came; receiving new opinions with liberality tempered by caution, and ſubmitting his practice to the teſt of reaſon and experience.

That he did not publiſh any work on the ſubject of his profeſſion, may be imputed to the preciſion with which he was accuſtomed to think. For he was ſatisfied with nothing that was not abſolutely perfect, and even his own ingenious labours did not receive his approbation.

He was equally diſtinguiſhed for an excellent diſpoſition, as for wiſdom and for proficiency in polite literature; but as a naturaliſt and antiquarian, he ſtood unequalled at home, and probably unrivalled abroad.

He preferred peace of mind, and contentment with a ſmall fortune, to empty titles and immoderate gain. He was, however, rapidly advanced to honours and emoluments, being ſucceſſively appointed phyſician in ordinary to King Charles the Second, created knight baronet, and elected to the chair of the College of Phyſicians. He was univerſally eſteemed, particularly by the great and the learned, and among the number of his friends were moſt of the nobles and men of rank in the country, ſuch as the Duke of Rothes, (whoſe phyſician he always was) the Earl of Murray, Scots Secretary of State, the Earl of Morton, the Earl of Strathmore, the famous Earl of Middleton, Viſcount Stormont, the learned Viſcount Tarbat, Sir John Murray of Drumcairn, Senator of the College of Juſtice, Sir Charles Scarburgh, Phyſician to the King, &c. &c.

He was ſteady in the true faith, and in the love and fear of God. In the habit of ſtudying and contemplating his works, he conceived the moſt exalted ideas of the wiſdom, goodneſs, and power of the Creator. In the diſcharge of his duties, both public and private, he ſubmitted to the controul of prudence; and he was a warm patriot, although a faithful ſubject. Politeneſs was inherent in his diſpoſition, and he was equally eſteemed by the learned and illiterate, the great and the vulgar. He was zealous in the ſervice of his friends, liberal to his relations, frank and polite to his brethren of the faculty.

He poſſeſſed a happy talent of diſcerning the inclinations and propenſities of men, from their manners and converſation; a natural endowment which he improved to an uncommon pitch of ſagacity, by his intercourſe with diſtinguiſhed characters. He converſed, therefore, upon ſuch ſubjects as he thought were adapted to the genius and purſuits of his auditors; and his diction

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was ſo nervous and elegant, his delivery ſo fluent, his deſcription ſo copious and diſtinct, that the ſubject, if placed before them, could not be more clearly underſtood. His naturally ſound judgment was matured by great experience, extenſive reading, and philoſophical ſtudy. When entertaining his friends with an account of his travels, or of remarkable occurrences of his life, they were at a loſs whether to admire the accuracy and fulneſs of his narrative, or the fervour and brilliancy of his ſtyle.

Of the extent of his politeneſs and addreſs thoſe only could judge who were induced from his fame to pay him a viſit. He received, and diſcourſed to every perſon with a pleaſant and ſmiling countenance; ſhewed his library and Muſeum, his ancient manuſcripts, coins, and rare books, accompanied by an account of whatever was rare or curious. To ſtudents of literature and the fine arts he gave ſuch books as might be of uſe to them, eſteeming himſelf amply rewarded in affording a freſh ſtimulus to enquiry and ſtudy.

Plants, ſeeds, foſſils, uncommon animals, and ancient coins, never eſcaped his attention, and he embraced every opportunity that occurred of adding to his collection, either by purchaſe, or by perſonal ſolicitation. As during a period of forty years he ſpared neither trouble nor expence in obtaining theſe, and in forming his library, it is not to be wondered at, that they were numerous and valuable.

These rarities continuing to pour in upon him from different parts of the world, he was for ſome years deſirous of obtaining a houſe ſufficiently large for the reception of his library and cabinet. At length he ſucceeded, having purchaſed an old building, to which he made capacious additions for the purpoſe he had in view; but ſuch is the viciſſitude of human affairs, that he had only a few months to live in the enjoyment of his improvements. Gouty and cholic diſorders began to ſhake his conſtitution, and a ſevere affliction in the death of his wife, weakened him ſo much that his end was viſibly faſt approaching.

From the period of his 30th year, when he was attacked by a ſlow fever, he enjoyed excellent health, until about three years before his death, when the gout took poſſeſſion of his extremities, and his conſtitution was annoyed by other diſeaſes. The pains of the gout at times abated, and the humours which had been driven by the ſtrength of nature from the limbs, invaded his bowels, inducing a paſſing of blood, by which he was ſenſibly weakened. His ſtomach next became affected with loathing of food, and converted any liquid which he ſwallowed into a moſt acrid and tormenting humour. He bore his ſufferings with the fortitude of a philoſopher, and the reſignation of a good man; and his ſtrength totally exhauſted, but his faculties unimpaired, he died in the beginning of the year 1694, the 62d of his age.

While in health, he was of a corpulent habit of body; of ſtature rather tall, a handſome face and ample forehead, marked with the characteriſtics of friendſhip and affability. He had a ſparkling eye, and moved with a firm ſtep. His face was tinged by a gentle flush, his hair, which he wore long, was of a cheſnut colour, his ſkin very fair, and of a ſoft texture.

The picture painted at Paris, which he brought home and left in the poſſeſſion of his ſon, was conſidered an excellent likeneſs.

His temper was lively and ſanguine, his memory quick and retentive, his underſtanding ſolid and regular.

He was elegant at table, and hoſpitable to his friends; and his natural endowments, and extenſive literary accompliſhments, were held in the higheſt eſteem by all his learned contemporaries.

SOME CONJECTURES RESPECTING THE ORIGIN OF STONES WHICH HAVE BEEN OBSERVED TO FALL FROM THE CLOUDS.

BY WILLIAM BEAUFORD, A. M.

THE falling of ſtones from the clouds, a natural phænomenon not generally underſtood, is by no means a novel circumſtance in the hiſtory of nature. Several ſtones were obſerved to fall from the clouds in Yorkſhire in 1360, in Bohemia and Saxony in 1480, in Bohemia about 1753, in Sienna in 1794, in Portugal in 1796, in Yorkſhire in England in 1795, and near Benares in the Eaſt Indies in 1798. From an analyſis made of theſe ſtones by the French academicians in 1768, and by the Royal Society of London in 1802, they are all found ſimilar in their component parts to each other, but diſſimilar to all bodies found in mines and quarries, being compoſed principally of four kinds of ſubſtances: the firſt being in the form of dark grains, compoſed of ſilex, magneſia, iron, and nickel; the ſecond a kind of pyrites; the third metallic iron; and the fourth a grey earthy ſubſtance, which ſerves as a cement to the others, and with which they were coated. From theſe compoſitions the matter ſeems to be of volcanic origin; yet it is difficult to conceive how ſtones of any conſiderable magnitude could be thrown at ſuch a diſtance from any volcano as thoſe found in Bohemia, Saxony, and Britain. The neareſt volcanos to Britain are thoſe of Veſuvius, Ætna, and Hecla: a ſtone to be thrown into Britain from any of theſe would require an impetus of between 3 and 400 miles; and, if allowance be made for the reſiſtance of the air, 1200 under the greateſt range of 2400 miles; a force not known to exiſt on the earth. It is true, volcanic aſhes, when collected in the upper regions, will be carried by the clouds to an amazing diſtance. But theſe are ſmall light aſhes, not ſtones. It is evident, therefore, if theſe ſubſtances originate from volcanic aſhes, they muſt be formed in the clouds, where thoſe aſhes, meeting with carbonic, ſulphuric, and other acids, and mixing with earthy particles drawn from terreſtrial objects, are, by the electric fluid in the lightning, precipitated from the aqueous vapours which bore them up, and becoming united, fall to the earth in the form of ſtones; as in ſome meaſure is evinced from the flaſhes of light and detonation which accompany their fall.

Substances alſo of the ſame nature may be formed in the clouds without the aſſiſtance of volcanic matter;

matter; for the carbonic, ſulphuric, and aqueous vapours, which riſe from mines, furnaces, bogs, vegetables, and animals, and the ſmall particles of ſilicious and calcareous earths which collect in the clouds, are decompoſed or made to aſſume new arrangements by the electric fire, whereby the minerals are generated and united to the earths, and conſequently fall in the form of ſtones. Thus ſtones, by means of electricity, are formed in the clouds from the ferriferous principles aſcending from volcanos, mines, and furnaces. Britain, indeed, is too far from any volcano to ſuppoſe that any quantity of volcanic matter can be wafted by the wind to this iſland; yet it contains a number of ferruginous mines and furnaces employed in the manufactory of that metal; from which proceeds an immenſe quantity of gas, containing the ferriferous matter, and ſuch matter as is generally connected with it. Beſides, there is a circumſtance not generally attended to by mineralogiſts—that all mines of whatever nature contain a mineralogical atmoſphere replete with the generic principles of the metal contained in the reſpective mines. That Nature, by her ſlow but regular operations, is daily producing metals from their elements, will hardly be denied: and whether the atmoſphere of which I ſpeak be produced by exhalations from the ingredients ſhe employs, or a part of the ingredients themſelves, the caſe will be the ſame as to the objects I have in view. This atmoſphere has a ſtrong and viſible effect on the ſtones and vegetables which cover the ſoil, eſpecially that which covers mines of iron, lead, and copper. Animal and vegetable exuviæ, and other decayed mundics, ariſing from bogs, moraſſes, and dirt-hills, produce a great quantity of carbonic and ſulphuric gaſes, containing the generic principles of iron, magneſia, and nickel, &c.: theſe, uniting with ſiliceous, argillaceous, and calcareous earths, produce in great quantities that ſpecies of iron ore termed bog ore, and that in much greater quantities than is generally imagined. Theſe ores are produced in lumps from 40 to 100 lbs. and more in weight, containing from one-fourth to one-half of pure metallic iron, intermixed with pyrites and vitrified ſubſtances reſembling glaſs and petrified ſhells, the inhabitants of freſh water lakes. Whence it is evident that a number of petrifactions and mineralizations are performed by water and air aſſiſted by the electric fluid alone; and a number of the operations of nature have been attributed by philoſophers to the effects of fire, and deemed volcanic, which are the effects of the aqueous and pneumatic elements.

In order to aſcertain in ſome reſpects the truth of this propoſition by experiment, I cauſed a quantity of gas, liberated from water by means of ſteel filings and vitriolic acid, to be received in a glaſs veſſel, to which was added carbonic acid from the fumes of charcoal and ſulphuric gas, with the fine duſt of chalk and earth, until the whole appeared a dark thick cloud. The electric ſpark being then paſſed through it, a flaſh of light and a ſmart detonation enſued. After this operation the cloud became more tranſparent, leaving at the bottom of the veſſel a quantity of water, with a grey powder, evidently metallic, mixed with earth. If the experiment had been performed on a larger ſcale, and the ingredients varied, the reſult might have been more decided, and the phænomenon more accurately demonſtrated.

This is a ſubject that merits every philoſophic inveſtigation. The magnitude of the ſtones undoubted-

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ly depends on the quantity of generating matter, and the height from whence it falls; yet, how ſtones of ſuch a weight as that which fell in Yorkſhire could be formed in the air, might be a ſubject of doubt, if the ſubſtance had not been found of the ſame nature as thoſe which fell in Bohemia and Sienna. But it ought to be conſidered that theſe ſubſtances are not formed inſtantaneous in the clouds: the conſtituting matter, precipitated by the electric ſhock, is thrown by the exploſion to a point, when, from the action of the air in falling, it becomes enveloped in the terra cementium with which the matter is mixed. Whence, the greater the height or range the matter has to paſs through from the time of the electric ſhock, the larger will be the ſtones. Moſt if not all the meteors formed in the air even at great heights probably originate from one cauſe; thoſe which contain the larger portion of inflammable air take fire at the electric ſhock, and produce thoſe luminous and fiery meteors ſo aſtoniſhing to mankind; while thoſe which contain leſs inflammable matter, but a greater quantity of the ferriferous principles, are formed into fire-balls or ferruginous ſtones of different magnitudes, which deſcend on the earth; whilſt the more light, or thoſe which are compoſed only of inflammable gaſes, mount into the upper regions of the atmoſphere, where taking fire, they fly off in luminous vapours. The height to which ſome of theſe vapours are carried before they are decompoſed is amazing; reaching into regions where we ſhould imagine the atmoſphere would not be of ſufficient denſity to ſuſtain them. But the natural hiſtory of the terreſtrial atmoſphere has not yet been fully inveſtigated; nor the power and effects of electricity in the formation of lithological, mineralogical, vegetable, and animal ſubſtances: ſubjects that demand the attention of the moſt able chemiſts and ſagacious philoſophers.

ON THE EDINBURGH BOOKSELLERS.

To the Publiſher of the Scots Magazine.

Sir,

Booksellers have been termed, with ſome degree of propriety, the midwives of literature; on the manner in which they perform their office, the healthy or ſickly ſtate of literature in a great meaſure depends, and for the exerciſe of their functions they are amenable to the public. To the public I therefore appeal, through the intervention of your publication, for the redreſs of an impropriety, which, if not timely corrected, may ſwell out into an abuſe. The bookſellers of this city, are