



1
00:00:00,600 --> 00:00:09,180

[Music]

2
00:00:14,220 --> 00:00:12,150

um good afternoon ladies and gentlemen

3
00:00:16,109 --> 00:00:14,230

so my name is Jean Christophe Dao and

4
00:00:17,999 --> 00:00:16,119

I'm an associate professor at the Japan

5
00:00:20,970 --> 00:00:18,009

advanced Institute of Science and

6
00:00:22,970 --> 00:00:20,980

Technology in Ishikawa Japan and I would

7
00:00:25,320 --> 00:00:22,980

also like to introduce to you my new

8
00:00:27,870 --> 00:00:25,330

collaborator in this new project I have

9
00:00:29,849 --> 00:00:27,880

initiated mr. mark Elwell and today I

10
00:00:32,790 --> 00:00:29,859

would like to talk to you about Thomas

11
00:00:35,040 --> 00:00:32,800

Kuhn Gaston Bachelard mitsuo Tackett any

12
00:00:38,880 --> 00:00:35,050

three different approaches to scientific

13
00:00:41,100 --> 00:00:38,890

change and progress so the theme of this

14

00:00:43,830 --> 00:00:41,110

conference is bonfire of the paradigms

15

00:00:46,680 --> 00:00:43,840

so I slightly modified my presentation

16

00:00:55,020 --> 00:00:46,690

in in order to suit the theme of the

17

00:00:56,490 --> 00:00:55,030

conference so actually we could start by

18

00:00:58,500 --> 00:00:56,500

being a little bit nasty and say okay

19

00:01:01,020 --> 00:00:58,510

which representatives of the current

20

00:01:04,650 --> 00:01:01,030

paradigm we're going to burn first so we

21

00:01:08,279 --> 00:01:04,660

could talk about one who's sook accused

22

00:01:12,630 --> 00:01:08,289

of fraud actually accepted as fraud okay

23

00:01:16,800 --> 00:01:12,640

so let's put him in the fire here then

24

00:01:19,620 --> 00:01:16,810

we could look at which Dawkins why why

25

00:01:24,059 --> 00:01:19,630

Richard Dawkins okay for becoming a guru

26
00:01:26,779 --> 00:01:24,069
maybe okay okay disappeared and then

27
00:01:29,719 --> 00:01:26,789
okay Cyril Bert okay accused of fraud

28
00:01:32,130 --> 00:01:29,729
okay well this one got into the fire

29
00:01:34,440 --> 00:01:32,140
okay so let's look at the roots of the

30
00:01:37,080 --> 00:01:34,450
problem we're starting the fire from the

31
00:01:40,800 --> 00:01:37,090
foundations aren't we so as it is used

32
00:01:42,389 --> 00:01:40,810
here what does paradigm refer to okay we

33
00:01:44,160 --> 00:01:42,399
need to consider here the framework of

34
00:01:46,190 --> 00:01:44,170
the conventional current practice of

35
00:01:52,320 --> 00:01:46,200
science

36
00:01:55,260 --> 00:01:52,330
here as an institution and let's look at

37
00:01:57,359 --> 00:01:55,270
some of the main elements of science as

38
00:01:59,760 --> 00:01:57,369

an institution so we have the peer

39

00:02:02,609 --> 00:01:59,770

review system we have famous institution

40

00:02:04,859 --> 00:02:02,619

which involve ER key publications we

41

00:02:07,559 --> 00:02:04,869

have established Authority and reliance

42

00:02:09,839 --> 00:02:07,569

on government funded grants so for

43

00:02:12,210 --> 00:02:09,849

example here you have an image of a

44

00:02:15,570 --> 00:02:12,220

monoliths I think that works a lot it

45

00:02:18,750 --> 00:02:15,580

says a lot of words and let's look first

46

00:02:21,750 --> 00:02:18,760

at a few examples with the peer-review

47

00:02:23,070 --> 00:02:21,760

system first of all the Piltdown man

48

00:02:25,770 --> 00:02:23,080

fabrication of physical

49

00:02:28,050 --> 00:02:25,780

evidence sir Sir Albert fabrication of

50

00:02:31,800 --> 00:02:28,060

data may be fabrication of researcher

51
00:02:34,310 --> 00:02:31,810
wrong who suck fraud the shown the

52
00:02:36,990 --> 00:02:34,320
recent Shirin scandal in Germany

53
00:02:40,500 --> 00:02:37,000
fabrication of data as well so there is

54
00:02:42,630 --> 00:02:40,510
a problem here ok let's go back to

55
00:02:45,240 --> 00:02:42,640
paradigm where does the word paradigm

56
00:02:48,000 --> 00:02:45,250
come into the discussion this term as

57
00:02:50,610 --> 00:02:48,010
most of you know is was coined by Thomas

58
00:02:52,950 --> 00:02:50,620
Kuhn a very famous American philosopher

59
00:02:54,960 --> 00:02:52,960
of science ok in his book the structure

60
00:02:58,290 --> 00:02:54,970
of scientific revolutions which he

61
00:03:00,480 --> 00:02:58,300
published in 1962 but Kuhn also used a

62
00:03:05,130 --> 00:03:00,490
more technical term he used the term

63
00:03:07,050 --> 00:03:05,140

disciplinary matrix as well ok let's

64

00:03:09,750 --> 00:03:07,060

define our terms before we continue

65

00:03:12,180 --> 00:03:09,760

what is the etymology of paradigm well

66

00:03:15,060 --> 00:03:12,190

if you look at Plato predict ma to show

67

00:03:18,150 --> 00:03:15,070

side-by-side pattern or comparison

68

00:03:23,070 --> 00:03:18,160

another meeting would be example to show

69

00:03:25,920 --> 00:03:23,080

from example in grammar for example in

70

00:03:27,930 --> 00:03:25,930

his book actually there are at least 22

71

00:03:30,030 --> 00:03:27,940

different uses of the term paradigm

72

00:03:32,220 --> 00:03:30,040

there are two main meanings which we are

73

00:03:34,650 --> 00:03:32,230

going to retain here that I've had been

74

00:03:38,220 --> 00:03:34,660

officially officially recognized by Kuhn

75

00:03:40,080 --> 00:03:38,230

later ok the first meaning would be body

76

00:03:41,940 --> 00:03:40,090

or collection of values and techniques

77

00:03:44,640 --> 00:03:41,950

that are shared by a group of scientists

78

00:03:46,259 --> 00:03:44,650

the second one would be the manner in

79

00:03:48,630 --> 00:03:46,269

which a person who is trained in a given

80

00:03:51,449 --> 00:03:48,640

field learns to recognize the element of

81

00:03:53,070 --> 00:03:51,459

entities in the first definition to

82

00:03:54,140 --> 00:03:53,080

isolate them and to distinguish them

83

00:03:56,840 --> 00:03:54,150

from each other

84

00:04:00,000 --> 00:03:56,850

ok if we look at the first definition

85

00:04:02,100 --> 00:04:00,010

what a paradigm does is to specify the

86

00:04:04,620 --> 00:04:02,110

correct way of formulating and solving

87

00:04:06,690 --> 00:04:04,630

problems and actually some elements of a

88

00:04:08,040 --> 00:04:06,700

paradigm would include mathematical

89

00:04:10,199 --> 00:04:08,050

language some mathematical

90

00:04:12,330 --> 00:04:10,209

generalizations frequently metaphors

91

00:04:14,790 --> 00:04:12,340

such as the hydraulic metaphor in

92

00:04:17,610 --> 00:04:14,800

electricity verbal explanation of a

93

00:04:19,920 --> 00:04:17,620

given phenomenon diagrams drawings

94

00:04:25,050 --> 00:04:19,930

models for example the more Bohr model

95

00:04:26,820 --> 00:04:25,060

Nathan and here also within that first

96

00:04:28,469 --> 00:04:26,830

definition of what we're looking at

97

00:04:30,930 --> 00:04:28,479

which we're considering is technology by

98

00:04:33,390 --> 00:04:30,940

which the work is done but also looking

99

00:04:35,480 --> 00:04:33,400

at the human side attitudes expectation

100

00:04:38,580 --> 00:04:35,490

belief practices

101
00:04:41,489 --> 00:04:38,590
okay if we look at the second definition

102
00:04:44,010 --> 00:04:41,499
recognized by Kuhn we're looking at the

103
00:04:46,080 --> 00:04:44,020
practical phase of a scientist training

104
00:04:48,989 --> 00:04:46,090
okay that is going from theory to

105
00:04:50,760 --> 00:04:48,999
practice by meditating on example an

106
00:04:52,619 --> 00:04:50,770
example I've thought about here is for

107
00:04:54,719 --> 00:04:52,629
example in electricity okay

108
00:04:56,790 --> 00:04:54,729
finding the electric field by

109
00:05:01,649 --> 00:04:56,800
considering different geometry so going

110
00:05:03,779 --> 00:05:01,659
from one geometry to another okay one

111
00:05:05,159 --> 00:05:03,789
specific component of a paradigm or

112
00:05:08,279 --> 00:05:05,169
disciplinary matrix would be the

113
00:05:10,980 --> 00:05:08,289

consensus on exemplars of good science

114

00:05:13,830 --> 00:05:10,990

which you typically find in books and

115

00:05:15,059 --> 00:05:13,840

papers for example Aristotle's analysis

116

00:05:17,399 --> 00:05:15,069

of motion

117

00:05:19,469 --> 00:05:17,409

Lavoisier's application of the balancing

118

00:05:21,450 --> 00:05:19,479

chemistry Maxwell's mathematize ie

119

00:05:24,899 --> 00:05:21,460

mathematization of the electromagnetic

120

00:05:27,600 --> 00:05:24,909

field that actually great texts are also

121

00:05:31,559 --> 00:05:27,610

paradigms in themselves containing

122

00:05:32,189 --> 00:05:31,569

theories and laws other models apart

123

00:05:34,829 --> 00:05:32,199

from Koons

124

00:05:37,950 --> 00:05:34,839

are the epistemological model they were

125

00:05:39,570 --> 00:05:37,960

by Gaston Bachelard and the

126
00:05:42,379 --> 00:05:39,580
phenomenal phenomenological model

127
00:05:45,689 --> 00:05:42,389
developed by mad Mitsotakis honey

128
00:05:48,390 --> 00:05:45,699
already before World War two in Japan in

129
00:05:50,700 --> 00:05:48,400
Kyoto I believe so let's talk a little

130
00:05:54,269 --> 00:05:50,710
bit about Mitsotakis and his model in

131
00:05:56,879 --> 00:05:54,279
1936 he developed the so-called doctrine

132
00:05:59,809 --> 00:05:56,889
of the three stages of scientific

133
00:06:03,480 --> 00:05:59,819
development based on Hegelian dialectic

134
00:06:06,089 --> 00:06:03,490
it contains the phenomenal the

135
00:06:08,719 --> 00:06:06,099
substantial and the essential stages so

136
00:06:10,649 --> 00:06:08,729
you start with the phenomenal stages

137
00:06:12,240 --> 00:06:10,659
observation arrogate regularities and

138
00:06:14,939 --> 00:06:12,250

phenomena and then you go to the

139

00:06:16,439 --> 00:06:14,949

substantial stage looking at entities

140

00:06:18,360 --> 00:06:16,449

okay that are related to those

141

00:06:20,939 --> 00:06:18,370

observation and finally the essence

142

00:06:22,829 --> 00:06:20,949

connecting entities and phenomena so

143

00:06:24,920 --> 00:06:22,839

corresponding to this triad we have

144

00:06:27,719 --> 00:06:24,930

three stages of scientific development

145

00:06:28,769 --> 00:06:27,729

okay one case example would be Newton

146

00:06:32,010 --> 00:06:28,779

and astronomy where you observe

147

00:06:33,929 --> 00:06:32,020

celestial bodies phenomenal stage you

148

00:06:36,089 --> 00:06:33,939

hypothesize real constituent in the

149

00:06:38,879 --> 00:06:36,099

universe substantial stage and the

150

00:06:41,309 --> 00:06:38,889

essential stage you'd ever derive some

151
00:06:44,189 --> 00:06:41,319
mathematical laws okay to explain the

152
00:06:46,469 --> 00:06:44,199
motions of the bodies this image has

153
00:06:48,269 --> 00:06:46,479
been taken from a presentation by Sochi

154
00:06:48,879 --> 00:06:48,279
Chi which he emeritus professor of

155
00:06:52,029 --> 00:06:48,889
philosophy

156
00:06:53,709 --> 00:06:52,039
of science at Kyoto University okay but

157
00:06:56,589 --> 00:06:53,719
actually according at least two hoochies

158
00:06:58,089 --> 00:06:56,599
and say Mitsui tacit Annie's model has

159
00:07:00,189 --> 00:06:58,099
some problems okay

160
00:07:01,600 --> 00:07:00,199
I won't go into details here but first

161
00:07:03,459 --> 00:07:01,610
of all what is the criterion for

162
00:07:05,890 --> 00:07:03,469
distinguishing the three stages you

163
00:07:08,649 --> 00:07:05,900

notice also that the process repeats

164

00:07:10,360 --> 00:07:08,659

itself and like in the Sparrow okay so

165

00:07:12,189 --> 00:07:10,370

what would be the logic for repeating

166

00:07:14,559 --> 00:07:12,199

the substantial and essential stages at

167

00:07:16,989 --> 00:07:14,569

a higher level for example going from

168

00:07:19,480 --> 00:07:16,999

Newtonian mechanics to an chen theory of

169

00:07:21,519 --> 00:07:19,490

general relativity so there are some

170

00:07:25,929 --> 00:07:21,529

problems with this model at least as

171

00:07:27,519 --> 00:07:25,939

articulated by og sensei

172

00:07:29,980 --> 00:07:27,529

let's look very quickly at Gaston

173

00:07:32,649 --> 00:07:29,990

Bachelard model of scientific change so

174

00:07:34,990 --> 00:07:32,659

it is based on epidemiological concepts

175

00:07:38,170 --> 00:07:35,000

and it predates actually Koons work by

176
00:07:40,240 --> 00:07:38,180
more than 20 years okay actually queuing

177
00:07:42,129 --> 00:07:40,250
was indirectly influenced by bachelor

178
00:07:45,189 --> 00:07:42,139
the other French philosopher Alexander

179
00:07:47,110 --> 00:07:45,199
query as well according to bachelor

180
00:07:48,909 --> 00:07:47,120
science is best known by reflection on

181
00:07:51,790 --> 00:07:48,919
its history so history of science is

182
00:07:53,529 --> 00:07:51,800
important to understand science Bachelor

183
00:07:56,040 --> 00:07:53,539
believed that there are some sharp

184
00:07:59,050 --> 00:07:56,050
breaks in their history of science okay

185
00:07:59,740 --> 00:07:59,060
in this model of scientific change in

186
00:08:01,719 --> 00:07:59,750
progress

187
00:08:05,529 --> 00:08:01,729
there are five key epistemological

188
00:08:08,980 --> 00:08:05,539

concepts epistemological break obstacle

189

00:08:12,159 --> 00:08:08,990

profile act and reforging a whole Fault

190

00:08:13,450 --> 00:08:12,169

in French okay so very quickly let's go

191

00:08:15,850 --> 00:08:13,460

through the vets who are a few of those

192

00:08:17,200 --> 00:08:15,860

I mean all of those if we look at the

193

00:08:19,510 --> 00:08:17,210

epistemological break there are two

194

00:08:20,980 --> 00:08:19,520

types a break or even a contradiction

195

00:08:23,740 --> 00:08:20,990

between scientific knowledge and

196

00:08:26,950 --> 00:08:23,750

ordinary knowledge based on common sense

197

00:08:29,740 --> 00:08:26,960

experiences a break between successive

198

00:08:31,540 --> 00:08:29,750

sunset scientific concepts okay

199

00:08:33,730 --> 00:08:31,550

if you look at an epistemological

200

00:08:36,430 --> 00:08:33,740

obstacle we are looking at to any

201
00:08:37,360 --> 00:08:36,440
concept or method that prevents a break

202
00:08:39,939 --> 00:08:37,370
from occurring

203
00:08:42,490 --> 00:08:39,949
common sense can be in the

204
00:08:44,889 --> 00:08:42,500
epistemological obstacle implicit views

205
00:08:47,829 --> 00:08:44,899
and attitudes unconscious strategies of

206
00:08:49,449 --> 00:08:47,839
thought images such as once again Bohr's

207
00:08:51,340 --> 00:08:49,459
model for example they may have been

208
00:08:53,560 --> 00:08:51,350
useful in the past but not anymore

209
00:08:55,360 --> 00:08:53,570
epistemic or profile would be an

210
00:08:58,800 --> 00:08:55,370
analysis of a given individuals

211
00:09:01,480 --> 00:08:58,810
understanding of a scientific concept an

212
00:09:02,440 --> 00:09:01,490
epistemological act would actually be a

213
00:09:05,050 --> 00:09:02,450

leap of genius

214

00:09:06,840 --> 00:09:05,060

okay by some scientists which would lead

215

00:09:09,040 --> 00:09:06,850

to scientific progress an

216

00:09:11,710 --> 00:09:09,050

epistemological reforging would be a

217

00:09:14,260 --> 00:09:11,720

preservation by a reformulation of old

218

00:09:17,170 --> 00:09:14,270

ideas in a new and broader context of

219

00:09:20,230 --> 00:09:17,180

salt for example including Euclidean

220

00:09:22,420 --> 00:09:20,240

geometry into non Euclidean geometry as

221

00:09:24,940 --> 00:09:22,430

a special case or Newtonian mechanics as

222

00:09:27,670 --> 00:09:24,950

a special case but not rejected of

223

00:09:28,630 --> 00:09:27,680

Einstein's relativistic mechanics in

224

00:09:32,530 --> 00:09:28,640

other words we're looking at a

225

00:09:34,510 --> 00:09:32,540

rectification of errors okay so only two

226

00:09:37,230 --> 00:09:34,520

problems inherent in tacit Annie's model

227

00:09:40,780 --> 00:09:37,240

we will focus on queuing verses bachelor

228

00:09:43,150 --> 00:09:40,790

so here I know it's a busy table to

229

00:09:45,190 --> 00:09:43,160

compare Kuhn and bash law so I will

230

00:09:47,680 --> 00:09:45,200

emphasize I will highlight the main

231

00:09:50,740 --> 00:09:47,690

points the similarities in yellow and

232

00:09:53,350 --> 00:09:50,750

the differences in red so both of them

233

00:09:54,910 --> 00:09:53,360

who were actually trained as physicists

234

00:09:56,860 --> 00:09:54,920

before they became philosophers of

235

00:09:59,230 --> 00:09:56,870

science okay

236

00:10:00,940 --> 00:09:59,240

I myself I'm a physician just now I'm

237

00:10:04,060 --> 00:10:00,950

getting into philosophy of science it's

238

00:10:05,620 --> 00:10:04,070

very interesting anyway history of

239

00:10:06,700 --> 00:10:05,630

science was very important to both of

240

00:10:09,190 --> 00:10:06,710

them okay

241

00:10:12,040 --> 00:10:09,200

whereas Kuhn focuses on scientific

242

00:10:14,350 --> 00:10:12,050

theory Gaston bachelor forces on the

243

00:10:17,230 --> 00:10:14,360

epistemological concept and if we look

244

00:10:20,410 --> 00:10:17,240

at a description of scientific change to

245

00:10:22,420 --> 00:10:20,420

bash for for Kuhn normal science was

246

00:10:25,630 --> 00:10:22,430

constituted by paradigms like puzzles

247

00:10:26,950 --> 00:10:25,640

you add pieces to the puzzle and when

248

00:10:28,450 --> 00:10:26,960

there is a piece that you would like to

249

00:10:32,110 --> 00:10:28,460

add that doesn't fit with the puzzle

250

00:10:34,120 --> 00:10:32,120

okay then you have a crisis which leads

251
00:10:36,430 --> 00:10:34,130
to Scientific Revolution in other words

252
00:10:37,660 --> 00:10:36,440
to paradigm shift according to Kuhn

253
00:10:41,560 --> 00:10:37,670
those are rare and there are

254
00:10:43,570 --> 00:10:41,570
discontinuous whereas for bachelor there

255
00:10:46,240 --> 00:10:43,580
is the historical discontinuity is

256
00:10:48,790 --> 00:10:46,250
normal okay the mode of change in the

257
00:10:50,890 --> 00:10:48,800
case of Kuhn is that those crises

258
00:10:52,570 --> 00:10:50,900
constitute a sudden event whereas

259
00:10:54,670 --> 00:10:52,580
actually in the case of bachelor there

260
00:10:57,220 --> 00:10:54,680
is a process that is involved is there

261
00:10:59,140 --> 00:10:57,230
scientific progress in the case of Kuhn

262
00:11:01,900 --> 00:10:59,150
not necessarily because there is so

263
00:11:04,090 --> 00:11:01,910

called Q loss okay a loss of explanatory

264

00:11:05,650 --> 00:11:04,100

power that can occur when you have a new

265

00:11:07,570 --> 00:11:05,660

theory okay

266

00:11:09,940 --> 00:11:07,580

in the case of bachelor usually yes

267

00:11:12,040 --> 00:11:09,950

there will be scientific progress is

268

00:11:14,140 --> 00:11:12,050

there a better approximation to the

269

00:11:15,840 --> 00:11:14,150

truth when I say the truth here I mean

270

00:11:19,949 --> 00:11:15,850

something that is

271

00:11:21,449 --> 00:11:19,959

objectively measurable okay no according

272

00:11:23,189 --> 00:11:21,459

to Kuhn because of the

273

00:11:25,470 --> 00:11:23,199

incommensurability the difficulty in

274

00:11:27,780 --> 00:11:25,480

comparing successive series in the case

275

00:11:30,449 --> 00:11:27,790

of bachelor yes through the correction

276

00:11:32,160 --> 00:11:30,459

of error so you can see that there is an

277

00:11:36,090 --> 00:11:32,170

interesting mix of similarities and

278

00:11:37,319 --> 00:11:36,100

differences between Kuhn and bachelor so

279

00:11:39,269 --> 00:11:37,329

this is the question I would like to

280

00:11:42,150 --> 00:11:39,279

submit to all of you in this conference

281

00:11:44,430 --> 00:11:42,160

can we elaborate a new model from Kuhn

282

00:11:46,590 --> 00:11:44,440

and Bachelor that will address real

283

00:11:48,720 --> 00:11:46,600

problems okay this is what I would like

284

00:11:50,910 --> 00:11:48,730

to start working on in my new project in

285

00:11:54,360 --> 00:11:50,920

other words I was just burning the old

286

00:11:57,090 --> 00:11:54,370

house science as an institution today or

287

00:12:01,170 --> 00:11:57,100

are we preparing the ground for planting

288

00:12:03,329 --> 00:12:01,180

a new crop so in building a new bonds we

289

00:12:04,860 --> 00:12:03,339

need a metric and of course we're

290

00:12:06,780 --> 00:12:04,870

planning to use anomalies and de metric

291

00:12:10,110 --> 00:12:06,790

and I know that there are famous experts

292

00:12:12,629 --> 00:12:10,120

here on anomalies I am just a rookie in

293

00:12:15,990 --> 00:12:12,639

that field but I hope to do some

294

00:12:17,460 --> 00:12:16,000

interesting work on it as you know there

295

00:12:18,900 --> 00:12:17,470

are well-known anomalies in the history

296

00:12:20,850 --> 00:12:18,910

of sine that led to scientific progress

297

00:12:22,949 --> 00:12:20,860

one of the best examples can be found in

298

00:12:24,900 --> 00:12:22,959

astronomy for example the anomalous

299

00:12:28,650 --> 00:12:24,910

orbit of uranus leading to the discovery

300

00:12:30,870 --> 00:12:28,660

of Neptune by laveyan Adams in 1846 the

301

00:12:32,490 --> 00:12:30,880

anomalous angular advance of the

302

00:12:35,269 --> 00:12:32,500

perihelion of Mercury's orbit around the

303

00:12:37,259 --> 00:12:35,279

Sun which was finally explained via

304

00:12:39,059 --> 00:12:37,269

relativist Einstein's theory of general

305

00:12:42,569 --> 00:12:39,069

relativity those are quite well-known

306

00:12:45,120 --> 00:12:42,579

examples but we can look at anomalies in

307

00:12:47,129 --> 00:12:45,130

so called fringe science so what is

308

00:12:49,800 --> 00:12:47,139

originally considered as fringe science

309

00:12:51,499 --> 00:12:49,810

could be now is that is now part of

310

00:12:54,090 --> 00:12:51,509

current paradigm would include

311

00:12:56,759 --> 00:12:54,100

continental drift beginners theories ok

312

00:12:59,100 --> 00:12:56,769

big bang theory by a balloon eight hell

313

00:13:02,420 --> 00:12:59,110

you centrism existence of Troy north

314

00:13:05,340 --> 00:13:02,430

colonization of the Americas etc ok

315

00:13:08,189 --> 00:13:05,350

anomalies that might soon be accepted as

316

00:13:11,129 --> 00:13:08,199

science that could constitute right now

317

00:13:14,340 --> 00:13:11,139

non science in Pope Arian terms ok or

318

00:13:16,800 --> 00:13:14,350

our pursuit of science the alai effect

319

00:13:19,379 --> 00:13:16,810

may be cold fusion crop circles

320

00:13:24,150 --> 00:13:19,389

cryptozoology energy healing human

321

00:13:25,620 --> 00:13:24,160

longevity UFO phenomenon etc so actually

322

00:13:28,799 --> 00:13:25,630

why is fringe science with its

323

00:13:29,730 --> 00:13:28,809

accompanying anomalies rejected so the

324

00:13:31,440 --> 00:13:29,740

current paradigm

325

00:13:33,630 --> 00:13:31,450

tend to become more of an obstacle to

326

00:13:35,610 --> 00:13:33,640

than a facilitator of scientific

327

00:13:38,220 --> 00:13:35,620

progress because there are some inherent

328

00:13:43,110 --> 00:13:38,230

problems that might be an accidental

329

00:13:46,140 --> 00:13:43,120

consequence of former technology okay we

330

00:13:50,360 --> 00:13:46,150

are going back to the list of elements

331

00:13:52,470 --> 00:13:50,370

that constitute a paradigm in the

332

00:13:53,850 --> 00:13:52,480

conventional view of science as an

333

00:13:56,630 --> 00:13:53,860

institution okay

334

00:14:00,660 --> 00:13:56,640

peer review system might lead to a mafia

335

00:14:03,000 --> 00:14:00,670

self-referential for example okay

336

00:14:05,210 --> 00:14:03,010

confirmation bias after all those can

337

00:14:08,160 --> 00:14:05,220

lead to problems with peer review system

338

00:14:10,470 --> 00:14:08,170

institution Yaqui and publication okay

339

00:14:12,410 --> 00:14:10,480

here the argument from Authority plays

340

00:14:14,640 --> 00:14:12,420

an important role the government

341

00:14:17,600 --> 00:14:14,650

dominated funding leads to a

342

00:14:20,700 --> 00:14:17,610

politicization of science technology

343

00:14:23,250 --> 00:14:20,710

actually using paper what I call here

344

00:14:25,440 --> 00:14:23,260

the paper priesthood okay can lead to

345

00:14:27,960 --> 00:14:25,450

inertia it takes quite a while in order

346

00:14:30,030 --> 00:14:27,970

to publish publication in for paper

347

00:14:33,240 --> 00:14:30,040

format whereas by using the internet it

348

00:14:34,770 --> 00:14:33,250

can be done much more quickly the

349

00:14:37,650 --> 00:14:34,780

concluding remark I would like to make

350

00:14:40,800 --> 00:14:37,660

here is technology has changed okay

351

00:14:44,160 --> 00:14:40,810

from the time of the monastery in the

352

00:14:48,150 --> 00:14:44,170

paper text to the printing press until

353

00:14:50,460 --> 00:14:48,160

now in the Internet age okay involving

354

00:14:53,490 --> 00:14:50,470

digital media there has been a

355

00:14:55,230 --> 00:14:53,500

tremendous advance in technology but we

356

00:14:59,490 --> 00:14:55,240

need to consider when building our new

357

00:15:01,170 --> 00:14:59,500

model okay and actually we would like to

358

00:15:03,720 --> 00:15:01,180

hypothesize that the sharing of

359

00:15:05,550 --> 00:15:03,730

knowledge via distributed systems needs

360

00:15:07,800 --> 00:15:05,560

to be integrated this to into this new

361

00:15:10,320 --> 00:15:07,810

model of scientific change and progress

362

00:15:12,750 --> 00:15:10,330

so I'm giving you here as a few example

363

00:15:15,300 --> 00:15:12,760

SETI at home which was started some 15

364

00:15:18,240 --> 00:15:15,310

years ago I believe distributed net

365

00:15:20,760 --> 00:15:18,250

amateur astronomy in other words we

366

00:15:24,960 --> 00:15:20,770

believe that we would need a protestants

367

00:15:28,320 --> 00:15:24,970

okay part by analogy with with what

368

00:15:31,350 --> 00:15:28,330

happened you know in the 6th in 16th

369

00:15:33,720 --> 00:15:31,360

century Europe Reformation of science in

370

00:15:36,480 --> 00:15:33,730

which every every person becomes a

371

00:15:39,120 --> 00:15:36,490

scientist can everybody become a

372

00:15:42,390 --> 00:15:39,130

scientist in principle potentially yes

373

00:15:43,530 --> 00:15:42,400

young people nowadays have tools which

374

00:15:46,740 --> 00:15:43,540

we will not even have

375

00:15:48,600 --> 00:15:46,750

dreamt about fifty years ago okay

376

00:15:51,749 --> 00:15:48,610

those tools can really be used so that

377

00:15:54,199 --> 00:15:51,759

everybody can become a scientist and

378

00:15:56,249 --> 00:15:54,209

especially the possibility of

379

00:16:01,550 --> 00:15:56,259

serendipitous discovery can be

380

00:16:04,110 --> 00:16:01,560

tremendously magnified we believe okay I

381

00:16:05,850 --> 00:16:04,120

would like to thank you for your

382

00:16:07,889 --> 00:16:05,860

attention I know that my presentation

383

00:16:10,740 --> 00:16:07,899

was a bit short so I suspect that there

384

00:16:12,930 --> 00:16:10,750

might be quite a lot of questions and if

385

00:16:14,790 --> 00:16:12,940

there is anything more you would like to

386

00:16:16,259 --> 00:16:14,800

discuss with me in detail of course I

387

00:16:17,790 --> 00:16:16,269

will be available after I look at the

388

00:16:29,490 --> 00:16:17,800

conference thank you very much

389

00:16:32,670 --> 00:16:29,500

terrific I'd like to point out that one

390

00:16:36,420 --> 00:16:32,680

of your fringe Sciences at least on your

391

00:16:38,430 --> 00:16:36,430

list sort of jumped out as not really

392

00:16:41,040 --> 00:16:38,440

fitting with the others because it's

393

00:16:44,249 --> 00:16:41,050

it's caught in a cleft stick and no

394

00:16:45,930 --> 00:16:44,259

reformulations or paradigm shift will

395

00:16:49,040 --> 00:16:45,940

fix the problem as it's currently

396

00:16:51,329 --> 00:16:49,050

defined and that is cryptozoology

397

00:16:53,879 --> 00:16:51,339

cryptozoologists are people who try to

398

00:16:56,519 --> 00:16:53,889

establish the existence of animals that

399

00:16:59,579 --> 00:16:56,529

are reported but are not yet known to be

400

00:17:01,050 --> 00:16:59,589

real but whenever they succeed it stops

401
00:17:03,689 --> 00:17:01,060
being part of their subject matter and

402
00:17:07,890 --> 00:17:03,699
the regular biologists take over that is

403
00:17:12,840 --> 00:17:07,900
a structural problem inherent to that

404
00:17:15,870 --> 00:17:12,850
science which I couldn't think of a way

405
00:17:17,039 --> 00:17:15,880
for them to get out of it but if it

406
00:17:18,809 --> 00:17:17,049
doesn't matter what the rest of the

407
00:17:21,059 --> 00:17:18,819
scientific paradigm does they have to

408
00:17:24,600 --> 00:17:21,069
fix their own definition in order to

409
00:17:27,390 --> 00:17:24,610
become part of a unified successful

410
00:17:30,140 --> 00:17:27,400
scientific system I thank you very much

411
00:17:36,600 --> 00:17:30,150
for pointing out this son it's a problem

412
00:17:39,570 --> 00:17:36,610
I think the idea of viewing progress in

413
00:17:46,049 --> 00:17:39,580

science and change in science in terms

414

00:17:49,950 --> 00:17:46,059

of a break it implies that science can

415

00:17:52,500 --> 00:17:49,960

be described as a one-dimensional thing

416

00:17:55,760 --> 00:17:52,510

or as one aspect whereas I think

417

00:17:58,100 --> 00:17:55,770

actually there are three important tasks

418

00:18:01,250 --> 00:17:58,110

Effects of science there is the theory

419

00:18:04,150 --> 00:18:01,260

and that's what the paradigms refer to

420

00:18:07,640 --> 00:18:04,160

there are methods and there are

421

00:18:10,820 --> 00:18:07,650

phenomena and facts and I believe that

422

00:18:15,410 --> 00:18:10,830

those three aspects of science don't

423

00:18:18,530 --> 00:18:15,420

change in lockstep one changes then

424

00:18:23,060 --> 00:18:18,540

another one then another one and I found

425

00:18:26,270 --> 00:18:23,070

a useful way of thinking about change is

426

00:18:29,240 --> 00:18:26,280

that if you're trying to if you're

427

00:18:34,070 --> 00:18:29,250

claiming a change in one aspect of

428

00:18:37,600 --> 00:18:34,080

science then Coons idea of paradigm

429

00:18:42,850 --> 00:18:37,610

shifts and scientific revolutions

430

00:18:46,340 --> 00:18:42,860

replies if however you try to change a

431

00:18:51,430 --> 00:18:46,350

mainstream consensus with two of the

432

00:18:54,980 --> 00:18:51,440

aspects at the same time you have no

433

00:19:00,830 --> 00:18:54,990

audience effectively and a classic

434

00:19:04,450 --> 00:19:00,840

example of that is Mendel who was

435

00:19:09,460 --> 00:19:04,460

ignored essentially for 50 years because

436

00:19:15,110 --> 00:19:09,470

he was using an unorthodox method and

437

00:19:18,860 --> 00:19:15,120

producing unorthodox data and if you try

438

00:19:21,650 --> 00:19:18,870

to suggest the change is needed in

439

00:19:27,320 --> 00:19:21,660

theory method and facts all at the same

440

00:19:31,220 --> 00:19:27,330

time then you have things like Loch Ness

441

00:19:34,190 --> 00:19:31,230

monsters Velikovsky's ideas and what is

442

00:19:37,970 --> 00:19:34,200

generally thought of as dismissed as

443

00:19:39,620 --> 00:19:37,980

pseudoscience thank you very much for

444

00:19:42,320 --> 00:19:39,630

your for your comments that's going to

445

00:19:42,320 --> 00:19:42,330

be very helpful

446

00:19:52,130 --> 00:19:50,330

I would like to make a comment that the

447

00:19:56,230 --> 00:19:52,140

signs that we have been discussing in

448

00:19:59,600 --> 00:19:56,240

this room is primarily dominated by

449

00:20:03,769 --> 00:19:59,610

modern science that originated in the

450

00:20:07,009 --> 00:20:03,779

West there were some talks there's

451
00:20:08,240 --> 00:20:07,019
another science about which people don't

452
00:20:11,450 --> 00:20:08,250
know anything because of poor

453
00:20:14,690 --> 00:20:11,460
dissemination and that's the ancient

454
00:20:18,320 --> 00:20:14,700
science of non-duality that originated

455
00:20:21,700 --> 00:20:18,330
thousands of years ago our Veda has come

456
00:20:26,389 --> 00:20:21,710
to or coming to us in the West

457
00:20:30,259 --> 00:20:26,399
acupuncture is here and also the science

458
00:20:34,129 --> 00:20:30,269
of yoga not the yoga that you see on the

459
00:20:37,220 --> 00:20:34,139
street or the deep science so one

460
00:20:41,090 --> 00:20:37,230
proposal one thought is that in this

461
00:20:43,159 --> 00:20:41,100
society we can entertain the idea what

462
00:20:46,190 --> 00:20:43,169
is their science they have been

463
00:20:50,330 --> 00:20:46,200

discussions here in this conference

464

00:20:54,470 --> 00:20:50,340

since morning the many concepts that can

465

00:20:58,039 --> 00:20:54,480

be put forward definitions terminology

466

00:21:00,470 --> 00:20:58,049

on and on but these signs even the

467

00:21:02,810 --> 00:21:00,480

terminology for example there is no

468

00:21:06,289 --> 00:21:02,820

standardization and I'm speaking to you

469

00:21:10,789 --> 00:21:06,299

from my own experience I think it'll be

470

00:21:13,370 --> 00:21:10,799

very fruitful exercise to find the

471

00:21:15,919 --> 00:21:13,380

interface between these two Sciences the

472

00:21:20,389 --> 00:21:15,929

ancient and the modern and you will see

473

00:21:24,230 --> 00:21:20,399

a lot of cross fertilization Oscar

474

00:21:26,389 --> 00:21:24,240

around to help the humanity move forward

475

00:21:29,539 --> 00:21:26,399

actually Bosch laughs talked about

476

00:21:32,539 --> 00:21:29,549

region of regions of rationality and

477

00:21:34,340 --> 00:21:32,549

that implied also regions of science not

478

00:21:37,399 --> 00:21:34,350

only field but I think he owes he might

479

00:21:40,389 --> 00:21:37,409

also have implied also geographically as

480

00:21:42,350 --> 00:21:40,399

well and actually in in the course of

481

00:21:44,629 --> 00:21:42,360

philosophy and history of science I have

482

00:21:47,690 --> 00:21:44,639

been teaching at G is actually the first

483

00:21:48,889 --> 00:21:47,700

that is been given in English when we

484

00:21:50,990 --> 00:21:48,899

look at the history of science

485

00:21:53,149 --> 00:21:51,000

I do not start with the Greek I look at

486

00:21:55,070 --> 00:21:53,159

Indian science I also look at Chinese

487

00:21:57,830 --> 00:21:55,080

science and even a little bit of

488

00:22:00,019 --> 00:21:57,840

Japanese signs well wasun for example

489

00:22:02,779 --> 00:22:00,029

mathematics in the 17th century of the

490

00:22:04,880 --> 00:22:02,789

way for example that calculus was also

491

00:22:07,970 --> 00:22:04,890

seemingly independent independently

492

00:22:11,750 --> 00:22:07,980

formalized by a bicycie kakuzu in Japan

493

00:22:14,090 --> 00:22:11,760

as well so I totally agree with you and

494

00:22:17,180 --> 00:22:14,100

actually in my research I would like to

495

00:22:19,519 --> 00:22:17,190

consider all those different regions of

496

00:22:22,060 --> 00:22:19,529

rationalities and regions of science in

497

00:22:26,120 --> 00:22:22,070

my model I'll be happy to give you some

498

00:22:34,419 --> 00:22:26,130

key references as a way to initiate

499

00:22:34,429 --> 00:22:40,800

ok thank you

500

00:22:43,420 --> 00:22:42,380

[Music]

