

How Non-Physical Influences Show Themselves in Physics

Ian Thompson



**SOCIETY
FOR
SCIENTIFIC
EXPLORATION**

1
00:00:07,909 --> 00:00:06,070

[Music]

2
00:00:10,549 --> 00:00:07,919

my name is ian thompson

3
00:00:11,910 --> 00:00:10,559

i'm from livermore in california and i'm

4
00:00:14,789 --> 00:00:11,920

going to talk about

5
00:00:16,150 --> 00:00:14,799

how the non-physical influences physics

6
00:00:19,429 --> 00:00:16,160

and physiology i'm going to make a

7
00:00:20,710 --> 00:00:19,439

proposal for how to bridge the gap

8
00:00:22,630 --> 00:00:20,720

between the non-physical and the

9
00:00:24,710 --> 00:00:22,640

physical

10
00:00:27,750 --> 00:00:24,720

so the outline of my talk

11
00:00:31,269 --> 00:00:29,669

explain how this

12
00:00:33,830 --> 00:00:31,279

issue is connected with the mind-body

13
00:00:36,790 --> 00:00:33,840

problem and how it's related to possible

14

00:00:38,950 --> 00:00:36,800

solutions of the mind-body problem

15

00:00:41,030 --> 00:00:38,960

and then the next element of the talk is

16

00:00:42,869 --> 00:00:41,040

to explain what i mean by non-physical i

17

00:00:44,549 --> 00:00:42,879

want to be a bit more precise

18

00:00:46,549 --> 00:00:44,559

and define it in a positive rather than

19

00:00:48,790 --> 00:00:46,559

a negative way

20

00:00:51,029 --> 00:00:48,800

and then in order to find and bridge the

21

00:00:53,670 --> 00:00:51,039

gap between these two things

22

00:00:55,910 --> 00:00:53,680

we want to find a soft spot on quantum

23

00:00:56,869 --> 00:00:55,920

physics something where changes could be

24

00:00:58,389 --> 00:00:56,879

made

25

00:00:59,590 --> 00:00:58,399

and then i'm going to

26

00:01:01,750 --> 00:00:59,600

say that

27

00:01:02,709 --> 00:01:01,760

varying the electric permittivity of the

28

00:01:06,710 --> 00:01:02,719

vacuum

29

00:01:08,149 --> 00:01:06,720

is one such way one such soft spot that

30

00:01:10,230 --> 00:01:08,159

in which quantum physics could be

31

00:01:12,230 --> 00:01:10,240

changed

32

00:01:14,310 --> 00:01:12,240

and then i show that the result of this

33

00:01:16,469 --> 00:01:14,320

is that energy is not always conserved

34

00:01:18,950 --> 00:01:16,479

locally and therefore we shouldn't try

35

00:01:20,390 --> 00:01:18,960

too hard to conserve energy locally in

36

00:01:22,469 --> 00:01:20,400

order to have the connection between

37

00:01:24,830 --> 00:01:22,479

mind and body

38

00:01:27,270 --> 00:01:24,840

and then in order to

39

00:01:30,630 --> 00:01:27,280

organize these changes from the point of

40

00:01:32,630 --> 00:01:30,640

view of physiology i show how to

41

00:01:35,030 --> 00:01:32,640

formulate the idea of targets as a new

42

00:01:37,190 --> 00:01:35,040

level of physics

43

00:01:41,990 --> 00:01:37,200

in order to see how that works and then

44

00:01:44,310 --> 00:01:42,000

i give some numerical examples of

45

00:01:45,830 --> 00:01:44,320

how to change proteins how to move them

46

00:01:49,270 --> 00:01:45,840

or do other things and then have a

47

00:01:53,670 --> 00:01:51,590

the problem that i'm trying to address

48

00:01:55,749 --> 00:01:53,680

is that it can be seen in many talks in

49

00:01:58,550 --> 00:01:55,759

this convention because they provide

50

00:02:01,670 --> 00:01:58,560

evidence for novel causes and lots of

51
00:02:03,670 --> 00:02:01,680
effects related to non-physical minds

52
00:02:06,630 --> 00:02:03,680
and we can see these because they have

53
00:02:08,150 --> 00:02:06,640
effects in in physical things

54
00:02:10,309 --> 00:02:08,160
and in fact when we think about it there

55
00:02:12,150 --> 00:02:10,319
are many effects of our mind

56
00:02:13,430 --> 00:02:12,160
on our body every second every time we

57
00:02:15,510 --> 00:02:13,440
move our finger

58
00:02:17,990 --> 00:02:15,520
because we decide to do so

59
00:02:20,229 --> 00:02:18,000
so we have the issue here of crossing

60
00:02:22,150 --> 00:02:20,239
the mind body gap

61
00:02:23,270 --> 00:02:22,160
in order to address this problem we have

62
00:02:25,110 --> 00:02:23,280
to ask

63
00:02:27,750 --> 00:02:25,120

is there something incomplete about

64

00:02:30,150 --> 00:02:27,760

physics and if there is can we make a

65

00:02:32,390 --> 00:02:30,160

proposal for how to complete it and

66

00:02:35,589 --> 00:02:32,400

could experiments see any specific new

67

00:02:39,589 --> 00:02:37,430

some of the traditional ways of crossing

68

00:02:41,750 --> 00:02:39,599

the mind body gap

69

00:02:43,750 --> 00:02:41,760

are first of all monism which is to say

70

00:02:45,670 --> 00:02:43,760

there isn't really a gap because there

71

00:02:48,830 --> 00:02:45,680

is a combined physical and mental world

72

00:02:50,390 --> 00:02:48,840

that has a uniform system of causes and

73

00:02:51,750 --> 00:02:50,400

effects

74

00:02:54,470 --> 00:02:51,760

and according to this view what is

75

00:02:56,390 --> 00:02:54,480

mental is really physical

76
00:02:57,830 --> 00:02:56,400
and what is physical is really mental so

77
00:02:59,830 --> 00:02:57,840
they're the same

78
00:03:01,110 --> 00:02:59,840
but if you just listen to the talks in

79
00:03:03,430 --> 00:03:01,120
this convention you'll see that the

80
00:03:05,750 --> 00:03:03,440
behavior that we want from minds are

81
00:03:07,670 --> 00:03:05,760
completely different from the behavior

82
00:03:09,350 --> 00:03:07,680
of physical things so it's very strange

83
00:03:11,190 --> 00:03:09,360
to say that they're really the same

84
00:03:14,390 --> 00:03:11,200
thing

85
00:03:16,550 --> 00:03:14,400
one remedy is called dualism famously

86
00:03:19,030 --> 00:03:16,560
from descartes are two levels

87
00:03:21,110 --> 00:03:19,040
they do exist distinct

88
00:03:22,470 --> 00:03:21,120

physical and mental substances that

89

00:03:26,470 --> 00:03:22,480

which are separate

90

00:03:28,710 --> 00:03:26,480

but interconnected in specific ways

91

00:03:30,309 --> 00:03:28,720

there's no causal closure anywhere but

92

00:03:31,589 --> 00:03:30,319

there are interactions which have to be

93

00:03:33,750 --> 00:03:31,599

spelt out

94

00:03:35,190 --> 00:03:33,760

and people have had trouble spelling out

95

00:03:38,070 --> 00:03:35,200

these interactions but that's what we're

96

00:03:39,830 --> 00:03:38,080

going to look at now

97

00:03:42,070 --> 00:03:39,840

my view will be somewhat nearer to

98

00:03:43,350 --> 00:03:42,080

dualism than modernism because i base my

99

00:03:45,350 --> 00:03:43,360

theory on

100

00:03:47,589 --> 00:03:45,360

of discrete degrees as

101

00:03:50,550 --> 00:03:47,599

on a generalized dualism

102

00:03:52,710 --> 00:03:50,560

these ideas come from emanuel swedenborg

103

00:03:56,710 --> 00:03:52,720

who talked about discrete degrees in

104

00:04:00,710 --> 00:03:58,869

in order to understand what's going on

105

00:04:03,030 --> 00:04:00,720

here we have to understand what some of

106

00:04:06,070 --> 00:04:03,040

these multiple levels are so we can say

107

00:04:08,869 --> 00:04:06,080

what's physical and what's not physical

108

00:04:11,670 --> 00:04:08,879

i know i i draw here first a very quick

109

00:04:14,149 --> 00:04:11,680

summary blue things are non-physical

110

00:04:16,710 --> 00:04:14,159

things spiritual mental intentions

111

00:04:19,110 --> 00:04:16,720

sensory motor mind to spiritual body

112

00:04:21,590 --> 00:04:19,120

all of those are non-physical can be

113

00:04:23,430 --> 00:04:21,600

included in a general sense of mental

114

00:04:26,629 --> 00:04:23,440

and then in green here we have physical

115

00:04:29,270 --> 00:04:26,639

things we have physical changes in

116

00:04:30,790 --> 00:04:29,280

material objects and in the middle

117

00:04:32,230 --> 00:04:30,800

there's something which i'm going to

118

00:04:34,790 --> 00:04:32,240

which i'm going to introduce in the

119

00:04:36,310 --> 00:04:34,800

future of this talk about final causes

120

00:04:38,710 --> 00:04:36,320

and targets i want to say those are

121

00:04:41,670 --> 00:04:38,720

physical but

122

00:04:43,510 --> 00:04:41,680

so i'm going to focus on this last step

123

00:04:46,070 --> 00:04:43,520

into the physical how the spiritual body

124

00:04:48,390 --> 00:04:46,080

and the sensory motor mind make

125

00:04:51,110 --> 00:04:48,400

changes in the physical world

126
00:04:52,710 --> 00:04:51,120
and i want to see how final causes which

127
00:04:55,670 --> 00:04:52,720
come from the mental of the spiritual

128
00:04:57,990 --> 00:04:55,680
bodies can create targets which affects

129
00:04:59,990 --> 00:04:58,000
what happens in physics

130
00:05:01,189 --> 00:05:00,000
and whatever i do here can be applied to

131
00:05:03,110 --> 00:05:01,199
all kinds

132
00:05:05,990 --> 00:05:03,120
of input from spiritual or mental

133
00:05:07,830 --> 00:05:06,000
discrete degrees

134
00:05:09,909 --> 00:05:07,840
so what i'm going to do is i'm going to

135
00:05:11,670 --> 00:05:09,919
describe something like final causes and

136
00:05:14,070 --> 00:05:11,680
targets and i'm going to make them

137
00:05:17,189 --> 00:05:14,080
causally active and i'm going to show

138
00:05:19,909 --> 00:05:17,199

how those causes operate

139

00:05:21,830 --> 00:05:19,919

and in these things i always take

140

00:05:24,230 --> 00:05:21,840

non-physical and physical

141

00:05:26,150 --> 00:05:24,240

different kinds of substances connected

142

00:05:26,950 --> 00:05:26,160

in ways which we'll see

143

00:05:28,790 --> 00:05:26,960

and

144

00:05:29,510 --> 00:05:28,800

you can think of this as i'm trying to

145

00:05:32,310 --> 00:05:29,520

show

146

00:05:37,110 --> 00:05:32,320

how dualism can work in a proper and

147

00:05:41,670 --> 00:05:38,310

if i'm going to say that there are

148

00:05:43,110 --> 00:05:41,680

non-physical effects on physical things

149

00:05:45,029 --> 00:05:43,120

then something must be different in

150

00:05:47,590 --> 00:05:45,039

physics and physiology because of this

151
00:05:49,350 --> 00:05:47,600
non-physical input the targets the input

152
00:05:51,189 --> 00:05:49,360
targets must make a difference there

153
00:05:54,070 --> 00:05:51,199
must be effects

154
00:05:56,550 --> 00:05:54,080
in the general biochemistry of cells

155
00:05:58,790 --> 00:05:56,560
and we would also expect effects in the

156
00:06:00,390 --> 00:05:58,800
brain and the neurons of the brain

157
00:06:01,990 --> 00:06:00,400
and so therefore that's the one way

158
00:06:06,629 --> 00:06:02,000
perhaps that mental desires and

159
00:06:08,150 --> 00:06:06,639
intentions can lead to bodily movements

160
00:06:10,309 --> 00:06:08,160
but in in

161
00:06:12,150 --> 00:06:10,319
trying to adjust physics i'm trying to

162
00:06:15,430 --> 00:06:12,160
keep the existing structure of physical

163
00:06:17,350 --> 00:06:15,440

theory as much as possible constant i'm

164

00:06:20,150 --> 00:06:17,360

trying to make sure that computers and

165

00:06:21,430 --> 00:06:20,160

microscopes and suns still work at least

166

00:06:23,430 --> 00:06:21,440

most of the time

167

00:06:25,110 --> 00:06:23,440

so what i'm going to do is i'm trying to

168

00:06:26,710 --> 00:06:25,120

find a soft spot

169

00:06:28,629 --> 00:06:26,720

in physical theory

170

00:06:30,550 --> 00:06:28,639

so laws and

171

00:06:31,909 --> 00:06:30,560

of operation of physical things are not

172

00:06:34,390 --> 00:06:31,919

always fixed

173

00:06:36,150 --> 00:06:34,400

but can vary as part of a bigger picture

174

00:06:37,670 --> 00:06:36,160

where the bigger picture includes

175

00:06:42,870 --> 00:06:37,680

non-physical things

176

00:06:46,309 --> 00:06:44,870

the effects that i want to see happening

177

00:06:48,469 --> 00:06:46,319

in bodies

178

00:06:50,390 --> 00:06:48,479

are in physical systems our bodies are

179

00:06:52,390 --> 00:06:50,400

physical systems they're made of atoms

180

00:06:56,950 --> 00:06:52,400

and molecules

181

00:06:59,110 --> 00:06:56,960

of protons neutrons and electrons

182

00:07:01,430 --> 00:06:59,120

in particular they're very large protein

183

00:07:03,670 --> 00:07:01,440

molecules and cells

184

00:07:06,629 --> 00:07:03,680

and these molecules have to fold into

185

00:07:08,790 --> 00:07:06,639

very specific shapes in order to

186

00:07:11,029 --> 00:07:08,800

have the right shape to catalyze a

187

00:07:12,629 --> 00:07:11,039

reaction that makes them into an enzyme

188

00:07:14,390 --> 00:07:12,639

for example

189

00:07:17,029 --> 00:07:14,400

but there's a puzzle about this folding

190

00:07:19,110 --> 00:07:17,039

of large protein molecules the speed and

191

00:07:20,309 --> 00:07:19,120

directionality of folding has has been a

192

00:07:22,870 --> 00:07:20,319

puzzle

193

00:07:25,670 --> 00:07:22,880

for the last 50 years

194

00:07:28,870 --> 00:07:25,680

ever since levantel posed his paradox in

195

00:07:33,110 --> 00:07:31,189

but i want to work out a way to predict

196

00:07:35,430 --> 00:07:33,120

that non-physical influences in living

197

00:07:38,629 --> 00:07:35,440

cells could provide targets for protein

198

00:07:39,430 --> 00:07:38,639

folding and thus speed up the folding

199

00:07:41,589 --> 00:07:39,440

and

200

00:07:42,870 --> 00:07:41,599

to make one way of resolving levantel's

201

00:07:44,790 --> 00:07:42,880

paradox

202

00:07:46,790 --> 00:07:44,800

i should mention that every year

203

00:07:48,550 --> 00:07:46,800

in the in the science literature there's

204

00:07:50,150 --> 00:07:48,560

a paper or two claiming to solve

205

00:07:51,670 --> 00:07:50,160

levental's paradox

206

00:07:57,189 --> 00:07:51,680

but i don't think they've been

207

00:08:01,830 --> 00:07:59,670

if we go into details and physics we can

208

00:08:04,390 --> 00:08:01,840

see actually discrete degrees even in

209

00:08:06,469 --> 00:08:04,400

physics if we go from effects

210

00:08:08,790 --> 00:08:06,479

to causes in other words up the causal

211

00:08:11,589 --> 00:08:08,800

chain we see that all of these things

212

00:08:13,990 --> 00:08:11,599

are connected the outermost physical

213

00:08:16,629 --> 00:08:14,000

discrete degree is classical newtonian

214

00:08:18,309 --> 00:08:16,639

physics made of mostly large objects

215

00:08:19,430 --> 00:08:18,319

like atoms and

216

00:08:21,350 --> 00:08:19,440

and

217

00:08:23,189 --> 00:08:21,360

rocks planets

218

00:08:25,270 --> 00:08:23,199

and all of these can be described by

219

00:08:27,830 --> 00:08:25,280

forces acting on masses giving

220

00:08:29,909 --> 00:08:27,840

acceleration

221

00:08:32,469 --> 00:08:29,919

but we know that the behavior

222

00:08:34,630 --> 00:08:32,479

of objects is not really exactly

223

00:08:37,430 --> 00:08:34,640

newtonian physics it actually quantum

224

00:08:40,310 --> 00:08:37,440

mechanics is more accurate for small

225

00:08:42,550 --> 00:08:40,320

items so particles that are in atoms and

226

00:08:43,990 --> 00:08:42,560

even molecules can be described in some

227

00:08:45,509 --> 00:08:44,000

ways more accurately by quantum

228

00:08:47,590 --> 00:08:45,519

mechanics

229

00:08:49,990 --> 00:08:47,600

because instead of particles moving with

230

00:08:52,310 --> 00:08:50,000

a fixed location we have wave packets

231

00:08:53,350 --> 00:08:52,320

governed by the schrodinger equation

232

00:08:54,870 --> 00:08:53,360

and

233

00:08:58,230 --> 00:08:54,880

then their path is described by

234

00:09:02,389 --> 00:09:00,150

but then we might ask where interaction

235

00:09:03,990 --> 00:09:02,399

potentials and forces come from

236

00:09:06,470 --> 00:09:04,000

in quantum mechanics

237

00:09:08,389 --> 00:09:06,480

these are in fact the masses and forces

238

00:09:10,550 --> 00:09:08,399

and quantum mechanics i determine my

239

00:09:13,190 --> 00:09:10,560

quantum field theory which is a discrete

240

00:09:15,509 --> 00:09:13,200

degree inside ordinary quantum physics

241

00:09:18,630 --> 00:09:15,519

where we have a field lagrangian with

242

00:09:21,509 --> 00:09:18,640

massive and massless fields and that and

243

00:09:23,509 --> 00:09:21,519

the variational principle shows how to

244

00:09:27,910 --> 00:09:23,519

work out from the lagrangian how these

245

00:09:31,430 --> 00:09:29,509

suppose we want to go even further

246

00:09:33,750 --> 00:09:31,440

inside this lagrangian

247

00:09:34,790 --> 00:09:33,760

quantum field theory what determines

248

00:09:36,389 --> 00:09:34,800

these

249

00:09:42,150 --> 00:09:36,399

masses and charges

250

00:09:46,150 --> 00:09:43,670

just to give you a preview of what i

251

00:09:49,509 --> 00:09:46,160

want to do i want to

252

00:09:51,350 --> 00:09:49,519

put a new connection between

253

00:09:53,829 --> 00:09:51,360

the outermost non-physical the sensory

254

00:09:55,910 --> 00:09:53,839

motor mind and the laurentian meshes and

255

00:09:58,310 --> 00:09:55,920

charges so between the blue and the

256

00:09:59,910 --> 00:09:58,320

green we want to have some new kind of

257

00:10:01,509 --> 00:09:59,920

connection

258

00:10:03,509 --> 00:10:01,519

and i'll explain later what this

259

00:10:05,509 --> 00:10:03,519

connection is so i'm i'm putting in a

260

00:10:07,509 --> 00:10:05,519

new discrete degree

261

00:10:09,430 --> 00:10:07,519

which i think should have been there all

262

00:10:11,430 --> 00:10:09,440

along but people haven't thought about

263

00:10:14,150 --> 00:10:11,440

it this is where some connections should

264

00:10:17,030 --> 00:10:14,160

be expected so the result of this

265

00:10:19,350 --> 00:10:17,040

is that the non-physical influences

266

00:10:21,990 --> 00:10:19,360

in the minds and so on will influence

267

00:10:25,509 --> 00:10:22,000

the values of the lagrangian masses and

268

00:10:29,829 --> 00:10:27,670

but you might have thought that in

269

00:10:31,269 --> 00:10:29,839

normal physics these lagrangian

270

00:10:33,590 --> 00:10:31,279

coefficients

271

00:10:35,430 --> 00:10:33,600

masses and charges have to be fixed

272

00:10:37,030 --> 00:10:35,440

many people think so

273

00:10:39,030 --> 00:10:37,040

if you look in wikipedia for the

274

00:10:41,910 --> 00:10:39,040

parameters of the standard model for

275

00:10:43,750 --> 00:10:41,920

example you can see a long list of 120

276

00:10:45,350 --> 00:10:43,760

or so parameters that have definite

277

00:10:46,949 --> 00:10:45,360

values

278

00:10:49,110 --> 00:10:46,959

but the point is which is not really

279

00:10:51,030 --> 00:10:49,120

mentioned very often is that these are

280

00:10:53,110 --> 00:10:51,040

observed values not the starting

281

00:10:54,630 --> 00:10:53,120

parameters which go in

282

00:10:57,030 --> 00:10:54,640

to the lagrangian

283

00:10:58,870 --> 00:10:57,040

and in fact

284

00:11:00,949 --> 00:10:58,880

the initial numbers by a process called

285

00:11:02,230 --> 00:11:00,959

renormalization have to be adjusted or

286

00:11:05,350 --> 00:11:02,240

tuned

287

00:11:06,949 --> 00:11:05,360

to give the observed numbers as output

288

00:11:09,430 --> 00:11:06,959

and the trouble is that the

289

00:11:11,670 --> 00:11:09,440

renormalization method is not fixed in

290

00:11:12,710 --> 00:11:11,680

the theory there are many different ways

291

00:11:15,190 --> 00:11:12,720

of doing

292

00:11:16,230 --> 00:11:15,200

renormalization methods

293

00:11:18,150 --> 00:11:16,240

and

294

00:11:20,630 --> 00:11:18,160

in fact the method you choose could be

295

00:11:22,470 --> 00:11:20,640

different at each place in each time

296

00:11:24,710 --> 00:11:22,480

so that means that the starting numbers

297

00:11:26,150 --> 00:11:24,720

even if they're fixed could give

298

00:11:28,710 --> 00:11:26,160

different masses and charges at

299

00:11:32,470 --> 00:11:28,720

different places in space and time

300

00:11:33,430 --> 00:11:32,480

so this is a preview of what i see is

301
00:11:35,269 --> 00:11:33,440
happening

302
00:11:38,389 --> 00:11:35,279
this middle degree is going to make

303
00:11:42,630 --> 00:11:40,470
you might ask

304
00:11:45,030 --> 00:11:42,640
where the physicists have already seen

305
00:11:47,509 --> 00:11:45,040
these charge variations perhaps if we

306
00:11:49,350 --> 00:11:47,519
compare local stars with distant stars

307
00:11:50,790 --> 00:11:49,360
we might see a difference perhaps the

308
00:11:54,310 --> 00:11:50,800
charges vary

309
00:11:55,430 --> 00:11:54,320
between local stars and distant stars

310
00:11:57,670 --> 00:11:55,440
john webb

311
00:11:59,990 --> 00:11:57,680
and his group in sydney have

312
00:12:02,470 --> 00:12:00,000
claimed that they have measured

313
00:12:05,590 --> 00:12:02,480

differences in the ratios of spectral

314

00:12:07,750 --> 00:12:05,600

lines which depend on electric charges

315

00:12:09,990 --> 00:12:07,760

and they show evidence depending on the

316

00:12:11,829 --> 00:12:10,000

angle as you can see in the picture here

317

00:12:13,350 --> 00:12:11,839

that the charges

318

00:12:16,310 --> 00:12:13,360

are very slightly different very

319

00:12:18,389 --> 00:12:16,320

slightly smaller in distant stars about

320

00:12:20,389 --> 00:12:18,399

one part and a hundred thousand

321

00:12:22,710 --> 00:12:20,399

it's not a very big effect

322

00:12:25,110 --> 00:12:22,720

but it does show

323

00:12:26,790 --> 00:12:25,120

that charge variations are conceivable

324

00:12:28,949 --> 00:12:26,800

in physics

325

00:12:31,030 --> 00:12:28,959

so we've broken the shell in some way

326

00:12:33,829 --> 00:12:31,040

we've shown that something like this is

327

00:12:38,310 --> 00:12:35,269

but we want to

328

00:12:40,470 --> 00:12:38,320

have not just distant stars being

329

00:12:42,949 --> 00:12:40,480

changed we want to have non-physical

330

00:12:44,310 --> 00:12:42,959

effects on the physical as i said before

331

00:12:45,750 --> 00:12:44,320

and our idea

332

00:12:48,310 --> 00:12:45,760

is that

333

00:12:50,550 --> 00:12:48,320

the fine-tuned parameters namely masses

334

00:12:53,990 --> 00:12:50,560

and charges can be varied locally in

335

00:12:56,870 --> 00:12:54,000

order to achieve ends in nature

336

00:12:58,790 --> 00:12:56,880

we're going to focus on electric forces

337

00:13:01,030 --> 00:12:58,800

and as i said physicists have proposed

338

00:13:03,430 --> 00:13:01,040

varying charges over the age of the

339

00:13:06,310 --> 00:13:03,440

universe over very long distances

340

00:13:09,269 --> 00:13:06,320

but now we propose to vary

341

00:13:11,190 --> 00:13:09,279

the charges in microseconds vary

342

00:13:13,030 --> 00:13:11,200

completely different scale

343

00:13:14,710 --> 00:13:13,040

and and vary them within living

344

00:13:16,870 --> 00:13:14,720

organisms

345

00:13:21,430 --> 00:13:16,880

so this is a new idea which will have to

346

00:13:25,829 --> 00:13:23,590

by varying the electric charge

347

00:13:27,910 --> 00:13:25,839

as a non-physical effect

348

00:13:30,629 --> 00:13:27,920

we as i said before we're going to

349

00:13:32,629 --> 00:13:30,639

establish a new discrete degree

350

00:13:34,710 --> 00:13:32,639

inside quantum field theory between

351
00:13:36,069 --> 00:13:34,720
quantum field theory and the outermost

352
00:13:38,710 --> 00:13:36,079
level of mind

353
00:13:40,389 --> 00:13:38,720
so i'm going to call these targets this

354
00:13:43,189 --> 00:13:40,399
new discrete degree

355
00:13:45,269 --> 00:13:43,199
the final causes set the targets or ends

356
00:13:48,069 --> 00:13:45,279
and the ends determine the means

357
00:13:49,910 --> 00:13:48,079
and we reach the targets by adjusting

358
00:13:51,509 --> 00:13:49,920
the electrical parameters of physical

359
00:13:53,670 --> 00:13:51,519
fields

360
00:13:55,910 --> 00:13:53,680
this is really fine tuning

361
00:13:57,829 --> 00:13:55,920
because this is not gradually

362
00:13:59,189 --> 00:13:57,839
gradual changes over the whole universe

363
00:14:00,949 --> 00:13:59,199

or fixing it at the beginning of the

364

00:14:02,870 --> 00:14:00,959

universe in the big bang

365

00:14:05,509 --> 00:14:02,880

but we're getting changes

366

00:14:07,750 --> 00:14:05,519

different at each time in each place in

367

00:14:09,350 --> 00:14:07,760

an organism

368

00:14:12,710 --> 00:14:09,360

so from the physics point of view it's a

369

00:14:14,550 --> 00:14:12,720

local not a global physics variation

370

00:14:17,750 --> 00:14:14,560

and physicists like to do things locally

371

00:14:19,910 --> 00:14:17,760

and not just globally

372

00:14:22,150 --> 00:14:19,920

so what we're going to suggest that

373

00:14:23,590 --> 00:14:22,160

these changes are specific to living

374

00:14:25,990 --> 00:14:23,600

organisms

375

00:14:27,829 --> 00:14:26,000

and that they occur at all scales in

376

00:14:33,269 --> 00:14:27,839

psychology and biology

377

00:14:35,670 --> 00:14:34,710

so let's see

378

00:14:38,870 --> 00:14:35,680

how

379

00:14:42,069 --> 00:14:38,880

electric forces could be changed so here

380

00:14:44,389 --> 00:14:42,079

i give the standard formula coulomb's

381

00:14:46,230 --> 00:14:44,399

formula for the inverse square law the

382

00:14:49,110 --> 00:14:46,240

force

383

00:14:51,590 --> 00:14:49,120

between charge q_1 and position 1 and q_2

384

00:14:54,470 --> 00:14:51,600

at position 2 is proportional to their

385

00:14:56,550 --> 00:14:54,480

product q_1 and q_2 divide by the square

386

00:14:58,470 --> 00:14:56,560

of the distance between them

387

00:15:00,870 --> 00:14:58,480

and there's an overall scale factor of

388

00:15:02,870 --> 00:15:00,880

one over four pi epsilon

389

00:15:05,189 --> 00:15:02,880

where epsilon is called the electric

390

00:15:07,110 --> 00:15:05,199

permittivity it's a scale factor

391

00:15:09,430 --> 00:15:07,120

and you can see that if q_1 and q_2 are

392

00:15:11,110 --> 00:15:09,440

the same sign

393

00:15:14,150 --> 00:15:11,120

both positive are both negatives in the

394

00:15:16,870 --> 00:15:14,160

product that the force has as a

395

00:15:18,870 --> 00:15:16,880

positive side and if

396

00:15:20,230 --> 00:15:18,880

q_1 and q_2 of opposite signs then when

397

00:15:22,230 --> 00:15:20,240

you multiply them together you get a

398

00:15:25,509 --> 00:15:22,240

negative number and so you get a

399

00:15:28,310 --> 00:15:25,519

negative force on this on this measure

400

00:15:30,949 --> 00:15:28,320

so this is coulomb's well-known inverse

401
00:15:35,670 --> 00:15:33,110
but now i'm going to go on and suggest

402
00:15:37,910 --> 00:15:35,680
that we're going to

403
00:15:40,470 --> 00:15:37,920
this new targets these new influx from

404
00:15:43,269 --> 00:15:40,480
the non-physical can vary charges if it

405
00:15:45,670 --> 00:15:43,279
varies q1 this will vary the force f

406
00:15:47,269 --> 00:15:45,680
forces will be different because of the

407
00:15:49,670 --> 00:15:47,279
different charges

408
00:15:52,069 --> 00:15:49,680
so we're not we're not introducing a new

409
00:15:54,870 --> 00:15:52,079
force but we're just adjusting an

410
00:15:56,230 --> 00:15:54,880
existing one we're not creating a

411
00:16:00,629 --> 00:15:56,240
special

412
00:16:03,670 --> 00:16:02,550
allowing mental or non-physical

413
00:16:04,389 --> 00:16:03,680

influences

414

00:16:07,030 --> 00:16:04,399

to

415

00:16:08,949 --> 00:16:07,040

scale up or down in the standard

416

00:16:10,870 --> 00:16:08,959

electric forces

417

00:16:12,949 --> 00:16:10,880

and if mental input could vary any of

418

00:16:15,189 --> 00:16:12,959

these to any of these charges q then

419

00:16:17,269 --> 00:16:15,199

they could vary the forces on electrons

420

00:16:20,069 --> 00:16:17,279

and ions and they could make things move

421

00:16:25,749 --> 00:16:20,079

in interesting ways in cells or wherever

422

00:16:29,350 --> 00:16:27,269

but we're going to actually change

423

00:16:31,670 --> 00:16:29,360

things very slightly

424

00:16:33,110 --> 00:16:31,680

jacob beckenstein you might be you might

425

00:16:34,150 --> 00:16:33,120

have heard of them from black hole

426
00:16:36,069 --> 00:16:34,160
theory

427
00:16:38,470 --> 00:16:36,079
showed that very similar effects could

428
00:16:39,749 --> 00:16:38,480
be obtained while keeping the charges q

429
00:16:41,430 --> 00:16:39,759
constant

430
00:16:43,670 --> 00:16:41,440
and as as

431
00:16:47,590 --> 00:16:43,680
to vary the permittivities ϵ_1 and

432
00:16:51,829 --> 00:16:49,910
variable q charges and constant

433
00:16:53,829 --> 00:16:51,839
permittivities we can have constant

434
00:16:55,189 --> 00:16:53,839
charges and variable permittivities the

435
00:16:58,150 --> 00:16:55,199
product

436
00:17:00,310 --> 00:16:58,160
the forces now depend on permittivities

437
00:17:01,990 --> 00:17:00,320
for both the charges but the queues can

438
00:17:03,670 --> 00:17:02,000

be constant

439

00:17:05,909 --> 00:17:03,680

and we'll see in a minute why this makes

440

00:17:07,110 --> 00:17:05,919

physics a lot easier

441

00:17:09,750 --> 00:17:07,120

and

442

00:17:12,470 --> 00:17:09,760

i'm going to now from now on

443

00:17:14,230 --> 00:17:12,480

to describe the influence of targets and

444

00:17:17,110 --> 00:17:14,240

non-physical things on physics is to

445

00:17:19,510 --> 00:17:17,120

vary the electrical permittivity

446

00:17:23,270 --> 00:17:19,520

even in the vacuum when there's no

447

00:17:25,510 --> 00:17:23,280

no dielectrics or capacitors

448

00:17:27,270 --> 00:17:25,520

and the reason that it's better to vary

449

00:17:29,750 --> 00:17:27,280

the permittivity

450

00:17:30,710 --> 00:17:29,760

and not the charges is that now we can

451
00:17:35,029 --> 00:17:30,720
keep

452
00:17:37,430 --> 00:17:35,039
maxwell's equations here are four

453
00:17:40,230 --> 00:17:37,440
maxwell's equations they govern

454
00:17:42,950 --> 00:17:40,240
the behavior of electric fields e

455
00:17:45,190 --> 00:17:42,960
and magnetic fields h

456
00:17:46,470 --> 00:17:45,200
in terms of ρ which is the charge

457
00:17:47,990 --> 00:17:46,480
density

458
00:17:50,070 --> 00:17:48,000
and

459
00:17:52,710 --> 00:17:50,080
 j which is the current density so this

460
00:17:53,750 --> 00:17:52,720
these four equations are responsible for

461
00:17:56,150 --> 00:17:53,760
the way

462
00:17:57,990 --> 00:17:56,160
currents produce magnetic fields charges

463
00:17:59,430 --> 00:17:58,000

produce electric fields

464

00:18:03,190 --> 00:17:59,440

and how you

465

00:18:05,510 --> 00:18:03,200

get traveling waves light radiation

466

00:18:06,950 --> 00:18:05,520

from james clark maxwell

467

00:18:09,510 --> 00:18:06,960

and we're going to allow the

468

00:18:12,150 --> 00:18:09,520

permittivity epsilon to vary that's

469

00:18:15,110 --> 00:18:12,160

perfectly allowed by maxwell's equations

470

00:18:17,110 --> 00:18:15,120

and there's no constraint on

471

00:18:19,029 --> 00:18:17,120

on varying the permittivity but you can

472

00:18:21,029 --> 00:18:19,039

prove from this first equation that

473

00:18:22,390 --> 00:18:21,039

charge is conserved so we we vary

474

00:18:24,950 --> 00:18:22,400

permittivity

475

00:18:26,470 --> 00:18:24,960

and we can we vary permeability mu for

476

00:18:29,430 --> 00:18:26,480

magnetic forces

477

00:18:31,750 --> 00:18:29,440

so that if μ goes up ϵ goes down

478

00:18:34,070 --> 00:18:31,760

so that means the c the speed of light

479

00:18:35,110 --> 00:18:34,080

is constant and that keeps einstein

480

00:18:36,950 --> 00:18:35,120

happy

481

00:18:39,190 --> 00:18:36,960

because his theory of relativity is

482

00:18:40,549 --> 00:18:39,200

based on the constancy of the speed of

483

00:18:41,750 --> 00:18:40,559

light and so

484

00:18:45,669 --> 00:18:41,760

we can

485

00:18:47,590 --> 00:18:45,679

maxwell's equations by varying the

486

00:18:49,510 --> 00:18:47,600

permittivity in one way

487

00:18:51,990 --> 00:18:49,520

the permeability in a corresponding way

488

00:18:54,549 --> 00:18:52,000

but keep the speed of light constant so

489

00:18:56,789 --> 00:18:54,559

we're trying to preserve

490

00:18:59,350 --> 00:18:56,799

normal physics equations as much as

491

00:19:03,669 --> 00:19:02,870

now you need the magnetic fields h

492

00:19:04,710 --> 00:19:03,679

if

493

00:19:06,950 --> 00:19:04,720

you have

494

00:19:08,310 --> 00:19:06,960

things moving fast

495

00:19:11,430 --> 00:19:08,320

but in

496

00:19:14,870 --> 00:19:11,440

living cells things move slowly and so

497

00:19:17,110 --> 00:19:14,880

we only need the first equation

498

00:19:18,950 --> 00:19:17,120

which i've written down here

499

00:19:21,510 --> 00:19:18,960

in which the charge density ρ is the

500

00:19:22,470 --> 00:19:21,520

source of the electric field

501
00:20:00,950 --> 00:19:22,480
e

502
00:20:02,870 --> 00:20:00,960
of this

503
00:20:03,990 --> 00:20:02,880
changing of the electric permittivity

504
00:20:07,830 --> 00:20:04,000
has to be

505
00:20:09,270 --> 00:20:07,840
according to emmy nurtures theorem from

506
00:20:11,990 --> 00:20:09,280
2015

507
00:20:14,710 --> 00:20:12,000
if the physics laws depend on time the

508
00:20:16,230 --> 00:20:14,720
energy and momentum are not necessarily

509
00:20:19,669 --> 00:20:16,240
conserved

510
00:20:22,470 --> 00:20:19,679
if prop if epsilon varies with time that

511
00:20:24,870 --> 00:20:22,480
means energy is not conserved if epsilon

512
00:20:27,750 --> 00:20:24,880
varies with position that means momentum

513
00:20:30,310 --> 00:20:27,760

is not conserved but here

514

00:20:31,909 --> 00:20:30,320

permittivity depends on both position r

515

00:20:33,750 --> 00:20:31,919

and time t

516

00:20:35,669 --> 00:20:33,760

so therefore it's varying in time and

517

00:20:39,110 --> 00:20:35,679

space so therefore energy

518

00:20:41,190 --> 00:20:39,120

and momentum are both not conserved

519

00:20:44,070 --> 00:20:41,200

and you can see it immediately here i

520

00:20:46,470 --> 00:20:44,080

write a formula for electrostatic energy

521

00:20:48,710 --> 00:20:46,480

between two charged particles q_i and q_j

522

00:20:50,630 --> 00:20:48,720

j

523

00:20:54,390 --> 00:20:50,640

and you can see that it depends on these

524

00:20:56,070 --> 00:20:54,400

epsilons which vary with space and time

525

00:20:59,190 --> 00:20:56,080

but you can still calculate by the

526

00:21:01,830 --> 00:20:59,200

formula we had the forces between

527

00:21:03,990 --> 00:21:01,840

objects once you put in the epsilon

528

00:21:05,590 --> 00:21:04,000

electric permittivities so we can still

529

00:21:07,270 --> 00:21:05,600

do all of

530

00:21:08,870 --> 00:21:07,280

standard

531

00:21:10,390 --> 00:21:08,880

electrostatic theory there's a lot of

532

00:21:12,149 --> 00:21:10,400

work on electrostatic theory with

533

00:21:14,830 --> 00:21:12,159

variable permittivities

534

00:21:18,149 --> 00:21:14,840

mostly they're from from water

535

00:21:19,909 --> 00:21:18,159

or capacitors or dielectrics but here we

536

00:21:21,110 --> 00:21:19,919

can have the permittivity varying in the

537

00:21:22,630 --> 00:21:21,120

vacuum so

538

00:21:26,789 --> 00:21:22,640

it's a bit different but most of the

539

00:21:30,390 --> 00:21:29,190

some people did not realize

540

00:21:31,909 --> 00:21:30,400

that

541

00:21:33,669 --> 00:21:31,919

energy had to be

542

00:21:35,990 --> 00:21:33,679

varied it couldn't be conserved if you

543

00:21:38,470 --> 00:21:36,000

have time-dependent laws from some input

544

00:21:40,710 --> 00:21:38,480

many people try to keep

545

00:21:42,710 --> 00:21:40,720

energy conservation and causal closure

546

00:21:44,710 --> 00:21:42,720

of the physical

547

00:21:46,710 --> 00:21:44,720

and tried to make some extension of of

548

00:21:47,909 --> 00:21:46,720

physics which kept these two things for

549

00:21:49,669 --> 00:21:47,919

example

550

00:21:51,750 --> 00:21:49,679

john nichols tried

551

00:21:54,630 --> 00:21:51,760

to have quantum mechanics

552

00:21:56,549 --> 00:21:54,640

have probabilities which are biased

553

00:21:59,830 --> 00:21:56,559

because of some input for some nodes and

554

00:22:02,630 --> 00:21:59,840

physical input Henry Stapp tried to

555

00:22:04,870 --> 00:22:02,640

vary the time of probabilistic events in

556

00:22:07,510 --> 00:22:04,880

quantum physics

557

00:22:10,230 --> 00:22:07,520

according to some non-physical input

558

00:22:12,549 --> 00:22:10,240

these two principles would allow

559

00:22:13,830 --> 00:22:12,559

energy to be conserved

560

00:22:15,909 --> 00:22:13,840

but

561

00:22:18,149 --> 00:22:15,919

they're very small effects some people

562

00:22:20,950 --> 00:22:18,159

have proposed to move energy from one

563

00:22:22,870 --> 00:22:20,960

location to another nearby a place

564

00:22:24,710 --> 00:22:22,880

so that the total energy is conserved

565

00:22:27,510 --> 00:22:24,720

but as energy is not conserved at each

566

00:22:29,909 --> 00:22:27,520

location separately not locally

567

00:22:31,830 --> 00:22:29,919

other people have proposed non-local

568

00:22:33,029 --> 00:22:31,840

entanglement to communicate across

569

00:22:35,350 --> 00:22:33,039

distances

570

00:22:37,590 --> 00:22:35,360

but unfortunately any quantum mechanical

571

00:22:40,630 --> 00:22:37,600

entanglement cannot be used

572

00:22:42,390 --> 00:22:40,640

for signal transmission

573

00:22:46,390 --> 00:22:42,400

a lot of these proposals

574

00:22:48,070 --> 00:22:46,400

involve quantum physics but chances

575

00:22:50,470 --> 00:22:48,080

in quantum physics are very small in

576
00:22:53,029 --> 00:22:50,480
living organisms

577
00:22:55,350 --> 00:22:53,039
they're there but so changes in the

578
00:22:56,870 --> 00:22:55,360
chances are even smaller

579
00:22:59,750 --> 00:22:56,880
and these are all much smaller than

580
00:23:02,149 --> 00:22:59,760
electric changes we that we would get by

581
00:23:04,070 --> 00:23:02,159
varying the electric the vacuum electric

582
00:23:06,870 --> 00:23:04,080
permittivity so i think

583
00:23:09,350 --> 00:23:06,880
this the scheme of varying the electric

584
00:23:11,110 --> 00:23:09,360
forces is much more promising to make an

585
00:23:13,669 --> 00:23:11,120
observable effect

586
00:23:17,909 --> 00:23:13,679
for how non-physical influences the

587
00:23:23,110 --> 00:23:20,390
the remaining part of my talk

588
00:23:26,070 --> 00:23:23,120

is to discuss how

589

00:23:28,710 --> 00:23:26,080

an organism gets to vary these electric

590

00:23:31,190 --> 00:23:28,720

permittivities

591

00:23:33,270 --> 00:23:31,200

we've talked about final causes and ends

592

00:23:34,310 --> 00:23:33,280

and targets so let's spell out in more

593

00:23:37,270 --> 00:23:34,320

detail

594

00:23:39,830 --> 00:23:37,280

how they may work see i'm proposing a

595

00:23:42,070 --> 00:23:39,840

new discrete degree in the gap

596

00:23:43,909 --> 00:23:42,080

between sensory motor the outermost

597

00:23:46,390 --> 00:23:43,919

non-physical and blue

598

00:23:48,390 --> 00:23:46,400

and the lagrangian masses and charges on

599

00:23:50,710 --> 00:23:48,400

the right so i'm proposing

600

00:23:52,870 --> 00:23:50,720

that there is a new discrete degree i'm

601
00:23:54,230 --> 00:23:52,880
going to call targets

602
00:23:56,470 --> 00:23:54,240
and it receives

603
00:23:58,149 --> 00:23:56,480
final causes or the to target

604
00:24:00,390 --> 00:23:58,159
configurations

605
00:24:02,789 --> 00:24:00,400
from the non-physical

606
00:24:04,470 --> 00:24:02,799
and it influences the physical by using

607
00:24:07,350 --> 00:24:04,480
those

608
00:24:10,549 --> 00:24:07,360
final causes or final states

609
00:24:12,870 --> 00:24:10,559
to vary this electric permittivity

610
00:24:15,190 --> 00:24:12,880
so in the list on the right here

611
00:24:19,909 --> 00:24:15,200
it's number two which has been inserted

612
00:24:23,669 --> 00:24:22,310
so if we look at what biologists have

613
00:24:25,430 --> 00:24:23,679

already worked out

614

00:24:28,070 --> 00:24:25,440

seems to be needed

615

00:24:31,350 --> 00:24:28,080

for management of biological organisms

616

00:24:32,950 --> 00:24:31,360

michael levin in 2012

617

00:24:34,870 --> 00:24:32,960

looked at

618

00:24:36,390 --> 00:24:34,880

cell regeneration from

619

00:24:38,870 --> 00:24:36,400

from injury

620

00:24:41,029 --> 00:24:38,880

and also in growth after transplant and

621

00:24:43,590 --> 00:24:41,039

he deduced that there must be a kind of

622

00:24:45,350 --> 00:24:43,600

feedback system within each cell

623

00:24:47,110 --> 00:24:45,360

so that it knows the shape that it's

624

00:24:48,149 --> 00:24:47,120

supposed to achieve it is to know its

625

00:24:49,830 --> 00:24:48,159

target

626
00:24:52,390 --> 00:24:49,840
and it can tell if its current shape

627
00:24:53,909 --> 00:24:52,400
differs from the target

628
00:24:56,789 --> 00:24:53,919
and then if there is a difference then

629
00:24:59,110 --> 00:24:56,799
it by means of some kind of

630
00:25:01,029 --> 00:24:59,120
means ends analysis it knows works out

631
00:25:04,390 --> 00:25:01,039
how to get from its initial current

632
00:25:05,990 --> 00:25:04,400
shape to the target s

633
00:25:07,510 --> 00:25:06,000
and then it has a kind of

634
00:25:09,990 --> 00:25:07,520
self-surveillance to know when it's

635
00:25:12,789 --> 00:25:10,000
finally got to the desired shape and it

636
00:25:14,630 --> 00:25:12,799
can stop trying to make changes

637
00:25:16,470 --> 00:25:14,640
so this

638
00:25:19,110 --> 00:25:16,480

means that our picture from the previous

639

00:25:21,350 --> 00:25:19,120

page has to be added by this this dashed

640

00:25:24,390 --> 00:25:21,360

line there has to be some feedback from

641

00:25:25,669 --> 00:25:24,400

the arrangement of the quantum fields

642

00:25:26,870 --> 00:25:25,679

which tell you

643

00:25:28,630 --> 00:25:26,880

where the

644

00:25:30,870 --> 00:25:28,640

object is at the moment

645

00:25:32,789 --> 00:25:30,880

to compare it with the target you have

646

00:25:35,110 --> 00:25:32,799

to calculate the difference between the

647

00:25:38,710 --> 00:25:35,120

current minus the target and feed that

648

00:25:42,950 --> 00:25:39,830

that means

649

00:25:45,350 --> 00:25:42,960

targets actually have three functions

650

00:25:46,789 --> 00:25:45,360

they receive the final cause or the

651
00:25:49,830 --> 00:25:46,799
target configuration from the

652
00:25:51,590 --> 00:25:49,840
non-physical degree above it

653
00:25:53,510 --> 00:25:51,600
they determine the differences between

654
00:25:55,510 --> 00:25:53,520
the current state

655
00:25:56,710 --> 00:25:55,520
and the target for configuration in

656
00:25:58,390 --> 00:25:56,720
other words see whether they need to

657
00:25:59,669 --> 00:25:58,400
make any changes

658
00:26:01,510 --> 00:25:59,679
and then they vary the electric

659
00:26:03,510 --> 00:26:01,520
permittivities in order to minimize this

660
00:26:06,390 --> 00:26:03,520
difference and so achieve the target

661
00:26:11,510 --> 00:26:08,630
and i propose

662
00:26:13,669 --> 00:26:11,520
to do this this these three steps i want

663
00:26:15,510 --> 00:26:13,679

to make targets a new kind of physical

664

00:26:17,750 --> 00:26:15,520

degree

665

00:26:18,870 --> 00:26:17,760

because i want to avoid using the higher

666

00:26:21,590 --> 00:26:18,880

mind

667

00:26:23,190 --> 00:26:21,600

itself to do micromanage every movement

668

00:26:24,549 --> 00:26:23,200

of every molecule

669

00:26:25,669 --> 00:26:24,559

in the cell

670

00:26:28,149 --> 00:26:25,679

that's an

671

00:26:29,510 --> 00:26:28,159

extreme micromanagement i want the the

672

00:26:31,669 --> 00:26:29,520

mind or the

673

00:26:33,990 --> 00:26:31,679

the non-physical to specify a target and

674

00:26:35,990 --> 00:26:34,000

then delegate the process of achieving a

675

00:26:37,990 --> 00:26:36,000

target

676
00:26:39,590 --> 00:26:38,000
so that means the physical degree should

677
00:26:41,990 --> 00:26:39,600
be able

678
00:26:43,430 --> 00:26:42,000
to anticipate futures

679
00:26:45,110 --> 00:26:43,440
work out what's going to happen and then

680
00:26:46,630 --> 00:26:45,120
correct it if the thing wrong thing is

681
00:26:48,230 --> 00:26:46,640
going to happen it has to be able to

682
00:26:50,230 --> 00:26:48,240
anticipate the future without using any

683
00:26:53,110 --> 00:26:50,240
time travel and so we have to make some

684
00:26:55,430 --> 00:26:53,120
kind of feedback loop in order to keep

685
00:26:57,510 --> 00:26:55,440
changing the permittivities until the

686
00:26:58,950 --> 00:26:57,520
target is achieved

687
00:27:00,149 --> 00:26:58,960
so you can see here that there are some

688
00:27:04,950 --> 00:27:00,159

details

689

00:27:10,789 --> 00:27:07,029

so let's come to this question of

690

00:27:11,909 --> 00:27:10,799

anticipating future configurations

691

00:27:13,990 --> 00:27:11,919

targeting

692

00:27:16,230 --> 00:27:14,000

would be much more effective if it could

693

00:27:18,549 --> 00:27:16,240

if it could anticipate physical

694

00:27:19,750 --> 00:27:18,559

configurations in the near future

695

00:27:21,190 --> 00:27:19,760

for instance

696

00:27:23,110 --> 00:27:21,200

if you have a flying bird trying to

697

00:27:25,190 --> 00:27:23,120

intercept an insect you don't the bird

698

00:27:26,950 --> 00:27:25,200

doesn't just try and move to where the

699

00:27:27,990 --> 00:27:26,960

insect is now because the insect will

700

00:27:31,110 --> 00:27:28,000

have moved

701
00:27:33,350 --> 00:27:31,120
on see the bird has to anticipate

702
00:27:34,630 --> 00:27:33,360
what the intake insect is going to do or

703
00:27:37,110 --> 00:27:34,640
might do

704
00:27:39,110 --> 00:27:37,120
and then try and move to its future

705
00:27:41,830 --> 00:27:39,120
position

706
00:27:43,190 --> 00:27:41,840
so the same really applies

707
00:27:45,269 --> 00:27:43,200
in cells

708
00:27:46,149 --> 00:27:45,279
and molecules continually moving because

709
00:27:48,710 --> 00:27:46,159
of

710
00:27:50,389 --> 00:27:48,720
thermal vibration and movement

711
00:27:53,669 --> 00:27:50,399
flow in the cells

712
00:27:55,990 --> 00:27:53,679
so targets would be best specified at

713
00:27:57,430 --> 00:27:56,000

some future target time not just to

714

00:27:59,350 --> 00:27:57,440

something that would be good to achieve

715

00:28:00,630 --> 00:27:59,360

now

716

00:28:02,230 --> 00:28:00,640

and that would further allow

717

00:28:04,070 --> 00:28:02,240

permittivities in the whole time

718

00:28:06,950 --> 00:28:04,080

interval between now and the future

719

00:28:09,669 --> 00:28:06,960

target time to be adjusted

720

00:28:11,669 --> 00:28:09,679

there's room to maneuver

721

00:28:13,830 --> 00:28:11,679

we when we delegate a job to someone we

722

00:28:14,950 --> 00:28:13,840

have to give them some time to achieve

723

00:28:17,190 --> 00:28:14,960

it we don't

724

00:28:19,510 --> 00:28:17,200

expect them to make an immediate change

725

00:28:20,789 --> 00:28:19,520

to change everything instantaneously

726

00:28:23,029 --> 00:28:20,799

nothing in physics happens

727

00:28:25,350 --> 00:28:23,039

instantaneously

728

00:28:27,909 --> 00:28:25,360

but to anticipate future configurations

729

00:28:33,029 --> 00:28:27,919

we have to separate in physics the idea

730

00:28:37,430 --> 00:28:35,510

metric time and process time

731

00:28:39,269 --> 00:28:37,440

get to be distinguished especially

732

00:28:41,909 --> 00:28:39,279

because of quantum mechanics quantum

733

00:28:44,549 --> 00:28:41,919

physics but in fact henry bergson and

734

00:28:47,510 --> 00:28:44,559

others alfred north whitehead

735

00:28:49,750 --> 00:28:47,520

also postulated process time

736

00:28:51,990 --> 00:28:49,760

which is the changes of state

737

00:28:54,470 --> 00:28:52,000

of an object the success of internal

738

00:28:57,350 --> 00:28:54,480

states successive actualizations as in

739

00:28:59,669 --> 00:28:57,360

quantum selections and metric time

740

00:29:01,590 --> 00:28:59,679

or clock time is measurable like space

741

00:29:04,549 --> 00:29:01,600

or space time

742

00:29:06,230 --> 00:29:04,559

so we all know of space time

743

00:29:08,470 --> 00:29:06,240

is one way of understanding special

744

00:29:11,350 --> 00:29:08,480

relativity einstein's relativity but

745

00:29:14,950 --> 00:29:11,360

that's spreading all time out like space

746

00:29:17,430 --> 00:29:14,960

it's only dealing with metric time

747

00:29:19,510 --> 00:29:17,440

so we're going to use both both

748

00:29:20,789 --> 00:29:19,520

kinds of time but because space time

749

00:29:23,190 --> 00:29:20,799

already exists

750

00:29:25,750 --> 00:29:23,200

you can use it to look ahead

751
00:29:28,070 --> 00:29:25,760
and see where deterministic fields get

752
00:29:30,149 --> 00:29:28,080
to in the future

753
00:29:32,870 --> 00:29:30,159
because the metric future already exists

754
00:29:34,630 --> 00:29:32,880
space time exists at all times already

755
00:29:36,710 --> 00:29:34,640
if we have metric time and we can look

756
00:29:38,389 --> 00:29:36,720
ahead then we can extrapolate the

757
00:29:40,710 --> 00:29:38,399
current position

758
00:29:43,510 --> 00:29:40,720
to its future time so we have what we

759
00:29:46,230 --> 00:29:43,520
call a current extrapolation we compare

760
00:29:48,149 --> 00:29:46,240
the current extrapolation position

761
00:29:50,230 --> 00:29:48,159
to the target arrangement and this makes

762
00:29:52,230 --> 00:29:50,240
much more sense makes much more

763
00:29:55,350 --> 00:29:52,240

effective

764

00:29:57,350 --> 00:29:55,360

targeting processes

765

00:29:58,789 --> 00:29:57,360

so

766

00:30:01,029 --> 00:29:58,799

we're going to work out a way of

767

00:30:03,590 --> 00:30:01,039

adjusting

768

00:30:05,830 --> 00:30:03,600

future permittivities how to adjust the

769

00:30:09,430 --> 00:30:05,840

permittivity in the near future between

770

00:30:11,350 --> 00:30:09,440

now and the target time and to do this

771

00:30:14,310 --> 00:30:11,360

we have to send waves backwards and

772

00:30:17,029 --> 00:30:14,320

forwards in metric time

773

00:30:19,269 --> 00:30:17,039

we have forward propagating waves which

774

00:30:20,549 --> 00:30:19,279

reveal what the future configuration is

775

00:30:22,710 --> 00:30:20,559

going to be

776

00:30:24,310 --> 00:30:22,720

and then we have backward propagating a

777

00:30:26,710 --> 00:30:24,320

joint waves

778

00:30:28,549 --> 00:30:26,720

to reveal the sensitivity

779

00:30:30,950 --> 00:30:28,559

of

780

00:30:32,789 --> 00:30:30,960

that difference to changes in the

781

00:30:34,950 --> 00:30:32,799

intermediating time so this

782

00:30:37,590 --> 00:30:34,960

is a theory called sulfur joint theory

783

00:30:39,750 --> 00:30:37,600

or a joint model theory which is often

784

00:30:42,710 --> 00:30:39,760

used in engineering which we're using

785

00:30:43,590 --> 00:30:42,720

here is to probe backwards and forwards

786

00:30:46,470 --> 00:30:43,600

just

787

00:30:48,470 --> 00:30:46,480

as a human might and make a plan for the

788

00:30:50,870 --> 00:30:48,480

near future to do something but now it's

789

00:30:52,710 --> 00:30:50,880

being done mechanically in a physical

790

00:30:55,029 --> 00:30:52,720

system

791

00:30:57,110 --> 00:30:55,039

and we repeat doing this until the

792

00:30:59,190 --> 00:30:57,120

physical system reaches the target so

793

00:31:03,190 --> 00:30:59,200

we'll see some examples of this

794

00:31:07,669 --> 00:31:05,029

i'm going to show some

795

00:31:09,909 --> 00:31:07,679

examples of how targets for proteins

796

00:31:11,830 --> 00:31:09,919

might work using molecular dynamical

797

00:31:14,549 --> 00:31:11,840

models so i'm just

798

00:31:17,509 --> 00:31:14,559

using classical newtonian physics

799

00:31:19,590 --> 00:31:17,519

to just show how charged particles can

800

00:31:22,950 --> 00:31:19,600

move

801
00:31:25,830 --> 00:31:22,960
if they're a protein for example

802
00:31:28,230 --> 00:31:25,840
and the example i'm going to use

803
00:31:30,230 --> 00:31:28,240
is a as a hundred

804
00:31:34,710 --> 00:31:30,240
as a protein with a hundred amino acids

805
00:31:36,870 --> 00:31:35,509
so

806
00:31:37,990 --> 00:31:36,880
these negative

807
00:31:40,230 --> 00:31:38,000
red is

808
00:31:42,070 --> 00:31:40,240
as negative charge in blue as positive

809
00:31:44,549 --> 00:31:42,080
charge

810
00:31:47,590 --> 00:31:44,559
and i've put this i put this molecule in

811
00:31:50,549 --> 00:31:47,600
a cage modeled on a chaperone cage a

812
00:31:52,549 --> 00:31:50,559
separate molecule is a cage in which

813
00:31:54,630 --> 00:31:52,559

proteins to be folded are put inside

814

00:31:56,950 --> 00:31:54,640

there and something happens in chaperone

815

00:32:00,470 --> 00:31:56,960

molecules which folds

816

00:32:02,149 --> 00:32:00,480

proteins up to the required position

817

00:32:05,750 --> 00:32:02,159

now the interesting feature is that

818

00:32:08,549 --> 00:32:05,760

inside the on the inside of chaperone

819

00:32:10,710 --> 00:32:08,559

cages there are these charges

820

00:32:12,789 --> 00:32:10,720

minus three electron charges the green

821

00:32:15,029 --> 00:32:12,799

ones they're all negative but i've drawn

822

00:32:16,070 --> 00:32:15,039

them green at the bottom and orange at

823

00:32:18,470 --> 00:32:16,080

the top

824

00:32:20,549 --> 00:32:18,480

there are these

825

00:32:22,710 --> 00:32:20,559

charges on the inside

826
00:32:26,149 --> 00:32:22,720
of the

827
00:32:27,750 --> 00:32:26,159
imagine varying those in order to repel

828
00:32:29,190 --> 00:32:27,760
or attract different parts of the

829
00:32:31,190 --> 00:32:29,200
molecule

830
00:32:34,070 --> 00:32:31,200
so this is a very simple model it's a

831
00:32:38,710 --> 00:32:37,029
and now so this is a normal behavior

832
00:32:39,590 --> 00:32:38,720
of

833
00:32:40,630 --> 00:32:39,600
this

834
00:32:43,350 --> 00:32:40,640
system

835
00:32:46,789 --> 00:32:43,360
this molecule protein molecule inside

836
00:32:51,990 --> 00:32:50,470
but now we want to make a target

837
00:32:53,430 --> 00:32:52,000
and there's a little bit of mathematics

838
00:32:57,190 --> 00:32:53,440

of targets which we don't really need to

839

00:32:59,190 --> 00:32:57,200

go into but basically g is a measure of

840

00:33:00,149 --> 00:32:59,200

how far the target

841

00:33:02,389 --> 00:33:00,159

differs

842

00:33:04,710 --> 00:33:02,399

from the desired position so

843

00:33:07,269 --> 00:33:04,720

g starts as a positive number and we

844

00:33:09,350 --> 00:33:07,279

want it to go small down to g equal to

845

00:33:12,149 --> 00:33:09,360

zero that means we've achieved the

846

00:33:15,909 --> 00:33:13,350

so

847

00:33:18,070 --> 00:33:15,919

where i've put this molecule

848

00:33:20,310 --> 00:33:18,080

inside a cage

849

00:33:23,590 --> 00:33:20,320

and if we just let it go normally it

850

00:33:24,950 --> 00:33:23,600

doesn't do very much at all it just

851

00:33:26,789 --> 00:33:24,960

sits here

852

00:33:29,110 --> 00:33:26,799

rotating very slowly because it's in the

853

00:33:31,509 --> 00:33:29,120

middle of the cage and there's much less

854

00:33:36,789 --> 00:33:31,519

energy than the pre previous one this is

855

00:33:44,230 --> 00:33:41,509

but now i want this molecule

856

00:33:46,310 --> 00:33:44,240

to move left by one nanometer one of

857

00:33:47,350 --> 00:33:46,320

these squares that's one millionth one

858

00:33:49,430 --> 00:33:47,360

billionth

859

00:33:51,509 --> 00:33:49,440

of a meter

860

00:33:53,029 --> 00:33:51,519

so i have worked out i'll show on the

861

00:33:53,830 --> 00:33:53,039

next slide how

862

00:33:57,029 --> 00:33:53,840

these

863

00:33:58,710 --> 00:33:57,039

primitive permittivities have changed

864

00:34:00,950 --> 00:33:58,720

these permittivities have

865

00:34:03,269 --> 00:34:00,960

changed for the

866

00:34:03,990 --> 00:34:03,279

where the charges are in the molecule

867

00:34:06,870 --> 00:34:04,000

and

868

00:34:08,310 --> 00:34:06,880

for the electrons in the cage

869

00:34:10,069 --> 00:34:08,320

and so now

870

00:34:13,909 --> 00:34:10,079

we see that

871

00:34:15,669 --> 00:34:13,919

the molecule moves in a different way

872

00:34:17,909 --> 00:34:15,679

because the electric charges have been

873

00:34:19,829 --> 00:34:17,919

changed sorry not the electric charges

874

00:34:21,349 --> 00:34:19,839

the permittivities have been changed so

875

00:34:22,710 --> 00:34:21,359

the electric charges have a different

876
00:34:24,389 --> 00:34:22,720
effect

877
00:34:25,669 --> 00:34:24,399
the forces from the electric charges are

878
00:34:27,349 --> 00:34:25,679
different

879
00:34:30,149 --> 00:34:27,359
it's moved over

880
00:34:31,430 --> 00:34:30,159
to one to position one so the target is

881
00:34:37,430 --> 00:34:31,440
to move the center of mass of this

882
00:34:40,710 --> 00:34:39,190
and we can see on the left here this g

883
00:34:43,669 --> 00:34:40,720
the gold function

884
00:34:47,270 --> 00:34:45,589
as

885
00:34:48,869 --> 00:34:47,280
four and then it drops down to zero and

886
00:34:50,470 --> 00:34:48,879
on the right here we can see the

887
00:34:53,190 --> 00:34:50,480
fractional changes

888
00:34:56,869 --> 00:34:53,200

in the in the char and the permittivity

889

00:34:59,109 --> 00:34:56,879

at for different plate different

890

00:35:00,390 --> 00:34:59,119

units on the molecule and also different

891

00:35:01,190 --> 00:35:00,400

charges

892

00:35:05,270 --> 00:35:01,200

uh

893

00:35:12,950 --> 00:35:08,150

and now we want to

894

00:35:16,630 --> 00:35:14,550

so the general predictions are that

895

00:35:18,550 --> 00:35:16,640

physical processes move more quickly to

896

00:35:20,950 --> 00:35:18,560

useful result that's the whole purpose

897

00:35:23,270 --> 00:35:20,960

of targets and furthermore this happens

898

00:35:25,510 --> 00:35:23,280

particularly with charged particles and

899

00:35:27,910 --> 00:35:25,520

atoms it wouldn't happen for neutrons

900

00:35:29,910 --> 00:35:27,920

for example

901
00:35:31,750 --> 00:35:29,920
and the specific predictions are that

902
00:35:33,910 --> 00:35:31,760
these electric effects and living in

903
00:35:35,589 --> 00:35:33,920
organisms fluctuate

904
00:35:37,750 --> 00:35:35,599
because of the targeting the vacuum

905
00:35:40,230 --> 00:35:37,760
permittivity changes

906
00:35:42,550 --> 00:35:40,240
in atoms and cells in a way which must

907
00:35:45,910 --> 00:35:42,560
be distinguished from the permittivity

908
00:35:47,510 --> 00:35:45,920
changes from water say or other solvents

909
00:35:49,190 --> 00:35:47,520
and furthermore we note that the model

910
00:35:51,750 --> 00:35:49,200
only changes the physics parameters

911
00:35:53,589 --> 00:35:51,760
needed to give useful results probably

912
00:35:55,510 --> 00:35:53,599
not all of the region but just the

913
00:35:57,750 --> 00:35:55,520

particular places

914

00:35:59,910 --> 00:35:57,760

for the atoms and the causal change so

915

00:36:01,990 --> 00:35:59,920

these atoms in the causal chain

916

00:36:04,390 --> 00:36:02,000

have brief shifts in energies

917

00:36:06,550 --> 00:36:04,400

and they their fluorescent light has

918

00:36:08,710 --> 00:36:06,560

changed in frequency so that's one way

919

00:36:11,430 --> 00:36:08,720

of observing it and here we go back to

920

00:36:12,790 --> 00:36:11,440

the way john barrow and john webb

921

00:36:13,990 --> 00:36:12,800

proposed

922

00:36:17,190 --> 00:36:14,000

to measure

923

00:36:19,750 --> 00:36:17,200

changes for astronomical

924

00:36:21,990 --> 00:36:19,760

fluorescent reactions and so

925

00:36:24,950 --> 00:36:22,000

the transitions between levels are

926

00:36:27,190 --> 00:36:24,960

different if the permittivity changes

927

00:36:29,109 --> 00:36:27,200

if and so therefore

928

00:36:31,030 --> 00:36:29,119

on the vertical scale here we're varying

929

00:36:33,030 --> 00:36:31,040

the strength of the electric field and

930

00:36:34,150 --> 00:36:33,040

we can see transition lines vary in

931

00:36:37,270 --> 00:36:34,160

wavelength

932

00:36:41,430 --> 00:36:37,280

very accurately with

933

00:36:44,790 --> 00:36:41,440

modern telescopes or all telescopes

934

00:36:46,390 --> 00:36:44,800

so this is one way of measuring that

935

00:36:49,109 --> 00:36:46,400

so to summarize

936

00:36:52,310 --> 00:36:49,119

this talk as a whole

937

00:36:54,710 --> 00:36:52,320

we propose two hypotheses to answer

938

00:36:56,150 --> 00:36:54,720

these questions what do mental effects

939

00:36:57,589 --> 00:36:56,160

change in the physics

940

00:37:01,030 --> 00:36:57,599

the answer is that they change the

941

00:37:02,710 --> 00:37:01,040

relative permittivity of the vacuum

942

00:37:03,829 --> 00:37:02,720

the second question is how do these

943

00:37:06,230 --> 00:37:03,839

changes

944

00:37:07,750 --> 00:37:06,240

get to be used in physiology

945

00:37:10,390 --> 00:37:07,760

and the answer to that is that there are

946

00:37:12,470 --> 00:37:10,400

target configurations given by input

947

00:37:14,230 --> 00:37:12,480

from the non-physical

948

00:37:16,710 --> 00:37:14,240

and so then there's a physical feedback

949

00:37:19,510 --> 00:37:16,720

mechanism to bring physical objects

950

00:37:20,630 --> 00:37:19,520

closer to this target in the near future

951
00:37:23,990 --> 00:37:20,640
to achieve

952
00:37:29,190 --> 00:37:26,390
and the overall implications are now we

953
00:37:31,030 --> 00:37:29,200
can see at least as a proposal how

954
00:37:32,550 --> 00:37:31,040
non-physical things can have effects in

955
00:37:34,310 --> 00:37:32,560
nature

956
00:37:36,550 --> 00:37:34,320
and furthermore these effects on

957
00:37:39,270 --> 00:37:36,560
permittivity should be measured because

958
00:37:41,750 --> 00:37:39,280
the energy levels in the atoms involved

959
00:37:43,750 --> 00:37:41,760
will change

960
00:37:46,069 --> 00:37:43,760
and very interestingly we have final

961
00:37:47,750 --> 00:37:46,079
causes and targets to be active in

962
00:37:49,510 --> 00:37:47,760
nature

963
00:37:51,589 --> 00:37:49,520

final causes have tried to be abolished

964

00:37:53,829 --> 00:37:51,599

for the last 400 years in science but

965

00:37:56,550 --> 00:37:53,839

here we have a prospect of bringing them

966

00:37:58,390 --> 00:37:56,560

back again so this widens the field of

967

00:37:59,349 --> 00:37:58,400

scientific explanations concerning

968

00:38:01,990 --> 00:37:59,359

mental

969

00:38:03,990 --> 00:38:02,000

and other non-physical causes

970

00:38:06,310 --> 00:38:04,000

and to summarize no longer is the

971

00:38:07,750 --> 00:38:06,320

physical universe causally closed

972

00:38:09,910 --> 00:38:07,760

so that means that the starting

973

00:38:11,430 --> 00:38:09,920

assumptions of so many papers

974

00:38:12,870 --> 00:38:11,440

trying to understand the mind-body

975

00:38:13,829 --> 00:38:12,880

problem they all start with causal

976

00:38:17,030 --> 00:38:13,839

closure

977

00:38:18,630 --> 00:38:17,040

this is not a good starting point

978

00:38:20,710 --> 00:38:18,640

so there's a few references here for

979

00:38:22,069 --> 00:38:20,720

people that i've quoted