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DARWIN'S PROBABILITIES

A REVIEW
OF HIS "DESCENT OF MAN"

The assertion which outsteps evidence is not only
a blunder—

HUXLEY

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AS the old School of Etymologists showed, if we are at liberty to interpose as many links as we please, it becomes easy to imagine that things the most heterogeneous should spring from each other while, however, the hypothesis of gradual change — change proceeding by infinitesimal stages which melt into each other so that the eye can not detect where the one begins and the other ends — makes such a transition easier for *imagination*, it does nothing to diminish the difficulty or the wonder of it for *thought*.

CAIRD.

GIVE unqualified assent to no propositions but those the truth of which is so clear that they can not be doubted.

HUXLEY



PROBABILITIES

IN the following argument, or only critical remarks, I am not questioning the theory of Evolution, nor disputing the correctness of Mr. Darwin's view of the origin of man: I only propose to show the nature and value of the evidence offered by him in his one book, *THE DESCENT OF MAN* (edition of 1886, Appleton): strictly confining myself to what he has put before his readers in that book, in which he tells us that he deals with the question — “*firstly whether man is descended from some pre-existing form, and secondly the manner of his development.*”

“It is notorious” [he writes at *page 6*] “that man is constructed on the same general type or model as other-mammals.” And “*consequently (p. 25)* we ought frankly to admit their community of descent.” This is the gist of his argument. But is community of descent a necessary or logical consequence of construction on the same general type or model?

“All the bones in the [human] skeleton [he writes, *p. 6*] can be compared with corresponding bones in a monkey, bat, or seal. So it is with his muscles, nerves, blood-vessels, and internal viscera. The brain . . .

follows the same law." Other animals are liable to the same diseases ; and [p. 7] monkeys man-like will get drunk and so have head-ache next morning. Similar parasites plague both ape and man. Gestation [p. 8] follows the same law. There is also the same law of lunar periods ; and "the stumps left after amputation of his limbs, especially during an early embryonic period, occasionally possess some power of regeneration as in the lower animals."

Letting pass the amputation in "an early embryonic period," and merely observing that pigs and ducks can also get drunk, though we may not be sure of an after head-ache,— even if all of the foregoing paragraph be accepted, must it necessarily indicate other than one general type or model? Similarity of pattern may lead us to suppose, but does not surely prove "community of descent."

But we are told of proof in "rudimentary remains:" the mammæ of males ; the incisor teeth of ruminants, which never cut the gums ; and the outer shell of the human ear, which being useless may be considered as a rudiment. These are observed by Mr. Darwin, who informs us that "the ears of the chimpanzee and orang are curiously like those of man. These animals never move or erect their ears : so that they are in an equally rudimentary condition with those of man so far as function is concerned. Why these animals as well as *the progenitors of man* should have lost the power of erecting their ears we can not say." [p. 14]

First, how know we that "the progenitors of man," (not heard of till page 13, then barely mentioned, and

unaccounted for thrust before Mr. Darwin's readers), did ever possess this power?

"It may be (continues Mr. Darwin, *p.* 14) although I am not satisfied with this view, that owing to their arboreal habits and great strength, they were but little in danger, and so during a lengthened period moved their ears but little and thus gradually lost the power of moving them. This would be a parallel case with that of those large and heavy birds which from inhabiting oceanic islands have not been exposed to attacks of beasts of prey and have consequently lost the power of using their wings for flight."

Another unsatisfactory "consequently." We require proof that they ever had such power. "May be," as a basis on which to build consequence, is not sufficient. The supposed arboreal habits of supposed progenitors are so far only unsupported assumptions.

This unproved *consequently* and *may be* and *probably* continually imperil the value of the Darwin argument. At *p.* 12 we are told that "the chief agents in causing organs to become rudimentary *seem* to have been disuse,"—rudiments "*may occur*" in such a way,—the process "*probably*" aided, &c. At *p.* 13 we learn that "some few persons have the power of contracting the superficial muscles on their scalps, and these muscles are in a variable and partially rudimentary condition." A case of a distant cousin, of a family possessing this power, is offered as "good illustration how persistent *may be* the transmission of an absolutely useless faculty, *probably* derived from our remote semi-human progenitors, since many monkeys have and frequently use

the power of largely moving their scalps up and down."

But how does this frequent monkey action establish "semi-human progenitors;" or, presuming there were such, support the probability of their having a faculty absolutely useless to them?

At *p.* 14 it is "*probable* that most of us . . . could recover some power of movement." Consequently it must have been lost by semi-human progenitors. And we are told of "a little blunt point projecting from the inwardly folded margin" of the human ear, sometimes in one ear only, which, "*it seems probable,*" is a vestige of the tip of a formerly erect and pointed ear. I am not disputing the correctness of Mr. Darwin's observations; but I question his deductions when based upon merely seeming probabilities. His conclusions *may be* also correct; but, as given in his own words, they are not proved, nor provable, not logically conclusive however actively jumped at.

"The homological construction of the whole frame in the members of the same class is intelligible if we admit their descent from a common progenitor, along with their subsequent adaptation to diversified conditions. On any other view the similarity of pattern between the hand of a man or monkey, foot of a horse, flipper of a seal, wing of a bat, &c., is utterly inexplicable. It is no scientific explanation to assert that all have been formed on the same ideal plan." [*p.* 24]

Certainly not! Neither is it a scientific explanation to assert that all are descended from a common stock, developed from an only supposed original.

Mr. Darwin says on: "With respect to development

we can clearly understand, on the principle of variations supervening at a rather late embryonic period, and being inherited at a corresponding period, how it is that the embryos of wonderfully different forms should still retain the structure of their common progenitor. No other explanation has ever been given of the marvelous fact that the embryos of a man, a seal, a bat, a reptile, &c., can at first hardly be distinguished from each other. In order to understand the existence of rudimentary organs we have *only to suppose* a former progenitor possessed the parts in question in a perfect state, and that under changed habits of life they became greatly reduced, either from simple disuse or through the natural selection of those individuals which were least encumbered with a superfluous part. . . Thus we can understand how it came to pass that man and all other vertebrate animals have been constructed on some general model, why they pass through the same early stages of development, and why they retain certain rudiments in common. *Consequently* we ought to frankly admit their community of descent." [p. 25]

Consequently because we have "only to suppose:" to suppose the very basis of the argument — an early progenitor, and also to suppose his possession of those rudimentary parts in a perfect state. Rather we ought to frankly admit the insufficiency of *consequence* based only on convenient supposition, whatever the want of a more satisfactory explanation: which later consideration in no way affects the Darwinian question.

"Although man may not have been much modified during the stages of his existence through the increased

or decreased use of parts, facts show that his liability in this respect has not been lost; and we positively know that the same law holds good with the lower animals. *Consequently we may infer* that when at a remote epoch the progenitors of man were in a transitional state, and were changing from quadrupeds into bipeds, natural selection would *probably* have greatly been aided by the inherited effects of the increased or diminished use of different parts of the body." [p. 35]

Nay! infer that a law observed in the lower animals may hold good with man, but we can not *consequently* include in the inference that man had progenitors in a transitional state changing from quadrupeds to bipeds. It is pleasant to be informed by so close an observer of our semi-human progenitors that they "would not have practised infanticide or polyandry, the instincts of the lower animals are never so perverted." [p. 46] As any one may know who has had to keep rabbits or a lady dog.

One need not dispute the supposition that the early progenitors would not have perfect use of their hands for so long as they were "especially fitted for climbing trees." "Such rough treatment would have blunted the sense of touch. . . From these causes alone it would have been an advantage to man" [our supposed four-footed progenitor] "to become a biped; but for many actions it is indispensable that the arms and the whole upper part of the body should be free, for this end he must stand firmly on his feet. To gain so great an advantage the feet have been rendered flat, and the great toe has been peculiarly modified." [pp. 51, 52]

This of the supposed four-footed progenitor! Were we sure of him, succeeding suppositions might be easy and probable. But do the most likely of suppositions give sight of this progenitor? Even though "we know that the anthropomorphous apes are now actually in an intermediate state, and approach more nearly to the bipedal than to the quadrupedal type." [p. 53]

'The family of the Simiadæ "is divided by almost all naturalists into the Catarhine group, or Old World monkeys all of which are characterised by the peculiar structure of their nostrils and by having four premolars in each jaw, and the Platyrrhine group, or New World monkeys characterised by differently constructed nostrils and by having six premolars in each jaw. Some other small differences might be mentioned. Now man unquestionably belongs in his dentition, the structure of his nostrils, and in other respects, to the Catarhine or Old World division; nor does he resemble the Platyrrhines more closely than the Catarhines in any characters excepting in a few of not much importance and apparently of adaptive nature. It is therefore against all probability that a New World species should have formerly varied and produced a man-like creature with all the distinctive characters proper to the Old World division, losing at the same time its own. There can *consequently* hardly be a doubt that man is an offshoot from the Old World Simian stem." [p. 153]

Proof that he is not derived from one monkey is no proof that he is an offshoot from another,

"If the anthropomorphous apes of the Old World be admitted to form a natural sub-group, then, as man

agrees with them, not only in all the characters which he possesses in common with all the Catarhine group, but in other peculiar characters, such as the absence of a tail and of callosities, and in general appearance, we *may infer* that some ancient member of the anthropomorphous sub-group gave birth to man. It is not probable that . . . a member of one of the other sub-groups should have given rise to a man-like creature resembling the higher apes in so many respects."

"A naturalist would undoubtedly have ranked as ape or as monkey an ancient form which possessed many characters common to the Catarhine and Platyrrhine monkeys, other characters in an intermediate condition, and *some few, perhaps*, distinct from those found now in either group. And as man from a genealogical point of view belongs to the Catarhine or Old World stock, we must conclude . . . that our early progenitors would be properly designated." [pp. 154-5]

Does the argument amount to any more than that a naturalist would properly designate as ape an ancient form with Catarhine peculiarities? But where is the showing that the ancient form existed as a progenitor of man? What reservation is there in that "we must not fall into the error of supposing the early progenitor of the whole Simian stock was identical with or even closely resembling any existing ape or monkey."

"We are naturally led to inquire where was the birth place of man at that stage of descent when our progenitors diverged from the Catarhine stock. The *fact* that they belonged to this stock clearly shows that they inhabited the Old World; but not Australia, nor any

oceanic island, as we may infer from the law of geographical distribution. In each of the great regions of the world the living mammals are closely related to the extinct species of the region. It is therefore *probable* that Africa was formerly inhabited by extinct apes allied to the gorilla and chimpanzee; and, as these two species are now man's nearest allies, it is *somewhat more probable* that our early progenitors lived on the African continent than elsewhere. But it is useless to speculate on this subject." [p. 155]

Very useless! Our early progenitors only supposed to have existed, their belonging to and diverging from the Catarhine stock can hardly be called "*fact*" even if, as opportunity for new supposing, Africa formerly was "inhabited by extinct apes."

"We have seen that man appears to have diverged from the Catarhine or Old World division of the Simiadæ *after* these had diverged from the New World division." [p. 157]

We have not seen it. Divergence of the Catarhine from the New World division has no where been laid before Mr. Darwin's readers even as a probability.

Passing that, we learn that the Lemuridæ, standing below and near the Simiadæ, show "many gradations leading insensibly from the crown of the animal creation down to creatures from which there is but a step, *as it seems*, to the lowest, smallest, and least intelligent of the placental mammalia." Whence "it is *probable* that the Simiadæ were originally developed from the progenitors of the existing Lemuridæ, these in their turn from forms standing very low in the mammalian

series." . . . "The Placentata are generally *supposed* to have been derived from the Implacentata or Marsupials, not however from forms closely resembling the existing Marsupials, but from their early progenitors. The Monotremata are plainly allied to the Marsupials, so forming a third and still lower division in the great Mammalian series. The Monotremata are eminently interesting as leading in several points of structure toward the class of reptiles. . . . Attempting to trace the genealogy of the Mammalia and man lower down, we have good reason to believe that no true bird or reptile intervenes in the direct line of descent."

—“Every evolutionist will admit that the five great vertebrate classes, mammals, birds, reptiles, amphibians, fishes,—are descended from some one prototype. As the class of fishes is the most lowly organised and appeared before the others, we may conclude that all the members of the vertebrate kingdom are derived from some fish-like animal. . . . Lastly, one single member of the immense and diversified class of fishes, the lancelet or amphioxus, is so different from other fishes that Hæckel maintains it ought to form a distinct class in the vertebrate kingdom.” . . . It presents “some affinities with the Ascidians, invertebrate, hermaphrodite, marine creatures, permanently attached to a support. They hardly appear like animals, consisting of a simple, tough, leathery sack, with two small projecting orifices. They belong to the Molluscoida, a lower division of the great kingdom of the Mollusca; but they have recently been placed by some naturalists among the Vermes or worms. Their larvæ somewhat

resemble tadpoles in shape, and have the power of freely swimming about." It has lately been observed that these larvæ "are related to the Vertebrata," and "it seems that we have at last gained a clue to the source from which the Vertebrata were derived. We should then be justified in believing that at some extremely remote period a group of animals existed,—resembling in many respects the larvæ of our present Ascidiæ, which diverged into two great branches, the one retrograding in development and producing the present class of Ascidiæ, the other rising to the crown and summit of the animal kingdom by giving birth to the Vertebrata." [pp. 157-8-9, 60]

And so, in the gloom of unknown time, we discover the progenitors of the Ascidiæ (a species of worms, whose larvæ somewhat resemble tadpoles, with power of swimming about) and, gaining what seems a clue to the origin of the Vertebrata, are justified in believing that a suppositious group of animals diverged into two branches, the one retrograding, the other rising to the crown and summit of the animal kingdom through a Catarhine ape to man:

Accepting these seemings and suppositions, as quite sufficient ground for belief, we may consequently give a readier belief to whatever may seem in accordance, analogous, or not decidedly opposite : as follows :—
(Our early progenitors were "covered with hair, both sexes having beards ;" their ears "probably pointed ;" their bodies "provided with a tail ;" their "limbs and bodies acted upon by muscles only occasionally re-appearing, but normally present in the Quadrumana."

Their feet were "prehensile;" they, "no doubt, were arboreal in their habits, and frequented some warm forest-clad land;" the males with "great canine teeth which served them as formidable weapons. At a still earlier period they must have been aquatic in their habits, . . . the lunar or weekly recurrent periods of some of our functions showing that we still retain traces of our primordial birth-place — a shore washed by the tides. At about the same early period the true kidneys were replaced by the *corpora wolffiana*; the heart existed as a simple pulsating vessel: the *chorda dorsalis* took the place of a vertebral column. These early ancestors of man, thus seen in the dim recesses of time, must have been as simply, even more simply organised than the lancelet or amphioxus." And some remote progenitor of the whole vertebrate kingdom appears to have been hermaphrodite. [pp. 160-1]

It is merely an assumption that "a group of animals existed, resembling in many respects the larvæ of our present Ascidiæ, and which diverged into two great branches, the one retrograding in development and producing the present class of Ascidiæ, the other rising to the crown and summit of the animal kingdom by giving birth to the Vertebrata." And this assumption or supposition is based absolutely and only upon other assumptions and supposed probabilities, which in Mr. Darwin's opinion justify belief.

His whole argument is resumed briefly at pages 164-5. — "The most ancient progenitors in the kingdom of Vertebrata at which we can obtain *an obscure glance* apparently consisted of a group of marine animals,

resembling the larvæ of existing Ascidiæ." These, only supposed to have existed, supposed also to have diverged into two branches, one of retrogression, one of development, "*probably* gave rise to a group of fishes as lowly organised as the lancelet, and from these the Ganoids, and other fishes like the Lepidosiren, *must* have been developed. From such fish a very small advance would carry us on to the Amphibians, We have seen that birds and reptiles were once intimately connected together; and the Monotremata now connect mammals with reptiles in a slight degree. But no one can at present say by what line of descent the three higher and related classes — namely mammals, birds, and reptiles, were derived from the lower vertebrates, amphibians and fishes. In the class of mammals the steps are *not difficult to conceive* which led from the ancient Monotremata to the ancient Marsupials, from these to the early progenitors of placental mammals. We may thus ascend to the Lemuridæ, and the interval is not very wide from these to the Simiadæ. The Simiadæ then branched off into two great stems, the New World and Old World monkeys; and from the latter, at a remote period, Man, the wonder and glory of the Universe, proceeded."

There is nothing even certainly named between the Ascidian larvæ and the Old World monkeys; and this so frail imaginary pedigree fails, for Mr. Darwin can only say "it is against all probability that some New World species should have formerly varied and produced a man-like creature." . Consequently he is "an offshoot from the Old World Simian stem." [p. 153]

But as this, like the Catarhine branching off, is only a supposition, need we trouble ourselves trying back to supposed progenitors of Ascidiæans.

Such is a thoroughly fair statement of Mr. Darwin's views in his own words from the "DESCENT OF MAN," in corroboration of which views (or conjectures) he offers to his readers suppositions, probable or seeming, based upon observations which, however numerous or indisputable, can only have been partial, and consequently inconclusive. No array of probabilities may be conclusive except to those "who from general reasons believe," beginning with belief in assertion only. In a strictly logical argument, the only argument of worth in scientific if in no other matters, there is not room to infer, to appeal to analogy, to suppose, to talk of probable or somewhat more probable, or to call the utmost probability fact. Take all I have fairly given in Mr. Darwin's own words, nothing strained or twisted, or unfairly disjoined or suppressed, into a court of law, as evidence or argument, and would it stand?

I have dealt solely with his book on the "DESCENT OF MAN." Carefully reading it and depending only on it, I find myself in this dilemma:— Either I have to take the observations and random deductions as only required to clinch a fore-settled tolerably sure theory proved by evidence elsewhere, this book merely some feeble supplementary illustration of that; or I have to look only to the book itself for the question with which it affects to deal:— "*Firstly, whether man is descended from some pre-existing form, and secondly the manner of his development.*" From the "Descent of Man I gather

a vast number of observations showing the wonderful variety, and no less wonderful unity, of life; but of Man's descent, or ascent, from any other animal I find nothing but conjectures to show that it might be so. Nor can I find in the whole book evidence of any one species changing or developing into another.

To conclude :— I neither deny nor do I discuss the probability of Mr. Darwin's guesses; I only contend that in this his book he does not produce fair ground of probability, that his "consequences" logically are not consequent, and that his "fact" is not always fact. His "*may be*" may have likelihood of correctness, but even so far is not clear from his book. He does not answer the question he puts before his readers: that of man's general descent and the special descent from an ape. What he has given us is no answer. Because man did not originate from a Platyrrhine ape does not warrant the conclusion that he can only be an offshoot from the Catarrhine; and that a mollusc, of a time far beyond knowledge or observation may have diverged into two kinds, one progressive one not, is conjecture too weak to build on. I have the greatest respect for Mr. Darwin's observation, I doubt not his belief: but — "a belief is void of justification unless its subject matter lies within the bounds of possible knowledge, and unless the evidence satisfies the conditions which experience imposes as the guarantee of credibility."

W. J. LINTON.