

Show 507

THE  
**SKEPTIC  
ZONE**  
PODCAST

[www.skepticzone.tv](http://www.skepticzone.tv)

8 July 2018



Dr Eugenie Scott

Tapping for health?  
Mandy-Lee Noble

You belong in Oakland Zoo  
with Dr Eugenie Scott

Not much help for  
Colds and Flu -  
Government held to account

1  
00:00:09,100 --> 00:00:06,010

[Music]

2  
00:00:11,830 --> 00:00:09,110

welcome to the skeptic zone the podcast

3  
00:00:13,910 --> 00:00:11,840

from Australia for science and reason

4  
00:00:22,859 --> 00:00:13,920

[Music]

5  
00:00:30,240 --> 00:00:25,960

yes it's the skeptic zone podcast

6  
00:00:32,950 --> 00:00:30,250

episode number 507 for the 8th of July

7  
00:00:35,500 --> 00:00:32,960

2018 Richard Saunders here with you from

8  
00:00:37,780 --> 00:00:35,510

Sydney Australia haven't been in the

9  
00:00:40,780 --> 00:00:37,790

country for about a month nice to be

10  
00:00:42,939 --> 00:00:40,790

home again but a bit of a jet lag going

11  
00:00:45,850 --> 00:00:42,949

to catch up with me pretty soon I'm sure

12  
00:00:48,310 --> 00:00:45,860

but never mind will will struggle on

13  
00:00:50,649 --> 00:00:48,320

will struggle on it's nice to see the

14

00:00:53,109 --> 00:00:50,659

skeptics own cats again Henrietta and

15

00:00:55,960 --> 00:00:53,119

Maud who look at me and said yeah yeah

16

00:00:59,020 --> 00:00:55,970

where's the food and it's nice to be

17

00:01:02,530 --> 00:00:59,030

back to a little taste of winter here in

18

00:01:05,590 --> 00:01:02,540

Sydney Australia coming up on this

19

00:01:08,679 --> 00:01:05,600

week's show diet sceptic the diet

20

00:01:14,590 --> 00:01:08,689

sceptic Mande Lee Noble will be looking

21

00:01:17,800 --> 00:01:14,600

at a very unusual therapy emotional

22

00:01:22,420 --> 00:01:17,810

freedom techniques or tapping where

23

00:01:26,230 --> 00:01:22,430

people tap tap tap tap on various

24

00:01:29,190 --> 00:01:26,240

parts of your body for various health

25

00:01:31,720 --> 00:01:29,200

reasons or that's the claim anyway

26

00:01:33,280 --> 00:01:31,730

tapping for health emotional freedom

27

00:01:36,340 --> 00:01:33,290

techniques coming up at the top of the

28

00:01:37,330 --> 00:01:36,350

show with Mandy Lee Noble following that

29

00:01:43,090 --> 00:01:37,340

what a treat

30

00:01:46,600 --> 00:01:43,100

at Auckland Zoo only about three days

31

00:01:48,610 --> 00:01:46,610

ago with dr. eugenie Scott now a

32

00:01:51,850 --> 00:01:48,620

longtime listeners to the show certainly

33

00:01:54,880 --> 00:01:51,860

know of dr. eugenie Scott we've had many

34

00:01:57,700 --> 00:01:54,890

adventures together or six months ago we

35

00:02:00,340 --> 00:01:57,710

went to the big trees National Park in

36

00:02:04,420 --> 00:02:00,350

California well a couple of days ago we

37

00:02:06,700 --> 00:02:04,430

were at Auckland Zoo and trips to the

38

00:02:09,850 --> 00:02:06,710

zoo are always fun I enjoy trips to the

39

00:02:13,479 --> 00:02:09,860

zoo but a trip to the zoo with someone

40

00:02:14,949 --> 00:02:13,489

of the stature and the knowledge of dr.

41

00:02:17,640 --> 00:02:14,959

eugenie Scott when it comes to

42

00:02:20,979 --> 00:02:17,650

evolutionary matters is quite something

43

00:02:22,869 --> 00:02:20,989

so you could be a fly on the wall you're

44

00:02:25,839 --> 00:02:22,879

a fly on my shoulder or something like

45

00:02:29,740 --> 00:02:25,849

that as dr. eugenie Scott and I wander

46

00:02:33,280 --> 00:02:29,750

around Auckland Zoo and see what there

47

00:02:35,559 --> 00:02:33,290

is to see then to wrap up the show

48

00:02:39,910 --> 00:02:35,569

a story a short story by our friend dr.

49

00:02:42,069 --> 00:02:39,920

Ken Harvey and his continuing quest to

50

00:02:44,619 --> 00:02:42,079

keep the government accountable the

51  
00:02:46,360 --> 00:02:44,629  
regulation the regulatory bodies

52  
00:02:49,839 --> 00:02:46,370  
accountable when it comes to matters of

53  
00:02:51,339 --> 00:02:49,849  
health care and health claims and he's

54  
00:02:55,929 --> 00:02:51,349  
going to be looking at a product called

55  
00:02:58,539 --> 00:02:55,939  
ease our cold does it easy cold we'll

56  
00:03:00,520 --> 00:02:58,549  
find out now stay tuned at the end of

57  
00:03:03,610 --> 00:03:00,530  
the show where you will have the chance

58  
00:03:06,210 --> 00:03:03,620  
to beat odds of eight million six

59  
00:03:10,720 --> 00:03:06,220  
hundred and forty thousand to one

60  
00:03:13,240 --> 00:03:10,730  
curious stay tuned but now it's time for

61  
00:03:15,129 --> 00:03:13,250  
me to run downstairs have an extra-large

62  
00:03:18,789 --> 00:03:15,139  
cup of coffee to keep myself going for a

63  
00:03:22,110 --> 00:03:18,799

little while longer before the before

64

00:03:25,599 --> 00:03:22,120

the jet lag takes over and some lovely

65

00:03:27,640 --> 00:03:25,609

Vegemite toast I have missed my Vegemite

66

00:03:30,600 --> 00:03:27,650

over the past month well I do that I

67

00:03:45,790 --> 00:03:30,610

hope you enjoy the skeptic zone

68

00:03:55,070 --> 00:03:47,900

that looks good enough to eat

69

00:04:02,210 --> 00:03:55,080

or does it here's the diet skeptic man

70

00:04:06,320 --> 00:04:02,220

daily Nobile hello skeptics and

71

00:04:14,210 --> 00:04:06,330

listeners mandelino ball here dietitian

72

00:04:16,940 --> 00:04:14,220

and skeptic reporting from Brisbane this

73

00:04:20,150 --> 00:04:16,950

week on the diet skeptic report I will

74

00:04:22,820 --> 00:04:20,160

be discussing psychological acupuncture

75

00:04:25,700 --> 00:04:22,830

the counseling therapy known as

76

00:04:28,670 --> 00:04:25,710

emotional freedom techniques often

77

00:04:31,880 --> 00:04:28,680

abbreviated to EFT or more commonly

78

00:04:34,130 --> 00:04:31,890

described as tapping emotional freedom

79

00:04:37,640 --> 00:04:34,140

techniques were developed from elements

80

00:04:41,120 --> 00:04:37,650

of exposure therapy cognitive or thought

81

00:04:43,580 --> 00:04:41,130

based therapy and mindfulness mixed in

82

00:04:48,320 --> 00:04:43,590

with acupuncture neuro linguistic

83

00:04:50,840 --> 00:04:48,330

programming and energy medicine as a

84

00:04:52,700 --> 00:04:50,850

dietitian what drew me into taking a

85

00:04:55,100 --> 00:04:52,710

deep dive into the evidence for

86

00:04:56,960 --> 00:04:55,110

emotional freedom techniques is its

87

00:05:00,800 --> 00:04:56,970

recent application in weight loss

88

00:05:03,800 --> 00:05:00,810

programs there are several credentialed

89

00:05:06,650 --> 00:05:03,810

health providers in Australia offering

90

00:05:10,520 --> 00:05:06,660

EFT to address food cravings to achieve

91

00:05:13,070 --> 00:05:10,530

weight loss furthermore the dietitians

92

00:05:15,830 --> 00:05:13,080

Association of Australia is currently

93

00:05:18,920 --> 00:05:15,840

promoting training in emotional freedom

94

00:05:22,130 --> 00:05:18,930

techniques under its Centre for advanced

95

00:05:24,950 --> 00:05:22,140

learning initiative emotional freedom

96

00:05:28,130 --> 00:05:24,960

techniques is a self administered

97

00:05:30,830 --> 00:05:28,140

therapy we tap on acupuncture points

98

00:05:34,040 --> 00:05:30,840

with two fingers on the head and upper

99

00:05:36,620 --> 00:05:34,050

body in a given sequence while repeating

100

00:05:40,880 --> 00:05:36,630

prescribed statements relevant to the

101  
00:05:43,670 --> 00:05:40,890  
issue you are focusing on improving if

102  
00:05:46,550 --> 00:05:43,680  
tea is an accessible easy self

103  
00:05:48,200 --> 00:05:46,560  
administered therapy there are many

104  
00:05:51,460 --> 00:05:48,210  
instructional videos on the internet

105  
00:05:53,900 --> 00:05:51,470  
which fully demonstrate the process

106  
00:05:56,810 --> 00:05:53,910  
tapping is often promoted by its

107  
00:05:59,990 --> 00:05:56,820  
proponents as a bit weird but

108  
00:06:03,230 --> 00:06:00,000  
evidence-based in this report of the

109  
00:06:06,890 --> 00:06:03,240  
diet skeptic I will look at the validity

110  
00:06:09,379 --> 00:06:06,900  
of the studies that have tested EFT as a

111  
00:06:10,879 --> 00:06:09,389  
treatment for food cravings and measured

112  
00:06:15,439 --> 00:06:10,889  
the effect on weight loss

113  
00:06:17,930 --> 00:06:15,449

I have also called on a special guest to

114

00:06:22,580 --> 00:06:17,940

comment on the scientific plausibility

115

00:06:24,680 --> 00:06:22,590

of psychological acupuncture firstly -

116

00:06:28,310 --> 00:06:24,690

the evidence for reduction in food

117

00:06:31,040 --> 00:06:28,320

cravings and weight loss Australian and

118

00:06:33,379 --> 00:06:31,050

Bondi University associate professor and

119

00:06:36,469 --> 00:06:33,389

the program director of masters of

120

00:06:38,960 --> 00:06:36,479

psychology dr. Peter Stapleton is

121

00:06:42,560 --> 00:06:38,970

described as a leader of worldwide

122

00:06:45,650 --> 00:06:42,570

research into psychological trials into

123

00:06:48,400 --> 00:06:45,660

new therapies in the area of obesity and

124

00:06:52,879 --> 00:06:48,410

weight management focused on clinical

125

00:06:55,779 --> 00:06:52,889

EFT I found three trials for food

126  
00:07:00,460 --> 00:06:55,789  
cravings that also managed weight loss

127  
00:07:02,899 --> 00:07:00,470  
co-authored by dr. Stapleton but firstly

128  
00:07:06,649 --> 00:07:02,909  
before we look at the outcomes of these

129  
00:07:08,870 --> 00:07:06,659  
trials it must be said that EFT includes

130  
00:07:11,210 --> 00:07:08,880  
other elements of evidence-based

131  
00:07:13,879 --> 00:07:11,220  
treatments and that none of these

132  
00:07:16,040 --> 00:07:13,889  
particular trials tests for whether it

133  
00:07:19,510 --> 00:07:16,050  
is those elements as opposed to the

134  
00:07:22,580 --> 00:07:19,520  
tapping then has produced the results

135  
00:07:25,909 --> 00:07:22,590  
also each of these three trials relied

136  
00:07:28,399 --> 00:07:25,919  
on self-reported data in the case of

137  
00:07:30,920 --> 00:07:28,409  
rating outcomes around food cravings

138  
00:07:34,240 --> 00:07:30,930

although validated tools may have been

139

00:07:37,730 --> 00:07:34,250

used these are still subjective measures

140

00:07:39,800 --> 00:07:37,740

finally the research papers on EFT have

141

00:07:42,950 --> 00:07:39,810

come from a very small pool of

142

00:07:46,010 --> 00:07:42,960

researchers many of whom are authors on

143

00:07:50,409 --> 00:07:46,020

multiple papers and some of whom have

144

00:07:52,909 --> 00:07:50,419

significant commercial interests in EFT

145

00:07:55,760 --> 00:07:52,919

starting with the most recent of these

146

00:07:58,930 --> 00:07:55,770

three trials the trial reported

147

00:08:01,700 --> 00:07:58,940

significant improvements for body weight

148

00:08:04,129 --> 00:08:01,710

depression symptoms and a psychological

149

00:08:04,910 --> 00:08:04,139

measure for the influence of available

150

00:08:08,810 --> 00:08:04,920

food at twelve

151  
00:08:12,310 --> 00:08:08,820  
months the paper was published in the

152  
00:08:15,530 --> 00:08:12,320  
journal Explorer in 2018

153  
00:08:19,490 --> 00:08:15,540  
David Gorski of science-based medicine

154  
00:08:22,040 --> 00:08:19,500  
has described the journal Explorer as a

155  
00:08:25,610 --> 00:08:22,050  
sham masquerading as a real scientific

156  
00:08:29,120 --> 00:08:25,620  
journal which publishes truly ridiculous

157  
00:08:31,820 --> 00:08:29,130  
studies the trial had no control group

158  
00:08:35,720 --> 00:08:31,830  
and despite the fact that participants

159  
00:08:38,810 --> 00:08:35,730  
had to pay around 250 US dollars to be

160  
00:08:43,520 --> 00:08:38,820  
included in the trial it still suffered

161  
00:08:46,040 --> 00:08:43,530  
a 25% loss to follow up the losses to

162  
00:08:48,470 --> 00:08:46,050  
follow up were merely excluded from the

163  
00:08:51,230 --> 00:08:48,480

data and no investigation into whether

164

00:08:53,750 --> 00:08:51,240

losses were around and were connected to

165

00:08:56,360 --> 00:08:53,760

a lack of success in treatment was ever

166

00:08:58,640 --> 00:08:56,370

done the second study was a

167

00:09:01,550 --> 00:08:58,650

non-inferiority study comparing

168

00:09:04,420 --> 00:09:01,560

cognitive behavioral therapy a gold

169

00:09:06,920 --> 00:09:04,430

standard for eating disorders with EFT

170

00:09:10,310 --> 00:09:06,930

measuring food cravings and weight loss

171

00:09:13,280 --> 00:09:10,320

as an outcome this studies potentially

172

00:09:15,770 --> 00:09:13,290

has a better study design than the

173

00:09:17,570 --> 00:09:15,780

previous study which may explain why it

174

00:09:21,260 --> 00:09:17,580

was published in the Journal of Applied

175

00:09:23,560 --> 00:09:21,270

Psychology at 12 months both groups

176

00:09:26,840 --> 00:09:23,570

demonstrated a clinically meaningful

177

00:09:29,330 --> 00:09:26,850

reduction in food cravings and it was

178

00:09:32,390 --> 00:09:29,340

concluded that EFT was not inferior to

179

00:09:35,450 --> 00:09:32,400

CBT however there was no significant

180

00:09:37,730 --> 00:09:35,460

reduction in weight in either group the

181

00:09:39,620 --> 00:09:37,740

third study showed significant

182

00:09:41,960 --> 00:09:39,630

improvements occurring in weight and

183

00:09:44,840 --> 00:09:41,970

subjective measures for food cravings at

184

00:09:47,510 --> 00:09:44,850

12 months however this study was

185

00:09:51,410 --> 00:09:47,520

published in the Journal of energy

186

00:09:54,680 --> 00:09:51,420

psychology in 2012 it also had no

187

00:09:57,380 --> 00:09:54,690

control group and over 50% lost to

188

00:09:59,480 --> 00:09:57,390

follow-up participants who continued

189

00:10:02,510 --> 00:09:59,490

including in trials are possibly more

190

00:10:05,150 --> 00:10:02,520

likely to be perceived benefit than

191

00:10:09,200 --> 00:10:05,160

those who are lost to follow-up and this

192

00:10:11,600 --> 00:10:09,210

may represent a bias in the results so

193

00:10:13,250 --> 00:10:11,610

to sum up the evidence for EFT is a

194

00:10:16,040 --> 00:10:13,260

treatment for improvements in food

195

00:10:18,830 --> 00:10:16,050

cravings and weight loss the trials are

196

00:10:21,019 --> 00:10:18,840

mostly published in low-quality journals

197

00:10:23,690 --> 00:10:21,029

and mostly did not have control groups

198

00:10:25,340 --> 00:10:23,700

or a study design that could demonstrate

199

00:10:28,760 --> 00:10:25,350

where the tapping was responsible for

200

00:10:30,530 --> 00:10:28,770

the measured effect no trials were

201  
00:10:32,540 --> 00:10:30,540  
longer than 12 months which given the

202  
00:10:34,790 --> 00:10:32,550  
current evidence on weight loss which is

203  
00:10:36,440 --> 00:10:34,800  
that weight loss is maximal at 6 to 12

204  
00:10:38,630 --> 00:10:36,450  
months and regardless of the degree of

205  
00:10:40,970 --> 00:10:38,640  
initial weight loss most weight is

206  
00:10:42,710 --> 00:10:40,980  
regained within a two-year period it

207  
00:10:45,200 --> 00:10:42,720  
could not be concluded that any of the

208  
00:10:46,519 --> 00:10:45,210  
current trials provide evidence of

209  
00:10:48,890 --> 00:10:46,529  
long-term weight loss

210  
00:10:51,410 --> 00:10:48,900  
there's also mirth mentioning that

211  
00:10:54,530 --> 00:10:51,420  
weight regain is driven by physiological

212  
00:10:55,220 --> 00:10:54,540  
factors as opposed to specific food

213  
00:10:58,370 --> 00:10:55,230

cravings

214

00:11:01,430 --> 00:10:58,380

as for the plausibility of energy

215

00:11:06,410 --> 00:11:01,440

psychology I thought I'd ask someone who

216

00:11:08,870 --> 00:11:06,420

is an expert in things energy-related my

217

00:11:13,460 --> 00:11:08,880

husband dr. Chris noble research

218

00:11:16,370 --> 00:11:13,470

physicist Chris is there any evidence

219

00:11:20,870 --> 00:11:16,380

for subtle energy pathways such as

220

00:11:23,450 --> 00:11:20,880

meridians and acupoints in the body no

221

00:11:25,579 --> 00:11:23,460

these subtle energies are poorly defined

222

00:11:27,280 --> 00:11:25,589

and are mostly assumed to be outside of

223

00:11:30,800 --> 00:11:27,290

our current understanding of physics

224

00:11:34,820 --> 00:11:30,810

Chris do you know what this energy would

225

00:11:37,310 --> 00:11:34,830

be well as far as I can work out the

226

00:11:39,980 --> 00:11:37,320

working hypothesis in energy psychology

227

00:11:42,380 --> 00:11:39,990

is that tapping produces electrical

228

00:11:45,020 --> 00:11:42,390

signals at acupressure points via the

229

00:11:47,150 --> 00:11:45,030

pizza electric effect and these signals

230

00:11:50,240 --> 00:11:47,160

then travel to other organs in the body

231

00:11:53,480 --> 00:11:50,250

such as the amygdala through collagen a

232

00:11:56,060 --> 00:11:53,490

semiconductor in connective tissue but

233

00:12:00,470 --> 00:11:56,070

isn't there collagen throughout our

234

00:12:03,320 --> 00:12:00,480

bodies yes and the idea has very little

235

00:12:05,480 --> 00:12:03,330

prior plausibility but it is easily

236

00:12:07,220 --> 00:12:05,490

testable and there seems to be very

237

00:12:09,740 --> 00:12:07,230

little effort to test some of these

238

00:12:13,400 --> 00:12:09,750

basic principles despite an entire

239

00:12:17,840 --> 00:12:13,410

journal devoted to energy psychology so

240

00:12:20,110 --> 00:12:17,850

Chris other researchers have tested EFT

241

00:12:24,019 --> 00:12:20,120

using functional magnetic resonance

242

00:12:27,290 --> 00:12:24,029

imaging could a functional magnetic

243

00:12:29,840 --> 00:12:27,300

resonance imaging test that is used to

244

00:12:33,049 --> 00:12:29,850

demonstrate brain activity in response

245

00:12:38,269 --> 00:12:33,059

to stimuli be used as a credible test

246

00:12:40,189 --> 00:12:38,279

EFT know with no plausible mechanism for

247

00:12:42,799 --> 00:12:40,199

energy psychology it would not be

248

00:12:45,439 --> 00:12:42,809

credible to use fMRI results there's

249

00:12:47,809 --> 00:12:45,449

evidence for EFT it sounds great in

250

00:12:50,569 --> 00:12:47,819

media releases and gives an aura of

251  
00:12:53,239 --> 00:12:50,579  
science but before you use it to try to

252  
00:12:55,339 --> 00:12:53,249  
prove something like EFT you really need

253  
00:12:57,829 --> 00:12:55,349  
to be exactly clear about what you were

254  
00:13:02,089 --> 00:12:57,839  
trying to measure well thank you Chris

255  
00:13:05,149 --> 00:13:02,099  
for clearing up those points so I think

256  
00:13:07,579 --> 00:13:05,159  
listeners we would all do well to hear

257  
00:13:10,579 --> 00:13:07,589  
the disclaimer and dr. Peter Stapleton's

258  
00:13:12,799 --> 00:13:10,589  
website this material is for your

259  
00:13:14,749 --> 00:13:12,809  
general knowledge only and it is not a

260  
00:13:17,599 --> 00:13:14,759  
substitute for traditional medical

261  
00:13:18,919 --> 00:13:17,609  
attention counseling therapy or advice

262  
00:13:22,609 --> 00:13:18,929  
from a qualified health care

263  
00:13:25,429 --> 00:13:22,619

professional and if you wish to embark

264

00:13:29,629 --> 00:13:25,439

on your own tapping journey you will

265

00:13:32,449 --> 00:13:29,639

find EFT is promoted as the universal

266

00:13:35,749 --> 00:13:32,459

healing aid a personal healing tool that

267

00:13:38,589 --> 00:13:35,759

can be applied to improve any human

268

00:13:41,599 --> 00:13:38,599

condition both physical and emotional

269

00:13:45,499 --> 00:13:41,609

EFT is promoted for all the following

270

00:13:48,069 --> 00:13:45,509

physical conditions allergies migraines

271

00:13:50,589 --> 00:13:48,079

pain management chronic fatigue syndrome

272

00:13:53,329 --> 00:13:50,599

multiple chemical sensitivities

273

00:13:55,519 --> 00:13:53,339

hypertension fibromyalgia cancer

274

00:13:58,009 --> 00:13:55,529

muscular dystrophy parkinson's disease

275

00:14:01,339 --> 00:13:58,019

cystic fibrosis and multiple sclerosis

276

00:14:03,229 --> 00:14:01,349

as well as other challenges such as

277

00:14:05,989 --> 00:14:03,239

behavioral issues in children

278

00:14:08,329 --> 00:14:05,999

relationship issues anger management

279

00:14:12,739 --> 00:14:08,339

stress management depression anxiety

280

00:14:16,519 --> 00:14:12,749

insomnia PTSD addictions sexual abuse

281

00:14:19,549 --> 00:14:16,529

and phobias EFT is also claimed to

282

00:14:24,049 --> 00:14:19,559

promote life abundance weight loss and

283

00:14:27,469 --> 00:14:24,059

career goals and finally some certified

284

00:14:31,999 --> 00:14:27,479

EFT universe practitioners provide

285

00:14:34,849 --> 00:14:32,009

additional EFT services such as matrix

286

00:14:39,979 --> 00:14:34,859

reimprinting for resolving issues in

287

00:14:42,499 --> 00:14:39,989

one's past or even quantum eft services

288

00:14:46,140 --> 00:14:42,509

for those with unresolved issues

289

00:14:49,050 --> 00:14:46,150

stemming from a past life

290

00:14:52,769 --> 00:14:49,060

so until next time skeptic listeners

291

00:14:56,400 --> 00:14:52,779

this has been mandala noble with special

292

00:15:09,930 --> 00:14:56,410

guest dr. Chris Noble signing off for

293

00:15:11,370 --> 00:15:09,940

the diet skeptic report hi I'm Darren

294

00:15:13,440 --> 00:15:11,380

McKee one of the hosts of the reality

295

00:15:15,360 --> 00:15:13,450

check each week my co-host and I explore

296

00:15:17,130 --> 00:15:15,370

a range of controversies and curiosities

297

00:15:18,600 --> 00:15:17,140

using science and critical thinking you

298

00:15:20,640 --> 00:15:18,610

can find us on itunes your favorite

299

00:15:22,170 --> 00:15:20,650

podcasting platform and on facebook by

300

00:15:23,850 --> 00:15:22,180

searching for the reality check or by

301

00:15:26,010 --> 00:15:23,860

following us on twitter at TRC

302

00:15:27,390 --> 00:15:26,020

underscore podcast until then keep an

303

00:15:40,250 --> 00:15:27,400

open mind but not so open your brain

304

00:15:43,470 --> 00:15:40,260

falls out you may well remember that

305

00:15:46,530 --> 00:15:43,480

some months ago I accompanied Jimmy

306

00:15:48,960 --> 00:15:46,540

Scott as we went to the big trees in

307

00:15:51,390 --> 00:15:48,970

California but the day Jeannie and I are

308

00:15:53,610 --> 00:15:51,400

at the Oakland Zoo and Jeannie this what

309

00:15:56,930 --> 00:15:53,620

paper thing you have in front of you is

310

00:15:59,610 --> 00:15:56,940

a map and we were just discussing how to

311

00:16:01,050 --> 00:15:59,620

our disbelief there's a lot of the

312

00:16:06,630 --> 00:16:01,060

younger generation who aren't sure how

313

00:16:09,210 --> 00:16:06,640

to use maps we're a couple of crabby old

314

00:16:11,310 --> 00:16:09,220

yeah we certainly are not crabby old

315

00:16:14,550 --> 00:16:11,320

people Richard but we know how to use up

316

00:16:15,930 --> 00:16:14,560

a map but Richard keeps trying to you

317

00:16:17,699 --> 00:16:15,940

know keeps taking his thumb and

318

00:16:19,410 --> 00:16:17,709

forefinger and trying to expand it but

319

00:16:21,210 --> 00:16:19,420

it's not gonna work that way you know

320

00:16:23,400 --> 00:16:21,220

and I tried talking to it I said take us

321

00:16:27,449 --> 00:16:23,410

to the lines that are didn't answer this

322

00:16:29,910 --> 00:16:27,459

is a map is a two-dimensional shape of

323

00:16:32,100 --> 00:16:29,920

the product upon which our lit written

324

00:16:35,970 --> 00:16:32,110

little lines and in this case of the map

325

00:16:38,130 --> 00:16:35,980

of the zoo lovely pictures of enclosures

326

00:16:39,240 --> 00:16:38,140

with little pictures of animals and this

327

00:16:40,690 --> 00:16:39,250

is going to be a fun day

328

00:16:43,840 --> 00:16:40,700

it's a

329

00:16:45,670 --> 00:16:43,850

brilliant warm sunny day here in Oakland

330

00:16:48,160 --> 00:16:45,680

we've just walked into the zoo this

331

00:16:50,020 --> 00:16:48,170

flamingos right in front of us as lots

332

00:16:51,100 --> 00:16:50,030

of children lots of children here today

333

00:16:52,780 --> 00:16:51,110

which is a good sign

334

00:16:54,550 --> 00:16:52,790

absolutely and we're just going to

335

00:16:59,190 --> 00:16:54,560

wander around and see what interesting

336

00:17:02,340 --> 00:16:59,200

things we can discover at Oakland Zoo

337

00:17:05,620 --> 00:17:02,350

[Music]

338

00:17:07,120 --> 00:17:05,630

we've just come to the the fence here

339

00:17:10,270 --> 00:17:07,130

the little enclosure the big enclosure

340

00:17:11,560 --> 00:17:10,280

of a tortoise and it's in the distance

341

00:17:13,630 --> 00:17:11,570

there and it looked like a clump of

342

00:17:16,930 --> 00:17:13,640

rocks but you're just about to say

343

00:17:20,290 --> 00:17:16,940

something about their history yeah

344

00:17:23,110 --> 00:17:20,300

galapagos tortoises have a definite role

345

00:17:26,939 --> 00:17:23,120

to play in inspiring Charles Darwin's

346

00:17:29,560 --> 00:17:26,949

idea about natural selection

347

00:17:32,830 --> 00:17:29,570

Darwin was having lunch or having dinner

348

00:17:35,560 --> 00:17:32,840

with some residents of the Galapagos

349

00:17:38,110 --> 00:17:35,570

Islands some European residents and one

350

00:17:40,510 --> 00:17:38,120

of them one of the residents casually

351  
00:17:44,440 --> 00:17:40,520  
mentioned oh you know so-and-so is able

352  
00:17:46,450 --> 00:17:44,450  
to tell you what Island a turtle comes

353  
00:17:49,780 --> 00:17:46,460  
from just by the shape of its shell

354  
00:17:53,200 --> 00:17:49,790  
huh and of course one of the things that

355  
00:17:55,570 --> 00:17:53,210  
that triggered Darwin's idea about the

356  
00:17:57,240 --> 00:17:55,580  
immutability of species as they called

357  
00:18:01,300 --> 00:17:57,250  
it back again had the idea of evolution

358  
00:18:04,150 --> 00:18:01,310  
and of course the idea that different

359  
00:18:08,400 --> 00:18:04,160  
islands would would be petri dishes for

360  
00:18:10,780 --> 00:18:08,410  
the adaptation of very similar organisms

361  
00:18:12,010 --> 00:18:10,790  
but different because of their

362  
00:18:13,750 --> 00:18:12,020  
adaptation for the particular

363  
00:18:15,970 --> 00:18:13,760

environment is one of the ideas that

364

00:18:18,370 --> 00:18:15,980

stimulated Darwinian natural selection

365

00:18:20,260 --> 00:18:18,380

if I remember the story correctly I

366

00:18:23,950 --> 00:18:20,270

think it had to do with the the ridge

367

00:18:25,660 --> 00:18:23,960

directly behind the the neck I think I

368

00:18:27,370 --> 00:18:25,670

remember reading that I was saying that

369

00:18:28,540 --> 00:18:27,380

that he could tell because the ridges

370

00:18:30,460 --> 00:18:28,550

were slightly different but you're right

371

00:18:32,620 --> 00:18:30,470

was basically the shape of the the shell

372

00:18:35,440 --> 00:18:32,630

he was looking at yeah there's details

373

00:18:37,660 --> 00:18:35,450

of course the other and of course Darwin

374

00:18:40,930 --> 00:18:37,670

didn't really twig to this whole idea

375

00:18:43,000 --> 00:18:40,940

until he got back to England and started

376

00:18:46,240 --> 00:18:43,010

looking over his notes and looking over

377

00:18:48,010 --> 00:18:46,250

the collections Darwin of course was an

378

00:18:49,960 --> 00:18:48,020

excellent geologist but he really was

379

00:18:51,760 --> 00:18:49,970

not an expert on either reptiles or

380

00:18:52,770 --> 00:18:51,770

birds or any of the other animals that

381

00:18:55,780 --> 00:18:52,780

he sent back and

382

00:18:59,440 --> 00:18:55,790

large quantities from his his voyage on

383

00:19:05,920 --> 00:18:59,450

the Beagle and it really was the

384

00:19:08,650 --> 00:19:05,930

mockingbirds that that helped secure

385

00:19:10,480 --> 00:19:08,660

this idea that animals on different

386

00:19:12,130 --> 00:19:10,490

islands would be adapted to slightly

387

00:19:14,110 --> 00:19:12,140

different environments even though they

388

00:19:17,860 --> 00:19:14,120

all were very similar yeah so from that

389

00:19:19,810 --> 00:19:17,870

it was pretty easy to come up with a

390

00:19:22,570 --> 00:19:19,820

hypothesis that well maybe all of these

391

00:19:24,790 --> 00:19:22,580

animals had a common ancestor and then

392

00:19:27,430 --> 00:19:24,800

diversified as they were separated on

393

00:19:29,260 --> 00:19:27,440

these different islands to adapt to the

394

00:19:32,140 --> 00:19:29,270

different environments of those islands

395

00:19:34,090 --> 00:19:32,150

and this has taught us the vovs over

396

00:19:36,010 --> 00:19:34,100

there he sees these heads now come up

397

00:19:38,620 --> 00:19:36,020

and we can see a little bit of movement

398

00:19:40,120 --> 00:19:38,630

but it's he's not exactly leaping over

399

00:19:43,000 --> 00:19:40,130

the place but you wouldn't expect a

400

00:19:50,770 --> 00:19:43,010

giant tortoise to do that for a tortoise

401

00:19:52,390 --> 00:19:50,780

that is a great deal of activity this is

402

00:19:55,530 --> 00:19:52,400

exciting take a photograph there's

403

00:20:01,180 --> 00:19:55,540

another one look we're just walking over

404

00:20:02,250 --> 00:20:01,190

down the fence line here and we can see

405

00:20:06,760 --> 00:20:02,260

another one

406

00:20:08,320 --> 00:20:06,770

yeah it's about 15 meters away just sort

407

00:20:13,890 --> 00:20:08,330

of sitting under the shade of the trees

408

00:20:16,120 --> 00:20:13,900

having a good day so - it's exciting -

409

00:20:19,000 --> 00:20:16,130

well there could be even more because

410

00:20:22,180 --> 00:20:19,010

the enclosure they have for the the

411

00:20:24,400 --> 00:20:22,190

tortoise is very big in fact please do

412

00:20:26,100 --> 00:20:24,410

not feed or touch the tortoise is a good

413

00:20:28,480 --> 00:20:26,110

advice we won't do that

414

00:20:30,760 --> 00:20:28,490

tortoises are really hard to get to

415

00:20:32,380 --> 00:20:30,770

breed in captivity I noticed they have

416

00:20:34,000 --> 00:20:32,390

two here I have no idea if it's a male

417

00:20:35,650 --> 00:20:34,010

and a female I have no idea if they are

418

00:20:37,260 --> 00:20:35,660

attempting to breed them or whatever I'm

419

00:20:39,460 --> 00:20:37,270

sure they would be absolutely

420

00:20:41,740 --> 00:20:39,470

outstandingly delighted if they did

421

00:20:43,150 --> 00:20:41,750

breathe but it's very difficult to get

422

00:20:44,770 --> 00:20:43,160

them breed to breed in captivity

423

00:20:48,610 --> 00:20:44,780

other than Olli yeah which is one of the

424

00:20:52,120 --> 00:20:48,620

reasons why you know Galapagos Tortoises

425

00:20:53,850 --> 00:20:52,130

and subspecies that belonged to the you

426

00:20:57,540 --> 00:20:53,860

know different groups there are

427

00:21:00,040 --> 00:20:57,550

eventually going extinct unfortunately

428

00:21:02,140 --> 00:21:00,050

now we're walking around I think I can

429

00:21:04,420 --> 00:21:02,150

see another one around this corner yes

430

00:21:06,080 --> 00:21:04,430

yes oh that's and it's that somewhat

431

00:21:07,820 --> 00:21:06,090

closer - we can

432

00:21:10,240 --> 00:21:07,830

walk around the enclosure sort of go

433

00:21:13,039 --> 00:21:10,250

bleed one into the other into the other

434

00:21:15,649 --> 00:21:13,049

lots of room and space fun that's very

435

00:21:17,480 --> 00:21:15,659

nice to see he's a little pond oh that's

436

00:21:19,090 --> 00:21:17,490

nice that's a reasonably close-up view

437

00:21:40,399 --> 00:21:19,100

now we're getting of this tortoise

438

00:21:45,830 --> 00:21:40,409

munching the grass walking along here

439

00:21:47,600 --> 00:21:45,840

looking across the chasm and just on the

440

00:21:53,320 --> 00:21:47,610

other side we've got three ring-tailed

441

00:21:58,909 --> 00:21:55,610

strolling along ignoring all the

442

00:22:01,880 --> 00:21:58,919

visitors ring-tailed lemurs something

443

00:22:08,180 --> 00:22:01,890

wonderful a lemur is a squirrel designed

444

00:22:10,909 --> 00:22:08,190

in Paris four of the mountain now they

445

00:22:17,990 --> 00:22:10,919

are really so charming yeah really

446

00:22:20,120 --> 00:22:18,000

beautiful animals prosimians oh casually

447

00:22:22,820 --> 00:22:20,130

you can think of three major groups of

448

00:22:25,100 --> 00:22:22,830

primates the prosimians the monkeys the

449

00:22:26,659 --> 00:22:25,110

apes and the humans and the monkeys apes

450

00:22:29,450 --> 00:22:26,669

and humans are much more closely related

451

00:22:31,580 --> 00:22:29,460

to each other than they are to groups

452

00:22:34,130 --> 00:22:31,590

like the prosimians to which the lemurs

453

00:22:38,539 --> 00:22:34,140

belong lemurs and Pato is a number of

454

00:22:42,139 --> 00:22:38,549

other African and Asian forms they're

455

00:22:45,080 --> 00:22:42,149

two separate the monkey monkey ape human

456

00:22:47,870 --> 00:22:45,090

group and the prosimian group are really

457

00:22:50,899 --> 00:22:47,880

two separate branches of the very large

458

00:22:53,860 --> 00:22:50,909

primate tree they're often considered

459

00:22:56,779 --> 00:22:53,870

quote more primitive quote than the

460

00:23:00,680 --> 00:22:56,789

anthropoid or a monkey a human group but

461

00:23:03,740 --> 00:23:00,690

as my old as my old professor James

462

00:23:07,760 --> 00:23:03,750

Gavin used to say primitive can you hang

463

00:23:09,560 --> 00:23:07,770

by your feet that's an odd term

464

00:23:11,330 --> 00:23:09,570

primitive I've heard it before but III

465

00:23:12,860 --> 00:23:11,340

know even Richard Dawkins writes about

466

00:23:17,480 --> 00:23:12,870

the terms

467

00:23:20,270 --> 00:23:17,490

it's it's so value Laden yeah it is

468

00:23:22,160 --> 00:23:20,280

absolutely and the point is if a group

469

00:23:23,930 --> 00:23:22,170

of animals are a particular animal is

470

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

successful and is still here and is

471

00:23:29,630 --> 00:23:25,950

breeding and is fine how can that be

472

00:23:31,850 --> 00:23:29,640

regarded as primitive well in that

473

00:23:35,860 --> 00:23:31,860

respect lemurs are very good at being

474

00:23:37,910 --> 00:23:35,870

lemurs or they wouldn't be here I mean

475

00:23:39,950 --> 00:23:37,920

there are a lot of animals that are

476  
00:23:42,680 --> 00:23:39,960  
being selected out because they can't

477  
00:23:45,890 --> 00:23:42,690  
survive in the Anthropocene or the human

478  
00:23:48,049 --> 00:23:45,900  
era in which we find ourselves but you

479  
00:23:49,460 --> 00:23:48,059  
know and unfortunately many primate

480  
00:23:51,860 --> 00:23:49,470  
groups are going to be part of that

481  
00:23:54,430 --> 00:23:51,870  
extinction event possibly even lemurs

482  
00:23:57,710 --> 00:23:54,440  
lemurs are like these ringtails

483  
00:24:00,740 --> 00:23:57,720  
they're restricted to a very narrow

484  
00:24:06,220 --> 00:24:00,750  
geographic area on the planet back in

485  
00:24:08,210 --> 00:24:06,230  
the Pliocene and earlier biosea

486  
00:24:09,950 --> 00:24:08,220  
Oligocene they were much more broadly

487  
00:24:11,990 --> 00:24:09,960  
spread but now you just find them on

488  
00:24:14,180 --> 00:24:12,000

madagascar and now with more

489

00:24:17,169 --> 00:24:14,190

environmental destruction in madagascar

490

00:24:19,669 --> 00:24:17,179

the habitats for lemurs and other

491

00:24:22,370 --> 00:24:19,679

persimmon ringtails and other prosimians

492

00:24:24,140 --> 00:24:22,380

on madagascar is becoming reduced and

493

00:24:26,299 --> 00:24:24,150

you know if you don't have a Baudette

494

00:24:27,740 --> 00:24:26,309

you don't survive yeah well I'm pleased

495

00:24:30,380 --> 00:24:27,750

to say the habitats they've provided

496

00:24:32,299 --> 00:24:30,390

them here is wonderful yeah I mean is

497

00:24:34,610 --> 00:24:32,309

it's as far removed as it from the old

498

00:24:36,410 --> 00:24:34,620

idea of you know walking along and

499

00:24:38,630 --> 00:24:36,420

seeing animals in cages as you can get

500

00:24:42,290 --> 00:24:38,640

they've got their own hillside trees

501  
00:24:44,299 --> 00:24:42,300  
environment shade it's it's a cage

502  
00:24:47,210 --> 00:24:44,309  
nevertheless but it's quite a nice one

503  
00:24:50,480 --> 00:24:47,220  
yeah I think these animals can live

504  
00:24:51,980 --> 00:24:50,490  
pretty contented in a very nice

505  
00:24:54,560 --> 00:24:51,990  
environment like this and they're

506  
00:24:56,030 --> 00:24:54,570  
completely acclimatized to a if that's

507  
00:24:57,919 --> 00:24:56,040  
the right word to people because there's

508  
00:24:59,530 --> 00:24:57,929  
lots of people here just chatting and

509  
00:25:03,020 --> 00:24:59,540  
looking at them like we are and they

510  
00:25:05,060 --> 00:25:03,030  
give a damn it you know zoo animals vary

511  
00:25:08,840 --> 00:25:05,070  
hugely in that regard

512  
00:25:11,870 --> 00:25:08,850  
I suspect animals like lemurs are find

513  
00:25:13,490 --> 00:25:11,880

us very entertaining yes let's go out

514

00:25:17,470 --> 00:25:13,500

and watch the people yes

515

00:25:21,320 --> 00:25:17,480

whereas great apes well specifically

516

00:25:24,170 --> 00:25:21,330

gorillas less so chimpanzees but

517

00:25:26,690 --> 00:25:24,180

certainly gorillas tend to be rather shy

518

00:25:28,970 --> 00:25:26,700

and in temperament and they they really

519

00:25:31,010 --> 00:25:28,980

don't like being stared at if you go to

520

00:25:33,350 --> 00:25:31,020

a gorilla cage quite often what you'll

521

00:25:35,780 --> 00:25:33,360

see is the back of a girl yeah

522

00:25:37,400 --> 00:25:35,790

regularly gorillas will either be

523

00:25:39,710 --> 00:25:37,410

sitting where they can't be seen or

524

00:25:41,960 --> 00:25:39,720

can't be seen as well where they'll just

525

00:25:44,090 --> 00:25:41,970

sit with their back to the audience to

526  
00:25:45,680 --> 00:25:44,100  
the to the viewing public now these are

527  
00:25:48,200 --> 00:25:45,690  
the guys here these are winged tails

528  
00:25:50,360 --> 00:25:48,210  
they seem to be perfectly content to be

529  
00:25:52,070 --> 00:25:50,370  
amused by us I think so and they're just

530  
00:25:54,440 --> 00:25:52,080  
going about their daily activities

531  
00:25:58,010 --> 00:25:54,450  
having a bit of food they're sitting in

532  
00:26:01,460 --> 00:25:58,020  
the shade and when you leave is one of

533  
00:26:03,290 --> 00:26:01,470  
the things that zoos do and looking

534  
00:26:05,450 --> 00:26:03,300  
around this cage I think that's there

535  
00:26:09,610 --> 00:26:05,460  
maybe using that and this enclosure as

536  
00:26:12,800 --> 00:26:09,620  
well is they they hide food around the

537  
00:26:14,450 --> 00:26:12,810  
the enclosure to make it a little bit

538  
00:26:17,180 --> 00:26:14,460

more of a challenge rather than just you

539

00:26:20,120 --> 00:26:17,190

know here's your here's your Purina

540

00:26:23,240 --> 00:26:20,130

lemur chow and this bucket over here

541

00:26:25,490 --> 00:26:23,250

near their gate they will hide the

542

00:26:28,560 --> 00:26:25,500

various foodstuffs in the case these

543

00:26:31,019 --> 00:26:28,570

guys eat fruits and vegetables mostly

544

00:26:33,690 --> 00:26:31,029

that full of and probably someone

545

00:26:36,210 --> 00:26:33,700

get out to hit the protein and all that

546

00:26:40,080 --> 00:26:36,220

but they'll they'll secrete the pieces

547

00:26:41,789 --> 00:26:40,090

around the the cage cage a closure

548

00:26:44,610 --> 00:26:41,799

enclosure yeah that's the best term I

549

00:26:46,860 --> 00:26:44,620

think yes it's spacious it really is it

550

00:26:49,049 --> 00:26:46,870

so they'll secrete the food around the

551  
00:26:50,909 --> 00:26:49,059  
enclosures and then the animals have to

552  
00:26:52,730 --> 00:26:50,919  
kind of use their intelligence and use

553  
00:26:59,519 --> 00:26:52,740  
their senses their sense of smell and

554  
00:27:01,529 --> 00:26:59,529  
color vision to find the stuff and

555  
00:27:04,310 --> 00:27:01,539  
that's good for them that you know keeps

556  
00:27:07,310 --> 00:27:04,320  
them keeps their little brains as usual

557  
00:27:09,659 --> 00:27:07,320  
that one over there sitting there look

558  
00:27:29,009 --> 00:27:09,669  
it's looking right at us and what are

559  
00:27:31,320 --> 00:27:29,019  
they doing primates watching other

560  
00:27:33,419 --> 00:27:31,330  
primates we are privately whoa did you

561  
00:27:33,960 --> 00:27:33,429  
see they're very good at jumping and

562  
00:27:36,899 --> 00:27:33,970  
lipped

563  
00:27:38,580 --> 00:27:36,909

a huge deal at the baboon enclosure they

564

00:27:40,470 --> 00:27:38,590

are clearly but this is specifically

565

00:27:43,049 --> 00:27:40,480

that hamadryas baboons enclosure which

566

00:27:45,629 --> 00:27:43,059

is significant because all baboons are

567

00:27:49,440 --> 00:27:45,639

not alike hamid reyes are particularly

568

00:27:51,659 --> 00:27:49,450

interesting as baboons because they have

569

00:27:54,899 --> 00:27:51,669

a social system that's a bit different

570

00:27:57,960 --> 00:27:54,909

from your typical olive baboon or other

571

00:28:00,149 --> 00:27:57,970

all baboons are ground living monkeys

572

00:28:01,799 --> 00:28:00,159

and they spend most of their time on the

573

00:28:03,419 --> 00:28:01,809

ground they can climb trees they

574

00:28:05,129 --> 00:28:03,429

generally sleep in trees it's not

575

00:28:07,590 --> 00:28:05,139

that they can't go into trees but their

576

00:28:10,430 --> 00:28:07,600

major adaptation is living on the ground

577

00:28:13,100 --> 00:28:10,440

exploding from ground resources like

578

00:28:16,220 --> 00:28:13,110

rhizomes and

579

00:28:21,620 --> 00:28:16,230

grass roots and stems and things like

580

00:28:23,210 --> 00:28:21,630

that but hamid reyes are particularly

581

00:28:28,750 --> 00:28:23,220

interesting among the bad ones because

582

00:28:33,080 --> 00:28:28,760

their social system is different from

583

00:28:35,150 --> 00:28:33,090

most other baboon species you have a big

584

00:28:36,770 --> 00:28:35,160

group of males and females and you have

585

00:28:38,750 --> 00:28:36,780

a male dominance hierarchy and a female

586

00:28:40,910 --> 00:28:38,760

dominance hierarchy they all kind of

587

00:28:43,970 --> 00:28:40,920

live together Hamid rights are different

588

00:28:46,610 --> 00:28:43,980

because they have a single male who has

589

00:28:47,720 --> 00:28:46,620

a group of females living with him and

590

00:28:50,960 --> 00:28:47,730

then of course the children of the

591

00:28:53,090 --> 00:28:50,970

females and this kind of what's been

592

00:28:54,350 --> 00:28:53,100

referred to as a harem relationship

593

00:28:56,180 --> 00:28:54,360

that's what we can see at the moment

594

00:28:58,670 --> 00:28:56,190

there's the big male there on the this

595

00:29:01,720 --> 00:28:58,680

log of over there and there are so many

596

00:29:04,640 --> 00:29:01,730

little ones lots and lots of children

597

00:29:06,020 --> 00:29:04,650

little little young oh there they go

598

00:29:08,960 --> 00:29:06,030

they're all running across the face of

599

00:29:11,060 --> 00:29:08,970

that to be the waterfall over there yeah

600

00:29:12,830 --> 00:29:11,070

there's a I don't know much about this

601  
00:29:15,110 --> 00:29:12,840  
particular colony but obviously they

602  
00:29:17,600 --> 00:29:15,120  
have monkeys of several different ages

603  
00:29:19,250 --> 00:29:17,610  
in here they clearly are doing okay on

604  
00:29:21,380 --> 00:29:19,260  
the you know getting them to reproduce

605  
00:29:23,390 --> 00:29:21,390  
by the way take a look at that big male

606  
00:29:26,240 --> 00:29:23,400  
the see how he's got this gorgeous big

607  
00:29:29,270 --> 00:29:26,250  
coat crosses head and shoulders and

608  
00:29:31,820 --> 00:29:29,280  
notice how well-groomed that coat is

609  
00:29:34,850 --> 00:29:31,830  
that that there's no tangles yes and

610  
00:29:38,090 --> 00:29:34,860  
that it doesn't care at all it's really

611  
00:29:39,500 --> 00:29:38,100  
very smooth the male gets a lot of

612  
00:29:41,210 --> 00:29:39,510  
grooming

613  
00:29:43,910 --> 00:29:41,220

and it looks like it's just being

614

00:29:47,980 --> 00:29:43,920

brushed exactly he's easy really quite

615

00:29:51,200 --> 00:29:47,990

well taken care of shall we say but the

616

00:29:54,110 --> 00:29:51,210

so a male will take over in the wild not

617

00:29:57,290 --> 00:29:54,120

obviously in the zoo a male will take

618

00:30:00,350 --> 00:29:57,300

over a group of females and he will sire

619

00:30:02,750 --> 00:30:00,360

children of those females for the next

620

00:30:04,760 --> 00:30:02,760

several years until he gets too old or

621

00:30:06,530 --> 00:30:04,770

until another male comes along to kind

622

00:30:08,630 --> 00:30:06,540

of drive him off and replace him and

623

00:30:11,150 --> 00:30:08,640

then that male will take over the

624

00:30:14,750 --> 00:30:11,160

females remain constant so to speak the

625

00:30:16,400 --> 00:30:14,760

females in their offspring will will be

626

00:30:18,800 --> 00:30:16,410

the core of the troop so they're really

627

00:30:21,470 --> 00:30:18,810

the ones who you know that that's the

628

00:30:25,640 --> 00:30:21,480

continuity in the end the social

629

00:30:29,930 --> 00:30:25,650

grouping the male children of the of the

630

00:30:31,490 --> 00:30:29,940

group will spin off when they become you

631

00:30:36,260 --> 00:30:31,500

know teenagers the equivalent of

632

00:30:38,990 --> 00:30:36,270

teenagers for four baboons a few years

633

00:30:41,540 --> 00:30:39,000

old because they would be directly in

634

00:30:44,570 --> 00:30:41,550

competition with the single male yeah I

635

00:30:46,520 --> 00:30:44,580

head of the group so the the male

636

00:30:48,770 --> 00:30:46,530

spin-off but the females and their

637

00:30:50,960 --> 00:30:48,780

children remain and they are the core of

638

00:30:53,120 --> 00:30:50,970

the truth they look like they're having

639

00:30:54,650 --> 00:30:53,130

a great deal of I'm gonna just walk to

640

00:30:56,960 --> 00:30:54,660

the other end of this little walkway

641

00:30:58,310 --> 00:30:56,970

here Genie because we're standing in the

642

00:30:59,750 --> 00:30:58,320

direct sunlight at the moment so he

643

00:31:02,120 --> 00:30:59,760

might get a better view from over here

644

00:31:04,430 --> 00:31:02,130

they're having a great time I mean if I

645

00:31:05,630 --> 00:31:04,440

can understand their behavior they seem

646

00:31:09,650 --> 00:31:05,640

quite happy they're running around

647

00:31:13,100 --> 00:31:09,660

jumping on things and climbing up a sort

648

00:31:15,410 --> 00:31:13,110

of a cliff wall here and generally just

649

00:31:17,840 --> 00:31:15,420

hanging out well one thing that you'll

650

00:31:20,340 --> 00:31:17,850

find true of baby primates as they love

651  
00:31:22,350 --> 00:31:20,350  
to play they certainly do and

652  
00:31:24,509 --> 00:31:22,360  
there's something quite cute about any

653  
00:31:26,909 --> 00:31:24,519  
baby mammal I think yeah it's really

654  
00:31:29,909 --> 00:31:26,919  
true you noticed by the door over there

655  
00:31:31,470 --> 00:31:29,919  
there's a couple of youngsters kind of

656  
00:31:34,279 --> 00:31:31,480  
wrestling and pushing each other and

657  
00:31:37,799 --> 00:31:34,289  
you're climbing up the fake rocks and

658  
00:31:40,529 --> 00:31:37,809  
having a good time it's it's all you

659  
00:31:43,049 --> 00:31:40,539  
know any mammalian play is a great way

660  
00:31:44,850 --> 00:31:43,059  
to develop the skills for being an adult

661  
00:31:46,860 --> 00:31:44,860  
whatever that species is there's a

662  
00:31:48,389 --> 00:31:46,870  
little fella going up there but you put

663  
00:31:50,430 --> 00:31:48,399

a bunch of kids in there and they do be

664

00:31:53,999 --> 00:31:50,440

doing the same thing we don't call

665

00:31:56,100 --> 00:31:54,009

monkey bars for nothing there goes there

666

00:31:59,490 --> 00:31:56,110

goes some chasing behavior yeah that

667

00:32:01,680 --> 00:31:59,500

looks like that looks like a young male

668

00:32:06,240 --> 00:32:01,690

he's they believe they may have to

669

00:32:08,039 --> 00:32:06,250

remove him from the the troop at some

670

00:32:10,499 --> 00:32:08,049

point in the future but then zoos have

671

00:32:13,259 --> 00:32:10,509

those kinds of exchanges they'll you

672

00:32:16,499 --> 00:32:13,269

know they'll swap animals around as they

673

00:32:18,960 --> 00:32:16,509

need to do to retain the appropriate

674

00:32:29,899 --> 00:32:18,970

social grouping yeah that definitely

675

00:32:34,710 --> 00:32:29,909

looks like a young male and that's where

676  
00:32:37,230 --> 00:32:34,720  
sadly the recorder stopped recording and

677  
00:32:38,970 --> 00:32:37,240  
unbeknownst to me and Geney we went

678  
00:32:41,490 --> 00:32:38,980  
around and looked at some more animals

679  
00:32:42,899 --> 00:32:41,500  
especially the great apes and Geney was

680  
00:32:44,580 --> 00:32:42,909  
telling me all about the muscle

681  
00:32:46,860 --> 00:32:44,590  
structure and the arm structure in

682  
00:32:49,529 --> 00:32:46,870  
various points about evolution and where

683  
00:32:52,289 --> 00:32:49,539  
they diverged it was fascinating stuff

684  
00:32:56,580 --> 00:32:52,299  
but sadly when I checked the recordings

685  
00:32:59,669 --> 00:32:56,590  
later on those recordings failed however

686  
00:33:03,180 --> 00:32:59,679  
and I hope you can appreciate how lucky

687  
00:33:05,610 --> 00:33:03,190  
I was to have a well if not exactly a

688  
00:33:08,999 --> 00:33:05,620

guided tour around Auckland Zoo at a

689

00:33:12,029 --> 00:33:09,009

trip around the zoo we have somebody who

690

00:33:13,610 --> 00:33:12,039

is such an expert in her field as dr.

691

00:33:15,570 --> 00:33:13,620

eugenie Scott

692

00:33:18,039 --> 00:33:15,580

[Music]

693

00:33:20,499 --> 00:33:18,049

if you ever get the chance to visit a

694

00:33:22,600 --> 00:33:20,509

zoo with dr. eugenie Scott I sincerely

695

00:33:24,730 --> 00:33:22,610

recommend you take it up Thank You

696

00:33:43,210 --> 00:33:24,740

Jeanne thank you very much for a

697

00:33:45,789 --> 00:33:43,220

wonderful day at Oakland Zoo hi I'm

698

00:33:47,590 --> 00:33:45,799

Yvette Don Troma aka SCI babe and I

699

00:33:50,769 --> 00:33:47,600

debunk bad science for a living this

700

00:33:52,299 --> 00:33:50,779

includes health nutrition and general BS

701  
00:33:54,070 --> 00:33:52,309  
on the Internet and I'm looking forward

702  
00:34:12,639 --> 00:33:54,080  
to seeing you all at skeptic on on

703  
00:34:15,099 --> 00:34:12,649  
Australia this October now is a story

704  
00:34:18,760 --> 00:34:15,109  
brought to my attention by dr. Ken

705  
00:34:23,399 --> 00:34:18,770  
Harvey a longtime campaigner for science

706  
00:34:25,869 --> 00:34:23,409  
and reason especially in medicine and

707  
00:34:28,210 --> 00:34:25,879  
especially when it comes to the claims

708  
00:34:32,710 --> 00:34:28,220  
of medical so-called medical products

709  
00:34:35,379 --> 00:34:32,720  
this is reported at med rich calm that a

710  
00:34:38,889 --> 00:34:35,389  
you links in this week's show notes made

711  
00:34:41,409 --> 00:34:38,899  
reach proprietary limited a story by dr.

712  
00:34:43,419 --> 00:34:41,419  
Ken Harvey therapeutics goods

713  
00:34:47,349 --> 00:34:43,429

administration's new complaint system

714

00:34:49,050 --> 00:34:47,359

fails at either cold test outcome of

715

00:34:53,440 --> 00:34:49,060

advertising complaints investigations

716

00:34:55,620 --> 00:34:53,450

specification 2018 enacted and this was

717

00:34:57,490 --> 00:34:55,630

posted on the 5th of July

718

00:34:59,960 --> 00:34:57,500

[Music]

719

00:35:03,350 --> 00:34:59,970

stimulated by an article in today's of

720

00:35:05,030 --> 00:35:03,360

the conversation website also links in

721

00:35:08,420 --> 00:35:05,040

the show notes on farmer care

722

00:35:11,900 --> 00:35:08,430

laboratories either cold I have decided

723

00:35:14,090 --> 00:35:11,910

to try the TJ's new complaint system the

724

00:35:17,780 --> 00:35:14,100

photograph accompanying has a picture of

725

00:35:20,530 --> 00:35:17,790

easy cold the packaging either cold

726

00:35:23,270 --> 00:35:20,540

cough cold and flu day and night

727

00:35:27,410 --> 00:35:23,280

specifically formulated to help shorten

728

00:35:29,870 --> 00:35:27,420

a cold are the claims as I mentioned in

729

00:35:31,940 --> 00:35:29,880

a comment on this article this product

730

00:35:34,910 --> 00:35:31,950

has been the subject of a previous

731

00:35:38,690 --> 00:35:34,920

article in the conversation in 2015 it

732

00:35:41,080 --> 00:35:38,700

has also had six upheld complaints by

733

00:35:43,810 --> 00:35:41,090

the now abolished therapeutics goods

734

00:35:48,170 --> 00:35:43,820

advertising complaints resolution panel

735

00:35:50,150 --> 00:35:48,180

CRP from 2005 to 2016 and a

736

00:35:53,600 --> 00:35:50,160

recommendation to the secretary of the

737

00:35:56,060 --> 00:35:53,610

CRP in 2017 for failure to withdraw

738

00:35:58,190 --> 00:35:56,070

misleading representations that the

739

00:36:01,010 --> 00:35:58,200

product had quote been clinically

740

00:36:03,050 --> 00:36:01,020

trialed in the sense of being

741

00:36:05,360 --> 00:36:03,060

demonstrated to have effects such as

742

00:36:08,300 --> 00:36:05,370

reducing the duration impact on daily

743

00:36:11,330 --> 00:36:08,310

life or severity of symptoms of the cold

744

00:36:13,340 --> 00:36:11,340

in quote typically I could find no

745

00:36:16,370 --> 00:36:13,350

outcome of this recommendation to the

746

00:36:18,290 --> 00:36:16,380

secretary TGA on the TGA website in

747

00:36:20,710 --> 00:36:18,300

addition there was a decision to

748

00:36:24,410 --> 00:36:20,720

withdraw advertising approval in

749

00:36:27,430 --> 00:36:24,420

specified media only not the internet by

750

00:36:30,860 --> 00:36:27,440

the TGA on the 11th of October 2017

751  
00:36:33,500 --> 00:36:30,870  
regardless this product continues to be

752  
00:36:36,200 --> 00:36:33,510  
advertised with claims that have been

753  
00:36:38,960 --> 00:36:36,210  
repeatedly judged to be misleading and

754  
00:36:41,080 --> 00:36:38,970  
deceptive furthermore Pharma cares

755  
00:36:43,820 --> 00:36:41,090  
Laboratories has the unenviable

756  
00:36:45,890 --> 00:36:43,830  
reputation of having the most upheld

757  
00:36:48,110 --> 00:36:45,900  
complaints by any sponsor of

758  
00:36:51,740 --> 00:36:48,120  
complementary medicines over the 10-year

759  
00:36:54,740 --> 00:36:51,750  
life of this CRP however upon submission

760  
00:36:57,890 --> 00:36:54,750  
of the attached complaint I received the

761  
00:37:01,040 --> 00:36:57,900  
following error message and the message

762  
00:37:05,960 --> 00:37:01,050  
reads in red we're sorry but something

763  
00:37:09,220 --> 00:37:05,970

went wrong era I D Ashby 9 - 2 e e FD -

764

00:37:12,270 --> 00:37:09,230

3 a a 1 - 4 AF 2

765

00:37:15,220 --> 00:37:12,280

I think 9c I think you get the message

766

00:37:16,960 --> 00:37:15,230

we've been notified about this issue and

767

00:37:19,300 --> 00:37:16,970

we'll take a look shortly thank you for

768

00:37:21,640 --> 00:37:19,310

your patience this is the same error I

769

00:37:24,040 --> 00:37:21,650

reported to the TGA when I tested their

770

00:37:26,680 --> 00:37:24,050

system on the 17th of May

771

00:37:28,660 --> 00:37:26,690

it's a pity it remained when the system

772

00:37:31,180 --> 00:37:28,670

went live I submitted that this

773

00:37:33,790 --> 00:37:31,190

complaint should have been addressed as

774

00:37:36,490 --> 00:37:33,800

quote high priority and quote because

775

00:37:38,290 --> 00:37:36,500

the sponsor is recalcitrant the product

776  
00:37:40,420 --> 00:37:38,300  
has a number of uphill complaints and

777  
00:37:42,820 --> 00:37:40,430  
the varied advertising claims by the

778  
00:37:44,950 --> 00:37:42,830  
sponsor and many others continue to

779  
00:37:47,470 --> 00:37:44,960  
state or imply that the product will

780  
00:37:51,400 --> 00:37:47,480  
shorten the duration and severity of a

781  
00:37:53,950 --> 00:37:51,410  
cold when it will not by allege repeated

782  
00:37:58,500 --> 00:37:53,960  
breaches of the therapeutics Goods

783  
00:38:03,460 --> 00:37:58,510  
advertising code 2017 sections for 1b

784  
00:38:07,780 --> 00:38:03,470  
for 2a and 4 to see in addition specific

785  
00:38:09,910 --> 00:38:07,790  
indications on the AR TG public summary

786  
00:38:12,310 --> 00:38:09,920  
documents are equally misleading and

787  
00:38:15,880 --> 00:38:12,320  
deceptive I asked for an immediate

788  
00:38:18,540 --> 00:38:15,890

response from the TGA to me as to the

789

00:38:20,830 --> 00:38:18,550

priority allocated to this complaint and

790

00:38:24,580 --> 00:38:20,840

subsequently the measures taken by the

791

00:38:27,970 --> 00:38:24,590

TGA to achieve compliance and the

792

00:38:30,700 --> 00:38:27,980

outcome for publication I am concerned

793

00:38:32,560 --> 00:38:30,710

that the recently enacted therapeutics

794

00:38:34,650 --> 00:38:32,570

Goods information outcomes of

795

00:38:37,810 --> 00:38:34,660

advertising complaints investigations

796

00:38:40,900 --> 00:38:37,820

specification 2018 only states that

797

00:38:44,020 --> 00:38:40,910

quote the following specific kinds of

798

00:38:46,060 --> 00:38:44,030

therapeutic goods information may be

799

00:38:49,570 --> 00:38:46,070

released by the secretary to the public

800

00:38:52,690 --> 00:38:49,580

under subsection 61 5c of the Act

801  
00:38:55,480 --> 00:38:52,700  
end quote it remains to be seen what we

802  
00:38:59,020 --> 00:38:55,490  
get back from the TGA for the attached

803  
00:39:00,490 --> 00:38:59,030  
test complaint now the reason I'm

804  
00:39:01,750 --> 00:39:00,500  
bringing you this story and it's worth

805  
00:39:05,580 --> 00:39:01,760  
clicking on the link in the show notes

806  
00:39:08,170 --> 00:39:05,590  
that to have a look for yourself is to

807  
00:39:12,220 --> 00:39:08,180  
reiterate how important it is for people

808  
00:39:15,550 --> 00:39:12,230  
like dr. ken Harvey to be the what's the

809  
00:39:18,940 --> 00:39:15,560  
term The Barking Dog the watch dog the

810  
00:39:21,320 --> 00:39:18,950  
dog at the heels of government

811  
00:39:23,030 --> 00:39:21,330  
regulation to keep them

812  
00:39:26,510 --> 00:39:23,040  
honest to keep them up-to-date to keep

813  
00:39:28,730 --> 00:39:26,520

them aware because sadly all too often

814

00:39:31,280 --> 00:39:28,740

things like outrageous claims for

815

00:39:34,370 --> 00:39:31,290

complementary medicines just sort of

816

00:39:37,100 --> 00:39:34,380

slip under the radar go unnoticed or at

817

00:39:39,230 --> 00:39:37,110

least an act upon for many years hence

818

00:39:41,810 --> 00:39:39,240

we have products that claim to be

819

00:39:43,910 --> 00:39:41,820

all-natural etc making outrageous claims

820

00:39:46,280 --> 00:39:43,920

that that simply don't stack up when put

821

00:39:49,070 --> 00:39:46,290

to the test now this may be the

822

00:39:53,170 --> 00:39:49,080

situation where you're listening to this

823

00:39:55,490 --> 00:39:53,180

show anywhere around the world companies

824

00:39:56,570 --> 00:39:55,500

well they'll get away with what they can

825

00:39:59,900 --> 00:39:56,580

get away with and if they can make

826

00:40:02,060 --> 00:39:59,910

products cheaply quickly especially

827

00:40:05,900 --> 00:40:02,070

homeopathic products which obviously

828

00:40:09,290 --> 00:40:05,910

have have no benefit in a medical sense

829

00:40:12,800 --> 00:40:09,300

and make outrageous claims well that's

830

00:40:15,890 --> 00:40:12,810

what companies tend to do so it is vital

831

00:40:35,030 --> 00:40:15,900

that people like dr. ken Harvey keep on

832

00:40:37,760 --> 00:40:35,040

their case hi this is dr. Pamela Gaye

833

00:40:39,590 --> 00:40:37,770

from astronomy cast each week Fraser

834

00:40:41,440 --> 00:40:39,600

Cain and I take our listeners on a

835

00:40:44,600 --> 00:40:41,450

fact-based journey through the cosmos

836

00:40:47,450 --> 00:40:44,610

with our weekly podcast we explain not

837

00:40:49,250 --> 00:40:47,460

just what we know but how we know what

838

00:40:51,980 --> 00:40:49,260

we know about this universe that we

839

00:40:54,650 --> 00:40:51,990

share check us out at astronomy cast

840

00:40:56,480 --> 00:40:54,660

calm and look for us in itunes google

841

00:40:59,410 --> 00:40:56,490

play and where ever you download

842

00:41:14,900 --> 00:40:59,420

podcasts see online

843

00:41:20,100 --> 00:41:17,520

thank you for listening to the skeptic

844

00:41:23,220 --> 00:41:20,110

zone now as promised I'm gonna give you

845

00:41:26,820 --> 00:41:23,230

the chance to beat odds of eight million

846

00:41:30,150 --> 00:41:26,830

six hundred and forty thousand to one

847

00:41:32,400 --> 00:41:30,160

and as longtime listeners to the skeptic

848

00:41:34,260 --> 00:41:32,410

zone know every once in a while we play

849

00:41:41,720 --> 00:41:34,270

the dice game where I had a series of

850

00:41:46,500 --> 00:41:41,730

dice here I have a four-sided die a

851  
00:41:52,530 --> 00:41:46,510  
six-sided die a ten sided die a 20-sided

852  
00:41:57,030 --> 00:41:52,540  
die a thirty sided die and a sixty sided

853  
00:42:00,690 --> 00:41:57,040  
die right your chance to use your

854  
00:42:03,270 --> 00:42:00,700  
prediction powers or your powers of just

855  
00:42:05,220 --> 00:42:03,280  
dumb luck maybe I'm gonna roll each of

856  
00:42:08,340 --> 00:42:05,230  
these die tell you the answer and see

857  
00:42:10,890 --> 00:42:08,350  
how many you can get right maybe you are

858  
00:42:14,010 --> 00:42:10,900  
psychic who knows all right so first is

859  
00:42:20,340 --> 00:42:14,020  
the four-sided die it's in the shape of

860  
00:42:25,680 --> 00:42:20,350  
a pyramid so here we go and it's come up

861  
00:42:28,200 --> 00:42:25,690  
with two that's the first and so is two

862  
00:42:29,310 --> 00:42:28,210  
you move up to the six-sided die the

863  
00:42:37,290 --> 00:42:29,320

standard die

864

00:42:46,980 --> 00:42:37,300

here we go six let's move up to the

865

00:42:53,490 --> 00:42:46,990

10-sided dice shaking this 520 sided die

866

00:42:56,250 --> 00:42:53,500

here we go 22 those of you playing along

867

00:43:00,960 --> 00:42:56,260

at home and we move up to the 30 sided

868

00:43:04,610 --> 00:43:00,970

die it's quite chunky this one they keep

869

00:43:14,130 --> 00:43:09,240

13 lastly the the 60 sided die which is

870

00:43:16,920 --> 00:43:14,140

quite big and almost almost quite too

871

00:43:19,590 --> 00:43:16,930

smooth very little variation but good

872

00:43:22,950 --> 00:43:19,600

enough to come up with a random number

873

00:43:26,550 --> 00:43:22,960

here we go as it rolls around

874

00:43:29,250 --> 00:43:26,560

table and back again and come on keeps

875

00:43:34,140 --> 00:43:29,260

rolling off the tech guy how it's

876

00:43:42,120 --> 00:43:34,150

steadied now 57 so the numbers you want

877

00:43:44,099 --> 00:43:42,130

are two six five 2013 and 57 no

878

00:43:45,120 --> 00:43:44,109

supplementary number if you've got all

879

00:43:48,329 --> 00:43:45,130

those right

880

00:43:55,410 --> 00:43:48,339

you beat odds of eight million six

881

00:43:56,640 --> 00:43:55,420

hundred and forty thousand to one and

882

00:43:59,730 --> 00:43:56,650

maybe you should apply for the

883

00:44:02,490 --> 00:43:59,740

Australian skeptics \$100,000 psychic

884

00:44:05,730 --> 00:44:02,500

challenge if you think you have a

885

00:44:09,990 --> 00:44:05,740

psychic or a paranormal power why not

886

00:44:12,349 --> 00:44:10,000

apply at [www.sceeto.com](http://www.sceeto.com) not a you

887

00:44:15,300 --> 00:44:12,359

there's information there about the

888

00:44:17,640 --> 00:44:15,310

\$100,000 challenge yes it's certainly

889

00:44:20,400 --> 00:44:17,650

good to be back in Sydney Australia back

890

00:44:22,260 --> 00:44:20,410

in the skeptic ozone studios and the

891

00:44:23,940 --> 00:44:22,270

skeptic zone cats are all over me which

892

00:44:26,310 --> 00:44:23,950

is really nice in fact they've just

893

00:44:28,589 --> 00:44:26,320

never the studio at the moment they're

894

00:44:31,200 --> 00:44:28,599

looking for me for food I think food and

895

00:44:33,210 --> 00:44:31,210

back scratchers thank you - Mandy Lee

896

00:44:36,720 --> 00:44:33,220

Noble for this week's report and a big

897

00:44:41,180 --> 00:44:36,730

thank you to dr. eugenie Scott for being

898

00:44:44,339 --> 00:44:41,190

such a good friend a good friend indeed

899

00:44:47,220 --> 00:44:44,349

and what a pleasure it is to go anywhere

900

00:44:50,640 --> 00:44:47,230

with dr. Scott and have her explain

901  
00:44:53,820 --> 00:44:50,650  
interesting facts about natural history

902  
00:44:54,390 --> 00:44:53,830  
and evolution coming up on next week's

903  
00:44:56,160 --> 00:44:54,400  
show

904  
00:44:59,280 --> 00:44:56,170  
undoubtedly we'll bring you highlights

905  
00:45:02,060 --> 00:44:59,290  
of the talk coming up here in Sydney by

906  
00:45:05,099 --> 00:45:02,070  
dr. Angela Matt key now on the 12th

907  
00:45:06,839 --> 00:45:05,109  
Thursday the 12th at the at the

908  
00:45:08,910 --> 00:45:06,849  
Occidental hotel just near Wynyard

909  
00:45:10,849 --> 00:45:08,920  
station more details on this week's show

910  
00:45:13,920 --> 00:45:10,859  
notes hope to see you there at Sydney

911  
00:45:16,770 --> 00:45:13,930  
skeptics in the pub but until next week

912  
00:45:18,510 --> 00:45:16,780  
and with the jetlag rapidly catching up

913  
00:45:20,250 --> 00:45:18,520

on me I think it's almost time for bed

914

00:45:25,769 --> 00:45:20,260

this is Richard Saunders signing off

915

00:45:31,180 --> 00:45:28,269

you've been listening to the skeptic

916

00:45:37,870 --> 00:45:31,190

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917

00:45:41,370 --> 00:45:37,880

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921

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922

00:45:53,170 --> 00:45:50,499

itunes

923

00:45:56,559 --> 00:45:53,180

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924

00:45:59,279 --> 00:45:56,569

via patreon or paypal the skeptic zone

925

00:46:01,660 --> 00:45:59,289

podcast is an independent production

926

00:46:03,819 --> 00:46:01,670

reviews and opinions expressed on the

927

00:46:06,130 --> 00:46:03,829

skeptic zone and not necessarily those

928

00:46:07,930 --> 00:46:06,140

of Australian skeptics or any other