corporations, *e.g.*, of London, of the universities, also of the beginning and termination of war, and the articles of war, the extent of her majesty's dominions, the divisions of time, the meaning of English words, &c. (see Stephen's *Digest*, pt. ii. c. 7.) And, of course, facts which have been admitted for the purposes of the trial by the parties or their agents need not be proved. All other facts must be proved, either by oral or documentary evidence. Oral evidence is the testimony of a witness delivered before the court as to what he has himself actually seen or heard. All facts *may* be proved by oral evidence, except in some special cases where the law requires documentary evidence. A "document," in this sense, extends to any record, whether expressed in writing or symbols, and no matter what may be the nature of the substance on which it is recorded. A gold watch with an inscription on it, or a tombstone, is a document.

The most important rule in this branch of the subject is that which requires the contents of a document to be proved by the document itself. The law requires the "best evidence" procurable in each case, and if a document is in existence it is better evidence than any second-hand account of its contents. This is called primary evidence. But secondary evidence, either by means of written copies or oral accounts, is to be admitted in certain cases. If it is proved that the instrument has been lost or destroyed, or that it is in the hands of the opposite party, who, after notice, has refused to produce it, then "secondary" evidence of its contents may be given. So when the original is of such a nature that it cannot be easily moved (as, *e.g.*, a libel written on a wall), secondary evidence may be given. Secondary evidence includes (besides oral accounts by persons who have seen the original)—(1) examined copies, exemplifications, office copies, and certified copies; (2) other copies made from the original and proved to be correct; (3) counterparts of documents as against the parties who did not execute them (Stephen, *Digest*, part ii., c. 9). Public documents in general must be proved either by the production of the original or by the official copies in class (1) above. Stephen states the rule requiring documentary evidence in special cases as follows:—"When any judgment of any court or any other judicial or official proceeding, or any contract or grant, or any other disposition of property, has been reduced to the form of a document or a series of documents, no evidence may be given except the document itself, or secondary evidence" where such is admissible. The importance of this rule with reference to contracts will be at once apparent. When the contract has been reduced to writing, parole (or oral) evidence cannot be admitted to prove its contents. The writing itself, or secondary evidence, must be produced, and no variation of its terms can be proved by oral evidence. Thus, where goods were insured generally in ships from a particular port, and the ship in which they were shipped was lost, evidence could not be given that that particular ship was excepted from the policy. The mere fact that a memorandum was made, not intended to have effect as a contract, will not exclude oral evidence of the transaction. And certain facts, collateral to the contract, may be proved by oral evidence. Thus fraud, or want of consideration, or any circumstances which would affect its validity, may be so proved.

Of course, in the interpretation of contracts containing doubtful, technical, or unintelligible expressions, or using common words in a non-natural sense, recourse must be had to oral evidence. Thus the expression a "bale of gambier," in a written contract, may be proved by verbal evidence to mean a compressed package weighing two cwt. And where the expression "ten thousand rabbits" occurred in a lease, evidence to show that a thousand, in relation to rabbits, meant twelve hundred, was admitted. But when the document is utterly unmeaning (as where a legacy is left to ————), oral evidence cannot be resorted to for the purpose of supplying a meaning. Where more than one meaning is possible, reference may be to the surrounding circumstances, or the fact to which the document was or may have been intended to refer. These rules, it need hardly be said, apply only as between parties, and where the legal rights and obligations dependent on the instrument are in question.

Certain presumptions (*i.e.*, conclusions of fact adopted until they are disproved) relating to documents may be mentioned here. Thus a document is presumed to have been executed on the day on which it bears date. Again, where a document is not produced after due notice, it is presumed to have been duly stamped. And it is a most important presumption with reference to documents purporting and proved to be thirty years old, and produced from what appears to be the proper custody, that the signatures, execution, and attestation are as they purport to be. Or, as it is sometimes expressed, "when a deed is thirty years old, it proves itself." Alterations and interlineations in a deed are presumed to have been made before execution; in a will they are presumed to have been made afterwards. The nature of such presumptions is explained below.

One more rule with regard to documentary evidence may be added. When the law requires an instrument to be attested (*e.g.*, a will), it cannot be used in evidence unless one attesting witness is called to prove its execution, if there be an attesting witness alive and capable of giving evidence. If there be no such witness, the signature of at least one attesting witness, and of the person executing the deed, must be proved to be in their respective handwritings. This rule was said by Lord Ellenborough to be as "fixed, formal, and universal as any that can be stated in a court of justice." It formerly extended to all documents actually attested, not merely to those required to be attested by law.

3. *Burden of proof, competency of witnesses, &c.*—The general rule is that the burden of proof lies on the person who asserts the affirmative, or, as it is more accurately expressed by Sir J. Stephen, "whoever desires any court to give judgment, as to any legal right or liability dependent on the existence or non-existence of facts which he asserts or denies to exist, must prove that these facts do or do not exist." And the burden of proof, and the right of beginning in an action, lie on the party against whom judgment would be given if no evidence at all were offered in the case. Again, the effect of a presumption (*presumptio facti*, as distinguished from *presumptio juris* or conclusive proof) is to throw the burden of proof on the party who denies it as a matter of fact. And here it may be convenient to say a word or two with reference to presumptions. Writers on the law of evidence generally distinguish between presumptions of law and presumptions of fact—the latter being, the former not being, rebuttable by counter-evidence. The subject occupies a considerable space in most books on evidence. Sir J. Stephen regards it as falling properly under specific divisions of the substantive law. Thus the presumption that everybody knows the law he regards as belonging to the criminal law and not to the law of evidence. Presumptions of this sort (*presumptiones juris et de jure*) are an indirect way of expressing some legal principle. In the last case the rule is that ignorance of the law is no excuse for an illegal act, and the so-called presumption looks like an artificial and characteristic reason invented for its explanation. Presumptions of fact, *i.e.*, conclusions which on certain evidence must be adopted by the court until and unless they are disproved by counter-evidence, are cases in which the task of inference is taken out of the hands of the jury altogether. They are strongly objected to by Bentham (*Rationale of Judicial Evidence*, Introduction, c. 22) on this very ground. "On trial for a criminal offence, amongst others murder, in this and that case the law presumes malice. Of the presumption in this case, what is the plain English? That fearing that by a jury the man would be acquitted, the determination of the judge is that he shall be convicted." If the presumption, however, is the safest conclusion to act on in the circumstances, there would seem to be no harm in saving the jury the trouble of drawing the inference for themselves.

Besides these two classes of presumptions, and along with them, legal writers often discuss the presumptions which are said to be within the province of the jury itself. These are neither more nor less than various degrees of probability, in cases of circumstantial evidence; thus the leading text book on criminal practice (Archbold), following Coke and Blackstone, states that these presumptions are of three kinds—*violent*, *probable*, and *light* or *rash*. A case of violent presumption, generally given as an illustration, is where a person is found in a house run through the body, and a man is seen running away with a drawn sword in his hand, no other person being found about the premises. The conclusion that this man is the murderer is irresistible. The other cases are simply inferior degrees of probability established by circumstantial evidence, the lowest degree being described as such that it ought to have no weight with us at all. The distinctions are of no value, and are probably retained in text books because they are described by the same name as the two classes of legal presumptions above described—those, namely, which Sir J. Stephen distinguishes as "conclusive proof" and "presumption" respectively.

Presumptions of the second class abound in every branch of the law, and are to be explained with reference to its peculiar principles. Of the more general presumptions a number of examples have been collected in Stephen's *Digest*, part iii. c. 14. One of the most common is the presumption of death after seven years' absence which has been a good deal debated in the courts, but may now be considered to be settled. A person who has not been heard of for seven years is presumed to be dead, unless the circumstances are such as to account for his absence otherwise. But there is no presumption as to his having been dead at any particular time, *e.g.*, if a person was last heard of in 1860, the court in 1870 presumes that he is dead, but not that he was dead in 1867. The question of survivorship, where two or more persons are shown to have perished by the same catastrophe, as in cases of shipwreck, has been much discussed. It was at one time thought that there might be a presumption of survivorship in favour of the younger as against the older, of the male as against the female, &c. But it is now clear that there is no such presumption. Another common case is the presumption of legitimacy in favour of persons born during the continuance of lawful wedlock. The presumption of regularity in official proceedings (*omnia esse rite acta*) is also one of frequent occurrence.

The effect of presumptions may be compared with that of estoppel. The former establishes against a party a conclusion which stands unless and until he positively disproves it. By estoppel a party is prevented from disproving a fact which he has actually or constructively asserted. For examples see article ESTOPPEL.

With few exceptions all witnesses are now competent to testify in courts of justice. The following are the chief exceptions:—(1) persons incapacitated by extreme youth, or mental disease; and (2) in criminal cases the wife or husband of a prisoner, except when the prosecution is for injury or violence to such wife or husband. The old rules of exclusion have been noticed *supra*.

Certain classes of facts are protected from disclosure on various grounds. Thus, no person can be compelled to disclose communications made to him by his wife during marriage, and servants of the state cannot be compelled to give evidence in official matters without the consent of the head of the department to which they belong. But perhaps the most important case is that of communications between lawyer and client. The lawyer is not allowed to disclose such communications without the client's assent, nor can the client be compelled to disclose such communications himself. The rule, however, will not extend to communications in furtherance of any crime or fraud. Medical men and clergymen have no such privilege. There is, however, a general consensus of opinion in favour of protecting confessions made by prisoners to their spiritual advisers; and judges have from time to time expressed their reluctance to compel disclosure in such cases. To this class also belongs the rule that no person can be compelled to answer a question tending to criminate himself, although the fact that the answer might expose him to a civil action will be no protection.

In some few cases the evidence of more than one witness is required. Thus, in trials for treason, there must be at least two witnesses testifying to the same act or to different acts of the same treason, except when the treason consists in an attempt on the life or person of the queen. So in perjury, one witness, unless corroborated by circumstances, will not be sufficient to convict the prisoner. In actions for breach of promise of marriage, in affiliation cases, and in prosecutions when the only witness is an accomplice, such corroboration is also necessary. Otherwise in the law of England the testimony of one witness is sufficient to prove any fact.

The general rule is that testimony must be given on oath, but an oath is binding if administered in any form which the witness declares to be binding. By recent enactments, however, a person objecting on grounds of religious belief to the taking of any oath may be permitted to make a solemn affirmation instead; and any person who objects to take an oath, whether on religious grounds or not, or is objected to as incompetent to take an oath, may "solemnly promise and declare." In all cases the punishment of perjury attaches.

At the trial a witness is first of all examined by the party producing him (examination-in-chief); he is then cross-examined by the opposite party, and re-examined by his own party. The re-examination must refer to matters arising out of the cross-examination. There are certain questions which may be asked in cross-examination only. Thus, in the examination-in-chief, leading questions (*i.e.*, questions suggesting their own answer) are not allowed; in cross-examination they are. So also in cross-examination a witness may be asked any question tending to test his accuracy or credibility, or to destroy his credit by injuring his character, and he must answer them, however disgraceful may be the imputation they convey.[1] No

[1] The unlimited licence of cross-examination to character is the one flagrant abuse of the existing law of evidence; and but for the restraint imposed upon counsel, partly by public partly by professional opinion, would be a much more serious evil than it is. The illustration in Stephen's *Digest* is a notorious but perfectly fair example. "The question is whether A. committed perjury in swearing that he was R.T. B. depones that he made tattoo marks on the arm of R. T., which at the time of the trial were not and never had been on the arm of A. B. may be asked and compelled to answer the question, whether many years after the alleged tattooing, and many years before the occasion on which he was examined, he committed adultery with the wife of one of his friends." The Indian Evidence Act restricts the licence of cross-examination by the following provisions:—(1) Such questions are proper if they are of such a nature that the truth of the imputation would seriously affect the opinion of the court as to the credibility of the witness on the matter to which he testifies; (2) Such

evidence, however, can be led to contradict the answer in the latter case, unless it refer to a previous conviction, or to circumstances tending to throw doubt on the impartiality of the witness. A witness may in cross-examination, and a witness proving hostile or adverse to the party calling him, may, in examination-in-chief, be asked whether he had not on a former occasion made statements inconsistent with his present statements. The credit of a witness may also be impeached by the other party calling witnesses to swear that they believe him to be unworthy of belief, and counter-evidence may be given in reply. The theory of the proceedings is that a witness will tell his story in the most favourable way for the party calling him and against his opponent.

The improper admission or rejection of evidence was formerly a frequent ground for applications for new trial; under the Judicature Act a new trial will only be granted on such ground when some substantial wrong has been occasioned thereby.

The following are the most important writers on the law of evidence:—John Pitt Taylor (two vols. 8vo, 6th edition, London, 1872); Henry Roscoe (*Digest of the Law of Evidence on the trial of actions at Nisi Prius*, 13th edition, by Day and Powell, London, 1875) A. M. Best (*On the Principles of the Law of Evidence, with elementary rules for the interrogation of witnesses*, 6th edition, London, 1875); Edmund Powell (*Principles and Practice of the Law of Evidence*, 4th edition, London, 1875); Sir J. F. Stephen (*Digest of the Law of Evidence*, London, 1877); S. Greenleaf (*On the Law of Evidence*, 3 vols. 13th edition, Boston, 1876). (E. R.)

questions are improper if the imputation would not affect, or would affect in a slight degree, the opinion of the court as to the credibility of the witness on the matter to which he testifies; (3) Such questions are improper if there is a great disproportion between the importance of the imputation made against the witness's character and the importance of his evidence."

EVOLUTION

1. Evolution in Biology.

In the former half of the 18th century, the term "evolution" was introduced into biological writings, in order to denote the mode in which some of the most eminent physiologists of that time conceived that the generation of living things took place; in opposition to the hypothesis advocated, in the preceding century, by Harvey in that remarkable work[1] which would give him a claim to rank among the founders of biological science, even had he not been the discoverer of the circulation of the blood.

One of Harvey's prime objects is to defend and establish, on the basis of direct observation, the opinion already held by Aristotle; that, in the higher animals at any rate, the formation of the new organism by the process of generation takes place, not suddenly, by simultaneous accretion of rudiments of all or the most important of the organs of the adult; nor by sudden metamorphosis of a formative substance into a miniature of the whole, which subsequently grows; but by *epigenesis*, or successive differentiation of a relatively homogeneous rudiment into the parts and structures which are characteristic of the adult.

"Et primò, quidem, quoniam per *epigenesin* sive partium superxorientium additamentum pullum fabricari certum est: quænam pars ante alias omnes exstruatur, et quid de illa ejusque generandi modo observandum veniat, dispiciemus. Ratum sane est et in ovo manifestè apparet quod *Aristoteles* de perfectorum animalium generatione enuntiat: nimirum, non omnes partes simul fieri, sed ordine aliam post aliam; primùmque existere particulam genitalem, cujus virtute postea (tanquam ex principio quodam) reliquæ omnes partes prosiliant. Qualem in plantarum seminibus (fabis, putà, aut glandibus) gemmam sive apicem protuberantem cernimus, totius futuræ arboris principium. *Estque hæc particula veluti filius emancipatus seorsumque collocatus, et principium per se vivens; unde postea membrorum ordo describitur; et quæcunque ad absolvendum animal pertinent, disponuntur.*[2] Quoniam enim *nulla pars se ipsam generat; sed postquam generata est, se ipsam jam auget; ideo eam primùm oriri necesse est, quæ principium augendi contineat (sive enim planta, sive animal est, æque omnibus inest quod vim habeat vegetandi, sive nutriendi),*[3] simulque reliquas omnes partes suo quamque ordine distinguat et formet; proindeque in eadem primogenita particula anima primario inest, sensus, motusque, et totius vitæ auctor et principium." (*Exercitatio* 51.)

Harvey proceeds to contrast this view with that of the Medici," or followers of Hippocrates and Galen, who, "badly philosophizing," imagined that the brain, the heart, and the liver were simultaneously first generated in the form of vesicles; and, at the same time, while expressing his agreement with Aristotle in the principle of epigenesis, he maintains that it is the blood which is the primal generative part, and not, as Aristotle thought, the heart.

In the latter part of the 17th century, the doctrine of epigenesis thus advocated by Harvey was controverted on the ground of direct observation by Malpighi, who affirmed that the body of the chick is to be seen in the egg before the *punctum sanguineum* makes its appearance. But from this perfectly correct observation a conclusion which is by no means warranted was drawn; namely, that the chick as a whole really exists in the egg antecedently to incubation; and that what happens in the course of the latter process is no addition of new parts, "alias post alias natas," as Harvey puts it, but a simple expansion or unfolding of the organs which already exist, though they are too small and inconspicuous to be discovered. The weight of Malpighi's observations therefore fell into the scale of that doctrine which Harvey terms metamorphosis, in contradistinction to epigenesis.

The views of Malpighi were warmly welcomed on philosophical grounds by Leibnitz,[4] who found in them a support to his hypothesis of monads, and by Malebranche while, in the middle of the 18th century, not only speculative considerations, but a great number of new and interesting observations on the phenomena of generation, led the ingenious Bonnet, and Haller,[6] the first physiologist of the age, to adopt, advocate, and extend them.

Bonnet affirms that, before fecundation, the hen's egg contains an excessively minute but complete chick; and that fecundation and incubation simply cause this germ to absorb nutritious matters, which are deposited in the interstices of the elementary structures of which the miniature chick, or germ, is made up. The consequence of this intussusceptive growth is the "development" or "evolution" of the germ into the visible bird. Thus an organized individual (*tout organisé*) "is a composite body consisting of the original, or *elementary*, parts and of the matters which have been associated with them by the aid of nutrition;" so that, if these matters could be extracted from the individual (*tout*), it would, so to speak, become concentrated in a point, and would thus be restored to its primitive condition of a *germ*; "just as, by extracting from a bone the calcareous substance which is the source of its hardness, it is reduced to its primitive state of gristle or membrane."[1]

"Evolution" and "development" are, for Bonnet, synonymous terms; and since by "evolution" he means simply the expansion of that which was invisible into visibility, he was naturally led to the conclusion, at which Leibnitz had arrived by a different line of reasoning, that no such thing as generation, in the proper sense of the word, exists in nature. The growth of an organic being is simply a process of enlargement, as a particle of dry gelatine may be swelled up by the intussusception of water; its death is a shrinkage, such as the swelled jelly might undergo on desiccation. Nothing really new is produced in the living world, but the germs which develop have existed since the beginning of things; and nothing really dies, but, when what we call death takes place, the living thing shrinks back into its germ state.[2]

The two parts of Bonnet's hypothesis, namely, the doctrine that all living things proceed from pre-existing germs, and that these contain, one inclosed within the other, the germs of all future living things, which is the hypothesis of "*emboîtement*;" and the doctrine that every germ contains in miniature all the organs of the adult, which is the hypothesis of evolution or development, in the primary senses of these words, must be carefully distinguished. In fact, while holding firmly by the former, Bonnet more or less modified the latter in his later writings, and, at length, he admits that a "germ" need not be an actual miniature of the organism; but that it may be merely an "original preformation" capable of producing the latter.[3]

But, thus defined, the germ is neither more nor less than the "particula genitalis" of Aristotle, or the "primordium vegetale" or "ovum" of Harvey; and the "evolution" of such a germ would not be distinguishable from "epigenesis."

Supported by the great authority of Haller, the doctrine of evolution, or development, prevailed throughout the whole of the 18th century, and Cuvier appears to have substantially adopted Bonnet's later views, though probably he would not have gone all lengths in the direction of "emboîtement." In a well-known note to Laurillard's *Éloge*, prefixed to the last edition of the *Ossemens fossiles*, the "radical de l'être" is much the same thing as Aristotle's "particula genitalis" and Harvey's "ovum."[4]

Bonnet's eminent contemporary, Buffon, held nearly the same views with respect to the nature of the germ, and expresses them even more confidently.

"Ceux qui ont cru que le cœur étoit le premier formé, se sont trompés; ceux qui disent que c'est le sang se trompent aussi: tout est formé en même temps. Si l'on ne consulte que l'observation, le poulet se voit dans l'œuf avant qu'il ait été couvé."[5]

"J'ai ouvert une grande quantité d'œufs à differens temps avant et après l'incubation, et je me suis convaincu par mes yeux que le poulet existe en entier dans le milieu de la cicatrule au moment qu'il sort du corps de la poule."[6]

The "moule intérieur" of Buffon is the aggregate of elementary parts which constitute the individual, and is thus the equivalent of Bonnet's germ,[7] as defined in the passage cited above. But Buffon further imagined that innumerable "molecules organiques" are dispersed throughout the world, and that alimentation consists in the appropriation by the parts of an organism of those molecules which are analogous to them. Growth, therefore, was, on this hypothesis, partly a process of simple evolution, and partly of what has been termed syngenesis. Buffon's opinion is, in fact, a sort of combination of views, essentially similar to those of Bonnet, with others, somewhat similar to those of the "Medici" whom Harvey condemns. The "molecules organiques" are physical equivalents of Leibnitz's "monads."

It is a striking example of the difficulty of getting people to use their own powers of investigation accurately, that this form of the doctrine of evolution should have held its ground so long; for it was thoroughly and completely exploded, not long after its enunciation, by Caspar Frederick Wolff, who in his *Theoria Generationis*, published in 1759, placed the opposite theory of epigenesis upon the secure foundation of fact, from which it has never been displaced. But Wolff had no immediate successors. The school of Cuvier was lamentably deficient in embryologists; and it was only in the course of the first thirty years of the present century, that Prévost and Dumas in France, and, later on, Döllinger, Pander, Von Bär, Rathke, and Remak in Germany, founded modern embryology; and, at the same time, proved the utter incompatibility of the hypothesis of evolution as formulated by Bonnet and Haller, with easily demonstrable facts.

Nevertheless, though the conceptions originally denoted by "evolution" and "development" were shown to be untenable, the words retained their application to the process by which the embryos of living beings gradually make their appearance; and the terms "Development,"

[1] The *Exercitationes de Generatione Animalium*, which Dr George Ent extracted from him and published in 1651.
De Generatione Animalium, lib. ii. cap. x.
De Generatione, lib. ii. cap. iv.

[2] "Et primò, quidem, quoniam per *epigenesin* sive partium superxorientium additamentum pullum fabricari certum est: quænam pars ante alias omnes exstruatur, et quid de illa ejusque generandi modo observandum veniat, dispiciemus. Ratum sane est et in ovo manifestè apparet quod *Aristoteles* de perfectorum animalium generatione enuntiat: nimirum, non omnes partes simul fieri, sed ordine aliam post aliam; primùmque existere particulam genitalem, cujus virtute postea (tanquam ex principio quodam) reliquæ omnes partes prosiliant. Qualem in plantarum seminibus (fabis, putà, aut glandibus) gemmam sive apicem protuberantem cernimus, totius futuræ arboris principium. *Estque hæc particula veluti filius emancipatus seorsumque collocatus, et principium per se vivens; unde postea membrorum ordo describitur; et quæcunque ad absolvendum animal pertinent, disponuntur.*[2] Quoniam enim *nulla pars se ipsam generat; sed postquam generata est, se ipsam jam auget; ideo eam primùm oriri necesse est, quæ principium augendi contineat (sive enim planta, sive animal est, æque omnibus inest quod vim habeat vegetandi, sive nutriendi),*[3] simulque reliquas omnes partes suo quamque ordine distinguat et formet; proindeque in eadem primogenita particula anima primario inest, sensus, motusque, et totius vitæ auctor et principium." (*Exercitatio* 51.)

[3] "Ce mot (germe) ne désignera pas seulement un corps organisé *réduit en petit*; il désignera encore toute espèce de *préformation originelle dont un Tout organique peut résulter comme de son principe immédiat.*"—*Palingénésie Philosophique*, part x. chap. ii.

[4] "Cependant, pour revenir aux formes ordinaires ou aux âmes matérielles, cette durée qu'il leur faut attribuer, à la place de celle qu'on avoit attribuée aux atomes pourroit faire douter si elles ne vont pas de corps en corps; ce qui seroit la métempsychose, à peu près comme quelques philosophes ont cru la transmission du mouvement et celle des espèces. Mais cette imagination est bien éloignée de la nature des choses. Il n'y a point de tel passage; et c'est ici où les transformations de Messieurs Swammerdam, Malpighi, et Leewenhoek, qui sont des plus excellens observateurs de notre tems, sont venues à mon secours, et m'ont fait admettre plus aisément, que l'animal, et toute autre substance organisée ne commence point lorsque nous le croyons, et que sa generation apparente n'est qu'une développement et une espèce d'augmentation. Aussi si je remarqué que l'auteur de la *Recherche de la Verité*, M. Regis, M. Hartsoeker, et d'autres habiles hommes n'ont pas été fort éloignés de ce sentiment." Leibnitz, *Système nouveau de la Nature*, 1695. The doctrine of "Emboîtement" is contained in the *Considérations sur le principe de vie*, 1705; the preface to the *Theodicée*, 1710; and the *Principes de la Nature et de la Grace* (§ 6), 1718.

[5] "Il est vrai que la pensée la plus raisonnable et la plus conforme à l'experience sur cette question très difficile de la formation du fœtus; c'est que les enfans sont déja presque tout formés avant même l'action par laquelle ils sont conçus; et que leurs mères ne font que leur donner l'accroissement ordinaire dans le temps de la grossesse."—*De la Recherche de la Verité*, livre ii. chap. vii. p. 334, 7th ed., 1721.

[6] The writer is indebted to Dr Allen Thomson for reference to the evidence contained in a note to Haller's edition of Boerhaave's *Prælectiones Academicæ*, vol. v. pt. ii. p. 497, published in 1744, that Haller originally advocated epigenesis.

[1] *Considérations sur les Corps organisés*, chap. x.

[2] Bonnet had the courage of his opinions, and in the *Palingénésie Philosophique*, part vi. chap. iv., he develops a hypothesis which he terms "évolution naturelle;" and which, making allowance for his peculiar views of the nature of generation, bears no small resemblance to what is understood by "evolution" at the present day:—

"Si la volonté divine a créé par un seul Acte l'Universalité des êtres, d'où venoient ces plantes et ces animaux dont Moyse nous decrit la Production au troisieme et au cinquieme jour du renouvellement de notre monde?

"Abuserois-je de la liberté de conjectures si je disois, que les Plantes et les Animaux qui existent aujourd'hui sont parvenus par une sorte d'évolution naturelle des Etres organisés qui peuplaient ce premier Monde, sorti immédiatement des Mains du Createur? . . . .

"Ne supposons que trois révolutions. La Terre vient de sortir des Mains du Createur. Des causes preparées par sa Sagesse font développer de toutes parts les Germes. Les Etres organisés commencent à jouir de l'existence. Ils étoient probablement alors bien différens de ce qu'ils sont aujourd'hui. Ils l'etoient autant que ce premier Monde différoit de celui que nous habitons. Nous manquons de moyens pour juger de ces dissemblances, et peut-être que le plus habile Naturaliste qui auroit été placé dans ce premier Monde y auroit entièrement méconnu nos Plantes et nos Animaux."

[3] "Ce mot (germe) ne désignera pas seulement un corps organisé *réduit en petit*; il désignera encore toute espèce de *préformation originelle dont un Tout organique peut résulter comme de son principe immédiat.*"—*Palingénésie Philosophique*, part x. chap. ii.

[4] "M. Cuvier considérant que tous les êtres organisés sont dérivés de parens, et ne voyant dans la nature aucune force capable de produire l'organisation, croyait à la pré-existence des germes; non pas à la pré-existence d'un être tout formé, puisqu'il est bien évident que ce n'est que par des développemens successifs que l'être acquiert sa forme; mais, si l'on peut s'exprimer ainsi, à la pré-existence du *radical de l'être*, radical qui existe avant que la série des évolutions ne commence, et qui remonte certainement, suivant la belle observation de Bonnet, à plusieurs generations."—Laurillard, *Éloge de Cuvier*, note 12.

[5] *Histoire Naturelle*, tom. ii. ed. ii. 1750, p. 350.

[6] *Ibid.*, p. 351.

[7] See particularly Buffon, *l.c.* p. 41.