



Lecture 7
Victorian Sensation:
Vestiges of the Natural History of Creation

*"I do from my soul abhor the[se]
sentiments..."*

The Reverend Adam Sedgwick

Taking stock: the situation in 1840

- An increasingly clear sense of the reality of “deep time”
- An increasingly coherent picture of the successive eras of earth history, as represented in the geological column
- A wide range of options for reconciling Genesis and geology within broadly “catastrophist” or “uniformitarian” frameworks
- An increasing reluctance to invoke the Scriptures to explain geological phenomena
- *And an increasingly uneasy silence about what Darwin referred to as “that mystery of mysteries”, the origin of new species on the earth....*

BUT: there was dissent from right and left



A useful term

"Naturalism" or "Scientific naturalism":

- the belief that all natural phenomena are explicable in terms of natural law; and that, consequently, there is no place for so-called "supernatural" explanations in science

The “Mosaists”

- There was a reaction against mainstream natural history by some conservatives within the Christian community
- The “Scriptural Geologists” held out against historical geology in favor of a strict adherence to the Biblical “6 days of creation”

Scriptural geology

- Rodd, Thomas (Philobiblos), 1820, *A Defence of the Veracity of Moses*
- [Penn, Granville](#), 1822, *A Comparative Estimate of the Mineral and Mosaical Geologies*
- Bugg, George, 1826, *Scriptural Geology*
- [Ure, Andrew](#), 1829, *A New System of Geology*
- [Brown, James Mellor](#), 1833, *Reflections on Geology*
- Nolan, Frederick, 1833. *Analogy of Revelation and Science Established*
- Fairholme, George, 1833, *General View of the Geology of Scripture*, and 1837, *The Mosaic Deluge*
- [Cole, Henry](#), 1834, *Popular Geology Subversive of Divine Revelation*
- [Gisborne, Thomas](#), 1836, *Considerations on the Modern Theory of Geology*
- [Young, George](#), 1838, *Scriptural Geology*
- Rhind, William, 1838, *Age of the Earth, Considered Geologically and Historically*
- [Cockburn, William](#), 1839, *The Bible Defended Against the British Association*, and, 1838, *A Letter to Professor Buckland Concerning the Origin of the World*

Scriptural geology: assessment

- A heterogeneous group of writers reacting against the whole thrust of historical geology
- Few of these men contributed directly to geological inquiry through e.g., field-work; mainly, they commented on the work of the field-geologists
- Mostly evangelical Anglicans, the Scriptural geologists nevertheless demonstrated little sense of common purpose
- All told, they had little influence, even within Christian circles; and within early-19th century geology their role was marginal at best
- One historian's assessment: "while it may be proper to speak of Scriptural *Geology*, it is not really accurate to speak of Scriptural *Geologists*." (David Livingstone)

Dismissing Scriptural geology

"Some have attempted to ascribe the formation of all the stratified rocks to the effects of the Mosaic Deluge; an opinion ; which is irreconcilable with the enormous thickness and almost infinite subdivisions of these strata, and with the numerous and ; regular successions which they contain of the remains of animals and vegetables, differing more and more widely from existing species, as the strata in which we find them are placed at greater depths. The fact that a large proportion of these remains belong to extinct genera, and almost all of them to extinct species, that lived and multiplied and died on or near the spots where they are now found, shows that the strata in which they occur were deposited slowly and gradually, during long periods of time, and at widely distant intervals."

William Buckland, *Geology and Mineralogy Considered With Reference to Natural Theology*, 1837

The “evolutionists”

- Evolutionary ideas of all sorts proliferated in Enlightenment Europe
- The “nebular hypothesis” was essentially an evolutionary cosmology
- 2 generations of leading French naturalists in the 18th century played with notions of “transformism”, or what we would call evolution

Georges Luis-Leclerc, Comte de Buffon, 1707-78

- French naturalist & cosmologist
- Director, Jardin du Roi, Paris, 1739-78
- His 35 volume *Histoire Naturelle* was one of the great works of the French Enlightenment
- Suggested species may have improved or degenerated from original points of creation



Jean-Baptiste Pierre Antoine de Monet, Chevalier de Lamarck, 1744-1829

- Student of Buffon
- Much given to wide-ranging theorizing in natural philosophy & natural history
- Developed most complete transformist theory of life in generation after Buffon

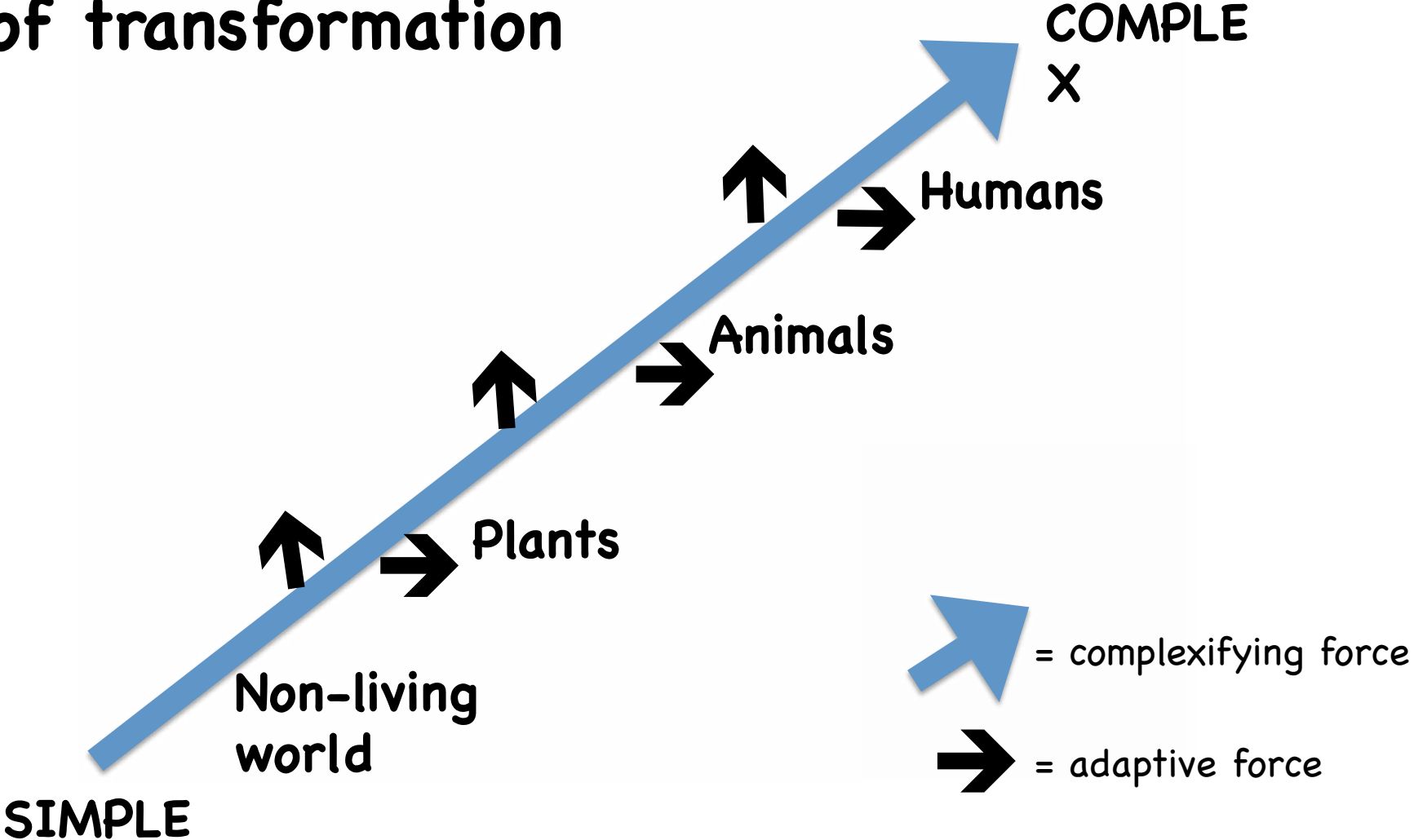


Lamarck's theory of transformation

Two primary forces drive transformation:

- *Le pouvoir de la vie (a complexifying force)*
 - natural movements of fluids etch out organs from tissues, leading to ever more complex construction regardless of the organ's use or disuse
- *L'influence des circonstances (an adaptive force)*
 - use and disuse of characters leads organisms to become more adapted to their environment

Lamarck's theory of transformation



Lamarck's reputation

TODAY

- Known as an (un?) important "forerunner of Darwin"
- Associated almost exclusively with the notion of "inheritance of acquired characteristics" (which, ironically, was a commonplace belief in Lamarck's day)

EARLY-19TH CENTURY

- Known as a leading taxonomist, e.g., of "invertebrate" animals (his term)
- Known as a speculative natural philosopher with a wide-ranging theory of "transformation"
- Known as an opponent of Cuvier's approach to biology

Lamarck's greatest misfortune



Lamarck's greatest misfortune

To be up against Cuvier for most of his career!



Cuvier's elegy at Lamarck's funeral

"[Lamarck's theory of life]...rested on two arbitrary suppositions the one, that it is the seminal vapour which organizes the embryo the other, that efforts and desires may engender organs. A system established on such foundations may amuse the imagination of a poet a metaphysician may derive from it an entirely new series of systems but it cannot for a moment bear the examination of any one who has dissected a hand, a viscus, or even a feather."

Transformist ideas in England

- Erasmus Darwin, 1731-1802
- Wide-ranging polymath of “English Enlightenment”
- Translated Linnaeus into English
- Author, *The Loves of the Plants* (1789); *Zoonomia* (1794-96)



Erasmus Darwin's "transformism"

"Would it be too bold to imagine that, in the great length of time since the earth began to exist, perhaps millions of ages before the commencement of the history of mankind would it be too bold to imagine that all warm-blooded animals have arisen from one living filament, which the great First Cause endued with animality, with the power of acquiring new parts, attended with new propensities, directed by irritations, sensations, volitions and associations, and thus possessing the faculty of continuing to improve by its own inherent activity, and of delivering down these improvements by generation to its posterity, world without end!"

“Would it be too bold...”?

Increasingly, in England, in the period after the French Revolution, the answer to this question was...

Yes!

Why?

In England after 1800, transformist ideas became increasingly associated with

- (revolutionary) France
- English radicalism (atheism, secularism, republicanism)
- Political radicalism

England in the 1830s & '40s

- First industrial revolution is profoundly transforming all aspects of English society:
 - 1832: Reform Act – extension of franchise
 - 1833: abolition of slavery
 - 1834: first inspected factory act
 - 1837: Victoria crowned
 - 1839: Chartism – demand for universal suffrage



Great Chartist Meeting, London 1848



Bristol Riot, 1831



Chartist Riot

Evolution and Society, 1800–1840

Only by appreciating the wider connotations of evolution in society in the early-1830s, can we appreciate why Lyell and others struggled so hard to “hold the line” of naturalistic approaches to the study of origins, asserting that:

- geological ages come and go naturalistically
- species come and go naturalistically
- *but the first origin of species, including the first ; origin of humankind, is a subject “beyond the reach of our philosophical inquiries”*

Lyell on Lamarck

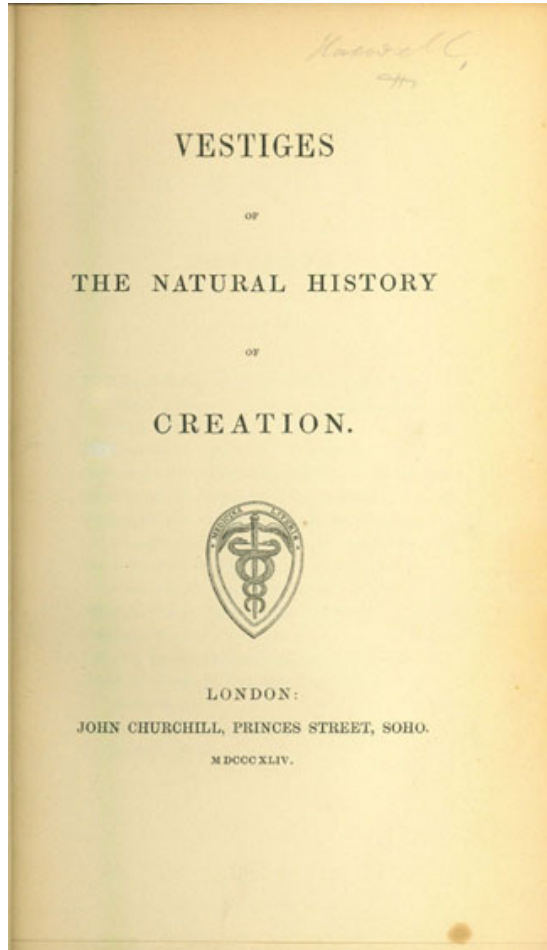
"If I had stated... the possibility of the introduction or origination of fresh species being a natural, in contradistinction to a miraculous process, I should have raised a host of prejudices against me, which are unfortunately opposed at every step to any philosopher who attempts to address the public on these mysterious subjects".

Lyell, letter to William Whewell, 1837

But then...

*A scandalous book, published anonymously,
blew the lid off this early-Victorian
compromise...*

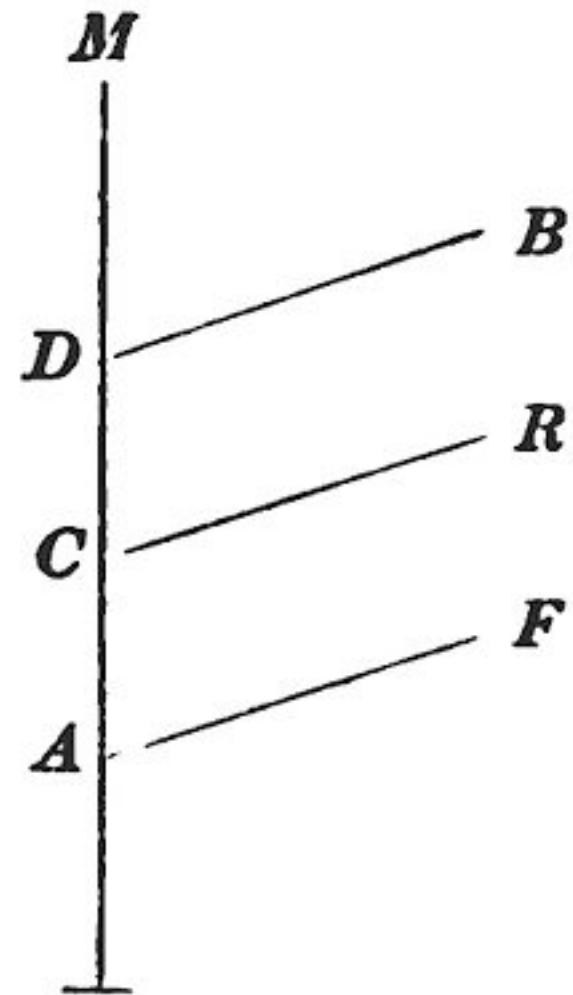
“Vestiges of the Natural History of Creation”, 1844



- An anonymous work, published out of London
- Circulated at first in small numbers, it rapidly achieved cult status
- Before long, everyone was reading it

What did *Vestiges* offer?

- A comprehensive theory of origins, embracing:
 - The nebular hypothesis
 - The first appearance of life by “spontaneous generation”
 - The first appearance of plants & animals
 - The origins of humankind
 - The development of mind
- All covered by a “universal law of development”



Vestiges' main thesis

"Thus the whole is complete on one principle. The masses of space are formed by law law makes them in due time ; theatres of existence for plants and animals sensation, ; disposition, intellect, are all in like manner developed and sustained in action by law. It is most interesting to observe into how small a field the whole of the mysteries ; of nature thus ultimately resolve themselves. The inorganic has one final comprehensive law, GRAVITATION The organic, the other great department of mundane things, rests in like manner on one law, and that is,— DEVELOPMENT. Nor may even these be after all twain, but only branches of one still more comprehensive law, the expression of that unity which man's wit can scarcely separate from Deity itself."

The book's popularity

Edition	Date	Copies
1	1844	750
2	1844	1000
3	1845	1500
4	1845	2000
5	1846	1500
6	1847	1000
7	1847	5000
8	1850	3000
9	1851	3000
10	1853	2500
11	1860	2500
12	1884	5000

Why was it so popular?

- It “chimed with the times”, tapping into all sorts of fashionable (and controversial) ideas and issues
- It was hugely ambitious, synthesizing “the latest” ideas across the sciences
- It was extremely well-written, and easily accessible to any reasonably literate person
- It was (increasingly) cheap and affordable
- It was anonymous – and remained so for 40 years

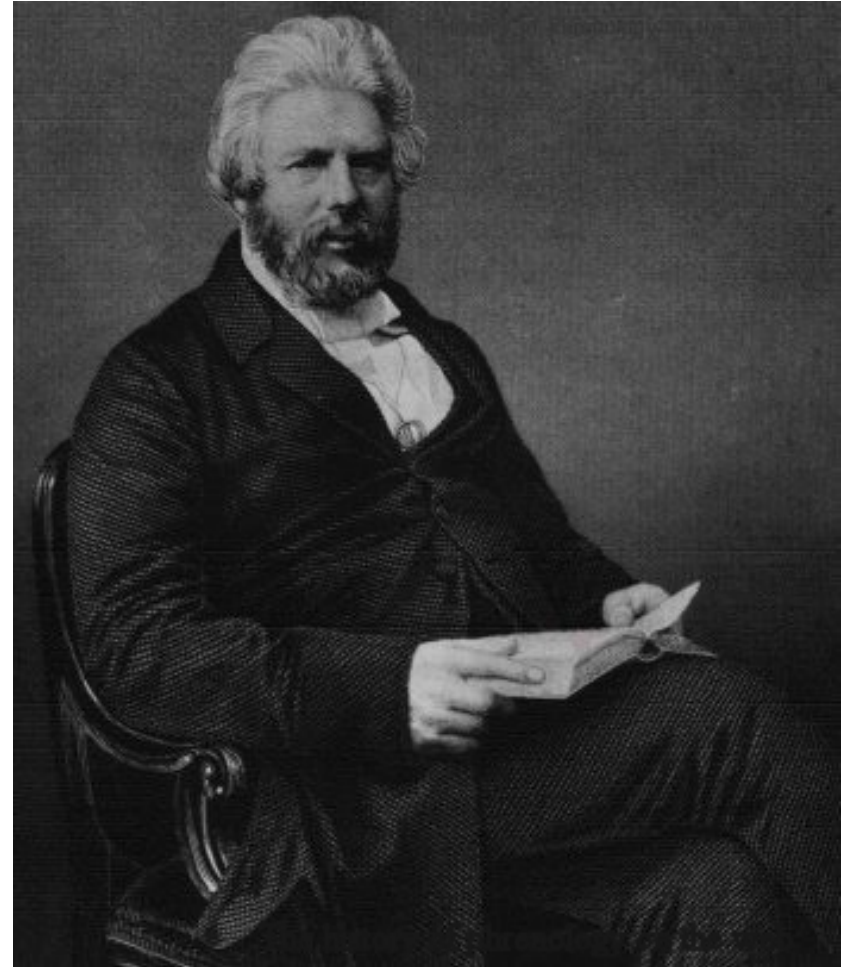
Who wrote it?

Among those suspected of being the author were:

- Geologist Charles Lyell
- Phrenologist George Combe
- Politician Sir Richard Vyvyan
- Prince Albert
- Ada Lovelace

And who actually wrote it?

- Robert Chambers, the well-known Edinburgh publisher
- No naturalist, he was nonetheless plugged into the Edinburgh intellectual scene
- He took elaborate pains to conceal his authorship, which was never leaked in his lifetime



Reviews: (1) The Examiner, 1844

"In this small and unpretending volume, we have found so many great results of knowledge and reflection, that we cannot too earnestly recommend it to the attention of thoughtful men. It is the first attempt that has been made to connect the natural sciences into a history of creation. An attempt which presupposed learning, extensive and various but not the large and liberal wisdom, the profound philosophical suggestion, the lofty spirit of beneficence,; and the exquisite grace of manner which make up the charm of this extraordinary book."

(2) The Edinburgh Review, 1845

A rambling, furious, scathing 85-page review, in which Adam Sedgwick threw pretty much everything he could lay his hands on at the anonymous author of *Vestiges*.

In addition to listing all of the book's many scientific inadequacies, Sedgwick lamented its "rank, unbending and degrading materialism", which – among other things – he feared would lead astray "our glorious matrons and maidens".

Ironically, Sedgwick also speculated that the anonymous author might be a woman – Harriet Martineau, perhaps, or the Countess Ada Lovelace?

Sedgwick's view, privately expressed

"I do from my soul abhor the sentiments, and I believe I could have crushed the book by proving it base, vulgar in spirit, (not so in dress and manner, and there is the mischief of it, but I would have strived to strip off the outer covering and show its inner deformity and foulness,) false, shallow, worthless, and, with the garb of philosophy, starting from principles which are at variance with all sober inductive truth. The sober facts of geology shuffled, so as to play a rogue's game; phrenology (that sinkhole of human folly and prating coxcombry); spontaneous generation transmutation of species and I know not what all to be swallowed, without tasting or trying, like so much horse-physic!! Gross credulity and rank infidelity joined in unlawful marriage, and breeding a ; deformed progeny of unnatural conclusions!"

Adam Sedgwick, Letter to Charles Lyell, 1845

Sedgwick, continued

“If the book be true, the labours of sober induction are in vain religion is a lie; human law is a mass of folly, and a base injustice; morality is moonshine; our labours for the black people of Africa were works of madmen and man and woman are only better beasts!”

Adam Sedgwick, Letter to Charles Lyell, 1845

Why was Sedgwick quite so angry?

- *Vestiges* was incautious
- *Vestiges* contained many errors
- *Vestiges* put controversial ideas in front of the masses
- Sedgwick was striving to hold science and religion together around a particular (catastrophist) compromise. He wanted to reassure the faithful that this compromise was valid by being the first to denounce the *Vestiges*' more radical, naturalistic synthesis
- Maybe Sedgwick sensed that in the end his attempted reconciliation of science and religion could not hold back the rising tide of naturalistic theorizing?

Taking stock again: the situation in 1850

"Conservative" Opposition ("Mosaists")

- "Mosaists", "Scriptural Geologists" and others who rejected evidence of an old earth subject to multiple transformations, in favor of strict adherence to the Scriptures

Mainstream Natural History

- Mainstream naturalists, both "catastrophists" and "uniformitarians", accepted an old earth subject to multiple transformations, but stopped short of attempting a naturalistic account of the appearance of new forms of life over the course of geological time

"Radical" Opposition ("Evolutionists")

- Evolutionists or transformists advocated a fully "naturalistic" account of the history of life, subject to a variety of hypothetical "laws of development"

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Thomas Henry Huxley, looking back in the late-19th century on "The Reception of the Origin of Species"

Coming next....

Voyages of
Discovery:
Darwin and
Wallace



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