

The Skeptic Zone



Show 147 - 12 Aug 2011

Dr Ginger Campbell

1
00:00:10,430 --> 00:00:08,570
blamed psychic medium John fantastic now

2
00:00:12,379 --> 00:00:10,440
it looks like the riding in England has

3
00:00:13,549 --> 00:00:12,389
finally calmed down I don't want to

4
00:00:14,990 --> 00:00:13,559
speak too soon because I could be wrong

5
00:00:17,300 --> 00:00:15,000
but after four days and 40 nights and

6
00:00:18,620 --> 00:00:17,310
not without loss of life it does seem to

7
00:00:20,150 --> 00:00:18,630
have settled John it wouldn't had a

8
00:00:22,550 --> 00:00:20,160
premonition about this it was really

9
00:00:24,019 --> 00:00:22,560
strange i was i was there for 19 days I

10
00:00:25,400 --> 00:00:24,029
was touring roll through the UK and

11
00:00:27,620 --> 00:00:25,410
before I went there I had my daughter

12
00:00:29,060 --> 00:00:27,630
with me it was for it before I went my

13
00:00:31,220 --> 00:00:29,070

wife I had a conversation and she was

14

00:00:32,990 --> 00:00:31,230

able to come with my son and long story

15

00:00:34,190 --> 00:00:33,000

short I had a weird vibe about going

16

00:00:35,870 --> 00:00:34,200

there and I wasn't sure if it was gonna

17

00:00:37,790 --> 00:00:35,880

be like a terrorist attack or if it was

18

00:00:39,170 --> 00:00:37,800

gonna be civil unrest and my wife was

19

00:00:40,549 --> 00:00:39,180

like well maybe it's not a good idea we

20

00:00:42,110 --> 00:00:40,559

take our four-year-old daughter and you

21

00:00:43,430 --> 00:00:42,120

go and I said no no we're gonna be fine

22

00:00:44,889 --> 00:00:43,440

everything's gonna be good and it was

23

00:00:47,180 --> 00:00:44,899

like moments after we left there that

24

00:00:48,979 --> 00:00:47,190

does took place I didn't exactly what

25

00:00:50,840 --> 00:00:48,989

was gonna be but I think somebody

26
00:00:53,240 --> 00:00:50,850
recently asked me what word scares me

27
00:00:55,760 --> 00:00:53,250
and one of the words that scares me is

28
00:00:57,500 --> 00:00:55,770
the word ignorance and the other word

29
00:00:59,150 --> 00:00:57,510
that I don't like is entitlement and

30
00:01:00,439 --> 00:00:59,160
when you see stuff like that that people

31
00:01:02,360 --> 00:01:00,449
would feel so entitled for whatever

32
00:01:04,460 --> 00:01:02,370
reason that they would be it's okay to

33
00:01:11,050 --> 00:01:04,470
do that and exhibit bad behavior it's

34
00:01:28,560 --> 00:01:14,210
welcome to the skeptic zone the podcast

35
00:01:35,980 --> 00:01:31,030
welcome to the skeptic zone episode

36
00:01:38,890 --> 00:01:35,990
number 147 Richard Saunders speaking to

37
00:01:41,380 --> 00:01:38,900
you from Sydney Australia the dog

38
00:01:45,480 --> 00:01:41,390

barking outside somewhere which I can't

39

00:01:48,370 --> 00:01:45,490

do anything about hey quiet Rover on

40

00:01:52,270 --> 00:01:48,380

this week's show well we kicked off with

41

00:01:54,940 --> 00:01:52,280

haha John Edward ah John Edward doesn't

42

00:01:57,640 --> 00:01:54,950

like the word entitlement a people

43

00:02:00,460 --> 00:01:57,650

shouldn't be entitled to do naughty

44

00:02:01,570 --> 00:02:00,470

things really John Edward and what was

45

00:02:04,330 --> 00:02:01,580

the other word that scares you John

46

00:02:08,500 --> 00:02:04,340

Edward ignorance thank you John Edward

47

00:02:11,740 --> 00:02:08,510

for your incredible hindsight's about

48

00:02:14,740 --> 00:02:11,750

the riots in London well it's just leave

49

00:02:17,050 --> 00:02:14,750

John Edward for the moment but we do

50

00:02:19,660 --> 00:02:17,060

have some good things on the show we

51
00:02:22,480 --> 00:02:19,670
have dr. Richie dr. Reggie reports

52
00:02:26,110 --> 00:02:22,490
talking this week to dr. ginger Campbell

53
00:02:28,510 --> 00:02:26,120
all about brain science sign apses and

54
00:02:31,180 --> 00:02:28,520
neurons false memories all that sort of

55
00:02:34,449 --> 00:02:31,190
stuff you know dr. ginger Campbell was

56
00:02:38,910 --> 00:02:34,459
our very first live guest on the skeptic

57
00:02:43,440 --> 00:02:38,920
zone when we did our very first episode

58
00:02:46,930 --> 00:02:43,450
from dragoncon in Atlanta Georgia in

59
00:02:50,380 --> 00:02:46,940
2008 and so sad that we won't be

60
00:02:51,729 --> 00:02:50,390
visiting Dragon Con this year this is

61
00:02:54,420 --> 00:02:51,739
the first time in three years that the

62
00:02:56,860 --> 00:02:54,430
skeptics don't haven't been to dragoncon

63
00:03:01,090 --> 00:02:56,870

unfortunately it's just a very very very

64

00:03:03,580 --> 00:03:01,100

long way to go and I will maybe next

65

00:03:05,290 --> 00:03:03,590

year maybe next year to all those people

66

00:03:08,770 --> 00:03:05,300

going to dragoncon have a hell of a time

67

00:03:11,530 --> 00:03:08,780

on our behalf following dr. ratio

68

00:03:14,850 --> 00:03:11,540

reports we have a report our i did with

69

00:03:17,710 --> 00:03:14,860

karen player from the australian museum

70

00:03:20,470 --> 00:03:17,720

now Karen's involved with museum in a

71

00:03:22,750 --> 00:03:20,480

box of fantastic outreach program from

72

00:03:24,990 --> 00:03:22,760

the Australian Museum and she's the

73

00:03:28,090 --> 00:03:25,000

newest member of the New South Wales

74

00:03:29,650 --> 00:03:28,100

Australian skeptics now I've got a

75

00:03:32,170 --> 00:03:29,660

little note here from our good friend

76

00:03:35,490 --> 00:03:32,180

Lucas Randall a great supporter of the

77

00:03:38,410 --> 00:03:35,500

skeptic zone he is telling me that the

78

00:03:39,559 --> 00:03:38,420

skeptic camp will skip the camp was such

79

00:03:41,690 --> 00:03:39,569

a success here in

80

00:03:43,099 --> 00:03:41,700

Sydney that our friends and Melbourne

81

00:03:46,569 --> 00:03:43,109

are going to do the same sort of thing

82

00:03:49,550 --> 00:03:46,579

they hope to have it happening in

83

00:03:52,399 --> 00:03:49,560

October later in October this year and

84

00:03:55,099 --> 00:03:52,409

they need your help support and general

85

00:03:57,140 --> 00:03:55,109

interest I can really recommend skeptic

86

00:03:58,640 --> 00:03:57,150

camp it was a fantastic day in here in

87

00:04:01,520 --> 00:03:58,650

Sydney I can't wait to go to the next

88

00:04:03,319 --> 00:04:01,530

one so if you're in Melbourne if you're

89

00:04:11,500 --> 00:04:03,329

in Victoria check out the website of

90

00:04:16,640 --> 00:04:11,510

Lucas run to [blog dot co d e n l x.org](http://blog.dotcodenl.x.org)

91

00:04:19,969 --> 00:04:16,650

[blog conics dot org](http://blog.conics.org) for more information

92

00:04:22,730 --> 00:04:19,979

about skeptic camp in Melbourne and if

93

00:04:25,300 --> 00:04:22,740

you're in Melbourne later on in October

94

00:04:27,650 --> 00:04:25,310

don't miss out on this fantastic event

95

00:04:31,640 --> 00:04:27,660

now thanks to all the people who wrote

96

00:04:36,050 --> 00:04:31,650

in when I tossed the dice at the end of

97

00:04:37,969 --> 00:04:36,060

the last episode of the skeptic zone so

98

00:04:40,640 --> 00:04:37,979

many people more than I thought actually

99

00:04:42,080 --> 00:04:40,650

said they predicted or they guessed or

100

00:04:44,810 --> 00:04:42,090

whatever you want to say the numbers

101
00:04:50,659 --> 00:04:44,820
that came up when I tossed the 20-sided

102
00:04:52,310 --> 00:04:50,669
dice TD 20 and I have it here again my

103
00:04:54,560 --> 00:04:52,320
lovely d20 what I'm going to do I was

104
00:04:57,200 --> 00:04:54,570
going I'm going to toss it four times in

105
00:04:59,930 --> 00:04:57,210
this episode once at the beginning and

106
00:05:02,899 --> 00:04:59,940
then after the first interview after the

107
00:05:05,839 --> 00:05:02,909
second segment towards the end it you

108
00:05:10,969 --> 00:05:05,849
EULA you'll hear them so you have four

109
00:05:12,740 --> 00:05:10,979
chances of guessing predicting using

110
00:05:17,330 --> 00:05:12,750
your psychic power to come up with the

111
00:05:20,589 --> 00:05:17,340
same number as the dice now if you do it

112
00:05:22,909 --> 00:05:20,599
first off that's a 120 shot well done

113
00:05:24,950 --> 00:05:22,919

now if you get the first number correct

114

00:05:28,339 --> 00:05:24,960

and the second number a bit later in the

115

00:05:31,820 --> 00:05:28,349

show that's a one in four hundred shot

116

00:05:34,159 --> 00:05:31,830

not bad if you get the first and the

117

00:05:37,820 --> 00:05:34,169

second and the third number is correct

118

00:05:41,360 --> 00:05:37,830

then that's a one in eight thousand shot

119

00:05:45,800 --> 00:05:41,370

and if you get all four numbers correct

120

00:05:48,490 --> 00:05:45,810

then you've beaten odds of 160,000 to

121

00:05:50,870 --> 00:05:48,500

one so get those neurons and synapses

122

00:05:52,279 --> 00:05:50,880

working right now we're going to do the

123

00:05:55,939 --> 00:05:52,289

first toss

124

00:05:58,369 --> 00:05:55,949

can give you a second Oh psychic

125

00:06:01,999 --> 00:05:58,379

predicting power here we go are you

126

00:06:03,709 --> 00:06:02,009

thinking of your number from 1 to 20

127

00:06:09,709 --> 00:06:03,719

could be one can be to all the way up to

128

00:06:15,469 --> 00:06:09,719

20 here we go tossing now the first

129

00:06:18,739 --> 00:06:15,479

number on today show is 17 so all those

130

00:06:19,909 --> 00:06:18,749

people who predicted 17 well done you

131

00:06:23,149 --> 00:06:19,919

know those people who didn't don't worry

132

00:06:26,179 --> 00:06:23,159

you get another chance soon well I'll

133

00:06:29,029 --> 00:06:26,189

put that aside for the moment and run

134

00:06:32,329 --> 00:06:29,039

downstairs here we go I'm going to run

135

00:06:36,019 --> 00:06:32,339

downstairs I'm going to make myself a

136

00:06:37,579 --> 00:06:36,029

paratha hmm very easy to make straight

137

00:06:41,600 --> 00:06:37,589

from the freezer fry it up in the frying

138

00:07:00,310 --> 00:06:41,610

pan crunchy and lovely paratha buy some

139

00:07:09,290 --> 00:07:03,710

now it's time for dr. Rachel reports

140

00:07:12,110 --> 00:07:09,300

with dr. Rachel Dunlop and i'm here

141

00:07:14,180 --> 00:07:12,120

today at tam 9 talking to dr. ginger

142

00:07:15,650 --> 00:07:14,190

Campbell hi ginger thanks for talking to

143

00:07:18,560 --> 00:07:15,660

us hi Rachel it's good to see you again

144

00:07:20,780 --> 00:07:18,570

we finally got to have a chat yeah good

145

00:07:22,670 --> 00:07:20,790

last year we were meant to talk and then

146

00:07:25,130 --> 00:07:22,680

I was so jet-lagged and I was just in a

147

00:07:26,420 --> 00:07:25,140

bit of a daze at at one point so I just

148

00:07:28,370 --> 00:07:26,430

kind of went to bed I think so we've

149

00:07:31,820 --> 00:07:28,380

missed actually catching up last year

150

00:07:33,740 --> 00:07:31,830

didn't we yes yeah so um this is not

151

00:07:36,380 --> 00:07:33,750

your first time obviously you're just my

152

00:07:38,930 --> 00:07:36,390

second I wasn't a second okay it's my

153

00:07:40,610 --> 00:07:38,940

second as well actually last year we did

154

00:07:42,500 --> 00:07:40,620

the workshops for science-based medicine

155

00:07:44,120 --> 00:07:42,510

which we're not doing this year but

156

00:07:46,760 --> 00:07:44,130

we're doing a panel on the placebo

157

00:07:48,800 --> 00:07:46,770

effect on Saturday which is really

158

00:07:50,630 --> 00:07:48,810

interesting the research I've been doing

159

00:07:52,010 --> 00:07:50,640

for that has been really fascinating I

160

00:07:56,840 --> 00:07:52,020

want to talk to you about neuroscience

161

00:07:58,580 --> 00:07:56,850

today okay now you have a podcast the

162

00:08:01,100 --> 00:07:58,590

brain science podcast which you've been

163

00:08:02,480 --> 00:08:01,110

doing for quite some time one of your

164

00:08:03,740 --> 00:08:02,490

recent interests although you're not a

165

00:08:06,200 --> 00:08:03,750

neuroscientist are you you're a

166

00:08:08,600 --> 00:08:06,210

physician yes what was your what's your

167

00:08:10,430 --> 00:08:08,610

specialty well I trained as a family

168

00:08:12,260 --> 00:08:10,440

physician but I've spent most of my

169

00:08:15,500 --> 00:08:12,270

career working as an emergency physician

170

00:08:19,239 --> 00:08:15,510

in rural little small hospitals where a

171

00:08:22,179 --> 00:08:19,249

lot of what you do is primary cares yeah

172

00:08:23,529 --> 00:08:22,189

I do everything I like the variety you

173

00:08:26,589 --> 00:08:23,539

like the variety I like the fact that

174

00:08:28,449 --> 00:08:26,599

every day is different yeah but we

175

00:08:30,339 --> 00:08:28,459

recently become interested in

176

00:08:31,989 --> 00:08:30,349

neuroscience and you did a talk at

177

00:08:33,969 --> 00:08:31,999

London skeptics in the pub which was

178

00:08:36,429 --> 00:08:33,979

broadcast as part of one of your podcast

179

00:08:40,240 --> 00:08:36,439

recently your books and science podcast

180

00:08:42,699 --> 00:08:40,250

an idea books and ideas podcast sorry up

181

00:08:46,119 --> 00:08:42,709

front can you give me a layman sort of

182

00:08:47,559 --> 00:08:46,129

description of what is neuroscience well

183

00:08:48,730 --> 00:08:47,569

if I know you were going to use my left

184

00:08:50,860 --> 00:08:48,740

sock I know I used a different

185

00:08:54,429 --> 00:08:50,870

definition in there and I forgotten what

186

00:08:58,420 --> 00:08:54,439

it was but basically it's it's the study

187

00:09:02,290 --> 00:08:58,430

of how the brain and the nervous system

188

00:09:05,340 --> 00:09:02,300

work and it can include anything from

189

00:09:09,600 --> 00:09:05,350

the molecular level all the way up to

190

00:09:12,759 --> 00:09:09,610

the level of the whole brain I think

191

00:09:16,600 --> 00:09:12,769

wikipedias got maybe 15 different sub

192

00:09:19,179 --> 00:09:16,610

branches of neuroscience listed the

193

00:09:21,429 --> 00:09:19,189

definition depends on in the field

194

00:09:24,090 --> 00:09:21,439

people that are in neuroscience don't

195

00:09:26,740 --> 00:09:24,100

consider psychology part of neuroscience

196

00:09:30,369 --> 00:09:26,750

but I think from the outside point of

197

00:09:34,509 --> 00:09:30,379

view psychology even could be considered

198

00:09:36,340 --> 00:09:34,519

a related field oh because the the sort

199

00:09:37,689 --> 00:09:36,350

of you in the talk that you gave are

200

00:09:39,790 --> 00:09:37,699

skeptics the pub you talked about C

201
00:09:43,059 --> 00:09:39,800
elegans which is actually a worm isn't

202
00:09:45,759 --> 00:09:43,069
it yes it's a very simple organism and

203
00:09:47,920 --> 00:09:45,769
it's been used to study neuroscience and

204
00:09:51,309 --> 00:09:47,930
that's because it's only got what a tin

205
00:09:54,189 --> 00:09:51,319
you're on so well it has I think 302

206
00:09:58,090 --> 00:09:54,199
neurons in total the thing that makes C

207
00:09:59,460 --> 00:09:58,100
elegans special is first of all was the

208
00:10:01,710 --> 00:09:59,470
first

209
00:10:05,340 --> 00:10:01,720
organism to have its entire genome

210
00:10:07,770 --> 00:10:05,350
sequenced and it's the only organism

211
00:10:10,740 --> 00:10:07,780
that we have the entire wiring diagram

212
00:10:12,870 --> 00:10:10,750
so to speak of every neuron in C elegans

213
00:10:16,200 --> 00:10:12,880

every neuron is the same unlike our

214

00:10:18,540 --> 00:10:16,210

brains and they know what every neuron

215

00:10:21,360 --> 00:10:18,550

in the brain of us will see how against

216

00:10:23,340 --> 00:10:21,370

excuse me doesn't have a brain but they

217

00:10:25,290 --> 00:10:23,350

know what every neuron in C elegans is

218

00:10:27,480 --> 00:10:25,300

connected to which other neurons it's

219

00:10:29,460 --> 00:10:27,490

connected to where the eight neurons

220

00:10:32,010 --> 00:10:29,470

thing comes in is that there's exactly

221

00:10:35,070 --> 00:10:32,020

eight dopamine dopaminergic your assets

222

00:10:38,670 --> 00:10:35,080

right yeah but yeah so so they know the

223

00:10:40,950 --> 00:10:38,680

entire wiring diagram so they know the

224

00:10:44,100 --> 00:10:40,960

level of detail but they know about C

225

00:10:46,620 --> 00:10:44,110

elegans is beyond any other creature at

226

00:10:50,340 --> 00:10:46,630

this point in history so it makes it a

227

00:10:54,150 --> 00:10:50,350

great thing for studying hmm so in terms

228

00:10:57,030 --> 00:10:54,160

of evolution of neurons and the brain

229

00:10:58,590 --> 00:10:57,040

it's a really good example of how the

230

00:11:02,850 --> 00:10:58,600

brain could have evolved isn't it

231

00:11:05,250 --> 00:11:02,860

because it's got an example of sinuses

232

00:11:07,050 --> 00:11:05,260

so can you explain what a synapse you

233

00:11:12,900 --> 00:11:07,060

know back up on that question or just a

234

00:11:16,320 --> 00:11:12,910

minute even back before C elegans we've

235

00:11:17,940 --> 00:11:16,330

got the evolution of what what we now

236

00:11:19,980 --> 00:11:17,950

call neuro transmitters although the

237

00:11:22,370 --> 00:11:19,990

chemical messengers already exist even

238

00:11:25,449 --> 00:11:22,380

before the first neuron arrives oh

239

00:11:28,869 --> 00:11:25,459

that's you know that's important

240

00:11:34,030 --> 00:11:28,879

yep there's a guy named Seth grant in in

241

00:11:38,350 --> 00:11:34,040

the UK that's studying the evolution of

242

00:11:40,210 --> 00:11:38,360

the synapse and how the receptors and

243

00:11:43,749 --> 00:11:40,220

the what becomes the neurotransmitters

244

00:11:47,739 --> 00:11:43,759

already exist even in yeast in yes

245

00:11:50,949 --> 00:11:47,749

really yeah which is way before even the

246

00:11:52,419 --> 00:11:50,959

first multicellular organisms so the

247

00:11:57,669 --> 00:11:52,429

evidence so the beginnings of the

248

00:12:00,730 --> 00:11:57,679

nervous system ago almost I'd say to the

249

00:12:02,530 --> 00:12:00,740

back back to the first single cell

250

00:12:04,869 --> 00:12:02,540

organisms once they started moving

251
00:12:06,519 --> 00:12:04,879
around and they had to be able to go to

252
00:12:07,989 --> 00:12:06,529
good stuff and away from bad stuff

253
00:12:11,139 --> 00:12:07,999
that's the beginning of the nervous

254
00:12:13,389 --> 00:12:11,149
system so then the synapse is actually a

255
00:12:15,669 --> 00:12:13,399
very high level of complexity compared

256
00:12:18,609 --> 00:12:15,679
to all those organisms that would Jesus

257
00:12:21,069 --> 00:12:18,619
it for me millions of years before there

258
00:12:22,090 --> 00:12:21,079
were multicellular organisms yeah well I

259
00:12:24,879 --> 00:12:22,100
mean you mentioned that the

260
00:12:28,509 --> 00:12:24,889
neurotransmitters evolved before neurons

261
00:12:31,749 --> 00:12:28,519
involved so that suggests that that that

262
00:12:36,460 --> 00:12:31,759
evolution started with the new proteins

263
00:12:39,759 --> 00:12:36,470

that other neurotransmitters aren't they

264

00:12:41,590 --> 00:12:39,769

right and and so this is the synapse is

265

00:12:44,230 --> 00:12:41,600

sort of the connection between your on

266

00:12:47,590 --> 00:12:44,240

tonight the excited the the the synapse

267

00:12:48,939 --> 00:12:47,600

is the place at which one cell I think

268

00:12:50,619 --> 00:12:48,949

the easiest way to think of it so place

269

00:12:52,720 --> 00:12:50,629

at which one cell sends out some

270

00:12:55,600 --> 00:12:52,730

chemical messengers and the other cell

271

00:12:57,280 --> 00:12:55,610

receives them and once you get to where

272

00:12:58,660 --> 00:12:57,290

that's a specialized connection where

273

00:13:00,850 --> 00:12:58,670

they're sitting there close to each

274

00:13:03,910 --> 00:13:00,860

other so that one knows that its message

275

00:13:05,829 --> 00:13:03,920

is going to that specific next cell

276

00:13:09,000 --> 00:13:05,839

which in the case the nervous system is

277

00:13:13,720 --> 00:13:09,010

a neuron then you've got a synapse

278

00:13:16,090 --> 00:13:13,730

so and again that that happens fairly

279

00:13:17,590 --> 00:13:16,100

early on as soon as you see the

280

00:13:20,620 --> 00:13:17,600

beginning of neurons and I honestly

281

00:13:23,950 --> 00:13:20,630

don't know when the first cell that

282

00:13:26,320 --> 00:13:23,960

would be called a neuron arose I don't

283

00:13:28,000 --> 00:13:26,330

know the answer to that but is a long

284

00:13:31,030 --> 00:13:28,010

time ago is the important thing to

285

00:13:33,010 --> 00:13:31,040

realize and that most of what's going on

286

00:13:34,330 --> 00:13:33,020

in the nervous system well a lot of

287

00:13:37,110 --> 00:13:34,340

what's going on the nervous system was

288

00:13:39,250 --> 00:13:37,120

happening even before we had a nervous

289

00:13:41,530 --> 00:13:39,260

system

290

00:13:43,090 --> 00:13:41,540

and so you talked about these proteins

291

00:13:44,560 --> 00:13:43,100

that are called neurotransmitters ginger

292

00:13:46,750 --> 00:13:44,570

there are different types of

293

00:13:48,640 --> 00:13:46,760

neurotransmitters aren't they that talk

294

00:13:50,890 --> 00:13:48,650

to different types of neurons now in our

295

00:13:52,720 --> 00:13:50,900

brain in our evolved rain and that

296

00:13:56,200 --> 00:13:52,730

results in different things happening

297

00:14:00,340 --> 00:13:56,210

right well the key is not so much the

298

00:14:02,140 --> 00:14:00,350

transmitter as it is the receptor that's

299

00:14:05,980 --> 00:14:02,150

why when you hear about something like

300

00:14:07,690 --> 00:14:05,990

dopamine doing different things in your

301

00:14:10,570 --> 00:14:07,700

body and you wonder well how can it be

302

00:14:12,550 --> 00:14:10,580

you know in my reward circuits and be in

303

00:14:14,980 --> 00:14:12,560

this other circuit like that I need for

304

00:14:18,130 --> 00:14:14,990

my movements a Parkinson's diseases is a

305

00:14:20,050 --> 00:14:18,140

problem of the dopaminergic system but

306

00:14:24,360 --> 00:14:20,060

that doesn't that part of its not a

307

00:14:28,270 --> 00:14:24,370

reward its movement or in it so it's

308

00:14:29,980 --> 00:14:28,280

what you might say whatky it what lock

309

00:14:33,160 --> 00:14:29,990

it goes into when it gets to the other

310

00:14:37,330 --> 00:14:33,170

hand so various neurotransmitters can

311

00:14:41,350 --> 00:14:37,340

have wide-ranging effects based on what

312

00:14:43,840 --> 00:14:41,360

receptor they connect with this is

313

00:14:47,050 --> 00:14:43,850

important clinically because if you try

314

00:14:49,000 --> 00:14:47,060

to make a drug that's going to increase

315

00:14:51,370 --> 00:14:49,010

a transmitter

316

00:14:53,080 --> 00:14:51,380

side effects will rise because it's not

317

00:14:55,000 --> 00:14:53,090

just going to the place that you're

318

00:14:58,300 --> 00:14:55,010

thinking about it's going to maybe

319

00:15:00,010 --> 00:14:58,310

places you hadn't thought about and so

320

00:15:02,140 --> 00:15:00,020

just to go back to C elegans for a

321

00:15:04,120 --> 00:15:02,150

second then we just touched on the fact

322

00:15:07,090 --> 00:15:04,130

that it's got eight dopaminergic neurons

323

00:15:08,650 --> 00:15:07,100

now those are involved in Parkinson's

324

00:15:10,900 --> 00:15:08,660

disease in the sense that they're lost

325

00:15:13,750 --> 00:15:10,910

in Parkinson's disease which is why

326

00:15:16,290 --> 00:15:13,760

people get this shaking and their

327

00:15:19,900 --> 00:15:16,300

inability to control movement and that

328

00:15:21,640 --> 00:15:19,910

organism has been used to study possibly

329

00:15:23,770 --> 00:15:21,650

drugs to help with Parkinson's disease

330

00:15:25,510 --> 00:15:23,780

isn't it yeah the other thing i forgot

331

00:15:27,280 --> 00:15:25,520

to say about C elegans that makes it

332

00:15:30,100 --> 00:15:27,290

great for studying is the fact that it's

333

00:15:33,210 --> 00:15:30,110

transparent that's right yeah and they

334

00:15:35,740 --> 00:15:33,220

can actually see the neurons and then um

335

00:15:38,200 --> 00:15:35,750

and they have this green fluorescent

336

00:15:40,810 --> 00:15:38,210

protein thing that the guy got the Nobel

337

00:15:43,090 --> 00:15:40,820

Prize for so they can actually sort of

338

00:15:45,730 --> 00:15:43,100

label the neurons and and you can see

339

00:15:47,830 --> 00:15:45,740

them sort of bright green shiny little

340

00:15:50,170 --> 00:15:47,840

neurons you know exactly which ones are

341

00:15:53,670 --> 00:15:50,180

your the ones you want to study or lit

342

00:15:59,100 --> 00:15:53,680

up so they can they can do that and then

343

00:16:02,940 --> 00:15:59,110

in the top that I gave in in London I

344

00:16:05,350 --> 00:16:02,950

showed a picture of the C elegans and

345

00:16:06,760 --> 00:16:05,360

guy called well who gave me some slots

346

00:16:08,500 --> 00:16:06,770

to use he also gave me a video showing

347

00:16:11,200 --> 00:16:08,510

they've actually even figured out C

348

00:16:13,450 --> 00:16:11,210

elegans can have seizures about a couple

349

00:16:15,550 --> 00:16:13,460

kinds of seizures this does not involve

350

00:16:18,310 --> 00:16:15,560

dopamine neurons but it's another

351

00:16:21,010 --> 00:16:18,320

example of how C elegans can again be is

352

00:16:23,350 --> 00:16:21,020

and the fact that it's I have to admit

353

00:16:25,620 --> 00:16:23,360

though a seizure in C elegans is not

354

00:16:27,540 --> 00:16:25,630

very interesting who

355

00:16:29,250 --> 00:16:27,550

you know it's stupid net worth seeing

356

00:16:33,030 --> 00:16:29,260

they're going you know shaking a little

357

00:16:34,890 --> 00:16:33,040

cuz it's a worm yeah yeah but but it I

358

00:16:36,930 --> 00:16:34,900

found it really fascinating that the C

359

00:16:39,720 --> 00:16:36,940

elegans not only could have seizures but

360

00:16:41,760 --> 00:16:39,730

different kinds of seizures I mean we

361

00:16:43,830 --> 00:16:41,770

think of those organisms as being so

362

00:16:46,410 --> 00:16:43,840

primitive but they're they're really

363

00:16:48,720 --> 00:16:46,420

very complex yeah well actually in the

364

00:16:51,000 --> 00:16:48,730

field i work in C elegans is used to

365

00:16:53,580 --> 00:16:51,010

study apoptosis which is programmed cell

366

00:16:55,350 --> 00:16:53,590

death right and I've send videos to of

367

00:16:57,270 --> 00:16:55,360

an undergoing the whole organism

368

00:16:59,820 --> 00:16:57,280

undergoing apoptosis and kind of its

369

00:17:01,920 --> 00:16:59,830

cells eating it eating themselves as and

370

00:17:03,870 --> 00:17:01,930

they look fantastic those videos but

371

00:17:05,579 --> 00:17:03,880

yeah you're right i mean apoptosis is

372

00:17:08,760 --> 00:17:05,589

another example of a very complex

373

00:17:11,370 --> 00:17:08,770

process that sells intrinsically have to

374

00:17:14,000 --> 00:17:11,380

sort of eat themselves i suppose undergo

375

00:17:17,699 --> 00:17:14,010

cell suicide and it exists in C elegans

376

00:17:20,160 --> 00:17:17,709

you know yeah I mean the fact that we

377

00:17:22,800 --> 00:17:20,170

have all these pieces in common with

378

00:17:24,780 --> 00:17:22,810

lower organisms is the one reason why we

379

00:17:28,290 --> 00:17:24,790

can figure out so many things about how

380

00:17:31,920 --> 00:17:28,300

neurons work using things like C elegans

381

00:17:35,430 --> 00:17:31,930

or please iya or and now a fruit flies

382

00:17:38,010 --> 00:17:35,440

or becoming a real big experimental

383

00:17:39,390 --> 00:17:38,020

animal in neuroscience that's good

384

00:17:42,039 --> 00:17:39,400

because I said we can learn so much

385

00:17:45,580 --> 00:17:42,049

without having to you know

386

00:17:46,930 --> 00:17:45,590

usually animals that have the kind of

387

00:17:49,330 --> 00:17:46,940

consciousness that would make us feel

388

00:17:51,220 --> 00:17:49,340

matically yeah challenged about using

389

00:17:53,049 --> 00:17:51,230

them yeah well that's I mean another

390

00:17:56,710 --> 00:17:53,059

example of the model we're about to

391

00:17:57,759 --> 00:17:56,720

start using for ALS is zebrafish we're

392

00:17:59,379 --> 00:17:57,769

actually going to be injecting

393

00:18:01,659 --> 00:17:59,389

neurotoxin well in fact we're going to

394

00:18:03,639 --> 00:18:01,669

be putting into the water but in the

395

00:18:05,950 --> 00:18:03,649

zebrafish leave and then they will make

396

00:18:08,919 --> 00:18:05,960

it into proteins and that will impact on

397

00:18:10,629 --> 00:18:08,929

whether they get ALS or not so it's I

398

00:18:12,549 --> 00:18:10,639

haven't worked with this model yet but

399

00:18:14,529 --> 00:18:12,559

it's something when it's established and

400

00:18:17,049 --> 00:18:14,539

it's fascinating that you can go back to

401
00:18:19,239 --> 00:18:17,059
zebrafish and still look at ALS from

402
00:18:22,419 --> 00:18:19,249
that perspective several years ago I

403
00:18:24,810 --> 00:18:22,429
interviewed dr. Eve martyr martyr who I

404
00:18:28,060 --> 00:18:24,820
think will someday get a Nobel Prize and

405
00:18:30,970 --> 00:18:28,070
she has been at Brandeis for 30 years

406
00:18:33,700 --> 00:18:30,980
and she's been studying the somatic

407
00:18:36,310 --> 00:18:33,710
gastric ganglion in the lobster last

408
00:18:38,440 --> 00:18:36,320
time I mean this one little batch of

409
00:18:40,090 --> 00:18:38,450
neurons and that sounds like it would be

410
00:18:42,039 --> 00:18:40,100
something she's actually been doing

411
00:18:44,259 --> 00:18:42,049
she's the reason I think she'll get a

412
00:18:46,180 --> 00:18:44,269
Nobel Prize someday is because she's one

413
00:18:48,999 --> 00:18:46,190

of the pioneers in figuring out the

414

00:18:51,879 --> 00:18:49,009

surfaces circuit kind of stuff and the

415

00:18:54,220 --> 00:18:51,889

thing she's figured out is that things

416

00:18:57,450 --> 00:18:54,230

that have they've always assumed had to

417

00:19:00,489 --> 00:18:57,460

be the same can be very very variable

418

00:19:02,499 --> 00:19:00,499

one of the new ideas that's emerging is

419

00:19:05,499 --> 00:19:02,509

the one of the things that makes biology

420

00:19:06,970 --> 00:19:05,509

different from engineer things you know

421

00:19:09,310 --> 00:19:06,980

with engineering we always make things

422

00:19:11,830 --> 00:19:09,320

redundant you know we we need to have a

423

00:19:14,830 --> 00:19:11,840

backup one yeah usually it's exactly the

424

00:19:16,840 --> 00:19:14,840

same as the one that might break

425

00:19:19,540 --> 00:19:16,850

biology doesn't work that way its

426

00:19:22,840 --> 00:19:19,550

backups are usually entirely different

427

00:19:25,300 --> 00:19:22,850

and what she's discovered is that some

428

00:19:28,210 --> 00:19:25,310

of the parameters of things like the ion

429

00:19:30,670 --> 00:19:28,220

channels can be vastly different and

430

00:19:34,120 --> 00:19:30,680

still end up with the same result and

431

00:19:35,890 --> 00:19:34,130

this has a what this has some very big

432

00:19:38,020 --> 00:19:35,900

implications for how we do science

433

00:19:40,540 --> 00:19:38,030

because you know the way we sample we

434

00:19:43,090 --> 00:19:40,550

will do an experiment many times and

435

00:19:44,950 --> 00:19:43,100

then average the results sort of working

436

00:19:47,500 --> 00:19:44,960

from the assumption that all these

437

00:19:49,060 --> 00:19:47,510

organisms are going to be more or less

438

00:19:51,730 --> 00:19:49,070

the same and that thing we're trying to

439

00:19:56,410 --> 00:19:51,740

measure yeah yeah but it turns out that

440

00:19:58,780 --> 00:19:56,420

might not be true well I'm not sure what

441

00:20:00,370 --> 00:19:58,790

we're that's gonna go well but that's

442

00:20:02,290 --> 00:20:00,380

just an example of one of the exciting

443

00:20:05,690 --> 00:20:02,300

things that's going on at the level of

444

00:20:09,680 --> 00:20:07,610

yeah invertebrates are turning out to be

445

00:20:11,870 --> 00:20:09,690

much more interesting than I think

446

00:20:15,049 --> 00:20:11,880

anyone ever just because they can't talk

447

00:20:17,210 --> 00:20:15,059

to us or look at us with things that we

448

00:20:19,549 --> 00:20:17,220

recognize as faces doesn't mean they're

449

00:20:20,720 --> 00:20:19,559

going to have an interesting so one of

450

00:20:22,700 --> 00:20:20,730

the other interesting things I find

451
00:20:24,889 --> 00:20:22,710
about neuroscience is that and you talk

452
00:20:26,840 --> 00:20:24,899
about this is that the dogma was that

453
00:20:29,029 --> 00:20:26,850
you couldn't make new neurons for a long

454
00:20:31,399 --> 00:20:29,039
time and we now know that that's not the

455
00:20:33,200 --> 00:20:31,409
case only certain parts of the brain

456
00:20:35,720 --> 00:20:33,210
though are a capable of making neurons

457
00:20:38,629 --> 00:20:35,730
are they it's not celebrating right I

458
00:20:41,720 --> 00:20:38,639
think I don't remember all the places

459
00:20:44,600 --> 00:20:41,730
the main one that people

460
00:20:46,570 --> 00:20:44,610
no about as the hippocampus because we

461
00:20:49,910 --> 00:20:46,580
know that's associated with memory and

462
00:20:52,190 --> 00:20:49,920
there's been research in things like

463
00:20:54,650 --> 00:20:52,200

people that are depressed and people

464

00:20:56,600 --> 00:20:54,660

that get antidepressants it looks like

465

00:21:01,550 --> 00:20:56,610

maybe they that helps them to be able to

466

00:21:03,620 --> 00:21:01,560

make new neurons again however I have

467

00:21:06,320 --> 00:21:03,630

think brain plasticity is a really

468

00:21:08,630 --> 00:21:06,330

really fascinating field but most of the

469

00:21:10,700 --> 00:21:08,640

stuff that's to me most interesting is

470

00:21:13,430 --> 00:21:10,710

things that happen that don't involve

471

00:21:16,250 --> 00:21:13,440

making new neurons but involve either

472

00:21:19,460 --> 00:21:16,260

uncovering connections we didn't know we

473

00:21:22,090 --> 00:21:19,470

had or making new connections I mean

474

00:21:25,070 --> 00:21:22,100

it's amazing you can take people with

475

00:21:28,010 --> 00:21:25,080

abnormal vision and blindfold them for a

476

00:21:30,050 --> 00:21:28,020

week and they can already and you can

477

00:21:32,740 --> 00:21:30,060

already see changes in their brain all

478

00:21:36,230 --> 00:21:32,750

right really you know they start using

479

00:21:38,060 --> 00:21:36,240

parts that in sensory circuits that they

480

00:21:41,420 --> 00:21:38,070

weren't using because basically vision

481

00:21:43,130 --> 00:21:41,430

normally dominates so that whole concept

482

00:21:44,980 --> 00:21:43,140

that I know it's a myth but the one of

483

00:21:48,500 --> 00:21:44,990

that winning is timpz our brain I mean

484

00:21:50,210 --> 00:21:48,510

gingers just facepalms by the way but

485

00:21:52,690 --> 00:21:50,220

it's such a common misconception isn't

486

00:21:55,220 --> 00:21:52,700

it you know where it started from that I

487

00:21:57,360 --> 00:21:55,230

should know the answer to that but I but

488

00:21:59,940 --> 00:21:57,370

I don't

489

00:22:02,640 --> 00:21:59,950

but you also used a really good example

490

00:22:05,910 --> 00:22:02,650

of how with respect to brain plasticity

491

00:22:07,170 --> 00:22:05,920

how memories are so pliable and you use

492

00:22:09,660 --> 00:22:07,180

the example of the Challenger disaster

493

00:22:12,450 --> 00:22:09,670

when you tell alice is about that yeah

494

00:22:14,340 --> 00:22:12,460

now that one wasn't originally from me I

495

00:22:16,710 --> 00:22:14,350

got it from Robert Burton who wrote a

496

00:22:19,710 --> 00:22:16,720

very wonderful book I'm called on being

497

00:22:22,640 --> 00:22:19,720

certain be can be interior right even

498

00:22:25,140 --> 00:22:22,650

when you're not one of my favorite guess

499

00:22:27,570 --> 00:22:25,150

basically what happened was and this was

500

00:22:29,580 --> 00:22:27,580

a study done by psychologists when the

501
00:22:31,110 --> 00:22:29,590
sent the Challenger disaster happened

502
00:22:32,790 --> 00:22:31,120
they had a bunch of people write down

503
00:22:34,049 --> 00:22:32,800
their experience is what they were

504
00:22:35,790 --> 00:22:34,059
feeling what they were doing when it

505
00:22:37,470 --> 00:22:35,800
happened and that sort of thing then a

506
00:22:39,480 --> 00:22:37,480
couple years later they went back and

507
00:22:41,070 --> 00:22:39,490
interviewed the same people and asked

508
00:22:42,810 --> 00:22:41,080
them you know what were you doing what

509
00:22:45,260 --> 00:22:42,820
were you feeling and there was only

510
00:22:48,000 --> 00:22:45,270
about a twenty five percent agreement

511
00:22:50,430 --> 00:22:48,010
most of what most people's memories had

512
00:22:54,270 --> 00:22:50,440
changed sometimes in a significant way

513
00:22:56,430 --> 00:22:54,280

and most remarkably if confronted with

514

00:22:58,980 --> 00:22:56,440

their own handwriting of what they had

515

00:23:01,260 --> 00:22:58,990

said happened a surprising number said

516

00:23:03,180 --> 00:23:01,270

well I wrote that but why I remember now

517

00:23:07,590 --> 00:23:03,190

is what really happened I mean because

518

00:23:10,260 --> 00:23:07,600

you're since the peak of the sureness of

519

00:23:12,580 --> 00:23:10,270

your memories is so strong that even if

520

00:23:14,140 --> 00:23:12,590

you look at your own handwriting

521

00:23:15,850 --> 00:23:14,150

have you ever had a comedy about any

522

00:23:17,880 --> 00:23:15,860

brothers and sisters yeah have you ever

523

00:23:20,380 --> 00:23:17,890

talked about when you were kids and

524

00:23:22,480 --> 00:23:20,390

noticed that it's like you had different

525

00:23:24,070 --> 00:23:22,490

childhoods yeah I have to be sure you

526

00:23:26,470 --> 00:23:24,080

know this is really funny because now

527

00:23:28,480 --> 00:23:26,480

that I'm aware of this stuff I always

528

00:23:30,159 --> 00:23:28,490

paraphrase those things with I know it

529

00:23:32,080 --> 00:23:30,169

probably didn't happen like this but

530

00:23:34,450 --> 00:23:32,090

this is what I remember now because I

531

00:23:36,310 --> 00:23:34,460

know it's and it's really fascinating to

532

00:23:38,409 --> 00:23:36,320

think that I remember things now that

533

00:23:40,570 --> 00:23:38,419

probably never happened and I'm aware of

534

00:23:42,850 --> 00:23:40,580

that as yeah I'm really looking forward

535

00:23:45,549 --> 00:23:42,860

to meeting Elizabeth Loftus she's gonna

536

00:23:48,130 --> 00:23:45,559

hear ya and she is one of the pioneers

537

00:23:50,950 --> 00:23:48,140

she is the one that basically showed how

538

00:23:54,220 --> 00:23:50,960

easily it is to instill false memories

539

00:23:57,370 --> 00:23:54,230

which is what hopefully put an end to

540

00:24:00,940 --> 00:23:57,380

that whole false memory um you know

541

00:24:03,070 --> 00:24:00,950

movement that was just really really bad

542

00:24:05,850 --> 00:24:03,080

and it was really damaging to vary by

543

00:24:08,919 --> 00:24:05,860

putting implanted memories in children's

544

00:24:10,210 --> 00:24:08,929

brains of people that would then think

545

00:24:11,860 --> 00:24:10,220

they were molested as kids and people

546

00:24:14,680 --> 00:24:11,870

were being prosecuted and going to jail

547

00:24:17,380 --> 00:24:14,690

for that sort of stuff yeah she did I

548

00:24:19,840 --> 00:24:17,390

think the experiment that she did was on

549

00:24:22,899 --> 00:24:19,850

what she did was she had some people and

550

00:24:24,669 --> 00:24:22,909

she asked them if they had ever been

551
00:24:27,279 --> 00:24:24,679
lost in the shopping center when they

552
00:24:29,169 --> 00:24:27,289
were kid and then I don't remember

553
00:24:31,330 --> 00:24:29,179
exactly how she did it but she got them

554
00:24:33,639 --> 00:24:31,340
to remember that that they had when they

555
00:24:35,590 --> 00:24:33,649
really hadn't just so it was a very

556
00:24:37,990 --> 00:24:35,600
benign way of demonstrating the

557
00:24:40,690 --> 00:24:38,000
principle but in a way that wasn't going

558
00:24:42,190 --> 00:24:40,700
to do her subjects any harm she wasn't

559
00:24:43,480 --> 00:24:42,200
in planning memories that were going to

560
00:24:45,980 --> 00:24:43,490
then you know cause them to be

561
00:24:50,330 --> 00:24:45,990
traumatized

562
00:24:53,000 --> 00:24:50,340
yeah yeah so um you also talked about

563
00:24:56,900 --> 00:24:53,010

how emotion is intrinsically linked to

564

00:24:58,610 --> 00:24:56,910

memory and so when what are the

565

00:25:01,160 --> 00:24:58,620

implications in for sort of skeptics and

566

00:25:03,290 --> 00:25:01,170

rationalists in that sense because we

567

00:25:05,660 --> 00:25:03,300

think of skeptics that we make decisions

568

00:25:08,540 --> 00:25:05,670

based purely on evidence and rationalism

569

00:25:10,549 --> 00:25:08,550

but we can't uncouple that emotional

570

00:25:13,310 --> 00:25:10,559

aspect from our brains can we no we

571

00:25:15,080 --> 00:25:13,320

can't because it's all in areas of the

572

00:25:19,370 --> 00:25:15,090

brain that we mostly don't have

573

00:25:21,200 --> 00:25:19,380

conscious access to and yeah that's I

574

00:25:24,950 --> 00:25:21,210

think that's probably a most important

575

00:25:28,070 --> 00:25:24,960

take-home message for skeptics is I

576

00:25:29,870 --> 00:25:28,080

thinking rationally is an ideal hmm

577

00:25:31,669 --> 00:25:29,880

actually though it's been proven that if

578

00:25:33,950 --> 00:25:31,679

you don't have that emotional connection

579

00:25:35,480 --> 00:25:33,960

you can't make decisions you can't even

580

00:25:37,460 --> 00:25:35,490

decide whether to eat breakfast so you

581

00:25:38,960 --> 00:25:37,470

really need that connection to make

582

00:25:41,870 --> 00:25:38,970

decisions now I don't think many people

583

00:25:43,280 --> 00:25:41,880

realize that yeah yeah but I mean then

584

00:25:45,440 --> 00:25:43,290

that's been shown in studies where

585

00:25:47,210 --> 00:25:45,450

people have had damage to that part of

586

00:25:48,919 --> 00:25:47,220

their brain and they're unable to even

587

00:25:51,410 --> 00:25:48,929

make decisions about what pen should i

588

00:25:54,230 --> 00:25:51,420

pick up to write this down yeah it's

589

00:25:56,870 --> 00:25:54,240

such a fascinating area yeah we really

590

00:25:59,630 --> 00:25:56,880

need that emotional component but we

591

00:26:02,030 --> 00:25:59,640

don't have very good access to it

592

00:26:06,560 --> 00:26:02,040

I think it should teach us to be well

593

00:26:08,690 --> 00:26:06,570

one more tolerant and to realize when

594

00:26:11,390 --> 00:26:08,700

you're talking to someone who is not a

595

00:26:14,140 --> 00:26:11,400

skeptic but just throwing more fat

596

00:26:17,840 --> 00:26:14,150

septum is not going to have any effect

597

00:26:19,760 --> 00:26:17,850

this is in instead you might want to say

598

00:26:21,020 --> 00:26:19,770

you might want to share something with

599

00:26:22,550 --> 00:26:21,030

them but a lot of times it's just

600

00:26:25,700 --> 00:26:22,560

waiting till they're in the right place

601
00:26:29,680 --> 00:26:25,710
so I think if you have a friend who you

602
00:26:31,970 --> 00:26:29,690
know as you know say really into

603
00:26:35,480 --> 00:26:31,980
pseudoscience or some magical thinking

604
00:26:40,010 --> 00:26:35,490
thing it's much better to be read as

605
00:26:43,340 --> 00:26:40,020
tolerant as you can manage and set a

606
00:26:45,080 --> 00:26:43,350
good example of being you know the kind

607
00:26:46,880 --> 00:26:45,090
of person who doesn't go around treating

608
00:26:48,980 --> 00:26:46,890
other people like idiots just because

609
00:26:51,200 --> 00:26:48,990
they disagree then if that person comes

610
00:26:53,660 --> 00:26:51,210
around at some point in their life

611
00:26:55,490 --> 00:26:53,670
they're going to come to you for those

612
00:26:57,650 --> 00:26:55,500
facts when they're ready but if you try

613
00:27:00,920 --> 00:26:57,660

to throw them at them or jumping down

614

00:27:02,380 --> 00:27:00,930

their throat this is just not going to

615

00:27:04,660 --> 00:27:02,390

work I'm going to

616

00:27:06,370 --> 00:27:04,670

well thanks a lot for taking the time to

617

00:27:07,660 --> 00:27:06,380

talk to mr. Dayton just so where can our

618

00:27:10,720 --> 00:27:07,670

listeners find out more about the

619

00:27:13,630 --> 00:27:10,730

wonderful work you're doing the best

620

00:27:17,170 --> 00:27:13,640

place to find everything is either go to

621

00:27:20,230 --> 00:27:17,180

Virginia Campbell md.com and you can get

622

00:27:21,850 --> 00:27:20,240

to both my podcasts from there or if

623

00:27:24,400 --> 00:27:21,860

you're in iTunes you can just search

624

00:27:28,750 --> 00:27:24,410

under ginger Campbell and you can find

625

00:27:32,010 --> 00:27:28,760

my podcast and my podcast apps and on

626

00:27:36,970 --> 00:27:32,020

twitter you dr. Artemis is no do see

627

00:27:39,460 --> 00:27:36,980

arte mis doc Artemis as in doc Artemis

628

00:27:42,660 --> 00:27:39,470

the Greek goddess right she was the

629

00:27:56,659 --> 00:27:42,670

athletic one thanks very much ginger

630

00:28:03,330 --> 00:28:00,269

hi I'm dr. ginger Campbell I started the

631

00:28:05,940 --> 00:28:03,340

brain science podcast in December 2006

632

00:28:08,370 --> 00:28:05,950

with the tagline the show for everyone

633

00:28:12,240 --> 00:28:08,380

who has a brain because you don't need a

634

00:28:15,600 --> 00:28:12,250

PhD to enjoy my podcast all you need is

635

00:28:18,480 --> 00:28:15,610

curiosity about how our brains make us

636

00:28:21,419 --> 00:28:18,490

who we are the brain science podcast is

637

00:28:23,879 --> 00:28:21,429

not a self-help show but understanding

638

00:28:26,970 --> 00:28:23,889

how the brain works will give you useful

639

00:28:29,909 --> 00:28:26,980

insights into your own behavior and the

640

00:28:31,740 --> 00:28:29,919

behavior of others on the show I talk

641

00:28:35,399 --> 00:28:31,750

about the latest books about the brain

642

00:28:37,139 --> 00:28:35,409

and I interview leading scientists of

643

00:28:39,960 --> 00:28:37,149

course I would love to be discovered by

644

00:28:43,139 --> 00:28:39,970

NPR but until then you can find the

645

00:28:58,180 --> 00:28:43,149

brain science podcast in iTunes and at

646

00:29:03,220 --> 00:29:01,240

and now we come to the second class

647

00:29:05,409 --> 00:29:03,230

remember the first number was 17 I

648

00:29:09,549 --> 00:29:05,419

better write that down okay first one

649

00:29:13,210 --> 00:29:09,559

was 17 toss one you go toss number two

650

00:29:15,999 --> 00:29:13,220

folks the 20-sided dice here we go are

651
00:29:20,440 --> 00:29:16,009
you thinking yes yes I hope so use those

652
00:29:44,740 --> 00:29:20,450
neurons okay plus number two coming up

653
00:29:47,619 --> 00:29:44,750
right now the number is 5 i'm here at

654
00:29:52,659 --> 00:29:47,629
the Australian Museum here in Sydney and

655
00:29:54,610 --> 00:29:52,669
it's science week well it's the science

656
00:29:58,539 --> 00:29:54,620
week for the school's I guess you'd say

657
00:30:01,960 --> 00:29:58,549
I'm in at their newly opened exhibition

658
00:30:04,029 --> 00:30:01,970
area here at the Museum and I'm

659
00:30:05,889 --> 00:30:04,039
surrounded by all sorts of little booths

660
00:30:07,690 --> 00:30:05,899
all with science we've got the

661
00:30:10,149 --> 00:30:07,700
University of New South Wales so in

662
00:30:12,960 --> 00:30:10,159
physics we've got the signs and

663
00:30:17,019 --> 00:30:12,970

education schools to us organization

664

00:30:19,480 --> 00:30:17,029

stand here about geography what else do

665

00:30:21,730 --> 00:30:19,490

we have here Heather Dale Wildlife Park

666

00:30:23,409 --> 00:30:21,740

have a stand here the University of

667

00:30:26,169 --> 00:30:23,419

Sydney is representative the young

668

00:30:28,960 --> 00:30:26,179

scientists of Australia are here with

669

00:30:32,049 --> 00:30:28,970

their stand jenolan caves which are a

670

00:30:33,810 --> 00:30:32,059

very famous natural cave formation which

671

00:30:36,090 --> 00:30:33,820

the cydia here

672

00:30:38,790 --> 00:30:36,100

and all sorts of other things we have

673

00:30:41,790 --> 00:30:38,800

some optical illusions what's this one

674

00:30:46,010 --> 00:30:41,800

University of Newcastle science and

675

00:30:50,310 --> 00:30:46,020

maths it says and there are some classic

676

00:30:50,310 --> 00:30:50,320

optical illusions on the wall

677

00:30:56,940 --> 00:30:54,539

now i'm here today to have a chat to the

678

00:30:59,460 --> 00:30:56,950

newest member of the australian skeptics

679

00:31:01,470 --> 00:30:59,470

here in New South Wales committee Karen

680

00:31:05,070 --> 00:31:01,480

player Karen actually works at the

681

00:31:07,799 --> 00:31:05,080

Australian Museum and she's busy at the

682

00:31:11,639 --> 00:31:07,809

moment at the one of the stands here

683

00:31:14,430 --> 00:31:11,649

giving information to children and the

684

00:31:16,759 --> 00:31:14,440

children you can hear no doubt are all

685

00:31:19,350 --> 00:31:16,769

primary school or elementary school kids

686

00:31:20,610 --> 00:31:19,360

that's about 200 kids in here all

687

00:31:22,980 --> 00:31:20,620

running around going from stay

688

00:31:25,289 --> 00:31:22,990

understand exploring and trying out the

689

00:31:29,580 --> 00:31:25,299

various science some of what their face

690

00:31:34,379 --> 00:31:29,590

painted it's a really great thing that

691

00:31:36,419 --> 00:31:34,389

we are so news in do here every year and

692

00:31:38,549 --> 00:31:36,429

i'll see if i can just chase down Karen

693

00:31:41,610 --> 00:31:38,559

in a moment and we'll have a little chat

694

00:31:44,909 --> 00:31:41,620

to her about what she does here and how

695

00:31:48,690 --> 00:31:44,919

important it is that science has

696

00:31:50,759 --> 00:31:48,700

presented the kids in this way so we've

697

00:31:52,409 --> 00:31:50,769

snuck away from that noise and chaos

698

00:31:54,090 --> 00:31:52,419

downstairs of all the kids running

699

00:31:57,149 --> 00:31:54,100

around but was really good to see it I'm

700

00:31:59,610 --> 00:31:57,159

with Karen player hi Karen hi how're you

701
00:32:02,009 --> 00:31:59,620
going I'm well now congratulations first

702
00:32:04,200 --> 00:32:02,019
of all for being invited onto the

703
00:32:06,720 --> 00:32:04,210
committee of the Australian skeptics New

704
00:32:08,100 --> 00:32:06,730
South Wales oh thank you it's I think

705
00:32:09,810 --> 00:32:08,110
it's going to be really exciting

706
00:32:14,009 --> 00:32:09,820
hopefully it's not going to be too scary

707
00:32:16,200 --> 00:32:14,019
scary oh you've got no idea your first

708
00:32:18,360 --> 00:32:16,210
assignment is it go to the most haunted

709
00:32:21,930 --> 00:32:18,370
place in Australia and be bored to death

710
00:32:24,539 --> 00:32:21,940
like the rest of it so much now as a

711
00:32:26,549 --> 00:32:24,549
welcome present I've decided to give you

712
00:32:28,860 --> 00:32:26,559
just to kick you off so to speak so you

713
00:32:31,499 --> 00:32:28,870

can really get get stuck into skepticism

714

00:32:33,210 --> 00:32:31,509

I've given you a DVD of our water

715

00:32:35,129 --> 00:32:33,220

divining adventures here in Australia

716

00:32:38,190 --> 00:32:35,139

called the great water divining DVD I've

717

00:32:39,899 --> 00:32:38,200

given you James Randy's the secrets of

718

00:32:41,580 --> 00:32:39,909

the psychic I'm looking forward to

719

00:32:43,680 --> 00:32:41,590

that's an interesting one he travels to

720

00:32:46,350 --> 00:32:43,690

rush or investigates things and it's all

721

00:32:48,419 --> 00:32:46,360

about his looking at uri geller and all

722

00:32:51,389 --> 00:32:48,429

sorts of things and I've also given you

723

00:32:55,529 --> 00:32:51,399

a copy of the full facts book of cold

724

00:32:57,480 --> 00:32:55,539

reading so you can start to get your

725

00:32:58,950 --> 00:32:57,490

education practice of my friend practice

726

00:33:00,570 --> 00:32:58,960

on your friends I'm going to dress you

727

00:33:02,610 --> 00:33:00,580

up as a gypsy when you when you

728

00:33:05,759 --> 00:33:02,620

you could do a thought okay there's so

729

00:33:07,289 --> 00:33:05,769

many things to know when you're when

730

00:33:09,750 --> 00:33:07,299

you're into skepticism but be that as it

731

00:33:13,409 --> 00:33:09,760

may I have found it really interesting

732

00:33:14,519 --> 00:33:13,419

that you'll work here at the Museum and

733

00:33:16,019 --> 00:33:14,529

I'd like to chat to you a little bit

734

00:33:18,389 --> 00:33:16,029

about that and especially what was

735

00:33:20,880 --> 00:33:18,399

happening downstairs yep absolutely so

736

00:33:25,500 --> 00:33:20,890

as I was mentioning before Tamela since

737

00:33:28,230 --> 00:33:25,510

that was a new exhibition space yeah so

738

00:33:30,149 --> 00:33:28,240

the estrella museums been looking at how

739

00:33:31,590 --> 00:33:30,159

we can fit bigger exhibitions into the

740

00:33:33,419 --> 00:33:31,600

museum so we've been doing a lot of

741

00:33:35,340 --> 00:33:33,429

refurbishment over the last five years

742

00:33:37,889 --> 00:33:35,350

and it's a brand-new space and that's

743

00:33:39,539 --> 00:33:37,899

really exciting that the first thing the

744

00:33:41,159 --> 00:33:39,549

first cab off the rank was the science

745

00:33:42,960 --> 00:33:41,169

and the city expo so we were very

746

00:33:44,820 --> 00:33:42,970

excited to be able to use that space for

747

00:33:47,310 --> 00:33:44,830

you know all of the science activities

748

00:33:48,810 --> 00:33:47,320

for the kids now the sign the sign sweet

749

00:33:50,940 --> 00:33:48,820

is it already started as it next week

750

00:33:53,220 --> 00:33:50,950

I'm not coming we start a little bit

751
00:33:55,019 --> 00:33:53,230
early thought so yeah so we're a little

752
00:33:56,490 --> 00:33:55,029
bit ahead of national science week so we

753
00:33:58,409 --> 00:33:56,500
have the two weeks of science in the

754
00:34:00,750 --> 00:33:58,419
city and then I think the week after is

755
00:34:02,580 --> 00:34:00,760
the National Science Week well every

756
00:34:06,330 --> 00:34:02,590
week science was that's right well here

757
00:34:08,129 --> 00:34:06,340
at the Museum absolutely the good

758
00:34:10,800 --> 00:34:08,139
attitude that happen what is your

759
00:34:13,859 --> 00:34:10,810
regular position here the museum um I

760
00:34:15,899 --> 00:34:13,869
work in a program called museum in a box

761
00:34:19,050 --> 00:34:15,909
which has been going for about forty

762
00:34:21,750 --> 00:34:19,060
seven years now and it's an outreach

763
00:34:23,849 --> 00:34:21,760

program getting museum quality specimens

764

00:34:26,639 --> 00:34:23,859

and education resources out to regional

765

00:34:28,470 --> 00:34:26,649

New South Wales so at the moment we have

766

00:34:30,300 --> 00:34:28,480

about twenty eight different topics

767

00:34:33,419 --> 00:34:30,310

ranging from you know indigenous

768

00:34:36,960 --> 00:34:33,429

cultural activities boxes for child care

769

00:34:38,639 --> 00:34:36,970

centers boxes on different animals and

770

00:34:42,119 --> 00:34:38,649

different habitats all the way up to

771

00:34:44,339 --> 00:34:42,129

boxes for you know year 12 science so

772

00:34:46,680 --> 00:34:44,349

yeah we have a lot that goes out this is

773

00:34:48,060 --> 00:34:46,690

so far we've had about five hundred and

774

00:34:50,099 --> 00:34:48,070

twenty boxes heading out around the

775

00:34:53,270 --> 00:34:50,109

state that's fantastic of course I

776

00:34:55,649 --> 00:34:53,280

outreaches something I'm deeply

777

00:34:57,599 --> 00:34:55,659

interested in and I and I do of course

778

00:35:00,020 --> 00:34:57,609

with the mr. investigators with a doctor

779

00:35:02,520 --> 00:35:00,030

or a chief and we'll be doing that show

780

00:35:05,280 --> 00:35:02,530

on the 20th here at the powerhouse

781

00:35:07,349 --> 00:35:05,290

museum in fact as part of science week

782

00:35:09,059 --> 00:35:07,359

and as we were walking into this little

783

00:35:10,859 --> 00:35:09,069

room for so I have a chat with you I

784

00:35:13,349 --> 00:35:10,869

noticed on the wall some photographs

785

00:35:14,010 --> 00:35:13,359

which warmed my heart of the old museum

786

00:35:18,930 --> 00:35:14,020

train

787

00:35:20,370 --> 00:35:18,940

which used to travel this state from

788

00:35:22,320 --> 00:35:20,380

this train museum it was brightly

789

00:35:25,530 --> 00:35:22,330

painted on the outside of the museum and

790

00:35:27,030 --> 00:35:25,540

and I remember as a boy visiting the

791

00:35:29,370 --> 00:35:27,040

museum train when it stopped in my

792

00:35:34,140 --> 00:35:29,380

little town of mom lyndy and that would

793

00:35:36,600 --> 00:35:34,150

have been I'm guessing 1978 1979-80

794

00:35:39,330 --> 00:35:36,610

around at that time where is the old

795

00:35:41,430 --> 00:35:39,340

museum track I don't know where

796

00:35:43,440 --> 00:35:41,440

physically is at all funnily enough a

797

00:35:45,990 --> 00:35:43,450

lot of the specimens and objects inside

798

00:35:47,790 --> 00:35:46,000

it have we go were taken out and were

799

00:35:49,320 --> 00:35:47,800

then absorbed into our hands on

800

00:35:51,750 --> 00:35:49,330

collections in our search and discover

801
00:35:53,550 --> 00:35:51,760
area so you know I do have i've seen

802
00:35:56,580 --> 00:35:53,560
some photos recently when we were doing

803
00:35:58,140 --> 00:35:56,590
when we're moving offices that had some

804
00:36:01,230 --> 00:35:58,150
of the same specimens that we're still

805
00:36:02,760 --> 00:36:01,240
using today that were on the train but

806
00:36:04,470 --> 00:36:02,770
we get people that do come into the

807
00:36:06,150 --> 00:36:04,480
museum that grew up in regional New

808
00:36:07,890 --> 00:36:06,160
South Wales and remember the Train

809
00:36:10,440 --> 00:36:07,900
really fondly so it was one of those

810
00:36:14,190 --> 00:36:10,450
great programs but I think it just

811
00:36:15,930 --> 00:36:14,200
became unsustainable yeah I guess I

812
00:36:18,420 --> 00:36:15,940
guess that's not surprising that would

813
00:36:22,410 --> 00:36:18,430

have been some question bolt and carding

814

00:36:24,960 --> 00:36:22,420

that thing around but what it I'm so

815

00:36:26,790 --> 00:36:24,970

exciting I remember this is the

816

00:36:29,520 --> 00:36:26,800

excitement and I would go there I was

817

00:36:32,130 --> 00:36:29,530

one of the kids who would go there every

818

00:36:33,990 --> 00:36:32,140

afternoon after school and just just

819

00:36:35,700 --> 00:36:34,000

hang around and pester the people who

820

00:36:37,350 --> 00:36:35,710

work there to sell its you again that

821

00:36:39,510 --> 00:36:37,360

sort of thing that's exactly what it's

822

00:36:41,730 --> 00:36:39,520

there for to enable those kids that

823

00:36:43,680 --> 00:36:41,740

really have that fascination and really

824

00:36:45,840 --> 00:36:43,690

want to explore and learn more to give

825

00:36:47,640 --> 00:36:45,850

those kids an opportunity to get access

826
00:36:49,800 --> 00:36:47,650
to those kinds of objects and specimens

827
00:36:52,620 --> 00:36:49,810
yeah I remember the snakes quite well

828
00:36:57,000 --> 00:36:52,630
actually it was several different snakes

829
00:36:58,770 --> 00:36:57,010
and you could actually handle them they

830
00:37:00,630 --> 00:36:58,780
let you pay am I suppose they weren't

831
00:37:01,920 --> 00:37:00,640
the tenement well you know things have

832
00:37:03,480 --> 00:37:01,930
changed a little bit with museum in a

833
00:37:05,250 --> 00:37:03,490
box we certainly don't send out any lies

834
00:37:07,170 --> 00:37:05,260
anymore that would be a bit of a

835
00:37:08,460 --> 00:37:07,180
surprise to the teachers but you know

836
00:37:10,170 --> 00:37:08,470
over the years we've had a lot of

837
00:37:11,850 --> 00:37:10,180
different outreach programs we did have

838
00:37:13,830 --> 00:37:11,860

the train we've had I think there was a

839

00:37:16,530 --> 00:37:13,840

bus that used to go around as well we

840

00:37:18,300 --> 00:37:16,540

also up until about five years ago I had

841

00:37:20,250 --> 00:37:18,310

a program called museum on a row on the

842

00:37:22,200 --> 00:37:20,260

road that was both an indigenous and

843

00:37:24,320 --> 00:37:22,210

then another one was a dinosaur one that

844

00:37:26,220 --> 00:37:24,330

would go out now those kinds of things

845

00:37:27,460 --> 00:37:26,230

you know we're always looking at

846

00:37:29,260 --> 00:37:27,470

reinventing

847

00:37:30,820 --> 00:37:29,270

those kinds of activities but museum in

848

00:37:32,140 --> 00:37:30,830

a box is one of those ones that outlived

849

00:37:33,790 --> 00:37:32,150

them all it's been around longer than

850

00:37:37,000 --> 00:37:33,800

the train and it's still going so the

851
00:37:39,640 --> 00:37:37,010
idea is basically teachers and get a box

852
00:37:41,080 --> 00:37:39,650
yes the Crocs um yeah so it goes to

853
00:37:44,200 --> 00:37:41,090
teachers often that the school library

854
00:37:46,089 --> 00:37:44,210
will take it and some of the central

855
00:37:47,890 --> 00:37:46,099
schools and Regional schools will have

856
00:37:50,380 --> 00:37:47,900
everything every single student will

857
00:37:52,750 --> 00:37:50,390
have access and we'll go through they

858
00:37:54,099 --> 00:37:52,760
get them for three weeks it gets sent

859
00:37:56,500 --> 00:37:54,109
out we organize all the freight and

860
00:37:58,570 --> 00:37:56,510
delivery and they send her back and do

861
00:37:59,980 --> 00:37:58,580
you find that you do much traveling in

862
00:38:03,070 --> 00:37:59,990
this job will you really based here

863
00:38:05,320 --> 00:38:03,080

museum I do try to get out and about at

864

00:38:07,089 --> 00:38:05,330

least what I would your shoes at least

865

00:38:09,700 --> 00:38:07,099

once a year I try to do a big regional

866

00:38:12,490 --> 00:38:09,710

trip and try to pick an area that we

867

00:38:15,220 --> 00:38:12,500

don't have a lot of access to so it'll

868

00:38:16,900 --> 00:38:15,230

often be it will rotate around this some

869

00:38:18,700 --> 00:38:16,910

areas that are really strong users of

870

00:38:20,170 --> 00:38:18,710

the program and other areas that don't

871

00:38:23,770 --> 00:38:20,180

at all so we try to target those areas

872

00:38:26,200 --> 00:38:23,780

and go visiting unfortunately I go at

873

00:38:28,270 --> 00:38:26,210

the wrong time of year in review well I

874

00:38:30,790 --> 00:38:28,280

went west last year in the middle of

875

00:38:34,270 --> 00:38:30,800

winter and it was it got it got very

876

00:38:36,099 --> 00:38:34,280

cold and we were camping so it was it

877

00:38:38,740 --> 00:38:36,109

was a bit of a challenge but an exciting

878

00:38:40,240 --> 00:38:38,750

trip and as part of science in the city

879

00:38:41,980 --> 00:38:40,250

in those kinds of programs we run

880

00:38:44,410 --> 00:38:41,990

science and the suburbs and science and

881

00:38:46,510 --> 00:38:44,420

the bush yeah and so I'm often part of

882

00:38:48,670 --> 00:38:46,520

those so they go out to regional centers

883

00:38:50,500 --> 00:38:48,680

as well so I try to go to as many of

884

00:38:52,120 --> 00:38:50,510

those as I can I think it was involved

885

00:38:54,099 --> 00:38:52,130

in science in the suburb of about four

886

00:38:57,130 --> 00:38:54,109

or five years back at it's an Olympic

887

00:38:58,990 --> 00:38:57,140

Park yes yes indeed i was doing image to

888

00:39:00,520 --> 00:38:59,000

investigators yeah that's right so we

889

00:39:02,380 --> 00:39:00,530

still do that every year sales out i was

890

00:39:03,849 --> 00:39:02,390

out there for 4 this year's events and

891

00:39:05,890 --> 00:39:03,859

i'll be going out to orange and narrow

892

00:39:08,230 --> 00:39:05,900

Brian September for the science and the

893

00:39:13,000 --> 00:39:08,240

bush there as well so they've also done

894

00:39:14,910 --> 00:39:13,010

Walker an Aubree did dubbo last year so

895

00:39:17,140 --> 00:39:14,920

we've made they do all of those regional

896

00:39:19,240 --> 00:39:17,150

big science event so it's like many

897

00:39:21,010 --> 00:39:19,250

science in the cities but we go to them

898

00:39:22,780 --> 00:39:21,020

so it's really that's a really exciting

899

00:39:24,790 --> 00:39:22,790

program and I try to go to as many of

900

00:39:26,520 --> 00:39:24,800

those as I can so I can so I can get out

901
00:39:30,099 --> 00:39:26,530
Bush as well must be very gratifying

902
00:39:31,900 --> 00:39:30,109
it's it is when we had a really exciting

903
00:39:33,310 --> 00:39:31,910
one that we just started doing video

904
00:39:34,060 --> 00:39:33,320
conferencing for a lot of regional

905
00:39:35,890 --> 00:39:34,070
school

906
00:39:38,230 --> 00:39:35,900
so it was our first year that we're done

907
00:39:40,270 --> 00:39:38,240
video conferencing we had through the

908
00:39:42,190 --> 00:39:40,280
country areas program had all of these

909
00:39:45,190 --> 00:39:42,200
regional schools I think we had you know

910
00:39:48,190 --> 00:39:45,200
25 schools and about a thousand students

911
00:39:50,440 --> 00:39:48,200
in 11 video conference which was a bit

912
00:39:53,290 --> 00:39:50,450
daunting but two weeks later we were

913
00:39:54,850 --> 00:39:53,300

down at all breeding and I had a student

914

00:39:57,340 --> 00:39:54,860

come up to me and said I saw you on TV

915

00:39:59,920 --> 00:39:57,350

I'll remember this student leaves four

916

00:40:02,650 --> 00:39:59,930

hours out of town out of away from

917

00:40:04,540 --> 00:40:02,660

Aubree in a really remote regional area

918

00:40:06,460 --> 00:40:04,550

and within the space of two weeks that

919

00:40:08,290 --> 00:40:06,470

had to you know face-to-face contacts

920

00:40:10,090 --> 00:40:08,300

with Australia museum staff so that was

921

00:40:12,130 --> 00:40:10,100

one of those really exciting moments to

922

00:40:15,010 --> 00:40:12,140

think that the students are really it

923

00:40:16,600 --> 00:40:15,020

was so excited to see is there live that

924

00:40:19,180 --> 00:40:16,610

we made the area to go down there to see

925

00:40:20,530 --> 00:40:19,190

them but also that you know because it

926
00:40:22,420 --> 00:40:20,540
was through video conferencing would be

927
00:40:24,370 --> 00:40:22,430
kind of bi you know you came to see us

928
00:40:25,930 --> 00:40:24,380
so when they go when we do video

929
00:40:27,550 --> 00:40:25,940
conferencing and things like that the

930
00:40:29,320 --> 00:40:27,560
kids will say I went to the Australian

931
00:40:30,730 --> 00:40:29,330
Museum even if you have never live in

932
00:40:33,040 --> 00:40:30,740
school so it's really really exciting

933
00:40:34,630 --> 00:40:33,050
that we can use our physical presence

934
00:40:36,610 --> 00:40:34,640
and going out to events as well as our

935
00:40:39,250 --> 00:40:36,620
video conferencing and resources like

936
00:40:41,200 --> 00:40:39,260
Museum in a box so yeah we really do try

937
00:40:44,170 --> 00:40:41,210
to get out there to to sort of some of

938
00:40:46,930 --> 00:40:44,180

the remote places and and New South

939

00:40:48,970 --> 00:40:46,940

Wales has many remote places when you

940

00:40:51,250 --> 00:40:48,980

think about yeah off the beaten track I

941

00:40:54,730 --> 00:40:51,260

mean if we're thinking about way up in

942

00:40:57,670 --> 00:40:54,740

the north-west of the state oh I don't

943

00:40:59,500 --> 00:40:57,680

know you do you have a program where you

944

00:41:01,570 --> 00:40:59,510

try to cover every part of the state

945

00:41:03,010 --> 00:41:01,580

over a number of years and we are

946

00:41:05,500 --> 00:41:03,020

looking at it I certainly this year I

947

00:41:07,870 --> 00:41:05,510

was going to go to book but

948

00:41:09,400 --> 00:41:07,880

unfortunately i'm not going to be able

949

00:41:11,380 --> 00:41:09,410

to go physically and i'll be actually

950

00:41:14,260 --> 00:41:11,390

doing that with my video conferencing

951
00:41:16,270 --> 00:41:14,270
now and they are looking at whether or

952
00:41:18,700 --> 00:41:16,280
not it's feasible to do a science in the

953
00:41:20,800 --> 00:41:18,710
bush at berk yeah we have talked about

954
00:41:23,470 --> 00:41:20,810
doing one at Broken Hill the further

955
00:41:25,420 --> 00:41:23,480
away we go the more difficult it is to

956
00:41:29,470 --> 00:41:25,430
get funding to be able to go out and run

957
00:41:31,450 --> 00:41:29,480
the events so yeah we do try to really

958
00:41:34,450 --> 00:41:31,460
look at where different events are and

959
00:41:35,740 --> 00:41:34,460
how we can get really good coverage so

960
00:41:38,080 --> 00:41:35,750
it's just a matter of trying to rotate

961
00:41:41,590 --> 00:41:38,090
around a little bit a lot of the science

962
00:41:44,110 --> 00:41:41,600
and the bushes events run as at the

963
00:41:46,390 --> 00:41:44,120

university campuses so you know they

964

00:41:48,130 --> 00:41:46,400

have partnerships with a lot of the univ

965

00:41:51,059 --> 00:41:48,140

to be able to go out and be saving these

966

00:41:53,019 --> 00:41:51,069

sounds like a very good idea for our

967

00:41:56,740 --> 00:41:53,029

especially for our United States

968

00:41:58,420 --> 00:41:56,750

listeners when we saying this this is

969

00:42:01,870 --> 00:41:58,430

involved with this this state we're in

970

00:42:05,859 --> 00:42:01,880

New South Wales the states in Australia

971

00:42:07,750 --> 00:42:05,869

by and large really because you could

972

00:42:09,750 --> 00:42:07,760

fiddle many of the United States into

973

00:42:12,430 --> 00:42:09,760

just our state of New South Wales and if

974

00:42:14,049 --> 00:42:12,440

to save me explain it to you just run to

975

00:42:15,819 --> 00:42:14,059

google maps and have a look at the size

976

00:42:18,039 --> 00:42:15,829

of a new south wales so it's a daunting

977

00:42:19,539 --> 00:42:18,049

task through other states have the

978

00:42:21,609 --> 00:42:19,549

similar program I would imagine they do

979

00:42:24,569 --> 00:42:21,619

yeah I'm certainly the queensland museum

980

00:42:27,130 --> 00:42:24,579

has a really strong loan program as well

981

00:42:29,620 --> 00:42:27,140

we do you know we do try not to cross

982

00:42:32,289 --> 00:42:29,630

too many borders and I'm we let

983

00:42:34,690 --> 00:42:32,299

Queensland do what they do best they run

984

00:42:37,990 --> 00:42:34,700

it their program site differently to the

985

00:42:40,359 --> 00:42:38,000

way we do we everything comes from from

986

00:42:42,309 --> 00:42:40,369

us the hub here and goes out whereas

987

00:42:44,799 --> 00:42:42,319

because Queensland is even bigger a

988

00:42:46,750 --> 00:42:44,809

state that you just Wales they have some

989

00:42:48,670 --> 00:42:46,760

regional hubs that they send the boxes

990

00:42:51,279 --> 00:42:48,680

to and then that location is in charge

991

00:42:53,680 --> 00:42:51,289

of sort of sending their box type

992

00:42:56,349 --> 00:42:53,690

program out from the original hub so

993

00:42:57,970 --> 00:42:56,359

it's a slightly different way that they

994

00:43:00,160 --> 00:42:57,980

structure because they are such a big

995

00:43:02,349 --> 00:43:00,170

state oh yeah yeah and western australia

996

00:43:04,210 --> 00:43:02,359

to is even bigger yes that's right good

997

00:43:05,890 --> 00:43:04,220

fit you could fit new south wales and

998

00:43:07,510 --> 00:43:05,900

queensland into western australia yeah

999

00:43:10,539 --> 00:43:07,520

with a bit of space to yes that's right

1000

00:43:12,130 --> 00:43:10,549

it's ridiculous you know people in

1001
00:43:14,680 --> 00:43:12,140
especially in this state of New South

1002
00:43:17,289 --> 00:43:14,690
Wales a very interested I'm sure in what

1003
00:43:19,990 --> 00:43:17,299
you're you're you're doing and may be

1004
00:43:22,120 --> 00:43:20,000
very interested to find out more how can

1005
00:43:25,349 --> 00:43:22,130
they find out more well certainly the

1006
00:43:28,690 --> 00:43:25,359
Australian Museum website is great

1007
00:43:30,099 --> 00:43:28,700
Australian Museum neto you from there

1008
00:43:31,750 --> 00:43:30,109
there's a whole section on education

1009
00:43:33,250 --> 00:43:31,760
services where you can see a lot of what

1010
00:43:35,829 --> 00:43:33,260
we're doing it's got museum in a box

1011
00:43:37,299 --> 00:43:35,839
it's got on-site visits it's got science

1012
00:43:39,220 --> 00:43:37,309
than the suburbs science and the bush

1013
00:43:41,680 --> 00:43:39,230

science in the city it's got our things

1014

00:43:43,809 --> 00:43:41,690

on video conferencing and it's got a lot

1015

00:43:45,339 --> 00:43:43,819

of one run long online resources for

1016

00:43:48,579 --> 00:43:45,349

teachers as well so that's a really good

1017

00:43:50,319 --> 00:43:48,589

way and you can email me or contact me

1018

00:43:52,000 --> 00:43:50,329

through the website can play in your

1019

00:43:53,529 --> 00:43:52,010

details are on the web that's right you

1020

00:43:54,109 --> 00:43:53,539

can search me on the website too and you

1021

00:43:56,480 --> 00:43:54,119

can come up

1022

00:43:58,069 --> 00:43:56,490

has my phone number and you can send a

1023

00:44:01,309 --> 00:43:58,079

direct contact email just from that

1024

00:44:03,559 --> 00:44:01,319

clicking Mexican how easy it is how very

1025

00:44:05,890 --> 00:44:03,569

easy is that we love technology the days

1026

00:44:08,420 --> 00:44:05,900

when I used to run to the to the train

1027

00:44:10,099 --> 00:44:08,430

in the late seventies because that was

1028

00:44:15,289 --> 00:44:10,109

one of the biggest events that happen in

1029

00:44:17,509 --> 00:44:15,299

my my little town probably or near and

1030

00:44:20,019 --> 00:44:17,519

now it was it was a it was so good and

1031

00:44:23,569 --> 00:44:20,029

the fact that I still remember it fondly

1032

00:44:25,910 --> 00:44:23,579

how thump teen years later is a good

1033

00:44:29,420 --> 00:44:25,920

indication and I hope many probably a

1034

00:44:30,890 --> 00:44:29,430

lot of listeners who grew up in country

1035

00:44:33,620 --> 00:44:30,900

New South Wales will probably be right

1036

00:44:36,079 --> 00:44:33,630

now thinking oh I remember the museum

1037

00:44:38,509 --> 00:44:36,089

trainer yeah we definitely have lots of

1038

00:44:40,489 --> 00:44:38,519

people that that have those memories of

1039

00:44:44,059 --> 00:44:40,499

we actually have a couple of staff

1040

00:44:45,499 --> 00:44:44,069

members here that came from regional New

1041

00:44:47,690 --> 00:44:45,509

South Wales and remembered museum in a

1042

00:44:49,279 --> 00:44:47,700

box and remember the train and you know

1043

00:44:51,650 --> 00:44:49,289

I've had people say to me know I wanted

1044

00:44:54,200 --> 00:44:51,660

to work at a museum source of music box

1045

00:44:56,690 --> 00:44:54,210

so I can't take credit of what happened

1046

00:44:58,190 --> 00:44:56,700

you know before my time but I've been

1047

00:44:59,630 --> 00:44:58,200

working on the program for the last four

1048

00:45:01,759 --> 00:44:59,640

years and it's probably you know been a

1049

00:45:04,160 --> 00:45:01,769

bit of a highlight of my time here at

1050

00:45:06,019 --> 00:45:04,170

the Museum fantastic work and welcome to

1051

00:45:09,620 --> 00:45:06,029

the wonderful and wacky and bizarre

1052

00:45:10,999 --> 00:45:09,630

world of skepticism painful and I'm so

1053

00:45:13,460 --> 00:45:11,009

pleased that you're doing such great

1054

00:45:24,420 --> 00:45:13,470

outreach work here at the Australian

1055

00:45:30,670 --> 00:45:28,210

hi this is scary papi i am ross Fletcher

1056

00:45:34,120 --> 00:45:30,680

okay Ross hey we're from a podcast

1057

00:45:35,860 --> 00:45:34,130

called oh no roster kerry we find out

1058

00:45:37,240 --> 00:45:35,870

what happens when you show up and ask

1059

00:45:39,490 --> 00:45:37,250

questions we've hung out with the

1060

00:45:42,070 --> 00:45:39,500

Cabalists the Mormons we've gone and

1061

00:45:44,530 --> 00:45:42,080

gotten ear candle gone to the Sikhs we

1062

00:45:46,120 --> 00:45:44,540

show up so you don't have to so find out

1063

00:45:48,250 --> 00:45:46,130

where we're going next we'll even have

1064

00:45:50,650 --> 00:45:48,260

special episodes where we have famous

1065

00:45:52,630 --> 00:45:50,660

guests like Brian Dalton from mr. deity

1066

00:45:54,670 --> 00:45:52,640

you heard that awesome theme music he

1067

00:45:58,840 --> 00:45:54,680

wrote that you should come visit us at

1068

00:46:02,020 --> 00:45:58,850

Oh No podcast.com or facebook.com slash

1069

00:46:05,890 --> 00:46:02,030

on rack what the hell's on a cross Oh in

1070

00:46:12,290 --> 00:46:05,900

RAC Oh Oh No Ross and Carrie that's our

1071

00:46:17,430 --> 00:46:15,810

and now we come to die stas number three

1072

00:46:19,710 --> 00:46:17,440

all those people out there who predicted

1073

00:46:24,060 --> 00:46:19,720

17 for the first toss and five for the

1074

00:46:26,730 --> 00:46:24,070

second oh oh boy but you can't wait here

1075

00:46:33,090 --> 00:46:26,740

it comes think of the number warming up

1076

00:46:53,130 --> 00:46:33,100

the dice now here it comes the third

1077

00:46:55,040 --> 00:46:53,140

number is 15 well of science week

1078

00:46:57,420 --> 00:46:55,050

kicking off I've come down here to

1079

00:47:00,660 --> 00:46:57,430

Martin place here in Sydney the great

1080

00:47:04,770 --> 00:47:00,670

vestrion more where I've just missed in

1081

00:47:07,710 --> 00:47:04,780

fact the science the kickoff for signs

1082

00:47:10,830 --> 00:47:07,720

week however there are still some people

1083

00:47:15,690 --> 00:47:10,840

here as the rain comes down and I'm at

1084

00:47:18,090 --> 00:47:15,700

this wonderful stand here run by none

1085

00:47:19,950 --> 00:47:18,100

other than glitz to give the wife Arthur

1086

00:47:21,990 --> 00:47:19,960

once again from a grain of salt in the

1087

00:47:24,720 --> 00:47:22,000

Australian skeptics and she's got a

1088

00:47:28,950 --> 00:47:24,730

whole stand here dedicated to chocolate

1089

00:47:32,010 --> 00:47:28,960

oh yes oh yes friends chocolate in fact

1090

00:47:33,870 --> 00:47:32,020

there's cocoa beans here and powder and

1091

00:47:35,010 --> 00:47:33,880

all sorts of this milk powder cocoa

1092

00:47:37,170 --> 00:47:35,020

butter

1093

00:47:39,930 --> 00:47:37,180

lots of different varieties of chopped

1094

00:47:43,710 --> 00:47:39,940

us on display and I might be able even

1095

00:47:45,390 --> 00:47:43,720

to have a sample of that let's find out

1096

00:47:48,140 --> 00:47:45,400

a little bit more about why this so much

1097

00:47:52,010 --> 00:47:49,910

oops I've caught up with you hello

1098

00:47:53,539 --> 00:47:52,020

goleta know each other so nice to see

1099

00:47:55,789 --> 00:47:53,549

you again lovely to see you each other

1100

00:47:59,480 --> 00:47:55,799

thank you sorry I turned up late but the

1101
00:48:00,890 --> 00:47:59,490
traffic today was terrible ah what did i

1102
00:48:02,539 --> 00:48:00,900
miss i know we're surrounded by

1103
00:48:04,849 --> 00:48:02,549
chocolate why are we surrounded by

1104
00:48:06,710 --> 00:48:04,859
Chopin because I love chocolate this

1105
00:48:08,180 --> 00:48:06,720
should be a better reason I know because

1106
00:48:10,160 --> 00:48:08,190
I love chocolate and chocolate is very

1107
00:48:14,599 --> 00:48:10,170
interesting in terms of the science

1108
00:48:16,609 --> 00:48:14,609
behind it quite an interesting thing to

1109
00:48:20,120 --> 00:48:16,619
work with because cocoa butter is very

1110
00:48:22,880 --> 00:48:20,130
complex fact that can solidify in five

1111
00:48:25,430 --> 00:48:22,890
actually six different forms and that

1112
00:48:27,470 --> 00:48:25,440
will influence how your chocolate will

1113
00:48:29,839 --> 00:48:27,480

be blood so if you have the right form

1114

00:48:31,849 --> 00:48:29,849

of crystals in your chocolate or in your

1115

00:48:33,920 --> 00:48:31,859

cocoa butter you will end up with a

1116

00:48:36,559 --> 00:48:33,930

product that have snap and have a gloss

1117

00:48:39,109 --> 00:48:36,569

and if it's not you will end up with

1118

00:48:41,660 --> 00:48:39,119

really dull product and we're looking at

1119

00:48:43,069 --> 00:48:41,670

some down a table here that's an

1120

00:48:45,440 --> 00:48:43,079

tempered chocolate this is the same

1121

00:48:47,990 --> 00:48:45,450

chocolate that is out of Stanford so you

1122

00:48:50,059 --> 00:48:48,000

don't have the correct or the desirable

1123

00:48:51,500 --> 00:48:50,069

crystals and that's why I change the

1124

00:48:54,289 --> 00:48:51,510

appearance and it has like a great

1125

00:48:56,299 --> 00:48:54,299

powdery appearance it looks like it

1126
00:48:58,250 --> 00:48:56,309
doesn't it very edible dunno you can eat

1127
00:49:00,319 --> 00:48:58,260
it you think it's the same yeah really

1128
00:49:02,480 --> 00:49:00,329
and just out of temper so what's

1129
00:49:05,319 --> 00:49:02,490
happening i melted my chocolate and then

1130
00:49:08,569 --> 00:49:05,329
the fat the cocoa butter did not

1131
00:49:11,029 --> 00:49:08,579
solidify in the desirable way that will

1132
00:49:13,460 --> 00:49:11,039
give you the snap and the gloss that we

1133
00:49:15,079 --> 00:49:13,470
are after you've got that next to the

1134
00:49:17,539 --> 00:49:15,089
real stuff here of the real commercial

1135
00:49:19,990 --> 00:49:17,549
stuff which is just break some of that

1136
00:49:22,360 --> 00:49:20,000
off looks lovely and shiny and

1137
00:49:24,640 --> 00:49:22,370
very nice as well now I get to eat the

1138
00:49:26,290 --> 00:49:24,650

chocolate and we've got lucky Josh at

1139

00:49:29,110 --> 00:49:26,300

Chapel on white chocolate dark chocolate

1140

00:49:31,210 --> 00:49:29,120

milk tub yes and the different

1141

00:49:33,250 --> 00:49:31,220

chocolates have different things inside

1142

00:49:36,550 --> 00:49:33,260

them so for example the dark chocolate

1143

00:49:40,180 --> 00:49:36,560

is made from cocoa mass which is the

1144

00:49:41,890 --> 00:49:40,190

center of the cacao beans grinded and on

1145

00:49:44,740 --> 00:49:41,900

top of that we have in the dark

1146

00:49:48,310 --> 00:49:44,750

chocolate sugar in the milk chocolate we

1147

00:49:49,990 --> 00:49:48,320

have the addition of milk powder milk

1148

00:49:51,610 --> 00:49:50,000

solids so we're going to have the cocoa

1149

00:49:54,310 --> 00:49:51,620

mass component we're going to have the

1150

00:49:58,950 --> 00:49:54,320

sugar obviously and we're going to have

1151
00:50:01,690 --> 00:49:58,960
their the cocoa butter and cocoa powder

1152
00:50:03,220 --> 00:50:01,700
they're a white chocolate is different

1153
00:50:05,020 --> 00:50:03,230
and the reason that is different is

1154
00:50:06,970 --> 00:50:05,030
because we don't have the cocoa powder

1155
00:50:09,550 --> 00:50:06,980
they are that's why the color is white

1156
00:50:12,370 --> 00:50:09,560
so in the white chocolate white

1157
00:50:14,290 --> 00:50:12,380
chocolate I don't like it you just wait

1158
00:50:17,110 --> 00:50:14,300
since two sickening for me I love the

1159
00:50:19,090 --> 00:50:17,120
dark wand a full-on biggest one I'm

1160
00:50:21,130 --> 00:50:19,100
picking up the jar now this is the the

1161
00:50:23,440 --> 00:50:21,140
dark dark chocolate we answer all they

1162
00:50:25,090 --> 00:50:23,450
look good yeah but they all look good to

1163
00:50:26,860 --> 00:50:25,100

me i mean i do enjoy every form of

1164

00:50:28,570 --> 00:50:26,870

chocolate i think chocolate with a bit

1165

00:50:30,580 --> 00:50:28,580

of chili in it it's surely are that's

1166

00:50:32,170 --> 00:50:30,590

very nice chocolate actually be just

1167

00:50:34,660 --> 00:50:32,180

before i was very lucky i got the last

1168

00:50:36,210 --> 00:50:34,670

little taste of a very interesting

1169

00:50:40,330 --> 00:50:36,220

chocolate there it is under the table

1170

00:50:43,030 --> 00:50:40,340

it's chocolate and blue cheese exactly

1171

00:50:44,890 --> 00:50:43,040

an interesting taste it is interesting

1172

00:50:46,690 --> 00:50:44,900

and that's was the whole point no just

1173

00:50:48,460 --> 00:50:46,700

to make something that say you try every

1174

00:50:51,440 --> 00:50:48,470

words about stepping out of your comfort

1175

00:50:52,970 --> 00:50:51,450

zone and trying different combinations

1176
00:50:54,440 --> 00:50:52,980
and they're dark chocolate and blue

1177
00:50:58,070 --> 00:50:54,450
cheese are really nice combination

1178
00:50:59,540 --> 00:50:58,080
together it's I must admit I I tayson I

1179
00:51:01,520 --> 00:50:59,550
could taste blue cheese and I can face

1180
00:51:03,290 --> 00:51:01,530
chocolate and it's a bit confusing

1181
00:51:06,320 --> 00:51:03,300
because I've never had the two together

1182
00:51:08,120 --> 00:51:06,330
it wasn't bad it was just very unusual

1183
00:51:09,170 --> 00:51:08,130
unusual yellow and that's the whole

1184
00:51:12,620 --> 00:51:09,180
point to have something a bit unusual

1185
00:51:15,020 --> 00:51:12,630
and making this ice cream with liquid

1186
00:51:18,800 --> 00:51:15,030
nitrogen actually contribute to a very

1187
00:51:21,380 --> 00:51:18,810
very cream smoothie smoothie mixture but

1188
00:51:23,690 --> 00:51:21,390

you went to visit dr. hei Anderson I did

1189

00:51:26,300 --> 00:51:23,700

and actually made a few batches of ice

1190

00:51:28,730 --> 00:51:26,310

cream with Rachel a lovely Rachel it was

1191

00:51:31,460 --> 00:51:28,740

so nice to host me and help me with

1192

00:51:33,560 --> 00:51:31,470

liquid nitrogen so yeah so it's a good

1193

00:51:35,690 --> 00:51:33,570

opportunity to thank her for being so

1194

00:51:37,190 --> 00:51:35,700

lovely and hospitable and help me with

1195

00:51:38,660 --> 00:51:37,200

my ice cream it's good to know a

1196

00:51:40,250 --> 00:51:38,670

scientist it's always good to know

1197

00:51:42,380 --> 00:51:40,260

scientists more than the more the

1198

00:51:43,640 --> 00:51:42,390

merrier and I can see around so give

1199

00:51:49,070 --> 00:51:43,650

himself over there he's helping himself

1200

00:51:51,890 --> 00:51:49,080

to some of these goodies mouth it's very

1201
00:51:53,420 --> 00:51:51,900
dangerous you're a little stole here in

1202
00:51:55,190 --> 00:51:53,430
the middle the city today that was very

1203
00:51:56,720 --> 00:51:55,200
popular i think it was actually because

1204
00:51:58,190 --> 00:51:56,730
people love chocolate and i think to

1205
00:52:00,320 --> 00:51:58,200
understand chocolate makes you

1206
00:52:02,120 --> 00:52:00,330
appreciate the product even more than

1207
00:52:03,350 --> 00:52:02,130
for even more yeah and especially when

1208
00:52:05,840 --> 00:52:03,360
you get to know a little bit about the

1209
00:52:09,200 --> 00:52:05,850
science behind the chocolate tastes even

1210
00:52:11,150 --> 00:52:09,210
better yeah how people can certainly if

1211
00:52:14,510 --> 00:52:11,160
they interested and I'm sure they will

1212
00:52:18,650 --> 00:52:14,520
be in what you do they can visit your

1213
00:52:21,380 --> 00:52:18,660

website which is the website is www of

1214

00:52:23,660 --> 00:52:21,390

course goleta como tu and i'm going to

1215

00:52:25,580 --> 00:52:23,670

do a few events during the science week

1216

00:52:27,320 --> 00:52:25,590

in different places

1217

00:52:29,780 --> 00:52:27,330

so a few chocolate events a little bit

1218

00:52:32,660 --> 00:52:29,790

of molecular gastronomy in the Botanic

1219

00:52:35,030 --> 00:52:32,670

Garden so a lot of interesting stuff for

1220

00:52:36,530 --> 00:52:35,040

kids and for adults so I'm good that's

1221

00:52:38,270 --> 00:52:36,540

that's really good might come along to

1222

00:52:42,080 --> 00:52:38,280

everything just to make sure the

1223

00:52:47,030 --> 00:52:42,090

chocolates up the quality so it's w WGAL

1224

00:52:48,620 --> 00:52:47,040

I tcom a you glee thank you for your

1225

00:53:02,870 --> 00:52:48,630

time and thank you for your chocolate

1226

00:53:07,710 --> 00:53:05,670

thank you for listening to the skeptic

1227

00:53:10,680 --> 00:53:07,720

zone this week what an interesting show

1228

00:53:13,109 --> 00:53:10,690

on next week's show even more from Tam

1229

00:53:15,300 --> 00:53:13,119

Las Vegas the more I think about it the

1230

00:53:17,520 --> 00:53:15,310

more I just can't believe that we got so

1231

00:53:19,530 --> 00:53:17,530

much material from Tam Las Vegas well

1232

00:53:22,010 --> 00:53:19,540

thanks very much to dr. 'he who was

1233

00:53:23,970 --> 00:53:22,020

there slightly longer than i was and

1234

00:53:26,010 --> 00:53:23,980

thank you to those people who have been

1235

00:53:28,710 --> 00:53:26,020

writing and asking about the think tank

1236

00:53:31,920 --> 00:53:28,720

yes we haven't had as many think tanks

1237

00:53:34,650 --> 00:53:31,930

as our normal lately partly due to me

1238

00:53:38,190 --> 00:53:34,660

being very busy with television

1239

00:53:39,750 --> 00:53:38,200

commitments and also it's just not

1240

00:53:41,790 --> 00:53:39,760

always easy to get everybody together

1241

00:53:44,130 --> 00:53:41,800

but we're going to have a try try for a

1242

00:53:47,460 --> 00:53:44,140

good girl fashion back to our roots

1243

00:53:49,740 --> 00:53:47,470

think tank hopefully next week but until

1244

00:53:54,720 --> 00:53:49,750

all oh sorry yes I was forgetting the

1245

00:53:57,090 --> 00:53:54,730

last toss ah the last us so toss number

1246

00:54:01,590 --> 00:53:57,100

one was 17 toss number two is five tops

1247

00:54:04,040 --> 00:54:01,600

number three was 15 here we go if anyone

1248

00:54:07,380 --> 00:54:04,050

gets this last one you've beaten odds of

1249

00:54:17,160 --> 00:54:07,390

160,000 21 the last toss of the 20-sided

1250

00:54:19,770 --> 00:54:17,170

dice last toss is number 10 this is

1251

00:54:26,040 --> 00:54:19,780

Richard Saunders signing off from Sydney

1252

00:54:30,720 --> 00:54:26,050

Australia you've been listening to the

1253

00:54:34,560 --> 00:54:30,730

skeptic zone visit our website at www