



NEW MODEL OF CONSCIOUSNESS

RALPH ABRAHAM

skeptiko.com

1
00:00:10,940 --> 00:00:08,320
on this episode of skeptic Oh

2
00:00:15,020 --> 00:00:10,950
mathematician and chaos theory pioneer

3
00:00:17,900 --> 00:00:15,030
dr. Ralph Abraham chaos theory presents

4
00:00:20,779 --> 00:00:17,910
a lot of problems when it comes to

5
00:00:23,120 --> 00:00:20,789
measurement which is really the the nuts

6
00:00:26,599 --> 00:00:23,130
and bolts of science in other words if

7
00:00:29,689 --> 00:00:26,609
you know the state of the world exactly

8
00:00:31,939 --> 00:00:29,699
well almost exactly with a slight error

9
00:00:34,610 --> 00:00:31,949
then you cannot make a long-term

10
00:00:37,580 --> 00:00:34,620
prediction so we don't know the global

11
00:00:40,160 --> 00:00:37,590
climate warming for example on the basis

12
00:00:43,549 --> 00:00:40,170
of mathematical models because the

13
00:00:46,760 --> 00:00:43,559

mathematical models are chaotic in this

14

00:00:48,560 --> 00:00:46,770

technical sense that the flap of a

15

00:00:49,790 --> 00:00:48,570

butterfly wing would make a huge

16

00:00:53,689 --> 00:00:49,800

difference in the prediction of the

17

00:00:55,580 --> 00:00:53,699

model long term now as we take this kind

18

00:00:58,459 --> 00:00:55,590

of mathematical model for complex

19

00:01:00,040 --> 00:00:58,469

systems upstairs into the realm of

20

00:01:02,810 --> 00:01:00,050

consciousness and then obviously

21

00:01:05,230 --> 00:01:02,820

consciousness has a lot of parts for one

22

00:01:07,940 --> 00:01:05,240

thing if you think of the individual

23

00:01:10,789 --> 00:01:07,950

consciousness of six billion people on

24

00:01:13,850 --> 00:01:10,799

the planet being somehow knitted

25

00:01:16,520 --> 00:01:13,860

together through communication by

26

00:01:21,080 --> 00:01:16,530

reading writing cell phones worldwide

27

00:01:23,060 --> 00:01:21,090

web etc into a complex system then

28

00:01:25,130 --> 00:01:23,070

obviously that complex system is going

29

00:01:38,230 --> 00:01:25,140

to have very chaotic behavior

30

00:01:42,230 --> 00:01:40,580

welcome to skeptic aware we explore

31

00:01:44,510 --> 00:01:42,240

controversial science with leading

32

00:01:46,730 --> 00:01:44,520

researchers thinkers and their critics

33

00:01:47,420 --> 00:01:46,740

I'm your host Alex Karras and on this

34

00:01:50,120 --> 00:01:47,430

episode

35

00:01:53,240 --> 00:01:50,130

dr. Ralph Abraham joins us to talk about

36

00:01:56,030 --> 00:01:53,250

chaos theory mathematic and building a

37

00:01:57,770 --> 00:01:56,040

better model of consciousness now you

38

00:01:59,840 --> 00:01:57,780

may remember that we heard from Ralph

39

00:02:01,940 --> 00:01:59,850

just a few episodes ago when we looked

40

00:02:04,010 --> 00:02:01,950

back at the dialogues between Terence

41

00:02:06,620 --> 00:02:04,020

Mckenna Rupert Sheldrake and Ralph

42

00:02:07,999 --> 00:02:06,630

Abraham but I was so intrigued by some

43

00:02:10,699 --> 00:02:08,009

of the things that he had to say that I

44

00:02:14,570 --> 00:02:10,709

wanted to contact him and get a full

45

00:02:16,880 --> 00:02:14,580

interview and I did and here it is today

46

00:02:19,250 --> 00:02:16,890

we welcome dr. Ralph Abraham to skeptic

47

00:02:21,080 --> 00:02:19,260

Oh dr. Abraham is a very highly regarded

48

00:02:23,030 --> 00:02:21,090

professor of mathematics at the

49

00:02:25,850 --> 00:02:23,040

University of California at Santa Cruz

50

00:02:28,160 --> 00:02:25,860

and a pioneer in the area of chaos

51
00:02:31,910 --> 00:02:28,170
theory now if you had a chance to listen

52
00:02:33,949 --> 00:02:31,920
to episode 196 of skeptic oh and our

53
00:02:36,800 --> 00:02:33,959
look back at those very interesting

54
00:02:39,949 --> 00:02:36,810
dialogues between Terence Mckenna Rupert

55
00:02:42,350 --> 00:02:39,959
Sheldrake and Ralph Abraham then you got

56
00:02:44,840 --> 00:02:42,360
a sampling of some of the deep thinking

57
00:02:46,790 --> 00:02:44,850
and the range of topics that this guy

58
00:02:48,590 --> 00:02:46,800
gets into so I thought it'd be

59
00:02:50,720 --> 00:02:48,600
interesting to have a full interview

60
00:02:53,390 --> 00:02:50,730
with them and I'm just delighted that

61
00:02:56,259 --> 00:02:53,400
you agreed to join me thanks so much and

62
00:02:58,850 --> 00:02:56,269
welcome to skeptic oh happy to be here

63
00:03:02,810 --> 00:02:58,860

well you know where I thought we'd start

64

00:03:05,540 --> 00:03:02,820

is math and mathematics because it's

65

00:03:09,470 --> 00:03:05,550

obviously been a big part of your life

66

00:03:10,970 --> 00:03:09,480

and in listening to some of the

67

00:03:13,610 --> 00:03:10,980

interviews you've done I was fascinated

68

00:03:17,440 --> 00:03:13,620

it's just the way you talk about your

69

00:03:19,310 --> 00:03:17,450

personal connection to mathematics and

70

00:03:21,050 --> 00:03:19,320

mathematical thinking because I think

71

00:03:23,930 --> 00:03:21,060

you know as someone who isn't in the

72

00:03:25,550 --> 00:03:23,940

field it's almost like gosh what is this

73

00:03:28,340 --> 00:03:25,560

guy really talking about what is it

74

00:03:31,850 --> 00:03:28,350

about math can you maybe get us a little

75

00:03:33,860 --> 00:03:31,860

bit closer to the mathematical mind in

76

00:03:38,240 --> 00:03:33,870

general and maybe how how a

77

00:03:41,410 --> 00:03:38,250

mathematician thinks yes okay I fell in

78

00:03:44,330 --> 00:03:41,420

love with mathematics around age 15 and

79

00:03:48,050 --> 00:03:44,340

since then until the present moment has

80

00:03:50,660 --> 00:03:48,060

really been the dominant thing and my

81

00:03:52,730 --> 00:03:50,670

frustration is that so

82

00:03:56,240 --> 00:03:52,740

few people are willing to think

83

00:03:58,309 --> 00:03:56,250

mathematically are afraid of the

84

00:04:00,440 --> 00:03:58,319

language of mathematics have had a bad

85

00:04:03,589 --> 00:04:00,450

experience with mathematics in school or

86

00:04:09,340 --> 00:04:03,599

for whatever reason haven't been

87

00:04:12,410 --> 00:04:09,350

rendered and unable to go into this

88

00:04:14,390 --> 00:04:12,420

space so when I tried to talk about

89

00:04:18,470 --> 00:04:14,400

whatever or since I'm thinking about it

90

00:04:22,810 --> 00:04:18,480

mathematically and having a practical

91

00:04:25,370 --> 00:04:22,820

problem in communicating so after

92

00:04:30,010 --> 00:04:25,380

beginning in mathematics at some years

93

00:04:33,770 --> 00:04:30,020

passed before I discovered this this

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00:04:38,150 --> 00:04:33,780

illness called mathematical anxiety or

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00:04:41,360 --> 00:04:38,160

the math avoidance reflex and this is by

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00:04:44,780 --> 00:04:41,370

now very well acknowledged in education

97

00:04:47,450 --> 00:04:44,790

circles that something is wrong with the

98

00:04:51,680 --> 00:04:47,460

way mathematics is taught with the

99

00:04:53,420 --> 00:04:51,690

result that very clever people go

100

00:04:55,700 --> 00:04:53,430

through school and don't quite get it

101
00:04:57,860 --> 00:04:55,710
even if later on they get a Nobel Prize

102
00:05:01,130 --> 00:04:57,870
in Physics or something there are just a

103
00:05:05,060 --> 00:05:01,140
few people that for some some personal

104
00:05:08,900 --> 00:05:05,070
accidental reason escape the handicap of

105
00:05:10,880 --> 00:05:08,910
math anxiety so I was lucky I think

106
00:05:15,010 --> 00:05:10,890
because of my mother's interest in

107
00:05:18,140 --> 00:05:15,020
mathematics that I escaped this stigma

108
00:05:21,740 --> 00:05:18,150
anyway mathematical thinking is in any

109
00:05:25,540 --> 00:05:21,750
case somewhat difficult because it is

110
00:05:28,640 --> 00:05:25,550
less related to ordinary experience than

111
00:05:32,920 --> 00:05:28,650
scientific thinking artistic thinking

112
00:05:36,409 --> 00:05:32,930
and and other types of intelligence

113
00:05:39,620 --> 00:05:36,419

here's an interesting quote of yours

114

00:05:41,630 --> 00:05:39,630

you said mathematics is completely

115

00:05:44,300 --> 00:05:41,640

separate in its philosophical outlook

116

00:05:46,629 --> 00:05:44,310

and in the personality the people who

117

00:05:49,820 --> 00:05:46,639

pursue it who are sometimes

118

00:05:51,050 --> 00:05:49,830

diametrically opposite to scientists

119

00:05:53,659 --> 00:05:51,060

what did you mean I think a lot of

120

00:05:55,550 --> 00:05:53,669

people would find that surprising well

121

00:05:59,060 --> 00:05:55,560

it's surprising because for some reason

122

00:06:03,080 --> 00:05:59,070

math and science had been linked in the

123

00:06:04,460 --> 00:06:03,090

popular imagination as closely related

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00:06:07,640 --> 00:06:04,470

areas

125

00:06:09,790 --> 00:06:07,650

thought so in the ecology of ideas there

126

00:06:13,180 --> 00:06:09,800

are the different subjects like

127

00:06:16,700 --> 00:06:13,190

anthropology history and so on these

128

00:06:19,030 --> 00:06:16,710

domains can be thought of as nations in

129

00:06:22,370 --> 00:06:19,040

a kind of a world geometry of thought

130

00:06:24,730 --> 00:06:22,380

popularly people think of math and

131

00:06:27,620 --> 00:06:24,740

science being in in the same corner

132

00:06:30,950 --> 00:06:27,630

maybe because it's true that science

133

00:06:32,840 --> 00:06:30,960

some kinds of styles require a lot of

134

00:06:36,580 --> 00:06:32,850

mathematics other kinds don't

135

00:06:39,530 --> 00:06:36,590

for example the taxonomy of plants how

136

00:06:41,330 --> 00:06:39,540

different plants can be recognized by

137

00:06:44,930 --> 00:06:41,340

their physical characteristics and

138

00:06:46,730 --> 00:06:44,940

sorting into different bins it doesn't

139

00:06:48,530 --> 00:06:46,740

really require very much mathematics it

140

00:06:50,450 --> 00:06:48,540

requires a lot of science which is you

141

00:06:54,260 --> 00:06:50,460

have to be a careful observer of nature

142

00:06:56,510 --> 00:06:54,270

and take good notes and learn the

143

00:06:59,360 --> 00:06:56,520

literature in the field and all that so

144

00:07:02,750 --> 00:06:59,370

there is a letter submit a certain

145

00:07:04,400 --> 00:07:02,760

overlap between math and science but I

146

00:07:06,740 --> 00:07:04,410

maintain that they are fundamentally

147

00:07:09,620 --> 00:07:06,750

different in the outlook and the kind of

148

00:07:11,840 --> 00:07:09,630

people that pursue them in fact many

149

00:07:13,790 --> 00:07:11,850

times people ask if I'm a scientist or

150

00:07:16,340 --> 00:07:13,800

they ask me a question about science I

151
00:07:18,740 --> 00:07:16,350
have to say well I know because I'm not

152
00:07:20,930 --> 00:07:18,750
a scientist and not only I haven't

153
00:07:23,030 --> 00:07:20,940
studied that but you know I've read

154
00:07:25,340 --> 00:07:23,040
about it but I don't really get it

155
00:07:25,909 --> 00:07:25,350
because my way of thinking is it's so

156
00:07:27,980 --> 00:07:25,919
different

157
00:07:31,520 --> 00:07:27,990
fascinating let's dive in there a little

158
00:07:34,340 --> 00:07:31,530
bit as a mathematician and as someone

159
00:07:36,920 --> 00:07:34,350
who's interested in consciousness how

160
00:07:40,730 --> 00:07:36,930
might those go forward together how can

161
00:07:43,280 --> 00:07:40,740
the models and model building abilities

162
00:07:47,770 --> 00:07:43,290
of the mathematician aid us in

163
00:07:49,780 --> 00:07:47,780

understanding this consciousness enigma

164

00:07:52,990 --> 00:07:49,790

well exactly

165

00:07:58,490 --> 00:07:53,000

model building I think is the key idea

166

00:08:00,440 --> 00:07:58,500

where mathematics has assisted the

167

00:08:03,860 --> 00:08:00,450

development of science and the history

168

00:08:08,090 --> 00:08:03,870

of science of the past 2,000 years let

169

00:08:12,190 --> 00:08:08,100

us say from my view is largely in in

170

00:08:14,940 --> 00:08:12,200

model building however there's a certain

171

00:08:17,760 --> 00:08:14,950

very narrow

172

00:08:20,400 --> 00:08:17,770

model which has for a long time

173

00:08:22,950 --> 00:08:20,410

predominated as the successful model

174

00:08:27,150 --> 00:08:22,960

building strategy in the sciences and

175

00:08:29,100 --> 00:08:27,160

this has to do with those fancy formulas

176

00:08:31,340 --> 00:08:29,110

that you see no low prize winners are

177

00:08:35,490 --> 00:08:31,350

writing on the blackboard in their Nobel

178

00:08:40,550 --> 00:08:35,500

lectures and and so on a lot of symbol

179

00:08:44,070 --> 00:08:40,560

symbolic equations based on algebra and

180

00:08:49,850 --> 00:08:44,080

calculus mathematical analysis and so on

181

00:08:52,410 --> 00:08:49,860

and quantum mechanics general relativity

182

00:08:58,190 --> 00:08:52,420

electricity and magnetism these major

183

00:09:00,660 --> 00:08:58,200

branches of physics have a mathematical

184

00:09:02,790 --> 00:09:00,670

foundation like Maxwell's equation

185

00:09:09,210 --> 00:09:02,800

Einstein equation the Schrodinger

186

00:09:11,070 --> 00:09:09,220

equation these equations belong to an

187

00:09:14,970 --> 00:09:11,080

area of mathematics which is nowadays

188

00:09:18,030 --> 00:09:14,980

seen as being a very small area so we

189

00:09:20,100 --> 00:09:18,040

have let us say in global analysis

190

00:09:24,170 --> 00:09:20,110

so-called a dynamical Systems Theory we

191

00:09:26,580 --> 00:09:24,180

have completely enormous ly more general

192

00:09:29,040 --> 00:09:26,590

strategies for building models in which

193

00:09:31,980 --> 00:09:29,050

there are no equations and which can

194

00:09:34,410 --> 00:09:31,990

only be explored with computer

195

00:09:36,300 --> 00:09:34,420

simulation and in fact there are

196

00:09:40,140 --> 00:09:36,310

computer simulations for which the model

197

00:09:43,080 --> 00:09:40,150

isn't even known as in neural neural

198

00:09:46,050 --> 00:09:43,090

network theory for example we we get the

199

00:09:48,420 --> 00:09:46,060

computer to improve its model maybe we

200

00:09:50,220 --> 00:09:48,430

give a starting point and then we get it

201
00:09:52,860 --> 00:09:50,230
to improve the model by testing its

202
00:09:56,340 --> 00:09:52,870
behavior if it does the job well st.

203
00:09:57,840 --> 00:09:56,350
crashing English language or the human

204
00:09:59,970 --> 00:09:57,850
genome or something like that within

205
00:10:03,570 --> 00:09:59,980
give it a carrot and otherwise we'd give

206
00:10:06,630 --> 00:10:03,580
it a slop and so a learning algorithm

207
00:10:09,750 --> 00:10:06,640
produces a working program that no human

208
00:10:12,150 --> 00:10:09,760
has ever seen exist in the computer and

209
00:10:14,760 --> 00:10:12,160
it is a successful model for a whole

210
00:10:17,580 --> 00:10:14,770
branch of science which is not based on

211
00:10:19,560 --> 00:10:17,590
the classical mathematical methods of

212
00:10:22,920 --> 00:10:19,570
ordinary and partial differential

213
00:10:26,790 --> 00:10:22,930

equations the binomial theorem factoring

214

00:10:28,770 --> 00:10:26,800

polynomials trigonometric functions

215

00:10:31,020 --> 00:10:28,780

Fourier analysis and all

216

00:10:33,600 --> 00:10:31,030

enormous and wonderful machinery of

217

00:10:36,120 --> 00:10:33,610

classical mathematics which provided the

218

00:10:38,580 --> 00:10:36,130

mathematical be essential framework and

219

00:10:41,970 --> 00:10:38,590

foundation for all the current branches

220

00:10:44,400 --> 00:10:41,980

of physics so we have more general since

221

00:10:47,610 --> 00:10:44,410

especially the computer revolution we

222

00:10:48,150 --> 00:10:47,620

have more and better methods of model

223

00:10:50,780 --> 00:10:48,160

building

224

00:10:54,720 --> 00:10:50,790

I think of fractal geometry for example

225

00:10:57,720 --> 00:10:54,730

you know Galileo said he was you know

226

00:11:02,550 --> 00:10:57,730

religious Christian kind of person in

227

00:11:05,670 --> 00:11:02,560

his time around the year 1600 and he

228

00:11:08,820 --> 00:11:05,680

said if you if you want to know the mind

229

00:11:11,670 --> 00:11:08,830

of God then you have to read the book

230

00:11:14,370 --> 00:11:11,680

that God wrote and that book is nature

231

00:11:16,320 --> 00:11:14,380

and nature is written God read wrote it

232

00:11:19,680 --> 00:11:16,330

in the language of mathematics and by

233

00:11:22,200 --> 00:11:19,690

that I mean he writes circles triangles

234

00:11:25,620 --> 00:11:22,210

line segments and so on in other words

235

00:11:28,260 --> 00:11:25,630

all the paraphernalia of geometry known

236

00:11:31,010 --> 00:11:28,270

in his time that he imagined that that

237

00:11:33,780 --> 00:11:31,020

was the language of nature suddenly

238

00:11:36,180 --> 00:11:33,790

computer evolution comes along suddenly

239

00:11:38,220 --> 00:11:36,190

after that another equally important

240

00:11:40,500 --> 00:11:38,230

revolution the computer graphic

241

00:11:42,360 --> 00:11:40,510

revolution suddenly it's like a

242

00:11:45,180 --> 00:11:42,370

microscope or a telescope has been

243

00:11:48,510 --> 00:11:45,190

invented in which we can look into a

244

00:11:51,000 --> 00:11:48,520

certain kind of shape and computer

245

00:11:53,490 --> 00:11:51,010

simulation and discover fractals and

246

00:11:55,800 --> 00:11:53,500

then we study we see all kinds of

247

00:12:00,870 --> 00:11:55,810

beautiful colored fractal patterns that

248

00:12:04,079 --> 00:12:00,880

are self-similar in all scales and with

249

00:12:05,970 --> 00:12:04,089

that enlightenment we look away from the

250

00:12:09,240 --> 00:12:05,980

computer screen and again in nature and

251

00:12:11,700 --> 00:12:09,250

there we see the litter on the forest

252

00:12:13,470 --> 00:12:11,710

floor we see the shape of clouds and

253

00:12:15,930 --> 00:12:13,480

mountain scene in silhouette we see

254

00:12:18,030 --> 00:12:15,940

fractals we see that nature is actually

255

00:12:21,570 --> 00:12:18,040

a book written in a language that

256

00:12:23,250 --> 00:12:21,580

Galileo didn't know he had no idea and

257

00:12:25,670 --> 00:12:23,260

since he didn't know and he couldn't see

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00:12:28,320 --> 00:12:25,680

these things in nature were invisible

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00:12:30,210 --> 00:12:28,330

until the cognitive apparatus was

260

00:12:32,430 --> 00:12:30,220

revealed for the first time into the

261

00:12:35,520 --> 00:12:32,440

collective human mind and then we look

262

00:12:40,980 --> 00:12:35,530

in nature and we see a whole lot more in

263

00:12:42,600 --> 00:12:40,990

in this way we see an example of model

264

00:12:45,329 --> 00:12:42,610

building in nature is so sick

265

00:12:47,790 --> 00:12:45,339

oh but it can make images of nature in

266

00:12:50,310 --> 00:12:47,800

science fiction films and and the like

267

00:12:53,250 --> 00:12:50,320

that are almost indistinguishable on the

268

00:12:56,970 --> 00:12:53,260

resolution of a photograph from the real

269

00:12:58,800 --> 00:12:56,980

thing and this model building is all

270

00:13:01,019 --> 00:12:58,810

going forward with a kind of model

271

00:13:03,690 --> 00:13:01,029

building technology a branch of

272

00:13:06,269 --> 00:13:03,700

mathematics fractal geometry that was

273

00:13:09,090 --> 00:13:06,279

totally unknown before the Year 1975

274

00:13:11,220 --> 00:13:09,100

yeah that's that's amazing and let's

275

00:13:15,030 --> 00:13:11,230

dive into that all the way into it and

276

00:13:16,980 --> 00:13:15,040

talk about God if you will because on

277

00:13:20,060 --> 00:13:16,990

the last episode of skeptic oh we had a

278

00:13:22,740 --> 00:13:20,070

chance to talk with neuroscientist and

279

00:13:25,110 --> 00:13:22,750

parapsychology researcher dr. Diane

280

00:13:26,940 --> 00:13:25,120

Powell and she's investigating some of

281

00:13:29,519 --> 00:13:26,950

these questions of consciousness by

282

00:13:31,319 --> 00:13:29,529

looking at and working with savants

283

00:13:33,329 --> 00:13:31,329

which i think is very interesting and

284

00:13:35,460 --> 00:13:33,339

maybe has some parallels but anyways we

285

00:13:37,680 --> 00:13:35,470

got to talking about consciousness and

286

00:13:39,630 --> 00:13:37,690

whether there was some order of

287

00:13:41,310 --> 00:13:39,640

consciousness which of course is really

288

00:13:43,889 --> 00:13:41,320

just kind of an intellectual way of

289

00:13:45,449 --> 00:13:43,899

getting back to the Galileo thing and

290

00:13:47,220 --> 00:13:45,459

talking about God really if there's an

291

00:13:50,730 --> 00:13:47,230

ordered consciousness but anyways I

292

00:13:52,560 --> 00:13:50,740

asked her whether she thought that her

293

00:13:54,600 --> 00:13:52,570

conclusion was that there was some kind

294

00:13:58,380 --> 00:13:54,610

of hierarchical order to consciousness

295

00:14:00,900 --> 00:13:58,390

and she said yes and that chaos theory

296

00:14:04,139 --> 00:14:00,910

was one of the things that she felt

297

00:14:06,810 --> 00:14:04,149

points us in that direction so you may

298

00:14:09,930 --> 00:14:06,820

be touched on it a little bit but could

299

00:14:12,600 --> 00:14:09,940

you tell us a little bit first of all

300

00:14:14,819 --> 00:14:12,610

what chaos theory is and this thing

301

00:14:17,250 --> 00:14:14,829

called the butterfly effect and stuff

302

00:14:19,759 --> 00:14:17,260

like that and whether or not you think

303

00:14:23,069 --> 00:14:19,769

it does point us towards that

304

00:14:27,480 --> 00:14:23,079

hierarchical structure of consciousness

305

00:14:30,900 --> 00:14:27,490

you bet yeah it's it's not a really

306

00:14:35,370 --> 00:14:30,910

difficult story chaos theory you know is

307

00:14:39,630 --> 00:14:35,380

enormous development explosion of new

308

00:14:42,120 --> 00:14:39,640

ideas discoveries and in in the area of

309

00:14:44,519 --> 00:14:42,130

mathematics especially computational

310

00:14:46,980 --> 00:14:44,529

mathematics it's going on it's

311

00:14:50,310 --> 00:14:46,990

derivative of the computer revolution

312

00:14:56,040 --> 00:14:50,320

and the computer graphic revolution so

313

00:14:56,340 --> 00:14:56,050

can theory began you know people trace

314

00:14:59,310 --> 00:14:56,350

it

315

00:15:02,720 --> 00:14:59,320

to portray a century ago in a kind of a

316

00:15:06,060 --> 00:15:02,730

theoretical development he had actually

317

00:15:10,110 --> 00:15:06,070

Hakurei was a servant okay he's one of

318

00:15:13,380 --> 00:15:10,120

the original mathematical supplants that

319

00:15:15,530 --> 00:15:13,390

was studied by psychologists so a porter

320

00:15:17,520 --> 00:15:15,540

a was one of the most prolific

321

00:15:20,730 --> 00:15:17,530

mathematicians of all time

322

00:15:23,000 --> 00:15:20,740

look 500 pages hundred books died at the

323

00:15:27,330 --> 00:15:23,010

age of 52 I mean he's a incredible

324

00:15:28,980 --> 00:15:27,340

person so the story he told in the book

325

00:15:32,220 --> 00:15:28,990

I'm a psychology of mathematical

326

00:15:35,640 --> 00:15:32,230

invention business I was headed for a

327

00:15:38,580 --> 00:15:35,650

picnic with my family we were standing

328

00:15:41,280 --> 00:15:38,590

in the bus stop waiting for the bus I

329

00:15:42,960 --> 00:15:41,290

had been working on the problem I was

330

00:15:45,270 --> 00:15:42,970

frustrated I couldn't prove this theorem

331

00:15:48,060 --> 00:15:45,280

and I was not thinking about it we were

332

00:15:50,970 --> 00:15:48,070

on the way to her picnic when I put my

333

00:15:53,280 --> 00:15:50,980

foot on the step of the bus to go up the

334

00:15:56,250 --> 00:15:53,290

solution to this problem popped into my

335

00:15:57,540 --> 00:15:56,260

mind I was so sure it was right and I

336

00:16:00,120 --> 00:15:57,550

didn't think about it for another minute

337

00:16:04,370 --> 00:16:00,130

when Rock went on a picnic so in this

338

00:16:07,700 --> 00:16:04,380

flash of illumination on previously

339

00:16:10,730 --> 00:16:07,710

completely unknown mathematical fact

340

00:16:13,380 --> 00:16:10,740

emerged into his mind he first saw

341

00:16:15,420 --> 00:16:13,390

something that turned out to be right

342

00:16:17,280 --> 00:16:15,430

and I have had this experience and many

343

00:16:19,680 --> 00:16:17,290

mathematicians have this experience and

344

00:16:22,140 --> 00:16:19,690

it's not the same as the scientific

345

00:16:23,970 --> 00:16:22,150

approach where you probe nature with all

346

00:16:26,580 --> 00:16:23,980

the instruments you've got with your

347

00:16:30,030 --> 00:16:26,590

with your voltmeter with your chemical

348

00:16:31,710 --> 00:16:30,040

kit and and so on it was a completely

349

00:16:34,980 --> 00:16:31,720

different thing where mathematical

350

00:16:37,770 --> 00:16:34,990

knowledge comes from that is gradually

351
00:16:41,340 --> 00:16:37,780
revealed over the course of thousands of

352
00:16:44,340 --> 00:16:41,350
years maybe more than thirty thousand

353
00:16:46,680 --> 00:16:44,350
years of mathematical discovery of

354
00:16:48,530 --> 00:16:46,690
different bits of things that end up

355
00:16:54,480 --> 00:16:48,540
actually fitting all together and

356
00:16:57,120 --> 00:16:54,490
including a small subset many models for

357
00:16:59,490 --> 00:16:57,130
natural phenomenon isn't there also a

358
00:17:00,900 --> 00:16:59,500
connection there I think back to a point

359
00:17:02,940 --> 00:17:00,910
you were making earlier in the

360
00:17:05,220 --> 00:17:02,950
difference between the mathematical I

361
00:17:06,510 --> 00:17:05,230
guess approach and the scientific

362
00:17:09,360 --> 00:17:06,520
approach

363
00:17:11,640 --> 00:17:09,370

chaos theory presents a lot of problems

364

00:17:14,760 --> 00:17:11,650

when it comes to measurement which is

365

00:17:17,100 --> 00:17:14,770

really the the nuts and bolts of science

366

00:17:20,010 --> 00:17:17,110

me chaos theory kind of throws into

367

00:17:23,490 --> 00:17:20,020

question the whole idea of measurement

368

00:17:25,949 --> 00:17:23,500

and how measurement really works or how

369

00:17:28,050 --> 00:17:25,959

effective it can really be but maybe we

370

00:17:31,200 --> 00:17:28,060

better back up and give people a sense

371

00:17:32,610 --> 00:17:31,210

for how chaos theory bring it down to

372

00:17:34,350 --> 00:17:32,620

earth in a way that they can understand

373

00:17:36,080 --> 00:17:34,360

maybe the butterfly effect or or

374

00:17:40,230 --> 00:17:36,090

something like that

375

00:17:42,720 --> 00:17:40,240

well yes I got carried away with the

376

00:17:45,830 --> 00:17:42,730

importance of the computer revolution in

377

00:17:49,680 --> 00:17:45,840

terms of new mathematical ideas and

378

00:17:53,460 --> 00:17:49,690

chaos theory is just was one of them was

379

00:17:54,900 --> 00:17:53,470

one of the first revelations of the

380

00:17:59,870 --> 00:17:54,910

computer revolution

381

00:18:03,600 --> 00:17:59,880

so this first observation took place in

382

00:18:06,510 --> 00:18:03,610

1961 so this is some 80 years or so

383

00:18:12,050 --> 00:18:06,520

after poor Corey had an idea in

384

00:18:15,830 --> 00:18:12,060

intuition that was subsequently

385

00:18:20,040 --> 00:18:15,840

validated by a computer discovery in

386

00:18:22,290 --> 00:18:20,050

1961 so at that time computers had been

387

00:18:24,960 --> 00:18:22,300

around for a while

388

00:18:29,490 --> 00:18:24,970

analog and digital computers of great

389

00:18:31,980 --> 00:18:29,500

importance in world war ii and folly and

390

00:18:35,490 --> 00:18:31,990

while studying mathematical model with

391

00:18:37,170 --> 00:18:35,500

the computer in the Department of

392

00:18:39,930 --> 00:18:37,180

Electrical Engineering in Kyoto

393

00:18:42,960 --> 00:18:39,940

University this first observer of

394

00:18:47,490 --> 00:18:42,970

chaotic phenomena in a mathematical

395

00:18:52,320 --> 00:18:47,500

model Yoshi later professor and graduate

396

00:18:56,790 --> 00:18:52,330

student Electrical Engineering he saw

397

00:18:59,730 --> 00:18:56,800

this that subsequently known by a lot of

398

00:19:01,740 --> 00:18:59,740

people as this metaphor of the butterfly

399

00:19:04,440 --> 00:19:01,750

effect that the flap of the butterfly's

400

00:19:09,260 --> 00:19:04,450

wings in Brazil could precipitate a

401
00:19:12,690 --> 00:19:09,270
tornado in western New Jersey so this

402
00:19:16,560 --> 00:19:12,700
this idea has as you suggested an

403
00:19:18,330 --> 00:19:16,570
important implication for science that

404
00:19:20,320 --> 00:19:18,340
has to do with measurement because it

405
00:19:24,910 --> 00:19:20,330
says the flap of the boat

406
00:19:28,150 --> 00:19:24,920
in other words if you know the state of

407
00:19:31,390 --> 00:19:28,160
the world exactly well almost exactly

408
00:19:33,640 --> 00:19:31,400
with a slight error then you cannot make

409
00:19:35,920 --> 00:19:33,650
a long-term prediction so we don't know

410
00:19:38,560 --> 00:19:35,930
the global climate warming for example

411
00:19:41,770 --> 00:19:38,570
on the basis of mathematical models

412
00:19:44,680 --> 00:19:41,780
because the mathematical models are

413
00:19:47,830 --> 00:19:44,690

chaotic in the stack technical sense

414

00:19:49,450 --> 00:19:47,840

that the flap of a butterfly wing would

415

00:19:51,490 --> 00:19:49,460

make a huge difference in the prediction

416

00:19:54,250 --> 00:19:51,500

of the model long term there would be

417

00:19:56,530 --> 00:19:54,260

the global warming our global cooling

418

00:19:59,350 --> 00:19:56,540

but you couldn't tell for sure because

419

00:20:02,020 --> 00:19:59,360

you can't measure the state of the the

420

00:20:04,330 --> 00:20:02,030

world the atmospheric chemistry the

421

00:20:05,800 --> 00:20:04,340

insulation of the Sun and so on you

422

00:20:12,010 --> 00:20:05,810

can't measure it all with perfect

423

00:20:14,830 --> 00:20:12,020

accuracy and the experience of dynamical

424

00:20:16,840 --> 00:20:14,840

systems has finally observed and

425

00:20:21,840 --> 00:20:16,850

discovered with computer graphics in

426
00:20:26,050 --> 00:20:21,850
1961 and subsequently that the slightest

427
00:20:28,900 --> 00:20:26,060
error in the measurement means a huge

428
00:20:33,880 --> 00:20:28,910
error in the long term behavior that

429
00:20:36,220 --> 00:20:33,890
means that this new style of model

430
00:20:38,020 --> 00:20:36,230
building had been bragging about is

431
00:20:40,540 --> 00:20:38,030
actually no good for long term

432
00:20:43,750 --> 00:20:40,550
prediction it is good for kind of

433
00:20:47,050 --> 00:20:43,760
understanding complex systems so this is

434
00:20:48,970 --> 00:20:47,060
why I'm gonna connect with understanding

435
00:20:52,660 --> 00:20:48,980
of consciousness now the hierarchical

436
00:20:56,830 --> 00:20:52,670
structure of consciousness that models

437
00:20:58,420 --> 00:20:56,840
for climate complex systems in the sense

438
00:21:01,150 --> 00:20:58,430

there are many different parts there's

439

00:21:04,630 --> 00:21:01,160

the solar radiation there is the

440

00:21:07,690 --> 00:21:04,640

atmospheric chemistry there is the

441

00:21:13,290 --> 00:21:07,700

activity of humans creating heat on the

442

00:21:15,550 --> 00:21:13,300

planet on the surface and changing the

443

00:21:17,800 --> 00:21:15,560

reflectivity of the surface of the

444

00:21:19,240 --> 00:21:17,810

planet and by building a lot of

445

00:21:24,550 --> 00:21:19,250

buildings with aluminum roofs or

446

00:21:27,940 --> 00:21:24,560

whatever that the complex system in that

447

00:21:30,670 --> 00:21:27,950

sense when you try to model it

448

00:21:33,040 --> 00:21:30,680

mathematically always results in a

449

00:21:33,880 --> 00:21:33,050

chaotic dynamical system so the

450

00:21:36,670 --> 00:21:33,890

understand

451
00:21:39,370 --> 00:21:36,680
of chaos theory has studied by

452
00:21:43,950 --> 00:21:39,380
mathematicians beginning in 1961 and

453
00:21:46,300 --> 00:21:43,960
ongoing in the present time this

454
00:21:49,030 --> 00:21:46,310
understanding technical knowledge of

455
00:21:51,700 --> 00:21:49,040
chaotic dynamical systems has practical

456
00:21:54,790 --> 00:21:51,710
significance when we try to model a

457
00:21:58,330 --> 00:21:54,800
complex system because the complex

458
00:22:00,840 --> 00:21:58,340
system will behave behave chaotically so

459
00:22:04,090 --> 00:22:00,850
before the understanding of chaos theory

460
00:22:05,590 --> 00:22:04,100
1961 and so on mental models for complex

461
00:22:08,380 --> 00:22:05,600
systems were no good that they are

462
00:22:11,160 --> 00:22:08,390
always resulted in chaotic behavior that

463
00:22:14,440 --> 00:22:11,170

the scientists would then interpret as

464

00:22:16,480 --> 00:22:14,450

an artifact a failure of the model and

465

00:22:19,240 --> 00:22:16,490

so the models the complex systems were

466

00:22:21,850 --> 00:22:19,250

thrown out suddenly they could be

467

00:22:23,790 --> 00:22:21,860

understood even though not predictive

468

00:22:27,520 --> 00:22:23,800

they could be understood to a degree

469

00:22:30,070 --> 00:22:27,530

through the new teachings of chaos

470

00:22:32,860 --> 00:22:30,080

theory so the practical implication was

471

00:22:36,640 --> 00:22:32,870

that modeling complex systems becomes

472

00:22:38,700 --> 00:22:36,650

possible now as we take this kind of

473

00:22:42,270 --> 00:22:38,710

mathematical model for complex systems

474

00:22:46,990 --> 00:22:42,280

upstairs from physical systems like

475

00:22:48,460 --> 00:22:47,000

planet of planet Earth our climate into

476

00:22:50,440 --> 00:22:48,470

the realm of consciousness and then

477

00:22:53,290 --> 00:22:50,450

obviously consciousness has a lot of

478

00:22:56,440 --> 00:22:53,300

parts for one thing if you think of the

479

00:22:58,740 --> 00:22:56,450

individual consciousness of 6 billion

480

00:23:02,500 --> 00:22:58,750

people on the planet being somehow

481

00:23:05,320 --> 00:23:02,510

knitted together through communication

482

00:23:05,770 --> 00:23:05,330

by reading writing cell phones World

483

00:23:10,420 --> 00:23:05,780

Wide Web

484

00:23:12,250 --> 00:23:10,430

etc into a complex system then obviously

485

00:23:15,400 --> 00:23:12,260

that complex system is going to have

486

00:23:19,630 --> 00:23:15,410

very chaotic behavior and the techniques

487

00:23:21,550 --> 00:23:19,640

of chaos theory and modeling complex

488

00:23:23,920 --> 00:23:21,560

systems could be applied to

489

00:23:27,670 --> 00:23:23,930

consciousness and that of course has

490

00:23:30,490 --> 00:23:27,680

been carried out as a research program

491

00:23:32,910 --> 00:23:30,500

by a number of people about which I've

492

00:23:35,140 --> 00:23:32,920

written a book by the way modeling

493

00:23:39,730 --> 00:23:35,150

consciousness using these techniques of

494

00:23:43,420 --> 00:23:39,740

chaos theory called demystifying the

495

00:23:46,020 --> 00:23:43,430

Aakash Aakash being a Sanskrit word for

496

00:23:47,350 --> 00:23:46,030

this multi-leveled consciousness

497

00:23:49,210 --> 00:23:47,360

fastening you know

498

00:23:52,240 --> 00:23:49,220

I didn't know much about that I'll have

499

00:23:53,950 --> 00:23:52,250

to delve into that that book but I also

500

00:23:56,230 --> 00:23:53,960

want to I want to switch gears for a

501
00:23:57,970 --> 00:23:56,240
little bit Ralph for a long time you've

502
00:24:00,010 --> 00:23:57,980
been associated with psychedelics you've

503
00:24:02,380 --> 00:24:00,020
written about them spoken about using

504
00:24:04,450 --> 00:24:02,390
them and our featured quite prominently

505
00:24:07,930 --> 00:24:04,460
in the film from a few years back

506
00:24:11,169 --> 00:24:07,940
DMT the spirit molecule what do you

507
00:24:15,130 --> 00:24:11,179
think the psychedelic experience tells

508
00:24:17,919 --> 00:24:15,140
us about this mind equal brain equation

509
00:24:20,650 --> 00:24:17,929
we've been talking about I think you've

510
00:24:23,680 --> 00:24:20,660
already told us that you're moving way

511
00:24:25,720 --> 00:24:23,690
past mind equals brain but what in

512
00:24:28,900 --> 00:24:25,730
particular do you think psychedelics

513
00:24:32,610 --> 00:24:28,910

brings to that a discussion for me

514

00:24:36,130 --> 00:24:32,620

personally the psychedelic experience

515

00:24:39,400 --> 00:24:36,140

that I mean there was a wave of

516

00:24:41,169 --> 00:24:39,410

popularity of psychedelics in the 1960s

517

00:24:45,250 --> 00:24:41,179

associated with the hip culture

518

00:24:49,049 --> 00:24:45,260

so-called and that affected me at the at

519

00:24:53,200 --> 00:24:49,059

the time so I had an experience that

520

00:24:56,169 --> 00:24:53,210

many of my colleagues had but not a

521

00:25:00,159 --> 00:24:56,179

majority or anything and for me

522

00:25:02,760 --> 00:25:00,169

personally that gave the idea that

523

00:25:07,270 --> 00:25:02,770

there's more to consciousness than

524

00:25:10,140 --> 00:25:07,280

ordinary consensual consciousness why

525

00:25:12,610 --> 00:25:10,150

necessarily because some materialists

526

00:25:14,470 --> 00:25:12,620

scientists would say no it's just

527

00:25:17,289 --> 00:25:14,480

accessing another part of your brain and

528

00:25:18,669 --> 00:25:17,299

imaginal part that is able to create

529

00:25:21,460 --> 00:25:18,679

things and there really isn't any

530

00:25:28,090 --> 00:25:21,470

mystery there why why does it for you

531

00:25:31,390 --> 00:25:28,100

seem to indicate that there is more it's

532

00:25:34,690 --> 00:25:31,400

impossible to counter somebody else's

533

00:25:37,450 --> 00:25:34,700

theory of my personal experience and I

534

00:25:41,740 --> 00:25:37,460

can't prove anything I can only say that

535

00:25:45,640 --> 00:25:41,750

through my experience I gained the

536

00:25:49,720 --> 00:25:45,650

fantasy that things are connected

537

00:25:56,140 --> 00:25:49,730

through the immaterial field which is

538

00:25:58,180 --> 00:25:56,150

beyond science at present and this is of

539

00:26:01,619 --> 00:25:58,190

course it could all be a delusion I

540

00:26:05,399 --> 00:26:01,629

can't say it isn't but anyway

541

00:26:09,599 --> 00:26:05,409

this idea of fantasy or psychically real

542

00:26:14,099 --> 00:26:09,609

or whatever had a big effect on my

543

00:26:16,139 --> 00:26:14,109

professional work because I started you

544

00:26:19,619 --> 00:26:16,149

know I had during my psychedelic

545

00:26:21,299 --> 00:26:19,629

experiences I had how the feeling that I

546

00:26:26,099 --> 00:26:21,309

understood them mathematically because

547

00:26:29,940 --> 00:26:26,109

of my training I you know i imaged my

548

00:26:33,930 --> 00:26:29,950

experience using mathematical tools and

549

00:26:36,680 --> 00:26:33,940

so I could see I became convinced by

550

00:26:40,440 --> 00:26:36,690

these experiences in the 1960s that

551
00:26:45,389 --> 00:26:40,450
mathematics could actually be used to

552
00:26:49,139 --> 00:26:45,399
help explore these so-called paranormal

553
00:26:52,320 --> 00:26:49,149
effects that that I experienced as real

554
00:26:57,810 --> 00:26:52,330
has kind of more more real and ordinary

555
00:27:00,209 --> 00:26:57,820
reality that's the characteristic of the

556
00:27:02,269 --> 00:27:00,219
psychedelic experience especially have

557
00:27:05,639 --> 00:27:02,279
several psychedelic experiences this

558
00:27:08,159 --> 00:27:05,649
this illusion may become stronger and

559
00:27:10,639 --> 00:27:08,169
stronger that there is a kind of feeling

560
00:27:14,909 --> 00:27:10,649
of reality about the altered

561
00:27:17,430 --> 00:27:14,919
consciousness because of the way things

562
00:27:21,930 --> 00:27:17,440
hang together and there's intelligence

563
00:27:24,959 --> 00:27:21,940

is revealed it may be as many people

564

00:27:29,219 --> 00:27:24,969

claim a shortcut to mystical experience

565

00:27:33,060 --> 00:27:29,229

that other people historically have have

566

00:27:37,320 --> 00:27:33,070

explored more using meditation or

567

00:27:39,450 --> 00:27:37,330

austerities like fasting and so on what

568

00:27:42,479 --> 00:27:39,460

are you familiar with some of the recent

569

00:27:44,999 --> 00:27:42,489

research work that's been done by dr.

570

00:27:48,799 --> 00:27:45,009

Robin Kerr heart Harris and dr. David

571

00:27:53,579 --> 00:27:48,809

Nutt in the UK where they actually did

572

00:27:57,089 --> 00:27:53,589

fMRI scans of folks who had ingested

573

00:27:59,159 --> 00:27:57,099

psilocybin and their finding was quite

574

00:28:00,539 --> 00:27:59,169

surprising I think it does maybe provide

575

00:28:02,099 --> 00:28:00,549

the beginnings of some of that

576
00:28:02,759 --> 00:28:02,109
scientific evidence for what you're

577
00:28:05,489 --> 00:28:02,769
talking about

578
00:28:09,779 --> 00:28:05,499
because what they found was that instead

579
00:28:13,619 --> 00:28:09,789
of an excitation in the brain there was

580
00:28:14,440 --> 00:28:13,629
a reduced firing of the brain kind of

581
00:28:16,720 --> 00:28:14,450
consistent

582
00:28:18,820 --> 00:28:16,730
with some of the data we get back from

583
00:28:20,650 --> 00:28:18,830
the near-death experience science that

584
00:28:22,830 --> 00:28:20,660
says hey these people are flatlined and

585
00:28:27,430 --> 00:28:22,840
yet they're having the most profound

586
00:28:30,670 --> 00:28:27,440
conscious experience of their life so it

587
00:28:33,490 --> 00:28:30,680
supports this idea that maybe this brain

588
00:28:36,580 --> 00:28:33,500

is more of a filter to this a doorway to

589

00:28:38,770 --> 00:28:36,590

this larger consciousness are you are

590

00:28:40,800 --> 00:28:38,780

you familiar with that or would you know

591

00:28:45,610 --> 00:28:40,810

I'm not it sounds fascinating because

592

00:28:48,780 --> 00:28:45,620

you know after my experiences in the

593

00:28:51,700 --> 00:28:48,790

1960s and then going on since then with

594

00:28:53,500 --> 00:28:51,710

meditation and also reading about other

595

00:28:57,610 --> 00:28:53,510

people's experience and talking with

596

00:29:00,940 --> 00:28:57,620

people about their experience I you know

597

00:29:07,720 --> 00:29:00,950

I am my intuition my feeling that the

598

00:29:11,470 --> 00:29:07,730

mind is is not in the brain grew year by

599

00:29:13,750 --> 00:29:11,480

year stronger so the the idea that this

600

00:29:16,870 --> 00:29:13,760

sort of altered consciousness could be

601
00:29:19,420 --> 00:29:16,880
associated with reduced activity in the

602
00:29:21,820 --> 00:29:19,430
biological neural map is is very

603
00:29:25,710 --> 00:29:21,830
supportive there remains of the mystery

604
00:29:29,850 --> 00:29:25,720
which honestly borrows my mind that by

605
00:29:34,090 --> 00:29:29,860
by eating some chemical some

606
00:29:37,810 --> 00:29:34,100
neuropeptide or neurotransmitter or

607
00:29:42,340 --> 00:29:37,820
something that they eat a chemical which

608
00:29:48,180 --> 00:29:42,350
is has been manufactured by a plant like

609
00:29:52,600 --> 00:29:48,190
a mushroom and and then you have this

610
00:29:54,730 --> 00:29:52,610
altered state of consciousness and it

611
00:29:57,360 --> 00:29:54,740
boggles the mind because it shows that

612
00:30:00,340 --> 00:29:57,370
there is the intimate connection between

613
00:30:03,100 --> 00:30:00,350

the biological neural map and the

614

00:30:05,470 --> 00:30:03,110

physical brain and consciousness and no

615

00:30:07,150 --> 00:30:05,480

matter how separated the cosmic

616

00:30:10,530 --> 00:30:07,160

consciousness or the collective

617

00:30:12,820 --> 00:30:10,540

unconscious might be from an individual

618

00:30:16,150 --> 00:30:12,830

biological environment nevertheless

619

00:30:20,770 --> 00:30:16,160

there's some pathway of connection that

620

00:30:23,200 --> 00:30:20,780

involves the the chemistry of a

621

00:30:25,840 --> 00:30:23,210

biological cell do you have any

622

00:30:26,740 --> 00:30:25,850

philosophical problems with the idea

623

00:30:28,980 --> 00:30:26,750

that

624

00:30:32,500 --> 00:30:28,990

we're kind of saying the answer lies

625

00:30:35,260 --> 00:30:32,510

outside here in this plant I mean does

626

00:30:36,820 --> 00:30:35,270

that create any challenges in terms of

627

00:30:39,520 --> 00:30:36,830

we're talking about this higher order

628

00:30:41,440 --> 00:30:39,530

consciousness or really personal develop

629

00:30:44,320 --> 00:30:41,450

in some way and we're saying the answer

630

00:30:46,930 --> 00:30:44,330

is outside of us it's something we have

631

00:30:50,610 --> 00:30:46,940

to ingest at any philosophical concerns

632

00:30:53,649 --> 00:30:50,620

along as long no I think it's great I

633

00:30:58,450 --> 00:30:53,659

you know it's a mystery it's it's

634

00:31:01,840 --> 00:30:58,460

paranormal already the you know it's

635

00:31:04,659 --> 00:31:01,850

mysterious how drugs work to combat

636

00:31:08,740 --> 00:31:04,669

disease its mysterious how the immune

637

00:31:11,890 --> 00:31:08,750

system is able to to cure an individual

638

00:31:15,700 --> 00:31:11,900

of tuberculosis I mean it's it's amazing

639

00:31:17,520 --> 00:31:15,710

I have to tell you that the day I met

640

00:31:23,110 --> 00:31:17,530

Terence Mckenna

641

00:31:25,330 --> 00:31:23,120

in 1972 our belief in worlds in the fall

642

00:31:28,899 --> 00:31:25,340

of 1972 when I was standing on a street

643

00:31:31,180 --> 00:31:28,909

corner in in Santa Cruz and a friend

644

00:31:32,890 --> 00:31:31,190

drove by and said get in the car line to

645

00:31:36,570 --> 00:31:32,900

meet somebody and took me on a drive

646

00:31:38,770 --> 00:31:36,580

that took two hours to Berkeley and

647

00:31:42,970 --> 00:31:38,780

introduced me to Terence Mckenna

648

00:31:45,130 --> 00:31:42,980

who was who showed me a mushroom

649

00:31:48,360 --> 00:31:45,140

psilocybin mushroom growing you know

650

00:31:52,240 --> 00:31:48,370

like a flower pot on his desk

651
00:31:54,700 --> 00:31:52,250
and he had the idea of course he was

652
00:31:56,620 --> 00:31:54,710
thinking about how the ingestion of a

653
00:31:59,200 --> 00:31:56,630
psychedelic mushroom could actually give

654
00:32:03,779 --> 00:31:59,210
you an altered state of consciousness so

655
00:32:08,350 --> 00:32:03,789
he he shared with me his theory that the

656
00:32:13,029 --> 00:32:08,360
mushroom spore was a visitor from space

657
00:32:16,029 --> 00:32:13,039
and that the spore was covered with a

658
00:32:20,230 --> 00:32:16,039
protective coating that was opaque to

659
00:32:24,190 --> 00:32:20,240
ultraviolet that allowed the the DNA in

660
00:32:29,049 --> 00:32:24,200
the mushroom sport to survive a journey

661
00:32:33,250 --> 00:32:29,059
through space that the the mushroom

662
00:32:37,110 --> 00:32:33,260
spore had been invaded a planet Earth

663
00:32:39,970 --> 00:32:37,120

and that the mycelial mat of these

664

00:32:42,340 --> 00:32:39,980

mushroom colonies all over the

665

00:32:45,940 --> 00:32:42,350

planet was actually the intelligence

666

00:32:51,220 --> 00:32:45,950

that was guiding the emergence of human

667

00:32:56,380 --> 00:32:51,230

species from from primates into what we

668

00:33:03,039 --> 00:32:56,390

are today the modern Homo sapiens so

669

00:33:04,840 --> 00:33:03,049

this is not as woowoo as channeling from

670

00:33:07,419 --> 00:33:04,850

a Pleiades

671

00:33:11,409 --> 00:33:07,429

but scientifically as pretty is pretty

672

00:33:14,400 --> 00:33:11,419

far out anyway it goes in the direction

673

00:33:17,140 --> 00:33:14,410

of let us say an experiment

674

00:33:19,060 --> 00:33:17,150

experimenting with the idea that the

675

00:33:21,220 --> 00:33:19,070

intelligence that we have is in the

676

00:33:24,070 --> 00:33:21,230

mushroom our accounts eventually he

677

00:33:27,250 --> 00:33:24,080

wrote a book on this subject called food

678

00:33:31,030 --> 00:33:27,260

of the gods where the acquisition of

679

00:33:33,190 --> 00:33:31,040

language by by primates hundred thousand

680

00:33:36,340 --> 00:33:33,200

years ago or whatever that this was a

681

00:33:41,560 --> 00:33:36,350

correlate of eating the psychedelic

682

00:33:44,320 --> 00:33:41,570

mushrooms and in fact I think is

683

00:33:46,720 --> 00:33:44,330

widespread today in archeology and

684

00:33:49,260 --> 00:33:46,730

anthropology the idea that there is a

685

00:33:55,810 --> 00:33:49,270

role of psychedelics in the simultaneous

686

00:34:00,640 --> 00:33:55,820

emergence of art and religion and speech

687

00:34:03,190 --> 00:34:00,650

and so on in our Paleolithic prehistory

688

00:34:05,620 --> 00:34:03,200

I did want to talk in a little bit of

689

00:34:07,950 --> 00:34:05,630

time that we have left about a couple of

690

00:34:10,240 --> 00:34:07,960

different things if we could one is the

691

00:34:12,070 --> 00:34:10,250

evolution of consciousness something

692

00:34:14,980 --> 00:34:12,080

you've written about and talked about a

693

00:34:17,020 --> 00:34:14,990

lot and it's become almost cliché that

694

00:34:19,480 --> 00:34:17,030

this is happening that there is some

695

00:34:22,210 --> 00:34:19,490

evolution of consciousness but I have to

696

00:34:24,899 --> 00:34:22,220

wonder is that about the whole topic of

697

00:34:27,820 --> 00:34:24,909

evolution when we start talking about

698

00:34:29,889 --> 00:34:27,830

consciousness being outside of our brain

699

00:34:31,480 --> 00:34:29,899

and then when we start talking about

700

00:34:34,119 --> 00:34:31,490

some of the problems we're obviously

701
00:34:36,639 --> 00:34:34,129
going to have an understanding time in

702
00:34:38,619 --> 00:34:36,649
our relationship to time and when we

703
00:34:40,570 --> 00:34:38,629
bring into the equation some of the

704
00:34:42,580 --> 00:34:40,580
paranormal phenomena you know one of the

705
00:34:45,580 --> 00:34:42,590
guests we've had on our show is a guy

706
00:34:48,879 --> 00:34:45,590
named Andy Paquette published a book a

707
00:34:51,340 --> 00:34:48,889
very fascinating book he's a he has

708
00:34:53,349 --> 00:34:51,350
lucid dreams and he has precognitive

709
00:34:54,000 --> 00:34:53,359
dreams and he's recorded these for last

710
00:34:55,710 --> 00:34:54,010
20 years

711
00:34:57,300 --> 00:34:55,720
and he's recorded many that have been

712
00:35:00,630 --> 00:34:57,310
independently verified

713
00:35:02,460 --> 00:35:00,640

I mean if and this is well known it's so

714

00:35:04,950 --> 00:35:02,470

well known but it's not accepted by

715

00:35:07,380 --> 00:35:04,960

science of course but if there's such a

716

00:35:09,240 --> 00:35:07,390

thing as a precognitive dream then

717

00:35:11,520 --> 00:35:09,250

that's a it kind of calls into question

718

00:35:13,950 --> 00:35:11,530

a lot of these ideas we have about time

719

00:35:15,560 --> 00:35:13,960

and that of course calls into question a

720

00:35:18,090 --> 00:35:15,570

lot of these ideas we have about

721

00:35:22,160 --> 00:35:18,100

evolution including the evolution of

722

00:35:25,800 --> 00:35:22,170

consciousness so when we move into this

723

00:35:28,470 --> 00:35:25,810

beyond materialism beyond mind equal

724

00:35:30,830 --> 00:35:28,480

brain how do we keep our how do we keep

725

00:35:33,380 --> 00:35:30,840

our bearings at all in terms of

726

00:35:36,900 --> 00:35:33,390

understanding these things in a way that

727

00:35:39,480 --> 00:35:36,910

really has as meaning for us in the way

728

00:35:44,310 --> 00:35:39,490

we've been accustomed to I know it was

729

00:35:49,850 --> 00:35:44,320

my psychedelic experience or some other

730

00:35:53,970 --> 00:35:49,860

that liberated me from belief in in

731

00:35:57,780 --> 00:35:53,980

science what religious faith in science

732

00:36:04,770 --> 00:35:57,790

but it's somehow within science that has

733

00:36:08,360 --> 00:36:04,780

given us a false impression of time the

734

00:36:11,760 --> 00:36:08,370

idea that the past is all determined and

735

00:36:15,300 --> 00:36:11,770

the future is undetermined and there is

736

00:36:17,250 --> 00:36:15,310

some sharp boundary a membrane between

737

00:36:20,180 --> 00:36:17,260

the past in the future which is

738

00:36:24,230 --> 00:36:20,190

advancing through time like slicing

739

00:36:27,930 --> 00:36:24,240

cheese one slice at a time and and

740

00:36:30,180 --> 00:36:27,940

putting a slice of the future into the

741

00:36:33,350 --> 00:36:30,190

past so this kind of linear progression

742

00:36:36,660 --> 00:36:33,360

of time is served built in the basis of

743

00:36:38,730 --> 00:36:36,670

science the scientific method and and so

744

00:36:39,930 --> 00:36:38,740

on but everyone's personal experience of

745

00:36:43,670 --> 00:36:39,940

time is rather different

746

00:36:46,800 --> 00:36:43,680

and especially lots of people have had

747

00:36:50,220 --> 00:36:46,810

precognitive dreams including being 15

748

00:36:53,610 --> 00:36:50,230

so this particular kind of paranormal

749

00:36:55,970 --> 00:36:53,620

phenomenon like we have telekinesis

750

00:37:00,300 --> 00:36:55,980

telepathy I mean there are all these

751
00:37:04,440 --> 00:37:00,310
areas of was a paranormal phenomenon

752
00:37:06,720 --> 00:37:04,450
that advanced scientists like Rupert

753
00:37:08,180 --> 00:37:06,730
Sheldrake and being rate in our

754
00:37:12,599 --> 00:37:08,190
exploring today

755
00:37:17,250 --> 00:37:12,609
these are easy compared to the time

756
00:37:21,089 --> 00:37:17,260
paradox sort of paranormal phenomenon

757
00:37:24,120 --> 00:37:21,099
like precognitive dreams so that's the

758
00:37:27,210 --> 00:37:24,130
more difficult so I have felt as I went

759
00:37:29,910 --> 00:37:27,220
along in my career since the 1960s that

760
00:37:35,880 --> 00:37:29,920
making mathematical models for array of

761
00:37:38,940 --> 00:37:35,890
reality in which time presents different

762
00:37:40,560 --> 00:37:38,950
aspects not manual models of

763
00:37:43,339 --> 00:37:40,570

consciousness in which a precognitive

764

00:37:45,630 --> 00:37:43,349

dream would be explained by the model

765

00:37:49,560 --> 00:37:45,640

this has been important to me

766

00:37:51,740 --> 00:37:49,570

2:15 so in fact you know in my book in

767

00:37:55,079 --> 00:37:51,750

mystifying the archive shows or in

768

00:38:02,040 --> 00:37:55,089

jointly with my Indian friend she she

769

00:38:06,870 --> 00:38:02,050

Roy a quantum physicist I have included

770

00:38:09,150 --> 00:38:06,880

there some mathematical models for for

771

00:38:14,970 --> 00:38:09,160

this particular paranormal effect the

772

00:38:17,849 --> 00:38:14,980

time paradox effect in which there is as

773

00:38:21,900 --> 00:38:17,859

they believed in India some kind of

774

00:38:26,310 --> 00:38:21,910

object beyond time will challenge

775

00:38:29,790 --> 00:38:26,320

mechanical that the eschaton at the edge

776

00:38:33,530 --> 00:38:29,800

of time mathematical model in which

777

00:38:36,720 --> 00:38:33,540

there is this timeless thing and from it

778

00:38:39,000 --> 00:38:36,730

precipitates ordinary reality in a way

779

00:38:42,660 --> 00:38:39,010

that gives the illusion of the serial

780

00:38:46,800 --> 00:38:42,670

advance of ordinary time so mathematical

781

00:38:50,940 --> 00:38:46,810

models can help you understand your own

782

00:38:53,250 --> 00:38:50,950

experience when it's being denied by

783

00:38:55,620 --> 00:38:53,260

Orthodox science I think that's

784

00:38:57,630 --> 00:38:55,630

important especially for children who do

785

00:39:01,109 --> 00:38:57,640

have these experiences and then and

786

00:39:03,329 --> 00:39:01,119

learn to suppress them great I think

787

00:39:05,940 --> 00:39:03,339

that's probably a wonderful way to kind

788

00:39:08,099 --> 00:39:05,950

of wrap things up in the couple of

789

00:39:10,500 --> 00:39:08,109

minutes we have left Ralph can you tell

790

00:39:12,630 --> 00:39:10,510

folks the best way to learn about some

791

00:39:14,720 --> 00:39:12,640

of the things that you're up to and some

792

00:39:20,430 --> 00:39:14,730

of the great books that you've written

793

00:39:30,030 --> 00:39:25,050

things and and could be explored there

794

00:39:32,280 --> 00:39:30,040

so Ralph - Abraham gorgs then there's a

795

00:39:38,000 --> 00:39:32,290

menu on the left hand side of a home

796

00:39:41,700 --> 00:39:38,010

page with items like books articles

797

00:39:43,440 --> 00:39:41,710

lecture videos and so on and just

798

00:39:46,050 --> 00:39:43,450

browsing around through the list of

799

00:39:49,740 --> 00:39:46,060

things that would be the easiest way to

800

00:39:52,559 --> 00:39:49,750

get an idea of the variety of my

801
00:39:54,690 --> 00:39:52,569
thinking and writing the list of

802
00:39:58,650 --> 00:39:54,700
articles for example there's about 130

803
00:40:02,640 --> 00:39:58,660
of them they're the posted as as as

804
00:40:04,470 --> 00:40:02,650
freely readable files great with joint

805
00:40:08,010 --> 00:40:04,480
descriptions I think that's but that'd

806
00:40:10,319 --> 00:40:08,020
be the way to start learning golf great

807
00:40:12,359 --> 00:40:10,329
great well it's certainly been been

808
00:40:13,589 --> 00:40:12,369
interesting and love diving into the

809
00:40:16,920 --> 00:40:13,599
math stuff in the way that you've

810
00:40:19,680 --> 00:40:16,930
connected is just truly amazing and so

811
00:40:21,450 --> 00:40:19,690
imaginative thanks so much we have a lot

812
00:40:24,599 --> 00:40:21,460
to think about and discuss and thanks

813
00:40:26,730 --> 00:40:24,609

again for joining me on skeptic oh thank

814

00:40:28,430 --> 00:40:26,740

you so much Alex for invited you know

815

00:40:31,380 --> 00:40:28,440

really enormous ly enjoyed this thanks

816

00:40:33,240 --> 00:40:31,390

again to dr. Ralph Abraham for joining

817

00:40:34,740 --> 00:40:33,250

me today on skeptic Oh a couple of

818

00:40:36,420 --> 00:40:34,750

questions I'd like to tee up for you

819

00:40:38,309 --> 00:40:36,430

from this interview that we might want

820

00:40:39,990 --> 00:40:38,319

to discuss on the forum or on the

821

00:40:41,880 --> 00:40:40,000

website and there are two very different

822

00:40:44,880 --> 00:40:41,890

questions the first has to do with this

823

00:40:47,490 --> 00:40:44,890

idea of evolution of consciousness

824

00:40:50,400 --> 00:40:47,500

because it strikes me that we all assume

825

00:40:52,980 --> 00:40:50,410

that consciousness is evolving in a way

826

00:40:55,530 --> 00:40:52,990

that we understand and we have a way of

827

00:40:57,690 --> 00:40:55,540

looking back at history at science and

828

00:40:59,609 --> 00:40:57,700

say ah or evolve and consciousness is

829

00:41:02,579 --> 00:40:59,619

evolving but I'd like to turn that into

830

00:41:05,040 --> 00:41:02,589

more of a real question what evidence do

831

00:41:08,160 --> 00:41:05,050

we have that consciousness is evolving

832

00:41:10,020 --> 00:41:08,170

in this way that we think it is and if

833

00:41:11,609 --> 00:41:10,030

it is evolving where is it evolving

834

00:41:13,670 --> 00:41:11,619

towards and what's the evidence for that

835

00:41:15,900 --> 00:41:13,680

so that's question number one and

836

00:41:18,569 --> 00:41:15,910

question number two has to do with

837

00:41:20,099 --> 00:41:18,579

psychedelics as you know dr. Abraham has

838

00:41:21,960 --> 00:41:20,109

been associated along with Terence

839

00:41:24,930 --> 00:41:21,970

Mckenna the use of psychedelics

840

00:41:27,000 --> 00:41:24,940

mushrooms DMT all that stuff and there's

841

00:41:30,030 --> 00:41:27,010

this implied assumption in there that

842

00:41:32,460 --> 00:41:30,040

hey it's a good idea to perturb your

843

00:41:33,930 --> 00:41:32,470

consciousness as I think Terence Mckenna

844

00:41:34,620 --> 00:41:33,940

once said so I thought it'd be

845

00:41:37,200 --> 00:41:34,630

interesting to

846

00:41:39,390 --> 00:41:37,210

hash that out because the implication

847

00:41:42,120 --> 00:41:39,400

seems to be if we take it a certain way

848

00:41:44,670 --> 00:41:42,130

that this perturbing of consciousness is

849

00:41:48,480 --> 00:41:44,680

part of this evolution of consciousness

850

00:41:51,420 --> 00:41:48,490

thing do psychedelics play a key role in

851
00:41:54,299 --> 00:41:51,430
the evolution of consciousness and is

852
00:41:56,730 --> 00:41:54,309
this idea of perturbing consciousness

853
00:41:59,670 --> 00:41:56,740
and stirring it up something that is

854
00:42:02,009 --> 00:41:59,680
necessary for this for the development

855
00:42:04,529 --> 00:42:02,019
of individual consciousness or for the

856
00:42:06,660 --> 00:42:04,539
evolution of consciousness in general I

857
00:42:09,630 --> 00:42:06,670
have a lot of mixed feelings about this

858
00:42:12,089 --> 00:42:09,640
so I'm really looking forward to saying

859
00:42:13,980 --> 00:42:12,099
what some of your ideas are now of

860
00:42:16,349 --> 00:42:13,990
course the place to share your thoughts

861
00:42:20,460 --> 00:42:16,359
your ideas your opinions is on the

862
00:42:22,950 --> 00:42:20,470
skeptic Oh website it's at SK EPT Iko

863
00:42:25,349 --> 00:42:22,960

com you can leave a comment right there

864

00:42:27,960 --> 00:42:25,359

or you can click on over to the forum

865

00:42:29,759 --> 00:42:27,970

and join the forum and dive into the

866

00:42:31,019 --> 00:42:29,769

dialogue there of course while you're at

867

00:42:33,599 --> 00:42:31,029

the website you're gonna want to check

868

00:42:36,059 --> 00:42:33,609

out our more than 200 previous shows of

869

00:42:38,849 --> 00:42:36,069

skeptic oh they're all there for free

870

00:42:40,529 --> 00:42:38,859

download if you enjoy them please tell

871

00:42:42,870 --> 00:42:40,539

your friends to tell your community

872

00:42:44,490 --> 00:42:42,880

about them like so many of you have well

873

00:42:46,440 --> 00:42:44,500

that's going to do it for today I have a

874

00:42:48,420 --> 00:42:46,450

number of interesting shows coming up I

875

00:42:51,089 --> 00:42:48,430

hope you'll stay with me for all of that

