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1  
00:00:05,180 --> 00:00:02,300  
hi this is Patrick at stop spraying us

2  
00:00:07,639 --> 00:00:05,190  
calm and on the phone or actually Skype

3  
00:00:11,810 --> 00:00:07,649  
with said that with us today we have m'q

4  
00:00:17,740 --> 00:00:11,820  
west from Medibank and Amy why don't you

5  
00:00:25,700 --> 00:00:22,550  
all right well I am a retired video game

6  
00:00:28,640 --> 00:00:25,710  
programmer I worked on the game Tony

7  
00:00:34,069 --> 00:00:28,650  
Hawk's Pro Skater about ten years ago

8  
00:00:37,069 --> 00:00:34,079  
and I retired and just kind of doing

9  
00:00:38,810 --> 00:00:37,079  
some part-time work since then and I

10  
00:00:40,100 --> 00:00:38,820  
have a lot of spare time and so I just

11  
00:00:43,130 --> 00:00:40,110  
been following up on things I find it

12  
00:00:44,959 --> 00:00:43,140  
personally interesting to me and I've

13  
00:00:47,299 --> 00:00:44,969

always been interested in things like

14

00:00:50,350 --> 00:00:47,309

you know UFOs and things like that and

15

00:00:52,639 --> 00:00:50,360

strange topics and so I tend to like

16

00:00:53,450 --> 00:00:52,649

argue with people on the internet about

17

00:00:56,090 --> 00:00:53,460

things like that

18

00:00:58,340 --> 00:00:56,100

and I ended up just setting up my own

19

00:01:01,610 --> 00:00:58,350

site to do that I started with a site

20

00:01:03,740 --> 00:01:01,620

called contrails science which I think

21

00:01:05,690 --> 00:01:03,750

that I studied around 10 years ago which

22

00:01:07,670 --> 00:01:05,700

was talking about the the chemtrail

23

00:01:12,350 --> 00:01:07,680

theory which I'm sure you're familiar

24

00:01:14,630 --> 00:01:12,360

with and now and then I kind of branched

25

00:01:16,580 --> 00:01:14,640

out into meta bunk where I talked about

26

00:01:20,719 --> 00:01:16,590

a whole bunch of other like conspiracy

27

00:01:22,100 --> 00:01:20,729

type things like 9/11 things you know

28

00:01:24,560 --> 00:01:22,110

things like people who think the Sandy

29

00:01:26,510 --> 00:01:24,570

Hook was fake people who think the earth

30

00:01:27,980 --> 00:01:26,520

is flat I do a whole variety of things

31

00:01:30,410 --> 00:01:27,990

but I kind of started out doing the

32

00:01:31,999 --> 00:01:30,420

whole chemtrail thing and so I still did

33

00:01:33,710 --> 00:01:32,009

quite a bit of that we do a lot of stuff

34

00:01:34,910 --> 00:01:33,720

like identifying planes and flying

35

00:01:37,700 --> 00:01:34,920

objects and stuff it's kind of

36

00:01:38,929 --> 00:01:37,710

interesting stuff and nobody pays me to

37

00:01:41,719 --> 00:01:38,939

do it it's just something I do by myself

38

00:01:43,490 --> 00:01:41,729

you know I made enough money on the with

39

00:01:46,010 --> 00:01:43,500

the video games and it's just can I do

40

00:01:47,899 --> 00:01:46,020

it as a as a hobby and an you live in

41

00:01:54,010 --> 00:01:47,909

California now back yes I do yes I'm

42

00:01:57,609 --> 00:01:54,020

over by Sacramento so anyway as people

43

00:02:02,510 --> 00:01:57,619

whoever knows me I've been talking about

44

00:02:05,209 --> 00:02:02,520

and rails and for some time and I

45

00:02:08,690 --> 00:02:05,219

thought it would be really useful for

46

00:02:11,420 --> 00:02:08,700

people to hear the other side because

47

00:02:13,880 --> 00:02:11,430

anyone who is in one group will only

48

00:02:16,220 --> 00:02:13,890

hear one thing you know

49

00:02:19,280 --> 00:02:16,230

the same for the other side so III

50

00:02:28,010 --> 00:02:19,290

thought I'd have a chat with with Nick

51  
00:02:31,600 --> 00:02:28,020  
to to explain how he sees the on

52  
00:02:34,790 --> 00:02:31,610  
chemtrail contrail conspiracy theory and

53  
00:02:37,070 --> 00:02:34,800  
i have a few questions you know it'll be

54  
00:02:40,370 --> 00:02:37,080  
like you know things actually let's

55  
00:02:42,800 --> 00:02:40,380  
start off with first of all what is a

56  
00:02:44,660 --> 00:02:42,810  
calm trial or what is a kam trial well

57  
00:02:46,730 --> 00:02:44,670  
first of all I want to say I thank you

58  
00:02:50,350 --> 00:02:46,740  
for doing this type of thing because I

59  
00:02:53,270 --> 00:02:50,360  
think there is a lot of polarization

60  
00:02:55,280 --> 00:02:53,280  
between groups where people they just

61  
00:02:56,930 --> 00:02:55,290  
don't listen to what they perceive as

62  
00:02:59,810 --> 00:02:56,940  
being the other side like people will

63  
00:03:01,340 --> 00:02:59,820

think that you know I'm anything I say

64

00:03:02,660 --> 00:03:01,350

is a lie so they just won't listen to it

65

00:03:05,990 --> 00:03:02,670

and you know I've got a lot of

66

00:03:09,260 --> 00:03:06,000

information on my website that is it's

67

00:03:11,150 --> 00:03:09,270

all well referenced and you can verify

68

00:03:14,720 --> 00:03:11,160

it for yourself it's not just me saying

69

00:03:18,440 --> 00:03:14,730

saying something but your question

70

00:03:19,789 --> 00:03:18,450

a contrail is a condensation trail it's

71

00:03:22,460 --> 00:03:19,799

actually a type of cloud

72

00:03:24,770 --> 00:03:22,470

it's really essentially the same as a

73

00:03:27,979 --> 00:03:24,780

regular cloud like a cirrus cloud a

74

00:03:31,430 --> 00:03:27,989

high-altitude cloud and it's formed when

75

00:03:35,570 --> 00:03:31,440

the the water in the aircraft engine

76

00:03:37,759 --> 00:03:35,580

exhaust mixes with the ambient air and

77

00:03:39,380 --> 00:03:37,769

basically triggers the formation of a

78

00:03:41,750 --> 00:03:39,390

cloud it's not actually a cloud formed

79

00:03:43,370 --> 00:03:41,760

from the water in the exhaust that just

80

00:03:45,710 --> 00:03:43,380

actually triggers the formation of the

81

00:03:47,780 --> 00:03:45,720

cloud and there's two types of contrail

82

00:03:49,460 --> 00:03:47,790

those exhaust contrail which is what as

83

00:03:52,130 --> 00:03:49,470

I just described and then there's

84

00:03:55,150 --> 00:03:52,140

another type which has led to a lot of

85

00:03:57,770 --> 00:03:55,160

confusion which is the aerodynamic

86

00:04:00,650 --> 00:03:57,780

contrail which forms over the entire

87

00:04:02,509 --> 00:04:00,660

surface of the wing and this it looks a

88

00:04:05,360 --> 00:04:02,519

bit different closer it's more like a

89

00:04:08,330 --> 00:04:05,370

flat ribbon than a couple of streams

90

00:04:10,310 --> 00:04:08,340

coming out of the engine and it can form

91

00:04:17,420 --> 00:04:10,320

at lower altitudes and in a wider range

92

00:04:19,219 --> 00:04:17,430

of conditions aerodynamic so is this

93

00:04:21,440 --> 00:04:19,229

related to like for example like Hong

94

00:04:24,500 --> 00:04:21,450

Kong is humid and hot and whenever

95

00:04:26,830 --> 00:04:24,510

planes land there you'll see wingtip

96

00:04:28,659 --> 00:04:26,840

vortices coming off the side is it so

97

00:04:30,909 --> 00:04:28,669

to that it is similar to that yeah what

98

00:04:32,700 --> 00:04:30,919

is it's a reduction in the air pressure

99

00:04:35,080 --> 00:04:32,710

you know when you have a vortex

100

00:04:37,030 --> 00:04:35,090

obviously it's the air is spinning round

101  
00:04:38,379 --> 00:04:37,040  
very rapidly and that forces the air to

102  
00:04:39,909 --> 00:04:38,389  
the outside so the pressure in the

103  
00:04:42,219 --> 00:04:39,919  
middle of a vortex is lower than the

104  
00:04:44,469 --> 00:04:42,229  
pressure outside and you might you may

105  
00:04:46,120 --> 00:04:44,479  
have seen like science experiments on TV

106  
00:04:48,610 --> 00:04:46,130  
where people say if I make a cloud in a

107  
00:04:50,110 --> 00:04:48,620  
bottle and they do it by you know

108  
00:04:51,700 --> 00:04:50,120  
pumping air into a bottle and then

109  
00:04:55,180 --> 00:04:51,710  
opening it quickly you know when you

110  
00:04:58,000 --> 00:04:55,190  
open a beer bottle you see a tiny little

111  
00:05:00,820 --> 00:04:58,010  
bit of like a cloud basically in the

112  
00:05:02,230 --> 00:05:00,830  
neck of the beer bottle that's the same

113  
00:05:05,430 --> 00:05:02,240

type of thing the pressure is being

114

00:05:08,530 --> 00:05:05,440

suddenly lowered which means the the

115

00:05:10,180 --> 00:05:08,540

area's expands and so it's unable to

116

00:05:12,010 --> 00:05:10,190

hold the same amount of moisture and so

117

00:05:13,840 --> 00:05:12,020

it basically a cloud just kind of

118

00:05:16,060 --> 00:05:13,850

springs into existence because the

119

00:05:19,360 --> 00:05:16,070

conditions make it impossible for the

120

00:05:21,520 --> 00:05:19,370

water to stay in its gas form so yes

121

00:05:25,290 --> 00:05:21,530

that's the same way like when wet air

122

00:05:27,969 --> 00:05:25,300

goes up abandon it turns into pressure

123

00:05:30,820 --> 00:05:27,979

essentially yes essentially yeah it's

124

00:05:33,010 --> 00:05:30,830

kind of different because of the way the

125

00:05:35,379 --> 00:05:33,020

yeah the air is moving from one place to

126

00:05:37,240 --> 00:05:35,389

another with in that instance whereas in

127

00:05:40,650 --> 00:05:37,250

in this instance the pressure is being

128

00:05:44,879 --> 00:05:40,660

lowered in the same place so it's like

129

00:05:50,620 --> 00:05:44,889

I'm not sure if you mentioned or maybe

130

00:05:52,480 --> 00:05:50,630

misremembered so there's with these the

131

00:05:54,779 --> 00:05:52,490

air destroyed Onam their aerodynamic

132

00:05:56,980 --> 00:05:54,789

ones that go the full length of the wing

133

00:05:57,580 --> 00:05:56,990

isn't there some traumatic effect in

134

00:06:02,770 --> 00:05:57,590

there as well

135

00:06:08,170 --> 00:06:02,780

yes how does that happen it happens

136

00:06:09,640 --> 00:06:08,180

because of the way the the way they [h\_\_\h]

137

00:06:12,460 --> 00:06:09,650

by the way for listeners that's yeah

138

00:06:14,200 --> 00:06:12,470

others in color basically it skis it's a

139

00:06:15,219 --> 00:06:14,210

kind of a rainbow effect but if you look

140

00:06:17,440 --> 00:06:15,229

at it it's not actually the same

141

00:06:20,320 --> 00:06:17,450

spectrum as a rainbow it's a different

142

00:06:23,770 --> 00:06:20,330

type of spectrum it's I think called me

143

00:06:27,070 --> 00:06:23,780

scattering mie scattering and it's to do

144

00:06:29,020 --> 00:06:27,080

with the size of the particles when the

145

00:06:32,710 --> 00:06:29,030

cloud is forming they start out as being

146

00:06:36,219 --> 00:06:32,720

a microscopic tiny little you know nano

147

00:06:38,380 --> 00:06:36,229

sized particles of water and then they

148

00:06:40,020 --> 00:06:38,390

grow in the air as more and more water

149

00:06:41,670 --> 00:06:40,030

you get attracted to the

150

00:06:43,170 --> 00:06:41,680

hissing water drops so you suss it with

151  
00:06:44,580 --> 00:06:43,180  
very very small particles and then they

152  
00:06:46,290 --> 00:06:44,590  
become a bit larger as you get further

153  
00:06:48,120 --> 00:06:46,300  
back so as you get further away from the

154  
00:06:51,170 --> 00:06:48,130  
plane the particles are going to be a

155  
00:06:53,100 --> 00:06:51,180  
bit bigger and the size of the particle

156  
00:06:54,720 --> 00:06:53,110  
affects the way it interacts with light

157  
00:06:56,190 --> 00:06:54,730  
because they're all and there are

158  
00:07:00,240 --> 00:06:56,200  
similar size to the wavelength of the

159  
00:07:02,040 --> 00:07:00,250  
light and so the different sizes scatter

160  
00:07:05,100 --> 00:07:02,050  
different colors of light and so you get

161  
00:07:06,930 --> 00:07:05,110  
this spectrum of light behind the play

162  
00:07:08,790 --> 00:07:06,940  
as it can look quite pretty some of them

163  
00:07:10,290 --> 00:07:08,800

are very nice looking from the ground

164

00:07:11,460 --> 00:07:10,300

they kind of look washed out but you may

165

00:07:13,380 --> 00:07:11,470

have seen some of the photographs taken

166

00:07:15,450 --> 00:07:13,390

from higher-up if he's taken from

167

00:07:17,510 --> 00:07:15,460

another plane the sky kind of looks

168

00:07:21,840 --> 00:07:17,520

black and you get this very dramatic

169

00:07:23,760 --> 00:07:21,850

colors in the in the trail and at that

170

00:07:26,430 --> 00:07:23,770

point is actually water vapor you think

171

00:07:29,340 --> 00:07:26,440

of contrails normally as being ice and

172

00:07:32,760 --> 00:07:29,350

you sometimes get a replica halo effect

173

00:07:35,070 --> 00:07:32,770

in a regular ice contrail but when an

174

00:07:37,350 --> 00:07:35,080

aerodynamic contrail is forming it

175

00:07:38,820 --> 00:07:37,360

actually starts out as tiny here it's

176

00:07:41,250 --> 00:07:38,830

very cool water droplets and it gives

177

00:07:44,160 --> 00:07:41,260

this very very nice effect so these

178

00:07:49,470 --> 00:07:44,170

these are mostly lower lower altitude

179

00:07:51,450 --> 00:07:49,480

and higher humidity the well there's

180

00:07:53,130 --> 00:07:51,460

this this is another thing with these

181

00:07:55,290 --> 00:07:53,140

aerodynamic controls the ones that you

182

00:07:57,060 --> 00:07:55,300

see that persist up in the air are

183

00:07:59,390 --> 00:07:57,070

actually pretty high altitude still

184

00:08:03,030 --> 00:07:59,400

there in the like of 15 to 25,000 feet

185

00:08:04,830 --> 00:08:03,040

range and now regular contrails form

186

00:08:07,820 --> 00:08:04,840

generally higher than that twenty-five

187

00:08:10,200 --> 00:08:07,830

to forty thousand feet or 40,000 plus by

188

00:08:12,210 --> 00:08:10,210

regular I mean exhaust contrails which

189

00:08:13,860 --> 00:08:12,220

are the more common contrails so you do

190

00:08:17,310 --> 00:08:13,870

get these exhausts contrails a pretty

191

00:08:20,580 --> 00:08:17,320

high altitude I see them here

192

00:08:22,230 --> 00:08:20,590

like Sacramento a lot because the the

193

00:08:25,130 --> 00:08:22,240

traffic that's climbing out of San

194

00:08:27,510 --> 00:08:25,140

Francisco there's heading eastbound is

195

00:08:31,320 --> 00:08:27,520

climbing through around that range

196

00:08:34,740 --> 00:08:31,330

twenty to twenty-five thirty thousand

197

00:08:36,330 --> 00:08:34,750

feet over my house here so I see these

198

00:08:38,520 --> 00:08:36,340

aerodynamic controls a lot more than

199

00:08:40,770 --> 00:08:38,530

than many people would would see them

200

00:08:46,170 --> 00:08:40,780

you probably would not see them being in

201  
00:08:48,900 --> 00:08:46,180  
San Francisco sometimes yeah I mean what

202  
00:08:51,690 --> 00:08:48,910  
I just call them like like right he

203  
00:08:53,770 --> 00:08:51,700  
doing wing sprayers that looks like it

204  
00:08:56,440 --> 00:08:53,780  
looks like this trail yeah yeah

205  
00:09:00,070 --> 00:08:56,450  
there's a few videos as well like pretty

206  
00:09:02,620 --> 00:09:00,080  
famous videos put forth by ya chemtrail

207  
00:09:04,060 --> 00:09:02,630  
people like Dane Wigington I think he's

208  
00:09:05,890 --> 00:09:04,070  
always saying you know we have absolute

209  
00:09:08,040 --> 00:09:05,900  
proof of chemtrails because he puts out

210  
00:09:11,110 --> 00:09:08,050  
these videos of aerodynamic contrails

211  
00:09:13,990 --> 00:09:11,120  
and I think you know he has been quite

212  
00:09:15,490 --> 00:09:14,000  
resistant to the explanation that their

213  
00:09:17,680 --> 00:09:15,500

aerodynamic contrails but that's where

214

00:09:19,450 --> 00:09:17,690

they are but my point real quick there

215

00:09:21,970 --> 00:09:19,460

about not seeing them over San Francisco

216

00:09:23,890 --> 00:09:21,980

is that you see them most commonly where

217

00:09:26,290 --> 00:09:23,900

planes are climbing it's quite rare to

218

00:09:27,700 --> 00:09:26,300

see them when a plane is cruising

219

00:09:29,740 --> 00:09:27,710

altitude because normally they just form

220

00:09:30,370 --> 00:09:29,750

exhaust contrails and so the exhaust

221

00:09:32,680 --> 00:09:30,380

contrails

222

00:09:35,380 --> 00:09:32,690

tend to just kind of blot out any

223

00:09:41,010 --> 00:09:35,390

aerodynamic once you see but you do see

224

00:09:49,390 --> 00:09:46,960

persistent contrails they are becoming

225

00:09:54,430 --> 00:09:49,400

more common would you agree or disagree

226

00:09:56,160 --> 00:09:54,440

I would I would disagree I think well it

227

00:09:58,690 --> 00:09:56,170

depends what you mean by more common

228

00:10:00,340 --> 00:09:58,700

there is more air traffic now than there

229

00:10:03,370 --> 00:10:00,350

was in the 80s so obvious is that

230

00:10:05,680 --> 00:10:03,380

there's a lot more persistent contrails

231

00:10:08,920 --> 00:10:05,690

now because because there's more air

232

00:10:11,680 --> 00:10:08,930

traffic there is there are actually some

233

00:10:13,480 --> 00:10:11,690

increases and I think what you were

234

00:10:15,930 --> 00:10:13,490

suggesting is that the conditions are

235

00:10:19,090 --> 00:10:15,940

changing so that there's there's more

236

00:10:20,380 --> 00:10:19,100

contrails or the singing of something

237

00:10:21,670 --> 00:10:20,390

added to the jet fuel or something like

238

00:10:24,850 --> 00:10:21,680

that but really there's there's a few

239

00:10:27,010 --> 00:10:24,860

other reasons why you see more one of

240

00:10:29,230 --> 00:10:27,020

them one of those reasons is something

241

00:10:34,120 --> 00:10:29,240

called they reduced vertical separation

242

00:10:36,820 --> 00:10:34,130

minima which is the minimum distance the

243

00:10:39,490 --> 00:10:36,830

minimum vertical distance the planes can

244

00:10:43,750 --> 00:10:39,500

fly the distance between them vertically

245

00:10:46,990 --> 00:10:43,760

which used to be 2,000 feet and in I

246

00:10:49,870 --> 00:10:47,000

believe the 2000s it was changed to

247

00:10:52,030 --> 00:10:49,880

1,000 feet which meant that a lot more

248

00:10:55,450 --> 00:10:52,040

air traffic could be fit into the same

249

00:10:57,700 --> 00:10:55,460

airspace so he give a much more denser

250

00:11:00,870 --> 00:10:57,710

packing of planes and that allowed more

251  
00:11:04,060 --> 00:11:00,880  
planes to fly asked cruising altitude

252  
00:11:07,449 --> 00:11:04,070  
and it opened up the door for things

253  
00:11:10,059 --> 00:11:07,459  
like a small local commercial

254  
00:11:11,499 --> 00:11:10,069  
or jets so there's actually this changes

255  
00:11:15,819 --> 00:11:11,509  
in the types of air traffic like you get

256  
00:11:18,669 --> 00:11:15,829  
like you can flies for example from from

257  
00:11:19,929 --> 00:11:18,679  
Sacramento to Medford you don't eat them

258  
00:11:21,309 --> 00:11:19,939  
they fitted in the South Southern Oregon

259  
00:11:23,230 --> 00:11:21,319  
I've learned there well I haven't

260  
00:11:25,749 --> 00:11:23,240  
learned there no I haven't blown there I

261  
00:11:27,429 --> 00:11:25,759  
know people who are flown there

262  
00:11:28,840 --> 00:11:27,439  
it's actually no I have learned there I

263  
00:11:31,590 --> 00:11:28,850

flew there from LA but you can actually

264

00:11:34,299 --> 00:11:31,600

fly there from from Sacramento like it's

265

00:11:37,030 --> 00:11:34,309

actually no you can't sorry I'm getting

266

00:11:41,739 --> 00:11:37,040

a bit confused you can fly to Medford

267

00:11:43,419 --> 00:11:41,749

from Los Angeles yeah yeah yeah you

268

00:11:47,499 --> 00:11:43,429

gotta fly from Sacramento must be poor

269

00:11:51,819 --> 00:11:47,509

Drive but that's the type of route that

270

00:11:54,699 --> 00:11:51,829

didn't exist 20 years ago because people

271

00:11:57,879 --> 00:11:54,709

will generally fly to hub cities and

272

00:11:59,829 --> 00:11:57,889

then fly to these other cities so you

273

00:12:02,679 --> 00:11:59,839

have an increase in the number of routes

274

00:12:05,259 --> 00:12:02,689

so let's say there is a new route

275

00:12:07,269 --> 00:12:05,269

between Sacramento and Medford the

276

00:12:09,040 --> 00:12:07,279

people between sacramento for Medford

277

00:12:11,530 --> 00:12:09,050

might see planes where they weren't

278

00:12:14,139 --> 00:12:11,540

seeing them before because the traffic

279

00:12:15,759 --> 00:12:14,149

was normally further over to the to the

280

00:12:19,059 --> 00:12:15,769

west because it's from San Francisco in

281

00:12:19,629 --> 00:12:19,069

LA so in other words more planes more

282

00:12:21,609 --> 00:12:19,639

trials

283

00:12:24,039 --> 00:12:21,619

well what planes there's more routes

284

00:12:25,840 --> 00:12:24,049

there's more high flying planes because

285

00:12:27,249 --> 00:12:25,850

of these smaller commuter jet so they're

286

00:12:29,230 --> 00:12:27,259

just gonna jump up and then jump down

287

00:12:33,429 --> 00:12:29,240

but they're still flying at high

288

00:12:34,869 --> 00:12:33,439

altitude and there there was one other

289

00:12:36,220 --> 00:12:34,879

reason I can't remember two off the top

290

00:12:38,319 --> 00:12:36,230

of my head but yeah there's a few other

291

00:12:40,210 --> 00:12:38,329

reasons but the atmosphere hasn't really

292

00:12:43,359 --> 00:12:40,220

changed in a way that creates more

293

00:12:47,859 --> 00:12:43,369

contrails oh yeah the other thing is

294

00:12:52,239 --> 00:12:47,869

high bypass engines I back past

295

00:12:54,539 --> 00:12:52,249

turbofans now this is something that

296

00:12:57,249 --> 00:12:54,549

kind of gets presented backwards

297

00:12:59,049 --> 00:12:57,259

high-bypass jet engines which are the

298

00:13:04,359 --> 00:12:59,059

modern types of engines with them the

299

00:13:06,489 --> 00:13:04,369

very big fans on the front they are much

300

00:13:08,669 --> 00:13:06,499

more efficient than the older engines

301

00:13:11,799 --> 00:13:08,679

which has a smaller fan on the front

302

00:13:14,169 --> 00:13:11,809

because they they convert a lot of the

303

00:13:16,419 --> 00:13:14,179

energy of the jet engine the jet turbine

304

00:13:18,789 --> 00:13:16,429

into turning this fan to produced thrust

305

00:13:21,370 --> 00:13:18,799

rather than just shooting the hot gases

306

00:13:24,250 --> 00:13:21,380

out of the back so this actually cools

307

00:13:26,950 --> 00:13:24,260

the exhaust of the hi the high-bypass

308

00:13:29,230 --> 00:13:26,960

turbofans and so the exhaust that's

309

00:13:32,710 --> 00:13:29,240

coming out when it mixes with the air is

310

00:13:36,190 --> 00:13:32,720

a little bit cooler and so it gets to

311

00:13:38,500 --> 00:13:36,200

the condensation point quicker and so

312

00:13:42,100 --> 00:13:38,510

it's actually a bit more likely to

313

00:13:45,640 --> 00:13:42,110

create a contrail than the older engine

314

00:13:47,770 --> 00:13:45,650

so new engines actually more more

315

00:13:50,020 --> 00:13:47,780

contraire friendly in a way than older

316

00:13:54,340 --> 00:13:50,030

engines not it's not a huge amount

317

00:13:57,250 --> 00:13:54,350

it changes the the range in which the

318

00:13:58,450 --> 00:13:57,260

temperature range if you can think of

319

00:14:00,490 --> 00:13:58,460

that the atmosphere is being like

320

00:14:02,590 --> 00:14:00,500

divided into slices like in two layers

321

00:14:04,540 --> 00:14:02,600

there's a layer at which the conditions

322

00:14:07,300 --> 00:14:04,550

are right for contrails and it expands

323

00:14:08,470 --> 00:14:07,310

that range by a few hundred feet so it

324

00:14:13,270 --> 00:14:08,480

does actually create a few more

325

00:14:17,340 --> 00:14:13,280

contrails than the older engines so

326

00:14:23,410 --> 00:14:17,350

going back to the term contrail

327

00:14:25,090 --> 00:14:23,420

condensation condensation don't you need

328

00:14:28,500 --> 00:14:25,100

a hundred percent humidity for something

329

00:14:31,360 --> 00:14:28,510

at different depths you do yes yes and

330

00:14:34,240 --> 00:14:31,370

relative humidity you do and that's

331

00:14:37,750 --> 00:14:34,250

where the moisture in the jet exhaust

332

00:14:41,440 --> 00:14:37,760

comes in you know when you burn

333

00:14:43,210 --> 00:14:41,450

something it's you're burning a

334

00:14:45,490 --> 00:14:43,220

hydrocarbon it was just hydrogen and

335

00:14:46,900 --> 00:14:45,500

carbon you're burning it in oxygen which

336

00:14:51,550 --> 00:14:46,910

is just you know oxygen

337

00:14:53,260 --> 00:14:51,560

oh so the hydrogen combines with the

338

00:14:55,390 --> 00:14:53,270

oxygen and the carbon combines with the

339

00:14:57,670 --> 00:14:55,400

oxygen so you end up with carbon dioxide

340

00:15:01,180 --> 00:14:57,680

which is carbon and oxygen and hydrogen

341

00:15:02,560 --> 00:15:01,190

oxygen which is h<sub>2</sub>o which is water so

342

00:15:06,250 --> 00:15:02,570

what comes out of the back of a jet

343

00:15:09,130 --> 00:15:06,260

engine is four parts carbon dioxide and

344

00:15:11,020 --> 00:15:09,140

one part water it's just an awful lot of

345

00:15:13,090 --> 00:15:11,030

water when you burn a gallon of jet fuel

346

00:15:16,060 --> 00:15:13,100

you're actually creating about 1.3

347

00:15:20,830 --> 00:15:16,070

gallons of water and so when you add

348

00:15:24,820 --> 00:15:20,840

this water to the the air outside the

349

00:15:27,400 --> 00:15:24,830

plane there's a brief period where the

350

00:15:29,890 --> 00:15:27,410

humidity goes over a hundred percent so

351

00:15:33,850 --> 00:15:29,900

if the humidity is outside is say 60 or

352

00:15:35,260 --> 00:15:33,860

70 percent yeah that's very cold air you

353

00:15:38,110 --> 00:15:35,270

mix it with this hot

354

00:15:39,610 --> 00:15:38,120

humid gas that's coming out and there's

355

00:15:41,710 --> 00:15:39,620

a brief period when in the humidity

356

00:15:43,630 --> 00:15:41,720

Rises over a hundred percent and at that

357

00:15:48,070 --> 00:15:43,640

point you get condensation of water

358

00:15:51,670 --> 00:15:48,080

liquid water but then surely like right

359

00:15:53,769 --> 00:15:51,680

now I'll don't see here if I spilled that

360

00:15:55,660 --> 00:15:53,779

tea it would evaporate it wouldn't I

361

00:15:57,220 --> 00:15:55,670

mean my cup wouldn't overflow but

362

00:16:01,180 --> 00:15:57,230

there's no one percent humidity here

363

00:16:05,280 --> 00:16:01,190

yeah well so what happens next in the

364

00:16:09,880 --> 00:16:05,290

contrail formation is the magic

365

00:16:12,040 --> 00:16:09,890

temperature of minus 40 degrees which is

366

00:16:13,960 --> 00:16:12,050

magic in a couple of ways one is that

367

00:16:16,840 --> 00:16:13,970

minus 40 degrees is the same in

368

00:16:19,690 --> 00:16:16,850

Fahrenheit and Celsius minus 40 C is

369

00:16:23,430 --> 00:16:19,700

minus 40 F which confuses some people

370

00:16:27,280 --> 00:16:23,440

but you could check it it's true and

371

00:16:29,500 --> 00:16:27,290

minus 40 degrees is what called the the

372

00:16:32,710 --> 00:16:29,510

homogeneous freezing temperature of

373

00:16:35,380 --> 00:16:32,720

water which means the temperature at

374

00:16:38,380 --> 00:16:35,390

which water will freeze without anything

375

00:16:41,620 --> 00:16:38,390

being added to it now when water freezes

376

00:16:43,510 --> 00:16:41,630

normally it needs to freeze on something

377

00:16:47,620 --> 00:16:43,520

it needs to some kind of nucleus some

378

00:16:48,940 --> 00:16:47,630

kind of nucleation site so you've

379

00:16:50,530 --> 00:16:48,950

probably seen little experiments where

380

00:16:51,069 --> 00:16:50,540

you take a bottle of water stick it in

381

00:16:54,160 --> 00:16:51,079

the freezer

382

00:16:55,900 --> 00:16:54,170

and you you take it out and it's still

383

00:16:59,050 --> 00:16:55,910

liquid and then you bang it on something

384

00:17:00,579 --> 00:16:59,060

and you see it freezes yeah yeah that's

385

00:17:04,510 --> 00:17:00,589

because it's you know gets disturbed and

386

00:17:05,710 --> 00:17:04,520

you nucleation sites form or you could

387

00:17:11,020 --> 00:17:05,720

like do something like put a bit of salt

388

00:17:12,250 --> 00:17:11,030

in it and it hello you stole her yeah

389

00:17:20,829 --> 00:17:12,260

yeah you might you suddenly gone very

390

00:17:22,510 --> 00:17:20,839

quiet I can hear you now sorry again I'm

391

00:17:24,220 --> 00:17:22,520

using the I mean the recording will

392

00:17:26,799 --> 00:17:24,230

sound good I'm using my microphone is

393

00:17:30,060 --> 00:17:26,809

just the this is the laptop right

394

00:17:35,320 --> 00:17:30,070

built-in microphone sorry alright so

395

00:17:39,220 --> 00:17:35,330

actually don't restart your yeah yeah

396

00:17:42,360 --> 00:17:39,230

I was talking about ice and that minus

397

00:17:45,040 --> 00:17:42,370

40 degrees is the homogeneous

398

00:17:46,900 --> 00:17:45,050

homogeneous nucleation actually just ice

399

00:17:48,430 --> 00:17:46,910

nucleation it's that is the temperature

400

00:17:49,030 --> 00:17:48,440

at which water will just freeze without

401  
00:17:53,890 --> 00:17:49,040  
having to add

402  
00:17:56,020 --> 00:17:53,900  
things do it so what's happening when

403  
00:17:57,610 --> 00:17:56,030  
you when you were say on a cold day when

404  
00:18:00,760 --> 00:17:57,620  
you breathe out you see a little cloud

405  
00:18:03,310 --> 00:18:00,770  
and this is comprised of liquid water

406  
00:18:05,260 --> 00:18:03,320  
droplets I mean most clouds at low

407  
00:18:07,480 --> 00:18:05,270  
altitude comprised of liquid water it's

408  
00:18:09,490 --> 00:18:07,490  
just you know trillions of very very

409  
00:18:12,760 --> 00:18:09,500  
small droplets of water in suspension

410  
00:18:16,180 --> 00:18:12,770  
and that little cloud will evaporate

411  
00:18:19,270 --> 00:18:16,190  
very quickly even I'm a fairly cold day

412  
00:18:23,560 --> 00:18:19,280  
but if the temperature is lower than

413  
00:18:25,960 --> 00:18:23,570

minus 40 then those tiny little droplets

414

00:18:27,940 --> 00:18:25,970

of water which a pure water will just

415

00:18:29,680 --> 00:18:27,950

freeze by themselves normally you know

416

00:18:30,880 --> 00:18:29,690

they wouldn't freeze because they're

417

00:18:33,340 --> 00:18:30,890

pure water and they're not touching

418

00:18:35,170 --> 00:18:33,350

anything but because it gets below this

419

00:18:37,120 --> 00:18:35,180

magic temperature of minus 40 the

420

00:18:39,580 --> 00:18:37,130

homogeneous nucleation ice nucleation

421

00:18:44,620 --> 00:18:39,590

temperature they freeze by themselves

422

00:18:50,070 --> 00:18:44,630

and they turn into ice and ice has a

423

00:18:53,980 --> 00:18:50,080

different humidity at which it will

424

00:18:56,850 --> 00:18:53,990

persist than water so when it freezes

425

00:19:00,760 --> 00:18:56,860

that kind of locks in the contrail

426

00:19:02,470 --> 00:19:00,770

there's two types of relative humidity

427

00:19:04,690 --> 00:19:02,480

you may have seen as relative humidity

428

00:19:06,550 --> 00:19:04,700

with respect to water and there's

429

00:19:10,090 --> 00:19:06,560

relatively relative humidity with

430

00:19:10,840 --> 00:19:10,100

respect to ice and you can convert one

431

00:19:13,240 --> 00:19:10,850

to the other

432

00:19:16,390 --> 00:19:13,250

and it turns out that the relative

433

00:19:18,490 --> 00:19:16,400

humidity with respect to ice is a

434

00:19:21,910 --> 00:19:18,500

hundred percent when the relative

435

00:19:24,130 --> 00:19:21,920

humidity with respect to water is only

436

00:19:25,750 --> 00:19:24,140

around like 60 or 70 percent or

437

00:19:29,200 --> 00:19:25,760

sometimes even lower it depends on the

438

00:19:32,500 --> 00:19:29,210

temperature so you can have a clear sky

439

00:19:34,570 --> 00:19:32,510

with no clouds in it and if you were to

440

00:19:36,730 --> 00:19:34,580

put you know or water cloud into that it

441

00:19:38,800 --> 00:19:36,740

would evaporate but if it's cold enough

442

00:19:41,260 --> 00:19:38,810

that water cloud will freeze into a nice

443

00:19:43,390 --> 00:19:41,270

cloud and then the humidity being like

444

00:19:45,640 --> 00:19:43,400

60 or 70 percent is then high enough for

445

00:19:46,990 --> 00:19:45,650

that ice cloud to persist and that's

446

00:19:49,030 --> 00:19:47,000

what happens with contrails with the

447

00:19:51,670 --> 00:19:49,040

exhaust contrails it's a bit different

448

00:19:55,090 --> 00:19:51,680

for aerodynamic better it's similar

449

00:19:56,890 --> 00:19:55,100

physics so you're saying that at minus

450

00:19:59,260 --> 00:19:56,900

40 you do not need a condensation

451

00:20:02,980 --> 00:19:59,270

nucleus that is correct yes you do not

452

00:20:06,790 --> 00:20:02,990

need a condensation nucleus for freezing

453

00:20:10,120 --> 00:20:06,800

you need comes well you don't really

454

00:20:12,130 --> 00:20:10,130

need a conversational nucleus that

455

00:20:13,840 --> 00:20:12,140

there's that this some complication is

456

00:20:15,250 --> 00:20:13,850

here because there's ice condensation

457

00:20:17,740 --> 00:20:15,260

nuclei and there's water condensation

458

00:20:19,840 --> 00:20:17,750

nuclei which are different things if

459

00:20:21,990 --> 00:20:19,850

there were ice condensation nuclei in

460

00:20:27,669 --> 00:20:22,000

the air you would actually get a cloud

461

00:20:30,460 --> 00:20:27,679

but ice requires a very specific type of

462

00:20:32,590 --> 00:20:30,470

molecular structure on which to condense

463

00:20:33,760 --> 00:20:32,600

water is much less picky water will

464

00:20:37,390 --> 00:20:33,770

condense on just about everything

465

00:20:39,340 --> 00:20:37,400

anything and there's always water

466

00:20:41,680 --> 00:20:39,350

condensation nuclei in the air which is

467

00:20:43,419 --> 00:20:41,690

where you see clouds all the time every

468

00:20:45,400 --> 00:20:43,429

time you see like a cloud up in the air

469

00:20:47,440 --> 00:20:45,410

it's formed because it's forming on

470

00:20:50,110 --> 00:20:47,450

basically things like mineral dust and

471

00:20:51,190 --> 00:20:50,120

salt and you know sulfur particles and

472

00:20:52,840 --> 00:20:51,200

things like that which are in the air

473

00:20:57,160 --> 00:20:52,850

normally because the axis water

474

00:20:58,780 --> 00:20:57,170

condensation nuclei now ice clouds they

475

00:21:01,960 --> 00:20:58,790

they're a bit different they they're a

476

00:21:03,280 --> 00:21:01,970

little harder to form so when when the

477

00:21:05,980 --> 00:21:03,290

plane is shooting things out the back

478

00:21:11,549 --> 00:21:05,990

it's the water forms on water

479

00:21:16,240 --> 00:21:11,559

condensation nuclei the ice requires

480

00:21:19,780 --> 00:21:16,250

that water to freeze and it won't form

481

00:21:21,460 --> 00:21:19,790

if it doesn't freeze so you need that

482

00:21:28,510 --> 00:21:21,470

that kind of magic temperature of minus

483

00:21:34,120 --> 00:21:28,520

40 okay and so once the plane by way the

484

00:21:38,950 --> 00:21:34,130

temperature that there's the the super

485

00:21:41,680 --> 00:21:38,960

humidity that was in the exhaust of the

486

00:21:49,360 --> 00:21:41,690

plane is long gone it gets back to you

487

00:21:53,320 --> 00:21:49,370

know normal stable red shouldn't there

488

00:21:56,799 --> 00:21:53,330

shouldn't land the I mean ice cube but

489

00:22:00,250 --> 00:21:56,809

you leave an ice cube out it'll it'll

490

00:22:02,950 --> 00:22:00,260

lose ice like well if you okay but if

491

00:22:04,780 --> 00:22:02,960

you leave it in the Sun I mean yeah it

492

00:22:06,460 --> 00:22:04,790

can melt but if you keep it cold if you

493

00:22:09,040 --> 00:22:06,470

keep it below freezing it will still

494

00:22:13,950 --> 00:22:09,050

reduce ice work the mass will come off

495

00:22:17,450 --> 00:22:13,960

yeah so how in a situation where it is

496

00:22:21,480 --> 00:22:17,460

less than you know

497

00:22:23,520 --> 00:22:21,490

100% rxi how could how could a I put

498

00:22:25,320 --> 00:22:23,530

that crystal grow and spread well the

499

00:22:28,740 --> 00:22:25,330

thing is he it wouldn't if it was below

500

00:22:32,280 --> 00:22:28,750

100 percent RH I it canopies below 100

501  
00:22:35,340 --> 00:22:32,290  
percent RH W it needs to have higher

502  
00:22:39,090 --> 00:22:35,350  
than 100% relative humidity with respect

503  
00:22:42,690 --> 00:22:39,100  
to ice and you know that is something

504  
00:22:44,610 --> 00:22:42,700  
around 50 to 70 percent of relative

505  
00:22:45,960 --> 00:22:44,620  
humidity with respect to water which is

506  
00:22:48,840 --> 00:22:45,970  
the normal thing that you see measured

507  
00:22:51,270 --> 00:22:48,850  
ba does need he does need a hundred so

508  
00:22:54,390 --> 00:22:51,280  
if you see a contrail that was existing

509  
00:22:56,910 --> 00:22:54,400  
in conditions that you know to have low

510  
00:22:58,230 --> 00:22:56,920  
humidity with respect to ice then that

511  
00:23:00,810 --> 00:22:58,240  
would obviously be something that's very

512  
00:23:03,960 --> 00:23:00,820  
suspicious but the problem there is that

513  
00:23:06,110 --> 00:23:03,970

it's very difficult to know what the

514

00:23:08,070 --> 00:23:06,120

relative humidity of something is

515

00:23:10,710 --> 00:23:08,080

without actually going there and

516

00:23:13,710 --> 00:23:10,720

measuring it he would had to come very

517

00:23:17,460 --> 00:23:13,720

vastly from one parcel there to the next

518

00:23:20,010 --> 00:23:17,470

if you think about I say clouds the

519

00:23:22,640 --> 00:23:20,020

humidity in a cloud is over a hundred

520

00:23:26,240 --> 00:23:22,650

percent the humidity outside of cloud is

521

00:23:28,710 --> 00:23:26,250

below a hundred percent so it can vary

522

00:23:30,390 --> 00:23:28,720

in the distance from the inside to the

523

00:23:33,780 --> 00:23:30,400

outside of a cloud and it's just the

524

00:23:36,180 --> 00:23:33,790

same in a cloudless sky even if you can't

525

00:23:38,610 --> 00:23:36,190

see it those areas of humidity are still

526

00:23:43,340 --> 00:23:38,620

there so you still get this variation in

527

00:23:46,919 --> 00:23:43,350

humidity so you it you can't really

528

00:23:49,350 --> 00:23:46,929

easily tell what the humidity is by

529

00:23:51,930 --> 00:23:49,360

looking up at a plane you know looking

530

00:23:54,720 --> 00:23:51,940

about a region of sky there's no way

531

00:23:56,340 --> 00:23:54,730

really of other than the fact that

532

00:23:57,840 --> 00:23:56,350

contrails are forming and contrails are

533

00:23:59,970 --> 00:23:57,850

actually one of the best indications of

534

00:24:02,310 --> 00:23:59,980

what the humidity is other than that is

535

00:24:06,900 --> 00:24:02,320

no easy way of telling what the humidity

536

00:24:10,410 --> 00:24:06,910

actually is sort of jump in I'll play

537

00:24:12,900 --> 00:24:10,420

devil's advocate why not there are

538

00:24:17,520 --> 00:24:12,910

there's there's plenty of videos where

539

00:24:20,610 --> 00:24:17,530

you see the plane and it looked like

540

00:24:23,040 --> 00:24:20,620

it's leaving a dotted line yeah is that

541

00:24:26,250 --> 00:24:23,050

is that because the would you say like

542

00:24:27,840 --> 00:24:26,260

these are warm or hot wet or dry pockets

543

00:24:29,190 --> 00:24:27,850

are that close together yeah yeah

544

00:24:30,060 --> 00:24:29,200

absolutely I mean that's what I was

545

00:24:32,580 --> 00:24:30,070

saying earlier

546

00:24:36,210 --> 00:24:32,590

with clouds if you look at say a cloudy

547

00:24:40,350 --> 00:24:36,220

sky that isn't 100% overcast this Apache

548

00:24:42,620 --> 00:24:40,360

cloudy sky now if you can have imagine a

549

00:24:45,810 --> 00:24:42,630

plane flying through those clouds and

550

00:24:47,070 --> 00:24:45,820

let's say it was just it was some type

551  
00:24:49,890 --> 00:24:47,080  
of plane that was changing the color of

552  
00:24:52,290 --> 00:24:49,900  
the clouds so whenever it flew through a

553  
00:24:53,940 --> 00:24:52,300  
cloud it changed the color of the bit it

554  
00:24:55,740 --> 00:24:53,950  
flew through so you can see these red

555  
00:24:58,620 --> 00:24:55,750  
lines or whatever as the plane through

556  
00:25:00,510 --> 00:24:58,630  
blue flew the cloud you know that type

557  
00:25:02,820 --> 00:25:00,520  
of patchiness is just is still there

558  
00:25:05,400 --> 00:25:02,830  
when the clouds are there so if you

559  
00:25:07,860 --> 00:25:05,410  
could imagine that same sky and take

560  
00:25:09,750 --> 00:25:07,870  
away these patchy clouds and then have a

561  
00:25:12,000 --> 00:25:09,760  
plane fly through those areas and

562  
00:25:14,250 --> 00:25:12,010  
wherever it flies through where one of

563  
00:25:17,220 --> 00:25:14,260

the clouds used to be it leaves a trail

564

00:25:21,450 --> 00:25:17,230

of cloud as its triggering the formation

565

00:25:24,660 --> 00:25:21,460

of clouds in that that region and that's

566

00:25:28,260 --> 00:25:24,670

why you see these these breaks in in the

567

00:25:30,810 --> 00:25:28,270

trails because you've got variations in

568

00:25:33,660 --> 00:25:30,820

in humidity usually but you know

569

00:25:35,810 --> 00:25:33,670

humidity relative humidity but also in

570

00:25:39,180 --> 00:25:35,820

temperature you see things like rising

571

00:25:40,380 --> 00:25:39,190

areas of you know convection and things

572

00:25:40,920 --> 00:25:40,390

like that but it could just be just

573

00:25:45,380 --> 00:25:40,930

normal

574

00:25:50,280 --> 00:25:47,820

actually ripples do you do anything

575

00:25:53,340 --> 00:25:50,290

about it I mean sure it's been brought

576  
00:26:00,330 --> 00:25:53,350  
up to there's I look on the NASA world

577  
00:26:04,320 --> 00:26:00,340  
view it's been seeing a lot of what you

578  
00:26:06,240 --> 00:26:04,330  
would probably call gravity waves they

579  
00:26:09,570 --> 00:26:06,250  
look like basically like ripples like

580  
00:26:11,460 --> 00:26:09,580  
you know when like in a low tide when

581  
00:26:14,100 --> 00:26:11,470  
the sea goes back and forth you have

582  
00:26:16,710 --> 00:26:14,110  
that sort of like grid pattern in on the

583  
00:26:18,780 --> 00:26:16,720  
sea and I know when you have two air

584  
00:26:23,130 --> 00:26:18,790  
masses going over each other you have

585  
00:26:30,540 --> 00:26:23,140  
these believe this ripple effect I have

586  
00:26:33,990 --> 00:26:30,550  
I have seen increasingly these ripples

587  
00:26:36,870 --> 00:26:34,000  
all over the place but I've seen them in

588  
00:26:40,680 --> 00:26:36,880

the same area with different wavelengths

589

00:26:42,720 --> 00:26:40,690

and different directions multiple I mean

590

00:26:43,919 --> 00:26:42,730

maybe I could send you some some

591

00:26:46,859 --> 00:26:43,929

pictures for that

592

00:26:50,389 --> 00:26:46,869

it cannot be explained by air masses

593

00:26:54,930 --> 00:26:50,399

well the atmosphere is essentially a

594

00:26:57,180 --> 00:26:54,940

fluid but so yeah the principles of

595

00:27:01,139 --> 00:26:57,190

fluid mechanics apply to it and it's

596

00:27:04,169 --> 00:27:01,149

it's the atmosphere is is very very tall

597

00:27:06,509 --> 00:27:04,179

yeah the atmospheres going up to seven

598

00:27:08,909 --> 00:27:06,519

miles or so where clouds in the region

599

00:27:10,649 --> 00:27:08,919

with clouds form and so there's regions

600

00:27:13,049 --> 00:27:10,659

of it moving in different directions you

601  
00:27:15,779 --> 00:27:13,059  
could have the air at one altitude

602  
00:27:19,009 --> 00:27:15,789  
moving like Northwest at 10 miles an

603  
00:27:22,259 --> 00:27:19,019  
hour and then have it moving southeast

604  
00:27:24,389 --> 00:27:22,269  
50 miles an hour like a mile above that

605  
00:27:26,190 --> 00:27:24,399  
so you can have all these different

606  
00:27:28,409 --> 00:27:26,200  
layers of the atmosphere that can do

607  
00:27:31,799 --> 00:27:28,419  
completely different things so it's

608  
00:27:33,570 --> 00:27:31,809  
quite possible to get ripples in the air

609  
00:27:35,279 --> 00:27:33,580  
moving in one direction and ripples in

610  
00:27:37,859 --> 00:27:35,289  
the air moving in another direction I

611  
00:27:39,749 --> 00:27:37,869  
think this is perhaps not entirely

612  
00:27:41,310 --> 00:27:39,759  
intuitive because when we think of

613  
00:27:43,560 --> 00:27:41,320

ripples we think of ripples on the

614

00:27:46,580 --> 00:27:43,570

surface of things like you think of

615

00:27:48,980 --> 00:27:46,590

ripples on the surface of the water

616

00:27:52,259 --> 00:27:48,990

which is the most common

617

00:27:53,759 --> 00:27:52,269

ripples that we have but these are more

618

00:27:56,850 --> 00:27:53,769

three-dimensional ripples they're not

619

00:27:59,549 --> 00:27:56,860

really on the surface of things they're

620

00:28:02,100 --> 00:27:59,559

kind of at a level like between two air

621

00:28:04,230 --> 00:28:02,110

masses but there's lots of different you

622

00:28:05,850 --> 00:28:04,240

know essentially surfaces all the way up

623

00:28:07,470 --> 00:28:05,860

when you go through the atmosphere so

624

00:28:09,930 --> 00:28:07,480

you could say there's the interface

625

00:28:12,180 --> 00:28:09,940

between like 10,000 feet and 12,000 feet

626  
00:28:14,070 --> 00:28:12,190  
then between 12,000 feet and 14,000 feet

627  
00:28:17,369 --> 00:28:14,080  
yeah yeah so you can have all these

628  
00:28:18,529 --> 00:28:17,379  
completely different layers so the fact

629  
00:28:20,279 --> 00:28:18,539  
that you get ripples in two directions

630  
00:28:23,009 --> 00:28:20,289  
doesn't really mean anything

631  
00:28:25,619 --> 00:28:23,019  
and the variation but actually several

632  
00:28:29,940 --> 00:28:25,629  
directions yeah eight or nine directions

633  
00:28:30,989 --> 00:28:29,950  
in the same area and they yeah but I'm

634  
00:28:32,909 --> 00:28:30,999  
talking about ones where you they're

635  
00:28:37,379 --> 00:28:32,919  
overlapping each other you can see that

636  
00:28:38,999 --> 00:28:37,389  
oh yeah crisscross yeah yes you see two

637  
00:28:41,820 --> 00:28:39,009  
things you see this in the ocean there

638  
00:28:45,090 --> 00:28:41,830

are actually there's a few places where

639

00:28:47,700 --> 00:28:45,100

you do actually see it on the surface of

640

00:28:49,830 --> 00:28:47,710

the ocean because of the way a bay forms

641

00:28:51,629 --> 00:28:49,840

is a lot harder to get in the ocean than

642

00:28:54,359 --> 00:28:51,639

in the atmosphere but you can actually

643

00:28:57,450 --> 00:28:54,369

see these these ripples actually at the

644

00:28:59,909 --> 00:28:57,460

same yeah the same water level

645

00:29:00,690 --> 00:28:59,919

each other it's pretty interesting but

646

00:29:04,830 --> 00:29:00,700

yeah

647

00:29:07,490 --> 00:29:04,840

you there's nothing to stop ripples

648

00:29:09,990 --> 00:29:07,500

forming in different directions even

649

00:29:12,659 --> 00:29:10,000

over the same area but certainly in the

650

00:29:14,820 --> 00:29:12,669

same region the wind direction could be

651  
00:29:17,159 --> 00:29:14,830  
very chaotic not only at different

652  
00:29:19,680 --> 00:29:17,169  
altitudes but in you know fairly close

653  
00:29:20,940 --> 00:29:19,690  
proximity within like a few tens or

654  
00:29:22,980 --> 00:29:20,950  
hundreds of miles you know you're

655  
00:29:26,630 --> 00:29:22,990  
looking at satellite images you're

656  
00:29:29,180 --> 00:29:26,640  
looking at pretty pretty broad areas

657  
00:29:33,019 --> 00:29:29,190  
yeah I don't I don't really see anything

658  
00:29:35,760 --> 00:29:33,029  
untoward there and if you look at like

659  
00:29:37,409 --> 00:29:35,770  
older satellite images they they show up

660  
00:29:42,330 --> 00:29:37,419  
in those as well I've got a great book

661  
00:29:47,130 --> 00:29:42,340  
called spacious skies by richest scorer

662  
00:29:49,110 --> 00:29:47,140  
and Arian their cake and it's got a

663  
00:29:52,049 --> 00:29:49,120

whole bunch of satellite images from the

664

00:29:53,789 --> 00:29:52,059

1980s and they show things like this and

665

00:29:55,019 --> 00:29:53,799

you know that basically is that for the

666

00:29:56,940 --> 00:29:55,029

same now house they were before

667

00:29:59,519 --> 00:29:56,950

of course now we've got earth view so

668

00:30:04,980 --> 00:29:59,529

you can spend all day looking at it so

669

00:30:07,590 --> 00:30:04,990

you can slice maybe like a side note

670

00:30:10,799 --> 00:30:07,600

here do you know there's a repository

671

00:30:15,480 --> 00:30:10,809

because like before I think it's like

672

00:30:20,460 --> 00:30:15,490

2005 2008 they mislaid their imagery did

673

00:30:23,730 --> 00:30:20,470

anyone else say that you know so yeah

674

00:30:28,620 --> 00:30:23,740

there there's there are repositories of

675

00:30:31,710 --> 00:30:28,630

various satellites I don't I mean I I do

676

00:30:34,529 --> 00:30:31,720

like the I mean that the world uses it

677

00:30:36,419 --> 00:30:34,539

looks it's way easier on the eye than

678

00:30:38,340 --> 00:30:36,429

you know like the radar any ones and

679

00:30:40,919 --> 00:30:38,350

stuff would it be I think they had like

680

00:30:42,840 --> 00:30:40,929

some sort of the claim that they had

681

00:30:44,130 --> 00:30:42,850

some simple drive crash and they lost it

682

00:30:46,019 --> 00:30:44,140

they did not look back what or something

683

00:30:47,789 --> 00:30:46,029

well you know the satellites their Terra

684

00:30:50,730 --> 00:30:47,799

and Aqua satellites that they used yes

685

00:30:52,769 --> 00:30:50,740

they only go back that far I'm not sure

686

00:30:54,360 --> 00:30:52,779

when they were actually launched you

687

00:30:56,220 --> 00:30:54,370

know just I'm just looking at will dude

688

00:30:59,340 --> 00:30:56,230

right now I want to see oh no it's dead

689

00:31:01,049 --> 00:30:59,350

stops on January 1st the 2008 and I

690

00:31:03,269 --> 00:31:01,059

think if you go try to go back one day

691

00:31:05,220 --> 00:31:03,279

it'll start dead but they used to be

692

00:31:10,490 --> 00:31:05,230

there but it's not there I'm seeing I'm

693

00:31:17,360 --> 00:31:14,600

maybe they fix it Hey Oh that was a

694

00:31:21,320 --> 00:31:17,370

sidenote another satellite thing that

695

00:31:23,570 --> 00:31:21,330

I've seen are these very sharp edged

696

00:31:25,910 --> 00:31:23,580

clouds that are becoming increasingly

697

00:31:28,880 --> 00:31:25,920

common at least they seemed increasingly

698

00:31:30,350 --> 00:31:28,890

common to make you know it just looks

699

00:31:32,090 --> 00:31:30,360

like they've been carved because I like

700

00:31:39,040 --> 00:31:32,100

before you start nice some of them are

701  
00:31:43,160 --> 00:31:39,050  
dead straight but others have come to be

702  
00:31:44,870 --> 00:31:43,170  
they they're very transitory cloud you

703  
00:31:46,910 --> 00:31:44,880  
don't they don't last very often the

704  
00:31:48,320 --> 00:31:46,920  
problem is like when you see them on a

705  
00:31:50,900 --> 00:31:48,330  
world view you know you're only getting

706  
00:31:53,720 --> 00:31:50,910  
one image a day are you getting to tell

707  
00:31:55,910 --> 00:31:53,730  
you three actually me aqua and Terra

708  
00:31:57,470 --> 00:31:55,920  
yeah but that there yeah that you

709  
00:31:59,090 --> 00:31:57,480  
generally don't see very much

710  
00:32:00,560 --> 00:31:59,100  
development because they're they're so

711  
00:32:03,290 --> 00:32:00,570  
far apart in terms of time I think

712  
00:32:06,560 --> 00:32:03,300  
they're like two hours well the the well

713  
00:32:07,880 --> 00:32:06,570

Tara goes over first and then Aquin so

714

00:32:10,490 --> 00:32:07,890

they are pretty close to each other

715

00:32:16,160 --> 00:32:10,500

right well but the what we have now is

716

00:32:18,320 --> 00:32:16,170

the goes sixteen satellite which was is

717

00:32:21,440 --> 00:32:18,330

not quite operational yet but it does

718

00:32:24,560 --> 00:32:21,450

actually there are viewers online this

719

00:32:28,100 --> 00:32:24,570

one called slider I think he just

720

00:32:30,620 --> 00:32:28,110

probably Google for goes six yeah I'm

721

00:32:37,070 --> 00:32:30,630

looking at our series after if that's

722

00:32:41,690 --> 00:32:37,080

slider I can send you a link to it yeah

723

00:32:45,370 --> 00:32:41,700

it's it's it's basically a full disk

724

00:32:51,130 --> 00:32:45,380

view of the earth and it's updated every

725

00:32:53,720 --> 00:32:51,140

15 minutes so you can oh oh you can get

726

00:32:57,550 --> 00:32:53,730

animations of these clouds forming and

727

00:33:02,810 --> 00:32:57,560

you can actually see contrails forming

728

00:33:05,480 --> 00:33:02,820

yeah so it's the rambi slider or a site

729

00:33:15,110 --> 00:33:05,490

I'll just drop your link currently

730

00:33:17,750 --> 00:33:15,120

flying so yeah I just sent you a link to

731

00:33:19,940 --> 00:33:17,760

it and if you click on that it it

732

00:33:23,240 --> 00:33:19,950

actually shows you a full disk version

733

00:33:25,520 --> 00:33:23,250

of what a full disk image

734

00:33:27,140 --> 00:33:25,530

from a geostationary satellite which is

735

00:33:31,220 --> 00:33:27,150

fairly high resolution it's not as high

736

00:33:33,440 --> 00:33:31,230

as a school yeah that the the sites a

737

00:33:34,940 --> 00:33:33,450

little clunky at the moment yeah I find

738

00:33:36,740 --> 00:33:34,950

it best to zoom right in and then

739

00:33:39,200 --> 00:33:36,750

refresh so you can see what's going on

740

00:33:41,450 --> 00:33:39,210

it can be zooming over California right

741

00:33:48,640 --> 00:33:41,460

now you'll see some ripple clouds to the

742

00:33:51,980 --> 00:33:48,650

north of LA and you'll see that we're

743

00:33:57,049 --> 00:33:51,990

close yeah you should be able to just

744

00:33:58,669 --> 00:33:57,059

double click to zoom in okay oh I would

745

00:34:00,140 --> 00:33:58,679

zoom in and then then refresh the page

746

00:34:04,039 --> 00:34:00,150

when you get to where you want to go

747

00:34:05,149 --> 00:34:04,049

because it's otherwise it misses up but

748

00:34:07,159 --> 00:34:05,159

yeah this is a very good way of looking

749

00:34:08,830 --> 00:34:07,169

at how these clouds form and to your

750

00:34:11,270 --> 00:34:08,840

point about square clouds

751

00:34:13,099 --> 00:34:11,280

there's no no not the square ones but

752

00:34:14,629 --> 00:34:13,109

the ones that look like they've been cut

753

00:34:19,879 --> 00:34:14,639

right

754

00:34:22,250 --> 00:34:19,889

yeah that's it's basically just two air

755

00:34:24,050 --> 00:34:22,260

masses pushing against each other the

756

00:34:25,550 --> 00:34:24,060

clouds are forming in one and then

757

00:34:27,260 --> 00:34:25,560

there's another air mass which is a

758

00:34:29,810 --> 00:34:27,270

different different temperature and then

759

00:34:32,149 --> 00:34:29,820

you get oh by the way thanks for this is

760

00:34:34,310 --> 00:34:32,159

awesome isn't really cool yeah look at

761

00:34:38,990 --> 00:34:34,320

the animation along the the border with

762

00:34:40,310 --> 00:34:39,000

Mexico yeah you can see like yeah if you

763

00:34:42,409 --> 00:34:40,320

look off the coast there you'll see the

764

00:34:45,139 --> 00:34:42,419

ripples forming in the in the ocean

765

00:34:47,810 --> 00:34:45,149

there all right yeah see so it's pretty

766

00:34:49,399 --> 00:34:47,820

cool and you can you can you can see it

767

00:34:51,230 --> 00:34:49,409

gives a lot much better view as to how

768

00:34:53,450 --> 00:34:51,240

these clouds form rather than the

769

00:34:57,349 --> 00:34:53,460

snapshot that you get with with world

770

00:34:59,990 --> 00:34:57,359

view and like if you look at the ones

771

00:35:02,570 --> 00:35:00,000

off the coast of Mexico you follow the

772

00:35:04,550 --> 00:35:02,580

Mexican border out and pass that first

773

00:35:05,990 --> 00:35:04,560

island then you see some ripples and

774

00:35:12,200 --> 00:35:06,000

they're kind of pointing towards that

775

00:35:15,349 --> 00:35:12,210

other little round island which I'm not

776

00:35:21,190 --> 00:35:15,359

sure what that is but there's a you can

777

00:35:24,829 --> 00:35:21,200

see I've seen those you'll see it in the

778

00:35:26,450 --> 00:35:24,839

like what you know they're known over an

779

00:35:28,390 --> 00:35:26,460

island it'll leave it throw like a wake

780

00:35:31,010 --> 00:35:28,400

of this [h\_\_h] yeah there's a leeway yeah

781

00:35:33,140 --> 00:35:31,020

which are your gravity waves but it's

782

00:35:35,960 --> 00:35:33,150

just the greatly amplified by passing

783

00:35:36,750 --> 00:35:35,970

over the island the other ways I just

784

00:35:38,880 --> 00:35:36,760

just

785

00:35:43,830 --> 00:35:38,890

regular basically as the air being

786

00:35:46,020 --> 00:35:43,840

squished and and rippled yes that's a

787

00:35:47,220 --> 00:35:46,030

fun thing but yet so straight-edged is

788

00:35:49,290 --> 00:35:47,230

in clouds

789

00:35:51,360 --> 00:35:49,300

that's generally you know like it's a

790

00:35:53,520 --> 00:35:51,370

front essentially if you you know about

791

00:35:58,260 --> 00:35:53,530

weather fronts and you see them on the

792

00:36:00,660 --> 00:35:58,270

weather and they are roughly straight

793

00:36:03,570 --> 00:36:00,670

lines yeah they're in places like

794

00:36:05,700 --> 00:36:03,580

they're often like long curved lines but

795

00:36:07,530 --> 00:36:05,710

look if you look at them locally they're

796

00:36:08,970 --> 00:36:07,540

actually you know they're not curving

797

00:36:11,430 --> 00:36:08,980

that much so they're essentially fairly

798

00:36:12,960 --> 00:36:11,440

straight so on one side of that line

799

00:36:14,520 --> 00:36:12,970

you've got warm air and the other side

800

00:36:17,400 --> 00:36:14,530

you've got cold air which makes the

801

00:36:20,430 --> 00:36:17,410

cloud formation different and so as

802

00:36:22,080 --> 00:36:20,440

there's those those fronts move around

803

00:36:24,780 --> 00:36:22,090

and they're pushed around by the big

804

00:36:27,770 --> 00:36:24,790

masses of air you will get these

805

00:36:38,310 --> 00:36:27,780

straight edges in the cloud banks I

806

00:36:41,190 --> 00:36:38,320

don't see any on there there's some

807

00:36:42,920 --> 00:36:41,200

cloud or some contrails down the bottom

808

00:36:45,600 --> 00:36:42,930

of Baja which look kind of interesting

809

00:36:48,150 --> 00:36:45,610

well there's usually quite a lot of

810

00:36:50,280 --> 00:36:48,160

activity there I notice yeah just a

811

00:36:54,310 --> 00:36:50,290

tourist right just at the top of the

812

00:36:54,320 --> 00:36:58,250

[Music]

813

00:37:01,890 --> 00:37:00,600

your your your viewers can't see what

814

00:37:09,600 --> 00:37:01,900

your listeners can't see what we're

815

00:37:11,820 --> 00:37:09,610

looking at so Fred oh is actually a

816

00:37:16,920 --> 00:37:11,830

really good example of the leeward then

817

00:37:19,410 --> 00:37:16,930

I'm looking at South Georgia Georgia

818

00:37:20,850 --> 00:37:19,420

Rose Ann next to Alabama no no yeah I

819

00:37:22,160 --> 00:37:20,860

mean we're from the same place when you

820

00:37:24,510 --> 00:37:22,170

actually know where South Georgia's

821

00:37:26,130 --> 00:37:24,520

remember like the island with a fault oh

822

00:37:31,010 --> 00:37:26,140

right okay that was the first place that

823

00:37:33,930 --> 00:37:31,020

we've been like a man like Yorkshire

824

00:37:35,850 --> 00:37:33,940

right oh yes I was born in Yorkshire I

825

00:37:39,540 --> 00:37:35,860

went to university in Manchester and

826

00:37:44,910 --> 00:37:39,550

lived there for a while yeah so there's

827

00:37:46,260 --> 00:37:44,920

a bunch of nines yes I drove back and

828

00:37:47,520 --> 00:37:46,270

forth a few times yeah there's a bunch

829

00:37:48,870 --> 00:37:47,530

of Georgia's like I always get confused

830

00:37:50,490 --> 00:37:48,880

which one people refer to there's

831

00:37:52,710 --> 00:37:50,500

Georgia the state there's George

832

00:37:54,980 --> 00:37:52,720

the the Eastern European country and

833

00:37:58,400 --> 00:37:54,990

then this South Georgia which which is

834

00:38:02,190 --> 00:37:58,410

one of the which are dead which island

835

00:38:04,410 --> 00:38:02,200

it's well it's it's it's basically when

836

00:38:06,890 --> 00:38:04,420

you go Falklands and take a left at the

837

00:38:12,990 --> 00:38:06,900

Falklands wait a minute it's east of

838

00:38:16,350 --> 00:38:13,000

Auckland about yeah okay yeah well down

839

00:38:18,510 --> 00:38:16,360

there something because they had they

840

00:38:20,430 --> 00:38:18,520

had the fishermen they remember when

841

00:38:23,430 --> 00:38:20,440

they yeah that was the first the first

842

00:38:29,460 --> 00:38:23,440

invasion wasn't it yeah yeah that's a

843

00:38:31,430 --> 00:38:29,470

nice kind of a straight-edged cloud yeah

844

00:38:33,540 --> 00:38:31,440

it doesn't really look like anything

845

00:38:35,730 --> 00:38:33,550

anyway but yeah we're looking at these

846

00:38:37,140 --> 00:38:35,740

clouds and the there's you look at the

847

00:38:38,960 --> 00:38:37,150

size of the earth like he'd be zoom back

848

00:38:41,370 --> 00:38:38,970

out and you look at how big it is and

849

00:38:42,570 --> 00:38:41,380

you see how many clouds there are and

850

00:38:45,150 --> 00:38:42,580

then you you know you watch the

851  
00:38:46,890 --> 00:38:45,160  
animation of the entire globe and you're

852  
00:38:48,660 --> 00:38:46,900  
bound to get some odd shapes at some

853  
00:38:51,060 --> 00:38:48,670  
point somewhere it's just inevitable

854  
00:38:52,620 --> 00:38:51,070  
there's just there's you know if you're

855  
00:38:55,230 --> 00:38:52,630  
looking at this thing right now there's

856  
00:38:57,540 --> 00:38:55,240  
probably like 10,000 different clouds

857  
00:39:00,330 --> 00:38:57,550  
that you could say something about and

858  
00:39:03,810 --> 00:39:00,340  
if you play the animation they're just

859  
00:39:05,970 --> 00:39:03,820  
changing every 15 minutes so if you

860  
00:39:09,930 --> 00:39:05,980  
spent time looking at these images

861  
00:39:13,650 --> 00:39:09,940  
you're going to see weird clouds you

862  
00:39:16,710 --> 00:39:13,660  
couldn't help but see them actually

863  
00:39:18,390 --> 00:39:16,720

speaking of weird clothes so I've been

864

00:39:21,480 --> 00:39:18,400

obviously paying attention for a while

865

00:39:24,270 --> 00:39:21,490

I've seen these ones that I call to

866

00:39:25,740 --> 00:39:24,280

repeat words you know domain you have a

867

00:39:27,240 --> 00:39:25,750

cloud and I think there's actually a

868

00:39:30,690 --> 00:39:27,250

name for they've got added to the Cloud

869

00:39:33,150 --> 00:39:30,700

Atlas which I'll close I call I column

870

00:39:34,620 --> 00:39:33,160

drippy clouds is a cloud and there's

871

00:39:37,470 --> 00:39:34,630

stuff that looks like it's coming out

872

00:39:39,420 --> 00:39:37,480

like it's a little like when you see

873

00:39:41,490 --> 00:39:39,430

like a rain storm when there's stuff

874

00:39:44,730 --> 00:39:41,500

coming then we see rainfall about here

875

00:39:46,530 --> 00:39:44,740

but it's this stuff it's like you have a

876

00:39:48,840 --> 00:39:46,540

cloud in place and this stuff sort of

877

00:39:50,490 --> 00:39:48,850

comes out and sort of gets sort of blow

878

00:39:53,010 --> 00:39:50,500

and slightly away it looks like it's a

879

00:39:55,140 --> 00:39:53,020

slightly heavier thing yeah that's

880

00:40:00,360 --> 00:39:55,150

probably I'm thinking you're referring

881

00:40:03,720 --> 00:40:00,370

to verga vir GA it's one of the new

882

00:40:06,990 --> 00:40:03,730

cloud atlas ones actually haven't known

883

00:40:08,430 --> 00:40:07,000

that this jellyfish cloud is yeah the

884

00:40:12,090 --> 00:40:08,440

jellyfish cloud yeah

885

00:40:29,070 --> 00:40:12,100

those I mean it's not really a Oh shows

886

00:40:32,820 --> 00:40:29,080

me the crappy movie I think they were

887

00:40:34,620 --> 00:40:32,830

included in the new a new name they call

888

00:40:37,190 --> 00:40:34,630

them see I'm seeing one site they're

889

00:40:39,900 --> 00:40:37,200

called some altocumulus Castiel honest

890

00:40:46,020 --> 00:40:39,910

but they're really just high altitude

891

00:40:49,650 --> 00:40:46,030

clouds with precipitation and the

892

00:40:51,540 --> 00:40:49,660

precipitation evaporates or melt

893

00:40:53,250 --> 00:40:51,550

you know evaporates a bit before he gets

894

00:40:56,190 --> 00:40:53,260

to the ground so you see these these

895

00:40:58,710 --> 00:40:56,200

dangles of precipitation but they're

896

00:41:02,130 --> 00:40:58,720

they're falling into regions of air

897

00:41:04,890 --> 00:41:02,140

which have much lower humidity so the

898

00:41:08,250 --> 00:41:04,900

the precipitation evaporates before it

899

00:41:11,790 --> 00:41:08,260

reaches the ground and the jellyfish

900

00:41:14,849 --> 00:41:11,800

cloud is really just as a specific shape

901  
00:41:16,940 --> 00:41:14,859  
of cloud that does this type of

902  
00:41:19,400 --> 00:41:16,950  
precipitation

903  
00:41:22,380 --> 00:41:19,410  
yeah they look they look pretty weird

904  
00:41:28,470 --> 00:41:22,390  
sometimes you see them perform from a

905  
00:41:32,670 --> 00:41:28,480  
contrail it's pretty rare you see on the

906  
00:41:43,530 --> 00:41:32,680  
the the new Cloud Atlas and I'm sure you

907  
00:41:50,760 --> 00:41:43,540  
have the same thing Haven hole-punch

908  
00:41:55,620 --> 00:41:50,770  
clouds yeah I I saw this came across

909  
00:42:00,650 --> 00:41:55,630  
this Popular Mechanics article from

910  
00:42:03,540 --> 00:42:00,660  
another 50 they're talking about like

911  
00:42:06,330 --> 00:42:03,550  
Brahma gets work with GAE back in the

912  
00:42:08,520 --> 00:42:06,340  
50s 60s row seating and they showed that

913  
00:42:11,550 --> 00:42:08,530

one where they can do that with a dry

914

00:42:12,030 --> 00:42:11,560

ice yeah yeah well you're good you're

915

00:42:13,950 --> 00:42:12,040

good

916

00:42:16,650 --> 00:42:13,960

make a hole punch punch Claire with dry

917

00:42:17,850 --> 00:42:16,660

ice I mean and I think isn't the

918

00:42:19,170 --> 00:42:17,860

official line

919

00:42:21,180 --> 00:42:19,180

the whole plant supplies it supplying

920

00:42:24,330 --> 00:42:21,190

flying through them that makes it yeah

921

00:42:26,610 --> 00:42:24,340

generally it's it almost always would

922

00:42:29,220 --> 00:42:26,620

seem to be a plane flying through them

923

00:42:32,670 --> 00:42:29,230

but the whole bunch clouds the one you

924

00:42:34,080 --> 00:42:32,680

saw I think in the you know the

925

00:42:35,790 --> 00:42:34,090

black-and-white picture of like the long

926

00:42:39,300 --> 00:42:35,800

like kind of it leaves them along for

927

00:42:40,830 --> 00:42:39,310

Allah Pharaoh a row in the clouds that's

928

00:42:42,750 --> 00:42:40,840

a much thicker cloud layer than a

929

00:42:44,940 --> 00:42:42,760

hole-punch cloud normally forming they

930

00:42:47,100 --> 00:42:44,950

normally form in very thin layers of

931

00:42:50,310 --> 00:42:47,110

plow it's just a few and attends one

932

00:42:52,140 --> 00:42:50,320

hundreds of feet thick and it's it's

933

00:42:54,840 --> 00:42:52,150

it's kind of related to what I was

934

00:43:02,280 --> 00:42:54,850

talking about earlier it's they're

935

00:43:03,780 --> 00:43:02,290

actually water clouds and the liquid

936

00:43:07,410 --> 00:43:03,790

water cloud so that they're made of

937

00:43:10,080 --> 00:43:07,420

actual liquid water droplets and what

938

00:43:11,730 --> 00:43:10,090

happens is something causes the cloud to

939

00:43:14,220 --> 00:43:11,740

get disturbed and it can be in a fairly

940

00:43:17,360 --> 00:43:14,230

small region and then they kind of start

941

00:43:20,100 --> 00:43:17,370

transitioning into ice clouds

942

00:43:22,770 --> 00:43:20,110

you know something gets passes through

943

00:43:26,190 --> 00:43:22,780

them and disturbs it or yeah maybe

944

00:43:28,830 --> 00:43:26,200

something was sprayed on it then they

945

00:43:30,270 --> 00:43:28,840

start precipitating out you can see

946

00:43:31,980 --> 00:43:30,280

what's going on if you look at a

947

00:43:34,350 --> 00:43:31,990

hole-punch cloud it you can see they

948

00:43:36,240 --> 00:43:34,360

have this exact same precipitation that

949

00:43:38,460 --> 00:43:36,250

you see beneath the jellyfish clouds

950

00:43:40,550 --> 00:43:38,470

it's this long kind of tail of

951  
00:43:42,360 --> 00:43:40,560  
precipitation that just evaporates away

952  
00:43:44,040 --> 00:43:42,370  
because it doesn't reach the ground

953  
00:43:48,570 --> 00:43:44,050  
because it's falling into a region of

954  
00:43:50,400 --> 00:43:48,580  
lower humidity but yeah the the water

955  
00:43:53,190 --> 00:43:50,410  
cloud is transitioning into a nice cloud

956  
00:43:55,610 --> 00:43:53,200  
and the ice clumps together and it falls

957  
00:44:00,810 --> 00:43:55,620  
down because the particles are bigger

958  
00:44:02,010 --> 00:44:00,820  
it's it's kind of a an unusual thing it

959  
00:44:03,540 --> 00:44:02,020  
took people quite a long time to figure

960  
00:44:05,850 --> 00:44:03,550  
out what was going on with these clouds

961  
00:44:09,630 --> 00:44:05,860  
because you don't see them every day but

962  
00:44:13,170 --> 00:44:09,640  
yeah it's a cool thing that's right did

963  
00:44:18,210 --> 00:44:13,180

you have a question about thinking back

964

00:44:22,140 --> 00:44:18,220

to the spreading thing so like how

965

00:44:24,060 --> 00:44:22,150

contrails spread yeah you know if unless

966

00:44:26,190 --> 00:44:24,070

it's hundred percent humidity you know a

967

00:44:28,350 --> 00:44:26,200

case shouldn't be able to I mean

968

00:44:32,599 --> 00:44:28,360

assuming it's above you know you say

969

00:44:37,910 --> 00:44:35,370

if it's if it's not they should be able

970

00:44:43,050 --> 00:44:37,920

to spreadsheet day that's correct yes

971

00:44:46,760 --> 00:44:43,060

and you're saying the there must be some

972

00:44:51,750 --> 00:44:46,770

condensation nuclei are involved with

973

00:44:53,910 --> 00:44:51,760

you say eww what you did well you can

974

00:44:57,990 --> 00:44:53,920

create a contrail without a condensation

975

00:45:00,720 --> 00:44:58,000

like this you can no you you don't need

976

00:45:03,450 --> 00:45:00,730

a condensation nucleus because the

977

00:45:05,940 --> 00:45:03,460

spaghetti - well no no there's there's

978

00:45:10,920 --> 00:45:05,950

plenty of water and condensation nuclei

979

00:45:12,300 --> 00:45:10,930

in the jet exhaust just like the why

980

00:45:14,550 --> 00:45:12,310

would it be water if it's you know it's

981

00:45:15,089 --> 00:45:14,560

like it's a hot gas coming out it's not

982

00:45:19,890 --> 00:45:15,099

water

983

00:45:21,660 --> 00:45:19,900

nuclei what I mean a condensation nuclei

984

00:45:24,660 --> 00:45:21,670

like little particles or things like

985

00:45:31,200 --> 00:45:24,670

cert or all right things like that on

986

00:45:34,859 --> 00:45:31,210

which water will condense okay so the

987

00:45:38,250 --> 00:45:34,869

suit would be the which is carbon which

988

00:45:41,760 --> 00:45:38,260

would be the thing that the water from

989

00:45:43,890 --> 00:45:41,770

the the burn feel would attach onto and

990

00:45:47,070 --> 00:45:43,900

that was the seed that would freeze yeah

991

00:45:50,790 --> 00:45:47,080

now it doesn't actually need that carbon

992

00:45:52,620 --> 00:45:50,800

if there's a type of experimental plane

993

00:45:55,680 --> 00:45:52,630

which I think was in the 60s or 70s

994

00:45:57,750 --> 00:45:55,690

which used a hydrogen engine and that

995

00:46:02,070 --> 00:45:57,760

burned pure hydrogen with pure oxygen

996

00:46:05,250 --> 00:46:02,080

and that didn't create any sauce at all

997

00:46:07,859 --> 00:46:05,260

and yet it still left a contrail and the

998

00:46:10,710 --> 00:46:07,869

reason it left a contrail was that there

999

00:46:13,260 --> 00:46:10,720

is condensation water condensation

1000

00:46:14,760 --> 00:46:13,270

nuclei in water friendly condensation

1001

00:46:18,060 --> 00:46:14,770

nuclei in the air already

1002

00:46:20,490 --> 00:46:18,070

which is why clouds form so you don't

1003

00:46:23,040 --> 00:46:20,500

need that sort of that's in the aircraft

1004

00:46:24,990 --> 00:46:23,050

a water droplet is a compensation

1005

00:46:27,030 --> 00:46:25,000

equally as well a water droplet itself

1006

00:46:30,390 --> 00:46:27,040

is a condensation you like any any water

1007

00:46:33,930 --> 00:46:30,400

itself is a condensation site in liquid

1008

00:46:37,890 --> 00:46:33,940

form and it isn't yeah exactly I mean

1009

00:46:40,260 --> 00:46:37,900

you can have there's homogeneous and

1010

00:46:42,690 --> 00:46:40,270

heterogeneous you know homogeneous you

1011

00:46:45,450 --> 00:46:42,700

need homogeneous means there's just

1012

00:46:47,790 --> 00:46:45,460

water it takes a pretty

1013

00:46:49,650 --> 00:46:47,800

large amount of supersaturation yeah or

1014

00:46:51,690 --> 00:46:49,660

it'll spontaneously become a water

1015

00:46:53,310 --> 00:46:51,700

droplet when you have a condensation

1016

00:46:56,940 --> 00:46:53,320

nucleus you can do it at a hundred

1017

00:47:02,370 --> 00:46:56,950

percent exactly and actually I think

1018

00:47:04,170 --> 00:47:02,380

with certain with certain condensation

1019

00:47:06,359 --> 00:47:04,180

nuclei I can be last 90 percent because

1020

00:47:08,640 --> 00:47:06,369

like you have the like when you buy

1021

00:47:11,220 --> 00:47:08,650

electronics has this old sachet which

1022

00:47:16,640 --> 00:47:11,230

says do not eat the silica stuff will

1023

00:47:18,900 --> 00:47:16,650

draw in water vapor yeah

1024

00:47:20,310 --> 00:47:18,910

hydroscopic I don't I don't know

1025

00:47:25,079 --> 00:47:20,320

actually if that actually it's a

1026  
00:47:26,730 --> 00:47:25,089  
hydrophilic or hydrophobic a museum

1027  
00:47:31,500 --> 00:47:26,740  
absorb it hydrophilic means that it

1028  
00:47:33,079 --> 00:47:31,510  
likes it L sticks to it I don't think

1029  
00:47:36,839 --> 00:47:33,089  
people people don't use those as

1030  
00:47:39,960 --> 00:47:36,849  
condensation nuclei just pointing out

1031  
00:47:43,140 --> 00:47:39,970  
that it is possible for that water can

1032  
00:47:45,780 --> 00:47:43,150  
go from I don't think that would change

1033  
00:47:47,339 --> 00:47:45,790  
from gas phase into something orbit well

1034  
00:47:49,109 --> 00:47:47,349  
maybe it's absorbed as of yet I don't

1035  
00:47:50,730 --> 00:47:49,119  
know again it can be absorbed it can be

1036  
00:47:52,079 --> 00:47:50,740  
absorbed otherwise they wouldn't put him

1037  
00:47:55,200 --> 00:47:52,089  
in our electronics and tell us not to

1038  
00:47:56,910 --> 00:47:55,210

heat up yeah well yeah it gets absorbed

1039

00:47:59,609 --> 00:47:56,920

but yeah people don't actually use that

1040

00:48:02,310 --> 00:47:59,619

for for cloud seeding right there were

1041

00:48:06,120 --> 00:48:02,320

some ideas where you could spray that

1042

00:48:10,200 --> 00:48:06,130

stuff on hurricanes there was a guy

1043

00:48:12,690 --> 00:48:10,210

rhyme up it was essentially this guy had

1044

00:48:16,220 --> 00:48:12,700

this idea he's using the same stuff that

1045

00:48:18,900 --> 00:48:16,230

is used in in diapers or whole nappies

1046

00:48:20,700 --> 00:48:18,910

which is very very absorbent obviously

1047

00:48:23,130 --> 00:48:20,710

because it needs to absorb a lot of of

1048

00:48:25,170 --> 00:48:23,140

liquid and they thought they could take

1049

00:48:27,780 --> 00:48:25,180

that exact same stuff and spray it into

1050

00:48:29,010 --> 00:48:27,790

hurricanes but it would soak up the

1051

00:48:31,260 --> 00:48:29,020

water if it's not going to do anything

1052

00:48:32,790 --> 00:48:31,270

in terms of making clouds or anything

1053

00:48:34,500 --> 00:48:32,800

like that it's not the type of thing you

1054

00:48:37,770 --> 00:48:34,510

would use for flowers I'm not entirely

1055

00:48:39,329 --> 00:48:37,780

sure about the artificial snow making

1056

00:48:41,190 --> 00:48:39,339

like snow blowers that they they add

1057

00:48:42,780 --> 00:48:41,200

some chemicals to the water there to

1058

00:48:45,900 --> 00:48:42,790

make make snow

1059

00:48:48,740 --> 00:48:45,910

I'm not really into my piece

1060

00:48:51,450 --> 00:48:48,750

I don't know these silver iodide and

1061

00:48:53,520 --> 00:48:51,460

infomercial started in operation yeah it

1062

00:48:54,420 --> 00:48:53,530

could be just that but I think there may

1063

00:48:56,400 --> 00:48:54,430

be something else as well because

1064

00:48:58,030 --> 00:48:56,410

they're you know they're spring they're

1065

00:49:00,340 --> 00:48:58,040

not spraying in super cold temper

1066

00:49:02,980 --> 00:49:00,350

whispers yeah so they still they still

1067

00:49:04,210 --> 00:49:02,990

need ice nuclei actually that would

1068

00:49:06,820 --> 00:49:04,220

still work wouldn't ya they don't need

1069

00:49:11,740 --> 00:49:06,830

that call of a temperature so probably

1070

00:49:15,640 --> 00:49:11,750

is just silver iodide yeah I'd have to

1071

00:49:19,120 --> 00:49:15,650

look into that so another question I'd

1072

00:49:21,610 --> 00:49:19,130

like to bring up is as you know I get my

1073

00:49:24,730 --> 00:49:21,620

rain water now analyzed and I have I

1074

00:49:26,290 --> 00:49:24,740

gotta get it kind of our rain comes in

1075

00:49:33,150 --> 00:49:26,300

off the ocean and pretty much on the

1076  
00:49:40,780 --> 00:49:35,290  
apartments sloppy hand looking bad

1077  
00:49:44,200 --> 00:49:40,790  
reading or whatever how when air masses

1078  
00:49:47,070 --> 00:49:44,210  
from the ocean having high levels of

1079  
00:49:51,880 --> 00:49:47,080  
nothing click aluminum barium John deal

1080  
00:49:53,620 --> 00:49:51,890  
so on albeay dandy I mean if you were for

1081  
00:49:55,720 --> 00:49:53,630  
the sake of argument to exclude user

1082  
00:50:00,970 --> 00:49:55,730  
error or me just like throwing like

1083  
00:50:06,280 --> 00:50:00,980  
aluminum by where could come to be

1084  
00:50:12,880 --> 00:50:06,290  
coming from hazard well you know exactly

1085  
00:50:15,910 --> 00:50:12,890  
you know exactly on the beach I'm in the

1086  
00:50:18,490 --> 00:50:15,920  
city and it's all it's I have it's like

1087  
00:50:20,200 --> 00:50:18,500  
you know few miles a residential between

1088  
00:50:21,880 --> 00:50:20,210

the in the beach so there's gonna

1089

00:50:23,950 --> 00:50:21,890

there's gonna be a little bit of service

1090

00:50:27,070 --> 00:50:23,960

there yeah and obviously being in a city

1091

00:50:29,290 --> 00:50:27,080

there's a lot of traffic and on air

1092

00:50:32,040 --> 00:50:29,300

traffic sorry a lot of road traffic so

1093

00:50:34,630 --> 00:50:32,050

you get a lot of and there's a lot of

1094

00:50:35,560 --> 00:50:34,640

houses with things like furnaces and

1095

00:50:38,470 --> 00:50:35,570

things like that so there's a lot of

1096

00:50:41,680 --> 00:50:38,480

pollution in the city so you're not

1097

00:50:43,180 --> 00:50:41,690

exactly getting like pristine air where

1098

00:50:44,710 --> 00:50:43,190

you are you might be interesting to for

1099

00:50:46,360 --> 00:50:44,720

you to try taking some samples by the

1100

00:50:49,480 --> 00:50:46,370

beach to see if you get variations but

1101  
00:50:51,700 --> 00:50:49,490  
there are other factors as well by the

1102  
00:50:53,800 --> 00:50:51,710  
way that's the thing the other thing is

1103  
00:50:55,930 --> 00:50:53,810  
that I do have such massive variation

1104  
00:51:00,160 --> 00:50:55,940  
because sometimes I'd like oh I'll get a

1105  
00:51:03,130 --> 00:51:00,170  
lot and then zip nada uh the variation

1106  
00:51:06,000 --> 00:51:03,140  
will go from you know down below 50 you

1107  
00:51:10,760 --> 00:51:06,010  
know micrograms per year to over 500

1108  
00:51:13,700 --> 00:51:10,770  
yeah looking at some of your you

1109  
00:51:15,970 --> 00:51:13,710  
I just randomly picked like one of your

1110  
00:51:17,960 --> 00:51:15,980  
reports off your website there's one

1111  
00:51:19,910 --> 00:51:17,970  
they see what does it say

1112  
00:51:21,470 --> 00:51:19,920  
Sheila Quincy Vaughn is that that's

1113  
00:51:23,690 --> 00:51:21,480

something save on they spelled it wrong

1114

00:51:25,400 --> 00:51:23,700

it was snow I got crappy writing I'm

1115

00:51:33,290 --> 00:51:25,410

really bad I don't know how I got this

1116

00:51:34,880 --> 00:51:33,300

notice Sivan yeah it's kind of

1117

00:51:37,700 --> 00:51:34,890

interesting as a variation you getting

1118

00:51:42,650 --> 00:51:37,710

in that like like you have a lot of iron

1119

00:51:44,570 --> 00:51:42,660

which the reason I test for iron was

1120

00:51:45,980 --> 00:51:44,580

because of David Keith's paper because

1121

00:51:49,730 --> 00:51:45,990

you know he proposed putting those

1122

00:51:52,480 --> 00:51:49,740

little nano discs with because they were

1123

00:51:55,760 --> 00:51:52,490

made of iron though they were because

1124

00:51:57,200 --> 00:51:55,770

the disc was 50 nanometers across there

1125

00:52:00,380 --> 00:51:57,210

was a layer of aluminum which is

1126

00:52:03,290 --> 00:52:00,390

aluminum oxide haha for aluminium for

1127

00:52:06,020 --> 00:52:03,300

you know the people back home and then

1128

00:52:09,859 --> 00:52:06,030

elemental aluminum yeah and then

1129

00:52:12,320 --> 00:52:09,869

underneath that there was a layer of

1130

00:52:15,320 --> 00:52:12,330

barium titanate and underneath that

1131

00:52:16,849 --> 00:52:15,330

ferrite the ferrite was so you could

1132

00:52:18,230 --> 00:52:16,859

steer it because they wanted like be

1133

00:52:20,930 --> 00:52:18,240

able to you want to be able to you know

1134

00:52:22,700 --> 00:52:20,940

they've tilted around you know to align

1135

00:52:24,800 --> 00:52:22,710

it with the Sun for reflection or

1136

00:52:26,300 --> 00:52:24,810

something like hey if he's talking about

1137

00:52:28,940 --> 00:52:26,310

it I'll look for it that's your never

1138

00:52:31,250 --> 00:52:28,950

got a huge amount of aluminum oh sorry

1139

00:52:35,750 --> 00:52:31,260

titanium and iron because there I've got

1140

00:52:42,290 --> 00:52:35,760

a picture of that disk and it doesn't

1141

00:52:45,010 --> 00:52:42,300

mention the ion if you go magnetite

1142

00:52:49,670 --> 00:52:45,020

that's he calls it his magnetites it's

1143

00:52:51,050 --> 00:52:49,680

Paris right a little bit at the bottom I

1144

00:52:52,780 --> 00:52:51,060

think there's a diagram if you can find

1145

00:52:55,370 --> 00:52:52,790

that pull up that paper the penis one

1146

00:52:59,800 --> 00:52:55,380

yeah I'm just looking at like a random

1147

00:53:02,450 --> 00:52:59,810

image that I saw yeah I think somewhere

1148

00:53:05,270 --> 00:53:02,460

yeah alright so yeah that makes sense

1149

00:53:07,940 --> 00:53:05,280

that like it seems but yeah the thing

1150

00:53:09,160 --> 00:53:07,950

about those disks is if they were using

1151  
00:53:11,330 --> 00:53:09,170  
that you see them under a microscope

1152  
00:53:14,150 --> 00:53:11,340  
because they're not that because I'm

1153  
00:53:17,540 --> 00:53:14,160  
small the ten microns across but they

1154  
00:53:19,540 --> 00:53:17,550  
were using that about mike rizzo was

1155  
00:53:23,380 --> 00:53:19,550  
mentioned i thought i'd look

1156  
00:53:27,269 --> 00:53:23,390  
specifically is being done right

1157  
00:53:30,880 --> 00:53:27,279  
actually this a good place to segue to

1158  
00:53:37,210 --> 00:53:30,890  
so of course there are these proposals

1159  
00:53:40,120 --> 00:53:37,220  
and they it's been discussed and for

1160  
00:53:42,579 --> 00:53:40,130  
people who aren't aware of this it's

1161  
00:53:48,220 --> 00:53:42,589  
been proposed as a possible solution for

1162  
00:53:50,650 --> 00:53:48,230  
a global warming to put reflective

1163  
00:53:52,839 --> 00:53:50,660

particles into the sky to reflect

1164

00:53:55,480 --> 00:53:52,849

sunlight back into space to reduce the

1165

00:53:58,509 --> 00:53:55,490

effective global warming yes and

1166

00:54:00,370 --> 00:53:58,519

originally there was you know the most

1167

00:54:03,549 --> 00:54:00,380

of the talk was about sulfates sulfates

1168

00:54:05,500 --> 00:54:03,559

that we were adapted and there's less

1169

00:54:07,779 --> 00:54:05,510

top of that I mean what a fantastic

1170

00:54:10,380 --> 00:54:07,789

brain is not terribly wonderful but

1171

00:54:13,079 --> 00:54:10,390

there has been discussion about using

1172

00:54:15,069 --> 00:54:13,089

amongst other things aluminum

1173

00:54:16,809 --> 00:54:15,079

nanoparticles David Keith talked about

1174

00:54:18,390 --> 00:54:16,819

that himself it's certainly been

1175

00:54:21,880 --> 00:54:18,400

proposed

1176

00:54:23,410 --> 00:54:21,890

that's true though I think the sulfate

1177

00:54:25,420 --> 00:54:23,420

thing is still the main thing that

1178

00:54:27,279 --> 00:54:25,430

people are looking at I've also heard

1179

00:54:30,370 --> 00:54:27,289

them like talking about calcite that's

1180

00:54:32,319 --> 00:54:30,380

another one you know I basically calcite

1181

00:54:34,029 --> 00:54:32,329

being sort of you know like antacid

1182

00:54:35,710 --> 00:54:34,039

stuff yeah that doesn't sound right

1183

00:54:37,329 --> 00:54:35,720

there's a thing called chemical

1184

00:54:40,599 --> 00:54:37,339

weathering which is a method of

1185

00:54:44,019 --> 00:54:40,609

sequestering come to oxide using calcium

1186

00:54:46,480 --> 00:54:44,029

carbonate but I'm not sure if that's

1187

00:54:48,849 --> 00:54:46,490

related because no they were actually

1188

00:54:51,940 --> 00:54:48,859

that was one of the proposals calcite

1189

00:54:53,559 --> 00:54:51,950

which I'm not sure I mean of course when

1190

00:54:55,299 --> 00:54:53,569

people look up geoengineering was the

1191

00:54:57,549 --> 00:54:55,309

two proposals one is carbon dioxide

1192

00:55:06,370 --> 00:54:57,559

removal and the other one is solar

1193

00:55:09,819 --> 00:55:06,380

radiation management or so the the my

1194

00:55:13,720 --> 00:55:09,829

research has been mostly concentrating

1195

00:55:16,740 --> 00:55:13,730

on human health impacts so the proposed

1196

00:55:20,019 --> 00:55:16,750

do you mention to you engineering things

1197

00:55:23,700 --> 00:55:20,029

like aluminum and it is actually pretty

1198

00:55:26,079 --> 00:55:23,710

aluminum it's not really good for you

1199

00:55:36,660 --> 00:55:26,089

it's been implicated with Alzheimer's

1200

00:55:44,309 --> 00:55:42,089

I I just want to like you know check

1201  
00:55:51,390 --> 00:55:44,319  
with you that you certainly would don't

1202  
00:55:53,039 --> 00:55:51,400  
you wouldn't condone putting adding more

1203  
00:55:55,740 --> 00:55:53,049  
poisons into the environment

1204  
00:55:58,289 --> 00:55:55,750  
I'm I'm against pollution of any sort

1205  
00:56:03,029 --> 00:55:58,299  
yeah yeah we're on the same page on

1206  
00:56:03,900 --> 00:56:03,039  
there you know there you got a yeah

1207  
00:56:05,549 --> 00:56:03,910  
you're gonna know you're talking about

1208  
00:56:10,069 --> 00:56:05,559  
though when you're you're saying like

1209  
00:56:12,509 --> 00:56:10,079  
pollution like aluminum oxide is not

1210  
00:56:14,509 --> 00:56:12,519  
something that I would consider air

1211  
00:56:17,009 --> 00:56:14,519  
pollution and you know worst it's a

1212  
00:56:19,579 --> 00:56:17,019  
possible irritant

1213  
00:56:23,849 --> 00:56:19,589

because it's other bit of oxide is

1214

00:56:26,460 --> 00:56:23,859

sandpaper when you sound something

1215

00:56:29,940 --> 00:56:26,470

you're using aluminum oxide that's what

1216

00:56:32,400 --> 00:56:29,950

they make it out of so it's not really a

1217

00:56:34,049 --> 00:56:32,410

politically it's clear link to

1218

00:56:36,660 --> 00:56:34,059

Alzheimer's you need it see there's a

1219

00:56:38,309 --> 00:56:36,670

link between aluminum on Alzheimer's the

1220

00:56:40,319 --> 00:56:38,319

world there is to put this there's a

1221

00:56:43,200 --> 00:56:40,329

suggested link and if you look at the

1222

00:56:44,819 --> 00:56:43,210

Alzheimer's Association or any the CDC

1223

00:56:47,339 --> 00:56:44,829

or anybody like that they will tell you

1224

00:56:49,470 --> 00:56:47,349

that there's no actual evidence of this

1225

00:56:51,299 --> 00:56:49,480

link if you think about it you know soda

1226

00:56:53,220 --> 00:56:51,309

cans are made of aluminum cooking things

1227

00:56:55,769 --> 00:56:53,230

are made of aluminum aluminum is found

1228

00:56:57,029 --> 00:56:55,779

in deodorants you know aluminum is

1229

00:56:59,279 --> 00:56:57,039

everywhere you know that the rocks

1230

00:57:02,130 --> 00:56:59,289

around you are made of aluminum the soil

1231

00:57:04,920 --> 00:57:02,140

in California in Northern California is

1232

00:57:07,859 --> 00:57:04,930

nearly 10 percent aluminum aluminum is

1233

00:57:09,450 --> 00:57:07,869

everywhere and so it's not like we're

1234

00:57:10,829 --> 00:57:09,460

seeing higher rates of illnesses in

1235

00:57:13,099 --> 00:57:10,839

Northern California versus southern

1236

00:57:16,620 --> 00:57:13,109

Florida because there's so much aluminum

1237

00:57:19,019 --> 00:57:16,630

foil in in Florida it's about you know

1238

00:57:20,579 --> 00:57:19,029

less than one percent aluminum soil in

1239

00:57:23,430 --> 00:57:20,589

Northern California is over ten percent

1240

00:57:25,259 --> 00:57:23,440

aluminum and it is you know in very

1241

00:57:28,170 --> 00:57:25,269

small form it's like in dust year so

1242

00:57:29,759 --> 00:57:28,180

when that when he dries and blows in the

1243

00:57:31,769 --> 00:57:29,769

air you're breathing in this this dust

1244

00:57:34,650 --> 00:57:31,779

that's got aluminum in it but you know

1245

00:57:35,970 --> 00:57:34,660

no one's ever discovered that people in

1246

00:57:38,700 --> 00:57:35,980

Northern California are getting sick

1247

00:57:40,680 --> 00:57:38,710

more than people in Florida if anything

1248

00:57:44,249 --> 00:57:40,690

it's the other way around so would you

1249

00:57:46,609 --> 00:57:44,259

say that the if there was say to be if

1250

00:57:50,040 --> 00:57:46,619

there was alone to be found in the air

1251

00:57:53,850 --> 00:57:50,050

you would say yeah there's Daniel

1252

00:57:57,120 --> 00:57:53,860

yeah so that's all from ground just like

1253

00:57:58,710 --> 00:57:57,130

stuff blowing from the ground from

1254

00:58:02,550 --> 00:57:58,720

industrial emissions but the vast

1255

00:58:04,860 --> 00:58:02,560

majority of aluminum in the air will

1256

00:58:10,170 --> 00:58:04,870

come just ro basic from mineral dust

1257

00:58:13,740 --> 00:58:10,180

rocks most rocks are a class of rocks

1258

00:58:15,180 --> 00:58:13,750

called aluminosilicates which contains

1259

00:58:16,410 --> 00:58:15,190

aluminum and silicon and a bunch of

1260

00:58:20,160 --> 00:58:16,420

other things like calcium and things

1261

00:58:23,250 --> 00:58:20,170

like that but yeah any rocky pick up is

1262

00:58:28,650 --> 00:58:23,260

going to have a lot of aluminum in it so

1263

00:58:30,180 --> 00:58:28,660

the so basically rocks but knocking into

1264

00:58:33,390 --> 00:58:30,190

each other will have create smaller

1265

00:58:35,640 --> 00:58:33,400

rocks and bit the average person like

1266

00:58:39,210 --> 00:58:35,650

eats around like five or six milligrams

1267

00:58:41,730 --> 00:58:39,220

of aluminum every day in their food just

1268

00:58:44,550 --> 00:58:41,740

because it's in the plants when the

1269

00:58:46,650 --> 00:58:44,560

plants grow in soil they take on some of

1270

00:58:48,780 --> 00:58:46,660

them you know many gets in there you get

1271

00:58:50,130 --> 00:58:48,790

a little bit from your your soda cans

1272

00:58:51,630 --> 00:58:50,140

not very much because they had they coat

1273

00:58:54,750 --> 00:58:51,640

it just robbed that happened he was

1274

00:58:58,950 --> 00:58:54,760

being all nasty and aluminum foil

1275

00:59:01,020 --> 00:58:58,960

Reynolds Wrap in America that's yes

1276

00:59:06,120 --> 00:59:01,030

there's a luminaire everywhere it's not

1277

00:59:08,820 --> 00:59:06,130

it's it's in sin back scenes it's an I'm

1278

00:59:11,160 --> 00:59:08,830

deodorant it's and I don't I'm not sure

1279

00:59:16,140 --> 00:59:11,170

it's in vaccines exact oh it is actually

1280

00:59:19,290 --> 00:59:16,150

it's the adjuvant well it's actually a

1281

00:59:21,510 --> 00:59:19,300

really good there's a bitter yeah

1282

00:59:25,080 --> 00:59:21,520

there's plenty research on that but yeah

1283

00:59:26,910 --> 00:59:25,090

lumina it's not right I mean it's common

1284

00:59:28,980 --> 00:59:26,920

it we have it we're surrounded by it we

1285

00:59:30,900 --> 00:59:28,990

live in an aluminum age and I know that

1286

00:59:31,830 --> 00:59:30,910

the lots of people say that aluminum is

1287

00:59:35,130 --> 00:59:31,840

really bad for you

1288

00:59:39,030 --> 00:59:35,140

but there's really no good evidence that

1289

00:59:44,490 --> 00:59:39,040

it's doing anything bad I you know you

1290

00:59:47,220 --> 00:59:44,500

probably look at more alternative sites

1291

00:59:48,990 --> 00:59:47,230

then than idea so you bring more into

1292

00:59:52,770 --> 00:59:49,000

more like an alternative health like

1293

00:59:55,650 --> 00:59:52,780

anti GMO type things but you know if you

1294

00:59:58,380 --> 00:59:55,660

look at the actual evidence it doesn't

1295

00:59:59,429 --> 00:59:58,390

really seem like you know it's doing

1296

01:00:02,199 --> 00:59:59,439

anything

1297

01:00:03,489 --> 01:00:02,209

okay I'll do this yeah we'd have to

1298

01:00:06,489 --> 01:00:03,499

agree to disagree on that one cuz it's a

1299

01:00:12,870 --> 01:00:06,499

very large topic well if you go to

1300

01:00:15,759 --> 01:00:12,880

PubMed type in aluminum and tox talk

1301

01:00:18,459 --> 01:00:15,769

toxicity or Alzheimer's you're gonna get

1302

01:00:20,019 --> 01:00:18,469

a whole lot of literature right but you

1303

01:00:21,639 --> 01:00:20,029

know you're not gonna get but I mean I I

1304

01:00:25,299 --> 01:00:21,649

know I know officially there hasn't been

1305

01:00:28,749 --> 01:00:25,309

the CDC hasn't said yes this causes that

1306

01:00:30,880 --> 01:00:28,759

I know I'm aware of that right but I

1307

01:00:32,679 --> 01:00:30,890

think you're perhaps putting a bit more

1308

01:00:34,719 --> 01:00:32,689

weight on it than it deserves like if

1309

01:00:36,669 --> 01:00:34,729

people like like Mike Adams say that

1310

01:00:38,859 --> 01:00:36,679

aluminum is bad for you it's not really

1311

01:00:40,719 --> 01:00:38,869

good evidence that aluminum is bad for

1312

01:00:43,499 --> 01:00:40,729

you and you can you can always find a

1313

01:00:46,509 --> 01:00:43,509

few papers on some subject on PubMed

1314

01:00:48,159 --> 01:00:46,519

because know they they they're not

1315

01:00:49,839 --> 01:00:48,169

really a publishing thing they just

1316

01:00:51,729 --> 01:00:49,849

catalogue everything so there's lots of

1317

01:00:53,229 --> 01:00:51,739

journals they don't have very strict

1318

01:00:57,239 --> 01:00:53,239

standards of publication and they have

1319

01:01:00,519 --> 01:00:57,249

pretty pretty poor levels of acceptance

1320

01:01:02,469 --> 01:01:00,529

what they will accept so yeah I'm not

1321

01:01:06,009 --> 01:01:02,479

really sold on the idea that aluminum is

1322

01:01:09,729 --> 01:01:06,019

bad for you but they do it is considered

1323

01:01:12,639 --> 01:01:09,739

a risk factor for Alzheimer's no it's

1324

01:01:15,639 --> 01:01:12,649

not it's not it's it's there's a

1325

01:01:17,709 --> 01:01:15,649

correlation between aluminum being found

1326

01:01:21,370 --> 01:01:17,719

in the brains of people who had

1327

01:01:25,870 --> 01:01:21,380

Alzheimer's that doesn't mean that that

1328

01:01:29,409 --> 01:01:25,880

they that their Alzheimer's was caused

1329

01:01:30,729 --> 01:01:29,419

by aluminum was much more likely is that

1330

01:01:35,439 --> 01:01:30,739

it's the other way around

1331

01:01:37,839 --> 01:01:35,449

and that the disease makes them take it

1332

01:01:40,089 --> 01:01:37,849

out more yes yeah that there's the

1333

01:01:42,519 --> 01:01:40,099

because of the drugs that they're given

1334

01:01:43,870 --> 01:01:42,529

those types of drugs which alter the

1335

01:01:46,739 --> 01:01:43,880

brain chemistry obviously you know

1336

01:01:50,229 --> 01:01:46,749

Alzheimer's is a degradation of

1337

01:01:51,939 --> 01:01:50,239

degrading of the brain so they have to

1338

01:01:53,799 --> 01:01:51,949

take all these very strong drugs as you

1339

01:01:56,949 --> 01:01:53,809

get into the later stages which do

1340

01:02:00,299 --> 01:01:56,959

things to your brain chemistry and that

1341

01:02:02,709 --> 01:02:00,309

is thought to be the reason why

1342

01:02:04,629 --> 01:02:02,719

Alzheimer's patients get this aluminum

1343

01:02:07,149 --> 01:02:04,639

in the brain because of the drugs that

1344

01:02:08,620 --> 01:02:07,159

they have been taking again I would have

1345

01:02:10,089 --> 01:02:08,630

to check that but that's as I remember

1346

01:02:11,259 --> 01:02:10,099

it well

1347

01:02:12,540 --> 01:02:11,269

I think that's one we're going to

1348

01:02:16,720 --> 01:02:12,550

disagree

1349

01:02:21,730 --> 01:02:16,730

which is fine it's both sides of this we

1350

01:02:25,359 --> 01:02:21,740

need both sides of this but I yeah

1351

01:02:31,450 --> 01:02:25,369

aluminum is not good personally I try to

1352

01:02:36,099 --> 01:02:31,460

I mean I cook in its until you know how

1353

01:02:37,870 --> 01:02:36,109

safe stuff is you know it's best but we

1354

01:02:39,940 --> 01:02:37,880

do know how safe aluminum is it's been

1355

01:02:41,800 --> 01:02:39,950

used for like you know that like a

1356

01:02:43,930 --> 01:02:41,810

century since aluminum became cheap

1357

01:02:47,109 --> 01:02:43,940

enough to use and everything and we use

1358

01:02:50,290 --> 01:02:47,119

it in cookware and I don't yeah you

1359

01:02:59,470 --> 01:02:50,300

don't I do and I'm fine nothing wrong

1360

01:03:02,859 --> 01:02:59,480

with my brain well talk about something

1361

01:03:10,089 --> 01:03:02,869

very briefly on your just no sample your

1362

01:03:12,250 --> 01:03:10,099

Chile Quinn Sivan you you mentioned I

1363

01:03:15,760 --> 01:03:12,260

think in the discussion something about

1364

01:03:17,230 --> 01:03:15,770

the the reporting limit alright yeah yes

1365

01:03:18,640 --> 01:03:17,240

a reporting limit there's reporting

1366

01:03:21,430 --> 01:03:18,650

limit in method detection limiter to

1367

01:03:23,770 --> 01:03:21,440

your hands method attack method

1368

01:03:28,930 --> 01:03:23,780

detection limit is what the machine is

1369

01:03:32,380 --> 01:03:28,940

able to find and the reporting limits

1370

01:03:36,670 --> 01:03:32,390

above that right and it's not this and I

1371

01:03:38,440 --> 01:03:36,680

haven't said that I I don't know at what

1372

01:03:41,020 --> 01:03:38,450

level these things are toxic you don't

1373

01:03:42,609 --> 01:03:41,030

know how much you know uranium is toxic

1374

01:03:45,190 --> 01:03:42,619

you don't know how much water is talk I

1375

01:03:47,740 --> 01:03:45,200

think I think the post you made on that

1376

01:03:50,050 --> 01:03:47,750

thing it kind of seemed to imply that

1377

01:03:51,250 --> 01:03:50,060

being higher than the reporting limit

1378

01:03:54,640 --> 01:03:51,260

was a bad thing

1379

01:03:57,490 --> 01:03:54,650

well I'm learn my point is why are we

1380

01:04:00,370 --> 01:03:57,500

having why are this are these large and

1381

01:04:02,740 --> 01:04:00,380

varying amounts of it do you thing is in

1382

01:04:05,400 --> 01:04:02,750

many cases than not actually a large I

1383

01:04:10,570 --> 01:04:05,410

mean you know the the limit for

1384

01:04:13,560 --> 01:04:10,580

aluminium aluminium in water is it's

1385

01:04:17,230 --> 01:04:13,570

like two milligrams per liter which is

1386

01:04:18,670 --> 01:04:17,240

2,000 parts per billion but the things

1387

01:04:21,940 --> 01:04:18,680

that you're finding in it are in the

1388

01:04:25,270 --> 01:04:21,950

hundreds so they're a lot lower than the

1389

01:04:26,230 --> 01:04:25,280

actual you know the limit that the EPA

1390

01:04:28,570 --> 01:04:26,240

said yeah

1391

01:04:31,120 --> 01:04:28,580

it's I mean with when when you put water

1392

01:04:32,859 --> 01:04:31,130

through water treatments there's you'll

1393

01:04:34,720 --> 01:04:32,869

have I mean groundwater can get can't a

1394

01:04:36,820 --> 01:04:34,730

know what's on the ground there's stuff

1395

01:04:39,580 --> 01:04:36,830

there's added you know this classify

1396

01:04:42,040 --> 01:04:39,590

stuff that gets added to drinking water

1397

01:04:44,109 --> 01:04:42,050

plus it can come through their pipes and

1398

01:04:46,960 --> 01:04:44,119

other kinds of stuff so what a great

1399

01:04:49,390 --> 01:04:46,970

area water shortly water from the tap is

1400

01:04:51,670 --> 01:04:49,400

not the same as waterfall implement

1401

01:04:54,250 --> 01:04:51,680

right so I that's my question I'd be

1402

01:04:57,370 --> 01:04:54,260

like my concern is how are you how do

1403

01:04:59,080 --> 01:04:57,380

you know it's high what my concern is I

1404

01:05:01,780 --> 01:04:59,090

want to find out what the condensation

1405

01:05:04,359 --> 01:05:01,790

nuclei are and what they're made of

1406

01:05:06,600 --> 01:05:04,369

these things when I see high levels of

1407

01:05:09,640 --> 01:05:06,610

how do you know parent and air is high

1408

01:05:19,810 --> 01:05:09,650

high relative to what what is normal

1409

01:05:22,480 --> 01:05:19,820

rainfall I got you know studies done

1410

01:05:23,980 --> 01:05:22,490

back from like a hundred years ago where

1411

01:05:26,680 --> 01:05:23,990

they measured the concentration of

1412

01:05:29,859 --> 01:05:26,690

various metals in rainwater and in snow

1413

01:05:31,390 --> 01:05:29,869

and it came out in just basically the

1414

01:05:37,720 --> 01:05:31,400

same types of levels that you're seeing

1415

01:05:42,190 --> 01:05:37,730

there's variations oh right and I begin

1416

01:05:44,590 --> 01:05:42,200

to get historical stuff you know you're

1417

01:05:46,270 --> 01:05:44,600

just looking at levels and you the

1418

01:05:48,580 --> 01:05:46,280

weight the way you put it like saying

1419

01:05:50,109 --> 01:05:48,590

like he has four times the reporting

1420

01:05:52,090 --> 01:05:50,119

limit makes it sound like it's four

1421

01:05:54,160 --> 01:05:52,100

times the danger level and I think that

1422

01:05:55,870 --> 01:05:54,170

confuses some people and it's not that's

1423

01:05:58,030 --> 01:05:55,880

just the reporting limit is just the

1424

01:06:00,280 --> 01:05:58,040

lowest level at which they can

1425

01:06:02,950 --> 01:06:00,290

accurately measure it no method

1426

01:06:04,210 --> 01:06:02,960

detection no method detection limit is

1427

01:06:07,359 --> 01:06:04,220

the lowest level at which they can

1428

01:06:08,890 --> 01:06:07,369

detect it reporting limit is the lowest

1429

01:06:10,420 --> 01:06:08,900

level at which they can measure it in

1430

01:06:11,920 --> 01:06:10,430

terms of giving you a number as to how

1431

01:06:15,520 --> 01:06:11,930

much there actually is an accurate

1432

01:06:17,440 --> 01:06:15,530

number below below that level they have

1433

01:06:19,330 --> 01:06:17,450

to kind of use these statistical methods

1434

01:06:22,390 --> 01:06:19,340

to work out what it might be so it's

1435

01:06:24,359 --> 01:06:22,400

pretty inaccurate but being five times

1436

01:06:26,650 --> 01:06:24,369

higher than the reporting limit well

1437

01:06:31,570 --> 01:06:26,660

yeah the other convenient thing about

1438

01:06:34,330 --> 01:06:31,580

reporting limit is because the since the

1439

01:06:37,630 --> 01:06:34,340

reporting limit like for aluminum is 50

1440

01:06:40,120 --> 01:06:37,640

and titanium is 0.5 you know if you just

1441

01:06:43,120 --> 01:06:40,130

give the Barrow numbers like

1442

01:06:45,580 --> 01:06:43,130

that a titanium would seem smaller than

1443

01:06:48,220 --> 01:06:45,590

aluminum I mean anything that just means

1444

01:06:50,320 --> 01:06:48,230

how good the testers are detecting those

1445

01:06:52,570 --> 01:06:50,330

things it means it's a lot harder for

1446

01:06:54,790 --> 01:06:52,580

the test to detect aluminum and adjust

1447

01:06:56,530 --> 01:06:54,800

it to detect titanium because titanium

1448

01:06:59,410 --> 01:06:56,540

ears are much more ya unique

1449

01:07:01,810 --> 01:06:59,420

spectrographic signature so they can

1450

01:07:04,870 --> 01:07:01,820

detect much smaller amounts of it but

1451

01:07:06,610 --> 01:07:04,880

aluminum is kind of a dull molecule so

1452

01:07:09,040 --> 01:07:06,620

you had to have a lot more of it to be

1453

01:07:10,720 --> 01:07:09,050

able to detect it so these reporting

1454

01:07:12,580 --> 01:07:10,730

limits don't mean anything they don't

1455

01:07:13,810 --> 01:07:12,590

mean anything about like how much there

1456

01:07:17,290 --> 01:07:13,820

actually is that they just mean

1457

01:07:19,870 --> 01:07:17,300

something about how well I am reporting

1458

01:07:27,130 --> 01:07:19,880

how much there is and the fact that this

1459

01:07:28,960 --> 01:07:27,140

is vast variation like right here use

1460

01:07:33,010 --> 01:07:28,970

that as anything because he doesn't mean

1461

01:07:35,020 --> 01:07:33,020

anything I'm showing the variation yeah

1462

01:07:36,700 --> 01:07:35,030

but you know the variation in the

1463

01:07:40,390 --> 01:07:36,710

reporting limit doesn't mean anything so

1464

01:07:42,850 --> 01:07:40,400

you're saying what the report the

1465

01:07:44,770 --> 01:07:42,860

reporting limit is fixed work for a loan

1466

01:07:49,870 --> 01:07:44,780

limits 50 for titanium that's point

1467

01:07:51,580 --> 01:07:49,880

right right I am showing how really say

1468

01:07:55,450 --> 01:07:51,590

something with times what the reporting

1469

01:07:58,330 --> 01:07:55,460

limit was it's completely different or

1470

01:07:59,980 --> 01:07:58,340

it's a unit I'm using it as a unit you

1471

01:08:01,300 --> 01:07:59,990

can't you can't use it as a loan you

1472

01:08:02,800 --> 01:08:01,310

know cuz it doesn't mean anything it

1473

01:08:04,180 --> 01:08:02,810

just means how good the test is all

1474

01:08:05,440 --> 01:08:04,190

you're doing is telling people how good

1475

01:08:07,120 --> 01:08:05,450

the test is you're not telling them

1476

01:08:09,100 --> 01:08:07,130

anything about how much there actually

1477

01:08:10,330 --> 01:08:09,110

is or how much there should be or how

1478

01:08:13,450 --> 01:08:10,340

much there is relative to what they

1479

01:08:15,820 --> 01:08:13,460

should be but that you're comparing

1480

01:08:19,210 --> 01:08:15,830

apples to oranges a minute or butter and

1481

01:08:20,980 --> 01:08:19,220

I'm talking about I'm talking about

1482

01:08:23,290 --> 01:08:20,990

you're using the reporting limit as a

1483

01:08:25,840 --> 01:08:23,300

unit you can't use it as a unit you

1484

01:08:27,670 --> 01:08:25,850

can't you shouldn't even mention the

1485

01:08:28,990 --> 01:08:27,680

reporting limit because it's just

1486

01:08:30,460 --> 01:08:29,000

confusing people they think the

1487

01:08:33,460 --> 01:08:30,470

reporting limit is the limit at which

1488

01:08:35,200 --> 01:08:33,470

you have to report it so if you say so

1489

01:08:38,500 --> 01:08:35,210

I think I think we're gonna disagree on

1490

01:08:40,420 --> 01:08:38,510

that give a good explanation as to why

1491

01:08:42,610 --> 01:08:40,430

saying something is five times the

1492

01:08:43,410 --> 01:08:42,620

reporting limit has any meaning then I'd

1493

01:08:48,130 --> 01:08:43,420

like to hear it

1494

01:08:51,310 --> 01:08:48,140

well I'm sorry these metals shouldn't be

1495

01:08:53,629 --> 01:08:51,320

in the rain at all and we're getting

1496

01:08:56,390 --> 01:08:53,639

there

1497

01:08:59,439 --> 01:08:56,400

we're getting wildly different amounts

1498

01:09:02,959 --> 01:08:59,449

of it and I'm using like that's just the

1499

01:09:06,229 --> 01:09:02,969

what that's how I will tell you explain

1500

01:09:10,539 --> 01:09:06,239

it baseball all right it's not a useful

1501  
01:09:13,879 --> 01:09:10,549  
measure the reporting limit I recommend

1502  
01:09:15,559 --> 01:09:13,889  
if you want your criticism of these

1503  
01:09:19,309 --> 01:09:15,569  
levels to be taken seriously you and

1504  
01:09:21,859 --> 01:09:19,319  
just focus on what the actual amount is

1505  
01:09:25,099 --> 01:09:21,869  
and then some actual limits such as an

1506  
01:09:27,320 --> 01:09:25,109  
EPA limit for that's for drinking water

1507  
01:09:30,320 --> 01:09:27,330  
that's not very well some something like

1508  
01:09:32,689 --> 01:09:30,330  
for example the historical levels of

1509  
01:09:33,559 --> 01:09:32,699  
these these things from the overt ously

1510  
01:09:35,990 --> 01:09:33,569  
yeah

1511  
01:09:51,950 --> 01:09:36,000  
did you see that one I have from Italy

1512  
01:09:53,030 --> 01:09:51,960  
there's a yeah it was like fifteen

1513  
01:09:55,850 --> 01:09:53,040

thousand four hundred and thirty

1514

01:09:58,490 --> 01:09:55,860

micrograms per liter there of aluminum

1515

01:10:15,050 --> 01:09:58,500

850 micrograms per liter it loves in

1516

01:10:17,330 --> 01:10:15,060

Perugia Italy on yeah it's the

1517

01:10:21,950 --> 01:10:17,340

variations the big thing movies for me

1518

01:10:24,649 --> 01:10:21,960

yeah the fact that and also if what we

1519

01:10:28,450 --> 01:10:24,659

if these proposals that I believe have

1520

01:10:34,070 --> 01:10:31,939

these are toxic metals and they're very

1521

01:10:36,430 --> 01:10:34,080

small if we're to believe what they're

1522

01:10:40,520 --> 01:10:36,440

they say you know that like nano sized

1523

01:10:46,700 --> 01:10:40,530

bits a metal and these are highly

1524

01:10:49,370 --> 01:10:46,710

bioavailable and well yeah I'm kind of

1525

01:10:51,979 --> 01:10:49,380

with you about like the the problems of

1526

01:10:53,209 --> 01:10:51,989

the geoengineering proposals in terms of

1527

01:10:54,830 --> 01:10:53,219

my health effects and things like that

1528

01:10:58,490 --> 01:10:54,840

these are things that need to be talked

1529

01:11:01,580 --> 01:10:58,500

about where I think yeah you've kind of

1530

01:11:03,680 --> 01:11:01,590

jump the gun is in thinking you have

1531

01:11:07,790 --> 01:11:03,690

evidence that these these programs are

1532

01:11:10,880 --> 01:11:07,800

already in place seeing variation

1533

01:11:14,200 --> 01:11:10,890

in levels yeah but when people have done

1534

01:11:16,820 --> 01:11:14,210

tests in the past they they also find

1535

01:11:20,870 --> 01:11:16,830

variations in the levels saying your

1536

01:11:24,560 --> 01:11:20,880

legs over threat would you so we'd say

1537

01:11:27,230 --> 01:11:24,570

that these models aren't in there I mean

1538

01:11:31,070 --> 01:11:27,240

all of the would you say that this has

1539

01:11:33,920 --> 01:11:31,080

done to user error or yeah I think it's

1540

01:11:36,500 --> 01:11:33,930

a variety of reasons but mostly I well

1541

01:11:38,690 --> 01:11:36,510

this so you at you and say so you would

1542

01:11:42,640 --> 01:11:38,700

say like the cirrus clouds aren't like

1543

01:11:45,260 --> 01:11:42,650

they don't have like metal I know

1544

01:11:46,730 --> 01:11:45,270

nothing suspicious in terms of metal

1545

01:11:48,830 --> 01:11:46,740

there is metal in the atmosphere of

1546

01:11:51,740 --> 01:11:48,840

course from police but the condensation

1547

01:11:53,240 --> 01:11:51,750

nuclei that do cause the the Cirrus and

1548

01:11:57,620 --> 01:11:53,250

stuff you'd say these are it was like

1549

01:12:00,380 --> 01:11:57,630

mostly certain whatnot Cirrus yes cirrus

1550

01:12:04,910 --> 01:12:00,390

don't for months such I think but yeah I

1551

01:12:07,160 --> 01:12:04,920

think the pollution in the air has

1552

01:12:09,920 --> 01:12:07,170

changed the cloud cover a bit over the

1553

01:12:11,300 --> 01:12:09,930

last hundred years it's gotten up and

1554

01:12:13,880 --> 01:12:11,310

down we actually has used to have more

1555

01:12:15,770 --> 01:12:13,890

pollution so things have have changed

1556

01:12:19,610 --> 01:12:15,780

with the Clean Air Act so there is an

1557

01:12:21,830 --> 01:12:19,620

effect from anthropogenic condensation

1558

01:12:23,690 --> 01:12:21,840

nuclei sources yes so since the Clean

1559

01:12:25,640 --> 01:12:23,700

Air Act the air should have been getting

1560

01:12:31,370 --> 01:12:25,650

linear that yeah it has and there's a

1561

01:12:34,400 --> 01:12:31,380

thing called global dimming which which

1562

01:12:36,620 --> 01:12:34,410

basically completely turned around after

1563

01:12:39,290 --> 01:12:36,630

the Clean Air Act's were implemented

1564

01:12:40,520 --> 01:12:39,300

it's kind of just slightly on the

1565

01:12:43,220 --> 01:12:40,530

upswing in the last couple of years

1566

01:12:46,220 --> 01:12:43,230

because of developing nations like China

1567

01:12:48,200 --> 01:12:46,230

and India but yeah that there's some

1568

01:12:51,260 --> 01:12:48,210

classic papers on global dimming and

1569

01:12:52,940 --> 01:12:51,270

things like pan evaporation rate yeah

1570

01:12:54,980 --> 01:12:52,950

because I remember seeing a doctor BBC

1571

01:12:56,930 --> 01:12:54,990

did a doctor here on and they said that

1572

01:12:58,670 --> 01:12:56,940

like after 9/11 all the planes were

1573

01:13:00,590 --> 01:12:58,680

grounded the temperature range when I'm

1574

01:13:02,300 --> 01:13:00,600

flying like a full degree yeah but the

1575

01:13:04,880 --> 01:13:02,310

the the research they were talking about

1576

01:13:07,670 --> 01:13:04,890

there with global dimming was actually

1577

01:13:10,730 --> 01:13:07,680

based on figures which I think were

1578

01:13:14,060 --> 01:13:10,740

going back to the mid 1980s or something

1579

01:13:16,130 --> 01:13:14,070

I can't remember exactly how much that

1580

01:13:19,070 --> 01:13:16,140

was but yeah global dimming after the

1581

01:13:21,020 --> 01:13:19,080

Clean Air Act went into effect it the

1582

01:13:23,360 --> 01:13:21,030

trend was reversed

1583

01:13:25,460 --> 01:13:23,370

so I mean the plan of operations is

1584

01:13:28,310 --> 01:13:25,470

blonde the other direction you know yeah

1585

01:13:30,230 --> 01:13:28,320

I mean it's the same thing basically the

1586

01:13:31,940 --> 01:13:30,240

global dimming is usually measured by

1587

01:13:33,320 --> 01:13:31,950

the kind of up a shrimp that's the T now

1588

01:13:34,040 --> 01:13:33,330

the Clean Air Act was the like in the

1589

01:13:35,870 --> 01:13:34,050

seventies right

1590

01:13:38,990 --> 01:13:35,880

yeah but the you know the effects didn't

1591

01:13:41,330 --> 01:13:39,000

you know take effect until the mid

1592

01:13:43,550 --> 01:13:41,340

nineteen eighties but this the

1593

01:13:45,440 --> 01:13:43,560

documentary I saw was made in the

1594

01:13:47,690 --> 01:13:45,450

nineteen nineties and they said and they

1595

01:13:49,190 --> 01:13:47,700

were saying like there was a researcher

1596

01:13:51,890 --> 01:13:49,200

out of Israel I'm sure you've seen yes

1597

01:13:54,140 --> 01:13:51,900

yeah but that money was saying that like

1598

01:13:59,500 --> 01:13:54,150

the the you know the amount of instant

1599

01:14:05,540 --> 01:14:02,930

installations and as in the SOL yeah

1600

01:14:08,900 --> 01:14:05,550

yeah wait wait

1601  
01:14:10,910 --> 01:14:08,910  
you know sunrise in the planet surface

1602  
01:14:12,590 --> 01:14:10,920  
yeah all right so yeah I'm just looking

1603  
01:14:14,750 --> 01:14:12,600  
at and I did a bunch of research into

1604  
01:14:17,000 --> 01:14:14,760  
this but it's a really good documenting

1605  
01:14:19,270 --> 01:14:17,010  
find it yeah but it's out of date though

1606  
01:14:24,950 --> 01:14:19,280  
that's that's the problem with it the

1607  
01:14:28,640 --> 01:14:24,960  
the research was up until the 1980s from

1608  
01:14:32,210 --> 01:14:28,650  
the 1950s to the 1980s there was global

1609  
01:14:33,680 --> 01:14:32,220  
dimming after that there was not it's

1610  
01:14:37,490 --> 01:14:33,690  
actually changed quite quite

1611  
01:14:39,020 --> 01:14:37,500  
significantly so you say from the 70 so

1612  
01:14:47,620 --> 01:14:39,030  
the 70s onwards it got better from the

1613  
01:14:53,240 --> 01:14:50,360

more sunlight getting through that means

1614

01:14:57,050 --> 01:14:53,250

there's less little tiny little cloud

1615

01:15:01,700 --> 01:14:57,060

condensation because like I'm a

1616

01:15:02,480 --> 01:15:01,710

photographer and it's this stuff this is

1617

01:15:09,380 --> 01:15:02,490

Scott

1618

01:15:09,980 --> 01:15:09,390

the sky looks a lighter blue than it

1619

01:15:13,370 --> 01:15:09,990

used to

1620

01:15:15,460 --> 01:15:13,380

yeah it's an interesting thing as well I

1621

01:15:21,950 --> 01:15:15,470

read an article on that a few years ago

1622

01:15:23,960 --> 01:15:21,960

yeah there there's actually a thing in

1623

01:15:27,410 --> 01:15:23,970

psychology where people remember colors

1624

01:15:29,450 --> 01:15:27,420

as being brighter than they actually are

1625

01:15:31,870 --> 01:15:29,460

well fortunately I'm a photographer so I

1626

01:15:34,610 --> 01:15:31,880

can look at actually slides right but

1627

01:15:35,990 --> 01:15:34,620

have you actually like be now

1628

01:15:38,270 --> 01:15:36,000

taking a whole bunch of slides with the

1629

01:15:40,160 --> 01:15:38,280

same film stock in the same camera yes

1630

01:15:42,590 --> 01:15:40,170

yes and you've compared them do you have

1631

01:15:46,450 --> 01:15:42,600

a page like showing that comparison I

1632

01:15:49,640 --> 01:15:46,460

did go to web recom slash Burning Man

1633

01:15:54,020 --> 01:15:49,650

I've been shooting that was a bird from

1634

01:15:55,400 --> 01:15:54,030

Burning Man 1998 to 2006 same film same

1635

01:16:01,550 --> 01:15:55,410

camera same lens

1636

01:16:03,680 --> 01:16:01,560

I feel interesting I'll look at that by

1637

01:16:10,400 --> 01:16:03,690

the way not safe work there might be a

1638

01:16:16,970 --> 01:16:10,410

boob less stressed

1639

01:16:18,320 --> 01:16:16,980

I have no bail now I mean of course you

1640

01:16:21,800 --> 01:16:18,330

know I mean I'm still using the same

1641

01:16:25,460 --> 01:16:21,810

film stock so but you can't you do you

1642

01:16:36,980 --> 01:16:25,470

do see a changeover I think that's over

1643

01:16:38,900 --> 01:16:36,990

ten years yes but like 2000 2009 I think

1644

01:16:40,550 --> 01:16:38,910

I went digital so forget about that

1645

01:16:43,520 --> 01:16:40,560

that's that's a different set up

1646

01:16:47,360 --> 01:16:43,530

everything before then was fuji chrome

1647

01:16:51,380 --> 01:16:47,370

Velvia rated at 40 is a shot with a 15

1648

01:16:53,060 --> 01:16:51,390

millimeter at 1.4 Nick Orleans on a f100

1649

01:16:59,390 --> 01:16:53,070

sorry so which when did you change over

1650

01:17:09,170 --> 01:16:59,400

I think it was I have to look it was

1651

01:17:11,660 --> 01:17:09,180

late it was 2008 maybe okay forget I I

1652

01:17:15,470 --> 01:17:11,670

was slowly dragged kicking and screaming

1653

01:17:16,490 --> 01:17:15,480

into the digital age on that they really

1654

01:17:19,210 --> 01:17:16,500

had this real punch

1655

01:17:23,120 --> 01:17:19,220

and of course well be a well via

1656

01:17:24,560 --> 01:17:23,130

exaggerated scullers yeah but you have

1657

01:17:27,440 --> 01:17:24,570

to compare apples to apples you have to

1658

01:17:28,820 --> 01:17:27,450

look at the ones shot in Velvia or in

1659

01:17:32,870 --> 01:17:28,830

different years and you can you can see

1660

01:17:34,190 --> 01:17:32,880

yeah you know it's statistically you

1661

01:17:38,120 --> 01:17:34,200

could all look at her quite a few shots

1662

01:17:39,740 --> 01:17:38,130

and maybe even a few years because you

1663

01:17:41,540 --> 01:17:39,750

were probably there it was a look a

1664

01:17:44,600 --> 01:17:41,550

couple of years ago like if they had

1665

01:17:48,290 --> 01:17:44,610

like a lot of like sandstorms in the

1666

01:17:53,400 --> 01:17:51,000

actually the sandstorms are awesome and

1667

01:17:56,459 --> 01:17:53,410

also the sprite even though alleged

1668

01:17:58,800 --> 01:17:56,469

doesn't happen when you have thin cloud

1669

01:18:00,240 --> 01:17:58,810

and that when the sun's low it makes

1670

01:18:01,979 --> 01:18:00,250

people look awesome

1671

01:18:04,620 --> 01:18:01,989

yeah yeah good lighting good lighting

1672

01:18:09,930 --> 01:18:04,630

good lighting one better your contracts

1673

01:18:17,940 --> 01:18:09,940

and chemtrails or Britain contrails but

1674

01:18:19,770 --> 01:18:17,950

yeah I'll check out this and so yeah the

1675

01:18:21,720 --> 01:18:19,780

whole purpose I mean go back to the

1676

01:18:25,950 --> 01:18:21,730

rainwater thing we will disagree in how

1677

01:18:29,670 --> 01:18:25,960

I report them but I might my point is

1678

01:18:34,380 --> 01:18:29,680

there is I'm why are we finding these

1679

01:18:36,090 --> 01:18:34,390

toxic metals in if they're in the rain

1680

01:18:36,510 --> 01:18:36,100

we're breathing Emmaus coming from this

1681

01:18:38,820 --> 01:18:36,520

yeah

1682

01:18:41,040 --> 01:18:38,830

well okay that's the whole point and the

1683

01:18:42,990 --> 01:18:41,050

fact that there's massive variation if

1684

01:18:44,729 --> 01:18:43,000

it was if it was a constant thing and

1685

01:18:46,110 --> 01:18:44,739

the variation was only a couple of a

1686

01:18:50,790 --> 01:18:46,120

standard deviation between and that'd be

1687

01:18:52,440 --> 01:18:50,800

fine but why this like orders of

1688

01:18:54,380 --> 01:18:52,450

magnitude well it's probably the wind

1689

01:18:57,750 --> 01:18:54,390

direction

1690

01:19:00,780 --> 01:18:57,760

how does like the air mass that created

1691

01:19:02,340 --> 01:19:00,790

the rain get formed did it form from

1692

01:19:05,550 --> 01:19:02,350

like you know wind blown from the north

1693

01:19:07,290 --> 01:19:05,560

or the south or from over the ocean and

1694

01:19:09,450 --> 01:19:07,300

it's partly like has it rained recently

1695

01:19:11,250 --> 01:19:09,460

if it hasn't rained recently and then it

1696

01:19:13,229 --> 01:19:11,260

rains then there's going to be a lot

1697

01:19:14,670 --> 01:19:13,239

more pollution in the air and the a kind

1698

01:19:18,030 --> 01:19:14,680

of washes it out and then the next day

1699

01:19:20,550 --> 01:19:18,040

you'll see a lot less so yeah there's

1700

01:19:24,060 --> 01:19:20,560

lots of natural variations and then you

1701

01:19:25,709 --> 01:19:24,070

know user error is harder to you know to

1702

01:19:29,190 --> 01:19:25,719

predict what will actually happen with

1703

01:19:33,660 --> 01:19:29,200

that but if you leave a sampling jar out

1704

01:19:36,900 --> 01:19:33,670

for like a like a week or so oh no no no

1705

01:19:39,870 --> 01:19:36,910

if when it starts raining I'll go up

1706

01:19:42,360 --> 01:19:39,880

I'll put in glass bowls I put on a

1707

01:19:46,709 --> 01:19:42,370

plastic sheet right away wait where were

1708

01:19:52,229 --> 01:19:46,719

those bowls beforehand well I keep them

1709

01:19:56,850 --> 01:19:52,239

clean like I use reverse osmosis water

1710

01:19:58,410 --> 01:19:56,860

to clean em and I store them facing down

1711

01:19:59,369 --> 01:19:58,420

so no crap that's it

1712

01:20:01,290 --> 01:19:59,379

well that

1713

01:20:03,959 --> 01:20:01,300

the rim of the bowl is touching the

1714

01:20:05,369 --> 01:20:03,969

whatever you're stirring the month it

1715

01:20:07,799 --> 01:20:05,379

could be stuff on the rim and when water

1716

01:20:09,389 --> 01:20:07,809

hits that it rolls down he doesn't take

1717

01:20:11,189 --> 01:20:09,399

very much you know we're talking about

1718

01:20:12,810 --> 01:20:11,199

parts per billion here so if you even

1719

01:20:17,219 --> 01:20:12,820

get like a little crumb or something

1720

01:20:19,589 --> 01:20:17,229

well this is there we have I'm using the

1721

01:20:22,319 --> 01:20:19,599

same technique for all of them only

1722

01:20:24,089 --> 01:20:22,329

still have massive variability you

1723

01:20:27,049 --> 01:20:24,099

should maybe try your doing a like some

1724

01:20:29,399 --> 01:20:27,059

kind of control where you take a bowl I

1725

01:20:32,119 --> 01:20:29,409

always take two bowls and that randomly

1726

01:20:34,560 --> 01:20:32,129

pick one take one stick it outside and

1727

01:20:37,589 --> 01:20:34,570

take the other one and put it like

1728

01:20:39,419 --> 01:20:37,599

outside but say underneath a plastic you

1729

01:20:41,989 --> 01:20:39,429

know an upside down plastic box or

1730

01:20:44,729 --> 01:20:41,999

something so he doesn't get anything in

1731

01:20:48,089 --> 01:20:44,739

and then fill it with the same amount of

1732

01:20:51,629 --> 01:20:48,099

water as the other bowl they'd like from

1733

01:20:52,799 --> 01:20:51,639

a bottle and then test both samples that

1734

01:20:55,139 --> 01:20:52,809

would be like a way of trying to

1735

01:20:55,859 --> 01:20:55,149

eliminate you know I identify any kind

1736

01:20:58,229 --> 01:20:55,869

of user error

1737

01:21:00,719 --> 01:20:58,239

there's propagating a little bit it

1738

01:21:02,399 --> 01:21:00,729

would because I mean like I said that

1739

01:21:05,099 --> 01:21:02,409

the windows pretty short because it's

1740

01:21:06,750 --> 01:21:05,109

like we're writing that because Ill you

1741

01:21:09,299 --> 01:21:06,760

know when I start sweating I'd want to

1742

01:21:11,219 --> 01:21:09,309

flight yeah yeah well you know you know

1743

01:21:12,899 --> 01:21:11,229

you don't wait until the next day when

1744

01:21:15,629 --> 01:21:12,909

it's been like right now it's been

1745

01:21:16,949 --> 01:21:15,639

raining for whatever so whatever it's

1746

01:21:18,839 --> 01:21:16,959

been in the atmosphere will be already

1747

01:21:20,639 --> 01:21:18,849

mostly washed out I mean there could be

1748

01:21:22,889 --> 01:21:20,649

even things like whatever's on your hand

1749

01:21:24,810 --> 01:21:22,899

if you've been handling something and

1750

01:21:28,199 --> 01:21:24,820

you your thumb is on the inside of the

1751

01:21:29,819 --> 01:21:28,209

bowl yeah but like if you just when you

1752

01:21:31,049 --> 01:21:29,829

pick up the bowl do you pick it up do

1753

01:21:37,799 --> 01:21:31,059

you ever touch the inside of the ball

1754

01:21:42,419 --> 01:21:37,809

like it's and where there's lots because

1755

01:21:44,699 --> 01:21:42,429

we're talking about like a little bit of

1756

01:21:47,429 --> 01:21:44,709

you know something falling into the bowl

1757

01:21:49,770 --> 01:21:47,439

from somewhere like from you or from

1758

01:21:52,080 --> 01:21:49,780

something else and then you yeah I take

1759

01:21:55,439 --> 01:21:52,090

it you're pouring it from the ball into

1760

01:21:57,750 --> 01:21:55,449

something else you probably have to pour

1761

01:22:07,500 --> 01:21:57,760

it into a jug first before you poured it

1762

01:22:11,310 --> 01:22:07,510

into yeah yeah when you go well yeah

1763

01:22:13,109 --> 01:22:11,320

that gets stored the same way and that

1764

01:22:18,419 --> 01:22:13,119

and then it goes in

1765

01:22:20,010 --> 01:22:18,429

the HP HP whatever the plastic bottle

1766

01:22:27,000 --> 01:22:20,020

with it the the buffer today's and

1767

01:22:29,100 --> 01:22:27,010

that's right there good love yeah well

1768

01:22:30,930 --> 01:22:29,110

you know overlap see and they'll give

1769

01:22:32,550 --> 01:22:30,940

you reasonably accurate results and

1770

01:22:35,550 --> 01:22:32,560

you're gonna find you're gonna find

1771

01:22:42,419 --> 01:22:35,560

these metals in the air and hence in the

1772

01:22:44,790 --> 01:22:42,429

rain so other sources what other sources

1773

01:22:46,500 --> 01:22:44,800

of metal in the air would there be so

1774

01:22:48,359 --> 01:22:46,510

yeah okay like cars and Industry and

1775

01:22:52,229 --> 01:22:48,369

stuff so so where else with their

1776

01:22:54,000 --> 01:22:52,239

beginning naturally-occurring of the

1777

01:22:55,740 --> 01:22:54,010

elemental metal not oxides no not

1778

01:22:57,209 --> 01:22:55,750

minerals but actually metal meds itself

1779

01:23:03,780 --> 01:22:57,219

you know you know actually measuring

1780

01:23:05,910 --> 01:23:03,790

elemental metal this person to that's a

1781

01:23:13,290 --> 01:23:05,920

total amount of metal so that includes

1782

01:23:16,020 --> 01:23:13,300

metal salts yeah or so based like

1783

01:23:17,939 --> 01:23:16,030

unoxidized elemental metal shouldn't be

1784

01:23:21,629 --> 01:23:17,949

in the atmosphere at all well no you're

1785

01:23:24,209 --> 01:23:21,639

gonna get sound cuz your I just friction

1786

01:23:26,280 --> 01:23:24,219

and stuff like that will I from brake

1787

01:23:28,260 --> 01:23:26,290

brake pads you get the metal on the

1788

01:23:30,600 --> 01:23:28,270

brake pads like wearing off essentially

1789

01:23:34,500 --> 01:23:30,610

quite a big source of pollution next to

1790

01:23:38,070 --> 01:23:34,510

some roads the brake brake pedal linings

1791

01:23:42,240 --> 01:23:38,080

and you know various other forms of

1792

01:23:43,379 --> 01:23:42,250

things like construction when building

1793

01:23:46,320 --> 01:23:43,389

things and you're gonna get bits of

1794

01:23:47,910 --> 01:23:46,330

metal but yeah elemental metal I don't

1795

01:23:50,520 --> 01:23:47,920

know if there's really that much of that

1796

01:23:54,890 --> 01:23:50,530

in the air because it tends to break

1797

01:23:58,890 --> 01:23:54,900

down in nature so you don't get very

1798

01:24:02,070 --> 01:23:58,900

hard to keep aluminum ya know scratch it

1799

01:24:04,589 --> 01:24:02,080

it hardly occurs at all in in its

1800

01:24:07,410 --> 01:24:04,599

metallic form in nature you have to kind

1801

01:24:10,470 --> 01:24:07,420

of crack it out of the rocks using this

1802

01:24:12,930 --> 01:24:10,480

quite energy intensive process it's a

1803

01:24:15,330 --> 01:24:12,940

lot of power yeah they're so you know

1804

01:24:19,680 --> 01:24:15,340

still cheaper than digging up other

1805

01:24:21,839 --> 01:24:19,690

things but yet my answer there was that

1806

01:24:25,200 --> 01:24:21,849

I I don't think there will be very much

1807

01:24:26,520 --> 01:24:25,210

in terms of elemental metals in yeah I

1808

01:24:28,799 --> 01:24:26,530

don't really know

1809

01:24:30,720 --> 01:24:28,809

but the test you're doing don't actually

1810

01:24:35,879 --> 01:24:30,730

show elemental metals and none of the

1811

01:24:37,859 --> 01:24:35,889

other tests that anyone else Dane

1812

01:24:43,649 --> 01:24:37,869

Wigington does he claims that they're

1813

01:24:46,729 --> 01:24:43,659

measuring elemental metal when tests

1814

01:24:49,919 --> 01:24:46,739

very specifically doesn't measure that

1815

01:24:51,779 --> 01:24:49,929

because basically what happens is when

1816

01:24:57,600 --> 01:24:51,789

you suffer of anyone who wants to do

1817

01:25:01,830 --> 01:24:57,610

this when you send a sample to a lab it

1818

01:25:03,209 --> 01:25:01,840

dissolved in an acid and that's how they

1819

01:25:06,479 --> 01:25:03,219

separate out the metals they know the

1820

01:25:09,750 --> 01:25:06,489

totalment of metal from elemental metal

1821

01:25:12,810 --> 01:25:09,760

to like like soap like the salt is

1822

01:25:15,029 --> 01:25:12,820

sodium and chloride so if you you know

1823

01:25:17,220 --> 01:25:15,039

if you put salt in a thing it'll say

1824

01:25:18,990 --> 01:25:17,230

okay there's this much sodium in it well

1825

01:25:20,669 --> 01:25:19,000

that's when they when they're doing very

1826

01:25:22,470 --> 01:25:20,679

specific tests so I don't think that's

1827

01:25:25,169 --> 01:25:22,480

how your live is actually testing for

1828

01:25:27,689 --> 01:25:25,179

the metals they're probably using plasma

1829

01:25:31,109 --> 01:25:27,699

spectrography I forget the name of the

1830

01:25:33,839 --> 01:25:31,119

guys now when I went to see it but they

1831

01:25:34,979 --> 01:25:33,849

they could give you a search for

1832

01:25:36,439 --> 01:25:34,989

different metals but there it is

1833

01:25:38,580 --> 01:25:36,449

actually broken down and includes the

1834

01:25:41,399 --> 01:25:38,590

includes the metals that have been

1835

01:25:45,540 --> 01:25:41,409

burned do other elements in salts

1836

01:25:47,370 --> 01:25:45,550

yeah but the tests like if you know how

1837

01:25:49,350 --> 01:25:47,380

much alright like if you gave them rust

1838

01:25:55,439 --> 01:25:49,360

they would say oh there's this much iron

1839

01:25:57,569 --> 01:25:55,449

in it yeah that's you know the way these

1840

01:26:00,299 --> 01:25:57,579

tests normally work is that they heat up

1841

01:26:02,399 --> 01:26:00,309

the sample there's all the first into

1842

01:26:04,859 --> 01:26:02,409

some kind of carrier and then they heat

1843

01:26:06,540 --> 01:26:04,869

it up so it turns into a plasma which

1844

01:26:10,379 --> 01:26:06,550

actually strips things down into these

1845

01:26:12,479 --> 01:26:10,389

actual atoms rather than the compound

1846

01:26:14,189 --> 01:26:12,489

and then they shine light through it to

1847

01:26:24,330 --> 01:26:14,199

laser through it and then they measure

1848

01:26:26,069 --> 01:26:24,340

the spectrum yeah sorption spectrum no

1849

01:26:32,220 --> 01:26:26,079

matter which way you say it sounded

1850

01:26:36,569 --> 01:26:32,230

wrong photography I can't even talk now

1851

01:26:39,299 --> 01:26:36,579

so yeah but yeah that that test doesn't

1852

01:26:40,290 --> 01:26:39,309

actually show like the individual things

1853

01:26:42,959 --> 01:26:40,300

like that the one you

1854

01:26:44,640 --> 01:26:42,969

with the dissolving in an acid I'm not

1855

01:26:48,660 --> 01:26:44,650

sure but I think that might be just four

1856

01:26:50,970 --> 01:26:48,670

very specific types of things rather

1857

01:26:53,850 --> 01:26:50,980

than you know because the the

1858

01:26:58,200 --> 01:26:53,860

spectrography one measures all of metals

1859

01:27:00,299 --> 01:26:58,210

basically at the same time yeah yeah I'd

1860

01:27:04,620 --> 01:27:00,309

have to check on that one either way

1861

01:27:06,839 --> 01:27:04,630

you're not deterring individuation and

1862

01:27:09,839 --> 01:27:06,849

like old colored yeah yeah good enough

1863

01:27:17,419 --> 01:27:09,849

points at my level in chemistry looks

1864

01:27:28,410 --> 01:27:20,069

actually I have an astronomy Oh level as

1865

01:27:33,930 --> 01:27:28,420

well see few clusters see desiccated

1866

01:27:35,669 --> 01:27:33,940

they're able to offer stuff anyway well

1867

01:27:41,189 --> 01:27:35,679

thank you thank you so much for coming

1868

01:27:47,970 --> 01:27:41,199

on this is like some but I don't like I

1869

01:27:50,220 --> 01:27:47,980

said I wanted to know shake hands kind

1870

01:27:52,740 --> 01:27:50,230

of thing like oh hi you know we both

1871

01:28:00,450 --> 01:27:52,750

know or of each other each other stand

1872

01:28:02,850 --> 01:28:00,460

and I we have very different ideas about

1873

01:28:07,260 --> 01:28:02,860

the same thing I think we would

1874

01:28:10,410 --> 01:28:07,270

hopefully both agree that it wouldn't be

1875

01:28:13,109 --> 01:28:10,420

they were something we would not want to

1876

01:28:15,390 --> 01:28:13,119

see happen because we don't know about

1877

01:28:19,859 --> 01:28:15,400

the health impact would I think but I'd

1878

01:28:22,859 --> 01:28:19,869

be right yeah well I think it's like

1879

01:28:25,109 --> 01:28:22,869

most geoengineering researchers think

1880

01:28:28,229 --> 01:28:25,119

it's not a very good idea like David

1881

01:28:29,700 --> 01:28:28,239

Keith would prefer to actually you know

1882

01:28:31,890 --> 01:28:29,710

reduce carbon emissions in fact he's

1883

01:28:33,240 --> 01:28:31,900

doing working in carbon capture the

1884

01:28:36,720 --> 01:28:33,250

reason most people are doing this work

1885

01:28:38,180 --> 01:28:36,730

in geoengineering research is just in

1886

01:28:39,439 --> 01:28:38,190

case and

1887

01:28:42,839 --> 01:28:39,449

[Music]

1888

01:28:45,299 --> 01:28:42,849

well it's not even that it's it's just

1889

01:28:47,760 --> 01:28:45,309

in case like China decides to do it or

1890

01:28:49,890 --> 01:28:47,770

if Russia decides to do it like you know

1891

01:28:51,390 --> 01:28:49,900

if we have the science we can persuade

1892

01:28:52,320 --> 01:28:51,400

them that it's a bad idea if we can

1893

01:28:55,230 --> 01:28:52,330

figure out whether it

1894

01:28:58,050 --> 01:28:55,240

about idea or not I think it's pretty

1895

01:29:01,130 --> 01:28:58,060

unlikely that the US government is going

1896

01:29:03,810 --> 01:29:01,140

to do anything anytime soon you know the

1897

01:29:05,700 --> 01:29:03,820

Republicans in America like the idea

1898

01:29:09,330 --> 01:29:05,710

because it lets them off the hook for

1899

01:29:12,540 --> 01:29:09,340

doing any kind of carbon reduction so

1900

01:29:14,730 --> 01:29:12,550

it's economically a good idea so you

1901

01:29:17,610 --> 01:29:14,740

know the fiscal conservatives like it

1902

01:29:19,740 --> 01:29:17,620

but yeah long-term I don't really see it

1903

01:29:22,440 --> 01:29:19,750

happening yeah

1904

01:29:26,640 --> 01:29:22,450

not within the next ten years at least

1905

01:29:29,250 --> 01:29:26,650

so so yeah probably hopefully never I

1906

01:29:30,750 --> 01:29:29,260

was well I know like David Keith II

1907

01:29:32,820 --> 01:29:30,760

think they're talking about then a

1908

01:29:33,270 --> 01:29:32,830

limited experiment if I'm a balloon or

1909

01:29:35,460 --> 01:29:33,280

something

1910

01:29:37,860 --> 01:29:35,470

yeah but the talk the amount that

1911

01:29:41,040 --> 01:29:37,870

talking about spraying is about I think

1912

01:29:43,770 --> 01:29:41,050

five kilograms which is you know like

1913

01:29:47,100 --> 01:29:43,780

may have 14 pounds or whatever actually

1914

01:29:48,330 --> 01:29:47,110

wasn't like the operation pop I used

1915

01:29:50,220 --> 01:29:48,340

last night I believe there's something

1916

01:29:51,930 --> 01:29:50,230

few plans for the entire operation

1917

01:29:54,840 --> 01:29:51,940

well Popeye yeah Popeye was

1918

01:29:56,460 --> 01:29:54,850

cloud-seeding operation yeah but it

1919

01:29:57,720 --> 01:29:56,470

doesn't take much but that's a

1920

01:30:01,470 --> 01:29:57,730

completely different type of thing there

1921

01:30:03,600 --> 01:30:01,480

we're talking management the other one

1922

01:30:05,760 --> 01:30:03,610

is like you know precipitation and

1923

01:30:08,400 --> 01:30:05,770

that's what I hear you can't you can't

1924

01:30:12,810 --> 01:30:08,410

you can you can achieve a lot with you

1925

01:30:17,280 --> 01:30:12,820

know not really

1926

01:30:21,330 --> 01:30:17,290

you can make oh sure I will have to take

1927

01:30:23,610 --> 01:30:21,340

issue with this so the smaller the

1928

01:30:27,510 --> 01:30:23,620

particle size the more condensation

1929

01:30:29,430 --> 01:30:27,520

nuclei you have right if you get stopped

1930

01:30:31,650 --> 01:30:29,440

very very small you get a hole or the

1931

01:30:34,620 --> 01:30:31,660

conversation nuclei with a pretty small

1932

01:30:37,530 --> 01:30:34,630

mass we're talking about solar radiation

1933

01:30:40,140 --> 01:30:37,540

management yeah when the the

1934

01:30:41,700 --> 01:30:40,150

condensation nuclei will attract water

1935

01:30:44,010 --> 01:30:41,710

and that will be the reflective thing

1936

01:30:46,260 --> 01:30:44,020

well that's just one of the types of

1937

01:30:48,120 --> 01:30:46,270

proposals like for example the the shiny

1938

01:30:49,560 --> 01:30:48,130

disk thing that you mentioned earlier is

1939

01:30:51,720 --> 01:30:49,570

completely different to that and the

1940

01:30:54,960 --> 01:30:51,730

aluminum oxide thing is different to

1941

01:30:57,030 --> 01:30:54,970

that again it depends whether well the

1942

01:31:00,470 --> 01:30:57,040

mechanism of them is about promote

1943

01:31:03,090 --> 01:31:00,480

promoting cirrus cloud formation or

1944

01:31:05,910 --> 01:31:03,100

subversive or Cirrus

1945

01:31:09,689 --> 01:31:05,920

losing some visible serious yeah

1946

01:31:11,910 --> 01:31:09,699

huh that sounds like less blue skies to

1947

01:31:15,689 --> 01:31:11,920

me well it's actually the same blue

1948

01:31:17,189 --> 01:31:15,699

skies well it it's sub visible so it

1949

01:31:18,870 --> 01:31:17,199

does they don't they don't stick

1950

01:31:21,900 --> 01:31:18,880

together just like it's like a vague

1951

01:31:24,660 --> 01:31:21,910

it's like these like doggy er yeah it's

1952

01:31:28,040 --> 01:31:24,670

there I haven't heard that term sub sub

1953

01:31:30,870 --> 01:31:28,050

visible serous yeah it's not actually

1954

01:31:32,600 --> 01:31:30,880

dense enough to actually interfere with

1955

01:31:36,810 --> 01:31:32,610

the sunlight at all

1956

01:31:39,270 --> 01:31:36,820

there's haze which is one step above sub

1957

01:31:41,700 --> 01:31:39,280

visible service some visible surface is

1958

01:31:42,750 --> 01:31:41,710

essentially invisible to the naked eye

1959

01:31:45,240 --> 01:31:42,760

doesn't really change the colour of the

1960

01:31:46,979 --> 01:31:45,250

sky but is still yeah it reflects like a

1961

01:31:48,660 --> 01:31:46,989

very small amount like one or two

1962

01:31:50,970 --> 01:31:48,670

percent or something like that so it'll

1963

01:31:54,330 --> 01:31:50,980

make it look that it doesn't really

1964

01:31:56,970 --> 01:31:54,340

because it it doesn't scatter the light

1965

01:31:59,310 --> 01:31:56,980

in the same way but and presumably

1966

01:32:01,169 --> 01:31:59,320

serious will be high-altitude yeah that

1967

01:32:04,410 --> 01:32:01,179

the physics a bit work out so that the

1968

01:32:05,880 --> 01:32:04,420

submersible service augmentation as I

1969

01:32:07,530 --> 01:32:05,890

remember doesn't actually change the Sun

1970

01:32:10,520 --> 01:32:07,540

at sky significantly like it there was

1971

01:32:12,840 --> 01:32:10,530

some research done on exactly that that

1972

01:32:15,300 --> 01:32:12,850

that question whether it would make the

1973

01:32:17,100 --> 01:32:15,310

skies look more built milky and they did

1974

01:32:18,510 --> 01:32:17,110

simulations of how it was scatter the

1975

01:32:21,930 --> 01:32:18,520

light and everything and it turned out

1976

01:32:25,470 --> 01:32:21,940

it was a very very small amount but a

1977

01:32:27,000 --> 01:32:25,480

small amount but physically perceptible

1978

01:32:30,540 --> 01:32:27,010

you wouldn't see it in you know photo

1979

01:32:38,459 --> 01:32:30,550

comparisons for example they ran

1980

01:32:42,020 --> 01:32:38,469

simulations alright anyway this is it's

1981

01:32:44,820 --> 01:32:42,030

a sub visible Cirrus would make would

1982

01:32:47,459 --> 01:32:44,830

make just increase the albedo a little

1983

01:32:48,930 --> 01:32:47,469

bit right it's not the idea yeah but

1984

01:32:51,900 --> 01:32:48,940

that's the albedo from the perspective

1985

01:32:53,820 --> 01:32:51,910

of the Sun so it's not yeah they're the

1986

01:32:57,390 --> 01:32:53,830

the milkiness of the sky and the albedo

1987

01:32:58,500 --> 01:32:57,400

aren't the exact same thing there are

1988

01:32:59,910 --> 01:32:58,510

different things one is like what

1989

01:33:00,959 --> 01:32:59,920

happens when you look up at the sky and

1990

01:33:03,780 --> 01:33:00,969

know there is like what happens when

1991

01:33:05,580 --> 01:33:03,790

radiation comes down from above if you

1992

01:33:10,140 --> 01:33:05,590

have gains the light coming through it's

1993

01:33:12,300 --> 01:33:10,150

no good well the I remember the albedo

1994

01:33:15,689 --> 01:33:12,310

is basically the Sun like how much

1995

01:33:17,880 --> 01:33:15,699

reflectivity like if it's overcast

1996

01:33:20,070 --> 01:33:17,890

that's high albedo when it's clear no

1997

01:33:24,540 --> 01:33:20,080

albedo

1998

01:33:26,610 --> 01:33:24,550

not exactly no that is if the air is

1999

01:33:30,570 --> 01:33:26,620

perfectly clean if the air is perfectly

2000

01:33:33,270 --> 01:33:30,580

clear albedo is the amount of white the

2001  
01:33:35,700 --> 01:33:33,280  
whiteness of the sky right base albedo

2002  
01:33:38,460 --> 01:33:35,710  
is how white it's from satellites or

2003  
01:33:41,640 --> 01:33:38,470  
from the reflectivity yeah so it's not

2004  
01:33:42,510 --> 01:33:41,650  
the same thing as as what you see when

2005  
01:33:44,130 --> 01:33:42,520  
you're looking up because when you're

2006  
01:33:47,040 --> 01:33:44,140  
looking up you're seeing the scattering

2007  
01:33:49,320 --> 01:33:47,050  
of the atmosphere which is related to

2008  
01:33:51,690 --> 01:33:49,330  
but not the same as the reflective

2009  
01:33:54,330 --> 01:33:51,700  
nature of this kinda yeah the atmosphere

2010  
01:33:55,980 --> 01:33:54,340  
it's like if you're a semantical

2011  
01:33:57,750 --> 01:33:55,990  
difference that exactly it's like if you

2012  
01:34:00,330 --> 01:33:57,760  
were if you were underwater and you were

2013  
01:34:02,190 --> 01:34:00,340

looking up it's very different from

2014

01:34:04,200 --> 01:34:02,200

being above the water I'm looking down

2015

01:34:06,540 --> 01:34:04,210

because you got this shiny surface from

2016

01:34:08,460 --> 01:34:06,550

above that you don't you have that then

2017

01:34:11,520 --> 01:34:08,470

from below you have this this dimming

2018

01:34:14,250 --> 01:34:11,530

effect of the water so you know your

2019

01:34:17,640 --> 01:34:14,260

point of position within the medium

2020

01:34:21,690 --> 01:34:17,650

makes a quite a large difference but it

2021

01:34:24,000 --> 01:34:21,700

either case the this that the incoming

2022

01:34:27,420 --> 01:34:24,010

solar radiation gets bounced off yeah

2023

01:34:29,310 --> 01:34:27,430

yeah but so subsequent so that should be

2024

01:34:31,320 --> 01:34:29,320

that should you would see now that

2025

01:34:32,850 --> 01:34:31,330

because I'm not just the heat it's not

2026

01:34:37,230 --> 01:34:32,860

the visible radiation is the heat

2027

01:34:39,930 --> 01:34:37,240

radiation oh it's only so this the sub

2028

01:34:42,000 --> 01:34:39,940

visible stuff and send you a link that

2029

01:34:46,680 --> 01:34:42,010

has a photo comparison between two

2030

01:34:48,960 --> 01:34:46,690

images one of which is a boat from from

2031

01:34:51,390 --> 01:34:48,970

Earth Observatory from the world view

2032

01:34:53,040 --> 01:34:51,400

one is the visible spectrum the true

2033

01:34:58,350 --> 01:34:53,050

color one and the one below that is the

2034

01:35:00,120 --> 01:34:58,360

cirrus detection and you can see the the

2035

01:35:03,390 --> 01:35:00,130

true color image you can't see that

2036

01:35:05,870 --> 01:35:03,400

boundary between the Cirrus and Osiris

2037

01:35:10,110 --> 01:35:05,880

because it looks exactly the same

2038

01:35:11,850 --> 01:35:10,120

the so visible Cirrus and the article

2039

01:35:14,310 --> 01:35:11,860

itself I believe is tacticals titled

2040

01:35:16,200 --> 01:35:14,320

invisible Cirrus because I'm looking at

2041

01:35:18,300 --> 01:35:16,210

the bottom one on the bottom left

2042

01:35:20,400 --> 01:35:18,310

actually the center of the image and the

2043

01:35:24,360 --> 01:35:20,410

bottom this looks like there's some

2044

01:35:28,230 --> 01:35:24,370

stuff coming off the side more more in a

2045

01:35:31,080 --> 01:35:28,240

more linear way and yeah but those are

2046

01:35:32,700 --> 01:35:31,090

the regions where this like a like the

2047

01:35:33,280 --> 01:35:32,710

middle of the middle top of the image

2048

01:35:34,900 --> 01:35:33,290

just

2049

01:35:37,390 --> 01:35:34,910

left of the middle at the top of the

2050

01:35:40,750 --> 01:35:37,400

image there's a clear delineation like

2051

01:35:42,400 --> 01:35:40,760

that third squirrel I was actually

2052

01:35:43,780 --> 01:35:42,410

looking at the shape of the actual cloud

2053

01:35:45,760 --> 01:35:43,790

but in the middle how it dip around the

2054

01:35:47,320 --> 01:35:45,770

edges sorry I got yeah so that the thin

2055

01:35:49,780 --> 01:35:47,330

gray stock is seeing around is this

2056

01:35:52,000 --> 01:35:49,790

invisible cirrus this submersible Cirrus

2057

01:35:54,880 --> 01:35:52,010

yeah and that's the type of thing if you

2058

01:35:56,920 --> 01:35:54,890

could so so what's that made of is that

2059

01:36:00,460 --> 01:35:56,930

water oh it still is still tiny ice

2060

01:36:06,490 --> 01:36:00,470

particles yeah but they're just really

2061

01:36:08,380 --> 01:36:06,500

really tiny yeah so that just goes right

2062

01:36:14,080 --> 01:36:08,390

through them basically but only affects

2063

01:36:18,310 --> 01:36:14,090

the infrared region so that's one factor

2064

01:36:19,810 --> 01:36:18,320

in you know the radiation budgets of the

2065

01:36:22,150 --> 01:36:19,820

earthing of the radiation going in and

2066

01:36:24,280 --> 01:36:22,160

the radiation going out if there's more

2067

01:36:26,020 --> 01:36:24,290

of these submersibles cirrus clouds and

2068

01:36:28,660 --> 01:36:26,030

there's gonna be more of some types of

2069

01:36:30,460 --> 01:36:28,670

radiation bouncing off probably

2070

01:36:33,220 --> 01:36:30,470

different types of radiation from below

2071

01:36:34,930 --> 01:36:33,230

will get scattered in different ways but

2072

01:36:36,520 --> 01:36:34,940

it all just alters the radiation budget

2073

01:36:37,860 --> 01:36:36,530

which is quite complicated as I'm sure

2074

01:36:39,729 --> 01:36:37,870

you know if you've looked into

2075

01:36:41,140 --> 01:36:39,739

geoengineering proposals there's all

2076

01:36:42,640 --> 01:36:41,150

different types of wave lengths and

2077

01:36:49,750 --> 01:36:42,650

different types of cloud which into fact

2078

01:36:52,150 --> 01:36:49,760

interact with different wavelengths I

2079

01:36:55,090 --> 01:36:52,160

have to say that I'm still really jazzed

2080

01:36:56,590 --> 01:36:55,100

without freaking animation so yeah well

2081

01:36:59,560 --> 01:36:56,600

you probably spend the next few weeks

2082

01:37:01,990 --> 01:36:59,570

play with it it's a lot of fun and can

2083

01:37:05,050 --> 01:37:02,000

you see the other side no because it's a

2084

01:37:07,320 --> 01:37:05,060

geostationary satellite oh okay so it's

2085

01:37:09,340 --> 01:37:07,330

actually over the East Coasters

2086

01:37:11,170 --> 01:37:09,350

but there's there's a few other

2087

01:37:13,360 --> 01:37:11,180

satellites that do similar things for

2088

01:37:16,450 --> 01:37:13,370

the other parts of the world there's

2089

01:37:20,229 --> 01:37:16,460

there's Japanese satellite Himawari

2090

01:37:23,500 --> 01:37:20,239

eight and then there's a meteor set for

2091

01:37:25,690 --> 01:37:23,510

the European satellite I'll send you a

2092

01:37:28,120 --> 01:37:25,700

link to that I collected all of them on

2093

01:37:33,160 --> 01:37:28,130

meta box and we're already called for

2094

01:37:35,590 --> 01:37:33,170

the skinny is minimum and they have

2095

01:37:39,310 --> 01:37:35,600

different interfaces than not all like

2096

01:37:40,570 --> 01:37:39,320

whites friendly as that one there's a

2097

01:37:46,680 --> 01:37:40,580

lot of fun just looking at the different

2098

01:37:51,730 --> 01:37:49,510

all right well boys have to play with

2099

01:37:55,950 --> 01:37:51,740

anyway I guess sent you're like those

2100

01:38:03,490 --> 01:37:55,960

sources and yeah they're a lot of fun

2101  
01:38:06,640 --> 01:38:03,500  
anyway we should do this again I I wish

2102  
01:38:12,550 --> 01:38:09,340  
even though we don't agree well you know

2103  
01:38:16,320 --> 01:38:12,560  
I think you know you say we disagree on

2104  
01:38:19,300 --> 01:38:16,330  
things as if it's kind of like a

2105  
01:38:21,070 --> 01:38:19,310  
philosophical disagreement and I think

2106  
01:38:22,960 --> 01:38:21,080  
you know maybe in some instances it

2107  
01:38:26,550 --> 01:38:22,970  
might be but I think there are also

2108  
01:38:30,580 --> 01:38:26,560  
areas in which we disagree when we could

2109  
01:38:32,110 --> 01:38:30,590  
get things verifiably correct like you

2110  
01:38:33,880 --> 01:38:32,120  
know for example like I don't know if

2111  
01:38:37,870 --> 01:38:33,890  
you still do this but you used to call

2112  
01:38:39,010 --> 01:38:37,880  
halo sundogs oh no that was a joke that

2113  
01:38:41,920 --> 01:38:39,020

was a joke but it's like these

2114

01:38:43,840 --> 01:38:41,930

incredibly rare sundogs yeah but no like

2115

01:38:45,550 --> 01:38:43,850

because it's I know it's a halo the

2116

01:38:57,430 --> 01:38:45,560

problem was a look other people started

2117

01:38:58,810 --> 01:38:57,440

calling them some dogs that just Cisco I

2118

01:39:01,630 --> 01:38:58,820

mean I post that that's the thing I do

2119

01:39:03,400 --> 01:39:01,640

daily I know I know but you you never

2120

01:39:05,410 --> 01:39:03,410

actually post any pictures of sundogs

2121

01:39:09,370 --> 01:39:05,420

because they are quite rare over San

2122

01:39:11,140 --> 01:39:09,380

Francisco yeah the actual ones the ones

2123

01:39:20,470 --> 01:39:11,150

with the corners so actually so when I

2124

01:39:22,720 --> 01:39:20,480

add Baker beach news day I saw one but

2125

01:39:27,250 --> 01:39:22,730

not like what they like quote-unquote

2126

01:39:29,470 --> 01:39:27,260

anywhere sundown oh yeah you know you

2127

01:39:31,240 --> 01:39:29,480

wouldn't be taken seriously so I think

2128

01:39:33,490 --> 01:39:31,250

youyou really muddying the water with

2129

01:39:35,230 --> 01:39:33,500

that yeah you're saying something is

2130

01:39:38,410 --> 01:39:35,240

incredibly rare and and then you're

2131

01:39:40,000 --> 01:39:38,420

posting pictures of something that isn't

2132

01:39:42,280 --> 01:39:40,010

incredibly rare it happens well time

2133

01:39:45,580 --> 01:39:42,290

when I first when I first pointed them

2134

01:39:46,900 --> 01:39:45,590

out I was dismissed oh it's just the one

2135

01:39:49,540 --> 01:39:46,910

he's like oh you think it'll be rare

2136

01:39:53,140 --> 01:39:49,550

sundogs so that was the joke right it's

2137

01:39:55,480 --> 01:39:53,150

an old joke and I it's it's you know

2138

01:39:57,040 --> 01:39:55,490

maybe I should I should I will actually

2139

01:40:00,040 --> 01:39:57,050

I will put a thing thing ya know it's a

2140

01:40:03,760 --> 01:40:00,050

halo yeah yeah

2141

01:40:05,050 --> 01:40:03,770

yeah lost in translation right you know

2142

01:40:06,490 --> 01:40:05,060

there are things like that I think where

2143

01:40:08,200 --> 01:40:06,500

if there is some kind of disagreement

2144

01:40:10,000 --> 01:40:08,210

like a you know I wrote a whole post on

2145

01:40:11,830 --> 01:40:10,010

Medibank about how son dogs are not

2146

01:40:13,630 --> 01:40:11,840

incredibly rare how halos are not

2147

01:40:18,700 --> 01:40:13,640

incredibly rare son dogs aren't even

2148

01:40:20,320 --> 01:40:18,710

that rare that I think there are certain

2149

01:40:23,440 --> 01:40:20,330

things where we can establish a baseline

2150

01:40:28,690 --> 01:40:23,450

of what the facts actually are I we can

2151  
01:40:30,310 --> 01:40:28,700  
you know say if a certain test uses you

2152  
01:40:32,680 --> 01:40:30,320  
know they will detect metals or not I

2153  
01:40:35,800 --> 01:40:32,690  
think that we can actually work through

2154  
01:40:38,140 --> 01:40:35,810  
some of our disagreements and you know

2155  
01:40:43,030 --> 01:40:38,150  
figure things out and try to work more

2156  
01:40:44,770 --> 01:40:43,040  
from a shared knowledge base rather than

2157  
01:40:46,120 --> 01:40:44,780  
just saying we disagree on everything

2158  
01:40:48,880 --> 01:40:46,130  
because there are things like you know

2159  
01:40:52,050 --> 01:40:48,890  
you know that you know what a low is we

2160  
01:40:54,580 --> 01:40:52,060  
disagree in a fundamental thing I

2161  
01:40:56,560 --> 01:40:54,590  
maintain that it is going on you

2162  
01:40:59,170 --> 01:40:56,570  
maintain it's not that's that's that's a

2163  
01:41:02,050 --> 01:40:59,180

big one but you maintain that partly

2164

01:41:05,050 --> 01:41:02,060

because of evidence that you think that

2165

01:41:07,450 --> 01:41:05,060

you have and I think we can look at that

2166

01:41:09,280 --> 01:41:07,460

and you and you maintain your side with

2167

01:41:11,560 --> 01:41:09,290

evidence you think you have not really I

2168

01:41:12,850 --> 01:41:11,570

actually spend most of my time pointing

2169

01:41:15,940 --> 01:41:12,860

out where people get their everything

2170

01:41:17,470 --> 01:41:15,950

that's wrong rather than presenting

2171

01:41:20,560 --> 01:41:17,480

evidence it's hard to present evidence

2172

01:41:21,700 --> 01:41:20,570

for something not existing because you

2173

01:41:23,620 --> 01:41:21,710

know it's difficult to prove a negative

2174

01:41:25,870 --> 01:41:23,630

not be possible that it's difficult so

2175

01:41:27,340 --> 01:41:25,880

what I do is I look at people saying

2176

01:41:30,010 --> 01:41:27,350

things like oh there are these high

2177

01:41:33,400 --> 01:41:30,020

levels of aluminum in in rain or snow

2178

01:41:34,780 --> 01:41:33,410

and then I will show them a new would

2179

01:41:37,390 --> 01:41:34,790

say therefore it's not coming from the

2180

01:41:39,580 --> 01:41:37,400

sky coming from somewhere else well I

2181

01:41:41,260 --> 01:41:39,590

would say like these levels have existed

2182

01:41:43,690 --> 01:41:41,270

for you know whatever like a hundred

2183

01:41:46,090 --> 01:41:43,700

years or whatever it's not that unusual

2184

01:41:48,820 --> 01:41:46,100

so yeah I would say that but like then

2185

01:41:50,710 --> 01:41:48,830

it becomes like is this just an

2186

01:41:52,560 --> 01:41:50,720

interpretation this is just your own

2187

01:41:55,030 --> 01:41:52,570

personal feeling that they shouldn't be

2188

01:41:57,850 --> 01:41:55,040

metals in the sky or are you basing it

2189

01:41:59,290 --> 01:41:57,860

on actual research and you're saying

2190

01:42:01,660 --> 01:41:59,300

like you think that there shouldn't be

2191

01:42:04,150 --> 01:42:01,670

metals in the sky because you live close

2192

01:42:05,590 --> 01:42:04,160

to the ocean is that actually true you

2193

01:42:07,240 --> 01:42:05,600

know have you actually any way of

2194

01:42:09,760 --> 01:42:07,250

verifying that other than just kind of

2195

01:42:11,080 --> 01:42:09,770

like that's how it seems to be to you I

2196

01:42:14,240 --> 01:42:11,090

mean that's the type of thing that you

2197

01:42:17,520 --> 01:42:14,250

should really look into

2198

01:42:20,730 --> 01:42:17,530

what are the expected levels of aluminum

2199

01:42:23,760 --> 01:42:20,740

or whatever in real tax it's a little

2200

01:42:25,650 --> 01:42:23,770

difficult with the historical airborne

2201

01:42:28,710 --> 01:42:25,660

aluminum things but it lead to stop

2202

01:42:30,750 --> 01:42:28,720

publishing data EPA just stopped

2203

01:42:32,370 --> 01:42:30,760

publishing in their 2002 so we've got a

2204

01:42:35,280 --> 01:42:32,380

big gap there yeah but you can look a

2205

01:42:42,210 --> 01:42:35,290

historical okay yes send you know link

2206

01:42:44,970 --> 01:42:42,220

already mesmerized by the globe appear

2207

01:42:46,860 --> 01:42:44,980

the United States prevalence in soil on

2208

01:42:49,940 --> 01:42:46,870

water that link that I sent to you

2209

01:42:56,400 --> 01:42:49,950

[Music]

2210

01:43:02,060 --> 01:42:56,410

alright and that has historical records

2211

01:43:05,340 --> 01:43:02,070

of aluminum I just sent you one of them

2212

01:43:11,070 --> 01:43:05,350

this is this airborne our soil based or

2213

01:43:15,030 --> 01:43:11,080

this was I believe in that was in soil

2214

01:43:19,350 --> 01:43:15,040

soil yeah and then I'm good the airborne

2215

01:43:21,990 --> 01:43:19,360

stuff is what I was looking for and like

2216

01:43:29,360 --> 01:43:22,000

EPA stopped reporting that in 2002

2217

01:43:36,660 --> 01:43:29,370

alright I found one in 1972 Pennsylvania

2218

01:43:38,910 --> 01:43:36,670

yeah if you could find airborne aluminum

2219

01:43:42,420 --> 01:43:38,920

stuff would be right but the thing is

2220

01:43:45,980 --> 01:43:42,430

they don't test for aluminum because

2221

01:43:50,070 --> 01:43:45,990

they use it as basically as a reference

2222

01:43:52,920 --> 01:43:50,080

because it's so prevalent in the air no

2223

01:43:54,240 --> 01:43:52,930

but I mean APA were doing up until 2002

2224

01:43:56,520 --> 01:43:54,250

and they stopped yeah because there was

2225

01:44:01,050 --> 01:43:56,530

no reason to do it cuz they're always

2226

01:44:03,750 --> 01:44:01,060

gonna find levels of aluminum because I

2227

01:44:05,730 --> 01:44:03,760

mean you you disagree on the toxicity of

2228

01:44:08,280 --> 01:44:05,740

it if it's a tough if it's a toxic thing

2229

01:44:09,420 --> 01:44:08,290

in the air EPA's job is to like to keep

2230

01:44:12,360 --> 01:44:09,430

target --top' they were and they were

2231

01:44:15,360 --> 01:44:12,370

never never testing for elemental

2232

01:44:18,270 --> 01:44:15,370

aluminum they were testing for aluminum

2233

01:44:19,620 --> 01:44:18,280

and some form in the air wouldn't have

2234

01:44:21,690 --> 01:44:19,630

told them anything if people were

2235

01:44:24,160 --> 01:44:21,700

spraying like real aluminum in the air

2236

01:44:26,830 --> 01:44:24,170

it's the metallic aluminium is the one

2237

01:44:30,490 --> 01:44:26,840

toxic or potentially toxic if we can get

2238

01:44:33,820 --> 01:44:30,500

past the blood-brain barrier in in nano

2239

01:44:37,120 --> 01:44:33,830

form but they weren't testing for that

2240

01:44:38,229 --> 01:44:37,130

they never tested for that they're

2241

01:44:39,280 --> 01:44:38,239

saying they stopped testing for it

2242

01:44:41,760 --> 01:44:39,290

doesn't really mean anything it just

2243

01:44:44,530 --> 01:44:41,770

means that they didn't see any reason to

2244

01:44:47,800 --> 01:44:44,540

they decided to stop reporting levels of

2245

01:44:49,660 --> 01:44:47,810

aluminum yeah mm see as did California

2246

01:44:51,070 --> 01:44:49,670

EPA as well right because it was costing

2247

01:44:52,870 --> 01:44:51,080

you know several million dollars a year

2248

01:44:55,150 --> 01:44:52,880

to attest for it and it wasn't telling

2249

01:44:56,740 --> 01:44:55,160

me I think as you get the same levels a

2250

01:44:59,380 --> 01:44:56,750

year after year because he's just

2251  
01:45:02,080 --> 01:44:59,390  
getting rock dust basically mineral dust

2252  
01:45:03,400 --> 01:45:02,090  
so you'd say like you'd say like like in

2253  
01:45:06,689 --> 01:45:03,410  
the atmosphere they'll be like no

2254  
01:45:09,220 --> 01:45:06,699  
elemental pretty much no metal over time

2255  
01:45:11,850 --> 01:45:09,230  
there will be extraordinarily low

2256  
01:45:14,709 --> 01:45:11,860  
amounts of it if anyone yeah I think it

2257  
01:45:18,520 --> 01:45:14,719  
would just Hoxie dies almost instantly

2258  
01:45:21,280 --> 01:45:18,530  
you know it forms a thin layer of oxide

2259  
01:45:23,080 --> 01:45:21,290  
very rapidly and if it's nano sized

2260  
01:45:27,459 --> 01:45:23,090  
that's you know pretty much all of the

2261  
01:45:30,280 --> 01:45:27,469  
aluminum anyway oxidizes rapidly you

2262  
01:45:35,760 --> 01:45:30,290  
know they use aluminum in rocket motors

2263  
01:45:38,290 --> 01:45:35,770

and in thermite yes precisely

2264

01:45:42,070 --> 01:45:38,300

but the thing is once but when it's

2265

01:45:45,250 --> 01:45:42,080

fired it's gonna like you know yeah it

2266

01:45:46,810 --> 01:45:45,260

turns into an oxide using fireworks to

2267

01:45:48,880 --> 01:45:46,820

make white lights and sparklers

2268

01:45:51,490 --> 01:45:48,890

sparklers have it anyway getting a

2269

01:45:54,150 --> 01:45:51,500

little off-topic here but yeah my point

2270

01:46:00,250 --> 01:45:54,160

is that I think we can actually resolve

2271

01:46:02,620 --> 01:46:00,260

differences of science like yeah like

2272

01:46:04,360 --> 01:46:02,630

questions about has there been any

2273

01:46:06,100 --> 01:46:04,370

change in the sampling of elemental

2274

01:46:07,840 --> 01:46:06,110

aluminum I say no there isn't because

2275

01:46:09,130 --> 01:46:07,850

they never tested for elemental only

2276

01:46:11,280 --> 01:46:09,140

with them they just tested you know the

2277

01:46:15,419 --> 01:46:11,290

same as they do now same as you do now

2278

01:46:18,100 --> 01:46:15,429

for you know aluminum in whatever form

2279

01:46:19,240 --> 01:46:18,110

so and we could you know there are

2280

01:46:22,030 --> 01:46:19,250

various other things like I probably get

2281

01:46:26,169 --> 01:46:22,040

through your website and find a bunch of

2282

01:46:28,209 --> 01:46:26,179

other things that yeah we disagree with

2283

01:46:30,070 --> 01:46:28,219

because you're wrong Oh actually I

2284

01:46:32,110 --> 01:46:30,080

here's the thing did you ever figure out

2285

01:46:34,600 --> 01:46:32,120

the difference with all those the

2286

01:46:36,040 --> 01:46:34,610

multiple rings that I was finding no

2287

01:46:37,779 --> 01:46:36,050

there was a there was I like the image

2288

01:46:40,540 --> 01:46:37,789

like the the halo which I'd like to

2289

01:46:42,459 --> 01:46:40,550

like it was like yeah there was sub

2290

01:46:45,759 --> 01:46:42,469

rings in it what were those that was a

2291

01:46:48,549 --> 01:46:45,769

that was a multiple ring halo an

2292

01:46:50,740 --> 01:46:48,559

incredibly rare one I read earlier I

2293

01:46:57,729 --> 01:46:50,750

wrote I wrote about it on meta bunk I

2294

01:47:00,009 --> 01:46:57,739

think yeah they happen under very rare

2295

01:47:03,669 --> 01:47:00,019

conditions just like sundogs a fairly

2296

01:47:09,399 --> 01:47:03,679

rare halos are not that rare but you

2297

01:47:10,450 --> 01:47:09,409

know how a halo forms refraction and

2298

01:47:13,180 --> 01:47:10,460

stuff all right

2299

01:47:25,149 --> 01:47:13,190

I mean do you know specifically why you

2300

01:47:26,830 --> 01:47:25,159

get this 22 degree halo well when you

2301  
01:47:30,910 --> 01:47:26,840  
send light through a prism I mean you

2302  
01:47:36,759 --> 01:47:30,920  
can light gets but it gets bent enough

2303  
01:47:39,160 --> 01:47:36,769  
it'll yeah yes essentially like the ice

2304  
01:47:44,229 --> 01:47:39,170  
crystals that form are these hexagonal

2305  
01:47:45,790 --> 01:47:44,239  
columns we maintaining that they all

2306  
01:47:46,629 --> 01:47:45,800  
have to be aligned in a certain way yes

2307  
01:47:50,319 --> 01:47:46,639  
yes they do

2308  
01:47:52,990 --> 01:47:50,329  
yeah so they're different different

2309  
01:47:56,279 --> 01:47:53,000  
types of crystals will form under

2310  
01:47:59,500 --> 01:47:56,289  
different atmospheric conditions halos

2311  
01:48:02,109 --> 01:47:59,510  
are generally I believe off top of my

2312  
01:48:05,939 --> 01:48:02,119  
head like horizontal ice crystals like

2313  
01:48:08,830 --> 01:48:05,949

they settle into this horizontal state

2314

01:48:12,759 --> 01:48:08,840

yeah I'm looking at your your photos

2315

01:48:16,899 --> 01:48:12,769

here of the multiple halo Nicole looking

2316

01:48:18,939 --> 01:48:16,909

yeah I did you like my everything I had

2317

01:48:22,080 --> 01:48:18,949

it I put a lens cap on her selfie stick

2318

01:48:27,490 --> 01:48:24,359

have you looked at the website

2319

01:48:29,770 --> 01:48:27,500

atmospheric optics I know that optics

2320

01:48:30,790 --> 01:48:29,780

they give a very good explanation of all

2321

01:48:39,160 --> 01:48:30,800

the different types they get an

2322

01:48:42,310 --> 01:48:39,170

explanation yeah yeah yeah yeah it's you

2323

01:48:47,169 --> 01:48:42,320

know it's yeah things like the 22

2324

01:48:50,849 --> 01:48:47,179

degrees is something that I I've seen

2325

01:49:02,119 --> 01:48:55,439

I I don't want to say anything negative

2326  
01:49:08,819 --> 01:49:05,040  
this was just so we can like say hi and

2327  
01:49:13,439 --> 01:49:08,829  
be nice how do you say without

2328  
01:49:16,169 --> 01:49:13,449  
interruption what your view was great

2329  
01:49:17,939 --> 01:49:16,179  
I'm this thing I think is important my

2330  
01:49:19,709 --> 01:49:17,949  
view is that we can make progress in

2331  
01:49:22,469 --> 01:49:19,719  
communication by discussing things like

2332  
01:49:32,129 --> 01:49:22,479  
this like you think that yeah at Optics

2333  
01:49:36,029 --> 01:49:32,139  
they're some of the refractive

2334  
01:49:37,589 --> 01:49:36,039  
properties of ice you know fixed they're

2335  
01:49:38,909 --> 01:49:37,599  
measurable you could shine a laser

2336  
01:49:41,399 --> 01:49:38,919  
through some ice and it would Bend

2337  
01:49:44,729 --> 01:49:41,409  
through a certain degrees and we can

2338  
01:49:46,679 --> 01:49:44,739

look at ice that same same with glass

2339

01:49:48,989 --> 01:49:46,689

glass depending on you know depending on

2340

01:49:51,449 --> 01:49:48,999

the glass will Bend a certain way but if

2341

01:49:53,699 --> 01:49:51,459

depending on what lens you make all of

2342

01:49:56,189 --> 01:49:53,709

it will Bend a different than that the

2343

01:49:58,049 --> 01:49:56,199

shape of the it's a refractive index

2344

01:49:59,520 --> 01:49:58,059

Plus this the the shape and the other

2345

01:50:01,199 --> 01:49:59,530

impurities and all kinds of stuff

2346

01:50:03,959 --> 01:50:01,209

there's a lot of things that go into

2347

01:50:06,029 --> 01:50:03,969

optics I know it's a super complex thing

2348

01:50:10,679 --> 01:50:06,039

I hated it when I was doing a level

2349

01:50:13,889 --> 01:50:10,689

physics that in fluid mechanics but then

2350

01:50:16,500 --> 01:50:13,899

Ill get it I understand this stuff if I

2351

01:50:20,040 --> 01:50:16,510

what I don't get is why you have such a

2352

01:50:21,449 --> 01:50:20,050

negative opinion of about optics yeah is

2353

01:50:24,479 --> 01:50:21,459

there something to do with their halos

2354

01:50:30,839 --> 01:50:24,489

cuz the old halo stuff is verifiable you

2355

01:50:33,329 --> 01:50:30,849

can verify that it will form we just we

2356

01:50:38,310 --> 01:50:33,339

disagree like for example I met a bunt

2357

01:50:41,699 --> 01:50:38,320

and I mean priority you do you do your

2358

01:50:44,429 --> 01:50:41,709

thing we do our thing and while we're

2359

01:50:46,560 --> 01:50:44,439

opening lines of communication here just

2360

01:50:48,449 --> 01:50:46,570

like you know during World War two like

2361

01:50:50,040 --> 01:50:48,459

they got out of the trenches and played

2362

01:50:53,549 --> 01:50:50,050

football and shared schnapps and stuff

2363

01:50:55,770 --> 01:50:53,559

as well as that one yeah that that's

2364

01:50:58,319 --> 01:50:55,780

that that's that's a spirit I'm bringing

2365

01:51:01,530 --> 01:50:58,329

this into and I don't want to I know

2366

01:51:04,940 --> 01:51:01,540

whatever disagree with them

2367

01:51:08,930 --> 01:51:04,950

let's not get into that it's divisive

2368

01:51:12,150 --> 01:51:08,940

the thing is the division that where is

2369

01:51:13,260 --> 01:51:12,160

the problem here like here you have one

2370

01:51:15,330 --> 01:51:13,270

point of view I have a different point

2371

01:51:17,190 --> 01:51:15,340

of view but again it's not like you know

2372

01:51:20,040 --> 01:51:17,200

I'm I'm liberal and you're a

2373

01:51:22,320 --> 01:51:20,050

conservative it's we're disagreeing on

2374

01:51:24,030 --> 01:51:22,330

fundamental like issues of science like

2375

01:51:25,620 --> 01:51:24,040

you're you're saying that yeah there's

2376  
01:51:28,620 --> 01:51:25,630  
something dubious about the way these

2377  
01:51:30,270 --> 01:51:28,630  
halos are forming and I'm saying that

2378  
01:51:33,780 --> 01:51:30,280  
there isn't and that is something I

2379  
01:51:39,750 --> 01:51:33,790  
think that we can resolve well for

2380  
01:51:41,700 --> 01:51:39,760  
another time but I do I do want to thank

2381  
01:51:43,220 --> 01:51:41,710  
you for taking time that yeah well thank

2382  
01:51:47,040 --> 01:51:43,230  
you for a polite conversation

2383  
01:51:50,400 --> 01:51:47,050  
you know I'm all about being nice I mean

2384  
01:51:53,130 --> 01:51:50,410  
we can disagree we can you know both

2385  
01:51:54,660 --> 01:51:53,140  
different we can you know decide which

2386  
01:52:00,630 --> 01:51:54,670  
side of the ten irons is better having

2387  
01:52:02,910 --> 01:52:00,640  
they're both pretty cool actually III so

2388  
01:52:06,270 --> 01:52:02,920

Ill actually I I was a newspaper

2389

01:52:08,670 --> 01:52:06,280

reporter in Ormskirk on one side of the

2390

01:52:15,540 --> 01:52:08,680

pen ions and I studied and Sheffield on

2391

01:52:17,580 --> 01:52:15,550

the other and I think I'm a singer cat I

2392

01:52:21,300 --> 01:52:17,590

mean of course I'm a mutt where my

2393

01:52:23,400 --> 01:52:21,310

accent comes but I think I still get a

2394

01:52:24,930 --> 01:52:23,410

little bit in northern England bury them

2395

01:52:27,120 --> 01:52:24,940

up to the Irish in there somewhere

2396

01:52:30,300 --> 01:52:27,130

can you hear any sounds pretty Irish to

2397

01:52:32,480 --> 01:52:30,310

me but have been a while why do patchy

2398

01:52:36,360 --> 01:52:32,490

do you ever get someone say oh you sound

2399

01:52:39,270 --> 01:52:36,370

European usually Australian I guess I

2400

01:52:42,150 --> 01:52:39,280

gotta straight in a lot but I was I was

2401  
01:52:44,670 --> 01:52:42,160  
dumbfounded when someone well for like

2402  
01:52:47,070 --> 01:52:44,680  
person like I went to college in Cardiff

2403  
01:52:50,070 --> 01:52:47,080  
and went when I was doing physics and

2404  
01:52:57,210 --> 01:52:50,080  
when when when someone said oh you have

2405  
01:52:59,520 --> 01:52:57,220  
an Irish accent like which when I came

2406  
01:53:02,010 --> 01:52:59,530  
here and it was broadened to all of

2407  
01:53:05,690 --> 01:53:02,020  
Europe that's like wow but I think I've

2408  
01:53:08,130 --> 01:53:05,700  
over time you lose the ear the different

2409  
01:53:11,010 --> 01:53:08,140  
regions I mean you thought you sounded I

2410  
01:53:14,830 --> 01:53:11,020  
was thinking Manchester well here I

2411  
01:53:18,320 --> 01:53:14,840  
lived there for six or seven years

2412  
01:53:21,070 --> 01:53:18,330  
I've been here since 94 uh about the

2413  
01:53:25,310 --> 01:53:21,080

same actually yeah I think it was 94 I

2414

01:53:30,080 --> 01:53:25,320

need three maybe no yeah yeah a long

2415

01:53:34,100 --> 01:53:30,090

time yep I don't feel American yeah well

2416

01:53:35,630 --> 01:53:34,110

I assume you're a citizen now I'm still

2417

01:53:38,210 --> 01:53:35,640

on a green card I just renew my green

2418

01:53:41,900 --> 01:53:38,220

card every every however many years it's

2419

01:53:44,810 --> 01:53:41,910

a rip spike yeah no I mean did it the

2420

01:53:46,730 --> 01:53:44,820

one reason I'd like to get citizenship

2421

01:53:49,130 --> 01:53:46,740

is what you read you dig that fascinates

2422

01:53:51,500 --> 01:53:49,140

me okay or just like why would you want

2423

01:53:54,740 --> 01:53:51,510

to get called for jury duty if I'm gonna

2424

01:53:57,890 --> 01:53:54,750

go now yeah yeah see how the sausage was

2425

01:53:59,240 --> 01:53:57,900

made from the inside yeah I get my

2426

01:54:04,070 --> 01:53:59,250

summons all the time but I never

2427

01:54:06,050 --> 01:54:04,080

actually been on do you go when they

2428

01:54:07,820 --> 01:54:06,060

just say hey I don't even go there they

2429

01:54:10,790 --> 01:54:07,830

have you call into this automated system

2430

01:54:12,890 --> 01:54:10,800

I guess they just I just been lucky

2431

01:54:14,270 --> 01:54:12,900

honey there was like five times as many

2432

01:54:18,410 --> 01:54:14,280

people as they need just so they have

2433

01:54:22,860 --> 01:54:18,420

enough yeah all right well I gotta go