



1
00:00:25,480 --> 00:00:20,679
welcome to shattered reality with your

2
00:00:28,510 --> 00:00:25,490
hosts Kate Valentine and furs prepare to

3
00:00:34,410 --> 00:00:28,520
have your paradigm shifted in the truths

4
00:00:37,450 --> 00:00:34,420
questioned and now shattered reality

5
00:00:40,920 --> 00:00:37,460
well hi hi ferocious and here we are

6
00:00:43,479 --> 00:00:40,930
again yes Kate here we are

7
00:00:48,850 --> 00:00:43,489
here we are at shattered reality and

8
00:00:53,920 --> 00:00:48,860
today is May 9th 2017 got a slate that

9
00:00:57,639 --> 00:00:53,930
that time and place and we have a really

10
00:01:00,220 --> 00:00:57,649
really very very interesting show we

11
00:01:03,100 --> 00:01:00,230
love to present edge science here on

12
00:01:06,399 --> 00:01:03,110
channel reality because that's what our

13
00:01:10,870 --> 00:01:06,409

podcast is really all about is is edge

14

00:01:13,810 --> 00:01:10,880

science and this is a subject which is a

15

00:01:17,800 --> 00:01:13,820

particular interest to me and I've

16

00:01:21,149 --> 00:01:17,810

written a number of kind of layman's

17

00:01:24,820 --> 00:01:21,159

sort of thoughts about the study of

18

00:01:26,649 --> 00:01:24,830

panspermia as you know on my on my blog

19

00:01:32,710 --> 00:01:26,659

and we've discussed it a little bit on

20

00:01:36,219 --> 00:01:32,720

the webcast here so today we have dr.

21

00:01:39,789 --> 00:01:36,229

Milton Wainwright well professor Milton

22

00:01:41,830 --> 00:01:39,799

Wainwright okay PhD as a doctor of the

23

00:01:43,899 --> 00:01:41,840

University of Sheffield I think that

24

00:01:45,940 --> 00:01:43,909

they title things differently over there

25

00:01:52,179 --> 00:01:45,950

in the UK but I see that's what we have

26
00:01:55,440 --> 00:01:52,189
for today and he has been a person who

27
00:02:00,190 --> 00:01:55,450
has worked with one of my favorites

28
00:02:03,940 --> 00:02:00,200
Chandra Wickramasinghe so we have him

29
00:02:05,350 --> 00:02:03,950
here on a Skype line right now what

30
00:02:08,679 --> 00:02:05,360
would you like to how would you like to

31
00:02:11,890 --> 00:02:08,689
be spoken to how shall we call you today

32
00:02:13,509 --> 00:02:11,900
yeah just called me Milton well that's a

33
00:02:15,519 --> 00:02:13,519
very friendly answer and thank you

34
00:02:20,570 --> 00:02:15,529
because art art podcast is very

35
00:02:22,220 --> 00:02:20,580
conversational it's 10:00

36
00:02:25,060 --> 00:02:22,230
the evening to me so I may be a little

37
00:02:27,740 --> 00:02:25,070
bit drowsy oh I hope not

38
00:02:31,160 --> 00:02:27,750

we're sorry to keep you up but we're

39

00:02:38,150 --> 00:02:31,170

absolutely thrilled to have you on the

40

00:02:43,190 --> 00:02:38,160

podcast absolutely thrilled you started

41

00:02:48,590 --> 00:02:43,200

out as a botanist you were a small-town

42

00:02:53,450 --> 00:02:48,600

or semi-rural young man in it in a town

43

00:02:56,630 --> 00:02:53,460

in western England in the UK is that

44

00:02:59,150 --> 00:02:56,640

correct yeah I am I was brought up in a

45

00:03:02,990 --> 00:02:59,160

coal mining village in South Yorkshire

46

00:03:04,460 --> 00:03:03,000

which is the north of England and I was

47

00:03:06,890 --> 00:03:04,470

very interested in natural history as a

48

00:03:09,199 --> 00:03:06,900

kid I used to roam the fields and

49

00:03:11,780 --> 00:03:09,209

looking for insects caterpillars and and

50

00:03:14,000 --> 00:03:11,790

flowers and things and I had the great

51
00:03:18,350 --> 00:03:14,010
privilege to go to University to study

52
00:03:21,949 --> 00:03:18,360
botany that was way back in 68 1968 so

53
00:03:24,979 --> 00:03:21,959
from then I became a microbiology

54
00:03:27,590 --> 00:03:24,989
studying bacteria well with a background

55
00:03:29,960 --> 00:03:27,600
like that it's no wonder that you expect

56
00:03:31,930 --> 00:03:29,970
life-forms to exist other than on this

57
00:03:35,030 --> 00:03:31,940
planet I mean look at the plethora of

58
00:03:37,759 --> 00:03:35,040
life-forms you find just in a small walk

59
00:03:41,330 --> 00:03:37,769
through the woods or a drop of seawater

60
00:03:43,699 --> 00:03:41,340
or lake water I guess that's right I

61
00:03:46,490 --> 00:03:43,709
used to take little drops of pond water

62
00:03:49,100 --> 00:03:46,500
and look at the Paramecium the amoeba

63
00:03:51,620 --> 00:03:49,110

and so on and so I was really hooked

64

00:03:53,180 --> 00:03:51,630

from a very early age you know and I've

65

00:03:53,630 --> 00:03:53,190

kind of been a biologist all my life

66

00:03:57,290 --> 00:03:53,640

really

67

00:03:59,449 --> 00:03:57,300

what strange dad great because I suppose

68

00:04:00,949 --> 00:03:59,459

from a coal mining community you know

69

00:04:02,780 --> 00:04:00,959

not many kids were interested in these

70

00:04:04,400 --> 00:04:02,790

things but I I seem to naturally

71

00:04:06,590 --> 00:04:04,410

gravitate to Natural History

72

00:04:09,199 --> 00:04:06,600

I was just wondering did you ever note

73

00:04:11,870 --> 00:04:09,209

of any fossils in any other call that

74

00:04:14,000 --> 00:04:11,880

came out in fact I have a couple of

75

00:04:17,060 --> 00:04:14,010

these I didn't see any in fact I did I

76

00:04:18,949 --> 00:04:17,070

tell I tell fibs I saw a few ferns when

77

00:04:21,770 --> 00:04:18,959

we were kids when we we have to burn the

78

00:04:23,960 --> 00:04:21,780

coal of course lutely and I couldn't

79

00:04:26,510 --> 00:04:23,970

remember seeing some large ferns in the

80

00:04:29,480 --> 00:04:26,520

coal yeah and the cold dated back to God

81

00:04:32,029 --> 00:04:29,490

knows when so really young men I mean

82

00:04:33,650 --> 00:04:32,039

this planet if you had looked back 350

83

00:04:36,110 --> 00:04:33,660

million years ago you

84

00:04:39,650 --> 00:04:36,120

thought you're on an alien planet it was

85

00:04:42,230 --> 00:04:39,660

so different yeah so boy so you have

86

00:04:44,600 --> 00:04:42,240

quite a background in just the wide

87

00:04:46,880 --> 00:04:44,610

dispersion of various life-forms and I

88

00:04:50,620 --> 00:04:46,890

think that as we get into the podcast

89

00:04:54,110 --> 00:04:50,630

you are familiarity with these very tiny

90

00:04:58,610 --> 00:04:54,120

microbial and sub microbial life forms

91

00:05:00,620 --> 00:04:58,620

it begins to play very importantly in

92

00:05:04,850 --> 00:05:00,630

your story but let's not get ahead of

93

00:05:08,360 --> 00:05:04,860

ourselves what I would like to do is to

94

00:05:12,260 --> 00:05:08,370

talk about first of all exactly what

95

00:05:16,550 --> 00:05:12,270

panspermia is and how that differs from

96

00:05:18,560 --> 00:05:16,560

another term which is pan psychism that

97

00:05:21,470 --> 00:05:18,570

everything is conscious in the universe

98

00:05:23,930 --> 00:05:21,480

including stars so I think that pan

99

00:05:26,960 --> 00:05:23,940

psychism is what drew me initially to

100

00:05:29,500 --> 00:05:26,970

the idea of panspermia so could you give

101

00:05:34,190 --> 00:05:29,510

us an expert's view on what exactly

102

00:05:36,340 --> 00:05:34,200

panspermia and neo panspermia are Yeah

103

00:05:39,890 --> 00:05:36,350

right I don't know about the other term

104

00:05:41,630 --> 00:05:39,900

about being consciousness but pet

105

00:05:43,550 --> 00:05:41,640

is a very straightforward idea most

106

00:05:46,100 --> 00:05:43,560

scientists believe that life on earth

107

00:05:48,680 --> 00:05:46,110

began here that chemicals got together

108

00:05:50,330 --> 00:05:48,690

in a warm pond as Darwin would say and

109

00:05:53,000 --> 00:05:50,340

these chemicals got together to make

110

00:05:55,250 --> 00:05:53,010

proto life early life and then this

111

00:05:58,640 --> 00:05:55,260

early life became microbial and then

112

00:06:00,050 --> 00:05:58,650

evolved into humans and so on we we all

113

00:06:03,230 --> 00:06:00,060

know this story this is called the

114

00:06:04,760 --> 00:06:03,240

chemical theory of evolution now people

115

00:06:06,830 --> 00:06:04,770

are interested in panspermia said well

116

00:06:08,720 --> 00:06:06,840

this didn't happen on earth necessarily

117

00:06:11,810 --> 00:06:08,730

it could have happened here but the main

118

00:06:15,260 --> 00:06:11,820

source of life was from outer space that

119

00:06:17,840 --> 00:06:15,270

organisms are proto organisms came from

120

00:06:21,020 --> 00:06:17,850

elsewhere and they were continually

121

00:06:23,480 --> 00:06:21,030

coming in all the time but obviously the

122

00:06:26,140 --> 00:06:23,490

her new hot now as soon as the earth

123

00:06:29,750 --> 00:06:26,150

cooled then these organisms could

124

00:06:33,860 --> 00:06:29,760

develop on earth and spread multiply and

125

00:06:36,200 --> 00:06:33,870

then they evolved into the full range of

126
00:06:40,000 --> 00:06:36,210
life on Earth so basically it's saying

127
00:06:42,710 --> 00:06:40,010
that life came from space okay but

128
00:06:45,500 --> 00:06:42,720
microbial sorts of life we're not

129
00:06:47,480 --> 00:06:45,510
speaking Heroes fully developed aliens

130
00:06:48,710 --> 00:06:47,490
or anything

131
00:06:49,939 --> 00:06:48,720
we're not talking about aliens now we're

132
00:06:53,420 --> 00:06:49,949
talking about a straightforward

133
00:06:55,159 --> 00:06:53,430
scientific theory but it just sort of

134
00:06:57,140 --> 00:06:55,169
begs the question though does it because

135
00:06:58,460 --> 00:06:57,150
I mean whether life began here or

136
00:07:02,900 --> 00:06:58,470
somewhere else

137
00:07:05,600 --> 00:07:02,910
it still began and philosophical point

138
00:07:07,999 --> 00:07:05,610

you know the human mind is wired to

139

00:07:09,770 --> 00:07:08,009

think in terms of beginnings and ends so

140

00:07:11,839 --> 00:07:09,780

quite naturally we think of life must

141

00:07:15,020 --> 00:07:11,849

beginning mm-hmm now it may well be that

142

00:07:16,309 --> 00:07:15,030

life was eternal now don't want to be

143

00:07:18,830 --> 00:07:16,319

ripped there this is not a religious

144

00:07:22,249 --> 00:07:18,840

notion it's just a philosophical notion

145

00:07:23,480 --> 00:07:22,259

that maybe life always was but we can't

146

00:07:26,450 --> 00:07:23,490

kind of get our minds around that

147

00:07:28,390 --> 00:07:26,460

because we think of being born dying

148

00:07:31,189 --> 00:07:28,400

getting married getting divorced

149

00:07:32,990 --> 00:07:31,199

starting a degree we're thinking - were

150

00:07:34,670 --> 00:07:33,000

hardwired to think in terms of

151

00:07:36,230 --> 00:07:34,680

beginnings and ends mm-hmm so it's

152

00:07:38,809 --> 00:07:36,240

almost impossible for us to get around

153

00:07:41,600 --> 00:07:38,819

the idea that life may always have been

154

00:07:43,129 --> 00:07:41,610

but that's a possibility mm-hmm well yes

155

00:07:46,219 --> 00:07:43,139

that is a possibility

156

00:07:49,040 --> 00:07:46,229

by all means and just to clear up what I

157

00:07:51,529 --> 00:07:49,050

meant by pants psychism for those

158

00:07:55,399 --> 00:07:51,539

listeners and something to the effect

159

00:07:58,339 --> 00:07:55,409

that many of the quantum physicists

160

00:08:01,339 --> 00:07:58,349

maintain especially Max Planck who said

161

00:08:03,260 --> 00:08:01,349

basically consciousness is fundamental

162

00:08:04,760 --> 00:08:03,270

you can't get behind consciousness and

163

00:08:07,610 --> 00:08:04,770

there are people out there including

164

00:08:10,070 --> 00:08:07,620

some astronomers I believe that that

165

00:08:12,560 --> 00:08:10,080

think that heavenly bodies such as

166

00:08:14,959 --> 00:08:12,570

neutron stars might have a form of

167

00:08:17,870 --> 00:08:14,969

consciousness and of course that this is

168

00:08:23,899 --> 00:08:17,880

a philosophical motion besides that that

169

00:08:26,870 --> 00:08:23,909

is very very akin to animism and in on

170

00:08:29,270 --> 00:08:26,880

earth people who believe in animism so

171

00:08:31,279 --> 00:08:29,280

just to clear that up a little bit I

172

00:08:33,260 --> 00:08:31,289

guess to a regular kind of scientist

173

00:08:36,469 --> 00:08:33,270

although I'm kind of a bit of a heretic

174

00:08:37,880 --> 00:08:36,479

I guess that would be you know quite

175

00:08:40,130 --> 00:08:37,890

well left field as you say over there

176
00:08:42,620 --> 00:08:40,140
but panspermia is a very straightforward

177
00:08:46,280 --> 00:08:42,630
scientific concept it's not to do with

178
00:08:48,560 --> 00:08:46,290
aliens or anything complex basically

179
00:08:52,819 --> 00:08:48,570
we're just saying that life came now

180
00:08:55,310 --> 00:08:52,829
Neil panspermia is a term that I coined

181
00:08:57,439 --> 00:08:55,320
saying that not only did life come and

182
00:08:59,870 --> 00:08:57,449
originated from space it's coming all

183
00:09:00,440 --> 00:08:59,880
the time so as you step outside the door

184
00:09:03,370 --> 00:09:00,450
this

185
00:09:05,450 --> 00:09:03,380
whatever all day long you will be

186
00:09:06,890 --> 00:09:05,460
potentially covered in microorganisms

187
00:09:09,530 --> 00:09:06,900
from space and this is what we've

188
00:09:12,950 --> 00:09:09,540

concentrated our research on this idea

189

00:09:14,510 --> 00:09:12,960

of neo neo meaning new of course so that

190

00:09:16,490 --> 00:09:14,520

life is coming in all the time not just

191

00:09:17,240 --> 00:09:16,500

that it originated but it's coming in

192

00:09:20,360 --> 00:09:17,250

all the time

193

00:09:22,880 --> 00:09:20,370

good well listen the question that I

194

00:09:26,170 --> 00:09:22,890

want to raise or this point that I want

195

00:09:31,130 --> 00:09:26,180

to make is that my personal interest in

196

00:09:35,420 --> 00:09:31,140

panspermia came a long time ago I guess

197

00:09:37,430 --> 00:09:35,430

it was in the 90s when it was somebody

198

00:09:38,740 --> 00:09:37,440

who you have worked with that Chandra

199

00:09:42,380 --> 00:09:38,750

Wickramasinghe

200

00:09:44,780 --> 00:09:42,390

when he was talking about the red rain

201
00:09:46,180 --> 00:09:44,790
that fell on parts of India and in the

202
00:09:49,220 --> 00:09:46,190
Indian Ocean

203
00:09:52,910 --> 00:09:49,230
can we go to a little bit to that and

204
00:09:59,240 --> 00:09:52,920
your your interactions with dr. wick

205
00:10:01,760 --> 00:09:59,250
aramis Singh fine yeah Chandra was

206
00:10:03,920 --> 00:10:01,770
working with Fred Hoyle way back in the

207
00:10:05,450 --> 00:10:03,930
seventies in fact in fact at that time

208
00:10:08,360 --> 00:10:05,460
they were publishing most of their

209
00:10:11,680 --> 00:10:08,370
papers in the major scientific journal

210
00:10:14,870 --> 00:10:11,690
Nature and this was a new idea and

211
00:10:16,970 --> 00:10:14,880
people were quite open to the idea as

212
00:10:19,490 --> 00:10:16,980
time went by they produce more and more

213
00:10:21,860 --> 00:10:19,500

evidence but paradoxically it became

214

00:10:23,390 --> 00:10:21,870

less and less fashionable so they really

215

00:10:26,270 --> 00:10:23,400

had to work over the last twenty thirty

216

00:10:29,810 --> 00:10:26,280

years to kind of get this idea accepted

217

00:10:31,250 --> 00:10:29,820

by scientists now I never met Fred Hoyle

218

00:10:33,890 --> 00:10:31,260

fair dial of course a famous astronomer

219

00:10:36,020 --> 00:10:33,900

mathematician should have got the Nobel

220

00:10:37,910 --> 00:10:36,030

Prize but was denied it I never actually

221

00:10:39,740 --> 00:10:37,920

met him although I I heard him you have

222

00:10:42,740 --> 00:10:39,750

a lecture in Sheffield many years ago

223

00:10:46,190 --> 00:10:42,750

but Chandra and I had been working now

224

00:10:49,720 --> 00:10:46,200

for about 17 years because I first

225

00:10:53,180 --> 00:10:49,730

started working with Chandra just just

226

00:10:54,740 --> 00:10:53,190

after 2000 I think and basically what

227

00:10:56,810 --> 00:10:54,750

happened was very interesting I had been

228

00:10:59,210 --> 00:10:56,820

lecturing on panspermia to my students

229

00:11:01,160 --> 00:10:59,220

and taking an interest in it but I

230

00:11:02,810 --> 00:11:01,170

assume that Chandra would have all the

231

00:11:04,760 --> 00:11:02,820

microbiologists they ever needed because

232

00:11:07,520 --> 00:11:04,770

people would be interested in this

233

00:11:10,460 --> 00:11:07,530

fantastic idea so I never contacted him

234

00:11:13,010 --> 00:11:10,470

but I wrote a letter there was a lot of

235

00:11:14,310 --> 00:11:13,020

criticism of his work Fred Hoyles work I

236

00:11:16,680 --> 00:11:14,320

wrote a letter to a

237

00:11:18,930 --> 00:11:16,690

scientific journal saying this guy's you

238

00:11:21,240 --> 00:11:18,940

know extremely intelligent the idea of

239

00:11:24,480 --> 00:11:21,250

panspermia is very scientific etc

240

00:11:27,060 --> 00:11:24,490

defending the idea and to my amazement

241

00:11:29,730 --> 00:11:27,070

Chandra emailed me and said would you

242

00:11:34,110 --> 00:11:29,740

like to work with me cool

243

00:11:35,640 --> 00:11:34,120

I said Wow you know to my mind every

244

00:11:38,280 --> 00:11:35,650

microbiologist in the world would want

245

00:11:41,100 --> 00:11:38,290

to do this but he said no basically

246

00:11:43,890 --> 00:11:41,110

because of the question of of their

247

00:11:46,350 --> 00:11:43,900

career etc their status they didn't want

248

00:11:50,160 --> 00:11:46,360

to get involved in this it was too off

249

00:11:52,440 --> 00:11:50,170

the wall to kind of alien associated and

250

00:11:54,440 --> 00:11:52,450

so on so I was more than delighted to go

251

00:11:57,300 --> 00:11:54,450

down to Cardiff where he was working and

252

00:12:01,050 --> 00:11:57,310

joined this team and we worked now for

253

00:12:04,140 --> 00:12:01,060

17 years or more well that's fantastic I

254

00:12:05,880 --> 00:12:04,150

I have not only have admiration for what

255

00:12:09,050 --> 00:12:05,890

you're doing but I have enormous

256

00:12:12,060 --> 00:12:09,060

admiration for both sir Fred Hoyle and

257

00:12:14,430 --> 00:12:12,070

Chandra Wickramasinghe now sir Fred yeah

258

00:12:16,830 --> 00:12:14,440

what so neat the Royal astronomer at one

259

00:12:20,250 --> 00:12:16,840

time I don't think he was but he was

260

00:12:21,990 --> 00:12:20,260

extremely it was he extremely well I

261

00:12:24,330 --> 00:12:22,000

can't you know I honestly don't know

262

00:12:27,360 --> 00:12:24,340

that but he was certainly very eminence

263

00:12:29,490 --> 00:12:27,370

a very eminent science fiction writer of

264

00:12:31,290 --> 00:12:29,500

course as well wrote the black the book

265

00:12:33,540 --> 00:12:31,300

the black cloud which is can still be

266

00:12:36,440 --> 00:12:33,550

read and enjoyed today so Fred Hoyle was

267

00:12:39,510 --> 00:12:36,450

a genius beyond beyond all doubt now

268

00:12:41,850 --> 00:12:39,520

Chandra has been working on this idea

269

00:12:44,250 --> 00:12:41,860

now for a world best part of 20 or 30

270

00:12:45,630 --> 00:12:44,260

odd years and he's come in for a

271

00:12:48,660 --> 00:12:45,640

tremendous amount of ill-informed

272

00:12:50,880 --> 00:12:48,670

criticism mmm-hmm even racism he comes

273

00:12:54,210 --> 00:12:50,890

from Sri Lanka and he's add he showed me

274

00:12:55,380 --> 00:12:54,220

letters of abusive kind of interaction

275

00:12:57,060 --> 00:12:55,390

god knows what it gets on the internet

276

00:12:57,810 --> 00:12:57,070

because these were letters that's

277

00:13:00,470 --> 00:12:57,820

terrible

278

00:13:03,480 --> 00:13:00,480

a lot of trolling and so on and so forth

279

00:13:08,550 --> 00:13:03,490

very nasty racist comments because of

280

00:13:10,770 --> 00:13:08,560

course panspermia is very badly placed

281

00:13:13,290 --> 00:13:10,780

in the sense that it attacks always

282

00:13:16,200 --> 00:13:13,300

seems to attack religion and science or

283

00:13:19,740 --> 00:13:16,210

at least Darwinism right so the

284

00:13:22,200 --> 00:13:19,750

doughiness don't like it and the extreme

285

00:13:23,430 --> 00:13:22,210

religious people don't like it so your

286

00:13:27,000 --> 00:13:23,440

bang in the middle and you get a lot of

287

00:13:28,309 --> 00:13:27,010

criticism from either side well your

288

00:13:32,550 --> 00:13:28,319

work

289

00:13:38,939 --> 00:13:32,560

in the last years less recent years has

290

00:13:42,329 --> 00:13:38,949

been very very clever very wonderful

291

00:13:46,019 --> 00:13:42,339

ideas that a person could do without a

292

00:13:48,749 --> 00:13:46,029

lot of money I understand and it

293

00:13:52,139 --> 00:13:48,759

involves weather balloons and if I were

294

00:13:55,949 --> 00:13:52,149

to say in very plain language you send

295

00:14:00,960 --> 00:13:55,959

something like a disk drive you know in

296

00:14:04,350 --> 00:14:00,970

a an envelope which is impermeable until

297

00:14:07,019 --> 00:14:04,360

it reaches the stratosphere up on a a

298

00:14:09,449 --> 00:14:07,029

weather balloon at which point it opens

299

00:14:14,189 --> 00:14:09,459

up and reveals something like a petri

300

00:14:17,189 --> 00:14:14,199

dish and then the organisms are captured

301
00:14:18,930 --> 00:14:17,199
and then it's almost go ahead almost

302
00:14:23,699 --> 00:14:18,940
there but not quite okay let us know

303
00:14:25,980 --> 00:14:23,709
yeah our our initial work was done with

304
00:14:27,809 --> 00:14:25,990
scientists in India now the Indians are

305
00:14:28,379 --> 00:14:27,819
very good at sending balloons into the

306
00:14:30,269 --> 00:14:28,389
stratosphere

307
00:14:31,860 --> 00:14:30,279
they send massive balloons we were

308
00:14:34,259 --> 00:14:31,870
sending massive blooms a massive

309
00:14:36,629 --> 00:14:34,269
payloads and we will find him Adri

310
00:14:39,059 --> 00:14:36,639
bacteria in the stratosphere now for

311
00:14:41,249 --> 00:14:39,069
various reasons we were kind of

312
00:14:42,960 --> 00:14:41,259
sidelined out of that work make basic

313
00:14:45,840 --> 00:14:42,970

because we couldn't find the funding in

314

00:14:47,819 --> 00:14:45,850

the UK to continue with the work so I

315

00:14:49,710 --> 00:14:47,829

was in a bit of a loose end and then I

316

00:14:51,480 --> 00:14:49,720

got an email from a friend of mine

317

00:14:53,309 --> 00:14:51,490

saying that within the University of

318

00:14:55,650 --> 00:14:53,319

Sheffield in the engineering department

319

00:14:57,329 --> 00:14:55,660

of all places there were two PhD

320

00:14:59,759 --> 00:14:57,339

students who were making money out of

321

00:15:02,309 --> 00:14:59,769

little business send him balloons to the

322

00:15:04,139 --> 00:15:02,319

stratosphere now what what they were

323

00:15:06,660 --> 00:15:04,149

doing and they still do is say you

324

00:15:08,550 --> 00:15:06,670

wanted to propose to your loved one you

325

00:15:10,860 --> 00:15:08,560

could have a little proposal sent into

326

00:15:12,329 --> 00:15:10,870

the interspace it would be filmed and

327

00:15:15,269 --> 00:15:12,339

you could show this at your wedding you

328

00:15:16,710 --> 00:15:15,279

know ah he proposed to me in space so

329

00:15:19,620 --> 00:15:16,720

you pay a couple hundred dollars for

330

00:15:21,269 --> 00:15:19,630

this it's very good way of making a

331

00:15:23,670 --> 00:15:21,279

little bit of money so the students were

332

00:15:26,100 --> 00:15:23,680

doing this and I got them into my office

333

00:15:29,340 --> 00:15:26,110

and I said this is fantastic

334

00:15:31,199 --> 00:15:29,350

are you interested in sending these

335

00:15:34,259 --> 00:15:31,209

balloons to the stratosphere and doing

336

00:15:36,059 --> 00:15:34,269

scientific study and they said yeah

337

00:15:37,620 --> 00:15:36,069

we're interested obviously you have to

338

00:15:40,639 --> 00:15:37,630

pay us a little bit of money to cover

339

00:15:42,319 --> 00:15:40,649

the costs so I did and we then

340

00:15:45,170 --> 00:15:42,329

sat down a thought of an experiment now

341

00:15:46,609 --> 00:15:45,180

I want to do it simple and cheap as

342

00:15:49,269 --> 00:15:46,619

before because the large balloons from

343

00:15:51,259 --> 00:15:49,279

India were costing us around about

344

00:15:54,079 --> 00:15:51,269

three-quarters of a million dollars per

345

00:15:55,579 --> 00:15:54,089

flight Wow nope you can see that that

346

00:15:58,009 --> 00:15:55,589

was getting pretty ridiculous

347

00:15:59,809 --> 00:15:58,019

yeah though what we thought about I

348

00:16:02,689 --> 00:15:59,819

don't know exactly thought about it was

349

00:16:06,799 --> 00:16:02,699

we would make a box and put into this

350

00:16:09,079 --> 00:16:06,809

box essentially a CD drawer and we could

351
00:16:11,449 --> 00:16:09,089
then open the CD drawer as you say in

352
00:16:14,660 --> 00:16:11,459
the stratosphere at any height we chose

353
00:16:16,280 --> 00:16:14,670
by GPS and everything's sterile of

354
00:16:19,249 --> 00:16:16,290
course there's no point doing it if it's

355
00:16:21,410 --> 00:16:19,259
not sterile and the drawer would open

356
00:16:24,919 --> 00:16:21,420
and we put these little stubs little

357
00:16:26,989 --> 00:16:24,929
kind of round objects which we could

358
00:16:29,449 --> 00:16:26,999
then put into an electron microscope a

359
00:16:31,730 --> 00:16:29,459
very high-powered microscope directly

360
00:16:34,460 --> 00:16:31,740
now anything that fell from the

361
00:16:36,350 --> 00:16:34,470
stratosphere onto the stubs that the

362
00:16:39,259 --> 00:16:36,360
draw would close and it would be

363
00:16:40,790 --> 00:16:39,269

contained within the box so there was no

364

00:16:43,400 --> 00:16:40,800

way that you get contamination it was

365

00:16:45,379 --> 00:16:43,410

old them extremely sterile we would then

366

00:16:48,439 --> 00:16:45,389

take the box to a clean room where

367

00:16:52,790 --> 00:16:48,449

there's no microbes there's no complaint

368

00:16:55,540 --> 00:16:52,800

area we'd open the box and we put the

369

00:16:58,610 --> 00:16:55,550

stubs into the microscope and then we'd

370

00:17:01,879 --> 00:16:58,620

do a vision of the surface to see what

371

00:17:06,409 --> 00:17:01,889

was there and what did you find

372

00:17:08,809 --> 00:17:06,419

well let me admit that I kind of wasn't

373

00:17:10,669 --> 00:17:08,819

hoping to find very much I thought okay

374

00:17:14,059 --> 00:17:10,679

I'll do this because it's there as it

375

00:17:18,939 --> 00:17:14,069

were and when I looked at my screen the

376

00:17:22,760 --> 00:17:18,949

students brought this into my my office

377

00:17:27,319 --> 00:17:22,770

and I was just gobsmacked absolutely I

378

00:17:29,450 --> 00:17:27,329

just gasped with amazement because here

379

00:17:32,960 --> 00:17:29,460

we had some very unusual organisms

380

00:17:36,230 --> 00:17:32,970

remember before we'd been catching kind

381

00:17:38,810 --> 00:17:36,240

of ordinary bacteria but here we had

382

00:17:42,620 --> 00:17:38,820

some very strange organisms now I've

383

00:17:45,289 --> 00:17:42,630

been a microbiologist biologist I guess

384

00:17:47,600 --> 00:17:45,299

for 40 odd years now if you include my

385

00:17:49,760 --> 00:17:47,610

childhood I said suppose after century

386

00:17:52,279 --> 00:17:49,770

50 years I'd never seen anything like

387

00:17:53,990 --> 00:17:52,289

this and believe me I know my microbes

388

00:17:56,120 --> 00:17:54,000

after all that time

389

00:18:00,560 --> 00:17:56,130

I've never seen anything like it and I

390

00:18:03,290 --> 00:18:00,570

was just absolutely amazed just a quick

391

00:18:07,310 --> 00:18:03,300

question did you do a control send up a

392

00:18:09,310 --> 00:18:07,320

CD that didn't open and came back yeah

393

00:18:13,490 --> 00:18:09,320

yeah we do that we did that we found

394

00:18:15,050 --> 00:18:13,500

Audrey kind of pieces of grass pollen on

395

00:18:18,530 --> 00:18:15,060

the outside of the box we always find

396

00:18:20,810 --> 00:18:18,540

that but nothing inside so the contents

397

00:18:23,300 --> 00:18:20,820

inside remained totally sterile on the

398

00:18:25,970 --> 00:18:23,310

control flight and when you say was the

399

00:18:30,620 --> 00:18:25,980

differential was that just shape or was

400

00:18:32,750 --> 00:18:30,630

a morphology or was a shape slightly

401
00:18:35,960 --> 00:18:32,760
larger than bacteria around about 10 to

402
00:18:39,710 --> 00:18:35,970
40 microns understands the kind of size

403
00:18:42,800 --> 00:18:39,720
differential and very unusual shape so

404
00:18:44,540 --> 00:18:42,810
we're talking about morphology now the

405
00:18:46,820 --> 00:18:44,550
question is how do we know they are

406
00:18:48,590 --> 00:18:46,830
biological because when we do this we

407
00:18:50,840 --> 00:18:48,600
get a lot of cosmic dust we get little

408
00:18:53,900 --> 00:18:50,850
bits of cosmic dust which are in organic

409
00:18:56,210 --> 00:18:53,910
they're made up of silicon iron and on

410
00:18:58,400 --> 00:18:56,220
the electron microscope which can look

411
00:19:02,360 --> 00:18:58,410
at very small objects we have a special

412
00:19:04,490 --> 00:19:02,370
machine called an EDX or an EDX which we

413
00:19:07,010 --> 00:19:04,500

can put a crosshair onto the particle

414

00:19:12,350 --> 00:19:07,020

we're looking at press a button and get

415

00:19:14,660 --> 00:19:12,360

a total elemental analysis good yes

416

00:19:19,580 --> 00:19:14,670

amazing machine mm-hmm the inorganic

417

00:19:22,910 --> 00:19:19,590

stuff comes up as well as I say iron so

418

00:19:24,800 --> 00:19:22,920

any inorganic material silicon obviously

419

00:19:28,280 --> 00:19:24,810

but when we do it on the biological

420

00:19:30,680 --> 00:19:28,290

particles we only get carbon oxygen and

421

00:19:32,510 --> 00:19:30,690

a small amount of nitrogen now that

422

00:19:38,600 --> 00:19:32,520

tells us these are organic

423

00:19:39,610 --> 00:19:38,610

they are biological entities hydrogen as

424

00:19:42,050 --> 00:19:39,620

well right

425

00:19:44,090 --> 00:19:42,060

yeah but the Machine won't detect IG ah

426

00:19:45,710 --> 00:19:44,100

okay I'm cop surgeon and a little bit of

427

00:19:50,390 --> 00:19:45,720

nitrogen okay it's not very good at

428

00:19:51,620 --> 00:19:50,400

detecting nitrogen over so we we know

429

00:19:55,670 --> 00:19:51,630

they're organic we know they're not

430

00:19:57,980 --> 00:19:55,680

inorganic now we also know they've got

431

00:20:00,740 --> 00:19:57,990

what we call bilateral symmetry that's

432

00:20:02,510 --> 00:20:00,750

very important in biology you and I and

433

00:20:05,570 --> 00:20:02,520

all organisms if you put a line through

434

00:20:07,070 --> 00:20:05,580

the middle of us we have the symmetry

435

00:20:09,799 --> 00:20:07,080

and either side of us right

436

00:20:13,159 --> 00:20:09,809

all being well of course so you got two

437

00:20:14,960 --> 00:20:13,169

arms two etc and these are bilateral

438

00:20:17,299 --> 00:20:14,970

symmetry so if you put a line down the

439

00:20:18,740 --> 00:20:17,309

middle of them you get equal on either

440

00:20:20,750 --> 00:20:18,750

side now that's very important because

441

00:20:23,149 --> 00:20:20,760

if this were organic fluff

442

00:20:27,970 --> 00:20:23,159

I don't know from your bellybutton or

443

00:20:30,200 --> 00:20:27,980

somewhere then it would be kind of

444

00:20:32,480 --> 00:20:30,210

varied it would not show bilateral

445

00:20:35,769 --> 00:20:32,490

symmetry so this is why we know they're

446

00:20:40,159 --> 00:20:35,779

organisms and not just bits of fluff I

447

00:20:43,299 --> 00:20:40,169

was amazed by a picture that I saw it

448

00:20:48,580 --> 00:20:43,309

may have been on your website of

449

00:20:51,830 --> 00:20:48,590

titanium vanadium sphere Lucy and mucoid

450

00:20:53,840 --> 00:20:51,840

material and I said this is right out of

451
00:20:56,000 --> 00:20:53,850
a science fiction Wow

452
00:21:00,110 --> 00:20:56,010
this was amazing I mean you can imagine

453
00:21:02,299 --> 00:21:00,120
how amazed I was when I saw this when

454
00:21:04,370 --> 00:21:02,309
the e-tax came up on that it was as you

455
00:21:08,779 --> 00:21:04,380
say titanium mainly and a little bit of

456
00:21:10,340 --> 00:21:08,789
vanadium but when we zoomed in closer by

457
00:21:12,560 --> 00:21:10,350
the way the students are Chris rose and

458
00:21:14,149 --> 00:21:12,570
Alex Baker I must mention their names

459
00:21:18,529 --> 00:21:14,159
because they do a lot of the very

460
00:21:21,409 --> 00:21:18,539
important experimental work and when we

461
00:21:24,950 --> 00:21:21,419
zoomed in we saw organic material on the

462
00:21:27,500 --> 00:21:24,960
outside a bit like a kind of a woolly

463
00:21:29,629 --> 00:21:27,510

jumper as it were and that was exciting

464

00:21:33,080 --> 00:21:29,639

but for some reason and I don't know why

465

00:21:34,970 --> 00:21:33,090

I just said to the students is there any

466

00:21:37,430 --> 00:21:34,980

chance you can move the ball the sphere

467

00:21:40,220 --> 00:21:37,440

across and we'll see what's behind it

468

00:21:43,549 --> 00:21:40,230

I had no real understanding of why I

469

00:21:45,560 --> 00:21:43,559

said that but I just said it now these

470

00:21:47,509 --> 00:21:45,570

people work in an engineering department

471

00:21:49,460 --> 00:21:47,519

and their microscopes are far better

472

00:21:53,090 --> 00:21:49,470

than the ones we normally use in in

473

00:21:55,730 --> 00:21:53,100

biology they're incredibly sensitive etc

474

00:21:58,850 --> 00:21:55,740

and they have an amazing and amazing

475

00:21:59,870 --> 00:21:58,860

machine and this basically is a microbe

476
00:22:03,769 --> 00:21:59,880
manipulator

477
00:22:07,070 --> 00:22:03,779
it's extremely thin much thinner than a

478
00:22:10,310 --> 00:22:07,080
human hair and using this they could

479
00:22:14,419 --> 00:22:10,320
just move the ball across well when they

480
00:22:18,620 --> 00:22:14,429
move the ball across who's kind of guns

481
00:22:20,549 --> 00:22:18,630
came out of the ball to the side and we

482
00:22:24,169 --> 00:22:20,559
edex that is carbon so

483
00:22:26,759 --> 00:22:24,179
what we've got is a titanium bowl with

484
00:22:30,539 --> 00:22:26,769
biology inside it and biology on the

485
00:22:32,820 --> 00:22:30,549
outside of it and obviously this is not

486
00:22:37,460 --> 00:22:32,830
heard of on earth it's just completely

487
00:22:40,830 --> 00:22:37,470
unknown you know sounds like an egg well

488
00:22:42,570 --> 00:22:40,840

one of the things I did say and I had to

489

00:22:44,759 --> 00:22:42,580

say this for the sake of completeness I

490

00:22:46,320 --> 00:22:44,769

don't necessarily believe it but you

491

00:22:47,730 --> 00:22:46,330

know there's a theory of directed

492

00:22:51,139 --> 00:22:47,740

panspermia you must have heard about

493

00:22:54,749 --> 00:22:51,149

this yes this was the idea that aliens

494

00:22:56,909 --> 00:22:54,759

basically seed the cosmos with life and

495

00:23:00,029 --> 00:22:56,919

if this were the case this would make a

496

00:23:01,769 --> 00:23:00,039

perfect vehicle for sending life because

497

00:23:05,549 --> 00:23:01,779

it's got a titanium sphere which in

498

00:23:08,519 --> 00:23:05,559

connective of course very durable and

499

00:23:10,950 --> 00:23:08,529

let's go do it now I don't particularly

500

00:23:13,409 --> 00:23:10,960

kind of push this theory because one of

501
00:23:15,769 --> 00:23:13,419
the problems is apart from this if it

502
00:23:18,239 --> 00:23:15,779
were spent sent by an alien civilization

503
00:23:20,639 --> 00:23:18,249
you'd have to find the spaceship to find

504
00:23:22,139 --> 00:23:20,649
out you know how it was sent and most

505
00:23:25,200 --> 00:23:22,149
scientists would kind of laugh at this

506
00:23:27,149 --> 00:23:25,210
idea were it not for the facts that the

507
00:23:30,600 --> 00:23:27,159
main proponent of it was Francis Crick

508
00:23:32,249 --> 00:23:30,610
how do netplay yes so Francis came up

509
00:23:34,560 --> 00:23:32,259
with this idea wrote a book about it a

510
00:23:35,970 --> 00:23:34,570
few papers and people took him seriously

511
00:23:37,859 --> 00:23:35,980
now if I'd have come up with the idea

512
00:23:40,049 --> 00:23:37,869
they'd still be laughing of course but

513
00:23:42,659 --> 00:23:40,059

when you win a Nobel Prize people tend

514

00:23:44,460 --> 00:23:42,669

to open to other source okay a little

515

00:23:46,379 --> 00:23:44,470

more attention I guess but let me ask

516

00:23:48,299 --> 00:23:46,389

you something now I don't know

517

00:23:49,710 --> 00:23:48,309

everything and you probably know more

518

00:23:53,220 --> 00:23:49,720

than me but you don't know everything

519

00:23:58,289 --> 00:23:53,230

either but in your in your experience

520

00:24:01,379 --> 00:23:58,299

how how would a titanium vanadium sphere

521

00:24:03,389 --> 00:24:01,389

form in nature on the other hand well

522

00:24:05,759 --> 00:24:03,399

for example they do have that on earth

523

00:24:10,850 --> 00:24:05,769

though foraminifera are one celled

524

00:24:13,560 --> 00:24:10,860

organisms in the ocean yeah well is that

525

00:24:16,560 --> 00:24:13,570

maybe the titanium spheres exist

526
00:24:17,850 --> 00:24:16,570
naturally anyway and these organisms are

527
00:24:21,029 --> 00:24:17,860
acting like a hermit crab

528
00:24:22,980 --> 00:24:21,039
yeah so the shell is natural or it

529
00:24:24,749 --> 00:24:22,990
occurs wherever it occurs and the

530
00:24:27,659 --> 00:24:24,759
organisms just get in there and use it

531
00:24:28,950 --> 00:24:27,669
as their home because it's difficult to

532
00:24:30,600 --> 00:24:28,960
imagine well of course you don't know

533
00:24:32,460 --> 00:24:30,610
what you're talking about in terms of

534
00:24:34,080 --> 00:24:32,470
organisms but it's difficult to imagine

535
00:24:36,570 --> 00:24:34,090
them laying down a titanium

536
00:24:41,130 --> 00:24:36,580
fear like this although nothing's

537
00:24:43,620 --> 00:24:41,140
impossible so I suspect maybe they maybe

538
00:24:46,440 --> 00:24:43,630

they're just using it as a passenger or

539

00:24:49,320 --> 00:24:46,450

a vehicle to to move around I don't know

540

00:24:51,480 --> 00:24:49,330

these are the speculations yes but then

541

00:24:54,720 --> 00:24:51,490

you'd have to speculate where titanium

542

00:24:57,600 --> 00:24:54,730

spheres exist you know and if there was

543

00:25:01,529 --> 00:24:57,610

some you know some location in space

544

00:25:03,299 --> 00:25:01,539

where it was common yep tracer we

545

00:25:05,460 --> 00:25:03,309

obviously don't know a great deal about

546

00:25:06,870 --> 00:25:05,470

these because we we're at the beginning

547

00:25:08,970 --> 00:25:06,880

of our studies and no one else is

548

00:25:10,649 --> 00:25:08,980

joining in at the moment that we're very

549

00:25:15,060 --> 00:25:10,659

much limited to what we can do ourselves

550

00:25:16,350 --> 00:25:15,070

and you know you can speculate till

551
00:25:17,850 --> 00:25:16,360
you're blue in the face of course but

552
00:25:20,370 --> 00:25:17,860
until we get more and more information

553
00:25:23,130 --> 00:25:20,380
we know we're where they're coming from

554
00:25:24,990 --> 00:25:23,140
or what they are it's really distressing

555
00:25:27,120 --> 00:25:25,000
because really a long time ago I was

556
00:25:29,639 --> 00:25:27,130
interested in exobiology and everyone

557
00:25:31,740 --> 00:25:29,649
treated as if it were UFOs and then NASA

558
00:25:33,570 --> 00:25:31,750
started to call it astrobiology and

559
00:25:35,700 --> 00:25:33,580
suddenly yeah it's a wonder I feel

560
00:25:36,930 --> 00:25:35,710
didn't well you know it's a problem with

561
00:25:38,549 --> 00:25:36,940
us job well as you know around the world

562
00:25:40,980 --> 00:25:38,559
is a lot of people are jumping on the

563
00:25:42,990 --> 00:25:40,990

bandwagon most of it is not devoted to

564

00:25:44,399 --> 00:25:43,000

looking for life in space it's looking

565

00:25:44,610 --> 00:25:44,409

for life in extreme environments on

566

00:25:47,220 --> 00:25:44,620

earth

567

00:25:49,080 --> 00:25:47,230

great so people go to the Antarctic if

568

00:25:51,539 --> 00:25:49,090

they get money to do this well it's not

569

00:25:53,130 --> 00:25:51,549

really related to space because space is

570

00:25:55,110 --> 00:25:53,140

gonna be far more extreme than the

571

00:25:57,750 --> 00:25:55,120

Antarctic or whatever so it's a good

572

00:25:59,250 --> 00:25:57,760

little bandwagon you can jump on but the

573

00:26:01,830 --> 00:25:59,260

great thing about this is we're actually

574

00:26:03,720 --> 00:26:01,840

doing something at least away from the

575

00:26:05,760 --> 00:26:03,730

earth in the stratosphere so you

576
00:26:07,260 --> 00:26:05,770
basically go ahead basically what we're

577
00:26:09,440 --> 00:26:07,270
doing is we're hoping to catch things

578
00:26:13,639 --> 00:26:09,450
that are coming in right mm-hmm

579
00:26:16,350 --> 00:26:13,649
so what you need is some really great

580
00:26:18,570 --> 00:26:16,360
scientists in other places to replicate

581
00:26:20,220 --> 00:26:18,580
your studies is that the case that's

582
00:26:23,460 --> 00:26:20,230
exactly what we need we need people to

583
00:26:25,919 --> 00:26:23,470
be open-minded as I said you intimated

584
00:26:28,049 --> 00:26:25,929
earlier on this approach costs

585
00:26:30,389 --> 00:26:28,059
relatively nothing it's a few thousand

586
00:26:32,730 --> 00:26:30,399
dollars a few thousand pounds now you

587
00:26:35,010 --> 00:26:32,740
know NASA sent sixty spent sixty billion

588
00:26:36,480 --> 00:26:35,020

dollars I don't know sending a lander to

589

00:26:37,769 --> 00:26:36,490

mark they could do this tomorrow they

590

00:26:40,110 --> 00:26:37,779

have the technology there's nothing

591

00:26:42,270 --> 00:26:40,120

complicated about it they obviously have

592

00:26:43,740 --> 00:26:42,280

the money to do it most universities

593

00:26:45,360 --> 00:26:43,750

with an electron microscope and a

594

00:26:47,890 --> 00:26:45,370

balloon we're talking about a cheap

595

00:26:50,950 --> 00:26:47,900

weather below nothing expensive

596

00:26:52,840 --> 00:26:50,960

but every scientist in the world nearly

597

00:26:55,930 --> 00:26:52,850

everyone it could be having a go at this

598

00:26:59,140 --> 00:26:55,940

but we've heard rumors of Japanese

599

00:27:00,940 --> 00:26:59,150

workers and but as yet no one is

600

00:27:02,980 --> 00:27:00,950

repeating it which is quite amazing I

601
00:27:04,990 --> 00:27:02,990
mean what the hell are they doing you

602
00:27:08,080 --> 00:27:05,000
know well why don't you give your

603
00:27:10,720 --> 00:27:08,090
website oh good I mean right now so that

604
00:27:14,500 --> 00:27:10,730
anybody who listens to this and has an

605
00:27:16,810 --> 00:27:14,510
interest they may want to do it we're

606
00:27:21,970 --> 00:27:16,820
talk to someone they know who can do it

607
00:27:23,560 --> 00:27:21,980
yeah well it's my right okay can't

608
00:27:25,510 --> 00:27:23,570
remember actually you've caught me a but

609
00:27:26,980 --> 00:27:25,520
the actual website address but if you go

610
00:27:28,300 --> 00:27:26,990
onto Google and just put Milton

611
00:27:31,570 --> 00:27:28,310
Wainwright you'll get a lot of the news

612
00:27:33,250 --> 00:27:31,580
and the the the input that and I think

613
00:27:36,010 --> 00:27:33,260

that will direct you to my website I

614

00:27:38,890 --> 00:27:36,020

said it'd be a perfect PhD thesis may be

615

00:27:41,110 --> 00:27:38,900

excellent yeah really would be very good

616

00:27:44,470 --> 00:27:41,120

yeah yeah I mean you know it would

617

00:27:46,210 --> 00:27:44,480

fantastic for pH DS or cyan't even if

618

00:27:48,160 --> 00:27:46,220

you have access to the microscope that

619

00:27:49,300 --> 00:27:48,170

the big requirement I mean you can

620

00:27:50,710 --> 00:27:49,310

collect the samples but the big

621

00:27:53,680 --> 00:27:50,720

requirement is the electron microscope

622

00:27:55,480 --> 00:27:53,690

of course so theoretically colleges

623

00:27:58,240 --> 00:27:55,490

could do it if they had a microscope and

624

00:28:00,250 --> 00:27:58,250

so on now one important point I need to

625

00:28:04,720 --> 00:28:00,260

emphasize it when we first published

626

00:28:06,940 --> 00:28:04,730

this now two points in fact we tried the

627

00:28:09,250 --> 00:28:06,950

top journals and they wouldn't even open

628

00:28:11,320 --> 00:28:09,260

the envelope as it works so we have to

629

00:28:14,110 --> 00:28:11,330

use journals which are regarded not as

630

00:28:16,360 --> 00:28:14,120

kind of like nature etc now this is one

631

00:28:19,750 --> 00:28:16,370

of the problems with doing exciting new

632

00:28:21,280 --> 00:28:19,760

work it's often the case that the top

633

00:28:23,680 --> 00:28:21,290

journals weren't entertaining now this

634

00:28:26,170 --> 00:28:23,690

is not special pleading this is the way

635

00:28:28,150 --> 00:28:26,180

of the world right now the other thing

636

00:28:30,460 --> 00:28:28,160

is that a lot of people said these

637

00:28:32,890 --> 00:28:30,470

organisms are coming from Earth it was a

638

00:28:35,590 --> 00:28:32,900

total major reaction because in our

639

00:28:37,930 --> 00:28:35,600

papers we explain why they're not coming

640

00:28:39,720 --> 00:28:37,940

from Earth now the two reasons why that

641

00:28:42,220 --> 00:28:39,730

what main two reasons are first of all

642

00:28:45,100 --> 00:28:42,230

we can do and other people have done

643

00:28:47,710 --> 00:28:45,110

this we can do calculations we can do

644

00:28:50,290 --> 00:28:47,720

modelling that says that particles

645

00:28:53,410 --> 00:28:50,300

bigger than 6 microns so just keep in

646

00:28:56,350 --> 00:28:53,420

mind the number 6 anything bigger than 6

647

00:29:00,220 --> 00:28:56,360

can't escape into the stratosphere at

648

00:29:01,980 --> 00:29:00,230

the heights we sample from we're looking

649

00:29:05,789 --> 00:29:01,990

at organisms which are in

650

00:29:08,370 --> 00:29:05,799

10 to 40 microns so six four so

651
00:29:11,190 --> 00:29:08,380
theoretically they can't escape into the

652
00:29:13,560 --> 00:29:11,200
stratosphere now you might say okay well

653
00:29:15,539 --> 00:29:13,570
that your thickness your theories are

654
00:29:19,860 --> 00:29:15,549
wrong your numbers are wrong and etc etc

655
00:29:22,830 --> 00:29:19,870
the clincher is this we've done about

656
00:29:26,940 --> 00:29:22,840
ten flights now and on no occasion do we

657
00:29:30,990 --> 00:29:26,950
find any grass pollen or anything other

658
00:29:32,580 --> 00:29:31,000
than these microbes on the stubs now if

659
00:29:34,260 --> 00:29:32,590
they were coming from Earth you would

660
00:29:36,090 --> 00:29:34,270
expect them to be covered in all this

661
00:29:37,860 --> 00:29:36,100
material sure right mm-hmm

662
00:29:40,080 --> 00:29:37,870
you'll expect the organisms will look

663
00:29:42,060 --> 00:29:40,090

you know to be in the middle of a mass

664

00:29:44,100 --> 00:29:42,070

of this stuff because obviously there's

665

00:29:45,360 --> 00:29:44,110

so much I don't know this in fact we

666

00:29:47,789 --> 00:29:45,370

might never see what we're looking at

667

00:29:50,399 --> 00:29:47,799

but these organisms are occurring in

668

00:29:52,919 --> 00:29:50,409

pristine condition they're on the stubs

669

00:29:53,490 --> 00:29:52,929

alone or in pairs there's nothing around

670

00:29:57,419 --> 00:29:53,500

them

671

00:30:00,180 --> 00:29:57,429

now unless there's a sieve which is

672

00:30:04,080 --> 00:30:00,190

impossible which takes out all the grass

673

00:30:06,930 --> 00:30:04,090

from Earth in the stratosphere and only

674

00:30:10,700 --> 00:30:06,940

lets our organisms through they must be

675

00:30:13,019 --> 00:30:10,710

coming from space or from outside earth

676

00:30:15,060 --> 00:30:13,029

the other point is that there's the

677

00:30:18,060 --> 00:30:15,070

sphere you are talking about made an

678

00:30:21,000 --> 00:30:18,070

impact event on the sampler you made a

679

00:30:23,940 --> 00:30:21,010

little crater mm-hmm now you can't get a

680

00:30:27,480 --> 00:30:23,950

crater if you're being wafted up from

681

00:30:31,019 --> 00:30:27,490

Earth the velocity is too low it must be

682

00:30:33,450 --> 00:30:31,029

coming at speed from outside so for

683

00:30:35,940 --> 00:30:33,460

these reasons we're confident and

684

00:30:38,460 --> 00:30:35,950

nobody's kind of arguing against our

685

00:30:40,590 --> 00:30:38,470

theories I mean I give these talks all

686

00:30:42,360 --> 00:30:40,600

over the world and I get the usual

687

00:30:45,090 --> 00:30:42,370

questions and everybody says oh it's

688

00:30:47,940 --> 00:30:45,100

contamination mm-hmm but at the end of

689

00:30:49,769 --> 00:30:47,950

the talk no one can say well you know I

690

00:30:51,720 --> 00:30:49,779

can shoot you down in flames this is

691

00:30:53,340 --> 00:30:51,730

nonsense

692

00:30:54,840 --> 00:30:53,350

I'd love it if somebody could tell us

693

00:30:57,480 --> 00:30:54,850

well we're going wrong because I don't I

694

00:30:59,070 --> 00:30:57,490

don't believe we are but no one can

695

00:31:01,830 --> 00:30:59,080

shoot us down in flames so I've said

696

00:31:03,960 --> 00:31:01,840

I'll well I actually I've I've run out

697

00:31:06,060 --> 00:31:03,970

of money now but I did say earlier on

698

00:31:08,820 --> 00:31:06,070

when I had some finance that I would go

699

00:31:12,389 --> 00:31:08,830

anywhere in the world to any meeting of

700

00:31:14,039 --> 00:31:12,399

scientists of whatever and they could

701
00:31:15,110 --> 00:31:14,049
shoot me down in flame reduce me to

702
00:31:19,549 --> 00:31:15,120
tears

703
00:31:23,330 --> 00:31:19,559
they could by explaining to us why we're

704
00:31:26,299 --> 00:31:23,340
going wrong and we've done that we've

705
00:31:30,410 --> 00:31:26,309
been to Sri Lanka I've been to various

706
00:31:31,100 --> 00:31:30,420
other countries in the UK a lot and no

707
00:31:33,860 --> 00:31:31,110
one yet

708
00:31:35,990 --> 00:31:33,870
shut us down in flames two two things

709
00:31:37,820 --> 00:31:36,000
here that come to my mind and one thing

710
00:31:40,820 --> 00:31:37,830
is something that we started out with

711
00:31:43,250 --> 00:31:40,830
today in our introduction with you in

712
00:31:46,460 --> 00:31:43,260
your background the other big thing is

713
00:31:50,030 --> 00:31:46,470

that these microorganisms that you are

714

00:31:52,940 --> 00:31:50,040

seeing most of them don't occur on earth

715

00:31:55,790 --> 00:31:52,950

correct now the answer to that of course

716

00:31:57,440 --> 00:31:55,800

is well we've just not seen them so you

717

00:31:59,840 --> 00:31:57,450

know I mean the criticism would be quite

718

00:32:01,700 --> 00:31:59,850

you know quite obvious well you say

719

00:32:04,490 --> 00:32:01,710

you've never seen them but maybe they

720

00:32:06,500 --> 00:32:04,500

come from a deep-sea vent you know off

721

00:32:09,740 --> 00:32:06,510

on jurors which nobody's nobody's family

722

00:32:11,990 --> 00:32:09,750

so it but that's a good comment but it

723

00:32:14,090 --> 00:32:12,000

could always be circumvented by a critic

724

00:32:17,210 --> 00:32:14,100

saying well we're just not seeing them

725

00:32:19,760 --> 00:32:17,220

yet and you just happen well the other

726

00:32:22,270 --> 00:32:19,770

comment that I was going to say is that

727

00:32:25,580 --> 00:32:22,280

maybe your critics are victims of

728

00:32:27,950 --> 00:32:25,590

scientism and and they just say well it

729

00:32:31,910 --> 00:32:27,960

can't be so that's why it's not true

730

00:32:33,290 --> 00:32:31,920

because sir it can't I don't I don't

731

00:32:35,450 --> 00:32:33,300

really want to go into this but we've

732

00:32:37,520 --> 00:32:35,460

had tremendous about a negative not

733

00:32:41,750 --> 00:32:37,530

scientific negative criticism but a lot

734

00:32:44,169 --> 00:32:41,760

of attacks on us charleen etc and also

735

00:32:48,260 --> 00:32:44,179

from the scientific community in general

736

00:32:49,370 --> 00:32:48,270

so you know I don't I I wanted people to

737

00:32:51,620 --> 00:32:49,380

attack us I want them to do

738

00:32:53,810 --> 00:32:51,630

scientifically I want us you know I am

739

00:32:55,310 --> 00:32:53,820

about to retire although I continue

740

00:32:56,570 --> 00:32:55,320

doing this work but I'm retiring from

741

00:32:59,870 --> 00:32:56,580

lecturing and so on

742

00:33:01,880 --> 00:32:59,880

I'm 67 now I'm getting a bit tired but I

743

00:33:06,200 --> 00:33:01,890

will continue with this this kind of

744

00:33:09,440 --> 00:33:06,210

work obviously but you know I I don't

745

00:33:11,299 --> 00:33:09,450

want to die thinking well you know say

746

00:33:13,610 --> 00:33:11,309

about 20 years left I'd like somebody to

747

00:33:17,720 --> 00:33:13,620

tell me exactly where we're going wrong

748

00:33:21,890 --> 00:33:17,730

or tell me we're right obviously now I

749

00:33:24,560 --> 00:33:21,900

kind of fantasize that maybe let's say I

750

00:33:27,500 --> 00:33:24,570

live until I'm 80 of 20 years lens or

751

00:33:29,659 --> 00:33:27,510

whatever there may be a compendium you

752

00:33:31,940 --> 00:33:29,669

know we've found like 10 or

753

00:33:34,340 --> 00:33:31,950

there may be this amazing compendium

754

00:33:36,260 --> 00:33:34,350

that they give to me showing thousands

755

00:33:37,880 --> 00:33:36,270

of these organisms coming in you know

756

00:33:39,770 --> 00:33:37,890

they're being collected over the next

757

00:33:42,020 --> 00:33:39,780

10-15 years or so

758

00:33:43,970 --> 00:33:42,030

well that would be tremendous yeah that

759

00:33:46,250 --> 00:33:43,980

would be wonderful excitement wouldn't

760

00:33:47,840 --> 00:33:46,260

it in fact it's very excited to come

761

00:33:50,900 --> 00:33:47,850

towards the end of my career and to get

762

00:33:52,250 --> 00:33:50,910

this you know as a scientist there's

763

00:33:54,789 --> 00:33:52,260

nothing more exciting than something

764

00:33:57,350 --> 00:33:54,799

finding something new

765

00:33:58,850 --> 00:33:57,360

absolutely and I'm hoping though

766

00:34:01,039 --> 00:33:58,860

although you pay although you pay for

767

00:34:03,500 --> 00:34:01,049

novelty by being attacked you know

768

00:34:04,490 --> 00:34:03,510

scientists we get this impression of

769

00:34:05,930 --> 00:34:04,500

science where we're given this

770

00:34:08,659 --> 00:34:05,940

impression of scientists being open

771

00:34:12,379 --> 00:34:08,669

minded etc etc but in fact there's a lot

772

00:34:13,960 --> 00:34:12,389

of antagonism to new ideas as you know

773

00:34:18,710 --> 00:34:13,970

mm-hm

774

00:34:20,470 --> 00:34:18,720

yes well I'm hoping that this podcast

775

00:34:24,940 --> 00:34:20,480

and other lectures that you've given

776

00:34:27,619 --> 00:34:24,950

inspire some person to replicate your

777

00:34:29,300 --> 00:34:27,629

you're finding somewhere around the

778

00:34:31,550 --> 00:34:29,310

world and I I can't see why they

779

00:34:33,500 --> 00:34:31,560

wouldn't do it well this is a very

780

00:34:36,080 --> 00:34:33,510

interesting could I just mention other

781

00:34:37,879 --> 00:34:36,090

thing of course people say well why is

782

00:34:39,830 --> 00:34:37,889

it important that these organisms are

783

00:34:41,780 --> 00:34:39,840

coming in and wells to things that

784

00:34:43,940 --> 00:34:41,790

people always say first of all why it's

785

00:34:45,740 --> 00:34:43,950

important well one of the things it may

786

00:34:47,990 --> 00:34:45,750

be bringing in is new information you

787

00:34:49,340 --> 00:34:48,000

know evolution we always think of and

788

00:34:51,680 --> 00:34:49,350

this is why the Darwinists don't like

789

00:34:54,109 --> 00:34:51,690

this idea they're so kind of stuck on

790

00:34:56,659 --> 00:34:54,119

the idea that information has come from

791

00:34:59,060 --> 00:34:56,669

within the biological community over

792

00:35:01,400 --> 00:34:59,070

millions of years what if information is

793

00:35:04,430 --> 00:35:01,410

coming out from out us out of space what

794

00:35:07,760 --> 00:35:04,440

is DNA and organisms coming in it will

795

00:35:09,950 --> 00:35:07,770

add new information to evolution now so

796

00:35:12,830 --> 00:35:09,960

it opens up a completely new idea of

797

00:35:15,109 --> 00:35:12,840

biology it's kind of exobiology it opens

798

00:35:16,820 --> 00:35:15,119

up our view of life in the cosmos

799

00:35:20,720 --> 00:35:16,830

yeah they don't just on this little

800

00:35:21,980 --> 00:35:20,730

rocky island a rocky planet rather now

801
00:35:24,440 --> 00:35:21,990
the other thing is people always said to

802
00:35:25,870 --> 00:35:24,450
me are they going to kill us is this the

803
00:35:29,210 --> 00:35:25,880
end of the world you know some kind of

804
00:35:31,609 --> 00:35:29,220
b-movie and my simple answer to that is

805
00:35:33,140 --> 00:35:31,619
well they've been coming in longer than

806
00:35:35,330 --> 00:35:33,150
they've been around longer than we have

807
00:35:37,640 --> 00:35:35,340
and they haven't destroyed as yet there

808
00:35:41,420 --> 00:35:37,650
is much of their much part of biology as

809
00:35:42,830 --> 00:35:41,430
we are so that I lost them Chandra and

810
00:35:44,660 --> 00:35:42,840
Fred Hoyle

811
00:35:46,730 --> 00:35:44,670
yesterday diseases might come from space

812
00:35:50,690 --> 00:35:46,740
so there's a there's a possibility of

813
00:35:54,950 --> 00:35:50,700

that but wasn't there a study awhile

814

00:35:59,000 --> 00:35:54,960

back up like it before the 20th century

815

00:36:02,180 --> 00:35:59,010

where somebody equated the passage of

816

00:36:06,410 --> 00:36:02,190

large comets through the center of the

817

00:36:08,780 --> 00:36:06,420

solar system with like flus that came

818

00:36:11,840 --> 00:36:08,790

about a few months later up to a year

819

00:36:13,880 --> 00:36:11,850

later but well from the Year dot people

820

00:36:18,740 --> 00:36:13,890

have associated comments with tragedies

821

00:36:20,720 --> 00:36:18,750

with natural disasters Halley's comet

822

00:36:22,430 --> 00:36:20,730

Halley's Comet if you will was

823

00:36:25,460 --> 00:36:22,440

associated with plagues and famines

824

00:36:28,040 --> 00:36:25,470

Celeste and Fred Hoyle and Chandra came

825

00:36:30,830 --> 00:36:28,050

up with this idea that diseases modern

826

00:36:35,500 --> 00:36:30,840

diseases like SARS and even possibly

827

00:36:38,570 --> 00:36:35,510

AIDS come from space and mutate here and

828

00:36:41,690 --> 00:36:38,580

they had new diseases now that really is

829

00:36:44,330 --> 00:36:41,700

kind of an extreme possibility problem

830

00:36:46,940 --> 00:36:44,340

with I mean if people don't believe in

831

00:36:50,150 --> 00:36:46,950

panspermia the idea of viruses from

832

00:36:52,550 --> 00:36:50,160

space is gonna be even more unbelievable

833

00:36:55,480 --> 00:36:52,560

but it's an interesting possibility yes

834

00:36:58,190 --> 00:36:55,490

okay well there's one other thing that

835

00:37:00,590 --> 00:36:58,200

ties into that and I'm trying to think

836

00:37:04,120 --> 00:37:00,600

of the gentleman's name he's recently

837

00:37:07,900 --> 00:37:04,130

deceased prematurely deceased but he

838

00:37:10,610 --> 00:37:07,910

talked about spores from mushrooms

839

00:37:13,940 --> 00:37:10,620

possibly coming in this very same way

840

00:37:16,240 --> 00:37:13,950

from space and that the spores from the

841

00:37:19,400 --> 00:37:16,250

mushrooms that crea they created

842

00:37:24,940 --> 00:37:19,410

mushrooms that were mind-expanding on

843

00:37:27,530 --> 00:37:24,950

earth and thereby a widened our oh

844

00:37:29,630 --> 00:37:27,540

that's interesting because I just looked

845

00:37:31,550 --> 00:37:29,640

at the internet before you before you

846

00:37:34,220 --> 00:37:31,560

contacted me and there's some work

847

00:37:37,940 --> 00:37:34,230

saying that Morning Glory seeds can

848

00:37:40,250 --> 00:37:37,950

survive in space Wow high levels of UV

849

00:37:41,900 --> 00:37:40,260

now Morning Glory of course as you

850

00:37:45,140 --> 00:37:41,910

possibly know he's an elusive Jen yes

851

00:37:49,070 --> 00:37:45,150

indeed some people take it like LSD

852

00:37:51,940 --> 00:37:49,080

it could be careful my dad take an awful

853

00:37:55,820 --> 00:37:51,950

lot of it though LSD cat you've tried

854

00:37:56,630 --> 00:37:55,830

obviously tried a few pounds yes I tried

855

00:37:58,789 --> 00:37:56,640

two or three

856

00:38:02,269 --> 00:37:58,799

and absolutely nothing happened I'm not

857

00:38:04,160 --> 00:38:02,279

ashamed to say yeah well so they're

858

00:38:07,339 --> 00:38:04,170

saying that maybe Morning Glory seeds

859

00:38:09,380 --> 00:38:07,349

came from soup and spare me I don't know

860

00:38:11,150 --> 00:38:09,390

about this I mean we concentrate on on

861

00:38:12,980 --> 00:38:11,160

microbes see the great thing about

862

00:38:15,710 --> 00:38:12,990

microbes is they're small and they can

863

00:38:18,019 --> 00:38:15,720

be protected from if they're covered in

864

00:38:19,549 --> 00:38:18,029

in cosmic dust or they're covered in if

865

00:38:22,190 --> 00:38:19,559

they're in a meteorite they can be

866

00:38:24,259 --> 00:38:22,200

protected from UV and radiation and the

867

00:38:27,680 --> 00:38:24,269

other thing is microbes of an extremely

868

00:38:29,539 --> 00:38:27,690

rapid reproduction rate so you can

869

00:38:31,730 --> 00:38:29,549

imagine let's just have a scenario where

870

00:38:35,150 --> 00:38:31,740

the earth is just cooling to the point

871

00:38:38,029 --> 00:38:35,160

where life is possible can exist on the

872

00:38:41,059 --> 00:38:38,039

on the planet the new planet one single

873

00:38:42,980 --> 00:38:41,069

proto life-form or a single bacterium or

874

00:38:46,910 --> 00:38:42,990

a single one of these entities if it

875

00:38:48,980 --> 00:38:46,920

lands it reproduces every 20 minutes now

876

00:38:52,130 --> 00:38:48,990

by the law of doubling which you know

877

00:38:53,960 --> 00:38:52,140

about I guess within a month or six

878

00:38:56,089 --> 00:38:53,970

months the whole of the surface of the

879

00:38:58,849 --> 00:38:56,099

earth would be covered in these life

880

00:39:00,890 --> 00:38:58,859

forms imagine that wouldn't take long

881

00:39:02,809 --> 00:39:00,900

because there's no competition there's

882

00:39:04,970 --> 00:39:02,819

nothing to eat them they've got plenty

883

00:39:07,130 --> 00:39:04,980

of nutrients they just double they

884

00:39:09,259 --> 00:39:07,140

double they double they double and so on

885

00:39:10,880 --> 00:39:09,269

and by that by six months the whole of

886

00:39:13,460 --> 00:39:10,890

the surface a if they were green for

887

00:39:16,819 --> 00:39:13,470

example will be coated in green life and

888

00:39:18,799 --> 00:39:16,829

that could then evolve it could perhaps

889

00:39:20,420 --> 00:39:18,809

interact with life that form I mean the

890

00:39:22,370 --> 00:39:20,430

possibilities that two things happened

891

00:39:24,740 --> 00:39:22,380

you should never be mutually exclusive

892

00:39:26,509 --> 00:39:24,750

maybe life did form on the earth and

893

00:39:29,630 --> 00:39:26,519

maybe a life supplement was supplemented

894

00:39:32,390 --> 00:39:29,640

from life coming in you know the two are

895

00:39:34,069 --> 00:39:32,400

not mutually exclusive but you can

896

00:39:38,450 --> 00:39:34,079

imagine how quickly they would develop

897

00:39:42,220 --> 00:39:38,460

if they this happened have you tried to

898

00:39:47,029 --> 00:39:42,230

grow like colonies of these on peat and

899

00:39:50,240 --> 00:39:47,039

well one of the problems we have we're

900

00:39:52,370 --> 00:39:50,250

limited by techniques with our

901
00:39:55,009 --> 00:39:52,380
microscope we have to cover the surface

902
00:39:56,960 --> 00:39:55,019
with gold so that we can image the

903
00:39:59,359 --> 00:39:56,970
images now once they're covered in gold

904
00:40:03,289 --> 00:39:59,369
of course we can't grow them so if we

905
00:40:05,599 --> 00:40:03,299
want to see them we can't grow them and

906
00:40:07,759 --> 00:40:05,609
if we grow them we can't see them so

907
00:40:09,529 --> 00:40:07,769
there's a problem here but there are

908
00:40:10,969 --> 00:40:09,539
other microscopes around the world which

909
00:40:12,169 --> 00:40:10,979
could do this

910
00:40:14,329 --> 00:40:12,179
now I'll tell you a very interesting

911
00:40:16,029 --> 00:40:14,339
story one of the things we want to do is

912
00:40:18,199 --> 00:40:16,039
what's called an isotope fractionation

913
00:40:20,719 --> 00:40:18,209

now an isotope fractionation is

914

00:40:24,799 --> 00:40:20,729

basically saying that say carbon has a

915

00:40:26,659 --> 00:40:24,809

different isotope ratio on earth from

916

00:40:29,449 --> 00:40:26,669

microbes in space this is what we

917

00:40:31,640 --> 00:40:29,459

theorized so if you could do a carbon or

918

00:40:34,400 --> 00:40:31,650

another element isotope fractionation on

919

00:40:36,739 --> 00:40:34,410

the on the organisms we finding and you

920

00:40:39,409 --> 00:40:36,749

may find a different ratio so they this

921

00:40:42,589 --> 00:40:39,419

would demonstrate excuse me

922

00:40:44,689 --> 00:40:42,599

hello they're coming from space now we

923

00:40:47,089 --> 00:40:44,699

don't have this machinery very expensive

924

00:40:49,459 --> 00:40:47,099

and complicated and on two or three

925

00:40:51,469 --> 00:40:49,469

occasions I've contacted laboratories

926

00:40:53,089 --> 00:40:51,479

and friends of mine have contacted

927

00:40:57,380 --> 00:40:53,099

laboratories around the world Cambridge

928

00:40:59,419 --> 00:40:57,390

for example and they've said ok we can

929

00:41:02,209 --> 00:40:59,429

do this we'll do it next month or so and

930

00:41:03,949 --> 00:41:02,219

in all cases just before they're

931

00:41:07,459 --> 00:41:03,959

supposed to do it I get an email saying

932

00:41:11,630 --> 00:41:07,469

sorry we can't do it and in all cases

933

00:41:13,370 --> 00:41:11,640

it's because generally the head of the

934

00:41:17,209 --> 00:41:13,380

Institute said we're not getting

935

00:41:19,099 --> 00:41:17,219

involved in this work because they they

936

00:41:21,739 --> 00:41:19,109

are worried it will attack their funding

937

00:41:23,839 --> 00:41:21,749

as you know science is all about funding

938

00:41:25,370 --> 00:41:23,849

now if you get associated with these

939

00:41:27,589 --> 00:41:25,380

cranks or saying light comes in from

940

00:41:30,079 --> 00:41:27,599

space mm-hmm it'll give the Institute a

941

00:41:33,469 --> 00:41:30,089

bad name so again this is not special

942

00:41:35,809 --> 00:41:33,479

pleading this is happening so it's quite

943

00:41:38,209 --> 00:41:35,819

amazing that you know this wonderful

944

00:41:41,899 --> 00:41:38,219

freedom that we expect from science it's

945

00:41:44,539 --> 00:41:41,909

not happening why I think it comes down

946

00:41:46,880 --> 00:41:44,549

to money but what interests me most

947

00:41:49,939 --> 00:41:46,890

about these things that you have found

948

00:41:54,079 --> 00:41:49,949

most of them do have carbon and oxygen

949

00:41:55,939 --> 00:41:54,089

and nitrogen and have you looked were

950

00:41:58,789 --> 00:41:55,949

there other elements present or just

951

00:42:00,799 --> 00:41:58,799

those well I mean Never Say Never but if

952

00:42:03,709 --> 00:42:00,809

you look by ok and I give lectures on

953

00:42:05,659 --> 00:42:03,719

this to my students mm-hmm you would say

954

00:42:08,899 --> 00:42:05,669

that all life by definition is

955

00:42:11,120 --> 00:42:08,909

carbon-based all right you cannot I mean

956

00:42:12,620 --> 00:42:11,130

you know unless there's some kind of

957

00:42:16,579 --> 00:42:12,630

weird chemistry that we don't know about

958

00:42:17,959 --> 00:42:16,589

and who knows life is based on carbon so

959

00:42:19,969 --> 00:42:17,969

we would expect life elsewhere in the

960

00:42:21,319 --> 00:42:19,979

cosmos to be carbon-based you know the

961

00:42:22,609 --> 00:42:21,329

science fiction writers talk about

962

00:42:24,049 --> 00:42:22,619

silicon-based life

963

00:42:25,939 --> 00:42:24,059

well silicon is that

964

00:42:28,189 --> 00:42:25,949

nonsense as far as we know I keep on

965

00:42:30,499 --> 00:42:28,199

kind of adding the caveat that as far as

966

00:42:32,410 --> 00:42:30,509

we know because as a heretic I don't

967

00:42:35,809 --> 00:42:32,420

want to suggest that everything to me

968

00:42:38,599 --> 00:42:35,819

these things are limited by my mind but

969

00:42:44,719 --> 00:42:38,609

as far as we can tell silicon for

970

00:42:47,299 --> 00:42:44,729

example it is climate right no yeah it's

971

00:42:49,969 --> 00:42:47,309

determine the source of energies no but

972

00:42:53,059 --> 00:42:49,979

so silicones out of the picture

973

00:42:55,370 --> 00:42:53,069

yeah it is but what also you also hint

974

00:42:58,219 --> 00:42:55,380

that there's a hint of a DNA type

975

00:42:59,539 --> 00:42:58,229

structure well we find it we are finding

976

00:43:01,339 --> 00:42:59,549

DNA in the stratosphere

977

00:43:03,620 --> 00:43:01,349

oh well that's pretty that's pretty

978

00:43:05,660 --> 00:43:03,630

phenomenal yeah I mean again I would

979

00:43:08,749 --> 00:43:05,670

expect I mean there's got to be some

980

00:43:10,009 --> 00:43:08,759

information system and the you know if a

981

00:43:11,749 --> 00:43:10,019

number of people are saying well maybe

982

00:43:14,479 --> 00:43:11,759

on earth even there's a different type

983

00:43:15,709 --> 00:43:14,489

of information that's not DNA now I

984

00:43:17,059 --> 00:43:15,719

don't know how they're going to

985

00:43:18,140 --> 00:43:17,069

demonstrate this because if you don't

986

00:43:20,239 --> 00:43:18,150

know what you're looking for how are you

987

00:43:22,189 --> 00:43:20,249

going to find it but some people are

988

00:43:25,160 --> 00:43:22,199

making a lot of head will making a lot

989

00:43:26,870 --> 00:43:25,170

of noise about this idea but I am kind

990

00:43:29,089 --> 00:43:26,880

of conservative about this I think life

991

00:43:32,469 --> 00:43:29,099

forms around the cosmos would be based

992

00:43:35,509 --> 00:43:32,479

on carbon they would be based on DNA and

993

00:43:37,579 --> 00:43:35,519

they would essentially be what we what

994

00:43:39,739 --> 00:43:37,589

we expect to find me here but different

995

00:43:42,339 --> 00:43:39,749

obviously they'd be modified by their

996

00:43:45,939 --> 00:43:42,349

conditions in which they're living in

997

00:43:49,429 --> 00:43:45,949

now I want to just ask you about another

998

00:43:52,069 --> 00:43:49,439

scientists work that you may be familiar

999

00:43:54,169 --> 00:43:52,079

with and I'm not asking you to critique

1000

00:43:57,079 --> 00:43:54,179

it as a given a good or bad but just

1001

00:43:59,449 --> 00:43:57,089

kind of what do you think about what

1002

00:44:03,140 --> 00:43:59,459

he's done and I'm talking about doctor

1003

00:44:05,689 --> 00:44:03,150

Richard Hoover in the US and the the

1004

00:44:10,249 --> 00:44:05,699

crinoids fossil's he seems to think he

1005

00:44:12,049 --> 00:44:10,259

found on the moment I know Mars no rich

1006

00:44:14,539 --> 00:44:12,059

in a lot of his talks in the States

1007

00:44:17,900 --> 00:44:14,549

mainly and I will critique him his works

1008

00:44:19,429 --> 00:44:17,910

amazing okay this is the kind of work

1009

00:44:22,599 --> 00:44:19,439

that people should be taking seriously

1010

00:44:25,999 --> 00:44:22,609

and repeated as you know this man was

1011

00:44:28,120 --> 00:44:26,009

kicked out where he was kind of he'd

1012

00:44:31,209 --> 00:44:28,130

retired he was working with NASA and

1013

00:44:34,489 --> 00:44:31,219

producing these amazing images of

1014

00:44:36,620 --> 00:44:34,499

fossilized not these are not living

1015

00:44:37,019 --> 00:44:36,630

organism these are fossilized organisms

1016

00:44:39,269 --> 00:44:37,029

they meet

1017

00:44:41,640 --> 00:44:39,279

rights and to microbiologists these

1018

00:44:43,049 --> 00:44:41,650

images are amazing but the people again

1019

00:44:44,370 --> 00:44:43,059

pooh-poohed them I don't think they look

1020

00:44:46,649 --> 00:44:44,380

at the evidence I think it's a knee-jerk

1021

00:44:48,390 --> 00:44:46,659

reaction and they completely ignore it

1022

00:44:49,829 --> 00:44:48,400

now every time I go to one of these

1023

00:44:52,079 --> 00:44:49,839

lectures I'm just I just come out

1024

00:44:54,539 --> 00:44:52,089

gobsmacked I'm just amazed by what he

1025

00:44:58,729 --> 00:44:54,549

shows you and yet it doesn't register in

1026
00:45:01,219 --> 00:44:58,739
the norm you know I mean it's kind of I

1027
00:45:03,719 --> 00:45:01,229
just can't understand the disconnect

1028
00:45:05,640 --> 00:45:03,729
really be people listening maybe they

1029
00:45:06,359 --> 00:45:05,650
don't want to listen maybe but it's it's

1030
00:45:09,319 --> 00:45:06,369
very good

1031
00:45:11,249 --> 00:45:09,329
extremely good work and he should be

1032
00:45:14,390 --> 00:45:11,259
they should be praised for it not

1033
00:45:18,989 --> 00:45:14,400
criticized well there was apparently a

1034
00:45:23,789 --> 00:45:18,999
what looked like a fossil on on Mars but

1035
00:45:27,839 --> 00:45:23,799
the rover the rover sorry about that the

1036
00:45:31,439 --> 00:45:27,849
rover found it and then they destroyed

1037
00:45:33,239 --> 00:45:31,449
it are you I don't know about I mean

1038
00:45:35,370 --> 00:45:33,249

obviously I read all these conspiracy

1039

00:45:37,019 --> 00:45:35,380

theories I don't like to get involved

1040

00:45:40,489 --> 00:45:37,029

too much in comes person series because

1041

00:45:42,749 --> 00:45:40,499

you know I've got enough on as it is yes

1042

00:45:44,609 --> 00:45:42,759

the you know where's the where's the

1043

00:45:48,779 --> 00:45:44,619

where can you find the proof unless I

1044

00:45:50,429 --> 00:45:48,789

mean I think there's a one of the things

1045

00:45:53,029 --> 00:45:50,439

that always amazing man written letters

1046

00:45:56,549 --> 00:45:53,039

to the London Times about this is that

1047

00:46:00,779 --> 00:45:56,559

NASA is sending these expensive Rovers

1048

00:46:03,209 --> 00:46:00,789

to planets and to cause a comments etc

1049

00:46:04,890 --> 00:46:03,219

and they're not looking for life now why

1050

00:46:06,449 --> 00:46:04,900

are they not looking for life like you

1051

00:46:08,729 --> 00:46:06,459

know any microbiologist can tell them

1052

00:46:11,370 --> 00:46:08,739

out to find life I mean they did this in

1053

00:46:15,299 --> 00:46:11,380

the 1970s with the biking issue and of

1054

00:46:17,399 --> 00:46:15,309

course there are people who suggest get

1055

00:46:20,249 --> 00:46:17,409

11 for example suggest that they did

1056

00:46:22,319 --> 00:46:20,259

demonstrate life on Mars and they kind

1057

00:46:24,959 --> 00:46:22,329

of overlooked it if you want to use that

1058

00:46:27,390 --> 00:46:24,969

expression now I don't know why that's

1059

00:46:29,969 --> 00:46:27,400

maybe it's political maybe it's kind of

1060

00:46:31,979 --> 00:46:29,979

something to do with the religious right

1061

00:46:34,169 --> 00:46:31,989

I don't know I don't I'm not party to

1062

00:46:35,729 --> 00:46:34,179

what they get up to but I would have

1063

00:46:37,319 --> 00:46:35,739

thought that they should spend more time

1064

00:46:39,749 --> 00:46:37,329

looking for life under the book they

1065

00:46:41,729 --> 00:46:39,759

they're working now on water follow the

1066

00:46:44,249 --> 00:46:41,739

water if you find water you may have

1067

00:46:46,409 --> 00:46:44,259

life well you know the argument to that

1068

00:46:48,149 --> 00:46:46,419

is well you found the water but maybe

1069

00:46:50,880 --> 00:46:48,159

there's not life so why not look for the

1070

00:46:51,990 --> 00:46:50,890

life and this really as you can imagine

1071

00:46:54,089 --> 00:46:52,000

you can hear from my the tone in my

1072

00:46:56,549 --> 00:46:54,099

voice getting excited I get really

1073

00:46:58,349 --> 00:46:56,559

annoyed about this because I think the

1074

00:47:00,870 --> 00:46:58,359

American taxpayers who are funding NASA

1075

00:47:01,859 --> 00:47:00,880

want to know one thing about the cosmos

1076

00:47:03,960 --> 00:47:01,869

is their life

1077

00:47:06,569 --> 00:47:03,970

great and they using all this taxpayers

1078

00:47:10,109 --> 00:47:06,579

money not to look for life now why is

1079

00:47:12,990 --> 00:47:10,119

that I don't know well I certainly want

1080

00:47:15,180 --> 00:47:13,000

to know I'm among the American taxpayers

1081

00:47:17,460 --> 00:47:15,190

who want to know what about you Kate I

1082

00:47:19,380 --> 00:47:17,470

would definitely like but I believe that

1083

00:47:21,779 --> 00:47:19,390

there is life so for me it's not even a

1084

00:47:23,549 --> 00:47:21,789

question you know the old UFO specialist

1085

00:47:25,650 --> 00:47:23,559

has no doubt but that there's life

1086

00:47:28,799 --> 00:47:25,660

elsewhere I mean just if you just take

1087

00:47:33,450 --> 00:47:28,809

the law of fractals alone there has to

1088

00:47:34,980 --> 00:47:33,460

be I mean it so I just think and I

1089

00:47:36,750 --> 00:47:34,990

really don't think you should waste a

1090

00:47:38,400 --> 00:47:36,760

lot of your time and money arguing with

1091

00:47:40,349 --> 00:47:38,410

skeptics just plow ahead with what

1092

00:47:48,089 --> 00:47:40,359

you're doing and produce that one great

1093

00:47:51,299 --> 00:47:48,099

paper and then tell them all it's very

1094

00:47:51,720 --> 00:47:51,309

depressing and it yeah it does you know

1095

00:47:53,670 --> 00:47:51,730

I mean I

1096

00:47:55,589 --> 00:47:53,680

they came a point when I thought I might

1097

00:47:58,410 --> 00:47:55,599

be sucked from my university position

1098

00:48:00,390 --> 00:47:58,420

yeah and a lot of people yes I'm not

1099

00:48:02,880 --> 00:48:00,400

against special pleading but you know

1100

00:48:05,220 --> 00:48:02,890

the reality of this is the reality if

1101
00:48:08,400 --> 00:48:05,230
you try and do anything outside the box

1102
00:48:10,620 --> 00:48:08,410
to use the expression you get a lot of

1103
00:48:13,109 --> 00:48:10,630
trouble and if you want to call me a

1104
00:48:15,420 --> 00:48:13,119
heretic heretics come in for a lot of

1105
00:48:17,309 --> 00:48:15,430
problems and I feel interesting heretics

1106
00:48:18,480 --> 00:48:17,319
actually have done a lot of I'm

1107
00:48:20,549 --> 00:48:18,490
interested in history of science and

1108
00:48:23,430 --> 00:48:20,559
I've done a lot of research on heretics

1109
00:48:26,339 --> 00:48:23,440
for example Jack benveniste the memory

1110
00:48:28,710 --> 00:48:26,349
of water this idea that water may have a

1111
00:48:30,210 --> 00:48:28,720
memory that aids or me on the APPA the--

1112
00:48:32,400 --> 00:48:30,220
although he never actually linked it

1113
00:48:35,999 --> 00:48:32,410

with homeopathy now I went over to Paris

1114

00:48:38,220 --> 00:48:36,009

and I met this guy and very very

1115

00:48:40,230 --> 00:48:38,230

charming he recently died unfortunately

1116

00:48:41,759 --> 00:48:40,240

but he said you know Milton I can't

1117

00:48:43,799 --> 00:48:41,769

understand this he said I was one of the

1118

00:48:46,650 --> 00:48:43,809

top scientists in France

1119

00:48:48,870 --> 00:48:46,660

Legion of Honor or whatever and then I

1120

00:48:51,720 --> 00:48:48,880

did an experiment but suddenly I'm a bad

1121

00:48:54,690 --> 00:48:51,730

scientist why why am ia bad scientist

1122

00:48:56,670 --> 00:48:54,700

this happens though many times I think

1123

00:48:59,099 --> 00:48:56,680

it's just because science has become its

1124

00:49:01,019 --> 00:48:59,109

own religion and religion and politics

1125

00:49:03,059 --> 00:49:01,029

always go hand in hand and when you

1126
00:49:04,620 --> 00:49:03,069
threaten the power structure you're out

1127
00:49:06,810 --> 00:49:04,630
yeah well

1128
00:49:09,660 --> 00:49:06,820
as you say certainly money is a major

1129
00:49:11,160 --> 00:49:09,670
factor I mean grants have always been a

1130
00:49:12,900 --> 00:49:11,170
major problem major thing

1131
00:49:14,340 --> 00:49:12,910
factor in the United States I mean

1132
00:49:17,910 --> 00:49:14,350
obviously science is doing extremely

1133
00:49:20,220 --> 00:49:17,920
well so it does work but in this country

1134
00:49:22,380 --> 00:49:20,230
we are getting more and more organized

1135
00:49:24,590 --> 00:49:22,390
around money for example in in my

1136
00:49:27,630 --> 00:49:24,600
university and most university in the UK

1137
00:49:30,270 --> 00:49:27,640
youngsuk I find this up seeing young

1138
00:49:31,860 --> 00:49:30,280

scientists taken on and if they don't

1139

00:49:34,320 --> 00:49:31,870

get a big grant within three years

1140

00:49:36,720 --> 00:49:34,330

they're sacked hmm now the reason I

1141

00:49:38,940 --> 00:49:36,730

think that's obscene is it because you

1142

00:49:42,270 --> 00:49:38,950

know scientists have to develop they

1143

00:49:43,710 --> 00:49:42,280

have to mature sure like saintil

1144

00:49:45,240 --> 00:49:43,720

Leonardo DaVinci if you don't come up

1145

00:49:50,040 --> 00:49:45,250

with the Mona Lisa in three years you're

1146

00:49:54,830 --> 00:49:50,050

sacked you know well we we agree with

1147

00:49:57,960 --> 00:49:54,840

you on that that idea that money has

1148

00:50:01,760 --> 00:49:57,970

while it has helped science it has also

1149

00:50:05,300 --> 00:50:01,770

in in other ways destroyed the

1150

00:50:08,100 --> 00:50:05,310

entrepreneurial single person like

1151
00:50:10,350 --> 00:50:08,110
working on something well that's they

1152
00:50:12,000 --> 00:50:10,360
used to call an attic scientists and

1153
00:50:14,670 --> 00:50:12,010
that's I would say you're the classic

1154
00:50:16,500 --> 00:50:14,680
example of one you have an idea it's

1155
00:50:19,350 --> 00:50:16,510
you've proven it and you've used just

1156
00:50:20,940 --> 00:50:19,360
basic basic tools to do it well you know

1157
00:50:22,530 --> 00:50:20,950
most of the most of the major

1158
00:50:24,480 --> 00:50:22,540
developments in science have come

1159
00:50:28,170 --> 00:50:24,490
through there in dippity chance disk um

1160
00:50:29,940 --> 00:50:28,180
you know if you try and plan to find a

1161
00:50:31,770 --> 00:50:29,950
cure for cancer chances are you won't

1162
00:50:33,990 --> 00:50:31,780
find it I can almost predict that

1163
00:50:35,400 --> 00:50:34,000

someone will find the cause or a cure

1164

00:50:35,940 --> 00:50:35,410

for cancer when they're looking for

1165

00:50:39,330 --> 00:50:35,950

something else

1166

00:50:42,720 --> 00:50:39,340

mm-hmm they're just working on I don't

1167

00:50:44,880 --> 00:50:42,730

I'll spiders knees yeah the work on

1168

00:50:46,380 --> 00:50:44,890

spiders knees and they find the a this

1169

00:50:49,440 --> 00:50:46,390

looks like cancer or something you know

1170

00:50:51,000 --> 00:50:49,450

that is how the most most of the

1171

00:50:53,220 --> 00:50:51,010

developments are made but modern science

1172

00:50:56,730 --> 00:50:53,230

goes against that it wants to predict it

1173

00:50:59,430 --> 00:50:56,740

wants to control organize it becomes

1174

00:51:01,890 --> 00:50:59,440

some kind of you know organizational

1175

00:51:04,560 --> 00:51:01,900

bureaucratic bureaucracy yeah rather

1176

00:51:06,540 --> 00:51:04,570

than this beautiful wonder of people

1177

00:51:09,990 --> 00:51:06,550

just bumping into things you know mm-hmm

1178

00:51:13,350 --> 00:51:10,000

for the purpose of curiosity what Curia

1179

00:51:15,930 --> 00:51:13,360

where curiosity takes you right now I am

1180

00:51:18,220 --> 00:51:15,940

afraid that our time with shattered

1181

00:51:22,780 --> 00:51:18,230

reality is basic

1182

00:51:24,280 --> 00:51:22,790

/ well I was just warming up though well

1183

00:51:27,940 --> 00:51:24,290

we would love for you to come back on

1184

00:51:31,720 --> 00:51:27,950

sometime and if I was a not an associate

1185

00:51:34,750 --> 00:51:31,730

member but a full member of the sse that

1186

00:51:37,120 --> 00:51:34,760

is if I were Emma Craddock accredited

1187

00:51:41,830 --> 00:51:37,130

scientist well I would certainly invite

1188

00:51:46,720 --> 00:51:41,840

you to one of those those conventions

1189

00:51:49,390 --> 00:51:46,730

suppose I let my membership lapse and

1190

00:51:51,430 --> 00:51:49,400

you know I used to go to a lot of

1191

00:51:53,170 --> 00:51:51,440

conferences and a lot of the time I was

1192

00:51:55,060 --> 00:51:53,180

pretty well bored because I would hear

1193

00:51:57,910 --> 00:51:55,070

the same old stuff but I went to these

1194

00:51:59,950 --> 00:51:57,920

conferences and I would go if they start

1195

00:52:01,630 --> 00:51:59,960

at 7:00 in the morning I'd go at 7:00

1196

00:52:04,450 --> 00:52:01,640

and I stay there until 10 o'clock

1197

00:52:06,640 --> 00:52:04,460

because the soul full of amazing stuff

1198

00:52:09,130 --> 00:52:06,650

it isn't enough didn't always believe

1199

00:52:12,810 --> 00:52:09,140

some of it but it was unbelievable

1200

00:52:16,030 --> 00:52:12,820

fantastic range of very exciting ideas

1201

00:52:19,450 --> 00:52:16,040

and to me as well as a layperson it's a

1202

00:52:22,780 --> 00:52:19,460

very exciting event to go to and to have

1203

00:52:25,810 --> 00:52:22,790

my thoughts broadened and meet a lot of

1204

00:52:28,600 --> 00:52:25,820

wonderful guests foreshadowed reality ya

1205

00:52:30,810 --> 00:52:28,610

know you know to my mind that's the kind

1206

00:52:33,160 --> 00:52:30,820

of science that should be done more of

1207

00:52:36,760 --> 00:52:33,170

more money and more interest should go

1208

00:52:39,070 --> 00:52:36,770

into it and stop you know stop this kind

1209

00:52:41,560 --> 00:52:39,080

of mundane inside the box stuff that

1210

00:52:43,810 --> 00:52:41,570

people are doing yeah this sort of

1211

00:52:46,540 --> 00:52:43,820

glorified technicians and not really in

1212

00:52:48,220 --> 00:52:46,550

good investigators anymore expression

1213

00:52:51,430 --> 00:52:48,230

English expression called journeyman you

1214

00:52:56,170 --> 00:52:51,440

know yeah yeah yeah what a lot of my

1215

00:52:57,730 --> 00:52:56,180

journey man who careerists you know it's

1216

00:53:01,900 --> 00:52:57,740

finished I think I mean I'm an old man

1217

00:53:03,820 --> 00:53:01,910

getting probably an old man got but you

1218

00:53:07,030 --> 00:53:03,830

know to me science is a wonder

1219

00:53:09,130 --> 00:53:07,040

it's a fascination is it's beautiful and

1220

00:53:11,650 --> 00:53:09,140

often I see that it's turning into a

1221

00:53:13,900 --> 00:53:11,660

regular churning out of the yep you know

1222

00:53:16,150 --> 00:53:13,910

the stock ideas and the stock responses

1223

00:53:20,610 --> 00:53:16,160

mm-hmm it's pretty sad

1224

00:53:24,340 --> 00:53:20,620

I agree thank you so much for being on

1225

00:53:27,100 --> 00:53:24,350

shattered reality podcast and our

1226

00:53:30,820 --> 00:53:27,110

intentions are for you to prosper and to

1227

00:53:31,870 --> 00:53:30,830

get some somebody somebody's in the

1228

00:53:35,230 --> 00:53:31,880

barrel out there

1229

00:53:37,779 --> 00:53:35,240

to do replicate studies for you and we

1230

00:53:39,940 --> 00:53:37,789

couldn't wish that more so I thought if

1231

00:53:43,509 --> 00:53:39,950

everybody wants to contact me for some

1232

00:53:45,370 --> 00:53:43,519

advice I have no money but we don't need

1233

00:53:48,249 --> 00:53:45,380

a lot of money but advice I'll certainly

1234

00:53:49,420 --> 00:53:48,259

provide well thank you so much and we're

1235

00:53:53,710 --> 00:53:49,430

gonna say goodbye now

1236

00:53:57,120 --> 00:53:53,720

yeah dr. Wainwright thank you so much I

1237

00:54:02,079 --> 00:53:57,130

wish you best of luck in your future

1238

00:54:05,829 --> 00:54:02,089

thank you thank you okay so that is

1239

00:54:07,359 --> 00:54:05,839

really a wonderful yeah I had a bunch of

1240

00:54:09,039 --> 00:54:07,369

questions I would have liked have asked

1241

00:54:11,950 --> 00:54:09,049

him oh yeah we ran out of time I'll have

1242

00:54:13,480 --> 00:54:11,960

to get him back on Bobi fascinating to

1243

00:54:14,829 --> 00:54:13,490

think that they rained viruses and

1244

00:54:19,450 --> 00:54:14,839

that's what actually got rid of the

1245

00:54:21,249 --> 00:54:19,460

dinosaurs it could but then I think the

1246

00:54:24,640 --> 00:54:21,259

other question that would have come up

1247

00:54:26,529 --> 00:54:24,650

would in that if this much life forms

1248

00:54:28,329 --> 00:54:26,539

are raining constantly we really should

1249

00:54:30,700 --> 00:54:28,339

see a lot more different life forms

1250

00:54:32,589 --> 00:54:30,710

today but then maybe we do maybe we just

1251

00:54:36,309 --> 00:54:32,599

haven't found them well the ones that

1252

00:54:38,230 --> 00:54:36,319

originally may have come down when the

1253

00:54:40,870 --> 00:54:38,240

earth first cooled as he had mentioned

1254

00:54:43,569 --> 00:54:40,880

they were able to prosper right

1255

00:54:45,309 --> 00:54:43,579

immediately because they were it was a

1256

00:54:46,990 --> 00:54:45,319

fertile ground and they weren't eaten

1257

00:54:50,319 --> 00:54:47,000

they weren't eaten but today many of

1258

00:54:51,970 --> 00:54:50,329

these things could be eaten hmm and I'm

1259

00:54:55,690 --> 00:54:51,980

I'm gonna have to write in our show

1260

00:54:58,839 --> 00:54:55,700

notes who the fellow was whose name just

1261

00:55:01,660 --> 00:54:58,849

escapes me who speculated on spores

1262

00:55:05,829 --> 00:55:01,670

coming in the same way and I know that

1263

00:55:07,509 --> 00:55:05,839

sir Fred Hoyle speculated on that too so

1264

00:55:09,609 --> 00:55:07,519

we'll put that in the show notes and I I

1265

00:55:12,339 --> 00:55:09,619

apologize for not remembering the

1266

00:55:15,099 --> 00:55:12,349

gentleman's name at the moment so what's

1267

00:55:18,249 --> 00:55:15,109

coming up next for us Papa - papa papa

1268

00:55:20,170 --> 00:55:18,259

drum roll May 20th and 21st I believe

1269

00:55:21,579 --> 00:55:20,180

well it's May 20th with the rain date of

1270

00:55:25,390 --> 00:55:21,589

May 21st okay

1271

00:55:30,009 --> 00:55:25,400

we will be up at PI beautiful downtown

1272

00:55:32,940 --> 00:55:30,019

Pineville New York and both Kate and I

1273

00:55:45,329 --> 00:55:32,950

Ferruccio will be there as well as our

1274

00:55:50,519 --> 00:55:48,390

but we'd love to see you there we would

1275

00:55:52,549 --> 00:55:50,529

love to see you if you are in the New

1276

00:55:56,640 --> 00:55:52,559

York New Jersey Connecticut Pennsylvania

1277

00:55:59,969 --> 00:55:56,650

area you should be accessible to this

1278

00:56:02,160 --> 00:55:59,979

wonderful UFO it's sort of fun it's a

1279

00:56:05,849 --> 00:56:02,170

lot of fun good food and and there's

1280

00:56:08,910 --> 00:56:05,859

plenty of food local vendors and the

1281

00:56:10,380 --> 00:56:08,920

Flying Saucer diner that's incumbent

1282

00:56:13,709 --> 00:56:10,390

source of whatever it is up there

1283

00:56:17,279 --> 00:56:13,719

wonderful places to be and be seen and

1284

00:56:20,640 --> 00:56:17,289

where you are UFO costume if you like I

1285

00:56:24,599 --> 00:56:20,650

will just be my normal alien self no

1286

00:56:28,680 --> 00:56:24,609

costume needed okay all right so I guess

1287

00:56:51,880 --> 00:56:28,690

that's it okay so shall we say goodbye