

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #1

Row 1	and he attributes the modification to the change of circumstances. The author (1855) has also treated Psychology on the principle of the necessary acquirement of each mental power and capacity by gradation.	animal species that actually exemplify it. To what natural laws or secondary causes the orderly succession and progression of such organic	to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc. (Ibid., vol. i, page xxxv), that Professor Owen	fixite ou la variation de l'espece, nous conduisent directement aux idees emises par deux hommes justement celebres, Geoffroy Saint-Hilaire et Goethe." Some other passages scattered through M. Lecoq's large work make it a little doubtful how far he extends his views on the
-------	--	--	--	---

This is the header text for row #2

Row 2	appear only in the offspring when nearly mature; peculiarities in the silk-worm are known to appear at the corresponding caterpillar or cocoon stage. But hereditary diseases and some other facts make me believe	word 'creation' the zoologist means 'a process he knows not what.'" He amplifies this idea by adding that when such cases as that of the Red Grouse are "enumerated by the zoologist as evidence of distinct creation of the bird in and for such islands, he chiefly expresses that he knows not how the Red Grouse came to be there, and there exclusively; signifying also, by this mode of expressing such ignorance, his belief that both the bird and the islands owed their origin to a great first	udders in cows and goats in countries where they are habitually milked, in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which has been suggested that the drooping is due to disuse of the muscles of the ear, from the animals being seldom much alarmed, seems probable. Many laws regulate variation, some few of which can be dimly seen, and	simple productions, he maintains that such forms are now spontaneously generated. (I have taken the date of the first publication of Lamarck from Isidore Geoffroy Saint-Hilaire's ("Hist. Nat. Generale", tom. ii. page 405, 1859) excellent history of opinion on this subject. In
-------	--	--	--	--

This is the header text for row #3

Row 3	carefully to study the several treatises on some of our old cultivated plants, as on the hyacinth, potato, even the dahlia, etc.; and it is really surprising to note the endless points of structure and constitution in which the varieties and sub-varieties differ slightly from each other. The whole organisation seems to have become plastic, and departs in a slight degree from that of the parental type.	The laws governing inheritance are for the most part unknown; no one can say why the same peculiarity in different individuals of the same species, or in different species, is sometimes inherited and sometimes not so; why the child often reverts in certain characteristics to its grandfather or grandmother or more remote ancestor; why a peculiarity is often transmitted from one sex to both sexes, or to one sex alone, more commonly but not exclusively to the like sex. It is a fact of some importance to us, that peculiarities appearing in the males of our	the males. Colour and constitutional peculiarities go together, of which many remarkable cases could be given among animals and plants. From facts collected by Heusinger, it appears that white sheep and pigs are injured by certain plants, while dark-coloured individuals escape: Professor Wyman has recently communicated to me a good illustration of this fact; on asking some farmers in Virginia how it was that all their	a changer. En resume, L'OBSERVATION des animaux sauvages demontre deja la variabilite LIMITEE des especes. Les EXPERIENCES sur les animaux sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR
-------	--	--	---	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #1

Row 1 - P2	animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing weigh less and the bones of the leg more, in proportion to the whole	that species were immutable productions, and had been separately created. This view has been ably maintained by many authors. Some few naturalists, on the other hand, have believed that species undergo modification, and that the existing forms of life are the descendants	Professor Owen with other palaeontologists as being firmly convinced of the immutability of species; but it appears ("Anat. of Vertebrates", vol. iii, page 796) that this was on my part a preposterous error. In the last edition of this work I inferred, and the inference still seems	"Description Physique des Isles Canaries" (1836, page 147), clearly
------------	--	---	--	---

This is the header text for row #2

Row 2 - P2	("Dublin Medical Press", page 322), propounded the doctrine that all organic beings have descended from one primordial form. His grounds of belief and treatment of the subject are wholly different from mine; but as Dr. Freke has now (1861) published his Essay on the "Origin of Species by means of Organic Affinity", the difficult attempt to give any idea of his views would be superfluous on my part.	lean toward the side of change. The "Vestiges of Creation" appeared in 1844. In the tenth and much	those of slight and those of considerable physiological importance, are endless. Dr. Prosper Lucas' treatise, in two large volumes, is the fullest and the best on this subject. No breeder doubts how strong is the tendency to inheritance; that like produces like is his fundamental	Mr. Herbert Spencer, in an Essay (originally published in the "Leader", March, 1852, and republished in his "Essays", in 1858), has contrasted the theories of the Creation and the Development of organic beings with remarkable skill and force. He argues from the analogy of domestic productions, from the changes which the embryos of many species undergo, from the difficulty of distinguishing species and varieties, and from
------------	---	--	--	--

This is the header text for row #3

Row 3 - P2	has been suggested that the drooping is due to disuse of the muscles of the ear, from the animals being seldom much alarmed, seems probable.	admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever as the rule, and non-inheritance as the anomaly. The laws governing inheritance are for the most part unknown; no one can say why the same peculiarity in different individuals of the same species, or in different species, is sometimes inherited and sometimes	Rafinesque, in his "New Flora of North America", published in 1836, wrote (page 6) as follows: "All species might have been varieties once, and many varieties are gradually becoming species by assuming constant and peculiar characters;" but further on (page 18) he adds, "except the original types or ancestors of the genus." In 1843-44 Professor Haldeman ("Boston Journal of Nat. Hist. U. States", vol. iv, page 468) has ably given the arguments for and against the	some one would be better fitted than others to bear the diseases of the country. This race would consequently multiply, while the others would decrease; not only from their inability to sustain the attacks of disease, but from their incapacity of contending with their more vigorous neighbours. The colour of this vigorous race I take for granted, from what has been already said, would be dark. But the same disposition to form varieties still existing, a darker and a darker race would in the course of time occur: and as the darkest would be the best
------------	--	--	--	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #1

Row 1 - P3	axiom of the continuous operation of creative power, or of the ordained becoming of living things." Further on (page xc), after referring	relation to the whole series of changes which they have suffered." In December, 1859, Dr. Hooker published his "Introduction to the Australian Flora". In the first part of this great work he admits the	fullest and the best on this subject. No breeder doubts how strong is the tendency to inheritance; that like produces like is his fundamental
------------	---	---	---

This is the header text for row #2

Row 2 - P3	instance, a woodpecker has become adapted to its peculiar habits of life. The work, from its powerful and brilliant style, though displaying in the early editions little accurate knowledge and a great want of scientific caution, immediately had a very wide circulation. In my	is inaccurate and without evidence. I also gave some extracts from a correspondence between Professor Owen and the editor of the "London Review", from which it appeared manifest to the editor as well as to myself, that Professor Owen claimed to have promulgated the theory of	all change in the organic, as well as in the inorganic world, being the result of law, and not of miraculous interposition. Lamarck seems to have been chiefly led to his conclusion on the gradual change of species, by the difficulty of distinguishing species and varieties, by the almost perfect gradation of forms in certain groups, and by the analogy of domestic productions. With respect to the means of modification, he attributed something to the direct action of the physical conditions of life, something to the crossing of already
------------	---	---	--

This is the header text for row #3

Row 3 - P3	Red Grouse of England were distinct creations in and for those islands respectively. Always, also, it may be well to bear in mind that by the word 'creation' the zoologist means 'a process he knows not what.'" He amplifies this idea by adding that when such cases as that of the Red Grouse are "enumerated by the zoologist as evidence of distinct creation of the bird in and for such islands, he chiefly expresses that he knows not how the Red Grouse came to be there, and there exclusively; signifying also, by this mode of expressing such ignorance, his belief	silk-worm are known to appear at the corresponding caterpillar or cocoon stage. But hereditary diseases and some other facts make me believe that the rule has a wider extension, and that, when there is no apparent reason why a peculiarity should appear at any particular age, yet that it does tend to appear in the offspring at the same period at which it	for many generations. No case is on record of a variable organism ceasing to vary under cultivation. Our oldest cultivated plants, such as wheat, still yield new varieties: our oldest domesticated animals are still capable of rapid improvement or modification. As far as I am able to judge, after long attending to the subject, the conditions of life appear to act in two ways--directly on the whole organisation or on certain parts alone and in directly by affecting the
------------	--	---	---

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #4

Row 4	Domestication," there are two factors: namely, the nature of the organism and the nature of the conditions. The former seems to be much the more important; for nearly similar variations sometimes arise under,	vol. iii, page 796) that this was on my part a preposterous error. In the last edition of this work I inferred, and the inference still seems to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc.(Ibid., vol. i, page xxxv), that Professor Owen admitted that natural selection may have done something in the formation	Changed habits produce an inherited effect as in the period of the flowering of plants when transported from one climate to another. With animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking	admirable paper on the Origin of Species ("Revue Horticole", page 102; since partly republished in the "Nouvelles Archives du Museum", tom. i, page 171), his belief that species are formed in an analogous manner as varieties are under cultivation; and the latter process he attributes to man's power of selection. But he does not show how selection acts under nature. He believes, like Dean Herbert, that species, when nascent, were more plastic than at present. He lays weight on what he calls the
-------	--	--	---	--

This is the header text for row #5

Row 5	of Dr. Wells' work. The Hon. and Rev. W. Herbert, afterward Dean of Manchester, in the fourth volume of the "Horticultural Transactions", 1822, and in his work on the "Amaryllidaceae" (1837, pages 19, 339), declares that	hypothesis of the development and modification of species: he seems to lean toward the side of change. The "Vestiges of Creation" appeared in 1844. In the tenth and much improved edition (1853) the anonymous author says (page 155): "The proposition determined on after much consideration is, that the several series of animated beings, from the simplest and oldest up to the	organisation or on certain parts alone and in directly by affecting the reproductive system. With respect to the direct action, we must bear in mind that in every case, as Professor Weismann has lately insisted, and as I have incidentally shown in my work on "Variation under Domestication," there are two factors: namely, the nature of the organism and the nature of the conditions. The former seems to be much the more important; for nearly similar variations sometimes arise under,	adaptations in nature; such as the long neck of the giraffe for browsing on the branches of trees. But he likewise believed in a law of progressive development, and as all the forms of life thus tend to progress, in order to account for the existence at the present day of
-------	--	--	--	--

This is the header text for row #6

Row 6	reproductive organs are not easily affected; so will some animals	habit. To this latter agency he seems to attribute all the beautiful adaptations in nature; such as the long neck of the giraffe for browsing on the branches of trees. But he likewise believed in a law	effect would have to be attributed to the DEFINITE action of the poor soil--that they would, to a large extent, or even wholly, revert to the wild aboriginal stock. Whether or not the experiment would succeed is not of great importance for our line of argument; for by the experiment	been chemically affected by circumambient molecules of a particular nature, and thus have given rise to new forms. In this same year, 1853, Dr. Schaaffhausen published an excellent
-------	---	---	---	--

This is the header text for row #7

Row 7	their native country! This is generally, but erroneously attributed to vitiated instincts. Many cultivated plants display the utmost vigour, and yet rarely or never seed! In some few cases it has been discovered	each great type of organisation, was formed and placed upon the surface of the globe at long intervals by a distinct act of creative power; and it is well to recollect that such an assumption is as unsupported by	accounted for by inheritance from either parent or from some more remote ancestor. Even strongly-marked differences occasionally appear in the young of the same litter, and in seedlings from the same seed-capsule. At long intervals of time, out of millions of individuals reared in the same country and fed on nearly the same food, deviations of structure so	sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR GENERIQUE." In his "Hist. Nat. Generale" (tom. ii, page 430, 1859) he amplifies analogous conclusions. From a circular lately issued it appears that Dr. Freke, in 1851 ("Dublin Medical Press", page 322), propounded the doctrine that all
-------	---	--	--	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #4

Row 4 - P2	once among several million individuals--and it reappears in the child, the mere doctrine of chances almost compels us to attribute its reappearance to inheritance. Every one must have heard of cases of albinism, prickly skin, hairy bodies, etc., appearing in several members of the same family. If strange and rare deviations of structure are truly inherited, less strange and commoner deviations may be freely admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever	the food; since they were not made for the sake of this, but it was the result of accident. And in like manner as to other parts in which there appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is all the parts of one whole) happened like as if	mind that in every case, as Professor Weismann has lately insisted, and as I have incidently shown in my work on "Variation under Domestication," there are two factors: namely, the nature of the organism and the nature of the conditions. The former seems to be much	vitiating instincts. Many cultivated plants display the utmost vigour, and yet rarely or never seed! In some few cases it has been discovered that a very trifling change, such as a little more or less water at some particular period of growth, will determine whether or not a plant will
------------	--	--	---	--

This is the header text for row #5

Row 5 - P2	how little Aristotle fully comprehended the principle, is shown by his remarks on the formation of the teeth.), the first author who in modern times has treated it in a scientific spirit was Buffon. But as his opinions fluctuated greatly at different periods, and as he does not enter on the causes or means of the transformation of species, I need not here enter on details.	this work a full account is given of Buffon's conclusions on the same subject. It is curious how largely my grandfather, Dr. Erasmus Darwin, anticipated the views and erroneous grounds of opinion of Lamarck in	was cautious in drawing conclusions, and did not believe that existing species are now undergoing modification; and, as his son adds, "C'est donc un probleme a reserver entierement a l'avenir, suppose meme que l'avenir doive avoir prise sur lui."	slightly--perhaps hardly more than in a state of nature. Some naturalists have maintained that all variations are connected with the act of sexual reproduction; but this is certainly an error; for I have given in another work a long list of "sporting plants;" as they are called by gardeners; that is, of plants which have suddenly produced a single bud with a new and sometimes widely different character from that
------------	---	---	--	---

This is the header text for row #6

Row 6 - P2	named which has not in some country drooping ears; and the view which has been suggested that the drooping is due to disuse of the muscles of the ear, from the animals being seldom much alarmed, seems probable.	the individuals of any one species or variety in a state of nature. And if we reflect on the vast diversity of the plants and animals which have been cultivated, and which have varied during all ages under the most	tom. xiii, page 581) his opinion that it is more probable that new species have been produced by descent with modification than that they	clear that organic beings must be exposed during several generations to new conditions to cause any great amount of variation; and that, when the organisation has once begun to vary, it generally continues varying for many generations. No case is on record of a variable organism
------------	--	--	---	---

This is the header text for row #7

Row 7 - P2	be done with equal efficacy, though more slowly, by nature, in the formation of varieties of mankind, fitted for the country which they inhabit. Of the accidental varieties of man, which would occur among the first few and scattered inhabitants of the middle regions of Africa, some one would be better fitted than others to bear the diseases of the country. This race would consequently multiply, while the others would decrease; not only from their inability to sustain the attacks of	VARIATION; INHERITANCE. Changed habits produce an inherited effect as in the period of the flowering of plants when transported from one climate to another. With animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing	idea of his views would be superfluous on my part. Mr. Herbert Spencer, in an Essay (originally published in the "Leader", March, 1852, and republished in his "Essays", in 1858), has contrasted the theories of the Creation and the Development of organic beings	appearing late in life, is clearly due to the male element. Having alluded to the subject of reversion, I may here refer to a statement often made by naturalists--namely, that our domestic varieties, when run wild, gradually but invariably revert in character
------------	--	---	--	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #4

Row 4 - P3	White Female, part of whose skin resembles that of a Negro"; but his paper was not published until his famous "Two Essays upon Dew and Single Vision" appeared in 1818. In this paper he distinctly recognises the	opinion it has done excellent service in this country in calling attention to the subject, in removing prejudice, and in thus preparing the ground for the reception of analogous views. In 1846 the veteran geologist M.J. d'Omalus d'Hallo published in an excellent though short paper ("Bulletins de l'Acad. Roy. Bruxelles", tom. xiii, page 581) his opinion that it is more probable that new species have been produced by descent with modification than that they	the last edition of this work I inferred, and the inference still seems to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc.(Ibid., vol. i, page xxxv), that Professor Owen admitted that natural selection may have done something in the formation of a new species; but this it appears (Ibid., vol. iii. page 798) is inaccurate and without evidence. I also gave some extracts from a
------------	--	---	---

This is the header text for row #5

Row 5 - P3	climate, etc. Each of the endless variations which we see in the plumage of our fowls must have had some efficient cause; and if the same cause were to act uniformly during a long series of generations on many individuals, all probably would be modified in the same manner. Such facts as the complex and extraordinary out growths which variably	("Dublin Medical Press", page 322), propounded the doctrine that all organic beings have descended from one primordial form. His grounds of belief and treatment of the subject are wholly different from mine; but as Dr. Freke has now (1861) published his Essay on the "Origin of Species by means of Organic Affinity", the difficult attempt to give any idea of his views would be superfluous on my part.	"horticultural experiments have established, beyond the possibility of refutation, that botanical species are only a higher and more permanent class of varieties." He extends the same view to animals. The dean believes that single species of each genus were created in an originally highly plastic condition, and that these have produced, chiefly by inter-crossing, but likewise by variation, all our existing species.
------------	--	---	--

This is the header text for row #6

Row 6 - P3	called by gardeners; that is, of plants which have suddenly produced a single bud with a new and sometimes widely different character from that	instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which has been suggested that the drooping is due to disuse of the muscles of	nature. He believes, like Dean Herbert, that species, when nascent, were more plastic than at present. He lays weight on what he calls the principle of finality, "puissance mysterieuse, indeterminee; fatalite pour les uns; pour les autres volonte providentielle, dont l'action
------------	---	--	--

This is the header text for row #7

Row 7 - P3	farmer's corn when threshed out of doors, applies the same argument to organisation; and adds (as translated by Mr. Clair Grece, who first pointed out the passage to me), "So what hinders the different parts (of the body) from having this merely accidental relation in nature? as the teeth, for example, grow by necessity, the front ones sharp, adapted	A well-known French botanist, M. Lecoq, writes in 1854 ("Etudes sur Geograph." Bot. tom. i, page 250), "On voit que nos recherches sur la fixite ou la variation de l'espece, nous conduisent directement aux idees emises par deux hommes justement celebres, Geoffroy Saint-Hilaire et Goethe." Some other passages scattered through M. Lecoq's large work make it a little doubtful how far he extends his views on the	of colder climates. I am indebted to Mr. Rowley, of the United States, for having called my attention, through Mr. Brace, to the above passage of Dr. Wells' work.
------------	--	---	--

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #8

Row 8	to lose their acquired characters, while kept under the same conditions and while kept in a considerable body, so that free intercrossing might check, by blending together, any slight deviations in their structure,	for many generations. No case is on record of a variable organism ceasing to vary under cultivation. Our oldest cultivated plants, such as wheat, still yield new varieties: our oldest domesticated animals are still capable of rapid improvement or modification. As far as I am able to judge, after long attending to the subject, the	word 'creation' the zoologist means 'a process he knows not what.'" He amplifies this idea by adding that when such cases as that of the Red Grouse are "enumerated by the zoologist as evidence of distinct creation of the bird in and for such islands, he chiefly expresses that he	clearness. Von Baer, toward whom all zoologists feel so profound a respect, expressed about the year 1859 (see Prof. Rudolph Wagner,
-------	--	---	---	--

This is the header text for row #9

Row 9	short beaks have small feet, and those with long beaks large feet. Hence if man goes on selecting, and thus augmenting, any peculiarity, he will almost certainly modify unintentionally other parts of the structure, owing to the mysterious laws of correlation. The results of the various, unknown, or but dimly understood laws of	from the difficulty of distinguishing species and varieties, and from the principle of general gradation, that species have been modified; and he attributes the modification to the change of circumstances. The author (1855) has also treated Psychology on the principle of the necessary acquirement of each mental power and capacity by gradation. In 1852 M. Naudin, a distinguished botanist, expressly stated, in an	flowering of plants when transported from one climate to another. With animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking more, than its wild parents. The great and inherited development of the udders in cows and goats in countries where they are habitually milked,	appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is all the parts of one whole) happened like as if they were made for the sake of something, these were preserved, having been appropriately constituted by an internal spontaneity; and whatsoever things were not thus constituted, perished and still perish." We here see the principle of natural selection shadowed forth, but how little Aristotle fully comprehended the principle, is shown by his
-------	--	--	--	---

This is the header text for row #10

Row 10	At long intervals of time, out of millions of individuals reared in the same country and fed on nearly the same food, deviations of structure so strongly pronounced as to deserve to be called monstrosities arise; but monstrosities cannot be separated by any distinct line from slighter variations. All such changes of structure, whether extremely slight or strongly marked, which appear among many individuals living together, may be considered as the in definite effects of the conditions of life	generated. (I have taken the date of the first publication of Lamarck from Isidore Geoffroy Saint-Hilaire's ("Hist. Nat. Generale", tom. ii. page 405, 1859) excellent history of opinion on this subject. In this work a full account is given of Buffon's conclusions on the same	axiom of the continuous operation of creative power, or of the ordained becoming of living things." Further on (page xc), after referring to geographical distribution, he adds, "These phenomena shake our confidence in the conclusion that the Apteryx of New Zealand and the Red Grouse of England were distinct creations in and for those islands	skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking more, than its wild parents. The great and inherited development of the udders in cows and goats in countries where they are habitually milked, in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which has been suggested that the drooping is due to disuse of the muscles of
--------	---	---	---	---

This is the header text for row #11

Row 11	can be drawn from domestic races to species in a state of nature. I have in vain endeavoured to discover on what decisive facts the above	belief and treatment of the subject are wholly different from mine;	In December, 1859, Dr. Hooker published his "Introduction to the Australian Flora". In the first part of this great work he admits the	man's power of selection. But he does not show how selection acts under nature. He believes, like Dean Herbert, that species, when nascent,
--------	---	---	--	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #8

Row 8 - P2	species, which are no longer capable of intercrossing. Rafinesque, in his "New Flora of North America", published in 1836, wrote (page 6) as follows: "All species might have been varieties once, and many varieties are gradually becoming species by assuming constant and peculiar characters;" but further on (page 18) he adds, "except the original types or ancestors of the genus."	facts collected by Heusinger, it appears that white sheep and pigs are injured by certain plants, while dark-coloured individuals escape: Professor Wyman has recently communicated to me a good illustration of	the first few and scattered inhabitants of the middle regions of Africa, some one would be better fitted than others to bear the diseases of the country. This race would consequently multiply, while the others would decrease; not only from their inability to sustain the attacks of disease, but from their incapacity of contending with their more vigorous neighbours. The colour of this vigorous race I take for granted, from what has been already said, would be dark. But the same disposition to form varieties still existing, a darker and a darker race	the exception of the plantigrades or bear family, which seldom produce young; whereas, carnivorous birds, with the rarest exception, hardly ever lay fertile eggs. Many exotic plants have pollen utterly worthless, in the same condition as in the most sterile hybrids. When, on the one hand, we see domesticated animals and plants, though often weak and sickly, breeding freely under confinement; and when, on the other hand, we see individuals, though taken young from a state of nature perfectly
------------	--	--	--	---

This is the header text for row #9

Row 9 - P2	attention to it in the "Gardeners' Chronicle", on April 7, 1860. The differences of Mr. Matthew's views from mine are not of much importance: he seems to consider that the world was nearly depopulated at successive periods, and then restocked; and he gives as an alternative, that new forms may be generated "without the presence of any mold or germ of former aggregates." I am not sure that I understand some passages; but it seems that he attributes much influence to the direct action of the conditions of life. He clearly saw, however, the full force of the	of the same family. If strange and rare deviations of structure are truly inherited, less strange and commoner deviations may be freely admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever as the rule, and non-inheritance as the anomaly. The laws governing inheritance are for the most part unknown; no one	supposed to have been caused by some miasma have arisen and spread over the world, so at certain periods the germs of existing species may have been chemically affected by circumambient molecules of a particular	were to act uniformly during a long series of generations on many individuals, all probably would be modified in the same manner. Such facts as the complex and extraordinary outgrowths which variably follow from the insertion of a minute drop of poison by a gall-producing insect, shows us what singular modifications might result in the case of plants from a chemical change in the nature of the sap.
------------	---	---	---	---

This is the header text for row #10

Row 10 - P2	paper ("Edinburgh Philosophical Journal", vol. XIV, page 283) on the Spongilla, clearly declares his belief that species are descended from other species, and that they become improved in the course of modification. This same view was given in his Fifty-fifth Lecture, published in the "Lancet" in 1834.	species have been produced by descent with modification than that they have been separately created: the author first promulgated this opinion in 1831.	under confinement, even when the male and female unite. How many animals there are which will not breed, though kept in an almost free state in their native country! This is generally, but erroneously attributed to vitiated instincts. Many cultivated plants display the utmost vigour, and yet rarely or never seed! In some few cases it has been discovered that a very trifling change, such as a little more or less water at some	of the same family. If strange and rare deviations of structure are truly inherited, less strange and commoner deviations may be freely admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever as the rule, and non-inheritance as the anomaly. The laws governing inheritance are for the most part unknown; no one
-------------	---	---	--	---

This is the header text for row #11

Row 11 - P2	as I do. As far as the mere enunciation of the principle of natural selection is concerned, it is quite immaterial whether or not Professor	first appeared in the parent. I believe this rule to be of the highest importance in explaining the laws of embryology. These remarks are of course confined to the first APPEARANCE of the peculiarity, and not	Professor Wyman has recently communicated to me a good illustration of this fact; on asking some farmers in Virginia how it was that all their	climate, etc. Each of the endless variations which we see in the plumage
-------------	---	--	--	--

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #8

Row 8 - P3	times has treated it in a scientific spirit was Buffon. But as his opinions fluctuated greatly at different periods, and as he does not enter on the causes or means of the transformation of species, I need not here enter on details. Lamarck was the first man whose conclusions on the subject excited much	not of great importance for our line of argument; for by the experiment itself the conditions of life are changed. If it could be shown that our domestic varieties manifested a strong tendency to reversion--that is, to lose their acquired characters, while kept under the same conditions	scientific caution, immediately had a very wide circulation. In my opinion it has done excellent service in this country in calling attention to the subject, in removing prejudice, and in thus preparing the ground for the reception of analogous views. In 1846 the veteran geologist M.J. d'Omalus d'Halloy published in an
------------	--	---	--

This is the header text for row #9

Row 9 - P3	refutation, that botanical species are only a higher and more permanent class of varieties." He extends the same view to animals. The dean believes that single species of each genus were created in an originally highly plastic condition, and that these have produced, chiefly by inter-crossing, but likewise by variation, all our existing species. In 1826 Professor Grant, in the concluding paragraph in his well-known	element; in nearly the same manner as the increased length of the horns in the offspring from a short-horned cow by a long-horned bull, though appearing late in life, is clearly due to the male element.	etc.), in which he maintains the development of organic forms on the earth. He infers that many species have kept true for long periods, whereas a few have become modified. The distinction of species he
------------	--	--	--

This is the header text for row #10

Row 10 - P3	Isid. Geoffroy there is no doubt that Goethe was an extreme partisan of similar views, as shown in the introduction to a work written in 1794 and 1795, but not published till long afterward; he has pointedly remarked ("Goethe als Naturforscher", von Dr. Karl Meding, s. 34) that the future question for naturalists will be how, for instance, cattle got their horns and not for what they are used. It is rather a singular instance of the manner in which similar views arise at about the same	In December, 1859, Dr. Hooker published his "Introduction to the Australian Flora". In the first part of this great work he admits the truth of the descent and modification of species, and supports this doctrine by many original observations.	de la nature, fonction qui est pour lui sa raison d'etre." (From references in Bronn's "Untersuchungen uber die Entwicklungs-Gesetze", it appears that the celebrated botanist and palaeontologist Unger published, in 1852, his belief that species undergo development and modification. Dalton, likewise, in Pander and Dalton's work on Fossil Sloths, expressed, in 1821, a similar belief. Similar views have, as is well known, been maintained by Oken in his mystical "Natur-Philosophie". From other references in Godron's work "Sur l'Espece", it seems that
-------------	--	--	--

This is the header text for row #11

Row 11 - P3	becoming of living things." Further on (page xc), after referring to geographical distribution, he adds, "These phenomena shake our confidence in the conclusion that the Apteryx of New Zealand and the Red Grouse of England were distinct creations in and for those islands		Arboriculture", in which he gives precisely the same view on the origin
-------------	---	--	---

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #12

Row 12	The third volume of the "Journal of the Linnean Society" contains papers, read July 1, 1858, by Mr. Wallace and myself, in which, as stated in the introductory remarks to this volume, the theory of Natural Selection is promulgated by Mr. Wallace with admirable force and clearness.	about many slight changes, such as size from the amount of food, colour from the nature of the food, thickness of the skin and hair from climate, etc. Each of the endless variations which we see in the plumage of our fowls must have had some efficient cause; and if the same cause were to act uniformly during a long series of generations on many individuals, all probably would be modified in the same manner. Such facts as the complex and extraordinary out growths which variably follow from the insertion of a minute drop of poison by a gall-producing	M. Isidore Geoffroy Saint-Hilaire, in his lectures delivered in 1850 (of which a Resume appeared in the "Revue et Mag. de Zoolog.", Jan., 1851), briefly gives his reason for believing that specific characters "sont fixes, pour chaque espece, tant qu'elle se perpetue au milieu des memes circonstances: ils se modifient, si les circonstances ambiantes viennent a changer. En resume, L'OBSERVATION des animaux sauvages demontre deja	subject, so that it remained unnoticed until Mr. Matthew himself drew attention to it in the "Gardeners' Chronicle", on April 7, 1860. The differences of Mr. Matthew's views from mine are not of much importance: he seems to consider that the world was nearly depopulated at successive periods, and then restocked; and he gives as an alternative, that new forms may be generated "without the presence of any mold or germ of
--------	---	--	--	--

This is the header text for row #13

Row 13	disposition to form varieties still existing, a darker and a darker race would in the course of time occur: and as the darkest would be the best fitted for the climate, this would at length become the most prevalent,	Many laws regulate variation, some few of which can be dimly seen, and will hereafter be briefly discussed. I will here only allude to what may be called correlated variation. Important changes in the embryo or larva will probably entail changes in the mature animal. In monstrosities,	en raison de sa destinee dans l'ordre de choses dont il fait partie. C'est cette puissance qui harmonise chaque membre a l'ensemble, en l'appropriant a la fonction qu'il doit remplir dans l'organisme general de la nature, fonction qui est pour lui sa raison d'etre." (From references in Bronn's "Untersuchungen uber die Entwicklungs-Gesetze", it appears that the celebrated botanist and palaeontologist Unger published, in 1852, his belief that species undergo development and modification. Dalton, likewise, in Pander and Dalton's work on Fossil	en raison de sa destinee dans l'ordre de choses dont il fait partie. C'est cette puissance qui harmonise chaque membre a l'ensemble, en l'appropriant a la fonction qu'il doit remplir dans l'organisme general
--------	--	---	--	---

This is the header text for row #14

Row 14	Institution on the "Persistent Types of Animal Life". Referring to such cases, he remarks, "It is difficult to comprehend the meaning of such facts as these, if we suppose that each species of animal and plant, or each great type of organisation, was formed and placed upon the surface of the globe at long intervals by a distinct act of creative power; and it is well to recollect that such an assumption is as unsupported by	inflammation of various organs. With respect to what I have called the in direct action of changed conditions, namely, through the reproductive system of being affected, we may infer that variability is thus induced, partly from the fact of	not of great importance for our line of argument; for by the experiment itself the conditions of life are changed. If it could be shown that our domestic varieties manifested a strong tendency to reversion--that is,	the modification of species, or at least disbelieve in separate acts of creation, twenty-seven have written on special branches of natural history or geology.) In 1853 a celebrated geologist, Count Keyserling ("Bulletin de la Soc. Geolog.", 2nd Ser., tom. x, page 357), suggested that as new diseases, supposed to have been caused by some miasma have arisen and spread over the world, so at certain periods the germs of existing species may have
--------	--	--	---	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #12

Row 12 - P2	produce seeds. I cannot here give the details which I have collected and elsewhere published on this curious subject; but to show how singular the laws are which determine the reproduction of animals under confinement, I may mention that carnivorous animals, even from the tropics, breed in this country pretty freely under confinement, with the exception of the plantigrades or bear family, which seldom produce young; whereas, carnivorous birds, with the rarest exception, hardly	cases, he remarks, "It is difficult to comprehend the meaning of such facts as these, if we suppose that each species of animal and plant, or each great type of organisation, was formed and placed upon the surface of the globe at long intervals by a distinct act of creative power; and	phenomena may have been committed, we, as yet, are ignorant." In his address to the British Association, in 1858, he speaks (page li) of "the axiom of the continuous operation of creative power, or of the ordained becoming of living things." Further on (page xc), after referring to geographical distribution, he adds, "These phenomena shake our confidence in the conclusion that the Apteryx of New Zealand and the Red Grouse of England were distinct creations in and for those islands respectively. Always, also, it may be well to bear in mind that by the	Any variation which is not inherited is unimportant for us. But the number and diversity of inheritable deviations of structure, both those of slight and those of considerable physiological importance, are endless. Dr. Prosper Lucas' treatise, in two large volumes, is the fullest and the best on this subject. No breeder doubts how strong is the tendency to inheritance; that like produces like is his fundamental
-------------	---	---	--	--

This is the header text for row #13

Row 13 - P2	has been suggested that the drooping is due to disuse of the muscles of the ear, from the animals being seldom much alarmed, seems probable. Many laws regulate variation, some few of which can be dimly seen, and will hereafter be briefly discussed. I will here only allude to what may be called correlated variation. Important changes in the embryo or larva will probably entail changes in the mature animal. In monstrosities,	knows not how the Red Grouse came to be there, and there exclusively; signifying also, by this mode of expressing such ignorance, his belief that both the bird and the islands owed their origin to a great first Creative Cause." If we interpret these sentences given in the same address, one by the other, it appears that this eminent philosopher felt in 1858 his confidence shaken that the Apteryx and the Red Grouse first appeared in their respective homes "he knew not how," or by some process	the conditions of life. He clearly saw, however, the full force of the principle of natural selection. The celebrated geologist and naturalist, Von Buch, in his excellent "Description Physique des Isles Canaries" (1836, page 147), clearly expresses his belief that varieties slowly become changed into permanent species, which are no longer capable of intercrossing.	degenerations of the same type. It was not until 1828 that he published his conviction that the same forms have not been perpetuated since the origin of all things. Geoffroy seems to have relied chiefly on the conditions of life, or the "monde ambiant" as the cause of change. He was cautious in drawing conclusions, and did not believe that existing species are now undergoing modification; and, as his son adds, "C'est
-------------	--	---	--	--

This is the header text for row #14

Row 14 - P2	appear only in the offspring when nearly mature; peculiarities in the silk-worm are known to appear at the corresponding caterpillar or cocoon stage. But hereditary diseases and some other facts make me believe that the rule has a wider extension, and that, when there is no apparent reason why a peculiarity should appear at any particular age, yet that	opinions fluctuated greatly at different periods, and as he does not enter on the causes or means of the transformation of species, I need not here enter on details. Lamarck was the first man whose conclusions on the subject excited much attention. This justly celebrated naturalist first published his views	forms may be generated "without the presence of any mold or germ of former aggregates." I am not sure that I understand some passages; but it seems that he attributes much influence to the direct action of the conditions of life. He clearly saw, however, the full force of the	to their aboriginal stocks. Hence it has been argued that no deductions can be drawn from domestic races to species in a state of nature. I have in vain endeavoured to discover on what decisive facts the above statement has so often and so boldly been made. There would be great
-------------	--	--	--	--

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #12

Row 12 - P3	organic beings have descended from one primordial form. His grounds of belief and treatment of the subject are wholly different from mine; but as Dr. Freke has now (1861) published his Essay on the "Origin of Species by means of Organic Affinity", the difficult attempt to give any idea of his views would be superfluous on my part. Mr. Herbert Spencer, in an Essay (originally published in the "Leader", March, 1852, and republished in his "Essays", in 1858), has contrasted	organisation terminating in the highest dicotyledons and vertebrata, these grades being few in number, and generally marked by intervals of organic character, which we find to be a practical difficulty in ascertaining affinities; SECOND, of another impulse connected with the vital forces, tending, in the course of generations, to modify organic	difficulty in proving its truth: we may safely conclude that very many of the most strongly marked domestic varieties could not possibly live in a wild state. In many cases we do not know what the aboriginal stock was, and so could not tell whether or not nearly perfect reversion had ensued. It would be necessary, in order to prevent the effects of intercrossing, that only a single variety should be turned loose in its new home. Nevertheless, as our varieties certainly do occasionally revert in some of their characters to ancestral forms, it seems to me
-------------	---	--	---

This is the header text for row #13

Row 13 - P3	the modification of species, or at least disbelieve in separate acts of creation, twenty-seven have written on special branches of natural history or geology.)	many remarkable cases could be given among animals and plants. From facts collected by Heusinger, it appears that white sheep and pigs are injured by certain plants, while dark-coloured individuals escape: Professor Wyman has recently communicated to me a good illustration of this fact; on asking some farmers in Virginia how it was that all their	in a wild state. In many cases we do not know what the aboriginal stock was, and so could not tell whether or not nearly perfect reversion had ensued. It would be necessary, in order to prevent the effects of intercrossing, that only a single variety should be turned loose in
-------------	---	--	--

This is the header text for row #14

Row 14 - P3	is really surprising to note the endless points of structure and constitution in which the varieties and sub-varieties differ slightly from each other. The whole organisation seems to have become plastic, and departs in a slight degree from that of the parental type.	sickly, breeding freely under confinement; and when, on the other hand, we see individuals, though taken young from a state of nature perfectly tamed, long-lived, and healthy (of which I could give numerous	Professor Owen with other palaeontologists as being firmly convinced of the immutability of species; but it appears ("Anat. of Vertebrates", vol. iii, page 796) that this was on my part a preposterous error. In the last edition of this work I inferred, and the inference still seems to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc. (Ibid., vol. i, page xxxv), that Professor Owen
-------------	---	--	---

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #15

Row 15	Hairless dogs have imperfect teeth; long-haired and coarse-haired animals are apt to have, as is asserted, long or many horns; pigeons with feathered feet have skin between their outer toes; pigeons with short beaks have small feet, and those with long beaks large feet. Hence if man goes on selecting, and thus augmenting, any peculiarity, he will almost certainly modify unintentionally other parts of the structure, owing to the mysterious laws of correlation.	were long ago preceded by Dr. Wells and Mr. Matthews. M. Isidore Geoffroy Saint-Hilaire, in his lectures delivered in 1850 (of which a Resume appeared in the "Revue et Mag. de Zoolog.", Jan., 1851), briefly gives his reason for believing that specific characters "sont fixes, pour chaque espece, tant qu'elle se perpetue au milieu des memes circonstances: ils se modifient, si les circonstances ambiantes viennent	animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking more, than its wild parents. The great and inherited development of the udders in cows and goats in countries where they are habitually milked,	expresses his belief that varieties slowly become changed into permanent species, which are no longer capable of intercrossing.
--------	---	---	---	---

This is the header text for row #16

Row 16	be done with equal efficacy, though more slowly, by nature, in the formation of varieties of mankind, fitted for the country which they inhabit. Of the accidental varieties of man, which would occur among the first few and scattered inhabitants of the middle regions of Africa,	admirable paper on the Origin of Species ("Revue Horticole", page 102; since partly republished in the "Nouvelles Archives du Museum", tom. i,	admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever	and he attributes the modification to the change of circumstances.
--------	---	--	---	--

This is the header text for row #17

Row 17	In 1826 Professor Grant, in the concluding paragraph in his well-known paper ("Edinburgh Philosophical Journal", vol. XIV, page 283) on the Spongilla, clearly declares his belief that species are descended from other species, and that they become improved in the course of	instance, a woodpecker has become adapted to its peculiar habits of life. The work, from its powerful and brilliant style, though displaying in the early editions little accurate knowledge and a great want of scientific caution, immediately had a very wide circulation. In my opinion it has done excellent service in this country in calling	they were made for the sake of something, these were preserved, having been appropriately constituted by an internal spontaneity; and whatsoever things were not thus constituted, perished and still perish." We here see the principle of natural selection shadowed forth, but how little Aristotle fully comprehended the principle, is shown by his	varieties are under cultivation; and the latter process he attributes to man's power of selection. But he does not show how selection acts under nature. He believes, like Dean Herbert, that species, when nascent, were more plastic than at present. He lays weight on what he calls the principle of finality, "puissance mysterieuse, indeterminee; fatalite
--------	--	--	--	---

This is the header text for row #18

Row 18	class of varieties." He extends the same view to animals. The dean believes that single species of each genus were created in an originally highly plastic condition, and that these have produced, chiefly by inter-crossing, but likewise by variation, all our existing species. In 1826 Professor Grant, in the concluding paragraph in his well-known paper ("Edinburgh Philosophical Journal", vol. XIV, page 283) on the	vitiated instincts. Many cultivated plants display the utmost vigour, and yet rarely or never seed! In some few cases it has been discovered that a very trifling change, such as a little more or less water at some particular period of growth, will determine whether or not a plant will	Sloths, expressed, in 1821, a similar belief. Similar views have, as is well known, been maintained by Oken in his mystical "Natur-Philosophie". From other references in Godron's work "Sur l'Espece", it seems that Bory St. Vincent, Burdach, Poiret and Fries, have all admitted that new species are continually being produced. I may add, that of the thirty-four authors named in this Historical Sketch, who believe in the modification of species, or at least disbelieve in separate acts	that the rule has a wider extension, and that, when there is no apparent reason why a peculiarity should appear at any particular age, yet that it does tend to appear in the offspring at the same period at which it first appeared in the parent. I believe this rule to be of the highest importance in explaining the laws of embryology. These remarks are of course confined to the first APPEARANCE of the peculiarity, and not to the primary cause which may have acted on the ovules or on the male
--------	---	---	---	--

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #15

Row 15 - P2	in the father and child, we cannot tell whether it may not be due to the same cause having acted on both; but when among individuals, apparently exposed to the same conditions, any very rare deviation, due to some extraordinary combination of circumstances, appears in the parent--say, once among several million individuals--and it reappears in the child, the mere doctrine of chances almost compels us to attribute	In 1846 the veteran geologist M.J. d'Omalus d'Halloy published in an excellent though short paper ("Bulletins de l'Acad. Roy. Bruxelles", tom. xiii, page 581) his opinion that it is more probable that new species have been produced by descent with modification than that they	parent-form. In June, 1859, Professor Huxley gave a lecture before the Royal Institution on the "Persistent Types of Animal Life". Referring to such cases, he remarks, "It is difficult to comprehend the meaning of such	of the other buds on the same plant. These bud variations, as they may be named, can be propagated by grafts, offsets, etc., and sometimes by seed. They occur rarely under nature, but are far from rare under culture. As a single bud out of many thousands produced year after year on the same tree under uniform conditions, has been known suddenly to
-------------	--	---	--	---

This is the header text for row #16

Row 16 - P2	(Lachnanthes), which coloured their bones pink, and which caused the hoofs of all but the black varieties to drop off; and one of the "crackers" (i.e. Virginia squatters) added, "we select the black members of a litter for raising, as they alone have a good chance of living."	eminently susceptible the reproductive system is to very slight changes in the surrounding conditions. Nothing is more easy than to tame an	class of varieties." He extends the same view to animals. The dean believes that single species of each genus were created in an originally highly plastic condition, and that these have produced, chiefly by inter-crossing, but likewise by variation, all our existing species.	farmer's corn when threshed out of doors, applies the same argument to organisation; and adds (as translated by Mr. Clair Grece, who first pointed out the passage to me), "So what hinders the different parts (of
-------------	--	---	---	---

This is the header text for row #17

Row 17 - P2	species, which are no longer capable of intercrossing. Rafinesque, in his "New Flora of North America", published in 1836, wrote (page 6) as follows: "All species might have been varieties once, and many varieties are gradually becoming species by assuming constant	circonstances: ils se modifient, si les circonstances ambiantes viennent a changer. En resume, L'OBSERVATION des animaux sauvages demontre deja la variabilite LIMITEE des especes. Les EXPERIENCES sur les animaux sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR	idees emises par deux hommes justement celebres, Geoffroy Saint-Hilaire et Goethe." Some other passages scattered through M. Lecoq's large work make it a little doubtful how far he extends his views on the	truly inherited, less strange and commoner deviations may be freely admitted to be inheritable. Perhaps the correct way of viewing the whole subject would be, to look at the inheritance of every character whatever as the rule, and non-inheritance as the anomaly.
-------------	---	--	---	--

This is the header text for row #18

Row 18 - P2	Von Baer, toward whom all zoologists feel so profound a respect, expressed about the year 1859 (see Prof. Rudolph Wagner, "Zoologisch-Anthropologische Untersuchungen", 1861, s. 51) his conviction, chiefly grounded on the laws of geographical distribution, that forms now perfectly distinct have descended from a single parent-form.	vol. iv, page 468) has ably given the arguments for and against the hypothesis of the development and modification of species: he seems to lean toward the side of change.	Some naturalists have maintained that all variations are connected with the act of sexual reproduction; but this is certainly an error; for I have given in another work a long list of "sporting plants;" as they are called by gardeners; that is, of plants which have suddenly produced a single bud with a new and sometimes widely different character from that of the other buds on the same plant. These bud variations, as they may be named, can be propagated by grafts, offsets, etc., and sometimes by seed. They occur rarely under nature, but are far from rare under	donc un probleme a reserver entierement a l'avenir, suppose meme que l'avenir doive avoir prise sur lui." In 1813 Dr. W.C. Wells read before the Royal Society "An Account of a White Female, part of whose skin resembles that of a Negro"; but his paper was not published until his famous "Two Essays upon Dew and Single
-------------	---	--	--	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #15

Row 15 - P3	Geograph." Bot. tom. i, page 250), "On voit que nos recherches sur la fixite ou la variation de l'espece, nous conduisent directement aux idees emises par deux hommes justement celebres, Geoffroy Saint-Hilaire et Goethe." Some other passages scattered through M. Lecoq's large work make it a little doubtful how far he extends his views on the	The third volume of the "Journal of the Linnean Society" contains papers, read July 1, 1858, by Mr. Wallace and myself, in which, as stated in the introductory remarks to this volume, the theory of Natural Selection is promulgated by Mr. Wallace with admirable force and clearness.	The "Vestiges of Creation" appeared in 1844. In the tenth and much improved edition (1853) the anonymous author says (page 155): "The proposition determined on after much consideration is, that the several series of animated beings, from the simplest and oldest up to the
-------------	---	---	---

This is the header text for row #16

Row 16 - P3	species, by the difficulty of distinguishing species and varieties, by the almost perfect gradation of forms in certain groups, and by the analogy of domestic productions. With respect to the means of modification, he attributed something to the direct action of the	From other references in Godron's work "Sur l'Espece", it seems that Bory St. Vincent, Burdach, Poiret and Fries, have all admitted that new species are continually being produced. I may add, that of the thirty-four authors named in this Historical Sketch, who believe in	work make it a little doubtful how far he extends his views on the modification of species.
-------------	--	---	---

This is the header text for row #17

Row 17 - P3	conditions of life, or the "monde ambiant" as the cause of change. He was cautious in drawing conclusions, and did not believe that existing species are now undergoing modification; and, as his son adds, "C'est donc un probleme a reserver entierement a l'avenir, suppose meme que l'avenir doive avoir prise sur lui."	his "Zoonomia" (vol. i. pages 500-510), published in 1794. According to Isid. Geoffroy there is no doubt that Goethe was an extreme partisan of similar views, as shown in the introduction to a work written in 1794 and 1795, but not published till long afterward; he has pointedly remarked ("Goethe als Naturforscher", von Dr. Karl Meding, s. 34) that the future question for naturalists will be how, for instance, cattle got their horns and not for what they are used. It is rather a singular	the food; since they were not made for the sake of this, but it was the result of accident. And in like manner as to other parts in which there appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is all the parts of one whole) happened like as if they were made for the sake of something, these were preserved, having been appropriately constituted by an internal spontaneity; and
-------------	--	--	--

This is the header text for row #18

Row 18 - P3	la variabilite LIMITEE des especes. Les EXPERIENCES sur les animaux sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR	facts as these, if we suppose that each species of animal and plant, or each great type of organisation, was formed and placed upon the surface of the globe at long intervals by a distinct act of creative power; and	cultivate, during many generations, the several races, for instance, of the cabbage, in very poor soil--in which case, however, some effect would have to be attributed to the DEFINITE action of the poor soil--that they would, to a large extent, or even wholly, revert to the wild aboriginal stock. Whether or not the experiment would succeed is not of great importance for our line of argument; for by the experiment
-------------	--	---	--

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #19

Row 19	that all animals tend to vary in some degree, and, secondly, that agriculturists improve their domesticated animals by selection; and then, he adds, but what is done in this latter case "by art, seems to be done with equal efficacy, though more slowly, by nature, in the formation of varieties of mankind, fitted for the country which they	same cause having acted on both; but when among individuals, apparently exposed to the same conditions, any very rare deviation, due to some extraordinary combination of circumstances, appears in the parent--say, once among several million individuals--and it reappears in the child, the mere doctrine of chances almost compels us to attribute its reappearance to inheritance. Every one must have heard of cases of	facts as these, if we suppose that each species of animal and plant, or each great type of organisation, was formed and placed upon the surface of the globe at long intervals by a distinct act of creative power; and it is well to recollect that such an assumption is as unsupported by	by true generation of pre existing forms. Passing over allusions to the subject in the classical writers (Aristotle, in his "Physicae Auscultationes" (lib.2, cap.8, s.2), after remarking that rain does not
--------	---	--	--	---

This is the header text for row #20

Row 20	modifications, upon this planet, long prior to the existence of those animal species that actually exemplify it. To what natural laws or secondary causes the orderly succession and progression of such organic phenomena may have been committed, we, as yet, are ignorant." In his address to the British Association, in 1858, he speaks (page li) of "the axiom of the continuous operation of creative power, or of the ordained becoming of living things." Further on (page xc), after referring	reared under new or unnatural conditions. Many facts clearly show how eminently susceptible the reproductive system is to very slight changes in the surrounding conditions. Nothing is more easy than to tame an animal, and few things more difficult than to get it to breed freely under confinement, even when the male and female unite. How many animals there are which will not breed, though kept in an almost free state in their native country! This is generally, but erroneously attributed to	is, also, some probability in the view propounded by Andrew Knight, that this variability may be partly connected with excess of food. It seems clear that organic beings must be exposed during several generations to	be named, can be propagated by grafts, offsets, etc., and sometimes by seed. They occur rarely under nature, but are far from rare under culture. As a single bud out of many thousands produced year after year on the same tree under uniform conditions, has been known suddenly to assume a new character; and as buds on distinct trees, growing under different conditions, have sometimes yielded nearly the same variety--for instance, buds on peach-trees producing nectarines, and buds on common roses producing moss-roses--we clearly see that the
--------	--	---	---	--

This is the header text for row #21

Row 21	attention to it in the "Gardeners' Chronicle", on April 7, 1860. The	is, also, some probability in the view propounded by Andrew Knight, that this variability may be partly connected with excess of food. It seems	udders in cows and goats in countries where they are habitually milked, in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be	the Rev. Baden Powell, in his "Essays on the Unity of Worlds", 1855.
--------	--	---	--	--

This is the header text for row #22

Row 22	the more important; for nearly similar variations sometimes arise under, as far as we can judge, dissimilar conditions; and, on the other hand, dissimilar variations arise under conditions which appear to be nearly uniform. The effects on the offspring are either definite or in	fixes, pour chaque espece, tant qu'elle se perpetue au milieu des memes circonstances: ils se modifient, si les circonstances ambiantes viennent a changer. En resume, L'OBSERVATION des animaux sauvages demontre deja la variabilite LIMITEE des especes. Les EXPERIENCES sur les animaux sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR GENERALE." In his "Hist. Nat. Generale" (tom. ii, page 430, 1859) he	"crackers" (i.e. Virginia squatters) added, "we select the black members of a litter for raising, as they alone have a good chance of living." Hairless dogs have imperfect teeth; long-haired and coarse-haired	reared under new or unnatural conditions. Many facts clearly show how eminently susceptible the reproductive system is to very slight changes in the surrounding conditions. Nothing is more easy than to tame an
--------	--	---	--	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #19

Row 19 - P2	instances), yet having their reproductive system so seriously affected by unperceived causes as to fail to act, we need not be surprised at this system, when it does act under confinement, acting irregularly, and producing offspring somewhat unlike their parents. I may add that as some organisms breed freely under the most unnatural conditions--for	not here enter on details. Lamarck was the first man whose conclusions on the subject excited much attention. This justly celebrated naturalist first published his views in 1801; he much enlarged them in 1809 in his "Philosophie Zoologique",	Von Baer, toward whom all zoologists feel so profound a respect, expressed about the year 1859 (see Prof. Rudolph Wagner, "Zoologisch-Anthropologische Untersuchungen", 1861, s. 51) his conviction, chiefly grounded on the laws of geographical distribution, that forms now perfectly distinct have descended from a single parent-form. In June, 1859, Professor Huxley gave a lecture before the Royal	forms may be generated "without the presence of any mold or germ of former aggregates." I am not sure that I understand some passages; but it seems that he attributes much influence to the direct action of the conditions of life. He clearly saw, however, the full force of the principle of natural selection.
-------------	--	---	---	--

This is the header text for row #20

Row 20 - P2	and 1795, but not published till long afterward; he has pointedly remarked ("Goethe als Naturforscher", von Dr. Karl Meding, s. 34) that the future question for naturalists will be how, for instance, cattle got their horns and not for what they are used. It is rather a singular	of the same family. If strange and rare deviations of structure are truly inherited, less strange and commoner deviations may be freely admitted to be inheritable. Perhaps the correct way of viewing the whole	to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc. (Ibid., vol. i, page xxxv), that Professor Owen admitted that natural selection may have done something in the formation of a new species; but this it appears (Ibid., vol. iii. page 798) is inaccurate and without evidence. I also gave some extracts from a correspondence between Professor Owen and the editor of the "London	of a litter for raising, as they alone have a good chance of living." Hairless dogs have imperfect teeth; long-haired and coarse-haired animals are apt to have, as is asserted, long or many horns; pigeons with feathered feet have skin between their outer toes; pigeons with short beaks have small feet, and those with long beaks large feet. Hence
-------------	--	--	--	--

This is the header text for row #21

Row 21 - P2	we may infer that variability is thus induced, partly from the fact of this system being extremely sensitive to any change in the conditions, and partly from the similarity, as Kolreuter and others have remarked,	Review", from which it appeared manifest to the editor as well as to myself, that Professor Owen claimed to have promulgated the theory of natural selection before I had done so; and I expressed my surprise and satisfaction at this announcement; but as far as it is possible to	of the cabbage, in very poor soil--in which case, however, some	idea of his views would be superfluous on my part.
-------------	--	---	---	--

This is the header text for row #22

Row 22 - P2	all change in the organic, as well as in the inorganic world, being the result of law, and not of miraculous interposition. Lamarck seems to have been chiefly led to his conclusion on the gradual change of	admitted that natural selection may have done something in the formation of a new species; but this it appears (Ibid., vol. iii. page 798) is inaccurate and without evidence. I also gave some extracts from a correspondence between Professor Owen and the editor of the "London Review", from which it appeared manifest to the editor as well as to myself, that Professor Owen claimed to have promulgated the theory of natural selection before I had done so; and I expressed my surprise	to their aboriginal stocks. Hence it has been argued that no deductions can be drawn from domestic races to species in a state of nature. I have in vain endeavoured to discover on what decisive facts the above statement has so often and so boldly been made. There would be great difficulty in proving its truth: we may safely conclude that very many of the most strongly marked domestic varieties could not possibly live in a wild state. In many cases we do not know what the aboriginal stock	instance, a woodpecker has become adapted to its peculiar habits of life. The work, from its powerful and brilliant style, though displaying in the early editions little accurate knowledge and a great want of scientific caution, immediately had a very wide circulation. In my
-------------	---	--	--	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #19

Row 19 - P3	strongly pronounced as to deserve to be called monstrosities arise; but monstrosities cannot be separated by any distinct line from slighter variations. All such changes of structure, whether extremely slight or	Wallace and myself in the "Linnean Journal", and as that enlarged in the present volume. Unfortunately the view was given by Mr. Matthew very briefly in scattered passages in an appendix to a work on a different subject, so that it remained unnoticed until Mr. Matthew himself drew attention to it in the "Gardeners' Chronicle", on April 7, 1860. The	In 1831 Mr. Patrick Matthew published his work on "Naval Timber and Arboriculture", in which he gives precisely the same view on the origin of species as that (presently to be alluded to) propounded by Mr. Wallace and myself in the "Linnean Journal", and as that enlarged in the present volume. Unfortunately the view was given by Mr. Matthew very
-------------	---	--	---

This is the header text for row #20

Row 20 - P3	page 405, 1859) excellent history of opinion on this subject. In this work a full account is given of Buffon's conclusions on the same subject. It is curious how largely my grandfather, Dr. Erasmus Darwin, anticipated the views and erroneous grounds of opinion of Lamarck in his "Zoonomia" (vol. i. pages 500-510), published in 1794. According to Isid. Geoffroy there is no doubt that Goethe was an extreme partisan of	expressed about the year 1859 (see Prof. Rudolph Wagner, "Zoologisch-Anthropologische Untersuchungen", 1861, s. 51) his conviction, chiefly grounded on the laws of geographical distribution, that forms now perfectly distinct have descended from a single parent-form.	dissimilar variations arise under conditions which appear to be nearly uniform. The effects on the offspring are either definite or in definite. They may be considered as definite when all or nearly all the
-------------	--	--	--

This is the header text for row #21

Row 21 - P3	Bory St. Vincent, Burdach, Poiret and Fries, have all admitted that new species are continually being produced. I may add, that of the	this work a full account is given of Buffon's conclusions on the same subject. It is curious how largely my grandfather, Dr. Erasmus Darwin,	The Hon. and Rev. W. Herbert, afterward Dean of Manchester, in the fourth volume of the "Horticultural Transactions", 1822, and in his
-------------	--	--	--

This is the header text for row #22

Row 22 - P3	conditions, namely, through the reproductive system of being affected, we may infer that variability is thus induced, partly from the fact of this system being extremely sensitive to any change in the conditions, and partly from the similarity, as Kolreuter and others have remarked, between the variability which follows from the crossing of distinct species, and that which may be observed with plants and animals when	Some naturalists have maintained that all variations are connected with the act of sexual reproduction; but this is certainly an error; for I have given in another work a long list of "sporting plants;" as they are called by gardeners; that is, of plants which have suddenly produced a single bud with a new and sometimes widely different character from that of the other buds on the same plant. These bud variations, as they may	as some organisms breed freely under the most unnatural conditions--for instance, rabbits and ferrets kept in hutches--showing that their reproductive organs are not easily affected; so will some animals and plants withstand domestication or cultivation, and vary very
-------------	--	---	--

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #23

Row 23	modification, he attributed something to the direct action of the physical conditions of life, something to the crossing of already existing forms, and much to use and disuse, that is, to the effects of	principle of finality, "puissance mysterieuse, indeterminee; fatalite pour les uns; pour les autres volonte providentielle, dont l'action incessante sur les etres vivantes determine, a toutes les epoques de	EFFECTS OF HABIT AND OF THE USE OR DISUSE OF PARTS; CORRELATED VARIATION; INHERITANCE.	mind that in every case, as Professor Weismann has lately insisted, and as I have incidently shown in my work on "Variation under Domestication," there are two factors: namely, the nature of the organism and the nature of the conditions. The former seems to be much the more important; for nearly similar variations sometimes arise under,
--------	--	--	--	--

This is the header text for row #24

Row 24	important part in the formation of our domestic races. We see in definite variability in the endless slight peculiarities which distinguish the individuals of the same species, and which cannot be	organism and the nature of the conditions. The former seems to be much the more important; for nearly similar variations sometimes arise under, as far as we can judge, dissimilar conditions; and, on the other hand, dissimilar variations arise under conditions which appear to be	young; whereas, carnivorous birds, with the rarest exception, hardly ever lay fertile eggs. Many exotic plants have pollen utterly worthless, in the same condition as in the most sterile hybrids. When, on the one hand, we see domesticated animals and plants, though often weak and sickly, breeding freely under confinement; and when, on the other hand, we see individuals, though taken young from a state of nature perfectly tamed, long-lived, and healthy (of which I could give numerous instances), yet having their reproductive system so seriously affected	short beaks have small feet, and those with long beaks large feet. Hence if man goes on selecting, and thus augmenting, any peculiarity, he will almost certainly modify unintentionally other parts of the structure, owing to the mysterious laws of correlation.
--------	--	--	--	---

This is the header text for row #25

Row 25	will probably entail changes in the mature animal. In monstrosities, the correlations between quite distinct parts are very curious; and many instances are given in Isidore Geoffroy St. Hilaire's great work on this	vitiated instincts. Many cultivated plants display the utmost vigour, and yet rarely or never seed! In some few cases it has been discovered that a very trifling change, such as a little more or less water at some particular period of growth, will determine whether or not a plant will	that a very trifling change, such as a little more or less water at some particular period of growth, will determine whether or not a plant will produce seeds. I cannot here give the details which I have collected and elsewhere published on this curious subject; but to show how singular the laws are which determine the reproduction of animals under confinement, I may mention that carnivorous animals, even from the	that hypothesis which supposes the species living at any time to be the result of the gradual modification of pre-existing species, a hypothesis which, though unproven, and sadly damaged by some of its supporters,
--------	--	---	---	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #23

Row 23 - P2	Geograph." Bot. tom. i, page 250), "On voit que nos recherches sur la fixite ou la variation de l'espece, nous conduisent directement aux idees emises par deux hommes justement celebres, Geoffroy Saint-Hilaire et Goethe." Some other passages scattered through M. Lecoq's large work make it a little doubtful how far he extends his views on the	Grouse are "enumerated by the zoologist as evidence of distinct creation of the bird in and for such islands, he chiefly expresses that he knows not how the Red Grouse came to be there, and there exclusively;	sickly, breeding freely under confinement; and when, on the other hand, we see individuals, though taken young from a state of nature perfectly tamed, long-lived, and healthy (of which I could give numerous instances), yet having their reproductive system so seriously affected by unperceived causes as to fail to act, we need not be surprised at	the subject in the classical writers (Aristotle, in his "Physicae Auscultationes" (lib.2, cap.8, s.2), after remarking that rain does not fall in order to make the corn grow, any more than it falls to spoil the farmer's corn when threshed out of doors, applies the same argument to organisation; and adds (as translated by Mr. Clair Grece, who first
-------------	---	--	--	---

This is the header text for row #24

Row 24 - P2	vigorous neighbours. The colour of this vigorous race I take for granted, from what has been already said, would be dark. But the same disposition to form varieties still existing, a darker and a darker race would in the course of time occur: and as the darkest would be the best	facts as the complex and extraordinary out growths which variably follow from the insertion of a minute drop of poison by a gall-producing insect, shows us what singular modifications might result in the case of plants from a chemical change in the nature of the sap.	Some naturalists have maintained that all variations are connected with the act of sexual reproduction; but this is certainly an error; for I have given in another work a long list of "sporting plants;" as they are called by gardeners; that is, of plants which have suddenly produced a single bud with a new and sometimes widely different character from that of the other buds on the same plant. These bud variations, as they may be named, can be propagated by grafts, offsets, etc., and sometimes	to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc.(Ibid., vol. i, page xxxv), that Professor Owen admitted that natural selection may have done something in the formation of a new species; but this it appears (Ibid., vol. iii. page 798) is inaccurate and without evidence. I also gave some extracts from a
-------------	---	---	---	---

This is the header text for row #25

Row 25 - P2	weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking more, than its wild parents. The great and inherited development of the udders in cows and goats in countries where they are habitually milked, in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which	eminently susceptible the reproductive system is to very slight changes in the surrounding conditions. Nothing is more easy than to tame an animal, and few things more difficult than to get it to breed freely under confinement, even when the male and female unite. How many animals there are which will not breed, though kept in an almost free state in	how little Aristotle fully comprehended the principle, is shown by his remarks on the formation of the teeth.), the first author who in modern times has treated it in a scientific spirit was Buffon. But as his opinions fluctuated greatly at different periods, and as he does not enter on the causes or means of the transformation of species, I need	culture. As a single bud out of many thousands produced year after year on the same tree under uniform conditions, has been known suddenly to assume a new character; and as buds on distinct trees, growing under different conditions, have sometimes yielded nearly the same variety--for instance, buds on peach-trees producing nectarines, and buds on common roses producing moss-roses--we clearly see that the nature of the conditions is of subordinate importance in comparison
-------------	--	--	--	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #23

Row 23 - P3	The Hon. and Rev. W. Herbert, afterward Dean of Manchester, in the fourth volume of the "Horticultural Transactions", 1822, and in his work on the "Amaryllidaceae" (1837, pages 19, 339), declares that	with the nature of the organism in determining each particular form of variation; perhaps of not more importance than the nature of the spark, by which a mass of combustible matter is ignited, has in determining the nature of the flames. EFFECTS OF HABIT AND OF THE USE OR DISUSE OF PARTS; CORRELATED	culture. As a single bud out of many thousands produced year after year on the same tree under uniform conditions, has been known suddenly to assume a new character; and as buds on distinct trees, growing under different conditions, have sometimes yielded nearly the same variety--for instance, buds on peach-trees producing nectarines, and buds on common roses producing moss-roses--we clearly see that the nature of the conditions is of subordinate importance in comparison with the nature of the organism in determining each particular form of
-------------	--	---	--

This is the header text for row #24

Row 24 - P3	for many generations. No case is on record of a variable organism ceasing to vary under cultivation. Our oldest cultivated plants, such as wheat, still yield new varieties: our oldest domesticated animals are still capable of rapid improvement or modification. As far as I am able to judge, after long attending to the subject, the conditions of life appear to act in two ways--directly on the whole organisation or on certain parts alone and in directly by affecting the	highly plastic condition, and that these have produced, chiefly by inter-crossing, but likewise by variation, all our existing species. In 1826 Professor Grant, in the concluding paragraph in his well-known paper ("Edinburgh Philosophical Journal", vol. XIV, page 283) on the Spongilla, clearly declares his belief that species are descended from other species, and that they become improved in the course of modification. This same view was given in his Fifty-fifth Lecture,	lean toward the side of change. The "Vestiges of Creation" appeared in 1844. In the tenth and much
-------------	---	---	--

This is the header text for row #25

Row 25 - P3	age, though sometimes earlier. In many cases this could not be otherwise; thus the inherited peculiarities in the horns of cattle could appear only in the offspring when nearly mature; peculiarities in the silk-worm are known to appear at the corresponding caterpillar or cocoon stage. But hereditary diseases and some other facts make me believe that the rule has a wider extension, and that, when there is no apparent	When we compare the individuals of the same variety or sub-variety of our older cultivated plants and animals, one of the first points which strikes us is, that they generally differ more from each other than do the individuals of any one species or variety in a state of nature. And if we reflect on the vast diversity of the plants and animals which have been cultivated, and which have varied during all ages under the most different climates and treatment, we are driven to conclude that this	for having called my attention, through Mr. Brace, to the above passage of Dr. Wells' work. The Hon. and Rev. W. Herbert, afterward Dean of Manchester, in the fourth volume of the "Horticultural Transactions", 1822, and in his work on the "Amaryllidaceae" (1837, pages 19, 339), declares that "horticultural experiments have established, beyond the possibility of
-------------	---	--	---

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #26

Row 26	of the other buds on the same plant. These bud variations, as they may be named, can be propagated by grafts, offsets, etc., and sometimes by seed. They occur rarely under nature, but are far from rare under	with feathered feet have skin between their outer toes; pigeons with short beaks have small feet, and those with long beaks large feet. Hence if man goes on selecting, and thus augmenting, any peculiarity, he will	as some organisms breed freely under the most unnatural conditions--for instance, rabbits and ferrets kept in hutches--showing that their	In 1831 Mr. Patrick Matthew published his work on "Naval Timber and Arboriculture", in which he gives precisely the same view on the origin
--------	---	---	---	---

This is the header text for row #27

Row 27	Professor Wyman has recently communicated to me a good illustration of this fact; on asking some farmers in Virginia how it was that all their pigs were black, they informed him that the pigs ate the paint-root (Lachnanthes), which coloured their bones pink, and which caused the hoofs of all but the black varieties to drop off; and one of the	dissimilar variations arise under conditions which appear to be nearly uniform. The effects on the offspring are either definite or in definite. They may be considered as definite when all or nearly all the offspring of individuals exposed to certain conditions during several generations are modified in the same manner. It is extremely difficult to come to any conclusion in regard to the extent of the changes which have been thus definitely induced. There can, however, be little doubt about many slight changes, such as size from the amount of food,	difficulty in proving its truth: we may safely conclude that very many of the most strongly marked domestic varieties could not possibly live in a wild state. In many cases we do not know what the aboriginal stock was, and so could not tell whether or not nearly perfect reversion had ensued. It would be necessary, in order to prevent the effects of intercrossing, that only a single variety should be turned loose in	EFFECTS OF HABIT AND OF THE USE OR DISUSE OF PARTS; CORRELATED VARIATION; INHERITANCE. Changed habits produce an inherited effect as in the period of the
--------	--	--	--	---

This is the header text for row #28

Row 28	produced by the conditions of life are gradual. He argues with much force on general grounds that species are not immutable productions. But I cannot see how the two supposed "impulses" account in a scientific sense for the numerous and beautiful coadaptations which we see throughout nature; I cannot see that we thus gain any insight how, for instance, a woodpecker has become adapted to its peculiar habits of life. The work, from its powerful and brilliant style, though displaying	can say why the same peculiarity in different individuals of the same species, or in different species, is sometimes inherited and sometimes not so; why the child often reverts in certain characteristics to its grandfather or grandmother or more remote ancestor; why a peculiarity is often transmitted from one sex to both sexes, or to one sex alone, more commonly but not exclusively to the like sex. It is a fact of some importance to us, that peculiarities appearing in the males of our domestic breeds are often transmitted, either exclusively or in a much	word 'creation' the zoologist means 'a process he knows not what.'" He amplifies this idea by adding that when such cases as that of the Red Grouse are "enumerated by the zoologist as evidence of distinct creation of the bird in and for such islands, he chiefly expresses that he knows not how the Red Grouse came to be there, and there exclusively; signifying also, by this mode of expressing such ignorance, his belief	in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which has been suggested that the drooping is due to disuse of the muscles of the ear, from the animals being seldom much alarmed, seems probable. Many laws regulate variation, some few of which can be dimly seen, and
--------	---	--	--	--

This is the header text for row #29

Row 29	Australian Flora". In the first part of this great work he admits the truth of the descent and modification of species, and supports this doctrine by many original observations. The first edition of this work was published on November 24, 1859, and the second edition on January 7, 1860. CAUSES OF VARIABILITY.	conditions, namely, through the reproductive system of being affected, we may infer that variability is thus induced, partly from the fact of this system being extremely sensitive to any change in the conditions, and partly from the similarity, as Kolreuter and others have remarked, between the variability which follows from the crossing of distinct species, and that which may be observed with plants and animals when reared under new or unnatural conditions. Many facts clearly show how	the future question for naturalists will be how, for instance, cattle got their horns and not for what they are used. It is rather a singular instance of the manner in which similar views arise at about the same	as Sir John Herschel expresses it, "a natural in contradistinction to a miraculous process." The third volume of the "Journal of the Linnean Society" contains
--------	--	--	---	--

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #26

Row 26 - P2	From a circular lately issued it appears that Dr. Freke, in 1851 ("Dublin Medical Press", page 322) , propounded the doctrine that all	attention to the subject, in removing prejudice, and in thus preparing the ground for the reception of analogous views.	papers, read July 1, 1858, by Mr. Wallace and myself, in which, as stated in the introductory remarks to this volume, the theory of Natural Selection is promulgated by Mr. Wallace with admirable force and	signifying also, by this mode of expressing such ignorance, his belief that both the bird and the islands owed their origin to a great first Creative Cause." If we interpret these sentences given in the same address, one by the other, it appears that this eminent philosopher felt
-------------	--	---	--	--

This is the header text for row #27

Row 27 - P2	as wheat, still yield new varieties: our oldest domesticated animals are still capable of rapid improvement or modification.	Species by means of Organic Affinity", the difficult attempt to give any idea of his views would be superfluous on my part.	owing to the mysterious laws of correlation. The results of the various, unknown, or but dimly understood laws of variation are infinitely complex and diversified. It is well worth while carefully to study the several treatises on some of our old cultivated plants, as on the hyacinth, potato, even the dahlia, etc.; and it is really surprising to note the endless points of structure and constitution in which the varieties and sub-varieties differ slightly	same cause having acted on both; but when among individuals, apparently exposed to the same conditions, any very rare deviation, due to some extraordinary combination of circumstances, appears in the parent--say,
-------------	--	---	--	--

This is the header text for row #28

Row 28 - P2	reproductive organs are not easily affected; so will some animals and plants withstand domestication or cultivation, and vary very slightly--perhaps hardly more than in a state of nature. Some naturalists have maintained that all variations are connected with the act of sexual reproduction; but this is certainly an error; for I have given in another work a long list of "sporting plants;" as they are	species, which are no longer capable of intercrossing. Rafinesque, in his "New Flora of North America", published in 1836, wrote (page 6) as follows: "All species might have been varieties once, and many varieties are gradually becoming species by assuming constant	to me perfectly just, from a passage beginning with the words "no doubt the type-form," etc.(Ibid., vol. i, page xxxv), that Professor Owen admitted that natural selection may have done something in the formation of a new species; but this it appears (Ibid., vol. iii. page 798) is inaccurate and without evidence. I also gave some extracts from a correspondence between Professor Owen and the editor of the "London Review", from which it appeared manifest to the editor as well as to	weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may be safely attributed to the domestic duck flying much less, and walking
-------------	--	---	--	---

This is the header text for row #29

Row 29 - P2	to come to any conclusion in regard to the extent of the changes which have been thus definitely induced. There can, however, be little doubt about many slight changes, such as size from the amount of food,	single bud with a new and sometimes widely different character from that of the other buds on the same plant. These bud variations, as they may be named, can be propagated by grafts, offsets, etc., and sometimes by seed. They occur rarely under nature, but are far from rare under culture. As a single bud out of many thousands produced year after year on the same tree under uniform conditions, has been known suddenly to assume a new character; and as buds on distinct trees, growing under different conditions, have sometimes yielded nearly the same	it is well to recollect that such an assumption is as unsupported by tradition or revelation as it is opposed to the general analogy of nature. If, on the other hand, we view "Persistent Types" in relation to that hypothesis which supposes the species living at any time to be the result of the gradual modification of pre-existing species, a hypothesis	mind that in every case, as Professor Weismann has lately insisted, and as I have incidently shown in my work on "Variation under Domestication," there are two factors: namely, the nature of the organism and the nature of the conditions. The former seems to be much
-------------	--	--	---	---

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #26

Row 26 - P3	paper was not published until his famous "Two Essays upon Dew and Single Vision" appeared in 1818. In this paper he distinctly recognises the principle of natural selection, and this is the first recognition which	of the globe at long intervals by a distinct act of creative power; and it is well to recollect that such an assumption is as unsupported by tradition or revelation as it is opposed to the general analogy of	the ear, from the animals being seldom much alarmed, seems probable. Many laws regulate variation, some few of which can be dimly seen, and will hereafter be briefly discussed. I will here only allude to what may
-------------	---	---	--

This is the header text for row #27

Row 27 - P3	think may be trusted, is that, at whatever period of life a peculiarity first appears, it tends to reappear in the offspring at a corresponding age, though sometimes earlier. In many cases this could not be otherwise; thus the inherited peculiarities in the horns of cattle could appear only in the offspring when nearly mature; peculiarities in the silk-worm are known to appear at the corresponding caterpillar or cocoon stage. But hereditary diseases and some other facts make me believe that the rule has a wider extension, and that, when there is no apparent	and partly from the similarity, as Kolreuter and others have remarked, between the variability which follows from the crossing of distinct species, and that which may be observed with plants and animals when reared under new or unnatural conditions. Many facts clearly show how eminently susceptible the reproductive system is to very slight changes	Changed habits produce an inherited effect as in the period of the flowering of plants when transported from one climate to another. With animals the increased use or disuse of parts has had a more marked influence; thus I find in the domestic duck that the bones of the wing weigh less and the bones of the leg more, in proportion to the whole skeleton, than do the same bones in the wild duck; and this change may
-------------	---	---	---

This is the header text for row #28

Row 28 - P3	prouvent, de plus, que les differences produites peuvent etre de VALEUR GENERIQUE." In his "Hist. Nat. Generale" (tom. ii, page 430, 1859) he amplifies analogous conclusions. From a circular lately issued it appears that Dr. Freke, in 1851 ("Dublin Medical Press", page 322), propounded the doctrine that all	The "Philosophy of Creation" has been treated in a masterly manner by the Rev. Baden Powell, in his "Essays on the Unity of Worlds", 1855. Nothing can be more striking than the manner in which he shows that the introduction of new species is "a regular, not a casual phenomenon," or, as Sir John Herschel expresses it, "a natural in contradistinction to a miraculous process." The third volume of the "Journal of the Linnean Society" contains	appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is all the parts of one whole) happened like as if they were made for the sake of something, these were preserved, having been appropriately constituted by an internal spontaneity; and whatsoever things were not thus constituted, perished and still perish."
-------------	--	--	---

This is the header text for row #29

Row 29 - P3	Owen preceded me, for both of us, as shown in this historical sketch, were long ago preceded by Dr. Wells and Mr. Matthews. M. Isidore Geoffroy Saint-Hilaire, in his lectures delivered in 1850 (of which a Resume appeared in the "Revue et Mag. de Zoolog.", Jan., 1851),	and subsequently, 1815, in the Introduction to his "Hist. Nat. des Animaux sans Vertebres". In these works he up holds the doctrine that all species, including man, are descended from other species. He first did the eminent service of arousing attention to the probability of all change in the organic, as well as in the inorganic world, being the	he seems to consider that the world was nearly depopulated at successive periods, and then restocked; and he gives as an alternative, that new forms may be generated "without the presence of any mold or germ of former aggregates." I am not sure that I understand some passages; but
-------------	--	---	---

1 of 3	Col2	Col3	Col4	Col5
--------	------	------	------	------

This is the header text for row #30

Row 30	In 1852 M. Naudin, a distinguished botanist, expressly stated, in an admirable paper on the Origin of Species ("Revue Horticole", page 102; since partly republished in the "Nouvelles Archives du Museum", tom. i, page 171), his belief that species are formed in an analogous manner as	got their horns and not for what they are used. It is rather a singular instance of the manner in which similar views arise at about the same time, that Goethe in Germany, Dr. Darwin in England, and Geoffroy Saint-Hilaire (as we shall immediately see) in France, came to the same conclusion on the origin of species, in the years 1794-5.)	modifications, upon this planet, long prior to the existence of those animal species that actually exemplify it. To what natural laws or secondary causes the orderly succession and progression of such organic phenomena may have been committed, we, as yet, are ignorant." In his address to the British Association, in 1858, he speaks (page li) of "the axiom of the continuous operation of creative power, or of the ordained	amplifies analogous conclusions. From a circular lately issued it appears that Dr. Freke, in 1851 ("Dublin Medical Press", page 322), propounded the doctrine that all organic beings have descended from one primordial form. His grounds of belief and treatment of the subject are wholly different from mine; but as Dr. Freke has now (1861) published his Essay on the "Origin of
--------	---	--	--	---

2 of 3	Col6	Col7	Col8	Col9
--------	------	------	------	------

This is the header text for row #30

Row 30 - P2	knows not how the Red Grouse came to be there, and there exclusively; signifying also, by this mode of expressing such ignorance, his belief that both the bird and the islands owed their origin to a great first	more, than its wild parents. The great and inherited development of the udders in cows and goats in countries where they are habitually milked, in comparison with these organs in other countries, is probably another instance of the effects of use. Not one of our domestic animals can be named which has not in some country drooping ears; and the view which	clear that organic beings must be exposed during several generations to new conditions to cause any great amount of variation; and that, when the organisation has once begun to vary, it generally continues varying	supposed to have been caused by some miasma have arisen and spread over the world, so at certain periods the germs of existing species may have been chemically affected by circumambient molecules of a particular nature, and thus have given rise to new forms.
-------------	--	--	---	--

DEMO

3 of 3	Col10	Col11	Col12
--------	-------	-------	-------

This is the header text for row #30

Row 30 - P3	teeth, for example, grow by necessity, the front ones sharp, adapted for dividing, and the grinders flat, and serviceable for masticating the food; since they were not made for the sake of this, but it was the result of accident. And in like manner as to other parts in which there appears to exist an adaptation to an end. Wheresoever, therefore, all things together (that is all the parts of one whole) happened like as if they were made for the sake of something, these were preserved,	sauvages devenus domestiques, et sur les animaux domestiques redevenus sauvages, la demontrent plus clairement encore. Ces memes experiences prouvent, de plus, que les differences produites peuvent etre de VALEUR GENERIQUE." In his "Hist. Nat. Generale" (tom. ii, page 430, 1859) he amplifies analogous conclusions.	in the early editions little accurate knowledge and a great want of scientific caution, immediately had a very wide circulation. In my opinion it has done excellent service in this country in calling attention to the subject, in removing prejudice, and in thus preparing the ground for the reception of analogous views. In 1846 the veteran geologist M.J. d'Omalus d'Halloy published in an excellent though short paper ("Bulletins de l'Acad. Roy. Bruxelles",
-------------	--	---	---