

# AN INQUIRY

INTO THE PROBABLE

# ORIGIN OF THE HUMAN ANIMAL,

ON THE PRINCIPLES OF

MR. DARWIN'S THEORY OF NATURAL SELECTION,

AND IN OPPOSITION TO

THE LAMARCKIAN NOTION OF A MONKEY PARENTAGE.

BY

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&c. &c.

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"He who will go thus far, if he find on finishing this treatise that large bodies of facts, otherwise inexplicable, can be explained by the theory of descent, ought not to hesitate to go further." \* \* \* \*  
"His reason ought to conquer his imagination; though I have felt the difficulty far too keenly to be surprised at any degree of hesitation in extending the principle of natural selection to such startling lengths."—*Darwin*, "*On the Origin of Species*," p. 188.

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"TRUTH IS A FIXED STAR."—*Gerald Griffin*.

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## PREFACE.

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THE serio-comic squib that follows was prepared on short notice, and read to a meeting of the Dublin University Zoological and Botanical Association, on the 17th February, 1860. In printing a trifle of this kind, I wish to say a few words by way of preface.

As a naturalist, I venture to dissent from the theory of "Natural Selection," set forth and taught by Mr. Darwin in his book "On the Origin of Species."\* It strikes me that there is fallacy at the very base of Mr. Darwin's argument; and that his whole superstructure rests on the *assumption* that Variability acts indefinitely and continuously, without check or hindrance. For without Variability there can be no natural selection; and unless Variability be fluxional, commencing with the creation, and divaricating to the present time, you cannot account, on the theory of natural selection, for the present condition of the organic world.

Admitting that there exists in nature a divaricating tendency, called Variability; can it be maintained that there is not also an opposing and conservative influence, which continually tends to preserve the balance of nature? Such a tendency or law commends itself alike to our reason and to our experience, and proofs of its action may very easily be collected. The whole analogy of nature disposes us to believe in *balance*, and in the persistence of *average conditions* over large intervals of time.

What is called Variability, may be supposed to act like an organic *centrifugal* force; Uniformity its opposite, like a *centripetal*. If a tendency to Variability and to Uniformity, in any species, be nearly equal in amount, you will have a nearly invariable species, which may preserve its character unaltered throughout the course of its existence; such a species may be diagrammatically represented by a circular curve. If either force, in any species, be greatly greater than the other, then

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\* On the Origin of Species by means of Natural Selection, &c., by Charles Darwin, M.A., &c. London, 1860 (Murray).

by elliptical curves you may represent each species; and as it is well known that species do vary in very different proportions, so we may diagrammatically represent such variations by varying curves. Again, there may be some species in which the tendency to vary from the type is extreme, while the tendency to return is very feeble; such are almost undefineable, and may be represented in our diagrams by parabolas or hyperbolas. I need not carry this illustration further.

Again, contrary to Mr. Darwin's theory, I believe that there are *descending* as well as *ascending* types in the organic world. I do not think that Creation has been one uninterrupted march from a Diatome to a Man; but that in every recognized group, whether it be genus, tribe, or family; if it be much diversified, you may detect a central or typical species or genus, from which various branches seem to extend, and that some of these branches link on to higher, some to lower groups. Thus in large Orders there are exaggerated and depauperated generic types.

I think that Cryptogamic plants and Parasites furnish us with notable instances of *descending* or *degrading types*; by which I mean types whose least perfect forms are neither the oldest in time nor the most widely diffused in space. According to Mr. Darwin's theory, the least perfect types of any group ought *in all cases* (as they are in many cases) to be both the most widely diffused in space, and the oldest in time; for Natural Selection is ever moving onward, improving as she goes along and accumulating useful differentiations. Now, it will be admitted that *strictly* parasitic plants, which wholly depend for their existence on other plants, are probably younger in point of time than the plants on which they feed. It would be rather too great an assumption to meet this objection by saying that though *now* strictly parasitic, there was a time when they were not parasitic; yet, I know no other way of getting rid of the difficulty. Now, if we look at the great class of the Fungi, nothing is more evident than that the most perfectly organised species are those that are *least parasitic*, and many of them are very *widely diffused*; the *Agarics*, *Boleti*, &c. feed on decaying vegetable matter, but they are not restricted, like innumerable minute, and very imperfectly organized fungi, to particular living species. Is it quite certain that the *Oidium* which has so recently destroyed the Vine, and the *Botrytis* which, causing the great

potatoe blight, half depopulated Ireland, may not be of very modern creation? If the production of species be, as Mr. Darwin believes, still in progress, will he deny the *probable* recent "manufacture" of species like these, merely because, on the theory of natural selection, being rudimentary, they ought not to be modern. But passing from Fungi to other vegetable parasites: is the *misseltoe* or are the various species on which it lives the oldest? and which is the most perfect type? Would it be any proof of progress if our oak and apple and other trees, some millions of ages hence, should be wholly supplanted by forests of misseltoe? Would it be at all a sign of greater progress than if the religion of the Druids were to supplant Christianity? And what of the very large tropical and subtropical genus *Loranthus*? Mr. Darwin may see in Alph. De Candolle's great work on the Geogr. Distr. of Plants, that the species of *Loranthus* bear every impress of their comparatively recent "selection": they are all strictly parasitical, and nine-tenths of them are restricted to very small geographical limits, and very many to particular plants on which they feed. Nay, some of them are such servile copyists that they imitate, in their foliage, the foliage of the plant from whose sap they are nourished. Thus some of the Australian species which grow on *Eucalypti*, have leaves mimicking in form the particular species of *Eucalyptus* on which they grow. But a still more remarkable case occurs in *Loranthus aphyllus*, of Chili, a *wholly leafless* (if not the only leafless) species, and which is parasitic on a *leafless Cactus*. Finally, *Nuytsia floribunda*, the grandest of all loranthoid plants, is the *least* parasitic and therefore probably the oldest of them all! I need hardly say that if Dr. Hooker's views of the affinities of *Balanophoreæ* be correct, that Order will further confirm the view I have taken; namely that there is a descending, as well as an ascending scale in nature. Animal parasites tell the same tale.

In opposition to the Fungi, I regard the Algæ as an *ascending* type, or one whose least perfect forms are the most widely diffused, and probably the oldest. This great class of plants, based on the half animalized Diatomes, probably commences its vegetable history with the *Protococcus*, the simplest and one of the frailest of vegetables; it ascends through an endless variety of forms that mark distinctly progressive grades of structure, until in its highest family, we have such genera as



*Sargassum*, possessing a distinct stem, branches, leaves and floral-organs, and so far advanced in differentiation of sex that though still cryptogamic, yet every *spore* must be *separately* fertilized, exactly as every *ovule* of a phænogamous plant that becomes a seed must have access to pollen. This is an advance, in sexual differentiation, immeasurably greater than exists either in Mosses or in Ferns! The Ferns indeed are the most cryptogamic of cryptogamic plants, beautiful exceedingly, and infinitely diversified in their organs of vegetation; but, in their reproductive organs, low as the polyps themselves. And though they are *tolerably old*, on the earth's surface, they have as yet made no advance in embryology.

I could greatly extend and illustrate by innumerable examples, the position I have taken, respecting the probably recent origin of many degraded vegetable types. But I think it not *necessary* to our argument. For, if what I have called the tendency to Uniformity be admitted, as I doubt not it will eventually be, then Mr. Darwin's hypothesis of natural selection and all the conclusions into which it has led him, will fall to the ground; but the facts which he has so industriously and skilfully collected will remain to science, and can be explained on different principles. Unless Mr. Darwin can establish the *indefinitely* fluxional nature of Variability, he cannot advance a single step towards a sound induction. My reason assures me that no law of nature is both indefinite and indefinitely progressive. The horses of the sun do not run wildly through space; and gravitation itself acts with the exactness of clock-work. But I have no intention of entering into controversy with the Darwinians.

“He that will to Cupar, maun to Cupar.”

Truth will finally prevail over the most specious error; and “in this confidence of boasting,” I take my leave of the theory of natural selection.

Trinity College, Dublin,  
February 21st, 1860.

W. H. H.

## AN INQUIRY, &c.

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MAN, from a very early period of his history, has occupied himself in asking, and in striving to answer, the questions, Whence am I? What am I? Why am I? Where are my lost companions gone to? And whither shall I go when I shall follow them?

On the present evening I propose to examine, by the light of a new theory, recently set forth in Mr. Darwin's book "On the Origin of Species," the *first* of these questions, (Whence am I?) being persuaded that if the theory is found to solve this question to your satisfaction, the answers to the remaining questions need not trouble us, for they will follow as matters of course. A chemist, when he analyses a mineral, knows in what part of his cabinet to place it; and in like manner, when we shall have ascertained, with Mr. Darwin's assistance, the zoological lineage of our humanity, we shall be prepared to answer the *what*, the *why*, and the *whither*, on the stable footing of a philosophical induction.

What then is the *theory* proposed by Mr. Darwin for our acceptance, as that by which we may solve this most interesting question? For the full explanation (so far as already given to the public) I must refer you to the book itself; but I shall read to you,

from the last page of the book, a forcible passage, in which the author gives us the conclusions to which he has arrived, in the form of a short summary. The passage is as follows :—(*the italics are ours*)—

“ It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, *have all been produced by laws acting around us.* These laws, taken in the largest sense, being Growth with Reproduction; Inheritance which is almost implied by reproduction; Variability from the indirect and direct action of the external conditions of life and from use and disuse; a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character, and the Extinction of less improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is grandeur in this view of life, with its several powers, having been originally breathed by the Creator *into a few forms, or into one;* and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning, endless forms, most beautiful and most wonderful, have been, and are being evolved.”—p. 490.

One requires to pause and take breath after listening to such strange words as these. There is something startling in the cool manner in which the personal work and oversight of the Creator is reduced to a minimum; and the Creator Himself to the condition of a King Log, the nominal head over an irresponsible ministry. The law of GRAVITY sets the world a rolling, and rules the universe; the sun and

the moon call forth GROWTH, and favour REPRODUCTION ; the frost, and the wind, and the rain, modify climates, and induce VARIABILITY, by altering the CONDITIONS OF LIFE ; the struggle for food favours the strong, and starves the weak ; and all together culminate into what Mr. Darwin calls NATURAL SELECTION,\* a quasi-personal, observant, and superintending power, that sits behind the screen under which the Creator shrouds his doings ; and through which the organic world, as it now is, has been gradually "manufactured" from a few monads.

Though Mr. Darwin has not, except by inference,

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\* *Natural selection a quasi-personal power.* Whether Mr. Darwin attributes *personality* to what he calls "natural selection," or whether he simply regards it as a general expression for "the laws acting around us," I cannot tell ; but few thoughtful readers of his essay can avoid noticing that a distinct personality is implied in every act attributed to natural selection. No purely physical and impersonal law concerns itself with the question of "*usefulness.*" The rain falls and the sun shines whether it be useful or hurtful to the individual wetted or dried ; acids and alkalies neutralize each other ; poisons act and react on the stomach without any reference to the life or death of the patient ; and so of any other purely physical influence in nature. All physical forces may be calculated by man ; some by the mathematician, some by the chemist, but who can calculate how "natural selection" may most usefully act ? No one who is not in the secrets of Omniscience. Sometimes, in parts of the essay, one is tempted to think that by natural selection the author means that superintending power, to which we reverently give the name of Providence ; but Providence, in a Christian sense, is only another name for God ; and certainly Mr. Darwin does not speak of natural selection as if by it he meant any thing Divine. For he repeatedly tells us, that unless Variability be present, and sufficient time be allowed, natural selection is *impotent* ; it can effect no organic change whatever ; nay, he pointedly uses the term "*manufacture of species,*" as if to leave no room for doubting the inferior agency by which, what other men call the works of God, have been brought into being.

as yet pointedly entered into the history of the development of the human-animal, through natural selection, from some lower form ; yet he so clearly and repeatedly *hints* his belief in this origin of mankind, that I do not hesitate to say that his theory supposes it. Either man was that “*one form*” from which all animal and vegetable organisms originated, or one of those “*few forms*” which he hesitatingly admits ; or else the converse must be true, these forms must have been *monads*, and man must have sprung from one of them. That this *latter* is the supposition advocated in the book, is abundantly clear from a variety of passages.

It shall suffice, however, to quote but one passage, in order to bring the human subject fairly within the theory. The passage I select is that on the structure of the human eye :

“ To suppose that the eye, with all its inimitable contrivances for adjusting the focus to different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I freely confess, absurd in the highest possible degree. Yet reason tells me ; that if numerous gradations from a perfect and complex eye to one very imperfect and simple, each grade being *useful* to its possessor, can be shown to exist ; if further, the eye does vary ever so slightly, and the variations be inherited, which is certainly the case ; and if any variation or modification in the organ be ever useful to an animal under changing conditions of life, then the difficulty of believing that a perfect and complex eye could be formed by natural selection, though insuperable by our imagination, can hardly be considered real.”—p. 186. “ In looking for the gradations by which an organ *in any species* has been perfected, we *ought* to look *exclusively*

to its lineal ancestors ; but this is scarcely ever possible, and *we are forced* in each case to look to *species of the same group*, that is, to the *collateral descendants from the same original parent form*, in order to see *what gradations are possible*," &c.—p. 187.

Now if the first half of this quotation seem plausible and strong ; the second half shows clearly on what a shaky foundation it is built. We may freely admit that eyes *do* vary, and that the variation is often inherited.\* You know what the lady said to the late Lord Liverpool,

Happy Mr. Jenkinson,  
 Happy Mr. Jenkinson,  
 I'm sure, to you,  
 Your lady's true  
 For *you* have got a *winking son!*

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\* *Hereditary peculiarities.*—Though I have treated thus lightly the question of hereditary peculiarities, I am far from denying that their best qualities are often derived by children from their parents. Among other things, mothers' teaching has often as much to do with the mental health of the child as mothers milk has with the bodily nourishment. Everyone knows that Napoleon, Wellington, Napier, and many other great and good men had remarkable mothers. A case of mothers' teaching now occurs to me to mention. A talented friend, the authoress of "Parables from Nature," has just shown me two *valentines* which she received last Valentine's day from two of her little girls. Both children wishing to please mama, chose to send illustrated title-pages, as if for a work "On the Origin of Species," and each had drawn her symbolic groups in her best style, soberly, and without any caricature. The youngest had placed at the top of her page, on one side a *robin*, and on the other a *sea-anemone*; at the bottom, under the *robin*, there was a picture of *mama*, sitting writing at her desk; under the *anemone*, a picture of *mama's poodle*; and the upper and under figures were connected together by successive bars, such as heralds make use of to show lineal descent, in tracing families. This was very cleverly done for the young one. Her elder sister, with advanced artistic powers, and greater mental culture, had introduced four groups into her title-page. At the upper corner, on one side, was the head of a *sky-terrier*, and under it the head of



But does this *prove* that *every* person who has a peculiar habit of *winking* is descended from the late Lord Liverpool? I recommend the enquiry to the Heralds' College.

In his second paragraph, Mr. Darwin tells you how he connects, by lineal descent and blood relationship, the owners of all eyes, from the medusoid-owner of an eye-speck up to the owner of the human eye. He goes to the museum of the comparative anatomist, and there finds a series of eyes of all degrees of completeness, each, doubtless, suited to the wants of its owner, and to the conditions of life for which it was organised. The eye of the fish is suited for see-

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Shakespeare, and a twining plant connected these two. This plant commenced its growth below as a *bramble*, and in its upper part it bore a heavy crop of *figs*. On the opposite top-corner there was the figure of the little *bell-shaped* animal called a *Vorticella*; and under it was a *belle*, nicely dressed in powder and hoops. The twining plant connecting these two figures began growing as a *thistle*, and in its upper branches it was thickly hung with *grapes*. The allusion to "grapes from thorns, and figs from thistles," is obvious. The group under the first described figures consisted of an *owl*, sitting on an ivy twig, which gradually became an *olive* as it trailed down to the metamorphosed *owl*, namely a *bishop*! At the opposite and last lower corner, *swallows* building nests were contrasted with *their* metamorphosed descendant, a *mason* building a house; and these figures were connected by a *string of bees*, starting out of the ground, and ending in a line of *bee-cells*; showing the highest skill in constructive power. I have been thus particular in describing what may seem a trifle. But *mothers' teaching* is no trifle, and what I describe may be looked on as a "first-fruits" of the "Parables from Nature," "Worlds not Realised," "Aunt Judy's Tales," and other little books written for children by these children's mother. May England long possess mothers who can teach as these children have been taught; she need then not fear, though philosophers should succeed in proving that her *Cheshire cheese* (like London milk) is derived from the *chalk* formation.

ing in the medium through which the fish moves, as the eye of the vulture is for viewing the carrion from afar. But *because* we find eyes of intermediate power, and intermediate adaptation between these extremes, does this fact force any one unfettered by a pre-conceived theory to conclude that the eye of the vulture was formed, *through natural selection*, from the eye of the fish? What forces us then to believe that the human eye has gone through any successive changes, save those changes which it, like every other organ of our body, undergoes before birth? \* Nothing stronger than the *hypothesis* with which Mr. Darwin commences his argument. We return to the point from which we started: but we are no wiser than we were at the beginning. Mr. Darwin's hypothesis cuts the gordian knot, but it does not untie it; it does not, on the rules of inductive reasoning at least, explain the diffi-

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\* *Facts of Embryology*.—I do not see how the facts of embryology favour the theory of natural selection, any more than they favour the theory of Lamarck, or of the author of the *Vestiges of Creation*. To apply them to natural selection we require to suppose that every progressive condition of the foetus, from its first definition after fertilization, to its final condition at birth, represents a distinct specific form or variety of animal that once lived and pro-created; and that every stage in the upward progress, through a line of such animals, was arrived at successively, by methods analogous to those by which cattle-breeders improve the breed of cattle. But supposing an animal, resembling "the mulberry mass" in structure (a *Volvox*, for instance), had, through myriads of generations, pro-created a gradually improving line of descendants, each a pro-creating animal till the last had appeared as a *pro-creating infant*, or fairy, would this pro-creating infant stand father to the *human* race, and would the fully developed adult-man not come into being but after some myriad ages of further pro-creations? Surely this is transcendentalism. In a moral sense only "the child is father of the man."

culty. Mr. Darwin concludes that all organic species have come "*from a few forms or from one,*" because he can show that many natural species are highly variable, and because neither botanists nor zoologists are able to define logically the difference between what they call a species and a variety ; and because cattle-breeders "habitually speak of an animal's organisation as something plastic, which they can model almost as they please." Very well ; I admit that cattle-breeders, and pigeon and fowl fanciers, and horticulturists, can do a great deal, in altering the physical condition and appearance of many plants and animals ; but all such metamorphoses have their natural limits, which no length of time, no number of generations—so far as we know—can overstep. Show me a cattle-breeder that can put feathers on a cow, or extract *milk from a pigeon*, and then I will believe in the unlimited plasticity of animals, or anything else you please.

It is quite true that neither botanists nor zoologists can, in very many cases, authoritatively pronounce where one specific form ends, or where another begins. But surely, this fact of man's imperfect knowledge is no *proof* to an intelligent and unprejudiced mind, that there are really *no limits* to species : or that species are not the *aphorisms* of nature, Divine ideas which, by a law of their origin, preserve their individuality. In many cases it may not be easy, in some it may be impossible, to prove

the isolated existence of natural species, but neither can their existence be disproved. The school represented by Edward Forbes, a school not yet quite extinguished, believes in the reality of species ; that every *true* or "natural species" was separately created, and that it marks a distinct point in space and in time. The opposite school, now headed by Messrs. Darwin and Huxley, holds a contrary opinion ; but neither school can by possibility *prove* its position on irrefragible evidence or argument. The question will be a matter of opinion to the end of time. But then, a like difficulty shrouds the mystery of a creation ; the being of a God ; the immortality of the soul ; and many other matters which are above the scope of human analysis. Surely the story of the fly on the cart-wheel must occur to you. Man, from his point of vision, is like one who contemplates the *mer de glace* from a long distance. To his eye it presents a glittering surface, reflecting the sunbeams as a mirror, and seemingly so continuous that one may slide over it from end to end. But a nearer view may show him that it is everywhere cut up and crevassed ; that what seemed to be an unbroken plain, is a series of narrow ridges, separated by gulfs which his ladders will not always bridge. Thus, Mr. Darwin admits that the *law of hybridity* varies in amount from *zero* to the freest crossing. Now, until Mr. Darwin can cross that zero with his ladders, I shall continue to believe that *natural* species, like

the threads of a tapestry, though they have come from the same spindle, and have been twined, and coloured, and woven into a picture by the same Hand, are yet distinct and separate threads. Unitedly, they make a picture, whole and of perfect beauty ; but they are not blended together like the coloured shadows on an artist's canvas.

So much I have stated in order that my *real* opinion of the Darwinian theory may not be misunderstood. But I do not now propose to give you systematically a review of a book which contains the cream of the observations collected during twenty years of patient study of nature by a most acute, and careful, and ingenious observer. I have such perfect confidence in Mr. Darwin's truthfulness in any matter of fact, that, though I reject his hypothesis in toto, and receive in a very qualified measure many of the arguments by which he props it up, I accept *as facts* whatever statements *of fact* he makes in his book, *unconnected* with his theory. I have the honour to know him personally, though slightly, and have the highest respect for his character as a man, and his skill and learning as a naturalist ; but this shall not prevent me from treating his theory as I should treat any speculation which I may think involves incorrect views of natural science.

Let us, then, for this evening, assume with Mr. Darwin, that the world at first contained but one or few *monadic*-forms, and that *Natural Selection*, assisted

by Growth and Reproduction, Variability and the Struggle for Life, has gradually transmuted the aboriginal monads into the present organic creation which we call the Animal and Vegetable Kingdoms. Man is a part of that creation ; *therefore* he has been produced by natural selection, in the same way that the bee, the ant, and the monkey have been selected.

But allowing that Natural Selection has transmuted monads variously ; some into grass, some into palm-trees, some into monkeys, and some into men, it by no means follows that mankind are merely civilized monkeys. Mr. Darwin's theory by no means necessitates any such conclusion. I do not know what his private opinion on this matter may be, but he is far too able a naturalist, and far too ingenious a man, to adopt into his theory what is not *necessary* to it, especially when he can so easily show, by his theory, that the monkey parentage is *improbable*. The notion of a monkey procreator to mankind, as held by Lamarck and Monboddo, recommends itself chiefly to minds but little conversant with natural history, and accustomed to look *down* with contempt on a Negro, a Papuan, or a Fuegian, and *up* with admiration to the "human-expression of face" and "half human habits" of a Chimpanzee or Gorilla. On Lamarck's *notion*, that development proceeds from the inherent *will* and ingenuity of the progressing animal, and not from an external compelling cause, the change from a very human-looking monkey



into a human-creature seems plausible enough. The bones compare well together ; the sinews, and muscles, and viscera, and nerves are disposed on a similar pattern ; every man possesses the bony element of a tail ; and, "*setting aside prejudice,*" how can you tell whether one of these similarly organised and similarly looking animals may not pass into another *by an act of volition* ?

But Mr. Darwin's theory, so far as I understand it, makes it to be highly improbable that the first man, unless his instincts and powers were something very different from the instincts and powers of the most animalized savage known to us ;—that is (to use a bull), unless he were not a *man at all*, but only a *manly-beast* ;\*—makes it to be highly improbable that he could have been born of any monkey or ape having the organization, habits, and instincts of any quadrumanous animal known to us. For natural selection never perpetuates any varying organ or instinct, or "manufactures" any variety into a

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\* *Manly-beast.*—Have the advocates of the animal parentage of mankind considered the metaphysical crux into which their hypothesis directly leads—a difficulty as hard to solve as the famous crux of the Omphalos ? It is this.—If *man* were born of a *beast*, at what moment of time did the young one cease to be *beast* and become *man* ? Was it in the womb ; at birth ; after birth ; before maturity ; or at or after maturity ? *Whenever* the change occurred it must have been a *sudden* change, unless the *soul* of man be only a modification of the sentient part of a *beast*. If *sudden*, it must have been miraculous. If miraculous, what becomes of your theory, obviously conceived for the purpose of doing away with miracle ? If not miraculous, what becomes of your soul ?

species, unless the varying organ be profitable to the animal that has it, or unless the progressive variety have a constitution better fitted to do battle with the world than the animal from which it was procreated. If it be weaker or more troublesome than the ordinary young of its parent, it will be deserted; and if unable to procure its food regularly, it must, by the struggle for life, instantly perish. Now, what animal is so weak as savage man? What so little fitted to battle with the animal world, if dropped in a wood by a monkey mother? And what monkey is indued with patience to feed and tend a progeny that demands a score of years to develop its animal and sentient powers in their fulness?

Supposing, with Mr. Darwin's hypothesis, an animal parentage for man, and viewing civilized man, as the hypothesis would require us, as the most recent manufacture of natural selection and the struggle for life, we are forced to look for the *type* of our aboriginal *human* parent either in the Veddah of Ceylon, or in some earlier and perished, and still feebler and less perfect prototype. For, had the *variety* that procreated the Veddah not been *feebler* than he is, it would have continued to be naturally selected, and he would have perished; but as it has not been selected, and as the Veddah has been selected, and has procreated to the present day, we may rest assured, on the Darwinian hypothesis, that

the Veddah was once “the noblest work of”—natural selection! in short, the *select* man of his time!

Now, I ask any zoologist, would he entrust a pair of Veddah children to the most humane of ourang-outangs or gorillas, in an Asiatic or an African jungle, and expect, after fifteen or twenty years had rolled by, to discover a new case of Paul and Virginia? Granting the maternal instinct of the mother, would the wild man of the woods, her husband, be equally proud of his human progeny, and equally patient of its long minority? Examine his skull and his teeth in the museum, and you will quickly dispose of the question negatively. For my part, I should as soon think of entrusting the Portland vase to the safe keeping of a drunken idiot.

But I should do injustice to the theory of natural selection, were I to attribute to it the *necessity* of believing in the notion of a monkey procreator. Mr. Darwin will probably tell us that, though monkey and man certainly branched off from a common parent, the divarication may have taken place hundreds of thousands of millions of generations ago,\*

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\* Arguments against Mr. Darwin's hypothesis of transmutation, if they cite historic evidence such as that afforded by the unchanged skeletons of the *Ibis*, and of other animals preserved in the Egyptian records, are met by saying—“3,000 years is nothing in the history of a species; to induce the necessary variation, much greater time, say 3,000,000 years or generations, may be required.” Such a retort is certainly unanswerable, except by referring Mr. Darwin back to his own experiments on pigeons, on which, and on similar facts of *human* selection, he so greatly *founds* his doctrine of divarications,

and the common parent may have been like neither man nor monkey, and possibly not like anything that now either walks or crawls; that between this common parent and his innumerable representative species of the hundredth-thousandth-millionth degree of affinity now living, there must have existed *perfectly innumerable*\* intermediate animal-forms, all of which, being weaker and less prolific than *some* of their ever-varying progeny, and these than the still varying progeny of the next, and the next, and the next, and the next generation, have all perished; and that, *therefore*, it is impossible to connect the broken links in this long ancestral line. But, *because* the theory supposes that these intermediate forms

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through *natural* selection. Mr. Darwin in his dove-cot, in a very few years, has accomplished *immeasurably* more than "natural selection" has effected on the ibis, or the ostrich, or the cat, since the mummy-museum of Egypt was instituted! Does not this indicate that there is a balancing power in nature which acts contrary to the divaricating element, and by its counteraction maintains the stability of species? Is Mr. Darwin quite sure that "the statement often made by naturalists," of the tendency of varieties to revert back to their type, is so unsound as he seems to think?—p. 14. Is he quite sure that nature has not provided for maintaining in the organic world *average results* over large spaces of time, as is undoubtedly effected in the inorganic?

\* *Perfectly innumerable intermediate forms.*—See page 172, *et seq.* "On the absence or rarity of transitional varieties"—a curious example of ingenious but inconclusive reasoning. Mr. Darwin need hardly have applied to Mr. Watson, Dr. Asa Gray, and Mr. Wollaston to be informed whether "when varieties intermediate between two other forms occur, they are much rarer numerically than the forms which they connect." Surely the *exceptions* to any generalization (and what is a "book-species" but a generalization?) must of necessity be fewer than the cases in which the generalization holds true. But how does this fact bear on the theory of transmutation?

must have once lived and procreated ; either this has actually been so, or else (but heaven forefend !)  
 “ the objection is fatal to my theory.”

At this point we may fairly ask Mr. Darwin, where are the fossil remains of these *perfectly innumerable* intermediate forms ? In what strata of the earth's crust shall we look for them ? This objection is what is called the *geological difficulty* of the theory ; and it is sweepingly answered, either by supposing that all the strata which contained such remains have been swept away, and ground down to gravel and mud, and the materials used up in a newer manufacture ; or by supposing that the relative positions of land and water have changed, and that these fossil remains are now under the sea. To this last explanation I cannot help replying, “ Please, Mr. Darwin, desire the great-sea-serpent to

Call up their spirits from the vasty deep,”

and “ if they do come, when he doth call for them, I shall accept your explanation, but not till then.”

But, granting the great imperfection of the geological record, and confining our attention to living forms, though we may admit the wonderful variability of the pigeon, and deplore the immoveable stolidity of the ass ; still, granting all this, there are very many animals and plants which stand *isolated* from any near kindred, and which yet are so highly organised, and of such large size, that we can scarcely be-

lieve that all the evidence respecting their “*manufacture*” through natural selection, if evidence ever existed, could have been so completely destroyed. One of these *aberrant* animals is the *Hippopotamus*, which is so distinct from any other pachyderm, that McLeay declares (see *Cetoniidæ* of South Africa, p. 8, in Dr. Smith’s *Illustr. of South African Zoology*) that it would require, according to his system, the creation of at least twenty-four generic types, belonging to four distinct families, in order decently well to *connect* it with the other *tribes* of pachyderms. It is the sole species, according to McLeay, of that high generalisation to which he has assigned the term “*stirps*.” Now if this be the difficulty in the system of McLeay, which, as a minimum, requires but *five* types to make a divergence, how infinitely is the difficulty increased by Darwin’s hypothesis, which would demand an all but infinite number of variations to connect one mammalian “*stirps*” with another. For, hear how he explains the *diagram* of divarication, given at p. 117 of his essay :—

“The intervals between the horizontal lines in the diagram may represent each a thousand generations; but it would have been better if each had represented ten thousand generations. After a thousand generations species (A) is supposed to have produced two fairly well-marked varieties, namely  $a^1$  and  $m^1$ .”

We need not follow the process of this hypothesis further. The gist of the matter is, that step by step, by continual fluxional divarications from an origi-



nal form, first, varieties, then well marked species, then genera, &c., are fabricated. At the fourteen-thousandth variation (or, perhaps, at the fourteen-hundred-thousandth, for it is wholly a guess) two or more *closely allied* genera may, Mr. Darwin supposes, be thus formed. Now, apply this rule to the case of the *Hippopotamus*, which, to link it on to its next neighbour, requires not twenty-four *closely allied* genera, such as might stand on one common platform, but *four families* on four different platforms, and each of its genera on a platform of its own ; for we argue from *minimum* numbers, which necessarily force us to include *maximum* variations under each. What has become of all these hippopotamoid animals? Have they all died and made no sign? or has the great sea serpent swallowed them all?

I shall not stop to hunt for these Darwinian “men in buckram-suits,” *which were, and are not, and yet are*. But the subject of animals advancing in the scale of being through natural selection and the struggle for life is so very fascinating that I cannot leave the pachyderms without indulging a few *guesses* as to the origin of the *Rhinoceros*, taking for my *model* what Darwin tells us of the ostrich. “What is sauce for the goose is sauce for the gander,” and arguments that apply to the ostrich ought to fit the *Rhinoceros*. Mr. Darwin says,

“As the larger ground-feeding birds seldom take flight except to escape danger, I believe that the nearly wingless condition of several

birds which now inhabit, or have lately inhabited several oceanic islands tenanted by no beast of prey, has been caused by disuse. The ostrich, indeed, inhabits continents, and is exposed to danger from which it cannot escape by flight; but by kicking it can defend itself from enemies as well as many of the smaller quadrupeds. We may imagine that the early progenitor of the ostrich had habits like those of the bustard, and that as natural selection increased in successive generations the size and weight of its body, its legs were used more and its wings less, until they became incapable of flight."—p. 134-5.

In reading this passage I am struck with what seems to be a constitutional, and it may be *an inherited* faculty of Mr. Darwin's brain; the faculty of "secreting" *dimorphic* hypotheses—hypotheses which, whilst plausibly explaining one set of facts in nature in one way, will meet *similar* facts, if they oppose the first explanation, by a different, but as ingenious new explanation. Meanwhile Mr. Darwin seems to be no more conscious of exposing his argument to attack by such a line of reasoning, than the ostrich is of danger when she hides her head in the sand. In the passage just quoted we are told that the *Dinornis* and the *Apteria* became wingless from disuse of their wings, *because* they happened to live on oceanic islands tenanted by no beast of prey, and had therefore no need to use their wings for flight. But then the ostrich is a wingless bird, inhabiting a continent ranged over by the lion, the panther, and many other beasts of prey; why did it so foolishly lose the use of its wings? "Oh," says Mr. Darwin, "it can *still defend itself by kicking!*" I suppose that the *Dinornis*

and the Apterix, having no necessity to defend themselves by kicking, must be terribly lanky in the drumsticks.

And now, with the guide of Mr. Darwin's ostrich explanation, let us see what can be said respecting the "manufacture," through natural selection, of the Rhinoceros, an animal which, if he have not any very near cousins, has at least some poor relations, with which I think he may be not improbably connected. I suppose my lord Rhinoceros will acknowledge to the tapir, but as the tapir may, perhaps, be claimed by the elephant, I prefer selecting from an earlier divarication, and start from the pig. It does not require any great learning to see that a *Rhinoceros* is little better than *a hog in armour*. We shall make short work of him.

For, let us suppose that "once upon a time, when pigs were swine," a herd of pigs, driven off by their stronger fellows from an overstocked upland forest in time of scarcity, had migrated into an open country in search of food. Let us suppose this to have happened in some southern land, Palestine for instance, or some hill-country bordering on the hot plains of Persia; and that the migrating herd had found food as they proceeded, and had established themselves finally in new quarters. We suppose them to have been a mountain-breed, dwelling in oak woods, and well covered with hair, and to have debouched upon an open plain,

in a somewhat hotter and much more sun-exposed country than that from which they came out. Here, after a time, say a thousand generations or so, the changed conditions of life and change of food would begin to tell. If food were plenty, the pigs would soon fatten, and their constantly varying descendants, naturally selected, would grow larger and stronger. Owing to the sun-exposure, it is also highly probable that the hair would gradually grow scanty, and at last disappear altogether from the back ; but as the tendency to form hairs would still exist in the blood, Natural Selection would, no doubt, take advantage of this fact, and lay by the material of hair (at compound interest) for future use. We shall see what she does with it by-and-bye. We are all familiar with the Neapolitan and Chinese breeds of naked pigs ; so my supposition of the gradually disappearing bristles is most reasonable. But *pari passu* with the baldness, it is also reasonable to suppose that the hide would grow thicker and thicker, for it would be "*very useful*" to the naked backs to have a stout leather-jacket, to keep their blood cool. And so, after another few thousands of generations, the hide of the now considerably metamorphosed animal (no longer a pig, but a *parvenu*) might become nearly as thick as that of the *Rhinoceros*. But as it would be very inconvenient to so bulky an animal to have his thick coat all in one stiff piece, natural selection would look out for

some cracked-skinned individuals, and would, in another thousand generations or so, breed from them a paletot of the regular rhinoceros-pattern. Again, whilst this process of change was going forward in the skin, according to the law of "*Correlation of Organs*," every other organ of the selected animals would be undergoing transmutation. The dentition would change from the change in the "*Conditions of life*;" and the material of bristles, saved by Natural Selection, when she shaved her pigs, would now be employed in the construction of the horn on the snout. Every one knows that the *horn* of the *Rhinoceros* is not connected with the bony skeleton, but is a sort of compound-bristle, originating, like an ordinary simple bristle, in the skin. It is, in fact, perfectly analogous to the prickle on a rose-bush or bramble. The *Rhinoceros* first manufactured was probably the one-horned; but there is no reason why the process of change should stop here, for if one horn proved useful, two might be better still. We know, indeed, that there are both one-horned and two-horned species; a fact highly corroborative of our hypothesis. In most animals with horns, the horns are bi-lateral; and in such cases the horns could scarcely be multiplied without inconveniencing the animal, or destroying its symmetry. But as the horns of the *Rhinoceros* are placed in single and central file, there seems no good reason why other species

might not be discovered, or gradually eliminated by natural selection, with an increased number of horns. We have, for example, as my friend Dr. Kinahan will tell you, different species of mail-clad animals (shrimps and prawns) which differ from each other chiefly by the number of horns on their snouts, ranged also in single files, like the horns of the Rhinoceros. Bearing this in mind, and having *proved* the previously stated facts, I now come to my climax. If there be a *Rhinoceros* with one horn, and a *Rhinoceros* with two horns, why may not there be a forthcoming beast *with ten horns*? Gordon Cumming, and all speculators on a "Coming Trouble," who are interested in the discovering of such a "*lusus naturæ*," had better look closely into Mr. Darwin's speculations, for, believe me, this is not the only inference bearing collaterally on their controversies that may be naturally selected from his theory.

But, *revenons a nos moutons*, let us return towards our argument. You may perhaps think that I have hitherto been playing with my subject, as a cat plays with a mouse; but it is not so. It was necessary, by some apt illustrations, to show you to what conclusions the new method of studying nature may lead us; a method which, if applied to science in general, will go far to *supplement*, if not to supplant, the Baconian Philosophy. Already we have an *Inductive* and a *Deductive* school of philosophers, both useful, *so far as they go*; but Mr. Darwin's new



school, which may be called the *Pro-ductive*, unites the two former methods, and is, therefore, naturally, much more potent than either of the others taken separately. The inductive method deals with *hard* facts, and in Newton's "Law of Gravitation" you have a good example of a *hard induction*. The deductive method deals with *soft* facts, and in "Buckle's History of Civilization" you have an equally good example of a *soft deduction*. But the new *productive* philosophy treats *hard* and *soft* facts with equal impartiality, and Mr. Darwin's theory affords the best possible example of a *hard and soft production*. Like the feet of Nebuchadnezzar's image, it is part of iron, part of miry clay. But I fear Mr. Darwin is not an original productive-philosopher, for I find very early evidence of his system having existed many years ago; indeed, you may remember that in the writings, not of Daniel the Prophet, but of Jonathan the Swift, an account is given of a productive school at Laputa, in which the students, after many trials, succeeded in extracting sunbeams out of a cucumber and blood out of a turnip. Mr. Darwin has not as yet carried his philosophy to so high a result, but he is evidently advancing on the royal road to it.

Resuming our subject. My friend Dr. Carte may fairly ask me, supposing the Darwinian hypothesis be true, where are monkeys to be placed, if not as the immediate progenitors of mankind? Consulting

my authority, I shall endeavour to reply. Mr. Darwin likens the generations of varying animals and plants to the growth of an ordinary tree, proceeding from a single seed. A germinating seed shoots upwards a stem ; the stem divides ; branches are given off ; they branch again, and dwindle down to twigs. Branches and twigs alike bear lateral and terminal buds. The *terminal* bud, therefore, of each ultimate twig represents a dominant specific form, and the lateral buds next below it the previously *selected* but weaker and now dying-out specific forms, or what *we* should call the most nearly allied species. Where each twig joins on to a small branch, a *genus* will be marked ; several such twigs, springing from a common branch, indicate a tribe ; and so on, through orders and classes, you arrive at last near the base of the parent trunk, at that great bifurcation where the vegetable separates from the distinctly animal kingdom.

Now, as no one, not even Mr. Darwin himself, can tell with infallible certainty, the *exact points* of divarication or branching ; for unless we could trace the lineage of every known animal and plant up to the year One, these points could not be ascertained ; it follows that we may place the *Quadrumana* either next to man, on his own twig ; or, supposing an *earlier* divarication, we may place them *exactly where we please*. Such is the peculiar beauty of the “productive” method of reasoning. For, let us suppose

that natural selection wished to produce *two* chef-d'œuvres, in opposite styles of art, like Landseer's pictures of Peace and War, these opposite chef-d'œuvres being Man and the Gorilla; then we can understand how, from some far back, very early formed, and low-organised animal, she might, by selecting *two* of its varying offspring, breed up two *diverging* races, one of which should culminate in Man, the other in the Gorilla. In this case it is evident that the Gorilla would stand at the head of all the quadrumana, he could show a long ancestral line; while Man, poor fellow! the "*novus homo*," could not trace his plebeian blood a step higher than Adam! So that I think Dr. Carte and the objectors will agree with me that monkeys and men may be no more closely connected together than the two brothers, one of whom enlisted in the 99th, the other in the 100th Regiment.

Before proceeding, I am forced to say a word or two respecting Mr. Darwin's metaphor of a tree representing by its branches and twigs the lines of affinity and analogy among plants and animals. As a *metaphor*, or an illustration suited to convey to the mind *our notions* of the system of nature, it is all very well; but Mr. Darwin puts it forth not as a mere metaphor, but *as a fact* in which he believes, namely, that all animals and plants have sprung from a single germ, as all the buds and branches of a tree spring from a single seed; and that all

therefore have a "blood relationship" together. As a *metaphor*, I accept the parallel to a tree ; as a *fact*, I say, prove it. If the great problem of natural classification had been really solved, the result would have the rigid outlines of a demonstration. We should be able to place any plant or animal as confidently on its proper twig, as the calculating machine can place the figures of a set of logarithms. But so far from this being the case, the greatest disagreement prevails among botanists and zoologists as to the method of a strictly natural classification. Orders and genera placed in one class by one naturalist are by another referred to a different position ; one botanist thinks two Orders so near, that they are almost conterminous ; another, on reasons perhaps equally valid, places them at opposite ends of his system. Henfrey and others regard Conifers as *lower* than Endogens ; Dr. Hooker considers them the highest group of Exogens. So also among zoologists. Everything in classification is a matter of opinion ; and until varying opinion shall have done fermenting, and have thrown off the scum of hypotheses and "productive" theories (I fear, a distant time), natural history cannot take its place among the exact sciences, nor can naturalists declare, *ex cathedra*, that species are really grouped together on natural principles, much less that they have a blood relationship. If classification be not quite a "*Will-o'-the-wisp*," most assuredly in many cases it is a "*wisp of the will*."

Having finally dismissed our monkeys, let us now inquire, on the principles of the new philosophy, what is the probable line through which the human animal has been naturally selected. Mere outward organization, mere agreement in bones and sinews and nerves, may lead us far astray, as we have just seen while examining into the monkey hypothesis. We must, therefore, look to some other part of man's organization. And, fortunately for our inquiry, the human organism is so complex, and is linked by so many fine threads of affinity to innumerable organisms beneath it, that we have a tolerably wide field for conjecture to play in. Agreement in form having lead us to monkeys, but not convinced us of their consanguinity, let us next examine the subject of instinct, and try whether, through it, we can discover any more probable parentage of our race. It is not really necessary to our theory to suppose that any monkey-bud stands on the human twig, nor yet on the branch beneath us ; for, as I have already briefly shown, it is as probable that *man* is the ultimate and most perfect bud on one leading shoot of the tree, and *pseudo-man* (the gorilla) the ultimate and most perfect bud on another leading shoot : the one showing the result of natural selection usefully acting continually on one set of variations ; the other, the result of the same power, usefully acting on another set. On this hypothesis, therefore, the gorilla may either be our cousin a few steps removed,

or it may be related to man by an extremely remote copulation. And so of all other animal species that approach each other in outward form or structure, even the horse and the ass.\* The connection between

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\* *The horse and the ass.*—I have purposely instanced the horse and the ass, because of the inference which Mr. Darwin draws from the facts respecting *striped* horses, given at pp. 163-167 of his essay; facts which I think fairly tend to show that the wild parent of the domestic horse *may* have been more or less marked with stripes, as are all the other known species of the genus *Equus*. I do not, however, feel called on, by any rules of rational induction, to go one step further; but Mr. Darwin is so confident that herein he has found the key to an inference valuable for his theory, that he is almost angry (p. 167) with the stupidity of those who do not follow him. "For myself," he says, "I venture confidently to look back thousands on thousands of generations, and I see an animal striped like a Zebra, but perhaps otherwise very differently constructed, the common parent of our domestic horse, whether or not it be descended from one or more wild stocks, of the ass, the hemi-onus, quagga, and zebra." Now it is easy on paper, to look back "thousands on thousands of generations," and to see anything your imagination suggests; a stroke of the pen, an effort of the brain will do it. But it is not quite so easy to look historically back, and find any such striped animal, *the common parent of horse, ass, and zebra*. The horse and the ass have been man's servants from time immemorial, and probably we may look back two or three thousand equine and asinine generations *at least*, since these animals were first domesticated. The horse, from first to last, so far as our knowledge extends, has been as distinct from the ass as it now is. It has, no doubt, been *diversified*, as to particular breeds, over and over again; but we have no reason to suppose that its *average* constitution or form has sensibly altered. The races of high-bred Arabs are of great antiquity; Job's description of the war-horse is still worth quoting; Nimrod probably had a stud of hunters that would not have discredited Melton Mowbray; and doubtless there were cart-houses from the beginning, as well as there have always been hewers of wood and drawers of water among men. We have no proof that the horse has been unhorsed within the historic period; the ass, we know, was an ass in Baalam's day. Well, if 3000 generations have effected little or no change in two such well known species; is it *less* reasonable to suppose that 3,000



them *may* be, I do not say that it is, one of analogy and not of affinity ; a resemblance, for instance, like that between a Cactus, a Stapelia, and a fleshy Euphorbia. I recommend this theoretic difficulty to Mr. Darwin's ingenuity.

But to proceed. Mr. Darwin's chapter on instinct opens up a subject far too vast to be treated of at the fag-end of a rambling lecture. I must refer you to his book for the discussions on the wonderful instincts of the bee, and of the slave-making ants, and allow you to gather for yourselves the honeyed inferences that may be drawn, on "productive" principles, from the facts stated. As we have seen before, in the case of the human eye, which Mr. Darwin connects, through a blood relationship, with the eye speck of a Medusoid ; so also, by parity of reasoning, the varied instincts of the lower animals may be shown to culminate in the intellect—perhaps in the soul of man. If man has passed gradually through successively altering generations, from the monad-stage up to his present development ; and if between man and the monad we discover instincts

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or 30,000 previous generations would give a like result, than to suppose that "thousands on thousands of generations" would make two extremes meet ? I own I cannot see the cogency of Mr. Darwin's reasoning in this instance to any mind unfettered by a preconceived theory of transmutation. Besides, if we are to look to the Veddah as the most likely prototype of man, why may we not "see" in the Java pony the oldest living race of the horse ? If species are constantly improving by natural selection, this pigmy horse must either be an improvement, or the more immediate descendant of Mr. Darwin's striped animal.

infinitely diversified, connecting the all but human sagacity and foresight of the elephant with the scarcely as yet differentiated instinct of a coral-building polyp;—the inference on “productive” principles plainly is, that the immaterial part of man has been developed from—or at least by—a jelly, *pari passu* with the material. Look, the advocates of this theory will say, look at the dormant, polyp-like intellect, the merely animal instinct, of a human infant. Educate your child, and his intellect may grow till it touch the infinite; on the other hand, turn him loose into the woods, and he will become an idiot, less capable than the beasts around him. He will be like the offspring of some long domesticated animal, burdened with a frame so changed and enfeebled by the highly artificial life of his progenitors of many generations, that even natural selection herself can do nothing for him. He must perish. Grant all this; but still the gordian knot is as fastly tied as ever, and will remain so until the anatomist with scalpel and microscope, and the chemist with test and with crucible, shall show us the constituent elements of our sentient part.

Turning then from so hopeless an enquiry, let us try if we cannot discover traces in man of some long-lost instinct; some instinct which he once possessed in common with his animal procreators, but which now he can only re-acquire by painful effort. Many

interesting facts are stated by Mr. Darwin, of instincts acquired or lost apparently from changed conditions of life. Thus, our domestic poultry have gradually lost the free use of their wings, ducks hatched for a few successive generations under hens are said to lose all taste for an aquatic life ; pigeons acquire the habit of tumbling ; and near Glasgow "there are house tumblers which cannot fly eighteen inches high without going head over heels." I am surprised that Mr. Darwin has not connected this last-mentioned fact with *epilepsy* ; may not tumbling be to a pigeon, what "the falling sickness" is to man ?

Innumerable instances, Mr. Darwin states, could be given of diversified habits in individuals of the same species, a fact indicating the unsettled state of animal instincts, and explaining the readiness with which animals of one species acquire the habits which we regard as peculiar to another species. The old baboon at Exeter Change, which used to smoke his pipe and drink his pot of double X ; and the chimpanzee at the Zoological Gardens, that snapped a lady's mouchoir, used it, and threw it back to her, are notable instances. In these and like cases,

"It would be easy," says Mr. Darwin, "for natural selection to fit the animal, by some modification of its structure, for its changed habits, or exclusively for one of its several different habits. But it is difficult to tell, and immaterial for us, whether habits generally

change first, and structure afterwards ; or whether slight modifications of structure lead to changed habits ; both probably often change almost simultaneously."—p. 183.

In proof of this doctrine Mr. Darwin, among other instances, records the following fact :—

“ In North America, the black bear was seen by Hearne swimming for hours with widely open mouth, thus catching, *almost like a whale*, insects on the water.

I regret that this fact is so imperfectly stated: first, I should like to know whether this frolicksome bear had acquired any peculiar modification of the larynx, which prevented the water choking him as he swam open-mouthed *like a whale* ; next, was *Hearne*, who observed the fact, the same person as “ Hearne the Hunter ;” and lastly, were the insects *flies* ? If they were so, then I infer that the bear in question, though certainly “ very like a whale,” was just then rather more like a *gobe-mouche*.

Having duly digested these facts, we are now prepared to consider what instinct, still possessed by almost every mammalian, has been lost to man. The instinct I happen at the moment to think of is, the habit of swimming in the water. We are told by Oken that man is an aquatic type, and from our childhood's teachers we learn that there have been in old times both mer-men and mer-maids. The natives of Polynesia have retained the power of swimming nearly in its fullest extent. Almost before

a Polynesian child learns to walk, it learns to swim, and, when full grown, both sexes disport for hours together in the water. I knew a native of Feejee personally, who had been, as I was assured on good authority, "a night and a day in the deep," swimming all the time, and he came safe to land. Facts such as these, on the principles of the new philosophy, are sufficient to decide the element from which man was "naturally selected." And when we allow our thoughts once to take this direction, "*to go to sea*," as it were, it is surprising with what rapidity the productive inference advances. Though mer-men and mer-maidens are not now to be found, Natural Selection, like a prudent owner of copyright, has not left herself without a witness. She has conserved the various kinds of seals, creatures with faces much more pleasing than those of the most *good-natured* monkey, and almost as human looking. The only mammal that has yet learned to articulate, "the speaking fish" that said "papa and mamma," exhibited in London a few months ago, was merely a tamed seal. But further, connecting these facts and others that might be given, with the facts of authentic history, we may push our productive reasoning further. History tells us that the race of *Phocæ* or seals was the particular herd of the marine god Proteus, who could transform himself as he pleased; and we may guess that, having one day, for frolic, transformed one of his phocæ (or perhaps

*himself*) into a merman, his charm dropped in the water, and Natural Selection—*hey presto!*—whipped him up, and made a Man of him !

Our last surmise is perhaps too much of a “saltus” for the Darwinian hypothesis to stomach. But, if we admit the aquatic origin of man ; namely, that he has sprung from some unknown marine mammal, of which the seal is the nearest collateral representative, then we can at once explain how it is that we have lost the traces of his lineage so completely. For it is more probable that the remains of extinct post-tertiary marine mammals should be fossilized under the modern ocean, than that we should find them in any upheaved ocean-bed of earlier date. And, as a fact bearing out our inference, I may mention that the famous fossil human skeleton was found in the little oceanic island of Guadaloupe. When the “Atlantis” shall again be upheaved, we shall probably find petrified men, and perhaps *Petrified* thought, in plenty !

But to continue. Passing downwards from the mammal type, I have failed in again recovering the ariadnean thread of human ascent, until we enter the class amphibia ; but here I find distinct traces, and seemingly at a most interesting epoch of the history, namely, at or near that very divarication of the family-tree at which the gorilla-line branched off from the human. *Amphibia* and *Reptilia* we know are parallel classes ; now sufficiently distinct, but which,



on Dārwinian principles, must have divaricated from an animal having something in common with both. Such an animal should combine the characters partly of a lizard, and partly of a salamander. Now, supposing such an animal, and supposing it variable, natural selection would adapt and train one of its divaricating issue into the beginning of a true amphibian, another divaricating issue into the beginning of a true reptilian line. Again, by comparing the habits and aspects of amphibia with what remains of the broken human line ; and those of reptilia with the much more fully represented gorilla line, we may arrive at important inferences. For instance, compare a man with a monkey. We at once see that a man has no external tail, a monkey has a tail ; a man looks straight before him, and either walks erect, or may take a hop, step, and a jump ; your monkey goes on all-fours, and is fonder of swinging than jumping. Again, compare a typical amphibian, say a frog, with a typical reptile, say a snake ; the frog, like a man, has lost his tail, and looks straightforward as he hops along ; the snake, whose “small eye blinks wild and shy,” has, I may almost say, no body, but is all tail, and he glides onward,

—————“switching his tail,  
As a gentleman switches his cane.”

But I have no time to trace the serpent's lineage. Adam Clarke will tell you how to translate the

*nachash* of Genesis. I return to Jean Frog, the amphibian progenitor of Frenchmen. Every schoolboy who has seen a frog swimming in a pool, every school-girl who has seen a French dancing-master swimming round a room, by putting that and that together can carry on my argument. I need hardly say more than that Mr. Darwin has convinced me that whatever powers of swimming man has inherited from the lower animals, he has inherited from the frog and not from the monkey.

And now, having reached this part of my argument, and given you the clue to the question with which I started, namely, man's question, whence am I? I do not think it necessary to roll out any more of my yarn. I could readily spin it out for an hour or two longer. Innumerable illustrations strike me. I could tell you of the battles of the frogs and the mice, symbolic of man's first struggles with the spirit of evil; of the distinction between manly frogs and slaving toadies; of frog-lyrics, and the Marseillaise hymn as connected therewith; but I am warned by the lateness of the hour, and, besides, remembering the fatal consequences attending a funny verse of Oliver Wendell Holmes,\*

" I never dare to write  
As funny as I can."

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\* See Holmes' sparkling bubble called the "*The height of the ridiculous*."