Serendipity is not just a lucky coincidence. A new theory of serendipity: nature, emergence and mechanism explores the science of the information process behind this seemingly miraculous phenomenon. The authors present their conceptual investigations into serendipity’s nature and its mechanism by examining interesting real events and stories. Understanding the conditionality and survival drivers of serendipity, individuals or organizations can make better decisions on creating the right environment for facilitating the encounter and attainment of this valuable phenomenon. Flexible theoretical frameworks of mindsponge and 3D principles of creativity can help increase innovation in various fields of business, science, and policymaking.
A New Theory of Serendipity: Nature, Emergence and Mechanism

Quan-Hoang Vuong (Editor)

The Centre for Interdisciplinary Social Research, Phenikaa University

Yen Nghia, Ha Dong, Hanoi 100803, Vietnam
Overview

The book explores the nature, underlying causes, and the information processing mechanism of serendipity. It proposes that natural or social survival demands drive serendipity, and serendipity is conditional on the environment and the mindset, on both individual and collective levels. From Darwin’s evolution theory to Sun Tzu’s war tactics, major innovations throughout human history are unified by this key concept. In the rapidly changing world, information is abundant but rather chaotic. The adaptive power of serendipity allows people to notice treasures within this wild sea, but only for those who understand how it works. To increase the probability of encountering and attaining serendipity, one should employ the mindsponge mechanism and the 3D process of creativity, for without these frameworks, serendipity is truly an elusive target. The book also discusses methods to build environments and cultures rich in navigational and useful information to maximize the chance of finding and capitalizing on serendipity. As a skill, serendipity has a resemblance to how kingfishers observe and hunt their prey.
Preface

Like many curious people, I have long had questions about human creativity, innovativeness, capabilities of creating useful things in life, and sustainability as the most successful animal on this planet we call home.

I cannot say that I have all the answers, but some have been reached along the journey of studying this remarkable capacity of humankind. And this book intends to provide one such answer, specifically about serendipity and its conditions, much linked to the fight for the survival of humankind. Part of the answer arrived when Professor Ngô Bảo Châu – the Vietnamese French mathematician and Fields medalist, currently working at the University of Chicago and serving as Scientific Director of VIASM – told me the critically important period of his research path right before his great accomplishment (see [https://en.wikipedia.org/wiki/Ngô_Bảo_Châu](https://en.wikipedia.org/wiki/Ngô_Bảo_Châu)) in the 2019 Summer.

The book contains much of my thinking throughout the years of researching and contributions from some affiliates, who serve as contributing authors in several chapters. The book has the appearance of an edited volume. Nonetheless, contribution chapters are not separate; they together form only one answer.

I will show in this book that serendipity is a capacity, first and foremost useful for having creative performance. That capacity is conditional on the environment, the preparatory exercises, and the individual capability of managing information arriving at the individual. In light of this, serendipity is not a myth and is no longer the thing solely reserved for geniuses, as we usually think. Everybody can tap this resource for good. As people working in interdisciplinary social
research, we – the editor and contributing authors – have frequently employed this capacity to complete many of our research works; some of them had been thought of as impossible or unthinkable. That says, we have genuine trust in its value and now want to share it with the readers.

I hope that the book is useful and fun, and thank you for spending your time reading it.

Quan-Hoang Vuong
Hanoi, Vietnam
January 18, 2022
Email: qvuong.ulb@gmail.com
Acknowledgment

The editor and contributing authors would like to thank the AISDL research lab at Vuong & Associates (V&A) for providing financial and administrative support. We express our special thanks to Dam Thi Thu Ha, V&A’s Director, artists Vuong Thu Trang and Bui Quang Khiem.

The editor thanks his long-term research collaborator, Professor Nancy K. Napier (Boise State University, Idaho, USA), for her joint effort in developing some key concepts employed in this volume, such as “serendipity as a strategic advantage”, “mindsponge”, and “3D multi-filtering processes.” These concepts serve as the cornerstones of the subsequent academic discussions presented in this volume.
Book references


- 217 -


Harvey, F. (2021). Climate experts warn world leaders 1.5C is ‘real science’, not just talking point. The Guardian. Retrieved from
(January 11, 2022)
https://www.theguardian.com/environment/2021/oct/30/climate-experts-warn-world-leaders-15c-is-real-science-not-just-talking-point


https://thenounproject.com/search/?creator=2129742&q=Penrose&i=881121


La, V.-P., & Vuong, Q.-H. (2019). bayesvl: Visually learning the graphical structure of Bayesian networks and performing MCMC with ‘Stan’. *The Comprehensive R Archive Network (CRAN).*


Nguyen, H.-K. T., Nguyen, T.-H. T., Ho, M.-T., Ho, M.-T., & Vuong, Q.-H. (2019). Scientific publishing: the point of no return. In Q. H. Vuong & T. Trung (Eds.), *The Vietnamese Social Sciences at a Fork in the Road* (pp. 143-162). De Gruyter.


Vuong, Q. H. (2015). Be rich or don’t be sick: estimating Vietnamese patients’ risk of falling into destitution. *SpringerPlus, 4*(1), 529.


Vuong, Q.-H., Ho, M.-T., Nguyen, H.-K. T., Vuong, T.-T., Tran, T., Hoang, K.-L., ... La, V.-P. (2020). On how religions could accidentally incite lies and violence: folktales as a cultural transmitter. Palgrave Communications, 6, 82.


Vuong, Q. H. (2020). The rise of preprints and their value in social sciences and humanities. Science Editing, 7(1), 70-72.


## Index

### A

<table>
<thead>
<tr>
<th>Term</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aaron Kellner</td>
<td>141</td>
</tr>
<tr>
<td>academia</td>
<td>6, 132, 133, 196, 197</td>
</tr>
<tr>
<td>accidental Discovery</td>
<td>16, 19</td>
</tr>
<tr>
<td>African art</td>
<td>56, 57</td>
</tr>
<tr>
<td>African totem</td>
<td>56</td>
</tr>
<tr>
<td>Albert Einstein</td>
<td>24, 166</td>
</tr>
<tr>
<td>Alexander Fleming</td>
<td>68</td>
</tr>
<tr>
<td>Alexander Grothendieck</td>
<td>200</td>
</tr>
<tr>
<td>ammonia-soda process</td>
<td>3, 165, 168</td>
</tr>
<tr>
<td>analytic serendipity</td>
<td>25</td>
</tr>
<tr>
<td>ancestors</td>
<td>3, 68, 77, 79, 81</td>
</tr>
<tr>
<td>Arabian merchant</td>
<td>80</td>
</tr>
<tr>
<td>Arabian Peninsula</td>
<td>81</td>
</tr>
<tr>
<td>Archimedes</td>
<td>3, 58, 178</td>
</tr>
<tr>
<td>ASEAN Conference for Young Scientists</td>
<td>44, 45</td>
</tr>
<tr>
<td>Auralist</td>
<td>28</td>
</tr>
<tr>
<td>autonomy</td>
<td>27</td>
</tr>
<tr>
<td>Avenue Franklin Roosevelt</td>
<td>165</td>
</tr>
<tr>
<td>bibliometrics</td>
<td>6, 13, 14</td>
</tr>
<tr>
<td>Bidens pilosa</td>
<td>49</td>
</tr>
<tr>
<td>biological survival</td>
<td>78</td>
</tr>
<tr>
<td>birds</td>
<td>44</td>
</tr>
<tr>
<td>bisociation</td>
<td>29, 31</td>
</tr>
<tr>
<td>blockchain</td>
<td>169</td>
</tr>
<tr>
<td>Blue Period</td>
<td>56</td>
</tr>
<tr>
<td>Britain</td>
<td>69</td>
</tr>
<tr>
<td>Brussels</td>
<td>165</td>
</tr>
<tr>
<td>buffer zone</td>
<td>54, 95, 114, 122, 124</td>
</tr>
<tr>
<td>Bui Quang Khiem</td>
<td>IV, III, 12</td>
</tr>
<tr>
<td>-</td>
<td>62, 74, 108, 136, 137, 140, 174</td>
</tr>
<tr>
<td>Bushian serendipity</td>
<td>27</td>
</tr>
<tr>
<td>business</td>
<td>3, 5, 13, 15, 84, 85, 120, 121, 166, 169, 175</td>
</tr>
<tr>
<td>cancer</td>
<td>20</td>
</tr>
</tbody>
</table>

### B

<table>
<thead>
<tr>
<th>Term</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>buffered zone</td>
<td>54, 95, 114, 122, 124</td>
</tr>
<tr>
<td>Bushian serendipity</td>
<td>27</td>
</tr>
<tr>
<td>business</td>
<td>3, 5, 13, 15, 84, 85, 120, 121, 166, 169, 175</td>
</tr>
<tr>
<td>cancer</td>
<td>20</td>
</tr>
</tbody>
</table>
Casuarina leaves · 49 ·
Cédric Villani · 198 ·
Centre for Interdisciplinary
Social Research · 185 ·
Charles Darwin · 2 ·, 78 ·
cheese · 3 ·, 80 ·
chimpanzees · 81 ·
China · 63 ·, 80 ·, 119 ·, 169 ·
cicada and cricket collecting
[bắt ve và đọ dè] · 66 ·
civilization · 1 ·, 102 ·, 184 ·
climate change · 46 ·, 83 ·
coffee · 3 ·, 81 ·, 83 ·, 84 ·,
- 120 ·
coincidence · 4 ·, 23 ·, 42 ·, 82 ·
competitive advantage · 5 ·,
75 ·, 85 ·, 148 ·, 150 ·
conceptual structure · 14 ·
conditions · 4 ·, 7 ·, 29 ·,
41 ·, 51 ·, 57 ·, 69 ·, 70 ·,
- 82 ·, 91 ·, 96 ·, 97 ·, 100 ·
-, 101 ·, 102 ·, 103 ·, 109 ·
-, 116 ·, 117 ·, 121 ·, 123 ·,
-, 124 ·, 125 ·, 142 ·, 144 ·
-, 148 ·, 162 ·, 164 ·, 165 ·,
-, 166 ·, 168 ·
consciousness · 4 ·
Constantin Carathéodory Prize
· 200 ·
control · 3 ·, 4 ·, 79 ·, 84 ·
controlled sloppiness · 27 ·
cooperation · 2 ·, 164 ·
COP26 · 46 ·
cost-benefit judgment · 98 ·
Covid-19 pandemic · 3 ·, 68 ·,
- 69 ·
creativity · 20 ·, 22 ·, 54 ·,
- 69 ·, 72 ·, 91 ·, 95 ·, 116 ·
-, 122 ·
crocodiles · 77 ·
cryptocurrencies · 169 ·
Cubism · 57 ·
Cyanobacteria · 77 ·
Czech Republic · 65 ·

D

Dam Thu Ha · 90 ·, 130 ·,
214 ·
Darwinist theory of evolution ·
68 ·
DC Programming · 201 ·
Decision No. 1483/QD-TTg ·
202 ·, 211 ·, 228 ·
destiny · 23 ·
diet · 3 ·
Dijon · 41 ·, 64 ·
disasters · 83 ·
disciplined process · 93 ·, 98 ·,
-, 102 ·, 103 ·, 112 ·, 114 ·
-, 115 ·, 116 ·, 117 ·, 121 ·,
-, 149 ·, 150 ·
discovery · 8 ·, 20 ·, 22 ·,
23 ·, 27 ·, 29 ·, 58 ·, 65 ·,
- 85 -, - 103 -, - 115 -, - 119 -, - 125 -, - 143 -, - 144 -, - 147 -
diseases · - 1 -
Đỗ Tất Lợi · - 63 -
drug discovery · - 20 -
Duke of Brabant · - 165 -

E

Earth · - 1 -, - 2 -, - 77 -, - 83 -
East and Southeast Asian
countries · - 81 -
Eiffel Tower · - 112 -
Elizabeth Kolbert · - 2 -, - 77 -
entrepreneurship · - 33 -, - 125 -
, - 171 -, - 196 -, - 197 -, - 218 -
environmental destruction · - 2 -,
- 83 -
environmental stress · - 2 -, - 44 -
, - 55 -, - 83 -, - 170 -
enzyme papain · - 141 -, - 144 -
Ernest Rutherford · - 166 -
Ernest Solvay · - 3 -, - 164 -, -
165 -, - 166 -
Erwin Schrödinger · - 167 -
European Climate Foundation
· - 46 -
Existential threats · - 1 -, - 68 -, -
77 -
experiments · - 27 -, - 147 -, -
150 -, - 162 -

F

fate · - 4 -, - 23 -
Fields Medalist · - 198 -, - 200 -
financial frauds · - 170 -
fire · - 3 -, - 8 -, - 79 -
floppy-eared-rabbit · - 7 -, - 103 -
, - 125 -, - 141 -, - 142 -, - 145 -
, - 146 -, - 147 -, - 148 -, - 149 -
, - 150 -
flowerpecker · - 50 -
food · - 1 -, - 3 -, - 42 -, - 68 -, -
79 -, - 80 -, - 81 -, - 101 -, - 162 -
food shortages · - 1 -
France · - 41 -, - 54 -, - 64 -, - 112 -

G

Geneva · - 64 -
global optimization · - 200 -
global-scale inequality · - 46 -
Great Britain · - 69 -

H

Hanoi · - 44 -, - 48 -, - 49 -, - 53 -
happenstance · - 29 -, - 207 -
Hendrik Lorentz · - 166 -
Henri Poincaré · - 166 -
Herbert Spencer · - 2 -, - 78 -, -
82 -

- 235 -
history of Vietnam
mathematics · - 200 -
Hoàng Tụy · - 200 - , - 202 -
*Homo erectus* · - 77 -
*Homo habilis* · - 77 -
*Homo sapiens* · - 1 - , - 77 - , - 168 -
Horace Walpole · - 22 - , - 23 -
Howard Schultz · - 83 - , - 84 - , - 120 - , - 123 -
human history · - 1 - , - 70 - , - 80 -
human society · - 1 - , - 2 - , - 5 - , - 68 - , - 78 - , - 79 - , - 82 - , - 85 - , - 168 - , - 170 - , - 185 -

I

Iberian sculptures · - 56 -
identities · - 82 -
ideologies · - 75 - , - 82 - , - 170 -
Industrial Revolution · - 8 - , - 69 -
industrialism · - 70 -
information density · - 119 -
information particles · - 117 -
Information-seeking behaviors · - 15 -
innovation · - 1 - , - 2 - , - 4 - , - 20 - , - 22 - , - 54 - , - 57 - , - 70 - , - 72 - , - 78 - , - 85 - , - 120 - , - 162 - , - 167 - , - 168 - , - 169 -
inventory structure · - 14 - , - 15 -
intention · - 4 - , - 26 - , - 146 - , - 147 -
internal conflicts · - 1 - , - 2 - , - 83 -
International Solvay Institute for Chemistry · - 167 -
International Solvay Institute for Physics · - 167 -
intraspecific conflicts · - 2 - , - 70 -
Isaac Newton · - 3 - , - 58 -
Israel · - 80 -

J

Jordan Belfort · - 169 -
Juan Eduardo Cirlot · - 57 -

K

Karlštejn Castle · - 65 -
karma · - 23 -
King of the Belgians · - 165 -
soul-touching · - 101 · - 102 · - 131 · - 132 · - 138 · - 170 · - 194 · SSHPA · - 197 · - 198 · - 199 · - 203 · - 205 · Standford University · - 69 · Staphylococcus bacteria · - 68 · staple foods · - 3 · - 80 · Starbucks · - 83 · - 85 · - 120 · - 123 · Stephanian serendipity · - 27 · strategic advantage · - 5 · - 23 · strategies · - 3 · - 70 · - 183 · subjective sphere of influence · - 110 · suicidality · - 76 · Sun Tzu · - 3 · - 169 · survival of the fittest · - 2 · - 78 · - 82 · survival skill · - 7 · - 31 · - 63 · - 70 · - 83 · - 91 · - 101 · - 168 · Switzerland · - 64 ·

The Art of War · - 3 · - 70 · - 169 · the elixir of life · - 119 · the National Key Program on Mathematics Development · - 202 · The Oscars · - 169 · the paradox of control · - 17 · the sixth mass extinction · - 77 · The Wolf of Wall Street · - 169 · Thomas Malthus · - 82 · Three Princes of Serendip · - 22 · trademarks · - 20 · trust evaluator · - 95 · Tuy cuts · - 200 ·

unexpected information · - 23 · - 24 · - 26 · - 92 · - 96 · - 97 · - 98 · - 101 · - 102 · - 103 · - 109 · - 110 · - 112 · - 114 · - 115 · - 116 · - 117 · - 119 · - 121 · - 122 · - 124 · - 142 · - 144 · - 145 · - 150 · - 158 · unexpectedness · - 23 · - 27 · - 29 · - 41 · - 96 · - 109 · - 110 · - 119 · - 121 · - 123 · - 124 · - 143 · United States · - 112 · University of Chicago · - 172 · - 198 · - 225 ·

T

technology · - 2 · - 3 · - 19 · Temporal serendipity · - 25 · the 3D information process of creativity · - 6 · - 92 · - 93 · - 97 · - 109 · - 112 · - 125 · the 3D principles of creativity · - 109 ·
Upper Paleolithic · - 80 -
useful information · - 3 -, - 7 -, -
43 -, - 70 -, - 71 -, - 76 -, - 86 -,
- 103 -, - 104 -, - 113 -, - 114 -,
- 116 -, - 117 -, - 119 -, - 121 -,
- 157 -, - 158 -, - 159 -, - 162 -,
- 163 -, - 164 -, - 170 -, - 185 -

Washington Monument · - 112 -
wastewater · - 44 -, - 45 -, - 46 -, -
51 -, - 101 -
Web of Science · - 13 -, - 14 -
Werner Heisenberg · - 167 -
West Asia · - 80 -
Where’s Wally · - 111 -
wisdom · - 32 -, - 54 -, - 101 -, -
104 -, - 114 -, - 115 -, - 116 -, -
117 -, - 123 -, - 124 -, - 150 -, -
163 -
World War I · - 56 -
World War II · - 56 -, - 68 -

V

vaccine · - 3 -, - 69 -
video games · - 170 -
Vietnam · - 46 -, - 63 -, - 185 -
Vietnam Institute for
Advanced Study in
Mathematics (VIASM) · - 198 -
Vietnam Ministry of Education
and Training · - 199 -
Vietnam Prime Minister Pham
Minh Chinh · - 46 -
Vietnam’s National
Foundation for Science and
Technology Development
(NAFOSTED) · - 198 -
VOSviewer · - 14 -

Y

yogurt · - 3 -, - 80 -

孙

孙子 · - 3 -
孙子兵法 · - 3 -

火

火药/火薬 · - 119 -

车

车前草 · - 63 -, - 65 -