

1
00:00:01,730 --> 00:00:10,650
this is the cosmos a network of a

2
00:00:06,599 --> 00:00:15,138
hundred billion galaxies and it's the

3
00:00:10,650 --> 00:00:15,138
greatest story science has ever told

4
00:00:31,028 --> 00:00:37,549
life on Earth is one of unsolved

5
00:00:33,890 --> 00:00:41,259
mysteries of science come with me our

6
00:00:37,549 --> 00:00:41,259
journey is just the beginning

7
00:01:05,950 --> 00:01:13,689
welcome to the skeptic zone the podcast

8
00:01:09,109 --> 00:01:13,689
from Australia for science and reason

9
00:01:22,109 --> 00:01:29,170
welcome to the skeptic zone episode

10
00:01:25,030 --> 00:01:31,000
number 279 for the 23rd of february 2013

11
00:01:29,170 --> 00:01:33,340
Richard Saunders here with you from

12
00:01:31,000 --> 00:01:35,200
Sydney Australia and yes that clip

13
00:01:33,340 --> 00:01:39,270
before the theme music might have given

14
00:01:35,200 --> 00:01:41,560
you a hint a clue an inkling an insight

15
00:01:39,269 --> 00:01:43,989
into what's coming up on this week's

16
00:01:41,560 --> 00:01:47,260
show we have an interview with dr. Neil

17
00:01:43,989 --> 00:01:50,829
deGrasse Tyson and and urine all about

18
00:01:47,260 --> 00:01:55,150
the new cosmos TV series I was very

19
00:01:50,829 --> 00:01:58,780
fortunate to meet an and Neil as they

20
00:01:55,150 --> 00:02:01,450
insisted I call them in sydney in the

21
00:01:58,780 --> 00:02:03,400
last few days brought here by the

22
00:02:01,450 --> 00:02:06,189
wonderful people at the National

23
00:02:03,400 --> 00:02:08,050
Geographic Channel and a big shout out

24
00:02:06,189 --> 00:02:10,929
to the National Geographic Channel

25
00:02:08,050 --> 00:02:14,830
especially Cassie Crofts at the nat geo

26
00:02:10,929 --> 00:02:17,080
who was so helpful in providing me

27
00:02:14,830 --> 00:02:19,420
information and other things and getting

28
00:02:17,080 --> 00:02:21,280
this interview together now for those

29

00:02:19,419 --> 00:02:24,250
people in Australia the big news is

30
00:02:21,280 --> 00:02:27,250
Cosmo starts showing on the national

31
00:02:24,250 --> 00:02:31,239
geographic channel sunday the 16th of

32
00:02:27,250 --> 00:02:32,349
March at seven-thirty p.m. and for our

33
00:02:31,239 --> 00:02:36,569
listeners elsewhere in the world

34
00:02:32,349 --> 00:02:40,239
especially in the u.s. to read from the

35
00:02:36,569 --> 00:02:42,629
the press release Fox networks group

36
00:02:40,239 --> 00:02:46,150
announces the first-ever simultaneous

37
00:02:42,629 --> 00:02:49,780
cross-network global premiere event for

38
00:02:46,150 --> 00:02:52,120
cosmos a spacetime Odyssey on Sunday

39
00:02:49,780 --> 00:02:54,449
March ninth now this will premiere

40
00:02:52,120 --> 00:03:00,640
across 10 us networks including fox

41
00:02:54,449 --> 00:03:04,719
national geographic channel FX FXX FX em

42
00:03:00,639 --> 00:03:09,609
Fox Sports 1 Fox Sports to NatGeo wild

43
00:03:04,719 --> 00:03:12,580

nat geo mundo and Fox live multi network

44

00:03:09,610 --> 00:03:15,340

simul cast sponsored by samsung galaxy

45

00:03:12,580 --> 00:03:17,110

and the Chrysler brand thank you to

46

00:03:15,340 --> 00:03:19,509

those people so that's the day to

47

00:03:17,110 --> 00:03:21,760

remember for the people in the US and

48

00:03:19,509 --> 00:03:25,030

some other countries check your local

49

00:03:21,759 --> 00:03:28,929

our guides as they say much 9th is the

50

00:03:25,030 --> 00:03:31,330

date in Australia it's March 16th now if

51

00:03:28,930 --> 00:03:33,310

you want to win a cosmos pack including

52

00:03:31,330 --> 00:03:35,170

an autographed copy of the cosmos book

53

00:03:33,310 --> 00:03:38,560

autographed by Neil deGrasse

54

00:03:35,169 --> 00:03:41,439

Tyson and ander in download next week's

55

00:03:38,560 --> 00:03:44,379

episode of the skeptic zone for details

56

00:03:41,439 --> 00:03:47,650

of a new competition first prize of

57

00:03:44,379 --> 00:03:49,449

course that wonderful cosmos prize pack

58
00:03:47,650 --> 00:03:52,450
courtesy of the national geographic

59
00:03:49,449 --> 00:03:54,879
channel after the cosmos interviews it's

60
00:03:52,449 --> 00:03:57,939
a week in science from the Royal

61
00:03:54,879 --> 00:04:01,629
Institution of Australia www are I a

62
00:03:57,939 --> 00:04:04,300
u.s. okay you and then to round off the

63
00:04:01,629 --> 00:04:05,949
show it's dr. Rachel reports now a

64
00:04:04,300 --> 00:04:08,769
couple of weeks ago on the show we had

65
00:04:05,949 --> 00:04:11,139
the story of dr. ken harvey and why he

66
00:04:08,769 --> 00:04:13,569
resigned his position at de la trobe

67
00:04:11,139 --> 00:04:16,238
university over the deal with the swiss

68
00:04:13,568 --> 00:04:18,310
vitamin company doctor raid she

69
00:04:16,238 --> 00:04:21,129
interviews Cannon finds out more about

70
00:04:18,310 --> 00:04:23,160
his decision and more about the whole

71
00:04:21,129 --> 00:04:27,399
controversy and its really turned into a

72
00:04:23,160 --> 00:04:29,830
quite a story at dr. Reggie reports to

73
00:04:27,399 --> 00:04:31,388
round off this week's episode now before

74
00:04:29,829 --> 00:04:34,569
we get stuck into the show a quick

75
00:04:31,389 --> 00:04:36,939
couple of notes in 2012 and 2013 it was

76
00:04:34,569 --> 00:04:40,168
my great pleasure to attend the QED

77
00:04:36,939 --> 00:04:43,538
question explore discover convention in

78
00:04:40,168 --> 00:04:45,909
Manchester in the in the UK that's

79
00:04:43,538 --> 00:04:48,038
coming up again that will be held at the

80
00:04:45,910 --> 00:04:50,910
palace hotel in manchester on the

81
00:04:48,038 --> 00:04:53,589
twelfth and thirteenth of april 2014

82
00:04:50,910 --> 00:04:56,740
tickets are going fast this is a

83
00:04:53,589 --> 00:04:58,329
convention not to be missed it's simply

84
00:04:56,740 --> 00:05:00,189
one of the best ones I've ever attended

85
00:04:58,329 --> 00:05:03,639
around the world and I've certainly seen

86

00:05:00,189 --> 00:05:08,649
my share our best thing to do is quickly

87
00:05:03,639 --> 00:05:11,228
head to QED con dot org if you're going

88
00:05:08,649 --> 00:05:13,959
to be in the UK around April it's worth

89
00:05:11,228 --> 00:05:16,000
a side trip in fact it's worth a trip

90
00:05:13,959 --> 00:05:19,418
from the other side of the planet Wow

91
00:05:16,000 --> 00:05:22,418
and what a lineup they have for this

92
00:05:19,418 --> 00:05:24,579
year including Paul szenen these are

93
00:05:22,418 --> 00:05:26,889
really fabulous entertainer and magician

94
00:05:24,579 --> 00:05:28,599
and a good skeptic to dr. Richard

95
00:05:26,889 --> 00:05:31,538
Wiseman who is on the show last week

96
00:05:28,600 --> 00:05:32,800
always entertaining we have people are

97
00:05:31,538 --> 00:05:35,259
one of my favorite people in the world

98
00:05:32,800 --> 00:05:37,870
in fact Susan go back from guerrilla

99
00:05:35,259 --> 00:05:40,478
skepticism will be there robert

100
00:05:37,870 --> 00:05:43,120

Llewellyn from Red Dwarf he's going to

101

00:05:40,478 --> 00:05:46,538

be making your parents mark edward sunol

102

00:05:43,120 --> 00:05:49,030

etymotic who are the list goes on don't

103

00:05:46,538 --> 00:05:52,360

miss it QED this

104

00:05:49,029 --> 00:05:53,979

in Manchester and one last plug before

105

00:05:52,360 --> 00:05:57,400

we get into the show don't forget you

106

00:05:53,980 --> 00:05:59,350

can get your weekly fix of our reporter

107

00:05:57,399 --> 00:06:01,029

Maynard you don't have to hear him on

108

00:05:59,350 --> 00:06:05,350

the zone he's not on every week what a

109

00:06:01,029 --> 00:06:07,989

pity head to manor dot com au for crazy

110

00:06:05,350 --> 00:06:09,730

interviews music and more and now it's

111

00:06:07,990 --> 00:06:12,310

time to run downstairs and have a nice

112

00:06:09,730 --> 00:06:16,230

cup of hot chocolate this week while we

113

00:06:12,310 --> 00:06:16,230

all enjoy the skeptics

114

00:06:25,029 --> 00:06:37,218

the cosmos is all that is or ever was or

115
00:06:29,899 --> 00:06:39,948
ever will be come with me a generation

116
00:06:37,218 --> 00:06:42,050
ago the astronomer Carl Sagan stood here

117
00:06:39,949 --> 00:06:45,259
and launched hundreds of millions of us

118
00:06:42,050 --> 00:06:48,770
on a great adventure the exploration of

119
00:06:45,259 --> 00:06:52,879
the universe revealed by science it's

120
00:06:48,769 --> 00:06:54,560
time to get going again we're about to

121
00:06:52,879 --> 00:06:57,259
begin a journey that will take us from

122
00:06:54,560 --> 00:06:59,348
the infinitesimal to the infinite from

123
00:06:57,259 --> 00:07:02,629
the dawn of time to the distant future

124
00:06:59,348 --> 00:07:05,509
will explore galaxies and Suns and

125
00:07:02,629 --> 00:07:08,479
world's surf the gravity waves of

126
00:07:05,509 --> 00:07:12,110
space-time encounter beings that live

127
00:07:08,478 --> 00:07:15,889
and fire and ice explore the planets of

128
00:07:12,110 --> 00:07:18,830
stars that never die discover atoms as

129
00:07:15,889 --> 00:07:23,418
massive as suns and universes smaller

130
00:07:18,829 --> 00:07:27,168
than atoms cosmos is also a story about

131
00:07:23,418 --> 00:07:29,538
us it's the saga of how wandering bands

132
00:07:27,168 --> 00:07:35,269
of hunters and gatherers found their way

133
00:07:29,538 --> 00:07:37,750
to the Stars one adventure with many

134
00:07:35,269 --> 00:07:37,750
heroes

135
00:07:43,490 --> 00:07:48,569
well I'm delighted to be here in a

136
00:07:46,350 --> 00:07:50,280
wonderful what a wonderful view my

137
00:07:48,569 --> 00:07:52,139
goodness me I'm looking at the Sydney

138
00:07:50,279 --> 00:07:54,839
Harbour Bridge out the window but

139
00:07:52,139 --> 00:07:56,759
certainly the company I'm keeping right

140
00:07:54,839 --> 00:07:59,519
now is just as wonderful as the view I'm

141
00:07:56,759 --> 00:08:01,288
with dr. Neil deGrasse Tyson welcome to

142
00:07:59,519 --> 00:08:03,359
Australia thank you right I'm only my

143

00:08:01,288 --> 00:08:05,159
second time here and the first time

144
00:08:03,360 --> 00:08:07,169
where I'm spending any meaningful time

145
00:08:05,160 --> 00:08:09,780
so it's great but he's been friendly the

146
00:08:07,168 --> 00:08:11,159
view is gorgeous it's it's more

147
00:08:09,779 --> 00:08:14,969
beautiful than the already beautiful

148
00:08:11,160 --> 00:08:16,710
images that we all know represent Sydney

149
00:08:14,970 --> 00:08:18,270
it's almost locusts in the States it's

150
00:08:16,709 --> 00:08:21,000
like a postcard looking at better and

151
00:08:18,269 --> 00:08:24,769
I'm with andrian hello hello how are you

152
00:08:21,000 --> 00:08:27,509
I'm I'm beside myself I must have it and

153
00:08:24,769 --> 00:08:30,329
right sitting next to me right here is a

154
00:08:27,509 --> 00:08:33,209
15 year old boy yep who stayed up late

155
00:08:30,329 --> 00:08:35,579
in country Australia count the

156
00:08:33,208 --> 00:08:38,218
countryside little country town to watch

157
00:08:35,580 --> 00:08:41,009

a show called cosmos in 1981 and

158

00:08:38,219 --> 00:08:44,790

couldn't believe that great how great it

159

00:08:41,009 --> 00:08:47,389

was Oh miss Mayhew neural I'm completely

160

00:08:44,789 --> 00:08:51,269

gratified and very proud on behalf of

161

00:08:47,389 --> 00:08:53,370

coral and myself that it has such a

162

00:08:51,269 --> 00:08:55,319

place in your heart it certainly does

163

00:08:53,370 --> 00:08:58,049

and I would not be here and I would not

164

00:08:55,320 --> 00:09:00,000

be in the position I am in in life if it

165

00:08:58,049 --> 00:09:01,319

wasn't for that shares this there's no

166

00:09:00,000 --> 00:09:03,149

two ways about it you know there's lots

167

00:09:01,320 --> 00:09:05,100

of influences on one's life over the

168

00:09:03,149 --> 00:09:07,319

years but that certainly is one of the

169

00:09:05,100 --> 00:09:10,259

major ones for me but this is something

170

00:09:07,320 --> 00:09:13,110

you must have heard by well you know I

171

00:09:10,259 --> 00:09:16,439

I've thought for decades of doing an

172
00:09:13,110 --> 00:09:18,830
actual census of sending up the word

173
00:09:16,440 --> 00:09:21,900
perhaps through one of the scientific

174
00:09:18,830 --> 00:09:26,220
organizations and saying please let us

175
00:09:21,899 --> 00:09:29,370
know if you read science teach science

176
00:09:26,220 --> 00:09:32,570
do science are connected in any way to

177
00:09:29,370 --> 00:09:35,759
the scientific enterprise as a result of

178
00:09:32,570 --> 00:09:39,629
cosmos or something else that Carl Sagan

179
00:09:35,759 --> 00:09:42,299
did and I think that would be a very an

180
00:09:39,629 --> 00:09:43,889
astronomical number I suspect you're

181
00:09:42,299 --> 00:09:45,509
right because the original series and

182
00:09:43,889 --> 00:09:46,828
we'll get to the new series in a moment

183
00:09:45,509 --> 00:09:48,569
the original series was viewed by a

184
00:09:46,828 --> 00:09:50,399
staggering amount of people wasn't it

185
00:09:48,570 --> 00:09:52,860
yes I mean I think we stopped counting

186
00:09:50,399 --> 00:09:54,338
once we could make the case for

187
00:09:52,860 --> 00:09:57,300
three-quarters of a

188
00:09:54,339 --> 00:10:01,360
with Abby of as in billions and billions

189
00:09:57,299 --> 00:10:04,028
people worldwide and I think that number

190
00:10:01,360 --> 00:10:06,669
must have been overtaken because cosmos

191
00:10:04,028 --> 00:10:09,429
still lives in so many different formats

192
00:10:06,669 --> 00:10:12,308
and is in the audience now for the

193
00:10:09,429 --> 00:10:15,099
original series it's very young by the

194
00:10:12,308 --> 00:10:16,629
way just to amend what Anne said one

195
00:10:15,100 --> 00:10:19,028
could take a poll and find out who

196
00:10:16,629 --> 00:10:20,319
brought science or any part of its

197
00:10:19,028 --> 00:10:22,028
enterprise into their professional

198
00:10:20,318 --> 00:10:24,759
identity eyes or others teachers or

199
00:10:22,028 --> 00:10:26,318
researchers or lab technicians this sort

200

00:10:24,759 --> 00:10:28,539
of thing but there's another sort of

201
00:10:26,318 --> 00:10:31,028
hidden dimension to this and that is the

202
00:10:28,539 --> 00:10:33,458
power of something such as cosmos to

203
00:10:31,028 --> 00:10:35,350
affect people even if they are not

204
00:10:33,458 --> 00:10:38,458
scientist or have no such ambition

205
00:10:35,350 --> 00:10:41,740
because it can change your outlook on

206
00:10:38,458 --> 00:10:43,328
how you conduct your life suppose you

207
00:10:41,740 --> 00:10:46,389
now become a politician but you saw

208
00:10:43,328 --> 00:10:47,888
cosmos you will think differently when

209
00:10:46,389 --> 00:10:50,919
the vote comes up about how you allocate

210
00:10:47,889 --> 00:10:53,110
money this is it to the war machine as a

211
00:10:50,919 --> 00:10:55,719
to science research is it to to

212
00:10:53,110 --> 00:10:57,339
humanitarian causes and so I'd like to

213
00:10:55,720 --> 00:11:01,778
think of the influences caught up cosmos

214
00:10:57,339 --> 00:11:03,309

not only can it transform whether you

215

00:11:01,778 --> 00:11:06,480

become a scientist or not but can

216

00:11:03,308 --> 00:11:10,360

transform our culture in such a way that

217

00:11:06,480 --> 00:11:13,199

science can be embraced by everyone

218

00:11:10,360 --> 00:11:15,669

whether or not you made it your career

219

00:11:13,198 --> 00:11:17,289

absolutely it works on so many levels

220

00:11:15,669 --> 00:11:19,149

when you look at it and that respect

221

00:11:17,289 --> 00:11:22,778

what dragged me in if that's the right

222

00:11:19,149 --> 00:11:26,078

turn what captivated me from the very

223

00:11:22,778 --> 00:11:27,789

first episode was Carl Sagan sitting in

224

00:11:26,078 --> 00:11:30,609

this space ship of the imagination here

225

00:11:27,789 --> 00:11:33,219

we go and suddenly I thought stars die

226

00:11:30,610 --> 00:11:37,149

yeah and stars a bordo this happens

227

00:11:33,220 --> 00:11:38,769

right then came if and you may correct

228

00:11:37,149 --> 00:11:40,919

me here of course in the original series

229
00:11:38,769 --> 00:11:43,149
in the first episode I think Carl Sagan

230
00:11:40,919 --> 00:11:45,899
visited a recreation of the Library of

231
00:11:43,149 --> 00:11:47,860
Alexandria correct it which was

232
00:11:45,899 --> 00:11:50,708
fascinating and he lamented the fact

233
00:11:47,860 --> 00:11:53,470
that these this was lost to history now

234
00:11:50,708 --> 00:11:55,028
in the new series we have dr. Neil

235
00:11:53,470 --> 00:11:57,459
deGrasse Tyson in the spaceship of the

236
00:11:55,028 --> 00:12:00,399
imagination somewhat more modernized I

237
00:11:57,458 --> 00:12:03,088
must say very sexy and very sleek I have

238
00:12:00,399 --> 00:12:03,089
to say it's badass

239
00:12:03,330 --> 00:12:09,790
actually designed by ryan church he was

240
00:12:06,549 --> 00:12:12,129
famous for designing the space craft for

241
00:12:09,789 --> 00:12:14,860
JJ Abrams and various other Mulan

242
00:12:12,129 --> 00:12:17,350
western movies one of the many cinematic

243
00:12:14,860 --> 00:12:20,740
talents attracted to the new cosmos

244
00:12:17,350 --> 00:12:22,899
series out of love and admiration for

245
00:12:20,740 --> 00:12:24,539
the original yeah and by the way it's

246
00:12:22,899 --> 00:12:27,519
badass but it doesn't get in the way

247
00:12:24,539 --> 00:12:31,299
it's it's a remarkable combination of it

248
00:12:27,519 --> 00:12:33,458
is sheer beauty to behold it but when

249
00:12:31,299 --> 00:12:35,949
we're telling the story you're not

250
00:12:33,458 --> 00:12:39,369
thinking about the ship yes ship is just

251
00:12:35,950 --> 00:12:41,290
kind of framing for how we're getting to

252
00:12:39,370 --> 00:12:43,419
where we're going and and you could

253
00:12:41,289 --> 00:12:44,980
imagine a ship that was all about the

254
00:12:43,419 --> 00:12:49,319
ship and then that would be a

255
00:12:44,980 --> 00:12:52,028
distraction and so it's a very clever

256
00:12:49,320 --> 00:12:54,839
response to ann's description of what

257

00:12:52,028 --> 00:13:00,159
this ship needed to be in the script and

258
00:12:54,839 --> 00:13:02,589
so I'm happy to say that yes it's a bit

259
00:13:00,159 --> 00:13:04,838
of futuristic technology but it's not

260
00:13:02,589 --> 00:13:07,959
really about that well it's it's it's

261
00:13:04,839 --> 00:13:09,399
not only a way for you to have a look at

262
00:13:07,958 --> 00:13:10,659
these things but we're having a look at

263
00:13:09,399 --> 00:13:13,690
these things because you're having a

264
00:13:10,659 --> 00:13:15,219
look at these things and the only way we

265
00:13:13,690 --> 00:13:16,990
can realistically have a look at these

266
00:13:15,220 --> 00:13:18,250
things if we pretend we're in a

267
00:13:16,990 --> 00:13:22,320
spaceship having a look at these things

268
00:13:18,250 --> 00:13:25,120
and I must say I gotta laugh when you're

269
00:13:22,320 --> 00:13:29,528
plowing through the solar system and you

270
00:13:25,120 --> 00:13:31,179
nearly whack into Voyager that was quite

271
00:13:29,528 --> 00:13:34,120

funny cute and it was a beautiful thing

272

00:13:31,179 --> 00:13:35,679

because then we saw the disc very famous

273

00:13:34,120 --> 00:13:38,139

writer disc with the music and the

274

00:13:35,679 --> 00:13:43,809

imagery on it there are many moments in

275

00:13:38,139 --> 00:13:46,120

episode one that prefigure events and

276

00:13:43,809 --> 00:13:50,319

experiences that will come much later

277

00:13:46,120 --> 00:13:52,450

and so it's not just establishing our

278

00:13:50,320 --> 00:13:54,190

coordinates in space and time the

279

00:13:52,450 --> 00:13:57,160

address you see address our cosmic

280

00:13:54,190 --> 00:14:01,329

address yeah but and the cosmic calendar

281

00:13:57,159 --> 00:14:04,169

but also it's a way of beginning a kind

282

00:14:01,328 --> 00:14:08,759

of a series of adventure

283

00:14:04,169 --> 00:14:12,750

that some of which you know we will will

284

00:14:08,759 --> 00:14:16,950

return to in later episodes my favorite

285

00:14:12,750 --> 00:14:19,289

bit of the coming up on Voyager was you

286
00:14:16,950 --> 00:14:20,610
get close enough to it to see yes not

287
00:14:19,289 --> 00:14:23,099
only that there's the record there and

288
00:14:20,610 --> 00:14:25,649
you hear some of the sound but it's a

289
00:14:23,100 --> 00:14:27,360
little tattered yes it's a little

290
00:14:25,649 --> 00:14:29,610
obviously a weather-beaten of course on

291
00:14:27,360 --> 00:14:31,740
the weather in space yeah there's their

292
00:14:29,610 --> 00:14:34,110
micro meteoroids then yeah then we'll

293
00:14:31,740 --> 00:14:36,659
sort of Nick and ding your otherwise

294
00:14:34,110 --> 00:14:39,180
freshly launched shiny surface yeah and

295
00:14:36,659 --> 00:14:41,578
so you got the sense that this this has

296
00:14:39,179 --> 00:14:44,129
been traveling a while yeah no that's

297
00:14:41,578 --> 00:14:47,759
exactly what we had in mind and the idea

298
00:14:44,129 --> 00:14:50,370
was that you know because of the record

299
00:14:47,759 --> 00:14:52,409
and just of it was that the fact that it

300
00:14:50,370 --> 00:14:57,448
was my honor to be the creative director

301
00:14:52,409 --> 00:15:00,629
of the interstellar message I many

302
00:14:57,448 --> 00:15:03,899
nights of the year I lie awake imagining

303
00:15:00,629 --> 00:15:05,879
where Voyager we're both voyagers really

304
00:15:03,899 --> 00:15:09,659
are and what it would be like to ride

305
00:15:05,879 --> 00:15:13,559
alongside them and really feel you know

306
00:15:09,659 --> 00:15:16,289
what they cannot feel but if they were

307
00:15:13,559 --> 00:15:18,719
human what it would be like and I have

308
00:15:16,289 --> 00:15:22,230
imagined this countless times in the

309
00:15:18,720 --> 00:15:25,680
last 35 years knowing these are the most

310
00:15:22,230 --> 00:15:28,110
distant objects ever touched by you yes

311
00:15:25,679 --> 00:15:30,509
yes and not only that but that they have

312
00:15:28,110 --> 00:15:33,600
a future shelf life of a thousand

313
00:15:30,509 --> 00:15:38,250
million years and that shelf life has

314

00:15:33,600 --> 00:15:42,180
been determined by the genius engineers

315
00:15:38,250 --> 00:15:45,000
and designers and mathematicians who

316
00:15:42,179 --> 00:15:49,109
designed me trajectories of the mission

317
00:15:45,000 --> 00:15:51,509
they were saying that their spacecraft

318
00:15:49,110 --> 00:15:53,730
would last from a perhaps 10 or 15 years

319
00:15:51,509 --> 00:15:55,919
and here at 35 years later it's still

320
00:15:53,730 --> 00:15:58,170
teaching us wings so who knows that a

321
00:15:55,919 --> 00:15:59,818
thousand million years even covers the

322
00:15:58,169 --> 00:16:02,549
whole future of Voyager I was still

323
00:15:59,818 --> 00:16:05,009
getting communications from and we still

324
00:16:02,549 --> 00:16:08,609
wait a week though they be I mean we

325
00:16:05,009 --> 00:16:11,939
call across 1918-19 light hours to

326
00:16:08,610 --> 00:16:13,050
Voyager and then 1819 late hours later

327
00:16:11,940 --> 00:16:15,630
we get a

328
00:16:13,049 --> 00:16:18,509

turn signal batters out brilliant with

329

00:16:15,629 --> 00:16:21,088

this early 1970s technology of course

330

00:16:18,509 --> 00:16:23,220

yes of Constable nothing by the way at

331

00:16:21,089 --> 00:16:24,899

the time the original cosmos air Voyager

332

00:16:23,220 --> 00:16:27,269

had not really gotten anywhere yet I

333

00:16:24,899 --> 00:16:28,830

mean it was launched in 1977 and that

334

00:16:27,269 --> 00:16:31,110

losing it taught there was a tour of the

335

00:16:28,830 --> 00:16:33,389

planets mmm it was sort of fortuitously

336

00:16:31,110 --> 00:16:35,039

juxtaposed so that you would slingshot

337

00:16:33,389 --> 00:16:37,230

around one and would it aim you to the

338

00:16:35,039 --> 00:16:39,689

next planet slingshot around that get

339

00:16:37,230 --> 00:16:41,670

you to the next one and so the original

340

00:16:39,690 --> 00:16:44,370

cosmos did not have the benefit of

341

00:16:41,669 --> 00:16:46,769

celebrating the full voyage the cosmos

342

00:16:44,370 --> 00:16:48,389

with tape but no idea you didn't know

343
00:16:46,769 --> 00:16:51,328
but I mean not a photograph to full

344
00:16:48,389 --> 00:16:52,828
voice I don't know the outer dollars if

345
00:16:51,328 --> 00:16:55,769
it had been to some interesting places

346
00:16:52,828 --> 00:16:59,028
isn't there a scene and I'm sure there

347
00:16:55,769 --> 00:17:01,320
is a know exactly one of the episodes

348
00:16:59,028 --> 00:17:03,419
back to the jet propulsion laboratory

349
00:17:01,320 --> 00:17:05,250
from the outer solar the benefit of

350
00:17:03,419 --> 00:17:08,338
Alderson assume you may not have seen it

351
00:17:05,250 --> 00:17:10,980
also saw the scenes some time ago dr.

352
00:17:08,338 --> 00:17:12,688
Sagan is in a lab is that the Jet

353
00:17:10,980 --> 00:17:15,299
Propulsion lab never try anything and

354
00:17:12,689 --> 00:17:18,959
this picture has arrived now and there

355
00:17:15,299 --> 00:17:21,240
is a fresh picture of Neptune I know

356
00:17:18,959 --> 00:17:24,630
anything like that yes no I believe it

357
00:17:21,240 --> 00:17:27,000
it's probably Jupiter sure 200 Saturday

358
00:17:24,630 --> 00:17:30,059
couldn't have saturn and its in an

359
00:17:27,000 --> 00:17:34,259
episode called traveler's tale and it

360
00:17:30,058 --> 00:17:38,240
was um you know Carl just absolutely so

361
00:17:34,259 --> 00:17:41,429
brilliant in explaining a very complex

362
00:17:38,240 --> 00:17:43,500
idea of how a picture gets back from the

363
00:17:41,429 --> 00:17:46,410
outer solar system it was a delightful

364
00:17:43,500 --> 00:17:49,140
seen be guess it's so dramatic in a way

365
00:17:46,410 --> 00:17:50,970
it's not setup it's not rehearsed let's

366
00:17:49,140 --> 00:17:52,800
do this it's like I was barely know

367
00:17:50,970 --> 00:17:54,870
you're absolutely right listen up dude

368
00:17:52,799 --> 00:17:59,369
up che seems or explosions or anything

369
00:17:54,869 --> 00:18:00,659
no no no buddy nobody hits anyway it's

370
00:17:59,369 --> 00:18:02,699
really amazing yeah how's that

371

00:18:00,660 --> 00:18:04,610
impossible yeah but but that's an

372
00:18:02,700 --> 00:18:07,259
interesting point you bring up because

373
00:18:04,609 --> 00:18:09,839
one of the things that captivated me in

374
00:18:07,259 --> 00:18:11,429
the original series was the special

375
00:18:09,839 --> 00:18:12,750
effects and I have to you know i'll be

376
00:18:11,429 --> 00:18:14,190
upfront about that of course i was a

377
00:18:12,750 --> 00:18:17,220
fifteen-year-old kid that looked like i

378
00:18:14,190 --> 00:18:19,019
was in space and watching that the first

379
00:18:17,220 --> 00:18:22,429
series the first episode of the new

380
00:18:19,019 --> 00:18:24,470
series there is a wonderful moment and

381
00:18:22,429 --> 00:18:27,019
I don't think it lasts more than five or

382
00:18:24,470 --> 00:18:29,419
six seconds where you're hovering above

383
00:18:27,019 --> 00:18:32,298
the Great Red Spot on Jupiter it's got

384
00:18:29,419 --> 00:18:34,610
depth oh yes and I nearly fell off my

385
00:18:32,298 --> 00:18:36,589

chair if you look at the clouds are

386

00:18:34,609 --> 00:18:39,258

turning yeah yeah so if you if you look

387

00:18:36,589 --> 00:18:41,749

carefully everything there is in motion

388

00:18:39,259 --> 00:18:43,639

yeah so they're like turbulent Eddie's

389

00:18:41,749 --> 00:18:46,100

what we learn from our close approaches

390

00:18:43,638 --> 00:18:49,729

to the outer planets is that yes the

391

00:18:46,099 --> 00:18:52,009

Great Red Spot is a coherent turning

392

00:18:49,730 --> 00:18:54,259

system but on the boundary between the

393

00:18:52,009 --> 00:18:56,149

red spot and the outer areas there are

394

00:18:54,259 --> 00:18:59,259

these like turbulent little Eddie's that

395

00:18:56,148 --> 00:19:02,058

represent many little circular

396

00:18:59,259 --> 00:19:04,038

circulation systems and and in that view

397

00:19:02,058 --> 00:19:06,288

use if you watch it carefully you will

398

00:19:04,038 --> 00:19:08,210

see them turn and and let me say that

399

00:19:06,288 --> 00:19:11,419

for the first seven or eight versions of

400
00:19:08,210 --> 00:19:14,090
that shot they didn't turn and a writer

401
00:19:11,419 --> 00:19:16,278
Gumbo's who's our VFX supervisor and

402
00:19:14,089 --> 00:19:17,928
who's done a a balut brilliant job you

403
00:19:16,278 --> 00:19:22,429
know he'd show it to me I'd say they're

404
00:19:17,929 --> 00:19:25,309
not turning okay and he he created

405
00:19:22,429 --> 00:19:27,980
something magnificent and they now they

406
00:19:25,308 --> 00:19:29,808
now turn because you know if you're

407
00:19:27,980 --> 00:19:32,269
looking at a world and it's not turning

408
00:19:29,808 --> 00:19:35,298
or you're looking at up you know I cloud

409
00:19:32,269 --> 00:19:38,868
a system or a storm system it's not

410
00:19:35,298 --> 00:19:41,690
moving mmm you and that your ability to

411
00:19:38,868 --> 00:19:43,878
suspend disbelief fractures you've got

412
00:19:41,690 --> 00:19:47,110
to get the physics right and what we've

413
00:19:43,878 --> 00:19:51,048
tried very hard with Brannon Braga and

414
00:19:47,109 --> 00:19:55,359
director one end bill pope and with

415
00:19:51,048 --> 00:19:58,249
writer gambeson these geniuses is to

416
00:19:55,359 --> 00:20:00,439
really do our utmost to get the physics

417
00:19:58,249 --> 00:20:03,829
right know that you really have the

418
00:20:00,440 --> 00:20:05,720
fullness of being out in the university

419
00:20:03,829 --> 00:20:07,398
well that scene did it for me I mean I

420
00:20:05,720 --> 00:20:10,909
was enjoying the show but just that

421
00:20:07,398 --> 00:20:13,609
brief moment of the depth by the way

422
00:20:10,909 --> 00:20:16,490
even if you didn't notice that the

423
00:20:13,609 --> 00:20:18,918
clouds were in motion you're consciously

424
00:20:16,490 --> 00:20:21,079
your brain would have and because if

425
00:20:18,919 --> 00:20:24,350
it's a if they're not moving you know

426
00:20:21,079 --> 00:20:26,898
intuitively my life experience that it

427
00:20:24,349 --> 00:20:28,428
must be just a static photo in my

428

00:20:26,898 --> 00:20:31,339
backdrop and we're just trying to

429
00:20:28,429 --> 00:20:32,900
juxtapose it and you fool you it's the

430
00:20:31,339 --> 00:20:35,659
tiniest little move

431
00:20:32,900 --> 00:20:38,960
your brain recognizes that it's not just

432
00:20:35,660 --> 00:20:41,870
a fake photo juxtaposition that it's

433
00:20:38,960 --> 00:20:43,220
real I'm you were really there not sure

434
00:20:41,869 --> 00:20:45,319
you were really and you were really

435
00:20:43,220 --> 00:20:48,950
actually you did the rest of the heavy

436
00:20:45,319 --> 00:20:51,470
lifting we're Sweeting us the viewer

437
00:20:48,950 --> 00:20:52,940
everyone I think having to ask bill Polk

438
00:20:51,470 --> 00:20:56,360
the director of target okay where's the

439
00:20:52,940 --> 00:20:58,070
spot right now they put a little X on

440
00:20:56,359 --> 00:21:00,379
the green screen okay that's the spot

441
00:20:58,069 --> 00:21:02,269
let me go there don't let must both

442
00:21:00,380 --> 00:21:03,950

actors know that well yeah I know if I

443

00:21:02,269 --> 00:21:06,710

was really new to this yeah yeah a

444

00:21:03,950 --> 00:21:09,170

couple of the other things that I really

445

00:21:06,710 --> 00:21:11,240

I really stood out for me in the new

446

00:21:09,170 --> 00:21:14,029

episode because I am very familiar with

447

00:21:11,240 --> 00:21:17,599

the theory in a series of course clearly

448

00:21:14,029 --> 00:21:19,579

I um was that the new bits and pieces of

449

00:21:17,599 --> 00:21:21,889

wing being dropped in like the rogue

450

00:21:19,579 --> 00:21:23,659

planets I found completely fascinating

451

00:21:21,890 --> 00:21:27,620

and that's a bit of new science I mean

452

00:21:23,660 --> 00:21:29,330

the idea of rogue planets let me see

453

00:21:27,619 --> 00:21:33,619

when did that begin in mid 80s I would

454

00:21:29,329 --> 00:21:37,339

say there was a an attempt to create a

455

00:21:33,619 --> 00:21:39,379

solar system from scratch okay and when

456

00:21:37,339 --> 00:21:41,240

you do that everyone so it probably

457
00:21:39,380 --> 00:21:44,030
would look like our solar system because

458
00:21:41,240 --> 00:21:47,089
why would we be unusual in this exercise

459
00:21:44,029 --> 00:21:50,000
yeah then we start discovering but sorry

460
00:21:47,089 --> 00:21:51,409
this in the 80s we're making other solar

461
00:21:50,000 --> 00:21:54,950
systems other starts as they look like

462
00:21:51,410 --> 00:21:57,080
ours yeah in the 1990s we start

463
00:21:54,950 --> 00:21:59,330
discovering other star systems because

464
00:21:57,079 --> 00:22:00,980
exoplanets were that and we found out

465
00:21:59,329 --> 00:22:03,500
that their jupiter-sized planets

466
00:22:00,980 --> 00:22:06,079
orbiting really close to the host stars

467
00:22:03,500 --> 00:22:08,269
and would who ordered that whatever came

468
00:22:06,079 --> 00:22:10,490
out of anything and then when so they

469
00:22:08,269 --> 00:22:12,019
revisited the models the computer models

470
00:22:10,490 --> 00:22:14,630
of this and realize that there's

471
00:22:12,019 --> 00:22:16,190
episodes of planet migration that go on

472
00:22:14,630 --> 00:22:18,110
at the beginning of the formation of a

473
00:22:16,190 --> 00:22:21,620
solar system and at the largest planet

474
00:22:18,109 --> 00:22:24,049
in a migrating inward at the cost of

475
00:22:21,619 --> 00:22:27,289
flinging other planets out of the solar

476
00:22:24,049 --> 00:22:29,899
system and in fact the Sol system star

477
00:22:27,289 --> 00:22:33,069
systems may be created with twice as

478
00:22:29,900 --> 00:22:36,500
many planets as are ultimately stable in

479
00:22:33,069 --> 00:22:38,168
there mature lives and so we have eight

480
00:22:36,500 --> 00:22:39,700
planets now we might have had 20

481
00:22:38,169 --> 00:22:42,820
at the beginning where are they they are

482
00:22:39,700 --> 00:22:44,558
cast adrift Wow the rogue plan rogue

483
00:22:42,819 --> 00:22:47,918
planet it's so romantic it's like the

484
00:22:44,558 --> 00:22:49,749
flying dutchman you know oh my god great

485

00:22:47,919 --> 00:22:52,419
Annika great analogy what a world

486
00:22:49,749 --> 00:22:54,399
without a star it is really like ship

487
00:22:52,419 --> 00:22:57,129
without a crew or captain it's the

488
00:22:54,398 --> 00:22:59,558
petrol night time right and it would

489
00:22:57,128 --> 00:23:01,118
have to be large enough of course we

490
00:22:59,558 --> 00:23:03,220
picked a rogue star that would be

491
00:23:01,118 --> 00:23:04,329
interesting to visit I mean I rode the

492
00:23:03,220 --> 00:23:07,618
planet that would be interesting to

493
00:23:04,329 --> 00:23:10,449
visit for for the rogue planet that we

494
00:23:07,618 --> 00:23:13,388
selected it has to be large enough to

495
00:23:10,450 --> 00:23:16,200
have retained its heat of formation so

496
00:23:13,388 --> 00:23:18,638
that you could have sold sort of liquid

497
00:23:16,200 --> 00:23:21,460
it could in a way be in its own

498
00:23:18,638 --> 00:23:24,368
Goldilocks own meals where that is the

499
00:23:21,460 --> 00:23:26,590

heat retain from its formation can melt

500

00:23:24,368 --> 00:23:29,949

whatever is frozen there because it's

501

00:23:26,589 --> 00:23:31,480

not near any local star and so it would

502

00:23:29,950 --> 00:23:33,129

otherwise be completely frozen word

503

00:23:31,480 --> 00:23:34,269

enough for this retained heat it's the

504

00:23:33,128 --> 00:23:35,798

same heat in earth that makes the

505

00:23:34,269 --> 00:23:37,269

volcanoes and the plate tectonics yeah

506

00:23:35,798 --> 00:23:39,519

Paul isn't that none of us traceable to

507

00:23:37,269 --> 00:23:42,009

the Sun so imagine an earth cast adrift

508

00:23:39,519 --> 00:23:43,960

and which Jupiter could do it at the

509

00:23:42,009 --> 00:23:44,950

snap of a finger the Jupiter started

510

00:23:43,960 --> 00:23:47,019

moving and weird in the solar system

511

00:23:44,950 --> 00:23:48,879

earth would still have all this heat

512

00:23:47,019 --> 00:23:50,470

earth would have volcanoes and plate

513

00:23:48,878 --> 00:23:54,009

tectonics and all the rest of this and

514
00:23:50,470 --> 00:23:55,690
so we chose a large enough planet so

515
00:23:54,009 --> 00:23:57,339
that you can then have this interesting

516
00:23:55,690 --> 00:23:58,389
things to talk about it'd be smaller

517
00:23:57,339 --> 00:24:00,730
ones that would just be completely

518
00:23:58,388 --> 00:24:03,128
frozen over and be less interesting than

519
00:24:00,730 --> 00:24:05,079
the one we pick modulus cast adrift it

520
00:24:03,128 --> 00:24:09,969
wouldn't Mars like what happen Martha's

521
00:24:05,079 --> 00:24:12,999
dead yes yeah yes exactly and the idea

522
00:24:09,970 --> 00:24:16,450
you know the rogue planet was a twofer

523
00:24:12,999 --> 00:24:18,669
for us because it was also an ability to

524
00:24:16,450 --> 00:24:21,788
introduce the idea of seeing in

525
00:24:18,669 --> 00:24:23,769
different kinds of light and that's

526
00:24:21,788 --> 00:24:26,408
another theme that was good i don't up

527
00:24:23,769 --> 00:24:29,138
fast most of these episodes no and I

528
00:24:26,409 --> 00:24:32,619
might say with great pride I do believe

529
00:24:29,138 --> 00:24:36,788
that in the original series Steve soda

530
00:24:32,618 --> 00:24:39,220
Carl Sagan and I wrote that the missus

531
00:24:36,788 --> 00:24:42,249
before that the very first exoplanet had

532
00:24:39,220 --> 00:24:43,900
ever been discovered that the planets

533
00:24:42,249 --> 00:24:47,980
likely out number

534
00:24:43,900 --> 00:24:49,960
toys & and that was going out on a limb

535
00:24:47,980 --> 00:24:54,099
and a lot of people said Oh Carl Sagan

536
00:24:49,960 --> 00:24:57,549
he's so speculative but I'm kid that in

537
00:24:54,099 --> 00:24:59,469
global warming was another theme in the

538
00:24:57,549 --> 00:25:04,000
nineteen eighty in the original series

539
00:24:59,470 --> 00:25:07,630
produced mostly in 1979 that I think has

540
00:25:04,000 --> 00:25:11,440
held up so well my favorite line I've

541
00:25:07,630 --> 00:25:15,880
heard Carl utter is that air molecules

542

00:25:11,440 --> 00:25:18,039
don't carry passports so go wherever the

543
00:25:15,880 --> 00:25:19,600
breezes take them and they're not if you

544
00:25:18,039 --> 00:25:21,539
pollute your air over your country

545
00:25:19,599 --> 00:25:23,919
you're polluting everybody there

546
00:25:21,539 --> 00:25:26,259
absolutely yet but that's a very good

547
00:25:23,920 --> 00:25:29,650
point look I'll round off by saying that

548
00:25:26,259 --> 00:25:32,259
I I thoroughly enjoyed the first episode

549
00:25:29,650 --> 00:25:36,460
i've been really like you have a preview

550
00:25:32,259 --> 00:25:37,720
of that very nice not exactly a tribute

551
00:25:36,460 --> 00:25:39,340
to carl sagan i don't want to go that

552
00:25:37,720 --> 00:25:40,900
far in the first episode but an

553
00:25:39,339 --> 00:25:42,519
acknowledgement and important

554
00:25:40,900 --> 00:25:44,019
acknowledgement to carl sagan in the

555
00:25:42,519 --> 00:25:47,139
first episode which i thought was very

556
00:25:44,019 --> 00:25:50,109

well done because it could have gone too

557

00:25:47,140 --> 00:25:52,810

far right and then that wasn't the point

558

00:25:50,109 --> 00:25:54,359

it's there and it's powerful the other

559

00:25:52,809 --> 00:25:57,879

thing what I think that I think the goal

560

00:25:54,359 --> 00:26:00,009

was to fold it was in case you never

561

00:25:57,880 --> 00:26:03,520

knew who Carl Sagan was this in this

562

00:26:00,009 --> 00:26:10,750

very short of course montage we capture

563

00:26:03,519 --> 00:26:12,339

that but also why am I hosting and there

564

00:26:10,750 --> 00:26:15,480

anything because you are absolutely

565

00:26:12,339 --> 00:26:19,959

without equal the best person on earth

566

00:26:15,480 --> 00:26:22,589

that's about 15 so this is what I wasn't

567

00:26:19,960 --> 00:26:22,590

available right

568

00:26:23,170 --> 00:26:29,570

the day before they started shooting

569

00:26:25,369 --> 00:26:32,179

we've had mono nobody no in fact other

570

00:26:29,569 --> 00:26:35,329

people were available no no there's no

571
00:26:32,180 --> 00:26:38,990
question the point there's a there's

572
00:26:35,329 --> 00:26:41,329
this sort of Baton Pass hmm you get a

573
00:26:38,990 --> 00:26:45,710
sense in that in order a torch pass on

574
00:26:41,329 --> 00:26:48,500
that allows the viewer to recognize the

575
00:26:45,710 --> 00:26:51,049
content continuity of this exercise and

576
00:26:48,500 --> 00:26:54,019
and that's there's an aspect of that is

577
00:26:51,049 --> 00:26:57,369
manifest in script where science is a is

578
00:26:54,019 --> 00:26:59,990
a never-ending yeah I noticed that too

579
00:26:57,369 --> 00:27:03,469
generational news generation one of the

580
00:26:59,990 --> 00:27:05,480
things that I set out to accomplish and

581
00:27:03,470 --> 00:27:06,980
when we started writing I started

582
00:27:05,480 --> 00:27:08,839
writing these first drafts with Steve

583
00:27:06,980 --> 00:27:12,789
Sodor who was our original co-writer on

584
00:27:08,839 --> 00:27:18,589
on the original cosmos series was to

585
00:27:12,789 --> 00:27:22,579
present to the world a vision of the

586
00:27:18,589 --> 00:27:24,619
scientific enterprise as instead of you

587
00:27:22,579 --> 00:27:27,470
know it's the crazy guy who's going to

588
00:27:24,619 --> 00:27:31,339
kill us all who is the narcissistic

589
00:27:27,470 --> 00:27:33,680
doctor faustus dr. Frankenstein you know

590
00:27:31,339 --> 00:27:35,389
who you know that crazy scientist that's

591
00:27:33,680 --> 00:27:37,789
at the heart of so many blockbuster

592
00:27:35,390 --> 00:27:39,440
movies who's a threat to everything that

593
00:27:37,789 --> 00:27:42,619
doesn't have a human relationship with

594
00:27:39,440 --> 00:27:45,350
anyone what we what we wanted to do was

595
00:27:42,619 --> 00:27:47,989
to show this community of minds and the

596
00:27:45,349 --> 00:27:51,619
mentoring that goes on and the fact that

597
00:27:47,990 --> 00:27:54,230
it's never for any one generation to see

598
00:27:51,619 --> 00:27:57,259
the whole picture but it has to be you

599

00:27:54,230 --> 00:28:00,319
know if you if you're you know let's say

600
00:27:57,259 --> 00:28:02,930
you're religious person chances are the

601
00:28:00,319 --> 00:28:04,879
doctrines that you are promoting have

602
00:28:02,930 --> 00:28:07,789
not changed very much for a couple of

603
00:28:04,880 --> 00:28:09,740
thousand years in despite what how the

604
00:28:07,789 --> 00:28:11,299
world has changed but if you're a

605
00:28:09,740 --> 00:28:13,490
scientist you have to be comfortable

606
00:28:11,299 --> 00:28:15,740
with change and you have to be willing

607
00:28:13,490 --> 00:28:18,200
to be wrong and you be willing to hand

608
00:28:15,740 --> 00:28:20,539
that baton off to the next generation

609
00:28:18,200 --> 00:28:23,509
because they are likely to see a little

610
00:28:20,539 --> 00:28:27,769
more clearly than you have seen and the

611
00:28:23,509 --> 00:28:30,470
relationship between you know Carl and

612
00:28:27,769 --> 00:28:31,799
the very young neil degrasse tyson which

613
00:28:30,470 --> 00:28:34,200

was we don't want to over

614

00:28:31,799 --> 00:28:35,579

it wasn't like they were best pals or

615

00:28:34,200 --> 00:28:37,110

anything like that keep your drinking

616

00:28:35,579 --> 00:28:39,539

buddies knowing that no but that

617

00:28:37,109 --> 00:28:42,659

reaching out of the world famous

618

00:28:39,539 --> 00:28:45,210

scientists to the young man who would

619

00:28:42,660 --> 00:28:48,300

become your world-famous yeah uh-uh

620

00:28:45,210 --> 00:28:50,160

that's what's so beautiful is that we're

621

00:28:48,299 --> 00:28:53,099

even famous in the same way kind of

622

00:28:50,160 --> 00:28:56,779

weird yeah I mean interestingly the one

623

00:28:53,099 --> 00:28:59,819

lot of ways to become famous but but I

624

00:28:56,779 --> 00:29:01,139

what I learned from Carl from seeing

625

00:28:59,819 --> 00:29:03,809

Cosmo because I was already in graduate

626

00:29:01,140 --> 00:29:06,690

school at the time so the Carl was not a

627

00:29:03,809 --> 00:29:09,659

force that got me into science Carl for

628
00:29:06,690 --> 00:29:11,309
me was a force that demonstrated that

629
00:29:09,660 --> 00:29:14,370
it's possible to bring science to the

630
00:29:11,309 --> 00:29:15,809
public in a way where people feel like

631
00:29:14,369 --> 00:29:17,399
you're just in the living room with them

632
00:29:15,809 --> 00:29:19,619
and you just it's a fireside

633
00:29:17,400 --> 00:29:21,570
conversation about the universe cool you

634
00:29:19,619 --> 00:29:25,199
don't have to pontificate there's not a

635
00:29:21,569 --> 00:29:27,389
lecture it's not a it is it is let's sit

636
00:29:25,200 --> 00:29:29,759
down and let's just talk about the

637
00:29:27,390 --> 00:29:32,270
universe and to realize how successful

638
00:29:29,759 --> 00:29:35,789
that can't be as a means of

639
00:29:32,269 --> 00:29:37,889
communicating told me that I never one

640
00:29:35,789 --> 00:29:40,649
day a communicator desk that's how I'm

641
00:29:37,890 --> 00:29:42,690
going to do it because otherwise no one

642
00:29:40,650 --> 00:29:46,680
wants to be lectured to no one wants to

643
00:29:42,690 --> 00:29:50,490
be preached to you know you you people

644
00:29:46,680 --> 00:29:53,490
want people want to feel like they're

645
00:29:50,490 --> 00:29:56,009
sort of an equal partner in the delivery

646
00:29:53,490 --> 00:29:58,529
of the information and the wisdom and

647
00:29:56,009 --> 00:30:01,200
the knowledge and the perspective it's

648
00:29:58,529 --> 00:30:03,690
the sense of Wanda in the early 1980s I

649
00:30:01,200 --> 00:30:05,610
was lucky enough to go on a wonderful

650
00:30:03,690 --> 00:30:06,960
trip with Carl Sagan through the cosmos

651
00:30:05,609 --> 00:30:09,839
we need space ship of the imagination

652
00:30:06,960 --> 00:30:11,759
and now all these years later I can get

653
00:30:09,839 --> 00:30:13,769
my passport ready jump on with neil

654
00:30:11,759 --> 00:30:15,480
degrasse tyson to continue that sense of

655
00:30:13,769 --> 00:30:18,299
wonder well then you understand exactly

656

00:30:15,480 --> 00:30:20,940
how i feel and by the way it dunk it

657
00:30:18,299 --> 00:30:22,500
doesn't require a passport yes that's a

658
00:30:20,940 --> 00:30:24,600
very that's another nice thing no

659
00:30:22,500 --> 00:30:26,519
passport needed all you need is a

660
00:30:24,599 --> 00:30:28,649
beating heart and you're welcome on

661
00:30:26,519 --> 00:30:30,539
board the ship of the imagination we

662
00:30:28,650 --> 00:30:32,480
take dead people too but the live ones

663
00:30:30,539 --> 00:30:35,279
are

664
00:30:32,480 --> 00:30:37,349
and on that note I want to sincerely

665
00:30:35,279 --> 00:30:39,980
thank the other grass Tyson for

666
00:30:37,349 --> 00:30:43,189
continuing this wonderful voyage and

667
00:30:39,980 --> 00:30:46,529
very sincerely thank you and ruin for

668
00:30:43,190 --> 00:30:50,360
kicking off this wonderful way to with

669
00:30:46,529 --> 00:30:50,359
our Carl Sagan thank you so much

670
00:30:54,140 --> 00:30:59,110

now

671

00:30:56,210 --> 00:30:59,110
come with me

672

00:31:59,700 --> 00:32:03,850
hey this is jay novella from the

673

00:32:02,230 --> 00:32:05,769
skeptics guide to the universe podcast

674

00:32:03,849 --> 00:32:07,629
did you know that there are thousands of

675

00:32:05,769 --> 00:32:09,339
skeptical reports interviews and

676

00:32:07,630 --> 00:32:12,070
investigations going back to nineteen

677

00:32:09,339 --> 00:32:15,939
eighty one free to download just visit w

678

00:32:12,069 --> 00:32:17,619
WC epic coa you click the publications

679

00:32:15,940 --> 00:32:19,360
link and enjoy almost every back issue

680

00:32:17,619 --> 00:32:21,159
of the skeptic the journal from

681

00:32:19,359 --> 00:32:22,689
australian skeptics you can also

682

00:32:21,160 --> 00:32:25,000
subscribe online and get the latest

683

00:32:22,690 --> 00:32:27,009
digital or hard copy of this the world's

684

00:32:25,000 --> 00:32:30,670
second oldest skeptical magazine that's

685
00:32:27,009 --> 00:32:41,170
ww skeptics com a you or just google

686
00:32:30,670 --> 00:32:43,330
australian skeptics welcome to a week in

687
00:32:41,170 --> 00:32:45,730
science from our ioves bring you the

688
00:32:43,329 --> 00:32:48,189
science you need to know it was one

689
00:32:45,730 --> 00:32:50,470
small step for an animal one giant leap

690
00:32:48,190 --> 00:32:52,900
for the animal kingdom but just how did

691
00:32:50,470 --> 00:32:55,539
the first vertebrates walk onto land and

692
00:32:52,900 --> 00:32:59,670
breathe air for the first time it's time

693
00:32:55,539 --> 00:32:59,670
to take a closer look at our first steps

694
00:33:01,819 --> 00:33:07,349
two recent papers reveal key insights

695
00:33:05,009 --> 00:33:09,269
into how the first vertebrates walked

696
00:33:07,349 --> 00:33:11,759
onto land and took their first breath

697
00:33:09,269 --> 00:33:14,400
the mechanism that determines whether

698
00:33:11,759 --> 00:33:16,650
you have fish fins or walking limbs is

699
00:33:14,400 --> 00:33:18,630
the rate at which a couple of hox genes

700
00:33:16,650 --> 00:33:21,179
are expressed hox genes are like

701
00:33:18,630 --> 00:33:23,700
Orchestra conductors they regulate how a

702
00:33:21,179 --> 00:33:26,100
whole suite of other genes perform and

703
00:33:23,700 --> 00:33:28,200
changing its rate of expression can

704
00:33:26,099 --> 00:33:30,689
radically alter how an organism develops

705
00:33:28,200 --> 00:33:33,029
we learn more about limb building when

706
00:33:30,690 --> 00:33:36,419
developmental embryologists switch the

707
00:33:33,029 --> 00:33:38,279
hox genes from a fish to a mouse the

708
00:33:36,419 --> 00:33:41,100
fish Hawks gene could not produce

709
00:33:38,279 --> 00:33:42,928
fingers and toes in mice thus the

710
00:33:41,099 --> 00:33:45,658
genetic apparatus required to make

711
00:33:42,929 --> 00:33:50,100
fingers and toes must have evolved after

712
00:33:45,659 --> 00:33:52,080
walking limbs developed and we also now

713

00:33:50,099 --> 00:33:54,629
know how breathing developed for the

714
00:33:52,079 --> 00:33:56,369
first time and guess what we almost

715
00:33:54,630 --> 00:33:59,190
ended up breathing through our ears a

716
00:33:56,369 --> 00:34:02,069
team studied live Polly terrod fish from

717
00:33:59,190 --> 00:34:05,640
Africa these fish have a simple lung but

718
00:34:02,069 --> 00:34:07,918
no windpipe the team found that 93% of

719
00:34:05,640 --> 00:34:09,628
the air getting into the lung came

720
00:34:07,919 --> 00:34:12,329
through holes in the tops of the head

721
00:34:09,628 --> 00:34:14,759
called spiracles being surrounded by

722
00:34:12,329 --> 00:34:16,648
bone these structures are usually found

723
00:34:14,760 --> 00:34:18,750
in fossils of advanced fish and

724
00:34:16,648 --> 00:34:21,898
primitive walking vertebrates the

725
00:34:18,750 --> 00:34:23,849
tetrapods so now we can track how this

726
00:34:21,898 --> 00:34:26,638
early breathing mechanism developed in

727
00:34:23,849 --> 00:34:29,460

more advanced tetrapods like us the

728

00:34:26,639 --> 00:34:34,190

spiracles ended up becoming our ears and

729

00:34:29,460 --> 00:34:37,079

now for fast facts about walking on land

730

00:34:34,190 --> 00:34:39,389

while a standard body plan for tetrapods

731

00:34:37,079 --> 00:34:41,789

includes five fingers and toes at the

732

00:34:39,389 --> 00:34:44,639

ends of each limb some of the earliest

733

00:34:41,789 --> 00:34:46,469

land Walker's had eight digits in recent

734

00:34:44,639 --> 00:34:48,000

years several fossil finds have

735

00:34:46,469 --> 00:34:50,209

completed the picture of every

736

00:34:48,000 --> 00:34:53,340

conceivable intermediate stage between

737

00:34:50,210 --> 00:34:55,320

advanced fish and the first land walking

738

00:34:53,340 --> 00:34:57,600

vertebrates the Queensland lungfish

739

00:34:55,320 --> 00:34:59,730

while not an immediate ancestor tool and

740

00:34:57,599 --> 00:35:01,980

walking vertebrates provides a clear

741

00:34:59,730 --> 00:35:04,469

picture of how air-breathing evolved in

742
00:35:01,980 --> 00:35:07,289
fish before they walked onto the land

743
00:35:04,469 --> 00:35:08,879
and in case you're wondering Queensland

744
00:35:07,289 --> 00:35:11,190
lungfish are supposed to taste like a

745
00:35:08,880 --> 00:35:13,230
very oily salmon and they're covered in

746
00:35:11,190 --> 00:35:14,730
a thick sticky mucus

747
00:35:13,230 --> 00:35:16,559
I know that because I had to throw my

748
00:35:14,730 --> 00:35:19,289
shirt away after handling one of them

749
00:35:16,559 --> 00:35:21,420
that's it for this week in science for

750
00:35:19,289 --> 00:35:25,170
more information on walking on land go

751
00:35:21,420 --> 00:35:28,740
to the rars website raa us okay you

752
00:35:25,170 --> 00:35:31,409
follow us on twitter at our iOS and like

753
00:35:28,739 --> 00:35:40,559
us on Facebook I'm Paul Willis and we'll

754
00:35:31,409 --> 00:35:44,149
catch you next week in a world with

755
00:35:40,559 --> 00:35:44,150
access is about

756
00:35:46,539 --> 00:35:51,509
your messages are a scene for beyond

757
00:35:54,579 --> 00:36:00,009
andreasen is sidelined for magical

758
00:35:57,708 --> 00:36:00,009
thinking

759
00:36:00,469 --> 00:36:09,799
only three men stand between the two

760
00:36:04,000 --> 00:36:11,510
morrow what date is it 787 thing this is

761
00:36:09,800 --> 00:36:13,160
impressive it's a detail system present

762
00:36:11,510 --> 00:36:16,490
they're not their photographs of Chinese

763
00:36:13,159 --> 00:36:18,259
anthem we are not well received is a

764
00:36:16,489 --> 00:36:19,939
good guard we're fully don't discuss

765
00:36:18,260 --> 00:36:21,830
cryptozoology on the show very often

766
00:36:19,940 --> 00:36:24,289
because we don't know anything about how

767
00:36:21,829 --> 00:36:25,819
the truth the price gets lower and lower

768
00:36:24,289 --> 00:36:29,320
and lower and then he hits the ceiling

769
00:36:25,820 --> 00:36:29,320
it's a ceiling for the room below

770

00:36:29,639 --> 00:36:33,778
skeptical to the k from the Most High

771
00:36:31,679 --> 00:36:41,219
skeptics society find us on iTunes or

772
00:36:33,778 --> 00:36:46,130
you know don't now it's time for dr.

773
00:36:41,219 --> 00:36:46,129
Richie reports with dr. Rachel Dunlop

774
00:36:46,518 --> 00:36:50,848
hello listeners and welcome to dr.

775
00:36:48,960 --> 00:36:53,400
Reggie reports well this week I'm

776
00:36:50,849 --> 00:36:56,039
talking to dr. ken harvey who famously

777
00:36:53,400 --> 00:36:58,108
recently quit his position as an adjunct

778
00:36:56,039 --> 00:37:00,750
professor at a university here in

779
00:36:58,108 --> 00:37:03,210
australia this was a direct result of

780
00:37:00,750 --> 00:37:05,518
Latrobe universities getting on board

781
00:37:03,210 --> 00:37:08,220
with swiss a vitamin and supplement

782
00:37:05,518 --> 00:37:11,068
company who wants the university to

783
00:37:08,219 --> 00:37:13,018
demonstrate that their products work so

784
00:37:11,068 --> 00:37:15,028

just a little bit of background i'm dr.

785

00:37:13,018 --> 00:37:16,379

ken harvey was an adjunct senior

786

00:37:15,028 --> 00:37:18,568

lecturer in the School of Public Health

787

00:37:16,380 --> 00:37:21,510

at latrobe University where he has

788

00:37:18,568 --> 00:37:24,239

worked for the last 20 years but to most

789

00:37:21,510 --> 00:37:26,880

Australians he's most well-known for his

790

00:37:24,239 --> 00:37:28,709

regular campaigning against what he sees

791

00:37:26,880 --> 00:37:31,559

as the shortfalls in Australia's

792

00:37:28,710 --> 00:37:33,900

legislation surrounding alternative and

793

00:37:31,559 --> 00:37:35,910

complementary medicine dr. Harvey

794

00:37:33,900 --> 00:37:37,950

devotes a lot of his time speaking to

795

00:37:35,909 --> 00:37:40,759

local skeptical groups but also to the

796

00:37:37,949 --> 00:37:44,038

media on these issues and trying to

797

00:37:40,759 --> 00:37:45,990

reveal how it is legislation in

798

00:37:44,039 --> 00:37:48,269

Australia that is the big problem in

799
00:37:45,989 --> 00:37:51,088
terms of regulating alternative medicine

800
00:37:48,268 --> 00:37:53,548
he's a frequent figure on TV radio and

801
00:37:51,088 --> 00:37:55,949
in print media discussing the health

802
00:37:53,548 --> 00:37:58,079
legal financial and regulatory dynamics

803
00:37:55,949 --> 00:38:01,439
peculiar to Australia's apparent

804
00:37:58,079 --> 00:38:04,589
obsession with unproven and untested cam

805
00:38:01,440 --> 00:38:06,869
therapies and today I was very lucky to

806
00:38:04,588 --> 00:38:09,538
get some time from dr. ken harvey on the

807
00:38:06,869 --> 00:38:11,190
line from skype in melbourne so welcome

808
00:38:09,539 --> 00:38:12,750
to the skeptic zone ken harvey and thank

809
00:38:11,190 --> 00:38:15,298
you for taking the time to talk to us i

810
00:38:12,750 --> 00:38:18,449
know you're very busy it's good to be

811
00:38:15,298 --> 00:38:20,670
here edgy so can you fill out this is in

812
00:38:18,449 --> 00:38:22,710
briefly on what is going on and how you

813
00:38:20,670 --> 00:38:27,240
came to resign your position recently

814
00:38:22,710 --> 00:38:29,789
from latrobe University yes well Swiss

815
00:38:27,239 --> 00:38:33,298
wellness and I love that name wellness

816
00:38:29,789 --> 00:38:35,609
and actually offered latrobe 15 million

817
00:38:33,298 --> 00:38:37,858
dollars over six years if they would

818
00:38:35,608 --> 00:38:40,858
scientifically examine the quality and

819
00:38:37,858 --> 00:38:43,199
the efficacy of their products

820
00:38:40,858 --> 00:38:46,078
and indeed a vice chancellor of research

821
00:38:43,199 --> 00:38:47,969
sort of said Swiss products will

822
00:38:46,079 --> 00:38:49,950
continue to undergo rigorous and

823
00:38:47,969 --> 00:38:53,969
independent scientific assessments

824
00:38:49,949 --> 00:38:56,699
that's rather amusing because Swiss is

825
00:38:53,969 --> 00:38:58,828
well known to have had many of its

826
00:38:56,699 --> 00:39:00,808
products so many claims rich products

827

00:38:58,829 --> 00:39:03,480
reach the australian therapy goods

828
00:39:00,809 --> 00:39:06,960
advertising code indeed i've submitted

829
00:39:03,480 --> 00:39:09,960
some of us can complaints myself for

830
00:39:06,960 --> 00:39:12,239
example a recent 71 page judgment turn

831
00:39:09,960 --> 00:39:14,789
last year on 20 television

832
00:39:12,239 --> 00:39:18,269
advertisements for a variety of products

833
00:39:14,789 --> 00:39:20,430
from swiss in which the products claimed

834
00:39:18,268 --> 00:39:23,848
they were proven clinically proven

835
00:39:20,429 --> 00:39:28,139
scientifically showing clearly tested

836
00:39:23,849 --> 00:39:30,390
etc were the independent review found

837
00:39:28,139 --> 00:39:33,058
that most of the studies swiss used when

838
00:39:30,389 --> 00:39:36,088
we come they were not representative of

839
00:39:33,059 --> 00:39:37,890
general population they didn't support

840
00:39:36,088 --> 00:39:39,869
the representations that the products

841
00:39:37,889 --> 00:39:42,480

were clinically proven to do a variety

842

00:39:39,869 --> 00:39:46,349

of things and so as I think they were

843

00:39:42,480 --> 00:39:51,480

found to breach the 30 good advertising

844

00:39:46,349 --> 00:39:53,970

code now interestingly swiss swiss were

845

00:39:51,480 --> 00:39:56,248

requested to withdraw advertisements the

846

00:39:53,969 --> 00:39:58,379

chief executive Dean to ruling

847

00:39:56,248 --> 00:40:01,018

ridiculous and it accused a panel of

848

00:39:58,380 --> 00:40:03,269

being unqualified and called for an

849

00:40:01,018 --> 00:40:05,518

immediate overhaul of the panel so

850

00:40:03,268 --> 00:40:08,159

that's pretty typical of this company I

851

00:40:05,518 --> 00:40:11,778

mean they have had a lot of complaints

852

00:40:08,159 --> 00:40:14,308

upheld they don't take them seriously

853

00:40:11,778 --> 00:40:16,559

independent umpire seriously and they

854

00:40:14,309 --> 00:40:20,460

just keep on doing it so you can imagine

855

00:40:16,559 --> 00:40:22,769

my concern when now the university had

856
00:40:20,460 --> 00:40:26,278
wanted to care to come ship with this

857
00:40:22,768 --> 00:40:28,318
which is company in addition I mean it

858
00:40:26,278 --> 00:40:29,338
has transpired that a number of that

859
00:40:28,318 --> 00:40:31,139
approached a number of other

860
00:40:29,338 --> 00:40:35,159
universities who actually turned them

861
00:40:31,139 --> 00:40:38,778
down for a variety of good reasons so

862
00:40:35,159 --> 00:40:41,429
again my concern was that if latrobe

863
00:40:38,778 --> 00:40:44,088
idea if as the chemistry department was

864
00:40:41,429 --> 00:40:47,879
going to provide the evaluations of

865
00:40:44,088 --> 00:40:50,880
Swiss products that there was a would be

866
00:40:47,880 --> 00:40:52,670
a big pressure to actually find that

867
00:40:50,880 --> 00:40:55,099
these products work and we

868
00:40:52,670 --> 00:40:57,380
that that's actually quite easy to do

869
00:40:55,099 --> 00:41:00,170
for example in one of the complaints

870
00:40:57,380 --> 00:41:02,900
that was upheld another University

871
00:41:00,170 --> 00:41:06,048
performed a battery of 60 or more tests

872
00:41:02,900 --> 00:41:08,838
of mental functioning while looking at a

873
00:41:06,048 --> 00:41:12,259
Swiss multivitamin preparation and they

874
00:41:08,838 --> 00:41:13,849
did use a placebo-controlled trial but

875
00:41:12,260 --> 00:41:16,910
found as you might have mentioned that

876
00:41:13,849 --> 00:41:19,789
running 60 tests they found about one or

877
00:41:16,909 --> 00:41:22,848
two reach statistical significance which

878
00:41:19,789 --> 00:41:24,769
the company later big deal about so in

879
00:41:22,849 --> 00:41:27,588
short I mean I think the company is

880
00:41:24,769 --> 00:41:29,719
really wanting to use research and

881
00:41:27,588 --> 00:41:33,019
university affiliation as a fig leaf of

882
00:41:29,719 --> 00:41:36,048
respectability I think it pressure on

883
00:41:33,019 --> 00:41:38,059
researchers to come up with research

884

00:41:36,048 --> 00:41:40,159
designs that allow they might meet

885
00:41:38,059 --> 00:41:43,160
ethical approval and get published in

886
00:41:40,159 --> 00:41:45,230
peer review journals in fact a design to

887
00:41:43,159 --> 00:41:47,509
produce a positive result and we know

888
00:41:45,230 --> 00:41:49,338
that's a big problem in research in the

889
00:41:47,510 --> 00:41:51,559
pharmaceutical industry I mean we know

890
00:41:49,338 --> 00:41:53,449
that industry-sponsored research is much

891
00:41:51,559 --> 00:41:56,750
more likely to produce positive outcomes

892
00:41:53,449 --> 00:41:59,029
so taking all that into account how

893
00:41:56,750 --> 00:42:02,239
could I remain so I resigned

894
00:41:59,030 --> 00:42:04,460
interestingly it has produced quite

895
00:42:02,239 --> 00:42:06,798
interesting a lot of publicity and

896
00:42:04,460 --> 00:42:08,358
debate about and universities in their

897
00:42:06,798 --> 00:42:10,219
relationships with pharmaceutical

898
00:42:08,358 --> 00:42:12,170

companies given that you are probably

899

00:42:10,219 --> 00:42:14,149

the most high-profile person in the

900

00:42:12,170 --> 00:42:15,619

country that does this kind of stuff and

901

00:42:14,150 --> 00:42:17,780

you mentioned you personally have

902

00:42:15,619 --> 00:42:21,108

reported some inverter Smith's of Swiss

903

00:42:17,780 --> 00:42:22,819

to the TGA were you consulted about this

904

00:42:21,108 --> 00:42:26,179

deal are you allowed to tell us that how

905

00:42:22,818 --> 00:42:29,058

did you find out about it well I read

906

00:42:26,179 --> 00:42:30,739

the press release which was produced by

907

00:42:29,059 --> 00:42:32,690

the University it also boasts wish

908

00:42:30,739 --> 00:42:34,939

switch REM very much like an editorial

909

00:42:32,690 --> 00:42:36,950

for Swiss actually and that was the

910

00:42:34,940 --> 00:42:39,980

first I knew you that a memorandum of

911

00:42:36,949 --> 00:42:43,489

understanding had been signed now yes I

912

00:42:39,980 --> 00:42:45,530

I had been approached in May last year

913
00:42:43,489 --> 00:42:48,500
by the head of my school of public

914
00:42:45,530 --> 00:42:50,599
health who sort of said in an email look

915
00:42:48,500 --> 00:42:52,929
they understand she understood that

916
00:42:50,599 --> 00:42:55,519
Swiss was approaching the university

917
00:42:52,929 --> 00:42:57,919
with a possibility of doing research and

918
00:42:55,519 --> 00:43:00,079
what did I think about it and I wrote

919
00:42:57,920 --> 00:43:02,240
quite a long email which I pointed out

920
00:43:00,079 --> 00:43:04,970
there's things I pointed out that this

921
00:43:02,239 --> 00:43:07,909
company did not have a good track record

922
00:43:04,969 --> 00:43:10,819
research specifically designed to show

923
00:43:07,909 --> 00:43:13,069
their products work you know ran a

924
00:43:10,820 --> 00:43:16,550
temptation of being games to produce

925
00:43:13,070 --> 00:43:18,309
those results and I did save it you know

926
00:43:16,550 --> 00:43:20,840
there were better ways of going about it

927
00:43:18,309 --> 00:43:22,460
you know i'm not against from certainly

928
00:43:20,840 --> 00:43:24,640
a supportive of research and

929
00:43:22,460 --> 00:43:27,050
complementary medicine companies or

930
00:43:24,639 --> 00:43:29,409
looking at complementary medicines and i

931
00:43:27,050 --> 00:43:32,180
said that i was supportive of it but my

932
00:43:29,409 --> 00:43:34,519
idea was that if it was to be done

933
00:43:32,179 --> 00:43:37,069
ideally it should be done with a number

934
00:43:34,519 --> 00:43:40,250
of companies producer or offering money

935
00:43:37,070 --> 00:43:43,030
for an independent center it shouldn't

936
00:43:40,250 --> 00:43:46,940
be designed to test a company's products

937
00:43:43,030 --> 00:43:48,500
and ideally it would be set up through

938
00:43:46,940 --> 00:43:51,409
winners like the Australian Research

939
00:43:48,500 --> 00:43:54,739
Council which does have grants available

940
00:43:51,409 --> 00:43:57,170
to support industry cooperation they're

941

00:43:54,739 --> 00:43:58,969
called a RC linkage grants and put up

942
00:43:57,170 --> 00:44:00,950
good protocols you usually have a couple

943
00:43:58,969 --> 00:44:03,049
of two or more of industry sponsors

944
00:44:00,949 --> 00:44:05,118
sometimes several universities it's all

945
00:44:03,050 --> 00:44:08,269
open and aboveboard and if it keeps up

946
00:44:05,119 --> 00:44:11,088
then in fact you also get a RC

947
00:44:08,269 --> 00:44:13,099
government money as well and that was

948
00:44:11,088 --> 00:44:15,829
the sort of approach that I recommended

949
00:44:13,099 --> 00:44:19,010
but i had no idea how much of that was

950
00:44:15,829 --> 00:44:21,799
conveyed to the University hierarchy I

951
00:44:19,010 --> 00:44:24,530
heard nothing more thank you as I say

952
00:44:21,800 --> 00:44:27,050
the press release was announced and

953
00:44:24,530 --> 00:44:28,790
again my feeling well as well ok

954
00:44:27,050 --> 00:44:30,050
particularly ironic because the

955
00:44:28,789 --> 00:44:32,960

university website has actually

956

00:44:30,050 --> 00:44:35,000

published some of my papers criticizing

957

00:44:32,960 --> 00:44:39,320

Swiss but I presume they hadn't bothered

958

00:44:35,000 --> 00:44:40,699

to read and again I resigned so um what

959

00:44:39,320 --> 00:44:42,260

do you think the university hopes to

960

00:44:40,699 --> 00:44:44,358

achieve from this is it just about them

961

00:44:42,260 --> 00:44:46,670

obtaining this 15 million dollar worth

962

00:44:44,358 --> 00:44:48,319

of funding because I can't see how this

963

00:44:46,670 --> 00:44:50,539

would be a benefit to them obviously to

964

00:44:48,320 --> 00:44:52,880

Swiss it gives them an air of legitimacy

965

00:44:50,539 --> 00:44:54,739

having they could stamp latrobe on their

966

00:44:52,880 --> 00:44:57,740

products but what's the benefit from the

967

00:44:54,739 --> 00:44:59,569

uni beyond the 15 million dollars well

968

00:44:57,739 --> 00:45:00,919

that's a benefit there's no doubt about

969

00:44:59,570 --> 00:45:04,000

it i mean if australian universities

970
00:45:00,920 --> 00:45:06,769
have been slashed and burned by

971
00:45:04,000 --> 00:45:08,869
successive governments their money has

972
00:45:06,769 --> 00:45:11,179
been cut back there very much dependent

973
00:45:08,869 --> 00:45:12,680
upon full fee paying students

974
00:45:11,179 --> 00:45:16,069
particularly overseas students

975
00:45:12,679 --> 00:45:17,480
regrettably and it has produced a lot of

976
00:45:16,070 --> 00:45:20,410
pressures that on star

977
00:45:17,480 --> 00:45:25,039
earth in the administration to get money

978
00:45:20,409 --> 00:45:27,349
and so I do believe that the 15 million

979
00:45:25,039 --> 00:45:29,599
dollars was very attractive I mean I

980
00:45:27,349 --> 00:45:31,940
think to be fair I think the university

981
00:45:29,599 --> 00:45:33,739
probably felt that they were setting up

982
00:45:31,940 --> 00:45:36,920
they sent at the complementary medicine

983
00:45:33,739 --> 00:45:38,989
research that would do some good they

984
00:45:36,920 --> 00:45:42,920
certainly said they thought it would be

985
00:45:38,989 --> 00:45:45,229
independent but again the deal with one

986
00:45:42,920 --> 00:45:48,470
company and the deal that was

987
00:45:45,230 --> 00:45:52,340
particularly everyone says was to prove

988
00:45:48,469 --> 00:45:54,829
that Swiss products work no no I I think

989
00:45:52,340 --> 00:45:57,039
it had a number of floors and it clearly

990
00:45:54,829 --> 00:45:59,358
it's hard to get between a

991
00:45:57,039 --> 00:46:01,070
vice-chancellor of the University and 15

992
00:45:59,358 --> 00:46:04,190
million dollars you should the PPA to

993
00:46:01,070 --> 00:46:06,289
the point Shh so you did touch on before

994
00:46:04,190 --> 00:46:09,260
i mean i have read quite a lot of the

995
00:46:06,289 --> 00:46:10,880
publicity surrounding your resignation

996
00:46:09,260 --> 00:46:12,680
and of course there have been a lot of

997
00:46:10,880 --> 00:46:14,930
criticisms of you and one of those has

998

00:46:12,679 --> 00:46:17,719
been that well therefore you don't

999
00:46:14,929 --> 00:46:19,250
support research into complementary

1000
00:46:17,719 --> 00:46:21,529
medicine at all now you just touched on

1001
00:46:19,250 --> 00:46:23,809
that by talking about a RC discovery

1002
00:46:21,530 --> 00:46:26,570
grass but can you extrapolate a little

1003
00:46:23,809 --> 00:46:29,570
bit about your opinions on research into

1004
00:46:26,570 --> 00:46:31,760
can you do support it don't you look of

1005
00:46:29,570 --> 00:46:34,640
course I do I support appropriate

1006
00:46:31,760 --> 00:46:37,340
research and clearly there's a number of

1007
00:46:34,639 --> 00:46:39,920
areas where research is valuable I mean

1008
00:46:37,340 --> 00:46:43,340
a number of God Western medicines have

1009
00:46:39,920 --> 00:46:44,720
come out of traditional medicines you

1010
00:46:43,340 --> 00:46:47,710
know did you tell us that a foxglove

1011
00:46:44,719 --> 00:46:50,419
aspirin at willow black more recently

1012
00:46:47,710 --> 00:46:52,789

atomosynth or resistant falciparum

1013

00:46:50,420 --> 00:46:55,849

malaria scum out of traditional chinese

1014

00:46:52,789 --> 00:46:58,159

medical knowledge so clearly we need to

1015

00:46:55,849 --> 00:47:02,420

be researching traditions and we need to

1016

00:46:58,159 --> 00:47:05,779

be researching indigenous medical

1017

00:47:02,420 --> 00:47:08,720

knowledge but again there's equally a

1018

00:47:05,780 --> 00:47:10,609

lot of unproven stuff in traditional

1019

00:47:08,719 --> 00:47:13,368

stuffing traditional stuff homeopathy is

1020

00:47:10,608 --> 00:47:14,569

a classic example of that well those

1021

00:47:13,369 --> 00:47:16,789

duffle to be proven not to work

1022

00:47:14,570 --> 00:47:19,820

homeopathy again is I think the evidence

1023

00:47:16,789 --> 00:47:23,869

is well in that it it has no scientific

1024

00:47:19,820 --> 00:47:25,670

validity so it needs good research now

1025

00:47:23,869 --> 00:47:28,460

equally well one of the problems we have

1026

00:47:25,670 --> 00:47:30,289

an assistant in Australia is that it's

1027
00:47:28,460 --> 00:47:33,079
actually costs a lot

1028
00:47:30,289 --> 00:47:35,509
I'm and money to register complementary

1029
00:47:33,079 --> 00:47:37,699
medicines and get them independently

1030
00:47:35,509 --> 00:47:39,708
validated by the Therapeutic Goods

1031
00:47:37,699 --> 00:47:41,929
Administration you've got to do glove

1032
00:47:39,708 --> 00:47:45,649
good trials as a prescription

1033
00:47:41,929 --> 00:47:46,999
pharmaceuticals put up good data and the

1034
00:47:45,650 --> 00:47:49,160
complementary medicine industry has

1035
00:47:46,998 --> 00:47:51,548
found it's just not worth fear that they

1036
00:47:49,159 --> 00:47:54,108
would much prefer to spend money on hike

1037
00:47:51,548 --> 00:47:56,179
celebrities much better return on

1038
00:47:54,108 --> 00:47:57,918
investment having said that there are a

1039
00:47:56,179 --> 00:48:00,229
couple of companies that have done the

1040
00:47:57,918 --> 00:48:02,150
hard yards in Australia and got their

1041
00:48:00,228 --> 00:48:04,278
products registered by Therapeutic Goods

1042
00:48:02,150 --> 00:48:06,588
Administration which means they spent a

1043
00:48:04,278 --> 00:48:08,838
lot of time and effort and money on good

1044
00:48:06,588 --> 00:48:11,058
clinical trials to show their products

1045
00:48:08,838 --> 00:48:12,768
work now they're the sort of companies I

1046
00:48:11,059 --> 00:48:14,209
certainly believe that universities

1047
00:48:12,768 --> 00:48:16,488
should be working with and of course

1048
00:48:14,208 --> 00:48:19,159
again as I've said before that we should

1049
00:48:16,489 --> 00:48:22,668
be doing fundamental research on

1050
00:48:19,159 --> 00:48:25,338
indigenous medicines and herbal products

1051
00:48:22,668 --> 00:48:27,108
to try to extract active ingredients so

1052
00:48:25,338 --> 00:48:28,728
you mentioned before that it was the

1053
00:48:27,108 --> 00:48:31,068
chemistry department at latrobe that was

1054
00:48:28,728 --> 00:48:32,478
planning to do these studies I presume

1055

00:48:31,068 --> 00:48:34,599
that means they're not doing clinical

1056
00:48:32,478 --> 00:48:37,098
trials or would they be coordinating

1057
00:48:34,599 --> 00:48:38,838
clinical trials or just doing say

1058
00:48:37,099 --> 00:48:41,449
analysis of the products do you know

1059
00:48:38,838 --> 00:48:45,858
what they would be involved it hasn't

1060
00:48:41,449 --> 00:48:47,088
been at all clear and indeed I mean

1061
00:48:45,858 --> 00:48:49,239
certainly the chemistry department has

1062
00:48:47,088 --> 00:48:52,308
been involved in clinical trials of

1063
00:48:49,239 --> 00:48:55,759
foods and food extracts so presumably

1064
00:48:52,309 --> 00:48:56,989
they have the capabilities I think if

1065
00:48:55,759 --> 00:48:59,119
they were try to prove it's just

1066
00:48:56,989 --> 00:49:01,519
products work it would be double-blind

1067
00:48:59,119 --> 00:49:02,959
controlled trials and I think because I

1068
00:49:01,518 --> 00:49:06,318
say the only way to do it would be to

1069
00:49:02,958 --> 00:49:08,208

game the trial design which you know has

1070

00:49:06,318 --> 00:49:10,759

been done as I mentioned by other

1071

00:49:08,208 --> 00:49:12,528

universities so again it because I touch

1072

00:49:10,759 --> 00:49:15,498

ironic I mean I and others have pointed

1073

00:49:12,528 --> 00:49:17,059

out that you know latrobe really

1074

00:49:15,498 --> 00:49:19,278

although it's got expertise in a number

1075

00:49:17,059 --> 00:49:21,229

of areas really hasn't got expertise in

1076

00:49:19,278 --> 00:49:23,719

complementary medicines and clinical

1077

00:49:21,228 --> 00:49:25,518

trials there are other universities like

1078

00:49:23,719 --> 00:49:27,278

University of Western Sydney and others

1079

00:49:25,518 --> 00:49:30,078

that have got a much better track record

1080

00:49:27,278 --> 00:49:31,969

and again as I pointed out it has turned

1081

00:49:30,079 --> 00:49:34,249

out that a number of other universities

1082

00:49:31,969 --> 00:49:36,168

some with better track records in theory

1083

00:49:34,248 --> 00:49:38,538

of the latrobe were approached and

1084
00:49:36,168 --> 00:49:40,608
turned down this was often so the other

1085
00:49:38,539 --> 00:49:44,010
thing that you mentioned before about

1086
00:49:40,608 --> 00:49:46,380
how Swiss responded to your

1087
00:49:44,010 --> 00:49:48,270
plants and from the panel from the TGA I

1088
00:49:46,380 --> 00:49:50,780
also believe that there's currently and

1089
00:49:48,269 --> 00:49:53,190
potentially a defamation case going on

1090
00:49:50,780 --> 00:49:54,840
against the the guys who do the check

1091
00:49:53,190 --> 00:49:57,480
out on the ABC and you've been a guest

1092
00:49:54,840 --> 00:49:58,890
on that show and that was in a result of

1093
00:49:57,480 --> 00:50:01,639
criticism of their products on the

1094
00:49:58,889 --> 00:50:03,980
checkout do you know much about that

1095
00:50:01,639 --> 00:50:06,000
let's check out as a consumer affairs

1096
00:50:03,980 --> 00:50:09,449
program run by australian broadcasting

1097
00:50:06,000 --> 00:50:11,550
commission it's fast-paced its

1098
00:50:09,449 --> 00:50:14,309
hard-hitting it's very funny and and yes

1099
00:50:11,550 --> 00:50:16,560
i have been involved both in helping to

1100
00:50:14,309 --> 00:50:18,659
get those programs up and i did appear

1101
00:50:16,559 --> 00:50:23,449
very briefly with a cameo appearance and

1102
00:50:18,659 --> 00:50:26,909
one of them the they certainly had a go

1103
00:50:23,449 --> 00:50:29,969
specifically at swiss and its use of

1104
00:50:26,909 --> 00:50:32,879
celebrities and alls nicole kidman it

1105
00:50:29,969 --> 00:50:35,250
was a case in point and they also waited

1106
00:50:32,880 --> 00:50:38,880
a quack good detail about her and one of

1107
00:50:35,250 --> 00:50:43,050
sources products when the complaints

1108
00:50:38,880 --> 00:50:45,480
were upheld they simply reused the

1109
00:50:43,050 --> 00:50:48,390
complaint with a new label which again

1110
00:50:45,480 --> 00:50:50,219
is a fairly common technique to handle

1111
00:50:48,389 --> 00:50:53,190
complaints with a therapy goods

1112

00:50:50,219 --> 00:50:55,230
administration if you're at risk of

1113
00:50:53,190 --> 00:50:57,720
actually having a product d-lister then

1114
00:50:55,230 --> 00:51:00,210
you just create a new one much the same

1115
00:50:57,719 --> 00:51:03,089
ingredients different name where you go

1116
00:51:00,210 --> 00:51:04,829
and that was the topic of the check out

1117
00:51:03,090 --> 00:51:07,050
program and it did the beautiful

1118
00:51:04,829 --> 00:51:12,360
resource locators are on my website and

1119
00:51:07,050 --> 00:51:15,630
it's very amusing now they the checkup

1120
00:51:12,360 --> 00:51:19,460
guys copped a lawsuit from the founder

1121
00:51:15,630 --> 00:51:22,470
of swiss of defamation about still

1122
00:51:19,460 --> 00:51:24,389
battering honors lawsuits do proceeding

1123
00:51:22,469 --> 00:51:27,269
it's slow rate so that I fairly

1124
00:51:24,389 --> 00:51:30,480
confident that it hasn't really got any

1125
00:51:27,269 --> 00:51:33,420
substance to it and certainly the check

1126
00:51:30,480 --> 00:51:35,429

out boys are certainly haven't been

1127

00:51:33,420 --> 00:51:36,750

restrained there's a new series of a

1128

00:51:35,429 --> 00:51:39,149

check out coming up and there's a

1129

00:51:36,750 --> 00:51:42,300

wonderful promo which again takes off

1130

00:51:39,150 --> 00:51:44,309

Swiss for the new series again well

1131

00:51:42,300 --> 00:51:47,430

worth looking at and cups might put the

1132

00:51:44,309 --> 00:51:49,500

uniform resource location on your on

1133

00:51:47,429 --> 00:51:51,779

your website it's really very funny

1134

00:51:49,500 --> 00:51:52,949

again it shows at the company and indeed

1135

00:51:51,780 --> 00:51:55,500

that they've taken a complaint

1136

00:51:52,949 --> 00:51:56,029

resolution panel to court to to me it's

1137

00:51:55,500 --> 00:51:58,159

a sad

1138

00:51:56,030 --> 00:52:00,410

lection on a regulatory system I mean in

1139

00:51:58,159 --> 00:52:04,099

the beginning these products had a very

1140

00:52:00,409 --> 00:52:07,579

light touch regulation in Australia it's

1141
00:52:04,099 --> 00:52:09,619
basically self certified by the sponsors

1142
00:52:07,579 --> 00:52:11,179
that they are doing the right things in

1143
00:52:09,619 --> 00:52:12,799
terms of low-risk ingredients

1144
00:52:11,179 --> 00:52:15,739
manufactured under good manufacturing

1145
00:52:12,800 --> 00:52:18,050
practice they hold the evidence handle

1146
00:52:15,739 --> 00:52:20,869
their heart that they could be evidence

1147
00:52:18,050 --> 00:52:23,510
to back up the claims now just it's a

1148
00:52:20,869 --> 00:52:25,909
trust based system and we know that it's

1149
00:52:23,510 --> 00:52:28,490
just just people ride roughshod right

1150
00:52:25,909 --> 00:52:29,960
through it the limited the

1151
00:52:28,489 --> 00:52:32,839
post-marketing surveillance has been

1152
00:52:29,960 --> 00:52:34,789
done shows 90 descent on compliance as a

1153
00:52:32,840 --> 00:52:37,579
paper just recently are actually getting

1154
00:52:34,789 --> 00:52:40,039
some publicity again showing little

1155
00:52:37,579 --> 00:52:41,989
products available for sale and haven't

1156
00:52:40,039 --> 00:52:43,550
gone even prove eliciting system Anton

1157
00:52:41,989 --> 00:52:45,679
the Australian register therapied goods

1158
00:52:43,550 --> 00:52:48,110
have different ingredients to what they

1159
00:52:45,679 --> 00:52:49,879
need to have if you have a trust based

1160
00:52:48,110 --> 00:52:51,800
system it gets abused and that's what's

1161
00:52:49,880 --> 00:52:53,840
happened in Australia regrettable well

1162
00:52:51,800 --> 00:52:56,150
can I congratulate you on taking an

1163
00:52:53,840 --> 00:52:58,430
ethical stance on this issue and I i

1164
00:52:56,150 --> 00:53:00,289
wonder if just on finishing up did you

1165
00:52:58,429 --> 00:53:02,899
imagine you would create such a fear or

1166
00:53:00,289 --> 00:53:04,789
because to our overseas listeners who

1167
00:53:02,900 --> 00:53:06,530
haven't been around here recently it's

1168
00:53:04,789 --> 00:53:08,989
been all over the press everywhere

1169

00:53:06,530 --> 00:53:11,990
you've created a huge amount of media

1170
00:53:08,989 --> 00:53:14,269
about your resignation no I didn't think

1171
00:53:11,989 --> 00:53:16,759
it wouldn't it would go so well but

1172
00:53:14,269 --> 00:53:20,059
clearly I've touched a number of nerves

1173
00:53:16,760 --> 00:53:22,100
and many many colleagues of said emails

1174
00:53:20,059 --> 00:53:25,880
are ranked me up and congratulated me

1175
00:53:22,099 --> 00:53:28,819
ma'am so it's clearly touched a nerve

1176
00:53:25,880 --> 00:53:31,309
and some sore points people also said I

1177
00:53:28,820 --> 00:53:32,960
only wish that we were so dependent upon

1178
00:53:31,309 --> 00:53:35,210
University celery and building our

1179
00:53:32,960 --> 00:53:38,420
superannuation it's hard for us to

1180
00:53:35,210 --> 00:53:40,130
resign and again there's a lot of

1181
00:53:38,420 --> 00:53:42,860
advantages being in a trailer if your

1182
00:53:40,130 --> 00:53:45,079
career having an adjunct honorary

1183
00:53:42,860 --> 00:53:48,380

non-salaried appointment much easier to

1184

00:53:45,079 --> 00:53:50,960

resign and to just speak out at this

1185

00:53:48,380 --> 00:53:53,930

point so yeah I'm pleased I've done it

1186

00:53:50,960 --> 00:53:55,730

and it certainly created a stir well you

1187

00:53:53,929 --> 00:53:58,519

are our favorite cereal complainer and

1188

00:53:55,730 --> 00:53:59,809

consumer campaigner dr. ken harvey so we

1189

00:53:58,519 --> 00:54:03,199

hope this isn't the last we hear from

1190

00:53:59,809 --> 00:54:04,670

you know keep on doing it okay thank you

1191

00:54:03,199 --> 00:54:07,549

and thanks for being on the skeptic zone

1192

00:54:04,670 --> 00:54:08,990

can hi and for the links that came was

1193

00:54:07,550 --> 00:54:09,860

referring to in that interview please

1194

00:54:08,989 --> 00:54:12,949

head to our website

1195

00:54:09,860 --> 00:54:17,019

right at skeptic zone TV and until next

1196

00:54:12,949 --> 00:54:17,019

time this has been dr. H E reports

1197

00:54:23,170 --> 00:54:28,009

did you see that UFO sighting that made

1198
00:54:25,759 --> 00:54:29,719
the news what did that latest study

1199
00:54:28,009 --> 00:54:32,150
about alternative treatments really say

1200
00:54:29,719 --> 00:54:35,088
is this photo making the rounds real or

1201
00:54:32,150 --> 00:54:36,980
hoax doubtful news is a unique website

1202
00:54:35,088 --> 00:54:39,108
featuring news about pseudoscience the

1203
00:54:36,980 --> 00:54:40,838
paranormal anomalies and questionable

1204
00:54:39,108 --> 00:54:43,788
claims framed with the skeptical view

1205
00:54:40,838 --> 00:54:45,548
come visit doubtful newscom every day

1206
00:54:43,789 --> 00:54:49,278
for news about cryptozoology

1207
00:54:45,548 --> 00:54:52,190
conspiracies shams scams and more follow

1208
00:54:49,278 --> 00:54:53,719
us on twitter at doubtful news critical

1209
00:54:52,190 --> 00:54:56,028
thinking is essential in assessing

1210
00:54:53,719 --> 00:54:59,858
today's news duffel news helps you

1211
00:54:56,028 --> 00:54:59,858
decide can you really believe this stuff

1212
00:55:10,730 --> 00:55:15,599
and give a listening to the skeptic zone

1213
00:55:13,769 --> 00:55:18,300
and as mentioned on the top of the show

1214
00:55:15,599 --> 00:55:20,929
in next week's episode will be having

1215
00:55:18,300 --> 00:55:23,760
details of how you can win that cosmos

1216
00:55:20,929 --> 00:55:26,210
prize pack courtesy of the National

1217
00:55:23,760 --> 00:55:28,380
Geographic Channel and a note for

1218
00:55:26,210 --> 00:55:30,300
sydneysiders the next Australian

1219
00:55:28,380 --> 00:55:34,920
skeptics dinner meeting will be on March

1220
00:55:30,300 --> 00:55:38,760
29th all about technophobia so-called

1221
00:55:34,920 --> 00:55:44,369
wind farm syndrome and more for more

1222
00:55:38,760 --> 00:55:45,870
information visit www.pay.com.au and

1223
00:55:44,369 --> 00:55:47,839
don't forget there's a special door

1224
00:55:45,869 --> 00:55:51,389
prize one person will have their dinner

1225
00:55:47,840 --> 00:55:54,360
free and thank you to all those people

1226

00:55:51,389 --> 00:55:56,460
those wonderful people who chip in less

1227
00:55:54,360 --> 00:56:00,030
than a dollar a week to help the skeptic

1228
00:55:56,460 --> 00:56:04,079
zone stay online on air as it were and

1229
00:56:00,030 --> 00:56:08,940
you can chip in by visiting w WK pegs on

1230
00:56:04,079 --> 00:56:11,309
TV and following the paypal links thank

1231
00:56:08,940 --> 00:56:15,210
you again but for this week this is

1232
00:56:11,309 --> 00:56:18,000
Richard Saunders looking staring

1233
00:56:15,210 --> 00:56:24,480
wistfully off into the cosmos signing

1234
00:56:18,000 --> 00:56:27,750
off from Sydney Australia you've been

1235
00:56:24,480 --> 00:56:32,309
listening to the skeptic zone visit our

1236
00:56:27,750 --> 00:56:34,769
website at www skeptics on TV for

1237
00:56:32,309 --> 00:56:37,429
comments contacts and extra video

1238
00:56:34,769 --> 00:56:37,429
reports

1239
00:56:40,358 --> 00:56:42,420
you