

equalization of dramatic rights. All the theatres stand, in that respect, on the same level; and the liberated dramatist, like the roving bee, now extracts honey from each. He illustrated the free and open system by the fact that he had himself brought out an equestrian drama at Astley's. But he forgot that he might have done the same thing under the monopoly. There was nothing in the patent to prevent him. Whether under that restrictive régime he could have been tempted to write for Drury-lane or Covent-garden is a different matter; and in this, we imagine, lies the true secret of the rejoicings of the play-wrights. If the restraint is removed, so too is the thing restrained. We well remember that the legitimate drama was the *cheval de bataille* of the abolitionists. Shakspeare could not be played beyond the consecrated confines of Bow-street and Vinegar-yard. Why should not the Victoria play Shakspeare? Why should Houndsditch be denied the immortal bard? Well, the patents were abolished, and where is Shakspeare? Nowhere. He was placed, no doubt, when the race began, but he is nowhere in the running. This is one of the effects of the abolition which our popular author accidentally omitted to mention. There is not a single playhouse in London where that drama is played, for the exclusive representation of which the great theatres held their patents, and were deprived of them. Whether this is a result upon which the play-loving community should be congratulated, we will not pretend to determine; but it is obvious that the play-wrights have much reason to exult over it. The old lumbering Five-Act obstruction is out of their way. They have the stage to themselves. They can run up a highly exciting Domestic Drama, or a Three-Act picture of English life, taken direct from the French original, in less time than it would formerly have occupied merely to rehearse one of those antiquated solemnities. There is nothing in the shape of thoughtful writing or mighty dialogue with which they need fear competition. The abolition has done its work; it has abolished both the patents and the plays they protected. Much reason, therefore, have the play-wrights to exult. Whoever desires to have an accurate sense of the advantages those facile pens have derived from the total rout of a once formidable drama, should take a modern piece, say a Haymarket comedy, which is presumed to be the most skillful of the class, and study it in his closet. Let him examine it side by side with any by-gone play that happens to belong to the same order; let him carefully analyze and compare their structure, characters, and language. When he shall have completed the task, he will fully comprehend the reason why the modern play-wright protests against the obsolete form of Five Acts, and why he rejoices over the rarity of its appearance. The task to which we have invited the curious reader is an arduous one. But if he perseveres he will achieve two ends by it: he will not only discover in what elements the modern Haymarket comedy differs from the condemned comedy of other times, but he will be enabled to measure exactly its literary value. It is all very well to see these pieces, and to laugh heartily at the infinitesimal fun of Mr. Buckstone, and the dry humour of Compton; but you know nothing about the authorship till you have endeavoured to read one of them. We do not say you may not succeed in the attempt, for tastes and capacities differ. All we do say is—try. The consideration of the influence of this species of production upon the Stage, and the character of our dramatic criticism under the existing patchwork régime of plays and actors, must be reserved for another occasion.

THE TYPE-PLANS OF ANIMATED BEINGS AND THE SPECULATIONS OF PHILOSOPHERS.

[FIRST ARTICLE.]

FROM any part of the British shores we can easily collect some few familiar forms of life to illustrate the great groups into which all animated beings seem divided. We have only to tread on to that slippery ledge of rocks before us to gather what we want. Look into that little pool between the huge weed-clad stones, and on the tide-bared surface round. The little pool which you are looking down upon is the portrait of the one before me; and many other ramblers, in many another place, are looking down on pools just like our own. Here are conical limpets stuck down upon the rocks; there, some white-crustad barnacles are lapping the water with their feathery curls. In the ooze, and under the mud-covered sea-weeds, crabs and shrimp-like crustaceans scramble awkwardly but rapidly about at your approach, or closely crouch and hide themselves. Here, in a quiet nook under a protecting ledge, are clustered a dozen dorids; there, an eolis, with curious finger-like lungs upon its back, is crawling with rapid undulations over the slimy weeds. In another pool close by some rock-fish sport, and, perchance, there you may capture, too, some young cuttle-fish, to add another necessary illustration to what we want; but if you do not, you can easily procure one from any of the fishermen, who use them profitably for bait. You can gather tenderly a little crop of those horny corallines, and you can place in your collecting jar some of those pigmy jelly-fish not bigger than shillings, which are dabbed about in hundreds on the sands. Put in, too, a few of those ruddy, flower-like animals (*actiniae*), and if you do not mind wet feet, pull up some of those large-stalked tangles which are waving their broad fronds in the shallow sea just beyond where the tide still clings to the rocks; and a pocket-lens will enable you to detect amongst their entangled roots some tiny shell-like objects which naturalists call, from their outer envelopes being perforated with holes or pores, *Foraminifera*.



FIG. 1. *Eolis papillosa*.



FIG. 2. *Orbulina unicolora*.



FIG. 3. *Radalia Beccarii*.

We have now, in this small gathering, the types of many animal existences, each apparently based on a very different plan, but equally wonderful in the purpose and design exhibited.

As we must not presume, however, even in this sultry summer-time, that every one is at the "cool sea-side," or that the country hills and dales have no admiring visitors, we will ourselves take a ramble in the "flowery fields," and gather thence some few other objects illustrative of Nature's type-plans. This common worm will do for one, and from the stagnant pool we may gather a dozen things to suit our ends. Put a few bits of those floating twigs into a glass of water, and you will see dozens of tentaculated threads; these are hydræ, and will serve as well as the larger, gaudier "anemones" of the sea. Those translucent shrimps, paddling themselves with feathery, oar-like feet along in intercircling curves are just as good in illustration as our sea-side crabs; the little stickleback or minnow, from the stream close by, will do as well as rock-fish or as any other of the finny tribe. Search now the underside of stones or the floating leaves of the water-lily for short translucent branching threads. Your straining eyes will see nothing more when you lift the stones or lily-leaves,—for the tiny beings that inhabit them are very timid, and shut themselves up in their cells on the least disturbance. There are several kinds of these; but what we are most likely to find are the *Plumatella*, and these are equal to the stouter corallines of the rocky shores. In the water from the stagnant ditches, under the microscope,—you cannot perceive them without,—some jelly-like little beings may be seen twisting their bodies into fantastic shapes; here indenting them into temporary stomachs; there squeezing out their jelly-like flesh into equally temporary tentacles or feet. These *Amoeba* are even better examples than the marine *Foraminifera*, as they represent more properly the rudimentary state of their class. We have, then, from land-side and sea-side, familiar illustrations of the type-plans of animal creations,—the globular, the radiate, annulose, soft-bodied, and backboneed, or vertebrate.



FIG. 4. *Plumatella repens*.

We find thus we are brought down to some four or five primitive type-plans, upon one or another of which the individuals of every species, of every group of animals, are organically and primarily constructed, however advanced or restricted may be their actual development and organization,—however high or low may be their position in the scale of life. From the monad to the elephant; in our own land and all over the wide world, every organized living being is framed on one or another of these few plans.

In these days of strange notions and new theories, it behoves every one to look a little into matters for himself. It is not the authors of speculations and novel theories who are called upon to decide the merits of their own ideas; nor is it the ignorant or unread who should approve or condemn them. It is before the world—essentially, perhaps, before the reading and thinking world,—that these opinions are laid; and it is the world which accepts or rejects the new doctrines,—which reaps the knowledge or advantage, if any, to be derived from them.

Among the present leading topics of high interest is the question of the sudden development in age after age of higher and higher organic forms on the principle of "natural selection" which has been opened out by the recently-issued, learned, and interesting book of Mr. Darwin, "On the Origin of Species." We know there are some who think in such matters lay people should not meddle, and that scientific brains alone should reflect upon such subjects. We have just expressed our own opinion on this point, that people should make themselves competent to judge; but like other authors Mr. Darwin has put his book before the world, and already it has found five thousand purchasers. How many more readers and critics?

The consideration of the question requires leisure, thoughtfulness, and actual investigation. It involves, also, an acquaintance with the organic creations of the various and vast geological ages, and with the organic contents of the rock-formations of our great ranges of terrestrial space, for time is an essential element in all changes effected by natural means, and is especially regarded in that light by Mr. Darwin himself, in those he considers to have been slowly brought about in the organic kingdom by the influences of external circumstances, individual wants, necessities, and habits, and the natural tendency to "sportiveness," under the control of that principle which he denominates "natural selection." We can, therefore, neither confine our researches to the historic period, nor avoid the consideration of the gradual migrations and variations of geographical range of those ancient faunas revealed to us in a fossil state, which must have happened in the lapse of the stupendous ages of the past, by reason of the varied alterations of level, and the relative superficial distribution of the ancient lands and seas.

Mr. Darwin himself at one time, in common with the generality of modern naturalists, entertained the opposite theory to the one he is now advocating, a theory so ably supported by the late Professor Edward Forbes, of *specific centres of creation* of new forms. We see apparently in nature, as well now in our own days as in every stage of the past conditions of our planet, particular species, genera and families of animals confined in their geographical range to certain limited regions; we find certain prolific kinds, as well as certain rare sorts confined to very restricted areas; we find from the organic contents of the rock-formations,—those true historical records of the succession of the past physical events of our globe,—that in time, also, there have been similar restrictions of particular races of animals and plants. Of these, some seem to have been ushered in at a certain period; to have increased, multiplied, and swarmed at another; finally dying slowly and gradually out, to be succeeded by some new race, which in its turn, in like manner, had its reign of greatest development in numbers, and over consider-

able regions of space. Naturalists were thus led to the idea that these races had diverged and multiplied from a *specific centre* of original creation.

It is but right in this place that we should clearly define what is meant by the term or principle "natural selection." Reflecting on the correlation, well known to naturalists, and obvious to the most superficial observer, of the bones and general organization of the Vertebrate class, whether fish, bird, reptile, or mammal, all constructed on modifications of the same plan, all having a vertebral column; in each the limbs presenting modified conditions only of certain primitive structure-plans; as, for instance, the fins of the fish, the wings of the bird or of a bat, the arms of a man; on the like modifications of parts and organs severally in the tribes of shell-fish (*Mollusca*), crabs (*Crustacea*), worms (*Annelida*), or sea-urchins, jelly- and star-fish, and the ancient lily-like or crinoidal animals (*Radiata*), and other forms of the Invertebrate class; and reflecting, also, on the like modifications of type-plans in the vegetable kingdom,—Mr. Darwin has been specially led into the study of the *variations* of animals and plants, both in their state of nature and under domestication, whether as mere "sportive varieties," as they have been termed, or as the more permanent and regular kinds, such as the race-horse, coach-horse, cart-horse, pony, the various sorts of gooseberries, cherries, apples, &c., which have been brought about by skilful breeding or continued culture.

The accumulation of facts upon these subjects has further led Mr. Darwin into the belief that such modifications, whether naturally or artificially brought about, could and would be maintained under the necessary accompanying conditions of climate, nutriment, &c., and that in the free state of nature the "succession" of such variations has accomplished those marked differences we observe in the various species of animals and plants. "Now, as many more individuals of each species are born," Mr. Darwin "argues," than can possibly survive; and as, consequently, there is a frequent recurring struggle for existence, it follows that any being, if it vary, however slightly, in any manner profitable to itself, under the complex and sometimes varying conditions of life, will have a better chance of surviving, and thus be *naturally selected*. From the strong principle of inheritance, any selected variety will tend to propagate its new modified form.

Neither the doctrine of development of species by "natural selection," nor that of "specific centres of creation," is introduced here with any idea of our entering into the details of either of those vast investigations. For twenty years Mr. Darwin has been collecting materials in support of his views, and only the outlines of which are published; and we have not yet before us all the evidences on which he has based his conclusions. It is not likely, therefore, we should attempt more than to explain broadly the chief facts and principles upon which the interesting and important discussion is based. We have not collected so many shells, so many fish, so many plants or sea-weeds, to display as curious objects, but as illustrations of those universal structural *type-plans* of organization which certainly appear, from any evidence yet adduced, to be and to have been persistent. We may regard these *type-plans*,—indeed, we can scarcely do otherwise, when we look into the minute structure of organized beings,—as susceptible of innumerable modifications and adaptations within their respective limits, but the question becomes highly intricate when we attempt to deduce the modification of one *type-plan* into another.

The great points of Mr. Darwin's investigations are, whether the differences in the various classes of animals and plants have been derived from long-continued natural variations, as modifications of primitive *type-plans*, and whether these so-called primitive *type-plans* themselves may not really have been derived from some older, or anterior and more primitive plan.

#### AN HISTORICAL DRAMA.

THERE was once a gentleman of learning and position, whose name I forget at the present moment, who said, "I never wish to study any other history of England than Shakespear's plays. They present me with clearer pictures of the times and manners they depict; they lay bare more completely the springs of human action; and they are more exact in dates and the sequence of events than most of the ponderous historical volumes I can find in my library."

Allowing for a little love of paradox—a little fancy for appearing singular,—there may probably be some truth at the bottom of these remarks; and, any way, there must be many people existing in the world who never *will* study the history of their country unless it is presented to them in the shape of an amusing drama. If it is necessary that such people should be educated in this particular branch of knowledge, it is fortunate that Shakespear's plays are so popular and so historically reliable; and it is also fortunate that the successors of the great dramatist—the little knot of highly-talented gentlemen who call themselves the "Dramatic Authors' Society," and their more humble, or less famous brethren, who supply the passing dramas for the minor theatres,—are always willing to "illustrate" the times in which we live and move, according to their talents and their opportunities.

As one of the great events of the present year is the "fight for the championship," it is not surprising that the watchful dramatist has seized it for literary material, some years, perhaps, in advance of the regular historian. At the very moment when Thomas Sayers is a leading man—when he has been praised from the pulpit and by the journals, and when he has returned the compliment by praising the journals for their literary genius and descriptive talent,—when he has been *fitted* on board the Queen's ships, and received on the Liverpool Exchange with more honours and enthusiasm than were bestowed upon Lord Gough on his victorious return from India,—when he has been declared the "Mincing-lane Pet," with a retainer of a hundred guineas, and the "Capel-court Slasher," with another retainer of a similar amount,—when he has received more money for "colours," and shares of the railway fighting-train, than ever any professional gladiator received before,—when he has been made the object of a subscription by the House of Lords, another subscription by the House of Commons, many more subscriptions by different clubs and classes in London, in Paris, and throughout the provinces, and a wide extra subscription, amounting to more than four thousand pounds sterling, that is led off by a noble lord who sends a hundred pounds, and closed by a little girl,

under eleven years of age, who sends sixpence,—when all these honours and profits have been heaped upon the head of a single individual, it is not surprising that the historical stage should select him as the hero of many dramas, and seek to embody the leading incidents of his career. This "noble" pugilist, after several weeks of decent diplomatic reserve, has become reconciled to his American opponent, and the two countries seem to breathe again. We are now able to attend to our ordinary political and social business, as the two combatants have retired hand-in-hand to the country, for the profit and pleasure of a "sparring-tour." I have not heard, nor, I believe, has the respectable editor of our leading sporting contemporary, that any offer has been made to Sayers to stand for any town or borough as a member of Parliament. What is Pontefract about on this occasion? It was satisfied with "Mr." Gully, ex-champion and publican for many years, and why not try Sayers? Its name, when translated into English, signifies "broken-bridge," and shows a philological sympathy with pugilism.

The Olympic Theatre was the first to recognize the importance of the great pugilistic event, and to deal with it from a farcical point of view, in the piece called *B. B.* More than one of the minor houses were not slow to follow so high and so successful an example; but it was reserved for the Victoria Theatre, in the New Cut, Lambeth, to present its patrons with a drama, half "domestic," half historical, that may be fairly taken as having exhausted the subject. This drama contains much that is known, with much that was previously unknown; and the following is a fair copy of the play-bill, omitting the perishable part,—the names of the actors:—

#### THE CHAMPION'S BELT; OR, THE RING AND ITS MORAL.

Sir Harry Headlong .....	Mr. —	Tableau 4.—The First Meeting!
Tom Sayers .....	Mr. —	Shake Hands. The American's Colours.
John Heenan .....	Mr. —	The Toebiter and Tom.
Old Joe Sayers .....	Mr. —	The Toebiter rescued by Shorts.
Augustus Toebiter .....	Mr. —	Tableau 5.—The Meeting!
The Nimble Grasshopper .....	Mr. —	Owen Swift's Parlour.
Harry Branton .....	Mr. —	Three Cheers for Tom Sayers! The Belt!
Owen Swift .....	Mr. —	The Benicia Boy! Hurrah!
Goliath .....	Mr. —	The Colours of the Champion of England!
Police, Detectives, &c.		Grand Tableau; and End of First Act.
Mary Sayers .....	Mrs. —	Act. II.—The Training.
Mrs. Sayers .....	Miss —	The Toebiter up to his Work.
Shorts .....	Miss —	The Nimble Grasshopper.
Act I.—Exterior of Owen Swift's Tavern.		The Benicia Boy!
Tableau 1.—Previous to the Fight.		Heenan's Lodgings. Yankee Doodle.
Tableau 2.—FLOOR No. 1.		The Detective. The Escape!
Tableau 3.—Tom Sayers. Hurrah!		The Fight!!
Street. The Pedestrians.		Tableau.—Over the Ropes.
The Champion's Belt!		The Death-bed of Heenan.
Old Sayers's Lodging!		Grand Tableau.

The drama opens with a representation of a street, from which we learn that "Owen Swift's Tavern" (in Tichborne-street, Haymarket) is a large private house, with a handsome portico, standing in an extensive square. Immediately opposite this mansion is a cobbler's hut, not unlike a blacksmith's forge, in the occupation of "Old Joe Sayers," shoe-mender, and father of the "Champion." Here we have the visible emblems of two opposing principles. The house, or "tavern," is typical of idleness and dissipation; the hut is typical of industry and sobriety. Before the door of the first are a few betting-men and hangers-on of the "Ring," including a wild, gay nobleman in a battered white hat and blucher boots, described in the play-bill as "Sir Harry Headlong," while before the door of the second are the hard-working, perspiring "Joe Sayers" senior, the frugal and homely "Mrs. Sayers," and the virtuous and interesting "Mary Sayers," their daughter, forming together a beautiful "tableau," or family picture.

We learn, from a rather general conversation, that Sayers senior, while he retains some physical vestiges of muscular development, and the power of giving a blow from the shoulder, is opposed to the ring and all its associations, and that he has commanded his daughter "Mary" to disown all relationship with her brother "Tom," until he is found to walk once more in the paths of industry. We also learn that Sayers junior, otherwise "our noble Tom," otherwise "our glorious champion," has generously offered to maintain his father out of the gains of his pugilistic profession; but it is almost needless to say that the offer has been firmly though respectfully declined. Much striking of a lapstone, and much flourishing of an old boot take place, as pantomimic indications that the independent old cobbler is not yet incapable of earning his livelihood.

It appears, at this period of the Sayers history, that "Mary Sayers" has attracted the attention of the wild, gay nobleman, "Sir Harry Headlong," and though, strictly speaking, not persecuted with his addresses, she is chased by him round the square, or street, before described, and roughly embraced, in broad daylight, on the Queen's highway. It also appears that "John Heenan," the American Champion, who has arrived in England, is under an obligation to a "family bearing the name of Sayers," for some help rendered to him some years ago, in some part of America, and he is not the man to forget those in his prosperity who never forgot him in his adversity. There are also some traces of a tender attachment between him and "Mary Sayers," who only knows him for the present, under the assumed name of "John Carter."

The unseemly conduct of the wild, gay nobleman, in the Queen's highway, gives a happy opportunity to "John Carter," otherwise "John Heenan," of showing that his mouth is not crammed full of empty sentiments, and of introducing himself in a triumphant manner to the family he is in search of. He enters the square, or street, at the very moment when "old Joe Sayers" has been ruthlessly pushed aside, when "Mary Sayers" is being unwillingly embraced by the wild, gay nobleman, and with one blow of his stout American arm, he "doubles up" the feeble aristocratic victim of dissipation. The remarks of "John Carter," otherwise "John Heenan," after performing this feat, are worthy of a place amongst the maxims of school copy-books.

The noble American retires, after promising to visit "old Joe Sayers" and his daughter at their lodgings, and we are introduced, for the first time, to the English "Champion." He comes out of the house, or tavern, cheerful and confident. He observes that he has never yet seen his opponent, and should like to know whether he is going to fight a man or a mountain. His reception by a small but



what tones those who assume the name of Conservative politicians would argue in support of a great encroachment by one House upon the other." Did he mean to imply that modern Conservatism really means backing up every encroachment upon popular freedom? This was an ugly and damaging charge, and no wonder the Conservatives sat uneasily upon their seats. Mr. Gladstone had next to vindicate himself for not objecting to the resolutions. They were good, as far as they went, and they sufficiently vindicated the rights of the House of Commons by words. Yet the indignant orator, to the inconceivable astonishment of the Derbyites, and the unmeasured delight of the Liberals below the gangway, proceeded to declare that in his opinion "the House would do well to vindicate and establish its rights also by action." This looked like mutiny. Was the orator about to resign, or had he stipulated for the freedom of action he had indicated? Was the member for the University of Oxford about to set up an independent standard, to become the leader of a new party, and declare war against his chief? Was this great question of Constitutional Privilege to be an "open question" in the Cabinet, like the Ballot or Church-rate Abolition? These were some of the speculations that ran through the minds of Mr. Gladstone's hearers, as he declared that he held himself free to support any proposal that offered the slightest promise of success for traversing and revoking the unconstitutional action of the other House.

Among the Liberals who cheered the Chancellor of the Exchequer most vociferously was Mr. Lawson, Sir James Graham's nephew and brother-member for Carlisle. The Netherby Baronet has been the "dark-horse" in this race, voting with the Conservatives in the committee, but defending his vote on technical grounds, based upon the "instructions." But the nephew's cheer was worthy of a mighty son of Nimrod, as he is; and half a dozen others "gave tongue" with equal powers of vociferation. It was also noteworthy that Sir John Shelley alone, upon the Ministerial benches above the gangway cheered the orator. The Ministry and their adherents listened in silence to this menace of possible action; and when Mr. Gladstone sat down, after a lofty, eloquent, and well-reasoned assertion of the rights of the popular branch of the Legislature, not a man said "Hear, hear," or expressed by sound or look the smallest sympathy or approval. The enthusiasm was all below the gangway, and there it was abundant enough.

Lord Palmerston next day said, with charming frankness, that he had no intention of following up his resolutions. He would pursue the controversy with the Lords no further. It is not easy to say what the Commons, in the present temper of the country, could do; and the proof is, that the Chancellor of the Exchequer, after all the study he has given to the question, and with all his fertility of resource, is unable himself to suggest any course of present constitutional action which promises any hope of success. If he, with all his ingenuity and subtlety cannot devise a mode of delivering us from the Paper Duty in August, with what hope can we look to Mr. Digby Seymour, or Mr. Isaac Butt, for succour?

I doubt whether the public spirit, or the patriotism of the present House of Commons will be rated very high either by the constituencies of the empire or by posterity. They showed a month ago upon the Reform Bill, and now upon the Privilege question, that they have but one wish—to get through the session without a dissolution. Out of doors, that portion of the press which is opposed to the abolition of the Paper Duty, has exercised a torpedo influence upon public opinion. The stars, in their courses, have fought, too, for Lord Derby, and the bill for the China War has been presented to John Bull just when that respected individual has no "change" in his pocket, and is obliged to borrow a sovereign or two from a friend in Lombard-street, to his sore vexation, and the bitter humiliation of his Chancellor of the Exchequer.

#### TOWN AND TABLE TALK.

The "season" is drawing to a close. One Opera-house has already ended its subscription. London is beginning to move. Regent-street and Bond-street are thinning. The sessions at institutions and museums are in most cases ended. Still a course of twelve lectures, by Alexander Gordon Melville, in connection with the British Museum have just been commenced in the Museum of Practical Geology, Jermyn-street, and will be continued on Tuesdays, Thursdays, and Saturdays, till the end of the present month, commencing on each day at three o'clock. These lectures are free.

A new club in Arundel-street, Strand, entitled "The Arundel Club," has recently been established. The list of members includes many well-known names. Another new club, on Liberal principles, is in progress. The house is to be situated in or near Palace-yard, and to be almost within hearing of the division bell.

The Brough Memorial Fund is making satisfactory progress. Three or four of the principal London managers have offered to give benefits in aid, and a grand concert has been announced in St. James's Hall.

In a dignified and gentlemanly letter to the *Times*, M. Eugène Delaporte has made known how ill he has been used by one or two English hotel-keepers. As the representative of the *Orphéonistes*, who have been delighting London by their marvellous chorus-singing, M. Delaporte has not only been overcharged as only an English or Swiss landlord can overcharge, but was actually compelled to learn a little more of our English manners and customs, and to indulge in sight-seeing more than he contemplated, by spending some time at an English "lock-up house." Casual strangers will beware of the hotel and of the landlord indicated.

In a recent discussion in the *Field*, the Hon. Grantly F. Berkeley says,—“I ought to know the English rabbit naturally and scientifically, having studied ornithology, and killed and eaten them all my life.” In the same lively manner he further alludes to the whale as an ornithological specimen.

A fine slab of Cornwall Serpentine has lately been placed over the grave of Douglas Jerrold, at Norwood. It bears the following inscription:—"To Douglas William Jerrold. Died June 7th, 1857. An English writer whose works will keep his memory green better than any epitaph."

Messrs. Chapman & Hall have some new books in the press. Mr. Walter White's new work, "All Round the Wrekin," will be out in a few days, and was subscribed "out of print," a technicality known in the trade. A new work by the authoress of "Our Farm," called "From May-time to Hopping," will be published in a few days. "Our Farm of Four Acres" has reached the 16th edition. We are glad to welcome a new authoress in the field—not that authoresses are scarce,—Miss Macready, daughter of the great tragedian, has just finished a volume of poetry, which will be forthcoming immediately.

The fourth edition of Baron Forrester's "Portugal and its Capability" is about to appear. It will contain the new regulations of the Portuguese Government for the free export of the wines of the Douro to England—regulations which have been forced upon Portugal by the recent reduction of English duties upon French wines. Hitherto Port wine has paid a heavy Portuguese export as well as an English import duty.

Messrs. Murray and Heath, the photographic publishers, have just issued an interesting view of the National Rifle Association Meeting, held at Wimbledon. To all those who assisted at her Majesty's first shot, this will prove a valuable memento.

The total expense of the maintenance of the British Museum from its foundation in 1753 to March 31, 1860, has been £1,382,733. 13s. 4d.

T. W. Atkinson, author of "Western and Oriental Siberia," announces a new work, entitled "Travels in the Regions of the Upper and Lower Amoor, and the Russian Acquisitions on the Confines of India and China."

Messrs. Puttick and Simpson announce for auction, on Saturday, July 21st, a valuable collection of autographs, formed by the late E. Crowninshield, of Boston, U.S. They include all the principal names in American history, besides a selection of eminent European names.

Messrs. Puttick and Simpson also announce, during the season, the sale of the effects of the late Mr. Joseph Sams. These are a very extensive collection of books, MSS., antiquities, pictures, and autographs. The sale will occupy many days, and will prove highly interesting to collectors.

#### THE TYPE-PLANS OF ANIMATED BEINGS AND THE SPECULATIONS OF PHILOSOPHERS.

[SECOND ARTICLE.]

The struggles of naturalists after a perfect connected plan of classification have been almost as severe as the struggle for life which Mr. Darwin points out in animated nature. We see, however, certain organs, certain peculiarities prominently developed in some members of one group of animals or plants of which the genera and species are linked together by the bond of these common characteristic modifications of one of the primitive type-plans. Let us look for one moment at the mammalian class,—let us even select one limb only to simplify our meaning. Take, then, the fore-limb of locomotion—and out of the same number of bones, with a nearly like relative disposition to each other, we have the arm of man, the wing of the bird and of the bat, the flipper of the seal, and the fin of the fish. Let us restrict our exemplification within still narrower limits, and take the foot alone, and see to what an extraordinary extent its component bones are modified and adapted to various uses and purposes in the various groups; and while we look at the few selected examples given in our woodcut—restricted, necessarily, by our limits, to the smallest number of examples,—let us bear in mind that similar although slighter modifications are to be found in every single species, and that even individuals are not exempt from minor but ostensible variations of those least specific modifications.

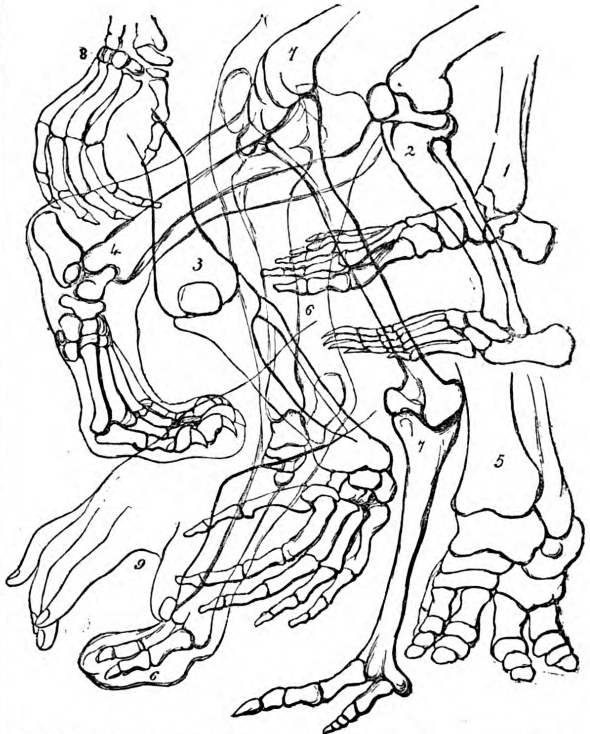


Fig. 1. Human foot. Fig. 2. Hind-foot of bear. Fig. 3. Foot-hand of gorilla. Fig. 4. Hind-limb of lion. Fig. 5. Hind-foot of elephant. Fig. 6. Hind-limb of camel. Fig. 7. Leg of ostrich. Fig. 8. Hand of gorilla. Fig. 9. Human hand.

One remarkable example of specific modification is afforded by the front-paws of animals of the lion or cat tribe in the sheaths into which their claws are retractable, and by which they are preserved sharp and clean, ready for

use. Whilst digressing thus back again to the fore-limbs, we may allude to the remarkable condition of the human hand, in respect to the length of the fingers. If you will place your hand on the table, you will see at a glance that the middle finger is the longest, and that the third (between the middle and little fingers) is next in length, while the thumb, or inner finger, is shortest of all. In vertebrate animals, with pentadactyle limbs this, as a general rule, holds good, and in those which have a less number of fingers or toes it is the representatives of the middle and third fingers which occupy the chief positions; while in the monodactyle foot of the horse it is the equivalent of the middle finger, which is modified into the hoof. We seem thus obliged to recognise the middle or longest finger as the most primitive. The tridactylate foot of the ancient reptiles is represented in the fore, middle, and third fingers of the human hand; the four-toed limbs next appear in order of succession; and, lastly, the thumb or pentadactyle form is produced. With progression of development, or from some other unknown cause, this seemingly last-added part, while so short and so laterally placed in the monkey tribe that those animals cannot touch with it the tips of each finger of the same hand, becomes considerably elongated, and placed opposably in man, who can perform this, to him, simple operation with the greatest facility, for it is this adaptation which gives to his hand its exquisitely varied capabilities and its wonderful perfection.\*

I can never pass that wonderful ape, the gorilla, peering with its large glass eyes from its corner case in the British Museum, without stopping and wondering at the strange likeness between that half-human face and the dark, unsightly features of the negro. There seems the like thick lips and flattened nose and low receding forehead; but here I pause, and look at the creature's bony framework. There is the same type-plan of the mammalian class—vertebræ formed on the same principle, skull of the same number of conjoined bones; ribs, arms, legs, feet, teeth, nails, all like modifications of the same constructive parts as we see throughout the entire class, but yet widely differing from those of man. The bear's approaches far more nearly to the human foot than does the hind-hand of the gorilla; the whole hind-limb of the former resembles that of man, and hence the capability of the bear for walking on its hinder limbs, its unsteadiness of gait arising from the reversed size of the toes, the inner being, contrary to man's, the smallest. Nothing, perhaps, is more remarkable in the differences between the gorilla and man than the differences of the capabilities of the hind-limbs. For example, take a man in the act of ascending a flight of stairs. This common attitude is impossible in the gorilla. The bear, as we know from the wandering dancing specimens in our streets, can alternately balance itself on either hind-foot; but the gorilla could not, by reason of the construction of its hind-limbs, repose the weight of its body on one foot, but would be forced to mount the steps on all-fours. There are other characters between the skeleton of the gorilla and man that the most casual observer could easily detect, and which place a great—but we can scarcely say we think an insuperable—gap between the mere organisation of the highest known *Quadruman* and that of Man. We all feel how objectionable to our pride is the idea of tracing back our ancestry to a monkey, although some arguments on the principle of inheritance of instinct might be well maintained against some of us for the mischievous propensities we might be presumed to have thus retained. There is ample scope, however, for debating the great principles of development and natural selection in the wide field of the rest of Nature, without going into the question at all of the first development, or the first creation of man. There is something so transcendently superior in the divinity—I know not how else to express it—of man's soul, that places him, at least for the present, quite out of the argument. But if it be truth that we must look back to one of those hirsute progenitors, and we should hereafter be forced to admit it, it will be something for Mr. Darwin's theory, that it necessitates our descent from the best, and not the worst of the tribe.

Now look back into the past, and pterodactyles, ichthyosaurs, hippotheres, mammoths, and many another of the strange and less familiarly-known animals of the geological ages, rise up and show like modifications of the same primitive type-plans from the earliest era of life to our own. Look back at the plants,—and there were some which grew by outer rings of bark and wood, and some by an inner growth, like canes and reeds. Look around, and they are growing so still.

Why, if repeated creations of species have been evoked, after repeated intervals, by the Great Ruler of all things, have these creations borne the stamps of the same unmistakable type-plans? Why, if some species were created at particular spots, and adapted to particular conditions, do we find other species or varieties in some neighbouring or distant places, under similar or different conditions, so like each other, that naturalists can neither agree as to the distinguishing features between them, nor determine how much variation should go to constitute a species, and how much should be restricted within the term variety. If varieties and species progressively merge into each other, why should not species diverge into genera. Admit this, and genera must be admitted to diverge into families, and families ultimately into classes. But here we must stop—at least for the present.

Let us take a glance in another direction, and ask—What is the meaning in nature of rudimentary limbs or organs? Why are creatures endowed with that which is useless to them? Look at the ox: the incisors of its lower jaw are strong and well-developed; in strict unison with its requirements for cropping grass they bite against the flat toothless surface of its upper jaw or skull. Why in the calf when young—through whose gums they are never cut, who has no possible use for them—are these rudimentary upper incisors developed for a time, to be ultimately absorbed away?

All these difficulties upon the principle of special creations for every species are inexplicable. But not so on the natural principle eliminated by Mr. Darwin, if that author be correct in the conclusions he has drawn from nature that these type-forms are inherited by progressive descent.

Let us turn now to another and very different class of facts. Do you know any of those few lowly-organised fish which naturalists have grouped as cyclostomes? Did you ever see the "glutinous hag," with its one recurved palatal tooth thrust into the body of the codfish as a holdfast, while it sawed, with the lingual plates of sharp-pointed teeth with which its sucking mouth on either side is armed, into its victim's flesh, and rasped its way

into its vitals. Other similar horrors in the habits of some parasitic animals immediately occur to one's mind, and make one almost shudderingly ask if the Great Creator could call into existence such monsters; but these fearful ideas vanish with the belief that natural circumstances in some exceptional cases might lead to their undesigned development, and that being adapted to no useful end, their kind must ultimately, in the struggle for life, perish.

Let us here, still more clearly, if we can, understand the principle of accumulated variation on which Mr. Darwin founds one essential part of his theory.

"Owing to this struggle for life, any variation, however slight, and from whatever cause proceeding, if it be in any degree profitable to an individual of any species, in its infinitely complex relation to other organic beings, and to external nature, will tend to the preservation of that individual, and will generally be inherited by its offspring. The offspring, also, will thus have a better chance of surviving; for, of the many individuals of any species which are periodically born, but a small number can survive. I have called this principle, by which each slight variation, if useful, is preserved by the term of natural selection, in order to mark its relation to man's power of selection. We have seen that man, by selection, can certainly produce great results, and can adapt organic beings to his own uses, through the accumulation of slight but useful variations, given to him by the hand of Nature. But natural selection, as we shall hereafter see, is a power incessantly ready for action, and is as immeasurably superior to man's feeble efforts, as the works of Nature are to those of Art. . . . It may metaphorically be said that natural selection is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up that which is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being, in relation to its organic and inorganic conditions of life. We see nothing of these slow changes in progress until the hand of time has marked the long lapse of ages; and then, so imperfect is our view into long-past geological ages, that we only see that the forms of life are now different from what they formerly were. . . . A struggle for existence inevitably follows, from the high rate at which all organic beings tend to increase. More individuals are produced than can possibly survive, and, therefore there must be this struggle for existence, either one individual with another of the same species, or with individuals of distinct species, or with the physical conditions of life."

Thus the tendency of individuals to vary, inherited and carried on continuously by the progeny, but prevented from a general intermingling by the natural opposition of one form of life to another in the general struggle for existence, gradually and imperceptibly modifies the offshoot of the original species into a new and differently-adapted form, or, in other words, gives rise to a new species. So beautiful is this idea, so accordant with the silent changes of Nature in her ever serene aspect, so worthy of the wonderful far-seeing design and power of the Infinite, that we may yet fairly entertain it, if even we should hesitate to adopt it as a primary cause, as a subsidiary principle, modifying within the restricted limits of the great Creator's type-plans, that varied fauna and flora which forms the glorious charm of our beautiful world.

Undoubtedly we may safely regard it in this modified light until future deep and patient researches shall have brought together such an amount of experiences and facts as will either establish its general applicability, or teach us to look in some other direction for an explanation of one of Nature's greatest mysteries.

In our next and concluding article on this topic, we shall go back into the far past, and see what evidence Geology brings to bear from the great roll of the Earth's history.

#### INAUGURATION OF HOGG'S MONUMENT AT ST. MARY'S LOCH.

BY ONE WHO WAS PRESENT.

SCOTLAND has at length discharged a debt long owing to the memory of one of her sons. In November, 1835, a band of sincerely sorrowful mourners—plain illiterate shepherds in their grey plaids, to whom he had endeared himself as a neighbour, men of letters who had been attracted by his genius and *geniality*,—bore, in slow procession, past St. Mary's Loch, the lifeless remains of the poet of the "Queen's Wake" to their last, lowly, lonely resting-place in Ettrick. Not until a quarter of a century had wellnigh elapsed—until June, 1860,—did his countrymen see fit to rear him a monument, to tell to wandering tourist that his remembrance has not faded from among the people of his native glens. Not, indeed, that he needed a stone to perpetuate his fame: that is engraven deep on the everlasting hills; and St. Mary's Loch must utter his praises so long as it contains a drop of water to ripple over its pebbly bed. Not for the poet, but for the people, was it well that a monument should be erected; and not for the people themselves, whose respect and admiration can be but poorly expressed, even in the finest "Denholm Sandstone," except to take away the reproach of the stranger who visits Ettrick or Yarrow without finding a memorial of the shepherd-poet who had hither led his feet.

Thursday, June 28th, was a red-letter day in the calendar of Ettrick Forest,—for forest it is still called, though

"The scenes are desert now, and bare,  
Where flourished once a forest fair,—

that often rang with sound of royal bugles, when royalty's staghounds pulled down noble hearts. An out-of-the-way place, and a solitary, is the forest; and its silence and solitariness have been well described by Hogg, or some one in his character in the "Noctes Ambrosiane." He says: "A great road runs through't, but often hae I sat on a knowe commanding miles o't, an' no ae single speck astir as far as the ee could reach, no a single speck, but aiblins a sheep crossing, or a craw alichting, or an auld crouching beggar-woman that ye thocht was leaning motionless on her stick, till by and by ye discerned the colour o' her red cloak, and, a gly while afterwards saw, rather than heard, her praying for an awmous, wi' shrivelled hauns faulded on her breast, or, in their palsy, held up heavenwards so beseechingly as to awaken charity in a meeser's heart."

Hogg, vain as he was (he had a considerable share of vanity, and not without good reason—he, a poor uneducated shepherd, having by the force of his own genius raised himself to be the admired companion of the first literary men in Scotland, when London was not so much the centre of intellect as it is now), could hardly have put much faith in the prophecy of

\* The gorilla can very clumsily approach this action.



and victims. But, like the "Danse Macabre," it would be a "Dance of Death." Jezebel, Herodias, Cleopatra, Semiramis, Helen of Troy, Messalina, Mary Stuart, and Catherine of Medicis, might lend the beauty and the passion to the story, and point its mighty moral; while Saul falling upon his sword, Sardanapalus with his blazing torch, Nero with his fiddle, Richard III. naked and dead on Bosworth Field, Charles I. with the grim headsman at his side, and grimmer Cromwell sad yet exultant near at hand, Louis XVI. striving to utter his last speech on the scaffold amid the rude rataplán of the drums of the Brewer Santerre and the shouts of the execrating rabble, Napoleon I. fretting out his soul on the melancholy rocks of St. Helena, poor Louis Philippe sneaking away disguised in a hackney coach, and running when no man pursued him, and Nicholas of Russia dying of a broken heart at sight of the Piper's bill, and a thousand other kings, chiefs, and great potentates, would exemplify in as many different ways the tragedy of this great world-story. And high, towering to the clouds, his head in storm and lightning, supreme amid all these personages, but shadowy, vague, and undefined, might loom the PIPER himself, the hero of this sublime epic,—

"In bulk as huge  
As whom the fables name of monstrous size,  
Titanic or earth-born, that warred on Jove,  
Briareus, or Typhon;"

—but unlike them, for he, the great, the invincible Piper, never "warred on Jove;" but is, and has always been, the servant and ambassador of Heaven—doing its behests, and executing judgment upon the guilty. It is a phrase both vulgar and incorrect, to talk of the Piper as the Devil, and to hint at there being "the Devil to pay." In the Piper there is no Devil, and nothing diabolical; for, though he is inexorable, and sometimes appear cruel, he is only cruel to be kind, and is, above all things, just, and the friend and supporter of order and harmony throughout the universe. If the story, as thus broadly indicated, be too vast for any man's lifetime, the student who desires to rank with Tacitus, Gibbon, Macaulay, or Carlyle, may confine himself to some single episode in the drama—that, for instance, which is both the latest and grandest—the episode of the French Revolution, commencing with Louis XIV., and ending with the flight of Louis Philippe in 1848. The Piper would be the central figure in the tragedy, mingled, as every tragedy should be, with some degree of comedy, if not of farce;—bringing in his little bill at every convenient opportunity [his little bill, not to be disputed for ever], for the mismanagement, waste, corruption, jobbery, luxury, carelessness, extravagance, and dishonest procrastination of kings, emperors, tribunes, and ministers;—bringing it in with compound interest, and taking part-payment in September massacres, wholesale fusillades, and *noyades*, and hangings to lamp-posts, taking it out in the heads of poor Louis and luckless Marie Antoinette, and putting up with bones and blood instead of money. When Richelieu said, in that famous phrase wrongly attributed to Metternich, "After me the Deluge," he meant, "After me the Piper." Richelieu saw the Piper plainly enough, as any man of common sense might have seen him; but he had neither the power, nor perhaps the courage, to persuade the nation to pay him; and so the Piper's bill ran on, growing as it rolled, like an avalanche, till he would tolerate no longer the procrastination and false words of his debtor, and down he came upon him with a swoop. Then burst forth Richelieu's deluge—a deluge of blood and tears, that carried away an ancient monarchy, a proud aristocracy, all the landmarks and bulwarks of a thousand years, and established a new order of things in the world, of which we in our day only see the beginnings. And all for despising the Piper! The lesson was not sufficiently present to the mind of the new generation and the new man who moulded that generation to his purpose. Out of the anarchy and bankruptcy of the Revolution emerged the strong Captain—

"Le Corse à cheveux plats"

—who made the Piper play to him to an excellent, new, and very martial fandango. But the Corsican forgot to pay him. The Piper, however, did not forget the bill which the Corsican owed him. He took an instalment of it at Moscow, another at Waterloo, and a final dividend—*quoad* the separate estate of Bonaparte—in the miserable squabbles and untimely deathbed of St. Helena. Thus hath it ever been—thus shall it ever be. Will no one write the history of the PIPER?

#### THE TYPE-PLANS OF ANIMATED BEINGS AND THE SPECULATIONS OF PHILOSOPHERS.

[CONCLUDING ARTICLE.]

In our second article we illustrated, as briefly as we could, the modifications of a portion of a single limb in terrestrial species of the vertebrate class. Like appreciable modifications can be readily made out in the organization of the invertebrate types. Of the mere globular animals, such as certain infusoria, the amebas, and foraminifera, we need scarcely make a remark, for it is well known how their forms amalgamate one with another, and that the most experienced naturalist can do little more than select those marked varieties which are arbitrarily denominated species. We can trace the modifications of the one ray-like disposition of parts through the star-fish, the coral, the jelly-fish, and sea-urchin; we see it in the beautiful fossil "stone-lilies" (erinoids); in the sea- and land-worms, and their allied forms, we note the divergences of the "ringed," or annulose, form of construction, and still farther, we can conceive its possible transmutation into the crustacean, or articulated class.

When, however, we come to the mollusca the task is more difficult; indeed, at the first unstudied glance, we may see but slight similarity of construction

between the gasteropods (whelks, snails, &c.) and the lamellibranchs ("plate-gills," oysters, river-mussels, &c.). And still more obscure seem the links which connect these with the nudibranchs ("naked-gills"), such as the colts we figured in our first article. To the naturalist well versed in their organization the modifications of type-plan in this class present facts of high interest. But so far as evidence is yet produced the mergence of one type-plan into another seems unproven; nor is it necessary, for the establishment of Mr. Darwin's theory, that it should be, for the type-plans may be, even directly, under his views, regarded as the great limbs of the Tree of Life, which have branched out from the most primitive of all life-forms. When we observe cell-animals, and cell-plants, and know that *cellular* tissue is the chief constituent of the framework of both animal and vegetable,—when we see how both cell-plants and cell-structure can be multiplied and extended by subdivision of the cells, as well as by actual generation, we see no *impossibility* in all Living Nature having sprung from a primeval monad; but that it has done so we have not the proof.

We have, however, in this article, to deal with the geological evidence in its bearings on the new doctrines of the variations of species and natural selection. However unpalatable it may be to geologists, there is much truth in the sweeping remarks of Mr. Darwin on the imperfection of the geologic record; and although we cannot go to the length of his depreciation—and by which we think he has greatly weakened his cause,—we are yet inclined to admit that we have only one volume, and that the smallest, of the earth's past history. We know only the present land-side; we know next to nothing of what is under the sea; still less of that which is in the inner depths of the globe. What we have, too, is like an old book from which a great mass of leaves has been torn, while here and there an illuminated page remains, to show how beautiful the volume must have been in its perfectness, and how highly interesting the knowledge that is lost. Even those fragments which have been preserved are not yet *all* read and interpreted.

Vast, indeed, in comparison with even all the ages which have happened since, is that lowermost great Silurian age, with its strange trilobites, and stranger fish. And yet what do we know of its land-surfaces, its ancient terrestrial conditions? Not a land-plant nor a land-animal of that remote period is known. Shall we say that none existed? In the new red sandstone there are footprints of birds—you cannot mistake them. They are not the prints of flying lizards which would have scrambled or shuffled along, but those of veritable birds, that planted their toes first on the sands with that elastic springing tread so peculiar to their class. Yet not a bone of one of those ancient birds has been found, although their footprints have been known these twenty years.

Mr. Darwin, too, pleads great gaps or intervals of time between the stratified deposits of one geological age and another, undoubtedly a reasonable supposition, which often might be extended to the very lines of demarcation between one stratum and another. Take the passage-bed between the lower green-sand and gault,—a narrow band of phosphatic nodules, not more than six inches to a foot in thickness, containing shells of *Inoceramus concentricus*, first detected in a zone of fossils a few feet below in the green-sand, and found in myriads in the gault above. This narrow stratum, thus linked with the cretaceous beds above and below it by the same fossil forms, separates deposits of the most opposite nature—the one a dark-blue clay, the other a tawny-green incoherent siliceous sand; and the evidence of this remarkable change is contained within the measurement of a two-foot rule. Will any one believe that the entire record of those great intervening physical changes which separated the littoral conditions of the ancient green-sands from the deeper sea-bed conditions of the gault, are preserved in this narrow seam? And yet, in this example there is a continuity of fossil forms which link these strata more closely together than happens in the majority of such cases.

Darwin beautifully compares the transmutations and divergences of species in the vast Past to a great tree, of which "the green and budding twigs may represent existing species; and those produced during each former year may represent the long succession of extinct species. At each period of growth all the growing twigs have tried to branch out on all sides, and to overtop and kill the surrounding twigs and branches, in the same manner as species and groups of species have tried to overmaster other species in the great battle for life. The limbs, divided into great branches, and these into lesser branches, were themselves once, when the tree was small, budding twigs; and this connection of the former and present buds, by ramifying branches, may well represent the classification of all extinct and living species in groups subordinate to groups. Of the many twigs which flourished when the tree was a mere bush, only two or three, now grown into great branches, yet survive and bear all the other branches; so with the species which lived during long past geological periods, very few now have living and modified descendants. From the first growth of the tree, many a limb and branch has decayed and dropped off; and these lost branches of various sizes may represent those whole orders, families, and genera which have now no living representatives, and which are known to us only from having been found in a fossil state. As we here and there see a thin straggling branch springing from a fork low down in a tree, and which by some chance has been favoured and is still alive on its summit, so we occasionally see an animal like the *Ornithorhynchus* or *Lepidosiren*, which in some small degree connects by its affinities two large branches of life, and which has apparently been saved from fatal competition by having inhabited a protected station. As buds give rise by growth to fresh buds, and these, if vigorous, branch out and overtop on all sides many a feebler branch, so, by generation I believe it to have been with the great Tree of Life, which fills with its dead and broken branches the crust of the earth, and covers the surface with its ever-branching and beautiful ramifications."

What a task for geologists is typified in this elaborate simile! It is their task, then, to re-draw, with the vividness of the artist's pencil, the great trunk and the dead branches of the Tree of Life—a noble task, but one of deep study and greatest care. The artist, painting the scenes of past history, can fall back on the written records of the men who saw and took part in those great events, but no man saw or recorded the wonderful scenes in the earth's past history; and from every nook and corner all over the habitable world have geologists to exhume, branch by branch, the dead members of the wide-spread living tree. What a work of time! It must be years before they can produce *all* their evidence. Some they can give you now, but think them not slothful if it be long before they stand up to reply to the great

question thus brought before them. We can, however, say something at once of the general bearings of geological knowledge on some points. We can give the first rudiments of the outlines of the ancient branchings of the great tree. Let us take one branch, the mollusca, or shell-fish. At the close of the first great period of geological history—the end of the Silurian age,—there were sixty-six genera of the same four sub-typical modifications, or families under which existing “soft-bodied” animals can be ranged; namely, the Cephalopods (represented now by the cuttle-fish and nautili), Gasteropods (= snails, whelks, &c.), Brachiopods (= terebratula, crania, &c.), and the Conchifera (= bivalve shells, oysters, mussels, &c.).

For simplicity of display, let us tabulate these facts; and that we may not encumber the tables with details, we will select four only of the geological eras, as examples of the gradual spreading of the great geological tree; but it must be borne in mind that of the omitted formations each represents a vast period of time and numerous phases of progression.

Geological Periods (= Growth of the Tree of Life).	Number of Genera of the Four sub-typical Groups of Mollusca (= one of the Limbs).				Total Genera (= Twigs).	Total Species (= Buds).
	Cephalopods.	Gasteropods.	Brachiopods.	Conchifera.		
First known period of life—the Silurian .....	13	11	16	13	= 53	= 317
Devonian .....	14	20	23	20	= 77	= 1035
Carboniferous .....	16	59	14	59	= 148	= 2147
Eocene .....	4	85	11	72	= 172	= 2636
The existing period .....	21	251	13	115	= 400	= 16000

Similar tables of all the other classes, both of animals and vegetables, could be given, showing like results and like general bearings, while the details of such tables would emphatically mark imperfections in the geological records. For example, in the Devonian period we know 1,035 species of 77 genera. In the Permian, two eras later (with the vast Carboniferous period intervening), we only know 74 species; but these belong to only 66 genera! Under these circumstances, can we think for one moment that Geology has gained a knowledge of all the species of the Permian age? Again, in the Eocene or early Tertiary period we know 2,636 species, belonging to 172 genera, while in the Pliocene or later Tertiary we know only 437 species, but which species belong to 192 genera. We must draw very odd conclusions if we deal with this fact *per se*. Although the geological record is perfect enough for the attainment of general results, we are by such considerations forced to one of two conclusions, from which there is no drawing back—namely, that either these species have been derived in the vast ages of the Past by successive development from each other in various ramifications, or that the special acts of direct creation have been successively and continuously more and more numerous up to the very date of the present. Has, then, the interference of the Divine Power become more and more necessary with the advance of the earth's progress, or have the defects of Nature become greater and greater with the world's old age? Has the creative energy reached its culminative point, to cease for ever, or does it still continue to be exerted in such minor details with ever and ever redoubled force? Surely the evident linking features of the great type-plans, persistent from first to last throughout all Nature and all Time, point to the more reasonable conclusions of a progressive development, accomplished under the perfect and unerring laws of the Supreme Intelligence.

It may be objected that if species have been formed by progressive development, we ought, notwithstanding all the imperfections of the geologic record, to find the first or oldest fossil forms of very low organisation; and that the links of after ages should distinctly mark the gradual changes to the higher ranks of existing animals and vegetables.

This would be to take an extreme view, and to make no allowance for the continuance of the lower organised forms, nor for the progressive introduction of new developments from various inferior species at different intervals. Something, however, approximate to such general results does occur. In some classes the oldest or primitive families are the least unlike to each other, and of lower grade of structure, as the Orthoceratites and Belemnites amongst the Cephalopods, the more highly organised cuttle-fishes coming in at a later and more advanced period.

There is another remarkable confirmatory fact of this view, namely, that the last developed in all classes (as a general rule) are the most typical or characteristic of their respective groups. It is thus from the earth's strata that we must seek to exhume those ancient organised forms which have constituted the forks in the Great Tree whence the main branches have sprung; while it is in the preserved traces of the ancient physical changes of the earth's crust in its varied relative conditions of dry-land to sea that we must look for the key to the present complicated diffusion and distribution of the various existing faunas and floras, for the submergences of some areas and the upheaval of others; the separation of islands from continental tracts and the junction of mainlands together, have, in the lapse of past geological ages, isolated or intermingled groups of very different animated beings and vegetations, while the altered circumstances of climate and terrestrial conditions must have been one of the chief influences of the tendencies of species to produce “varieties.”

Another important point of consideration in the geological evidence is the migration of species, and their geographical diffusion in geological times. This has a direct bearing on the idea of specific creations. Of one such migration we have remarkable evidence during the glacial period. During that extraordinary period of intense cold, many of the species of molluscs now inhabiting our own and other shores, and which had previously existed within the same geographical regions, migrated southward, returning again on the subsequent change to milder conditions of climate towards their former habitats. The evidence of this migration is not only derived from the fossils found in the stratified formations of that age, but in certain deep holes and cavities in the bottom of our present oceans and seas there still exist isolated colonies of their dwarfed descendants, which have not been able to extricate themselves from these pits, and are now found under conditions of temperature and depth of water unsuitable to their proper development, while they are surrounded by a fauna of more southern and very different aspect. Let us suppose such a migration in a far-past time. Suppose, too, the remains of such migrated mollusca to be entombed in a particular region in the ocean mud. In the course of subsequent events suppose other strata formed over this, inclosing the descendants of these migrated molluscs with other remains.

Now, suppose some intelligent geologist, an advocate of the special-creation doctrine, to make a section of these beds, they would present to his view a first appearance of a new species, exhibited in one line, or stratal horizon. He would be in ignorance of the migration, and would therefore conclude that it was a new species directly introduced, although in reality the species had been in existence for perhaps some thousands or ten thousands of years; and had, indeed, previously been modified in the long lapse of time from some pre-existing species, of which the only evidence which might have been preserved would be in the similar condition of a stratal zone or band; while of the intermediate and linking varieties not the slightest trace might remain; for in the very nature of things, the varieties producing the change must be fleeting and evanescent.

If these articles have shown to the reader some grounds for a just consideration of Darwin's theory, let him henceforth put aside the reproaches ever muttered against new doctrines of their tendencies to materialism and atheism. No such tendencies are compatible with the true teachings of Natural Science. Let us rather plead for the laws which regulate Nature than against them; for, can those laws, emanating from the Divine Source, be defective, or be unworthy means of carrying out His will? Why, indeed, should it be irreligious to think that the Great Creator in His first designs should have foreseen the necessity of future modifications to future altered conditions, and have provided in natural laws the means of accomplishing illimitable adaptations. Let us put time altogether out of question in such reflections, nor ask why He should not have created anything or everything in a moment, as with the flash of a thought? For what is Time to the Eternal? The uncountable millions of years by which we try to conceive the age of our planet may but be a passing thought to the Almighty. And what He could do! is not our question;—but to learn what He has done is the Naturalist's reward.

THE SCIENCE OF COOKERY.

As education progresses, and the laws of life are more fully made out, what was once matter of instinct becomes now the result of science, and the unlettered guesses of the savage pass into the formulas of the philosopher. Cookery is one of these unreasoning instincts with a scientific development; one of the primal necessities, apparently absolute and isolated, yet in reality based on universal laws, and of intricate complexity of relation. Cookery has many stages. From the savage who roasts his roots in heated ashes, and dries his long strips of raw meat in the sun, there is a wide step to the scientific entertainments of Brillat-Savarin and his class, where each dish has its relative place, its order of succession, its gastronomic meaning and idea, all as harmoniously consecutive as the garment of a musician, or the chromatic scale of a painter. And that step is not made all at once. It takes many generations from roots and biltongue to the Roman's dish of nightingales' brains; from Heliogabalus to Brillat-Savarin is again an advance; but even beyond Brillat-Savarin, and all his science of order, stands the food universalist, the cook for the million, the teacher of what nourishing properties lie in rejected articles of food, and in what best manner the poor, and persons of small means, may feed themselves with economy and delicacy.

Choice is only custom, and “what is one man's meat is another man's poison,” as the homely old proverb says, if not very euphoniously at least very truly. All nations have their favourite dishes, in which is generally some local fitness incapable of translation; and all other nations turn up their collective noses at the choice of their brothers and sisters. The hunters on the Mississippi have a famous dish called “musical jack,”—nothing less than rattlesnake stewed, fried, and spitchocked, for all the world like mammoth eels; the French fricassee their frogs, when in season, and a whole sect prefers horseflesh to honest beef and mutton; the Spaniards create their gastronomic paradise out of olives, garlic, and rivers of oil; the English affect roast beef full of blood-red gravy, rich, succulent, and redolent of osmazome; the Scotch like cock-a-leekie, haggis, and oatmeal porridge; the Chinese delight in rats, puppies, slugs, and birds' nests; the Esquimaux grins with pleasure over putrid whale-blubber, thick and slab; and the Australian finds caterpillars, grubs, and worms infinitely to his taste. Ask any one of these, and they will tell you that their dish was the undoubted first made by Eve within the circuit of the Four Rivers. And it would be the hardest lesson a man could set himself to try and teach the more ignorant of them all, that the things which they despise are positively fit for food, and perhaps on the whole better than their own choice. The Scotchman, with his mouth floury with oatmeal-bread, and his whiskers dripping with the gravy of sheep's stomach, would die before he would eat frog, rattlesnake, horse, milk-fed puppy, or sugar-fed rat; the Irishman did die, and of hunger too, rather than touch Indian meal, or ox-liver; the Spaniard, greasy with oil and smelling of garlic, would pitch the Highlander's oatmeal and cock-a-leekie to the crows and kites; the Frenchman thinks the son of perfidious Albion a monster because he eats beef whereof the gravy follows the knife, and prefers it to a nicely-seasoned ragout of foal or filly; and the Englishman thinks rat, dog, snake, slug, foal, filly, and frog, whales' blubber and walrus' flesh, with everything else unusual to the place of his birth, so much impurity, which God never meant freeborn Britons to eat. So we go on, rejecting this and that, on no better ground than want of custom, and suffering the pangs of hunger because we will not make the trial of unaccustomed food.

Two things are necessary to be taught the poor and ignorant: the one the value of several articles of food now left to waste by the wayside; the other how to cook. The English are notoriously the worst and most wasteful cooks in the world, and among the most prejudiced feeders. Fine wheaten bread—not half so nutritious, by the by, as that which has the bran left in, tea in unknown quantities, the best meat or none at all, a celebrated fish or two, with a score of prejudices against the cheap, the unknown, or the unusual, constitute the English idea of table comfort. As to any makeshift, any savoury preparation out of unpromising material,—not one in a thousand entertains such an idea. Unusual food is not considered respectable in England; and respectability is the modern Molnir. Yet thousands of hundredweights of good food yearly decay and spoil because of the silly fancies of ignorant people. Rich, wholesome, appetizing fungi poison the air when they might have fed the hungry, or added grace and flavour to the scanty meal; wet poor lands lie laden with their harvest of thistle and burdock, when they