



1
00:00:04,789 --> 00:00:01,829
the everything else show my guest

2
00:00:07,670 --> 00:00:04,799
tonight is randall carlson he's a master

3
00:00:09,750 --> 00:00:07,680
builder and architectural designer

4
00:00:13,070 --> 00:00:09,760
he's all kinds of things he's a teacher

5
00:00:15,669 --> 00:00:13,080
a geometrician a geotherm uh

6
00:00:17,510 --> 00:00:15,679
geomethologist geological explorer and a

7
00:00:20,070 --> 00:00:17,520
renegade scholar

8
00:00:22,150 --> 00:00:20,080
he's had four decades of study research

9
00:00:23,269 --> 00:00:22,160
and exploration into the interface

10
00:00:25,910 --> 00:00:23,279
between

11
00:00:28,550 --> 00:00:25,920
ancient mysteries and modern science

12
00:00:31,349 --> 00:00:28,560
he's been an active freemason for 30

13
00:00:33,430 --> 00:00:31,359

years and a past master of one of the

14

00:00:34,709 --> 00:00:33,440

oldest and largest masonic lodges in

15

00:00:36,549 --> 00:00:34,719

georgia

16

00:00:38,709 --> 00:00:36,559

and he's been recognized by the national

17

00:00:40,869 --> 00:00:38,719

science teachers association

18

00:00:43,510 --> 00:00:40,879

for his commitment to science

19

00:00:44,470 --> 00:00:43,520

education for young people how are you

20

00:00:46,470 --> 00:00:44,480

randall

21

00:00:49,510 --> 00:00:46,480

you're doing very well martin

22

00:00:51,029 --> 00:00:49,520

boy we just barely got this show on

23

00:00:53,189 --> 00:00:51,039

trying to get this technical stuff

24

00:00:54,549 --> 00:00:53,199

together i'm so glad you glad we got it

25

00:00:57,670 --> 00:00:54,559

together though

26

00:01:00,389 --> 00:00:57,680

well thank cameron for that

27

00:01:02,630 --> 00:01:00,399

yeah yeah right right um so before we

28

00:01:04,789 --> 00:01:02,640

get started uh there's so much i would

29

00:01:06,149 --> 00:01:04,799

like to ask you about we talked last

30

00:01:07,750 --> 00:01:06,159

year at some point

31

00:01:09,190 --> 00:01:07,760

um but

32

00:01:11,590 --> 00:01:09,200

one of the things i i just wanted to

33

00:01:13,429 --> 00:01:11,600

find out as far as this aspect of the

34

00:01:15,990 --> 00:01:13,439

many many things that you do

35

00:01:18,630 --> 00:01:16,000

uh how did you get started you know what

36

00:01:20,789 --> 00:01:18,640

what started down the road um to looking

37

00:01:24,469 --> 00:01:20,799

into all these really spectacular and

38

00:01:29,190 --> 00:01:26,789

well i if i was going to go back to the

39

00:01:31,510 --> 00:01:29,200

very first influences that i'd have to

40

00:01:34,310 --> 00:01:31,520

say was growing up as a kid in rural

41

00:01:36,950 --> 00:01:34,320

minnesota in the land that was created

42

00:01:40,149 --> 00:01:36,960

and sculpted completely by the ice age

43

00:01:43,270 --> 00:01:40,159

and only land on a

44

00:01:45,510 --> 00:01:43,280

one of the minnesota's 15 000 lakes

45

00:01:47,429 --> 00:01:45,520

that was actually a melt water puddle

46

00:01:48,950 --> 00:01:47,439

that was left over after the recession

47

00:01:50,630 --> 00:01:48,960

of the great ice sheets

48

00:01:52,069 --> 00:01:50,640

so it was just

49

00:01:55,429 --> 00:01:52,079

growing up i think in that kind of a

50

00:01:57,910 --> 00:01:55,439

landscape and having a lot of um

51
00:02:00,310 --> 00:01:57,920
interest in natural things in science

52
00:02:01,990 --> 00:02:00,320
and all just from a you know from being

53
00:02:03,429 --> 00:02:02,000
a very early age

54
00:02:04,789 --> 00:02:03,439
and uh

55
00:02:06,789 --> 00:02:04,799
you know just one of those things that

56
00:02:08,790 --> 00:02:06,799
kind of accumulates over the years and

57
00:02:10,869 --> 00:02:08,800
you never think you know as a kid that

58
00:02:12,790 --> 00:02:10,879
you're gonna really become obsessed with

59
00:02:15,589 --> 00:02:12,800
some of this stuff as an adult but

60
00:02:16,949 --> 00:02:15,599
that's what happened um

61
00:02:18,550 --> 00:02:16,959
you know of course i

62
00:02:21,990 --> 00:02:18,560
was out there in the in the 50s and the

63
00:02:23,750 --> 00:02:22,000

60s so i saw the landscape kind of in

64

00:02:26,150 --> 00:02:23,760

one of its last phases before it

65

00:02:28,229 --> 00:02:26,160

underwent a major transformation with

66

00:02:30,390 --> 00:02:28,239

modern development you know so the

67

00:02:32,550 --> 00:02:30,400

places that i grew up these wild natural

68

00:02:34,790 --> 00:02:32,560

places they don't exist anymore um

69

00:02:37,270 --> 00:02:34,800

except you know in a few old photographs

70

00:02:39,190 --> 00:02:37,280

and in people's imaginations but you

71

00:02:41,990 --> 00:02:39,200

know the lake is still there but the

72

00:02:44,470 --> 00:02:42,000

lake that we lived on at the time was um

73

00:02:46,790 --> 00:02:44,480

there was us our little house with our

74

00:02:49,030 --> 00:02:46,800

land board in the lake and was a farm

75

00:02:50,470 --> 00:02:49,040

about a mile up on one side and then on

76
00:02:51,509 --> 00:02:50,480
the other side of the lake and that was

77
00:02:55,830 --> 00:02:51,519
it

78
00:02:57,509 --> 00:02:55,840
lived on a two-lane gravel road

79
00:02:59,430 --> 00:02:57,519
all of our neighbors for the most part

80
00:03:01,589 --> 00:02:59,440
were farmers um

81
00:03:04,229 --> 00:03:01,599
now it's suburbia

82
00:03:06,710 --> 00:03:04,239
the little two-lane gravel road is a you

83
00:03:09,190 --> 00:03:06,720
know a four-lane paved

84
00:03:11,270 --> 00:03:09,200
road in the the our house which was the

85
00:03:12,470 --> 00:03:11,280
first non-farm house there's pretty much

86
00:03:14,790 --> 00:03:12,480
lost

87
00:03:16,710 --> 00:03:14,800
in the wilderness of suburbia

88
00:03:19,110 --> 00:03:16,720

and i'm tempted sometimes just go knock

89

00:03:21,589 --> 00:03:19,120

on that on their door say hey let me

90

00:03:22,869 --> 00:03:21,599

tell you what this used to be like here

91

00:03:23,670 --> 00:03:22,879

um

92

00:03:25,270 --> 00:03:23,680

but

93

00:03:27,190 --> 00:03:25,280

so that's i think that's really where it

94

00:03:28,550 --> 00:03:27,200

started but then getting sucked into the

95

00:03:30,869 --> 00:03:28,560

whole

96

00:03:33,589 --> 00:03:30,879

counterculture movement of the late 60s

97

00:03:35,270 --> 00:03:33,599

you know and becoming interested in

98

00:03:37,589 --> 00:03:35,280

in things of the mind and things of

99

00:03:39,589 --> 00:03:37,599

consciousness and kind of coming around

100

00:03:41,750 --> 00:03:39,599

full circle i would say about the late

101
00:03:42,630 --> 00:03:41,760
70s or early 80s

102
00:03:45,430 --> 00:03:42,640
and

103
00:03:49,750 --> 00:03:46,789
you know i

104
00:03:51,430 --> 00:03:49,760
a lot of my interest in in mythology and

105
00:03:53,830 --> 00:03:51,440
archaic traditions and spiritual

106
00:03:54,710 --> 00:03:53,840
traditions and stuff led me kind of back

107
00:03:56,949 --> 00:03:54,720
to

108
00:03:59,670 --> 00:03:56,959
realizing how important the landscape

109
00:04:01,990 --> 00:03:59,680
was to our ancestors and how they

110
00:04:04,550 --> 00:04:02,000
encoded and embodied stories in the

111
00:04:06,710 --> 00:04:04,560
landscapes just as they did in the sky

112
00:04:09,670 --> 00:04:06,720
in the stellar patterns you know the all

113
00:04:11,750 --> 00:04:09,680

cultures utilize the elements of the sky

114

00:04:15,190 --> 00:04:11,760

and the elements of the landscape to

115

00:04:16,469 --> 00:04:15,200

encode their their um ancestral stories

116

00:04:18,870 --> 00:04:16,479

and their traditions and this is how

117

00:04:21,509 --> 00:04:18,880

they're handed down by tales of how this

118

00:04:23,990 --> 00:04:21,519

particular rock came to exist or you

119

00:04:26,550 --> 00:04:24,000

know what happened when the coyote got

120

00:04:30,390 --> 00:04:26,560

transferred to the sky or you know these

121

00:04:32,230 --> 00:04:30,400

stories i found very very interesting so

122

00:04:34,790 --> 00:04:32,240

at some point i think probably about the

123

00:04:35,590 --> 00:04:34,800

mid 80s i'm going to really realize that

124

00:04:37,909 --> 00:04:35,600

um

125

00:04:40,830 --> 00:04:37,919

you know these stories weren't just

126
00:04:43,030 --> 00:04:40,840
things that had been conjured up by our

127
00:04:45,270 --> 00:04:43,040
pre-scientific illiterate barbaric

128
00:04:46,629 --> 00:04:45,280
ancestors but were actually

129
00:04:49,110 --> 00:04:46,639
vehicles for teaching and the

130
00:04:51,110 --> 00:04:49,120
transmission of knowledge and actual

131
00:04:53,670 --> 00:04:51,120
real historical experiences of people

132
00:04:55,830 --> 00:04:53,680
that once lived

133
00:04:58,469 --> 00:04:55,840
that realization was very very important

134
00:05:00,710 --> 00:04:58,479
to me and so at that point this is what

135
00:05:03,030 --> 00:05:00,720
kind of led into i think you

136
00:05:05,350 --> 00:05:03,040
use the term geomethology i think it

137
00:05:07,590 --> 00:05:05,360
almost came out as geothermology but

138
00:05:08,870 --> 00:05:07,600

it's geomythology which is

139

00:05:11,909 --> 00:05:08,880

actually

140

00:05:13,749 --> 00:05:11,919

becoming a more legitimate um

141

00:05:15,749 --> 00:05:13,759

scientific discipline which is

142

00:05:17,990 --> 00:05:15,759

essentially looking at traditions that

143

00:05:20,790 --> 00:05:18,000

have been handed down in the form of

144

00:05:23,029 --> 00:05:20,800

myths and tales and folklore and so on

145

00:05:26,230 --> 00:05:23,039

and extracting out from that the

146

00:05:28,390 --> 00:05:26,240

underlying historical verity of these

147

00:05:29,430 --> 00:05:28,400

particular traditions the the actual

148

00:05:31,189 --> 00:05:29,440

events

149

00:05:32,790 --> 00:05:31,199

that are being memorialized in these

150

00:05:37,189 --> 00:05:32,800

stories even though the stories may have

151
00:05:39,830 --> 00:05:37,199
taken on a a idiosyncratic or a moral or

152
00:05:41,990 --> 00:05:39,840
a spiritual connotation nonetheless when

153
00:05:45,430 --> 00:05:42,000
you read these stories about you know

154
00:05:47,670 --> 00:05:45,440
great floods and fires and these events

155
00:05:49,670 --> 00:05:47,680
they are actually conveying real

156
00:05:51,029 --> 00:05:49,680
scientifically verifiable information

157
00:05:53,830 --> 00:05:51,039
and this is essentially what

158
00:05:55,830 --> 00:05:53,840
geomythology is it's it's looking at

159
00:05:57,909 --> 00:05:55,840
these myths and stories from around the

160
00:06:00,870 --> 00:05:57,919
world and realizing that

161
00:06:02,550 --> 00:06:00,880
yeah we can actually reconstruct we can

162
00:06:04,469 --> 00:06:02,560
find important clues here that can

163
00:06:06,629 --> 00:06:04,479

complement the kinds of clues we're

164

00:06:08,070 --> 00:06:06,639

getting from other scientific branches

165

00:06:10,150 --> 00:06:08,080

today whether those you know whether

166

00:06:12,909 --> 00:06:10,160

we're looking at geology or astronomy or

167

00:06:15,510 --> 00:06:12,919

archaeology or paleontology or or

168

00:06:17,830 --> 00:06:15,520

sedimentology whatever the case may be

169

00:06:19,749 --> 00:06:17,840

that the the knowledge has been handed

170

00:06:22,469 --> 00:06:19,759

down to us this this corpus of these

171

00:06:23,830 --> 00:06:22,479

traditions can actually powerfully

172

00:06:27,430 --> 00:06:23,840

complement

173

00:06:28,950 --> 00:06:27,440

the work of of modern scientific inquiry

174

00:06:30,390 --> 00:06:28,960

so

175

00:06:31,350 --> 00:06:30,400

tell you it's difficult to pinpoint

176

00:06:33,990 --> 00:06:31,360

where was i mean there were certain

177

00:06:35,029 --> 00:06:34,000

points where i certainly had an epiphany

178

00:06:36,870 --> 00:06:35,039

where

179

00:06:40,309 --> 00:06:36,880

i i can pinpoint one i've told this

180

00:06:42,230 --> 00:06:40,319

story before in 1969 summer of 1969 i

181

00:06:44,950 --> 00:06:42,240

went to a rock concert that was on the

182

00:06:45,990 --> 00:06:44,960

uh bluffs of the minnesota river valley

183

00:06:48,469 --> 00:06:46,000

um

184

00:06:50,150 --> 00:06:48,479

outside of minneapolis minnesota

185

00:06:52,950 --> 00:06:50,160

and at that particular point the bluffs

186

00:06:55,110 --> 00:06:52,960

are about 250 feet high overlooking a

187

00:06:56,950 --> 00:06:55,120

valley that's five miles wide and

188

00:06:59,270 --> 00:06:56,960

there's there's matching set of bluffs

189

00:07:01,029 --> 00:06:59,280

on the opposite side and so i was out

190

00:07:03,990 --> 00:07:01,039

there on a beautiful early summer day in

191

00:07:06,230 --> 00:07:04,000

1969 and i decided to take a break from

192

00:07:07,270 --> 00:07:06,240

the crowd and the music so i wandered

193

00:07:09,350 --> 00:07:07,280

you know

194

00:07:11,589 --> 00:07:09,360

maybe a half a mile away over to the

195

00:07:14,469 --> 00:07:11,599

bluff overlook and i was standing there

196

00:07:17,589 --> 00:07:14,479

looking down onto the um onto the valley

197

00:07:20,230 --> 00:07:17,599

spread below me and i saw the minnesota

198

00:07:23,589 --> 00:07:20,240

river the modern minnesota river flowing

199

00:07:25,589 --> 00:07:23,599

there in a channel and as i looked back

200

00:07:27,589 --> 00:07:25,599

and forth this was my first

201
00:07:29,270 --> 00:07:27,599
intimation of this concept that's become

202
00:07:30,629 --> 00:07:29,280
extremely important to

203
00:07:32,070 --> 00:07:30,639
many of the things that i've attempted

204
00:07:34,469 --> 00:07:32,080
to understand over the years which is

205
00:07:35,990 --> 00:07:34,479
scale and variance or

206
00:07:38,390 --> 00:07:36,000
another term that would be used to be

207
00:07:41,510 --> 00:07:38,400
fractal self-similarity in the sense

208
00:07:44,870 --> 00:07:41,520
that what i saw was that this smaller

209
00:07:47,589 --> 00:07:44,880
river below in its channel mimicked this

210
00:07:49,990 --> 00:07:47,599
gigantic channel whose edge i was

211
00:07:52,150 --> 00:07:50,000
standing up up on these 250 foot high

212
00:07:54,309 --> 00:07:52,160
bluffs of course at the time i knew

213
00:07:55,990 --> 00:07:54,319

really nothing about geology

214

00:07:58,309 --> 00:07:56,000

and it was just really

215

00:08:00,950 --> 00:07:58,319

an intimation that i had about about

216

00:08:02,469 --> 00:08:00,960

that dumb circumstance and it was only

217

00:08:04,550 --> 00:08:02,479

later probably

218

00:08:06,309 --> 00:08:04,560

a decade and a half later or maybe even

219

00:08:08,150 --> 00:08:06,319

two decades later

220

00:08:10,710 --> 00:08:08,160

in doing research in fact i got

221

00:08:13,510 --> 00:08:10,720

challenged i was giving a lecture uh in

222

00:08:15,510 --> 00:08:13,520

the 80s and i was talking in the context

223

00:08:17,830 --> 00:08:15,520

of i was talking about architecture and

224

00:08:20,550 --> 00:08:17,840

i was talking about scale and variance

225

00:08:22,070 --> 00:08:20,560

in ancient architecture and the idea in

226

00:08:24,230 --> 00:08:22,080

scale of variant use in ancient

227

00:08:26,469 --> 00:08:24,240

architecture is that

228

00:08:29,189 --> 00:08:26,479

that the part of the whole design

229

00:08:31,909 --> 00:08:29,199

the component the the piece has to in

230

00:08:33,110 --> 00:08:31,919

some way mirror or reflect the geometry

231

00:08:35,110 --> 00:08:33,120

of the whole

232

00:08:37,509 --> 00:08:35,120

and so what you have is you have a

233

00:08:39,269 --> 00:08:37,519

pattern or a proportional relationship

234

00:08:41,029 --> 00:08:39,279

that's constant throughout the structure

235

00:08:43,430 --> 00:08:41,039

regardless of the scale

236

00:08:46,470 --> 00:08:43,440

and this applies of course to geometry

237

00:08:49,350 --> 00:08:46,480

uh geology as well and this is why in

238

00:08:50,949 --> 00:08:49,360

fact your your backdrop is is a good

239

00:08:52,310 --> 00:08:50,959

example of that because

240

00:08:54,630 --> 00:08:52,320

you'll notice that if you're sitting

241

00:08:56,230 --> 00:08:54,640

here without anything for scale you look

242

00:08:57,750 --> 00:08:56,240

at that picture that is your your

243

00:08:58,949 --> 00:08:57,760

background there

244

00:09:00,470 --> 00:08:58,959

and um

245

00:09:02,710 --> 00:09:00,480

you don't really know well what are we

246

00:09:04,230 --> 00:09:02,720

looking at but if there's a building or

247

00:09:06,470 --> 00:09:04,240

there or then you look down below and

248

00:09:08,710 --> 00:09:06,480

you can see oh there's boats down on the

249

00:09:11,269 --> 00:09:08,720

water or you look on the other side you

250

00:09:13,350 --> 00:09:11,279

see a building or then i've superimposed

251

00:09:15,829 --> 00:09:13,360

modern niagara falls there in order to

252

00:09:18,310 --> 00:09:15,839

give this sense of scale but if you look

253

00:09:19,990 --> 00:09:18,320

in any geology textbook you will see

254

00:09:22,230 --> 00:09:20,000

photographs say of an outcrop and there

255

00:09:23,910 --> 00:09:22,240

will always be something in there for

256

00:09:25,509 --> 00:09:23,920

scale because you may be looking at a

257

00:09:27,829 --> 00:09:25,519

picture and you go am i looking at

258

00:09:30,070 --> 00:09:27,839

something here that's a foot high or 100

259

00:09:33,509 --> 00:09:30,080

feet high you don't know without having

260

00:09:36,310 --> 00:09:33,519

something in there for scale so

261

00:09:37,990 --> 00:09:36,320

this idea of scale and variance applies

262

00:09:40,389 --> 00:09:38,000

not only to

263

00:09:42,230 --> 00:09:40,399

the realm of of design and architecture

264

00:09:44,550 --> 00:09:42,240

because this was one of the key

265

00:09:46,949 --> 00:09:44,560

principles of the of the designers of

266

00:09:48,790 --> 00:09:46,959

these old sacred structures was this

267

00:09:50,389 --> 00:09:48,800

relationship between the part and the

268

00:09:52,310 --> 00:09:50,399

whole to create

269

00:09:56,150 --> 00:09:52,320

it was believed that that was the basis

270

00:09:57,829 --> 00:09:56,160

of harmony itself was this this

271

00:09:59,590 --> 00:09:57,839

this proportional relationship between

272

00:10:01,190 --> 00:09:59,600

the part and the whole so anyways i was

273

00:10:03,110 --> 00:10:01,200

using that i was talking about that that

274

00:10:05,190 --> 00:10:03,120

was the the subject of the of the

275

00:10:07,030 --> 00:10:05,200

lecture and then i segued off into

276

00:10:09,269 --> 00:10:07,040

disgusting

277

00:10:12,310 --> 00:10:09,279

uh scale and variance or fractal

278

00:10:14,550 --> 00:10:12,320

similarity in the geological realm and i

279

00:10:18,069 --> 00:10:14,560

cited this case of the

280

00:10:19,590 --> 00:10:18,079

minnesota river valley and how the small

281

00:10:21,990 --> 00:10:19,600

river channel

282

00:10:23,990 --> 00:10:22,000

mirrored or mimicked this is this big

283

00:10:26,630 --> 00:10:24,000

channel that you can actually see quite

284

00:10:28,790 --> 00:10:26,640

clearly with google earth now um in fact

285

00:10:30,389 --> 00:10:28,800

it may be one of the may possibly be i

286

00:10:32,710 --> 00:10:30,399

might have even sent you a digital

287

00:10:33,750 --> 00:10:32,720

relief map of that particular

288

00:10:35,670 --> 00:10:33,760

uh

289

00:10:37,910 --> 00:10:35,680

area where i was looking now

290

00:10:39,990 --> 00:10:37,920

so anyways this guy who had a degree in

291

00:10:42,949 --> 00:10:40,000

geology was in the audience and he

292

00:10:44,230 --> 00:10:42,959

challenged me said no no no no no

293

00:10:46,230 --> 00:10:44,240

because what you're saying though is

294

00:10:48,790 --> 00:10:46,240

that there was a giant river there that

295

00:10:52,350 --> 00:10:48,800

would have cut this this very large five

296

00:10:55,190 --> 00:10:52,360

mile wide 250 foot deep channel

297

00:10:57,590 --> 00:10:55,200

catastrophically and he says in geology

298

00:10:59,590 --> 00:10:57,600

we know that everything happens one

299

00:11:01,430 --> 00:10:59,600

grain of one grain of sand and one drop

300

00:11:02,710 --> 00:11:01,440

of water at a time and so it what you

301
00:11:04,389 --> 00:11:02,720
were you're talking about it took

302
00:11:05,269 --> 00:11:04,399
millions of years

303
00:11:07,829 --> 00:11:05,279
and

304
00:11:09,590 --> 00:11:07,839
i said well i'm pretty sure

305
00:11:11,750 --> 00:11:09,600
that it wasn't millions of years i'm

306
00:11:13,910 --> 00:11:11,760
pretty sure that what we're seeing there

307
00:11:15,750 --> 00:11:13,920
was not something that was slow erosion

308
00:11:17,430 --> 00:11:15,760
because even then i knew wait a second

309
00:11:18,710 --> 00:11:17,440
you know we know that there were ice

310
00:11:21,110 --> 00:11:18,720
sheets there

311
00:11:22,630 --> 00:11:21,120
fifteen thousand your massive ice sheets

312
00:11:24,069 --> 00:11:22,640
and we know that five thousand years

313
00:11:25,910 --> 00:11:24,079

later they're gone

314

00:11:28,630 --> 00:11:25,920

so there had to have been enormous

315

00:11:31,990 --> 00:11:28,640

amounts of melt water but i had to get

316

00:11:33,590 --> 00:11:32,000

it at that point really um delved into

317

00:11:36,150 --> 00:11:33,600

the specifics of it enough that i was

318

00:11:37,990 --> 00:11:36,160

able to quote any facts and figures but

319

00:11:38,870 --> 00:11:38,000

him challenging me

320

00:11:40,470 --> 00:11:38,880

really

321

00:11:41,750 --> 00:11:40,480

kind of got my goat a little bit and i

322

00:11:43,190 --> 00:11:41,760

said okay

323

00:11:45,110 --> 00:11:43,200

i'm going to really get down to the

324

00:11:49,269 --> 00:11:45,120

details of this and and be able to

325

00:11:50,630 --> 00:11:49,279

actually argue my point here so i

326

00:11:52,069 --> 00:11:50,640

enrolled in i ended up actually

327

00:11:54,790 --> 00:11:52,079

enrolling in college and majoring in

328

00:11:56,550 --> 00:11:54,800

geology and did quite well in it i never

329

00:11:58,870 --> 00:11:56,560

went through and got the degree

330

00:12:01,269 --> 00:11:58,880

because i realized well what are my my

331

00:12:03,670 --> 00:12:01,279

career options when i with my degree in

332

00:12:05,190 --> 00:12:03,680

in geology would be basically work for

333

00:12:07,110 --> 00:12:05,200

the government or work for industry or

334

00:12:09,350 --> 00:12:07,120

some corporation and i was that's not

335

00:12:11,509 --> 00:12:09,360

where my interest in geology was at my

336

00:12:13,910 --> 00:12:11,519

job interest in geology was in learning

337

00:12:17,269 --> 00:12:13,920

how to decipher the landscape of this

338

00:12:19,990 --> 00:12:17,279

planet so in any case what i learned

339

00:12:21,670 --> 00:12:20,000

subsequently is that oh yeah guess what

340

00:12:24,470 --> 00:12:21,680

mainstream geologists who have studied

341

00:12:25,910 --> 00:12:24,480

that agreed that yeah there was a giant

342

00:12:27,750 --> 00:12:25,920

flow of water through there and they

343

00:12:30,470 --> 00:12:27,760

called it river warren and the peak

344

00:12:31,990 --> 00:12:30,480

discharge or peak capacity of glacial

345

00:12:35,350 --> 00:12:32,000

river warren

346

00:12:37,110 --> 00:12:35,360

was uh about 4 000 times greater than

347

00:12:39,350 --> 00:12:37,120

the modern minnesota river that flows in

348

00:12:41,590 --> 00:12:39,360

that valley and i know we have at least

349

00:12:43,829 --> 00:12:41,600

one picture showing scale and variance

350

00:12:45,509 --> 00:12:43,839

between a modern river i think the

351

00:12:47,030 --> 00:12:45,519

picture i've sent you is of the snake

352

00:12:53,910 --> 00:12:47,040

river

353

00:12:55,750 --> 00:12:53,920

i'll see if i can get that up there

354

00:12:56,629 --> 00:12:55,760

yeah if you can do that that'd be cool

355

00:12:58,550 --> 00:12:56,639

we

356

00:13:00,470 --> 00:12:58,560

because that's exactly what i'm talking

357

00:13:02,389 --> 00:13:00,480

about here and it's i took this picture

358

00:13:04,389 --> 00:13:02,399

from the air so it's about i think about

359

00:13:07,509 --> 00:13:04,399

3000 feet up

360

00:13:11,750 --> 00:13:09,990

in fact um

361

00:13:15,750 --> 00:13:11,760

i could tell you which if you have the

362

00:13:19,350 --> 00:13:17,110

yeah you can tell me which image it is

363

00:13:23,509 --> 00:13:19,360

and i'll and i'll pull it up okay let me

364

00:13:29,670 --> 00:13:23,519

just go there for a second um yep

365

00:13:32,710 --> 00:13:31,110

all right um

366

00:13:34,389 --> 00:13:32,720

all right so you can keep going

367

00:13:35,310 --> 00:13:34,399

say one more time

368

00:13:37,110 --> 00:13:35,320

eight

369

00:13:40,790 --> 00:13:37,120

taba

370

00:13:42,710 --> 00:13:40,800

snake river and bonneville flood channel

371

00:13:44,310 --> 00:13:42,720

okay so you can keep going because i i

372

00:13:45,750 --> 00:13:44,320

don't remember seeing any numbered like

373

00:13:46,829 --> 00:13:45,760

that but uh

374

00:13:48,629 --> 00:13:46,839

well go

375

00:13:50,629 --> 00:13:48,639

down basically it'll be after seven

376

00:13:53,590 --> 00:13:50,639

there's a series of eights

377

00:13:55,190 --> 00:13:53,600

eight something eight something you'll

378

00:13:57,509 --> 00:13:55,200

it's an area okay

379

00:13:59,030 --> 00:13:57,519

river canyon yeah i'm sorry i i don't i

380

00:14:02,230 --> 00:13:59,040

didn't get that one so

381

00:14:04,790 --> 00:14:02,240

um but that's okay

382

00:14:06,949 --> 00:14:04,800

we'll just keep continuing on here

383

00:14:08,790 --> 00:14:06,959

you know one of the things that

384

00:14:10,389 --> 00:14:08,800

i think about when it comes to all this

385

00:14:14,069 --> 00:14:10,399

stuff and just wanted to get your

386

00:14:15,509 --> 00:14:14,079

opinion of it and that is

387

00:14:17,590 --> 00:14:15,519

the earth is so

388

00:14:18,629 --> 00:14:17,600

old and it's so hard to understand

389

00:14:20,629 --> 00:14:18,639

numbers

390

00:14:22,870 --> 00:14:20,639

um i i know this particular case you're

391

00:14:24,949 --> 00:14:22,880

talking about though because i saw a

392

00:14:26,470 --> 00:14:24,959

documentary on it they were trying to uh

393

00:14:29,189 --> 00:14:26,480

geologists were trying to figure this

394

00:14:31,509 --> 00:14:29,199

out there was like a massive uh ice dam

395

00:14:32,629 --> 00:14:31,519

that broke and just flooded right

396

00:14:34,470 --> 00:14:32,639

through

397

00:14:36,470 --> 00:14:34,480

uh but it's amazing you actually figured

398

00:14:38,949 --> 00:14:36,480

that out before um

399

00:14:41,509 --> 00:14:38,959

before that you know became figured out

400

00:14:42,870 --> 00:14:41,519

by uh you know mainstream mainstream

401
00:14:44,470 --> 00:14:42,880
science

402
00:14:46,550 --> 00:14:44,480
uh or you you had a clue that was

403
00:14:48,949 --> 00:14:46,560
happening anyway well i don't mainstream

404
00:14:51,030 --> 00:14:48,959
science hasn't gone there yet

405
00:14:52,710 --> 00:14:51,040
but is that right oh that's right you're

406
00:14:54,470 --> 00:14:52,720
thinking of something else then they've

407
00:14:56,230 --> 00:14:54,480
got a textbook explanation which you

408
00:14:58,150 --> 00:14:56,240
know for the well the feature that

409
00:15:01,030 --> 00:14:58,160
you're super about that dry falls

410
00:15:02,470 --> 00:15:01,040
cataract that was a peak discharge

411
00:15:05,509 --> 00:15:02,480
flowing through that scene here of about

412
00:15:08,150 --> 00:15:05,519
350 million cubic feet per second which

413
00:15:10,310 --> 00:15:08,160

is about 10 times the flow of every

414

00:15:12,470 --> 00:15:10,320

single stream creek and river on earth

415

00:15:13,509 --> 00:15:12,480

flowing all together

416

00:15:16,310 --> 00:15:13,519

that was just

417

00:15:18,069 --> 00:15:16,320

one one flood stream uh of these

418

00:15:20,389 --> 00:15:18,079

gigantic floods at the end of the last

419

00:15:22,790 --> 00:15:20,399

ice age well no i uh

420

00:15:24,470 --> 00:15:22,800

i started having questions about the see

421

00:15:27,189 --> 00:15:24,480

i passed over i traveled over this

422

00:15:28,550 --> 00:15:27,199

landscape in 1970 of course didn't have

423

00:15:30,470 --> 00:15:28,560

any i was a year out of high school i

424

00:15:31,269 --> 00:15:30,480

had no clue what i was seeing other than

425

00:15:33,350 --> 00:15:31,279

that

426

00:15:35,750 --> 00:15:33,360

these landscapes are very impressive and

427

00:15:37,430 --> 00:15:35,760

there's something happened here what how

428

00:15:39,269 --> 00:15:37,440

do you explain this i didn't see this

429

00:15:41,189 --> 00:15:39,279

particular feature but i saw the

430

00:15:42,790 --> 00:15:41,199

northern end of this the channel scab

431

00:15:45,030 --> 00:15:42,800

lands um

432

00:15:46,389 --> 00:15:45,040

we did we drove down the uh columbia

433

00:15:47,829 --> 00:15:46,399

gorge i don't know if you've ever been

434

00:15:49,670 --> 00:15:47,839

through the columbia gorge lots of

435

00:15:51,110 --> 00:15:49,680

people have and anybody who's driven

436

00:15:53,990 --> 00:15:51,120

through the columbia gorge is going to

437

00:15:57,670 --> 00:15:54,000

testify that it's an extraordinary uh

438

00:15:59,749 --> 00:15:57,680

geological phenomena in there and um

439

00:16:00,550 --> 00:15:59,759

i got really impressed by that landscape

440

00:16:05,030 --> 00:16:00,560

and

441

00:16:07,990 --> 00:16:05,040

these these large debris fans splayed

442

00:16:10,069 --> 00:16:08,000

out from the tributary uh river valleys

443

00:16:11,509 --> 00:16:10,079

and you see these huge undercut

444

00:16:14,069 --> 00:16:11,519

waterfalls

445

00:16:16,150 --> 00:16:14,079

you know um it's like what in the world

446

00:16:17,910 --> 00:16:16,160

is how do you explain this you know that

447

00:16:20,550 --> 00:16:17,920

was you know it was pretty much it was

448

00:16:22,790 --> 00:16:20,560

being out in the world and seeing these

449

00:16:23,990 --> 00:16:22,800

seeing these things you know an early

450

00:16:26,550 --> 00:16:24,000

age that

451
00:16:29,110 --> 00:16:26,560
pretty much got me turned onto like hey

452
00:16:30,870 --> 00:16:29,120
there is a story here and i want to

453
00:16:32,629 --> 00:16:30,880
learn about i want to learn about the

454
00:16:34,069 --> 00:16:32,639
earth i want to learn about

455
00:16:35,670 --> 00:16:34,079
you know

456
00:16:37,189 --> 00:16:35,680
as i begin to learn about it the more i

457
00:16:39,430 --> 00:16:37,199
learned the more i began to realize how

458
00:16:41,350 --> 00:16:39,440
much we didn't know yet

459
00:16:43,030 --> 00:16:41,360
and of course when i started turning to

460
00:16:44,550 --> 00:16:43,040
some of the archaic traditions you know

461
00:16:46,870 --> 00:16:44,560
one of the things that i found over and

462
00:16:48,790 --> 00:16:46,880
over and over again was that um

463
00:16:51,670 --> 00:16:48,800

there was it was a very much a

464

00:16:54,389 --> 00:16:51,680

catastrophist world view as contrasted

465

00:16:55,910 --> 00:16:54,399

with the very gradualist world view that

466

00:16:57,590 --> 00:16:55,920

prevailed through most of the 20th

467

00:16:59,590 --> 00:16:57,600

century in our understanding of the

468

00:17:01,509 --> 00:16:59,600

earth history because with the rise of

469

00:17:03,509 --> 00:17:01,519

darwinian evolution through natural

470

00:17:05,510 --> 00:17:03,519

selection um

471

00:17:07,270 --> 00:17:05,520

and the abandonment of the you know the

472

00:17:09,429 --> 00:17:07,280

belief that the earth was only five or

473

00:17:11,829 --> 00:17:09,439

six thousand years old you know what

474

00:17:13,510 --> 00:17:11,839

happened is the time frame went from

475

00:17:15,590 --> 00:17:13,520

being constricted

476

00:17:19,350 --> 00:17:15,600

like this to being

477

00:17:20,949 --> 00:17:19,360

enormous right so what happened is is

478

00:17:22,549 --> 00:17:20,959

darwinian evolution through natural

479

00:17:24,150 --> 00:17:22,559

selection which would be a very slow

480

00:17:25,990 --> 00:17:24,160

incremental process

481

00:17:28,470 --> 00:17:26,000

pretty much emerged into the

482

00:17:30,630 --> 00:17:28,480

on the intellectual horizons of

483

00:17:33,390 --> 00:17:30,640

mankind during the during the 19th

484

00:17:36,390 --> 00:17:33,400

century as the same time as the

485

00:17:38,470 --> 00:17:36,400

uniformitarian or gradualist dogmas of

486

00:17:40,070 --> 00:17:38,480

of earth change and the two seem to go

487

00:17:42,710 --> 00:17:40,080

hand in glove to each other you know

488

00:17:43,830 --> 00:17:42,720

watch you can accept that there was slow

489

00:17:46,230 --> 00:17:43,840

incremental

490

00:17:48,630 --> 00:17:46,240

evolution it was easy to uh accept also

491

00:17:51,430 --> 00:17:48,640

that there was slow incremental uh

492

00:17:53,029 --> 00:17:51,440

geological change however in the early

493

00:17:54,230 --> 00:17:53,039

days of geology most of the founding

494

00:17:56,310 --> 00:17:54,240

fathers of geologists were

495

00:17:57,909 --> 00:17:56,320

catastrophists who looked at the

496

00:18:00,390 --> 00:17:57,919

landscape and believed that there were

497

00:18:02,549 --> 00:18:00,400

evidence in the landscape that the the

498

00:18:03,830 --> 00:18:02,559

gradualist processes that we've seen

499

00:18:06,310 --> 00:18:03,840

going on

500

00:18:08,070 --> 00:18:06,320

today in our own lifetimes had actually

501
00:18:09,909 --> 00:18:08,080
been um

502
00:18:11,669 --> 00:18:09,919
interrupted temporarily and while

503
00:18:14,150 --> 00:18:11,679
they're being interrupted you know

504
00:18:15,830 --> 00:18:14,160
there's a highly accelerated pace of

505
00:18:17,430 --> 00:18:15,840
change

506
00:18:19,270 --> 00:18:17,440
now is this an image i guess you pulled

507
00:18:20,310 --> 00:18:19,280
up here

508
00:18:22,310 --> 00:18:20,320
what's that

509
00:18:25,590 --> 00:18:22,320
did you pull up this image of the

510
00:18:27,029 --> 00:18:25,600
the pothole i just yeah just just uh

511
00:18:29,510 --> 00:18:27,039
i thought it was an interesting image

512
00:18:31,350 --> 00:18:29,520
that's all it's a yeah well let's talk

513
00:18:33,350 --> 00:18:31,360

about that okay

514

00:18:35,350 --> 00:18:33,360

because this gets right back to to some

515

00:18:38,310 --> 00:18:35,360

of the impressions this is it at

516

00:18:40,789 --> 00:18:38,320

taylor's falls it's a uh it's a basalt

517

00:18:42,789 --> 00:18:40,799

outcrop along the uh saint croix river

518

00:18:45,110 --> 00:18:42,799

that forms part of the border between

519

00:18:47,430 --> 00:18:45,120

minnesota and wisconsin

520

00:18:49,110 --> 00:18:47,440

and this was a place that we would go

521

00:18:51,590 --> 00:18:49,120

quite frequently when i was a kid and

522

00:18:53,830 --> 00:18:51,600

what we're doing here is we're i am down

523

00:18:56,789 --> 00:18:53,840

in the bottom of a pothole that has been

524

00:18:59,110 --> 00:18:56,799

drilled into this hard basalt bedrock

525

00:19:01,590 --> 00:18:59,120

the the gentleman do you recognize the

526
00:19:04,150 --> 00:19:01,600
gentleman who's gazing down yeah that

527
00:19:05,830 --> 00:19:04,160
looks like is that uh grant that that's

528
00:19:07,350 --> 00:19:05,840
graham hancock

529
00:19:09,029 --> 00:19:07,360
great that's who i meant yeah graham

530
00:19:11,029 --> 00:19:09,039
hancock yeah

531
00:19:13,110 --> 00:19:11,039
yeah that's graham there we were this

532
00:19:14,549 --> 00:19:13,120
was on our on our two week journey

533
00:19:17,430 --> 00:19:14,559
together a few years ago when he was

534
00:19:19,830 --> 00:19:17,440
researching magicians of the gods um

535
00:19:22,390 --> 00:19:19,840
this was actually the last geological

536
00:19:24,070 --> 00:19:22,400
stop that we made was this uh

537
00:19:25,510 --> 00:19:24,080
this particular outcrop along the saint

538
00:19:28,230 --> 00:19:25,520

croix river where

539

00:19:30,470 --> 00:19:28,240

there was this enormous extremely

540

00:19:31,669 --> 00:19:30,480

violent torrent of melt water that

541

00:19:33,110 --> 00:19:31,679

gushed through there at the end of the

542

00:19:34,150 --> 00:19:33,120

last ice age

543

00:19:35,590 --> 00:19:34,160

and one of the things you need to

544

00:19:37,430 --> 00:19:35,600

understand about

545

00:19:39,909 --> 00:19:37,440

water being a fluid

546

00:19:41,750 --> 00:19:39,919

it will compete recapitulate many of the

547

00:19:43,830 --> 00:19:41,760

same type of processes that we see in

548

00:19:44,789 --> 00:19:43,840

the atmosphere because the air is also a

549

00:19:47,029 --> 00:19:44,799

fluid

550

00:19:49,350 --> 00:19:47,039

but what you see here is that this is

551
00:19:50,710 --> 00:19:49,360
the evidence of coal king now caulking

552
00:19:53,029 --> 00:19:50,720
is what happens when you have the

553
00:19:55,830 --> 00:19:53,039
extreme turbulence in deep swiftly

554
00:19:57,669 --> 00:19:55,840
moving water and it actually forms what

555
00:20:00,310 --> 00:19:57,679
you could think of as underwater

556
00:20:03,190 --> 00:20:00,320
tornadoes and they are like literally

557
00:20:07,029 --> 00:20:03,200
like whirlpools underwater tornadoes

558
00:20:09,029 --> 00:20:07,039
that can that can spin with extreme uh

559
00:20:10,470 --> 00:20:09,039
force and and power

560
00:20:11,909 --> 00:20:10,480
and what they will do is they will pick

561
00:20:13,750 --> 00:20:11,919
up loose sediment and that loose

562
00:20:14,870 --> 00:20:13,760
sediment can be anything from sand up to

563
00:20:16,870 --> 00:20:14,880

boulders

564

00:20:19,029 --> 00:20:16,880

and it'll pick up that sediment and

565

00:20:21,029 --> 00:20:19,039

train it within the whirlpool and that

566

00:20:23,270 --> 00:20:21,039

becomes like a massive drill like a

567

00:20:24,230 --> 00:20:23,280

massive hydraulic drill and it could

568

00:20:26,390 --> 00:20:24,240

drill

569

00:20:29,909 --> 00:20:26,400

literally into bedrock and so we're

570

00:20:31,909 --> 00:20:29,919

standing here i'm down in this pothole

571

00:20:33,669 --> 00:20:31,919

looking up at graham this is not even

572

00:20:34,870 --> 00:20:33,679

one of the biggest ones

573

00:20:36,950 --> 00:20:34,880

this one's probably looks like it's

574

00:20:39,590 --> 00:20:36,960

about 15 feet in diameter

575

00:20:41,430 --> 00:20:39,600

um i'm probably not in the full bottom

576

00:20:45,190 --> 00:20:41,440

but the very largest ones are i think up

577

00:20:46,870 --> 00:20:45,200

to 25 feet diameter and 80 feet in depth

578

00:20:49,270 --> 00:20:46,880

and there's a couple of dozen of these

579

00:20:51,510 --> 00:20:49,280

things on this one particular outcrop

580

00:20:53,750 --> 00:20:51,520

which is is clear evidence that there

581

00:20:55,669 --> 00:20:53,760

were these massive turbulent floods

582

00:20:57,590 --> 00:20:55,679

rushing through here and this is one of

583

00:20:59,029 --> 00:20:57,600

the one of the diagnostics that you

584

00:21:01,510 --> 00:20:59,039

would look for that anybody would look

585

00:21:04,230 --> 00:21:01,520

for when traveling around and i've seen

586

00:21:05,750 --> 00:21:04,240

this in in countless dozens of river

587

00:21:07,669 --> 00:21:05,760

valleys around the north american

588

00:21:09,590 --> 00:21:07,679

continent where you'll have exposed

589

00:21:11,909 --> 00:21:09,600

bedrock and you will be able to see that

590

00:21:15,029 --> 00:21:11,919

there are um potholes that have been

591

00:21:16,310 --> 00:21:15,039

drilled in and it's not the modern

592

00:21:18,870 --> 00:21:16,320

water float that's creating those

593

00:21:21,990 --> 00:21:18,880

potholes it's just these short-lived

594

00:21:24,070 --> 00:21:22,000

high discharge turbulent events um that

595

00:21:25,430 --> 00:21:24,080

are related to the to the big meltdown

596

00:21:27,270 --> 00:21:25,440

of the great ice sheets because you got

597

00:21:29,830 --> 00:21:27,280

to bear in mind now at the end of the

598

00:21:32,789 --> 00:21:29,840

the late wisconsin ice age you know it

599

00:21:35,029 --> 00:21:32,799

between 12 and say 15 000 years ago

600

00:21:37,590 --> 00:21:35,039

there was somewhere around 6 million

601
00:21:39,110 --> 00:21:37,600
cubic miles of ice piled up on the north

602
00:21:41,750 --> 00:21:39,120
american continent it was up to two

603
00:21:43,909 --> 00:21:41,760
miles thick over the region of central

604
00:21:45,990 --> 00:21:43,919
canada and over the hudson bay region it

605
00:21:47,270 --> 00:21:46,000
reached from the atlantic to the pacific

606
00:21:49,990 --> 00:21:47,280
oceans and it reached from northern

607
00:21:52,149 --> 00:21:50,000
united states to the arctic ocean a

608
00:21:54,630 --> 00:21:52,159
drastically dramatically different kind

609
00:21:57,350 --> 00:21:54,640
of a climb than than we've experienced

610
00:21:58,470 --> 00:21:57,360
in in recent millennia um

611
00:22:01,750 --> 00:21:58,480
and

612
00:22:05,430 --> 00:22:01,760
something triggered a rapid melting here

613
00:22:06,470 --> 00:22:05,440

um between like 11 and 14 000 years ago

614

00:22:07,510 --> 00:22:06,480

that

615

00:22:08,390 --> 00:22:07,520

uh

616

00:22:11,029 --> 00:22:08,400

caused

617

00:22:12,390 --> 00:22:11,039

uh catastrophic water flows to emanate

618

00:22:15,430 --> 00:22:12,400

off of the ice sheet

619

00:22:17,270 --> 00:22:15,440

in their return to the ocean basins

620

00:22:19,270 --> 00:22:17,280

the sum total of water that have been

621

00:22:21,669 --> 00:22:19,280

drawn out of the ocean basins in order

622

00:22:23,590 --> 00:22:21,679

to create these giant ice sheets lowered

623

00:22:26,070 --> 00:22:23,600

global sea levels by up to somewhere

624

00:22:27,990 --> 00:22:26,080

around 400 feet so when all of that

625

00:22:30,950 --> 00:22:28,000

water all that ice started melting and

626

00:22:34,230 --> 00:22:30,960

the water began to pour back in it uh

627

00:22:36,710 --> 00:22:34,240

rose sea levels by like i said 400 feet

628

00:22:39,430 --> 00:22:36,720

and it completely altered the landscape

629

00:22:41,830 --> 00:22:39,440

of earth at the time and it was also

630

00:22:43,669 --> 00:22:41,840

associated not only with direct melt

631

00:22:45,110 --> 00:22:43,679

water like what you're seeing here in

632

00:22:47,270 --> 00:22:45,120

dry falls cataract this would have been

633

00:22:49,029 --> 00:22:47,280

direct melt water coming right off the

634

00:22:51,909 --> 00:22:49,039

uh okanagan lobe

635

00:22:54,630 --> 00:22:51,919

uh of the uh courtier and ice sheet that

636

00:22:57,029 --> 00:22:54,640

would be called but you can trace these

637

00:22:59,190 --> 00:22:57,039

gigantic belt water streams off the

638

00:23:02,070 --> 00:22:59,200

entire perimeter of the whole lake

639

00:23:03,430 --> 00:23:02,080

wisconsin ice complex so you have flows

640

00:23:05,590 --> 00:23:03,440

that were going into the atlantic you

641

00:23:07,190 --> 00:23:05,600

had flows going into the pacific i made

642

00:23:08,950 --> 00:23:07,200

a traverse from the headwaters of the

643

00:23:11,350 --> 00:23:08,960

fraser river all the way to the pacific

644

00:23:13,270 --> 00:23:11,360

ocean back in 1999

645

00:23:16,070 --> 00:23:13,280

and it

646

00:23:18,549 --> 00:23:16,080

the whole valley had all of the

647

00:23:20,390 --> 00:23:18,559

all of the evidence of

648

00:23:22,390 --> 00:23:20,400

all the features of gigantic

649

00:23:23,750 --> 00:23:22,400

catastrophic melt water floods flowing

650

00:23:26,549 --> 00:23:23,760

through there

651

00:23:28,390 --> 00:23:26,559

i did a traverse uh with my colleague

652

00:23:30,870 --> 00:23:28,400

brad young uh

653

00:23:32,789 --> 00:23:30,880

see i believe was also in 1999 going up

654

00:23:34,789 --> 00:23:32,799

to the to the very headwaters of the

655

00:23:36,630 --> 00:23:34,799

columbia river up in british columbia

656

00:23:38,310 --> 00:23:36,640

and following that all the way down and

657

00:23:40,710 --> 00:23:38,320

documenting the evidence for

658

00:23:43,270 --> 00:23:40,720

catastrophic melt water floods all the

659

00:23:45,270 --> 00:23:43,280

way down that and we've done that now

660

00:23:47,990 --> 00:23:45,280

i've lost count how many rivers we've

661

00:23:50,230 --> 00:23:48,000

we've traversed in order to document

662

00:23:52,870 --> 00:23:50,240

and and i have not seen a single river

663

00:23:55,430 --> 00:23:52,880

valley in north america that was not

664

00:23:57,430 --> 00:23:55,440

carrying enormously augmented flows at

665

00:24:00,390 --> 00:23:57,440

the end of the last ice age not one not

666

00:24:02,789 --> 00:24:00,400

one single river valley have i seen

667

00:24:05,909 --> 00:24:02,799

that didn't have evidence of

668

00:24:07,110 --> 00:24:05,919

again enormously increased discharges uh

669

00:24:10,710 --> 00:24:07,120

during that

670

00:24:14,070 --> 00:24:10,720

now what do you think um could have

671

00:24:15,350 --> 00:24:14,080

caused such uh a massive melting

672

00:24:18,310 --> 00:24:15,360

of uh

673

00:24:20,310 --> 00:24:18,320

of of that ice sheet so quickly well

674

00:24:22,310 --> 00:24:20,320

there we get to the crux of the whole

675

00:24:23,750 --> 00:24:22,320

mystery don't we

676
00:24:26,710 --> 00:24:23,760
well

677
00:24:28,710 --> 00:24:26,720
my suspicions go back about 25 years

678
00:24:30,390 --> 00:24:28,720
because i had been pondering this and

679
00:24:32,470 --> 00:24:30,400
pondering this

680
00:24:33,909 --> 00:24:32,480
trying to understand you know at this

681
00:24:36,149 --> 00:24:33,919
point i had not gone out and actually

682
00:24:37,909 --> 00:24:36,159
done uh serious

683
00:24:39,110 --> 00:24:37,919
field studies in the

684
00:24:41,350 --> 00:24:39,120
in the uh

685
00:24:42,870 --> 00:24:41,360
channel scab land or missoula flood

686
00:24:44,950 --> 00:24:42,880
landscapes yet

687
00:24:46,230 --> 00:24:44,960
but in looking at all

688
00:24:48,549 --> 00:24:46,240

working my way through all the

689

00:24:50,789 --> 00:24:48,559

scientific literature available

690

00:24:53,990 --> 00:24:50,799

i came to the conclusion that the whole

691

00:24:56,789 --> 00:24:54,000

theory there was serious um

692

00:24:58,310 --> 00:24:56,799

inconsistencies in the the prevailing

693

00:25:00,230 --> 00:24:58,320

theory

694

00:25:03,029 --> 00:25:00,240

which was that all this water came out

695

00:25:04,950 --> 00:25:03,039

of a great glacial lake in montana

696

00:25:07,909 --> 00:25:04,960

and as i began to go through the and

697

00:25:08,460 --> 00:25:07,919

learning about the the scientific

698

00:25:09,909 --> 00:25:08,470

um

699

00:25:13,110 --> 00:25:09,919

[Music]

700

00:25:15,350 --> 00:25:13,120

process by which it was finally accepted

701
00:25:17,430 --> 00:25:15,360
by mainstream geology geology that these

702
00:25:18,710 --> 00:25:17,440
giant floods had taken place it seemed

703
00:25:20,470 --> 00:25:18,720
like there was just a sort of a

704
00:25:22,470 --> 00:25:20,480
repetition of

705
00:25:23,830 --> 00:25:22,480
of the same kind of an attitude that was

706
00:25:25,990 --> 00:25:23,840
holding back

707
00:25:28,710 --> 00:25:26,000
you know why the the original discover

708
00:25:30,470 --> 00:25:28,720
of these landscapes was j harlan bratz

709
00:25:32,070 --> 00:25:30,480
we've been a high school teacher who got

710
00:25:34,789 --> 00:25:32,080
obsessed with geology and then

711
00:25:37,269 --> 00:25:34,799
eventually did become a phd geologist it

712
00:25:39,350 --> 00:25:37,279
did most of his life's work on the uh

713
00:25:42,390 --> 00:25:39,360

deciphering these uh

714

00:25:46,310 --> 00:25:42,400

massive erosional features in washington

715

00:25:47,909 --> 00:25:46,320

state such as dry falls cataract and um

716

00:25:50,549 --> 00:25:47,919

he began publishing on this and i think

717

00:25:52,470 --> 00:25:50,559

his first paper was in 1923 on

718

00:25:55,029 --> 00:25:52,480

specifically on the formation of these

719

00:25:56,789 --> 00:25:55,039

channels scab lands and mainstream

720

00:26:00,549 --> 00:25:56,799

geology basically considered him a

721

00:26:02,870 --> 00:26:00,559

crackpot and for the next 25 years he

722

00:26:04,870 --> 00:26:02,880

spent most of every season out in the

723

00:26:06,070 --> 00:26:04,880

field with graduate students and

724

00:26:08,950 --> 00:26:06,080

and um

725

00:26:11,350 --> 00:26:08,960

documenting these these features and he

726

00:26:13,269 --> 00:26:11,360

created these maps and he showed from

727

00:26:14,630 --> 00:26:13,279

not not only from the erosional effects

728

00:26:15,750 --> 00:26:14,640

but from the depositional effects

729

00:26:18,310 --> 00:26:15,760

because you got to realize that when you

730

00:26:19,510 --> 00:26:18,320

have a flood there's going to be two two

731

00:26:21,029 --> 00:26:19,520

parts to this process you're going to

732

00:26:22,230 --> 00:26:21,039

have an erosion

733

00:26:24,310 --> 00:26:22,240

part of it

734

00:26:26,070 --> 00:26:24,320

or an erosional phase and then all of

735

00:26:28,070 --> 00:26:26,080

that material that is picked up and

736

00:26:29,590 --> 00:26:28,080

moved and trained and moved over the

737

00:26:32,390 --> 00:26:29,600

landscape it's going to get dumped

738

00:26:33,830 --> 00:26:32,400

somewhere so you've got the erosional

739

00:26:37,029 --> 00:26:33,840

and then you've got the deposition and

740

00:26:39,269 --> 00:26:37,039

so he was basically documenting both and

741

00:26:40,549 --> 00:26:39,279

showing how you could only you know you

742

00:26:42,070 --> 00:26:40,559

could might take

743

00:26:44,390 --> 00:26:42,080

one of the features

744

00:26:46,549 --> 00:26:44,400

uh for example and explained by

745

00:26:49,110 --> 00:26:46,559

non-catastrophic um

746

00:26:51,990 --> 00:26:49,120

forces but then when you took the whole

747

00:26:54,789 --> 00:26:52,000

suite of features all together there was

748

00:26:56,630 --> 00:26:54,799

no way to explain it other than

749

00:26:59,269 --> 00:26:56,640

something extremely catastrophic

750

00:27:01,830 --> 00:26:59,279

profoundly catastrophic in terms of of

751
00:27:04,470 --> 00:27:01,840
this the scale of these floods

752
00:27:05,590 --> 00:27:04,480
well the the main geological objection

753
00:27:08,390 --> 00:27:05,600
was this

754
00:27:09,750 --> 00:27:08,400
you can't explain the source

755
00:27:12,549 --> 00:27:09,760
you say there were these

756
00:27:14,870 --> 00:27:12,559
gigantic floods ten times the flow of

757
00:27:16,950 --> 00:27:14,880
every river on earth but you can't

758
00:27:20,070 --> 00:27:16,960
explain where the source of the water

759
00:27:22,230 --> 00:27:20,080
came from therefore there were no floods

760
00:27:24,630 --> 00:27:22,240
that was the estimates of the logic for

761
00:27:26,710 --> 00:27:24,640
for 25 years right wow

762
00:27:28,549 --> 00:27:26,720
finally you have this you have another

763
00:27:31,350 --> 00:27:28,559

geologist worked for the u.s geological

764

00:27:33,750 --> 00:27:31,360

survey by the name of jt pardee who

765

00:27:35,669 --> 00:27:33,760

while wild bratz was studying eastern

766

00:27:38,070 --> 00:27:35,679

washington he's studying

767

00:27:38,950 --> 00:27:38,080

western montana about 500 miles to the

768

00:27:40,870 --> 00:27:38,960

east

769

00:27:42,630 --> 00:27:40,880

and what he was doing was looking for

770

00:27:45,669 --> 00:27:42,640

evidence that there had been a gigantic

771

00:27:47,909 --> 00:27:45,679

glacial lake um because the first thing

772

00:27:50,789 --> 00:27:47,919

he saw in his first paper that he wrote

773

00:27:52,630 --> 00:27:50,799

was back in 1910 and what he saw was

774

00:27:54,230 --> 00:27:52,640

that there were two things that clued

775

00:27:55,909 --> 00:27:54,240

him that there had once been this huge

776

00:27:57,990 --> 00:27:55,919

body of water within these mountain

777

00:27:59,990 --> 00:27:58,000

valleys one was the sediment on the

778

00:28:01,669 --> 00:28:00,000

floor of these valleys which was to be

779

00:28:03,510 --> 00:28:01,679

typical what a geologist would call a

780

00:28:05,669 --> 00:28:03,520

holocaust stream sediment which is a

781

00:28:07,510 --> 00:28:05,679

lake bottom center and then up on the

782

00:28:10,149 --> 00:28:07,520

mountainsides there were a succession of

783

00:28:13,110 --> 00:28:10,159

shorelines that that were very clearly

784

00:28:14,789 --> 00:28:13,120

demarcated and preserved and these are

785

00:28:16,549 --> 00:28:14,799

fossil shorelines they show up very

786

00:28:18,230 --> 00:28:16,559

conspicuously on

787

00:28:21,029 --> 00:28:18,240

mount jumbo and mount sentinel right

788

00:28:23,830 --> 00:28:21,039

there near the university of uh

789

00:28:25,669 --> 00:28:23,840

montana in missoula

790

00:28:27,269 --> 00:28:25,679

you can see them very clear i think i've

791

00:28:29,430 --> 00:28:27,279

sent you a picture

792

00:28:30,789 --> 00:28:29,440

where you can see the shorelines and

793

00:28:32,230 --> 00:28:30,799

that should be

794

00:28:34,789 --> 00:28:32,240

um

795

00:28:36,789 --> 00:28:34,799

pretty early on

796

00:28:40,149 --> 00:28:36,799

um

797

00:28:41,510 --> 00:28:40,159

if you look there uh try

798

00:28:43,669 --> 00:28:41,520

um

799

00:28:45,190 --> 00:28:43,679

7b

800

00:28:48,389 --> 00:28:45,200

yeah i don't have any of those numbers i

801
00:28:50,630 --> 00:28:48,399
only have like the 10 47 48

802
00:28:52,149 --> 00:28:50,640
of those numbers i don't have any

803
00:28:56,950 --> 00:28:52,159
like seven

804
00:28:59,110 --> 00:28:56,960
unless it's uh i'll change up four lines

805
00:29:01,269 --> 00:28:59,120
both shorelines

806
00:29:02,710 --> 00:29:01,279
all right let me just take a look

807
00:29:04,310 --> 00:29:02,720
you might be able to see

808
00:29:07,510 --> 00:29:04,320
go ahead and keep going if if you want

809
00:29:09,430 --> 00:29:07,520
to know yeah so so jt pardee saw these

810
00:29:11,110 --> 00:29:09,440
shorelines

811
00:29:12,310 --> 00:29:11,120
saw the typical lake bottom sediments

812
00:29:14,630 --> 00:29:12,320
and then had concluded from the

813
00:29:16,950 --> 00:29:14,640

elevation of the top shoreline outside

814

00:29:18,470 --> 00:29:16,960

of uh in outside of missoula montana

815

00:29:21,029 --> 00:29:18,480

that the lake right there had to have

816

00:29:24,230 --> 00:29:21,039

been close to a thousand feet deep

817

00:29:26,870 --> 00:29:24,240

and so he began to trace this

818

00:29:28,630 --> 00:29:26,880

uh these shorelines and and lake bottom

819

00:29:29,830 --> 00:29:28,640

sediments came to the conclusion that

820

00:29:32,789 --> 00:29:29,840

somewhere to the west of there in the

821

00:29:35,029 --> 00:29:32,799

clarke fort valley um there had been an

822

00:29:36,950 --> 00:29:35,039

ice dam and this idea had actually been

823

00:29:40,389 --> 00:29:36,960

proposed by t.c chamberlain back in

824

00:29:42,630 --> 00:29:40,399

about 1896 i think um

825

00:29:44,230 --> 00:29:42,640

who who also saw evidence that he that

826

00:29:45,510 --> 00:29:44,240

there was this large volume of water

827

00:29:47,430 --> 00:29:45,520

well

828

00:29:49,350 --> 00:29:47,440

what happened was

829

00:29:51,669 --> 00:29:49,360

the geological community was eventually

830

00:29:54,070 --> 00:29:51,679

able to come around and say oh okay look

831

00:29:55,990 --> 00:29:54,080

this party has provided the explanation

832

00:29:57,990 --> 00:29:56,000

all the water came from lake missoula

833

00:29:59,990 --> 00:29:58,000

there was a big ice dam near the ice dam

834

00:30:02,149 --> 00:30:00,000

gave way and all the water from lake

835

00:30:03,750 --> 00:30:02,159

missoula drained out and carved the

836

00:30:05,350 --> 00:30:03,760

channel scab lands on its way to the

837

00:30:06,389 --> 00:30:05,360

pacific ocean

838

00:30:08,549 --> 00:30:06,399

so

839

00:30:10,230 --> 00:30:08,559

as a result of that

840

00:30:12,470 --> 00:30:10,240

they begin a provisional acceptance of

841

00:30:13,430 --> 00:30:12,480

the idea of catastrophic flooding

842

00:30:15,430 --> 00:30:13,440

but

843

00:30:17,510 --> 00:30:15,440

in my opinion what they did was they

844

00:30:19,669 --> 00:30:17,520

said okay the source of water was lake

845

00:30:21,830 --> 00:30:19,679

missoula well some of the studies have

846

00:30:23,909 --> 00:30:21,840

shown that there may have been over 600

847

00:30:25,350 --> 00:30:23,919

cubic miles of water accumulated in

848

00:30:27,830 --> 00:30:25,360

those mountain valleys that's an

849

00:30:29,909 --> 00:30:27,840

enormous amount of water an enormous

850

00:30:31,190 --> 00:30:29,919

amount of water okay

851

00:30:33,750 --> 00:30:31,200

so

852

00:30:36,789 --> 00:30:33,760

my perspective on it was well where did

853

00:30:38,549 --> 00:30:36,799

that water come from okay let's see you

854

00:30:40,310 --> 00:30:38,559

are looking at the palouse there the

855

00:30:40,980 --> 00:30:40,320

rolling palooz

856

00:30:42,389 --> 00:30:40,990

um

857

00:30:43,830 --> 00:30:42,399

[Music]

858

00:30:45,029 --> 00:30:43,840

that that's just i'm just pulling up

859

00:30:46,310 --> 00:30:45,039

different images you don't really have

860

00:30:48,710 --> 00:30:46,320

to talk about it if you don't want to

861

00:30:53,230 --> 00:30:50,549

we can certainly talk about that but i

862

00:30:55,510 --> 00:30:53,240

think we need to get our images

863

00:30:58,310 --> 00:30:55,520

coordinated here and you know what i

864

00:31:02,070 --> 00:31:01,110

i can do that i think i have just

865

00:31:03,750 --> 00:31:02,080

um

866

00:31:06,149 --> 00:31:03,760

i'll get there and then we'll have i

867

00:31:07,190 --> 00:31:06,159

think we can get our images coordinated

868

00:31:09,909 --> 00:31:07,200

um

869

00:31:12,230 --> 00:31:09,919

yeah because i might have had the wrong

870

00:31:14,149 --> 00:31:12,240

okay okay so now i've got i've got you

871

00:31:14,950 --> 00:31:14,159

may have sent me the wrong okay you want

872

00:31:16,870 --> 00:31:14,960

to go

873

00:31:20,549 --> 00:31:16,880

for the shorelines go to

874

00:31:21,830 --> 00:31:20,559

uh one zero one two ten twelve

875

00:31:25,269 --> 00:31:21,840

okay

876

00:31:27,990 --> 00:31:25,279

mount jumbo shorelines

877

00:31:30,310 --> 00:31:28,000

yeah i'm sorry they start in the 1040s

878

00:31:32,470 --> 00:31:30,320

they started the 1040s

879

00:31:33,669 --> 00:31:32,480

yeah wait a minute hang on unless they

880

00:31:35,110 --> 00:31:33,679

go backwards

881

00:31:37,669 --> 00:31:35,120

yeah you probably can't they go down to

882

00:31:39,909 --> 00:31:37,679

10 22 and that's the last that's the

883

00:31:41,590 --> 00:31:39,919

lowest number i have

884

00:31:44,870 --> 00:31:41,600

oh okay

885

00:31:49,590 --> 00:31:47,909

go to um go to 10 22. let's see what

886

00:31:51,110 --> 00:31:49,600

that is

887

00:31:54,149 --> 00:31:51,120

okay coming up

888

00:31:56,149 --> 00:31:54,159

is cumberland falls

889

00:31:58,830 --> 00:31:56,159

okay there's cumberland falls that's a

890

00:32:01,590 --> 00:31:58,840

good one okay let's see let me get back

891

00:32:03,830 --> 00:32:01,600

to um

892

00:32:05,350 --> 00:32:03,840

there you are okay

893

00:32:08,149 --> 00:32:05,360

if you look at this this is actually in

894

00:32:11,509 --> 00:32:08,159

kentucky and what you see here is a

895

00:32:14,950 --> 00:32:13,190

what i would call anybody who can see

896

00:32:16,630 --> 00:32:14,960

this on online

897

00:32:19,350 --> 00:32:16,640

if you look at the

898

00:32:20,950 --> 00:32:19,360

uh texture of the bedrock

899

00:32:23,830 --> 00:32:20,960

around the falls

900

00:32:26,830 --> 00:32:23,840

you begin to see how scoured and and

901
00:32:28,870 --> 00:32:26,840
eroded it is and i

902
00:32:31,590 --> 00:32:28,880
think uh

903
00:32:33,830 --> 00:32:31,600
let's go here uh

904
00:32:35,830 --> 00:32:33,840
if you go to the next image should be

905
00:32:37,909 --> 00:32:35,840
cumberland falls cataract from google

906
00:32:39,590 --> 00:32:37,919
earth pro

907
00:32:40,710 --> 00:32:39,600
and what you're seeing there is from the

908
00:32:42,950 --> 00:32:40,720
air

909
00:32:44,470 --> 00:32:42,960
and you see that horseshoe shape that's

910
00:32:46,470 --> 00:32:44,480
a very typical

911
00:32:49,269 --> 00:32:46,480
formation that's left in the wake of

912
00:32:51,430 --> 00:32:49,279
catastrophic water flows

913
00:32:53,269 --> 00:32:51,440

because when water flows the the faster

914

00:32:54,870 --> 00:32:53,279

the water flow the greater the erosive

915

00:32:56,789 --> 00:32:54,880

potential but if you have a cross

916

00:32:57,830 --> 00:32:56,799

cross-section of

917

00:33:00,470 --> 00:32:57,840

water

918

00:33:03,029 --> 00:33:00,480

um what happens is along the boundaries

919

00:33:03,909 --> 00:33:03,039

of that water flow there's more friction

920

00:33:06,070 --> 00:33:03,919

so

921

00:33:08,389 --> 00:33:06,080

along the edges of the water flow it

922

00:33:11,269 --> 00:33:08,399

flows slower than it does in the middle

923

00:33:13,750 --> 00:33:11,279

and so water flows the fastest in the

924

00:33:15,830 --> 00:33:13,760

middle of a current and then it uh the

925

00:33:18,389 --> 00:33:15,840

velocity of the water flow

926

00:33:20,389 --> 00:33:18,399

hence its power falls off as you move

927

00:33:22,549 --> 00:33:20,399

towards the edges so

928

00:33:24,870 --> 00:33:22,559

the middle is going to erode faster than

929

00:33:26,870 --> 00:33:24,880

the edges and so what it does is it it

930

00:33:28,950 --> 00:33:26,880

erodes this um

931

00:33:31,350 --> 00:33:28,960

this horseshoe shape it's anybody who's

932

00:33:33,430 --> 00:33:31,360

been to niagara falls or looks up

933

00:33:36,310 --> 00:33:33,440

niagara falls

934

00:33:39,029 --> 00:33:36,320

you know from the air is going to see

935

00:33:41,750 --> 00:33:39,039

uh horseshoe falls uh at niagara has

936

00:33:44,149 --> 00:33:41,760

this very typical horseshoe shape

937

00:33:47,190 --> 00:33:44,159

and in fact the what you're seeing here

938

00:33:49,350 --> 00:33:47,200

in cumberland falls is a smaller version

939

00:33:52,789 --> 00:33:49,360

of the dry false cataract you've got

940

00:33:59,990 --> 00:33:56,070

but at the time this cataract was was um

941

00:34:02,710 --> 00:34:00,000

formed the flows were enormously

942

00:34:04,549 --> 00:34:02,720

much bigger than the flow you see here

943

00:34:08,069 --> 00:34:04,559

so if you go

944

00:34:11,669 --> 00:34:08,079

uh two images ahead you will see the

945

00:34:14,389 --> 00:34:11,679

debris the sediment that is below

946

00:34:16,310 --> 00:34:14,399

cumberland falls

947

00:34:18,389 --> 00:34:16,320

and there should be two people standing

948

00:34:19,190 --> 00:34:18,399

on a rock there one of them with the red

949

00:34:21,270 --> 00:34:19,200

shirt

950

00:34:23,190 --> 00:34:21,280

yep got it okay i want you to take a

951
00:34:24,069 --> 00:34:23,200
look at those boulders

952
00:34:26,310 --> 00:34:24,079
now

953
00:34:28,230 --> 00:34:26,320
those boulders are not being moved by

954
00:34:30,710 --> 00:34:28,240
the modern cumberland river those

955
00:34:33,589 --> 00:34:30,720
boulders are a fossil artifact of a

956
00:34:34,389 --> 00:34:33,599
gigantic melt water flood that rushed

957
00:34:36,629 --> 00:34:34,399
through

958
00:34:38,389 --> 00:34:36,639
this area at the end of the last ice age

959
00:34:40,230 --> 00:34:38,399
and you can look at the science to those

960
00:34:41,510 --> 00:34:40,240
boulders and realize

961
00:34:43,270 --> 00:34:41,520
that you know they've been sitting there

962
00:34:45,669 --> 00:34:43,280
stacked up like that for you know maybe

963
00:34:47,030 --> 00:34:45,679

12 or 13 000 years

964

00:34:48,310 --> 00:34:47,040

and

965

00:34:49,909 --> 00:34:48,320

this is the kind of thing that you would

966

00:34:51,190 --> 00:34:49,919

look for and in fact i don't know if i

967

00:34:52,310 --> 00:34:51,200

have a picture of it in here but if you

968

00:34:54,790 --> 00:34:52,320

went up and looked at some of the

969

00:34:57,109 --> 00:34:54,800

exposed bedrock up near the river you

970

00:34:59,910 --> 00:34:57,119

would find some pretty substantial

971

00:35:01,510 --> 00:34:59,920

potholes that had been drilled in so

972

00:35:04,470 --> 00:35:01,520

there's a number of these features that

973

00:35:06,390 --> 00:35:04,480

you look at that taken together

974

00:35:09,430 --> 00:35:06,400

make the case for catastrophic water

975

00:35:11,990 --> 00:35:09,440

flows i would challenge anybody to try

976
00:35:12,950 --> 00:35:12,000
to explain that boulder deposit right

977
00:35:14,150 --> 00:35:12,960
there

978
00:35:17,349 --> 00:35:14,160
without

979
00:35:18,950 --> 00:35:17,359
by some gradualist means

980
00:35:19,910 --> 00:35:18,960
and uh they're not going to be able to

981
00:35:21,109 --> 00:35:19,920
do it

982
00:35:23,750 --> 00:35:21,119
yeah um

983
00:35:25,829 --> 00:35:23,760
if you go to the next one 10 25

984
00:35:28,069 --> 00:35:25,839
falls creek falls tennessee you're going

985
00:35:31,349 --> 00:35:28,079
to see another cataract you see you're

986
00:35:33,430 --> 00:35:31,359
going to see that horseshoe shape

987
00:35:34,630 --> 00:35:33,440
i think you do you have it up there now

988
00:35:35,910 --> 00:35:34,640

martin

989

00:35:37,430 --> 00:35:35,920

yeah

990

00:35:39,750 --> 00:35:37,440

let's see

991

00:35:43,030 --> 00:35:39,760

no now we're looking okay that's

992

00:35:45,829 --> 00:35:43,040

those are more okay this is the 10 25

993

00:35:47,109 --> 00:35:45,839

yeah okay but

994

00:35:48,870 --> 00:35:47,119

i can put it

995

00:35:49,829 --> 00:35:48,880

put another one if you give me the image

996

00:35:53,430 --> 00:35:49,839

number

997

00:35:55,109 --> 00:35:53,440

uh

998

00:35:57,030 --> 00:35:55,119

10 26

999

00:36:00,230 --> 00:35:57,040

narroco left falls

1000

00:36:01,750 --> 00:36:00,240

nakalula falls okay that works

1001
00:36:05,190 --> 00:36:01,760
we were gonna i was gonna have you pull

1002
00:36:10,150 --> 00:36:09,190
which is falls creek falls tennessee

1003
00:36:12,630 --> 00:36:10,160
all right

1004
00:36:14,390 --> 00:36:12,640
okay

1005
00:36:16,390 --> 00:36:14,400
and

1006
00:36:20,390 --> 00:36:16,400
what we're looking at here is

1007
00:36:22,230 --> 00:36:20,400
just again there are more uh examples of

1008
00:36:24,310 --> 00:36:22,240
very much like the the feature you've

1009
00:36:26,630 --> 00:36:24,320
got is your backdrop there the feature

1010
00:36:29,349 --> 00:36:26,640
you've got in your ah here we go

1011
00:36:30,390 --> 00:36:29,359
this is false creek falls once again

1012
00:36:33,670 --> 00:36:30,400
what you're going to see is this

1013
00:36:35,750 --> 00:36:33,680

horseshoe shape profile which is utterly

1014

00:36:37,670 --> 00:36:35,760

dwarfs the modern flow that's in there

1015

00:36:38,829 --> 00:36:37,680

and this the other thing to notice is

1016

00:36:40,950 --> 00:36:38,839

also the

1017

00:36:42,630 --> 00:36:40,960

undercutting you notice how it you can

1018

00:36:44,550 --> 00:36:42,640

see how it's almost like a cave under

1019

00:36:46,390 --> 00:36:44,560

the waterfall

1020

00:36:49,270 --> 00:36:46,400

that is created by

1021

00:36:51,190 --> 00:36:49,280

again by massive violent eddy currents

1022

00:36:54,630 --> 00:36:51,200

that are sweeping around

1023

00:36:56,870 --> 00:36:54,640

uh in a circular fashion um undercutting

1024

00:36:58,630 --> 00:36:56,880

undercutting the rock because

1025

00:37:01,750 --> 00:36:58,640

what you have here was it'd be what's

1026
00:37:03,990 --> 00:37:01,760
called a plunge pool and when the

1027
00:37:04,790 --> 00:37:04,000
original water flow that created this

1028
00:37:07,109 --> 00:37:04,800
thing

1029
00:37:09,109 --> 00:37:07,119
was happening the entire screen here

1030
00:37:10,630 --> 00:37:09,119
would have been filled with water the

1031
00:37:12,230 --> 00:37:10,640
height of this

1032
00:37:14,390 --> 00:37:12,240
from where i took this picture i would

1033
00:37:17,510 --> 00:37:14,400
have been completely submerged

1034
00:37:19,990 --> 00:37:17,520
by this flow at its peak and then as it

1035
00:37:22,150 --> 00:37:20,000
as it's flowing what's happening is the

1036
00:37:24,710 --> 00:37:22,160
force of the water the sheer

1037
00:37:27,190 --> 00:37:24,720
forces of this water are going to be

1038
00:37:29,190 --> 00:37:27,200

plucking um and so it's this water if

1039

00:37:31,990 --> 00:37:29,200

you can imagine this as the water is

1040

00:37:34,310 --> 00:37:32,000

flowing over the rim or the lip of this

1041

00:37:35,829 --> 00:37:34,320

horseshoe-shaped cataract here

1042

00:37:37,990 --> 00:37:35,839

what it's doing is it's plucking the

1043

00:37:41,270 --> 00:37:38,000

force of the water is pulling pouring

1044

00:37:42,470 --> 00:37:41,280

plucking off boulders from this and then

1045

00:37:45,109 --> 00:37:42,480

transporting them washing them

1046

00:37:47,430 --> 00:37:45,119

downstream and so what we have is it's

1047

00:37:49,270 --> 00:37:47,440

called a resectional cataract and the

1048

00:37:50,390 --> 00:37:49,280

longer the flood flows

1049

00:37:52,790 --> 00:37:50,400

the the

1050

00:37:54,150 --> 00:37:52,800

the further back that cataract will

1051
00:37:55,750 --> 00:37:54,160
receive

1052
00:37:56,630 --> 00:37:55,760
what is happening is that the modern

1053
00:37:59,109 --> 00:37:56,640
flow

1054
00:38:01,589 --> 00:37:59,119
is creating a new very much smaller

1055
00:38:03,349 --> 00:38:01,599
notch within the ancient cataract and

1056
00:38:05,030 --> 00:38:03,359
that's what you see here and what you're

1057
00:38:08,630 --> 00:38:05,040
seeing here is you know maybe somewhere

1058
00:38:10,870 --> 00:38:08,640
between 12 and 14 000 years of

1059
00:38:14,390 --> 00:38:10,880
more modern scale erosion

1060
00:38:15,910 --> 00:38:14,400
um following the um catastrophic flows

1061
00:38:18,870 --> 00:38:15,920
at the end of the last ice age that

1062
00:38:21,270 --> 00:38:18,880
would have uh cut this now this is in

1063
00:38:24,390 --> 00:38:21,280

this is um this is tennessee the one we

1064

00:38:27,510 --> 00:38:24,400

just looked at was kentucky the next one

1065

00:38:29,910 --> 00:38:27,520

which would be i guess 1026

1066

00:38:32,550 --> 00:38:29,920

will be in alabama

1067

00:38:34,630 --> 00:38:32,560

and that is nakalula falls

1068

00:38:36,960 --> 00:38:34,640

and you're going to see a very similar

1069

00:38:41,030 --> 00:38:36,970

kind of a situation

1070

00:38:45,109 --> 00:38:43,829

yeah okay so there's nakalula falls

1071

00:38:46,550 --> 00:38:45,119

and

1072

00:38:48,230 --> 00:38:46,560

as you look at this

1073

00:38:50,870 --> 00:38:48,240

we're seeing again we're seeing a

1074

00:38:53,190 --> 00:38:50,880

semicircular kind of horseshoe shape we

1075

00:38:55,030 --> 00:38:53,200

see this massive undercutting and

1076

00:38:56,870 --> 00:38:55,040

anybody who's looking at this i want to

1077

00:38:58,870 --> 00:38:56,880

want you to pay special attention to the

1078

00:39:00,390 --> 00:38:58,880

texture of this rock

1079

00:39:02,069 --> 00:39:00,400

that you see exposed here because the

1080

00:39:03,910 --> 00:39:02,079

texture of this rock

1081

00:39:06,630 --> 00:39:03,920

really um

1082

00:39:09,349 --> 00:39:06,640

kind of tells the story about the forces

1083

00:39:11,990 --> 00:39:09,359

um the violent sheer forces that were

1084

00:39:14,470 --> 00:39:12,000

sweeping in a circular fashion

1085

00:39:16,470 --> 00:39:14,480

below this falls in order to to cut this

1086

00:39:18,710 --> 00:39:16,480

erosion like this and you can see the

1087

00:39:20,310 --> 00:39:18,720

human figures in here how um

1088

00:39:21,990 --> 00:39:20,320

how small they are and obviously as

1089

00:39:23,750 --> 00:39:22,000

you're looking at this

1090

00:39:26,390 --> 00:39:23,760

here you see the modern creek the modern

1091

00:39:29,270 --> 00:39:26,400

creek had nothing to do with creating

1092

00:39:31,990 --> 00:39:29,280

this cataract formation that we see here

1093

00:39:34,950 --> 00:39:32,000

it's simply occupying the channel that

1094

00:39:37,829 --> 00:39:34,960

was cut by the much more ancient

1095

00:39:40,630 --> 00:39:37,839

much larger current flow and then i

1096

00:39:42,310 --> 00:39:40,640

believe the next image is looking

1097

00:39:44,230 --> 00:39:42,320

downstream

1098

00:39:47,190 --> 00:39:44,240

from this yes so if we go to the next

1099

00:39:50,069 --> 00:39:47,200

image which would be 1027

1100

00:39:51,349 --> 00:39:50,079

you begin to see the debris that's below

1101

00:39:52,310 --> 00:39:51,359

the falls

1102

00:39:53,910 --> 00:39:52,320

and you

1103

00:39:56,710 --> 00:39:53,920

see the same kind of thing you can see

1104

00:39:58,790 --> 00:39:56,720

the scale of the boulders and the rocks

1105

00:40:01,109 --> 00:39:58,800

that were plucked

1106

00:40:02,950 --> 00:40:01,119

of the original falls

1107

00:40:04,310 --> 00:40:02,960

and so this whole feature here now is

1108

00:40:06,710 --> 00:40:04,320

like a fossil

1109

00:40:08,790 --> 00:40:06,720

it was created by these oversized

1110

00:40:11,910 --> 00:40:08,800

gigantic events

1111

00:40:14,230 --> 00:40:11,920

that then terminated and in the 11 or 12

1112

00:40:16,870 --> 00:40:14,240

or 13 000 years that have been sued

1113

00:40:20,470 --> 00:40:16,880

since then there have been no forces or

1114

00:40:22,870 --> 00:40:20,480

no processes capable of really doing too

1115

00:40:24,630 --> 00:40:22,880

much more additional change

1116

00:40:26,710 --> 00:40:24,640

to these features right here you'll see

1117

00:40:28,630 --> 00:40:26,720

that at the present rates of erosion

1118

00:40:30,230 --> 00:40:28,640

that little bitty creek pouring over

1119

00:40:32,069 --> 00:40:30,240

there in this falls

1120

00:40:34,950 --> 00:40:32,079

is going to take hundreds of thousands

1121

00:40:36,790 --> 00:40:34,960

of millions of years of erosion slow

1122

00:40:39,349 --> 00:40:36,800

normal erosion

1123

00:40:42,390 --> 00:40:39,359

to eat away and ultimately you know

1124

00:40:45,030 --> 00:40:42,400

reduce that overhanging rock and uh

1125

00:40:47,589 --> 00:40:45,040

eliminate the cataract altogether

1126
00:40:48,630 --> 00:40:47,599
but it was created in a geological

1127
00:40:49,589 --> 00:40:48,640
instant

1128
00:40:52,150 --> 00:40:49,599
um

1129
00:40:55,030 --> 00:40:52,160
probably over a matter of several weeks

1130
00:40:56,069 --> 00:40:55,040
uh several what what several weeks

1131
00:40:58,309 --> 00:40:56,079
really

1132
00:41:00,309 --> 00:40:58,319
quickly yeah yeah that's my point when

1133
00:41:02,470 --> 00:41:00,319
you see look look at that look at that

1134
00:41:03,990 --> 00:41:02,480
rock there that that guy in the green

1135
00:41:06,150 --> 00:41:04,000
shirt is sitting on

1136
00:41:09,030 --> 00:41:06,160
these these boulders stacked up here are

1137
00:41:11,829 --> 00:41:09,040
the size of houses big houses

1138
00:41:12,630 --> 00:41:11,839

and they were plucked by the current

1139

00:41:15,829 --> 00:41:12,640

flow

1140

00:41:17,190 --> 00:41:15,839

eating it away one grain of sand at a

1141

00:41:20,550 --> 00:41:17,200

time this is a

1142

00:41:23,190 --> 00:41:20,560

an extremely powerful unimaginably

1143

00:41:25,109 --> 00:41:23,200

powerful swift deep current that is

1144

00:41:26,390 --> 00:41:25,119

sweeping over the land

1145

00:41:28,390 --> 00:41:26,400

essentially

1146

00:41:31,109 --> 00:41:28,400

focusing along any zone of weakness that

1147

00:41:33,589 --> 00:41:31,119

it can find or any pre-existing river

1148

00:41:36,550 --> 00:41:33,599

channel but then immensely over

1149

00:41:39,510 --> 00:41:36,560

deepening it immensely reshaping it and

1150

00:41:41,829 --> 00:41:39,520

re-eroding it and and and coring these

1151
00:41:44,150 --> 00:41:41,839
gigantic blocks of rock so when you see

1152
00:41:47,109 --> 00:41:44,160
these gigantic blocks of rock like this

1153
00:41:48,470 --> 00:41:47,119
in association with the cataract that's

1154
00:41:51,190 --> 00:41:48,480
like

1155
00:41:52,550 --> 00:41:51,200
the giveaway right there see you

1156
00:41:53,829 --> 00:41:52,560
and you have to put these things

1157
00:41:55,109 --> 00:41:53,839
together in order to get the whole

1158
00:41:56,230 --> 00:41:55,119
picture

1159
00:41:58,150 --> 00:41:56,240
so what i'm trying to get people to

1160
00:42:00,790 --> 00:41:58,160
understand is that we're literally

1161
00:42:02,950 --> 00:42:00,800
living in the wreckage of a former world

1162
00:42:05,510 --> 00:42:02,960
system that that was

1163
00:42:07,349 --> 00:42:05,520

essentially destroyed uh you know 12 or

1164

00:42:09,670 --> 00:42:07,359

13 000 years ago in the transition out

1165

00:42:12,390 --> 00:42:09,680

of the ice age and this is a factor

1166

00:42:15,109 --> 00:42:12,400

that's overlooked in a lot of models of

1167

00:42:18,390 --> 00:42:15,119

prehistory that there is this massive

1168

00:42:20,390 --> 00:42:18,400

event that terminated the pleistocene

1169

00:42:23,109 --> 00:42:20,400

epoch and led the way into the modern

1170

00:42:24,950 --> 00:42:23,119

holocene which was very very different

1171

00:42:27,670 --> 00:42:24,960

than the pleistocene

1172

00:42:29,670 --> 00:42:27,680

and um we've inherited the world that

1173

00:42:31,750 --> 00:42:29,680

came in the aftermath

1174

00:42:34,230 --> 00:42:31,760

of a global catastrophe

1175

00:42:36,470 --> 00:42:34,240

since we're talking about this this last

1176

00:42:37,589 --> 00:42:36,480

ice age there were some really

1177

00:42:39,750 --> 00:42:37,599

interesting

1178

00:42:42,069 --> 00:42:39,760

large animals

1179

00:42:43,030 --> 00:42:42,079

walking the earth in north america i

1180

00:42:45,510 --> 00:42:43,040

remember

1181

00:42:46,470 --> 00:42:45,520

the snow mass um i think it was like the

1182

00:42:49,109 --> 00:42:46,480

zege

1183

00:42:51,670 --> 00:42:49,119

reservoir fossil find when they found

1184

00:42:54,390 --> 00:42:51,680

all the mastodons and uh

1185

00:42:57,510 --> 00:42:54,400

mammoths giant sloths camels

1186

00:43:00,309 --> 00:42:57,520

um you know there's a the massive beaver

1187

00:43:02,069 --> 00:43:00,319

and all these really strange

1188

00:43:04,870 --> 00:43:02,079

uh animals

1189

00:43:06,870 --> 00:43:04,880

that all were basically wiped out

1190

00:43:08,550 --> 00:43:06,880

megafauna yeah and many of these

1191

00:43:10,069 --> 00:43:08,560

mastodons have been around for a million

1192

00:43:11,589 --> 00:43:10,079

years and then suddenly boom they

1193

00:43:13,270 --> 00:43:11,599

disappear

1194

00:43:15,589 --> 00:43:13,280

again within a geological eye blink

1195

00:43:17,349 --> 00:43:15,599

that's indistinguishable from these

1196

00:43:19,430 --> 00:43:17,359

transitory events that we're looking

1197

00:43:21,030 --> 00:43:19,440

at here and what's interesting is that

1198

00:43:22,470 --> 00:43:21,040

when you do begin to look at the fossil

1199

00:43:24,390 --> 00:43:22,480

remains

1200

00:43:27,589 --> 00:43:24,400

and the circumstances under which many

1201
00:43:29,589 --> 00:43:27,599
of these animals are found about 90 of

1202
00:43:32,230 --> 00:43:29,599
the fossil remains that you that are

1203
00:43:34,950 --> 00:43:32,240
being uncovered are in alluvial type

1204
00:43:36,309 --> 00:43:34,960
deposits which means like gravel pits

1205
00:43:38,069 --> 00:43:36,319
peat bogs

1206
00:43:38,870 --> 00:43:38,079
so when you have a massive flood like

1207
00:43:40,470 --> 00:43:38,880
this

1208
00:43:42,550 --> 00:43:40,480
initially what it'll do

1209
00:43:44,870 --> 00:43:42,560
it'll it'll begin to pluck this gigantic

1210
00:43:46,710 --> 00:43:44,880
material but as the force of the water

1211
00:43:49,349 --> 00:43:46,720
causes this material to roll and tumble

1212
00:43:51,670 --> 00:43:49,359
it begins to fracture

1213
00:43:53,910 --> 00:43:51,680

as the water moves over a steeper

1214

00:43:55,829 --> 00:43:53,920

gradient you know it moves faster when

1215

00:43:57,990 --> 00:43:55,839

it moves over a more shallow gradient it

1216

00:43:59,829 --> 00:43:58,000

moves slower the faster the water is

1217

00:44:02,069 --> 00:43:59,839

moving the more power it has to pick up

1218

00:44:04,390 --> 00:44:02,079

material to carry that material

1219

00:44:05,750 --> 00:44:04,400

when the water slows down either because

1220

00:44:07,510 --> 00:44:05,760

the gradient

1221

00:44:10,150 --> 00:44:07,520

is which has been

1222

00:44:12,950 --> 00:44:10,160

steep shallows out

1223

00:44:14,069 --> 00:44:12,960

or you have a wider channel that gets

1224

00:44:15,750 --> 00:44:14,079

narrow

1225

00:44:18,309 --> 00:44:15,760

whenever you have a constriction in the

1226

00:44:20,550 --> 00:44:18,319

channel the water has to accelerate

1227

00:44:21,750 --> 00:44:20,560

to move through that channel because

1228

00:44:24,150 --> 00:44:21,760

it's there's a

1229

00:44:25,990 --> 00:44:24,160

conservation of momentum principle here

1230

00:44:27,670 --> 00:44:26,000

um because no matter what the same

1231

00:44:29,510 --> 00:44:27,680

volume of water is going to be moving

1232

00:44:31,510 --> 00:44:29,520

through the constricted channel as

1233

00:44:33,030 --> 00:44:31,520

through the wide channel if it's a

1234

00:44:35,190 --> 00:44:33,040

uniform flow

1235

00:44:36,790 --> 00:44:35,200

but because of that in order to get the

1236

00:44:38,870 --> 00:44:36,800

same amount of water through it has to

1237

00:44:41,190 --> 00:44:38,880

be moving faster but when it moves

1238

00:44:42,630 --> 00:44:41,200

faster it starts eroding so if you're

1239

00:44:44,950 --> 00:44:42,640

going through a constricted channel

1240

00:44:46,390 --> 00:44:44,960

water speeds up it begins to erode eats

1241

00:44:48,550 --> 00:44:46,400

away the sides in the bottom of the

1242

00:44:50,630 --> 00:44:48,560

channel carries that material down if

1243

00:44:52,950 --> 00:44:50,640

the channel opens out into a basin the

1244

00:44:54,550 --> 00:44:52,960

water slows down or if the water goes

1245

00:44:56,470 --> 00:44:54,560

from a steeper gradient to a shallower

1246

00:44:58,230 --> 00:44:56,480

gradient it slows down what do you think

1247

00:45:00,470 --> 00:44:58,240

happens once the water starts slowing

1248

00:45:02,390 --> 00:45:00,480

down it loses its competency to

1249

00:45:05,109 --> 00:45:02,400

transport material so it begins to

1250

00:45:07,510 --> 00:45:05,119

deposit that material it always deposits

1251

00:45:09,670 --> 00:45:07,520

the biggest material first and then as

1252

00:45:12,550 --> 00:45:09,680

the water continues to slow down the

1253

00:45:15,510 --> 00:45:12,560

size the grain size can go from from

1254

00:45:18,630 --> 00:45:15,520

boulders huge boulders to to cobbles to

1255

00:45:20,309 --> 00:45:18,640

pebbles to gravel to sand to silt

1256

00:45:22,150 --> 00:45:20,319

essential eventually

1257

00:45:24,390 --> 00:45:22,160

and at the termination of a flow where

1258

00:45:27,270 --> 00:45:24,400

the water might be stealing say in a

1259

00:45:29,589 --> 00:45:27,280

back flood basin you will get fine silty

1260

00:45:32,069 --> 00:45:29,599

sediments layered

1261

00:45:34,870 --> 00:45:32,079

but you can follow this whole sequence

1262

00:45:36,950 --> 00:45:34,880

and this will be what is called a paleo

1263

00:45:38,710 --> 00:45:36,960

current indicator it'll tell you you

1264

00:45:40,309 --> 00:45:38,720

could tell which way the water was

1265

00:45:42,470 --> 00:45:40,319

flowing by

1266

00:45:44,230 --> 00:45:42,480

looking at an outcrop and if you notice

1267

00:45:46,309 --> 00:45:44,240

oh look here on the north side are big

1268

00:45:48,230 --> 00:45:46,319

boulders and as you move you know

1269

00:45:49,910 --> 00:45:48,240

successively towards the south the

1270

00:45:51,910 --> 00:45:49,920

material gets smaller and smaller and

1271

00:45:54,550 --> 00:45:51,920

then finally two or three miles to the

1272

00:45:55,510 --> 00:45:54,560

south it grades out into fine sand and

1273

00:45:57,030 --> 00:45:55,520

silt

1274

00:45:59,270 --> 00:45:57,040

you know that that's the direction that

1275

00:46:01,589 --> 00:45:59,280

the water was moving as it was slowing

1276

00:46:03,670 --> 00:46:01,599

down and begin to to to deposit the

1277

00:46:05,109 --> 00:46:03,680

material it's load of sediment that it's

1278

00:46:05,990 --> 00:46:05,119

carrying

1279

00:46:07,270 --> 00:46:06,000

so

1280

00:46:08,950 --> 00:46:07,280

all of these things are the kind of

1281

00:46:11,109 --> 00:46:08,960

things you would look at in the field in

1282

00:46:12,710 --> 00:46:11,119

order to try to reconstruct

1283

00:46:14,790 --> 00:46:12,720

the events another thing that you would

1284

00:46:16,630 --> 00:46:14,800

look at is called imprecation so if if

1285

00:46:17,589 --> 00:46:16,640

rocks are being carried along in the

1286

00:46:21,750 --> 00:46:17,599

stream

1287

00:46:23,510 --> 00:46:21,760

those rocks what it does is it tends to

1288

00:46:26,870 --> 00:46:23,520

stack those rocks almost if you could

1289

00:46:28,470 --> 00:46:26,880

picture that you have a series of books

1290

00:46:30,630 --> 00:46:28,480

on a shelf right and they're standing

1291

00:46:33,190 --> 00:46:30,640

upright and then i push on it from this

1292

00:46:34,950 --> 00:46:33,200

direction and then the books tilt over

1293

00:46:36,950 --> 00:46:34,960

you see

1294

00:46:39,030 --> 00:46:36,960

they become imprecated so they kind of

1295

00:46:40,470 --> 00:46:39,040

become stacked and you can see many

1296

00:46:42,710 --> 00:46:40,480

examples of that

1297

00:46:44,150 --> 00:46:42,720

in the geological realm even on a small

1298

00:46:45,270 --> 00:46:44,160

scale

1299

00:46:47,109 --> 00:46:45,280

well these are the kind of things you

1300

00:46:49,270 --> 00:46:47,119

can look for because these are going to

1301
00:46:50,790 --> 00:46:49,280
tell you where did this flow come from

1302
00:46:52,950 --> 00:46:50,800
where was it going

1303
00:46:54,630 --> 00:46:52,960
in order to try to reconstruct now i

1304
00:46:56,630 --> 00:46:54,640
guess to come full circle what i'm

1305
00:46:59,109 --> 00:46:56,640
saying here is that when you begin to

1306
00:47:01,270 --> 00:46:59,119
look at the remains the fossil remains

1307
00:47:03,109 --> 00:47:01,280
of the extinct animals to get back to

1308
00:47:04,150 --> 00:47:03,119
that and that's what i'm going back to

1309
00:47:05,750 --> 00:47:04,160
is that

1310
00:47:08,950 --> 00:47:05,760
most of the time they're going to be

1311
00:47:11,589 --> 00:47:08,960
found in alluvial deposits meaning

1312
00:47:13,510 --> 00:47:11,599
they're found in deposits that were laid

1313
00:47:16,069 --> 00:47:13,520

down by flowing water

1314

00:47:17,589 --> 00:47:16,079

oftentimes they're in peat bogs where if

1315

00:47:19,270 --> 00:47:17,599

you have a back flood place where you

1316

00:47:23,190 --> 00:47:19,280

might have a basin with no particular

1317

00:47:25,430 --> 00:47:23,200

outlet and you have a a in rush of water

1318

00:47:27,109 --> 00:47:25,440

carrying sediment and whatever might be

1319

00:47:28,630 --> 00:47:27,119

floating in it and then the water

1320

00:47:30,470 --> 00:47:28,640

settles in there

1321

00:47:32,309 --> 00:47:30,480

and it's sediment laden eventually the

1322

00:47:34,550 --> 00:47:32,319

water settles down

1323

00:47:36,790 --> 00:47:34,560

but what you have in the aftermath is a

1324

00:47:38,630 --> 00:47:36,800

bog you know a low spot as kind of a

1325

00:47:41,109 --> 00:47:38,640

swampy peat bog

1326
00:47:42,870 --> 00:47:41,119
lots of these uh extinct megaphone have

1327
00:47:45,030 --> 00:47:42,880
been found in peat bogs

1328
00:47:46,630 --> 00:47:45,040
the the majority of them actually found

1329
00:47:49,829 --> 00:47:46,640
in gravel pins

1330
00:47:52,230 --> 00:47:49,839
when they're excavating for maybe uh uh

1331
00:47:55,109 --> 00:47:52,240
you know borrow pitch for for a railway

1332
00:47:57,270 --> 00:47:55,119
or excavating for a highway or just a

1333
00:48:00,150 --> 00:47:57,280
gravel quarry they're digging in there

1334
00:48:02,790 --> 00:48:00,160
and what do they find they find you know

1335
00:48:06,390 --> 00:48:02,800
the remains of an extinct mammoth or a

1336
00:48:08,550 --> 00:48:06,400
mastodon or they're found extruding from

1337
00:48:10,550 --> 00:48:08,560
the terraces along river valleys like

1338
00:48:13,109 --> 00:48:10,560

the famous big bone lick

1339

00:48:15,349 --> 00:48:13,119

in kentucky on the kentucky ohio border

1340

00:48:17,030 --> 00:48:15,359

is right along was on a tributary to the

1341

00:48:20,390 --> 00:48:17,040

ohio river

1342

00:48:23,270 --> 00:48:20,400

and there they uh in the late 1700s

1343

00:48:26,309 --> 00:48:23,280

um explorers came across this

1344

00:48:29,990 --> 00:48:26,319

valley along this river there and in the

1345

00:48:32,950 --> 00:48:30,000

terraces of this river were huge bones

1346

00:48:35,030 --> 00:48:32,960

sticking up rib cages and

1347

00:48:37,750 --> 00:48:35,040

you know skulls and all kinds of the

1348

00:48:39,510 --> 00:48:37,760

bones left over from a herd of mastodons

1349

00:48:40,710 --> 00:48:39,520

that apparently had been caught in a

1350

00:48:42,790 --> 00:48:40,720

flood

1351
00:48:45,030 --> 00:48:42,800
swept down drowned and then

1352
00:48:47,510 --> 00:48:45,040
as the material deposited it now forms

1353
00:48:50,390 --> 00:48:47,520
the flood plain of the modern river

1354
00:48:52,549 --> 00:48:50,400
but then what happens is the the modern

1355
00:48:55,270 --> 00:48:52,559
floodplain is entombing all of these

1356
00:48:57,829 --> 00:48:55,280
fossilized remains so if you have a

1357
00:49:01,030 --> 00:48:57,839
modern flood let's say like a 50-year

1358
00:49:02,870 --> 00:49:01,040
flood 100 year flood that comes along

1359
00:49:05,430 --> 00:49:02,880
causes some major erosion within the

1360
00:49:07,510 --> 00:49:05,440
modern valley might expose

1361
00:49:09,190 --> 00:49:07,520
things that had otherwise been buried

1362
00:49:11,510 --> 00:49:09,200
right that's kind of what happened with

1363
00:49:12,950 --> 00:49:11,520

the famous uh barosov commandments up in

1364

00:49:14,549 --> 00:49:12,960

1901

1365

00:49:16,630 --> 00:49:14,559

with the ending of the little ice age

1366

00:49:18,710 --> 00:49:16,640

there was a general thawing that began

1367

00:49:21,430 --> 00:49:18,720

up in siberia

1368

00:49:24,390 --> 00:49:21,440

a bank collapsed and exposed the skull

1369

00:49:27,109 --> 00:49:24,400

of this uh six-ton woolly mammoth that

1370

00:49:29,750 --> 00:49:27,119

had been entombed into permafrost and

1371

00:49:32,549 --> 00:49:29,760

this very interesting story but

1372

00:49:34,950 --> 00:49:32,559

the the study of an animal

1373

00:49:37,109 --> 00:49:34,960

when it from the time that it dies

1374

00:49:40,150 --> 00:49:37,119

until the time that it becomes preserved

1375

00:49:43,589 --> 00:49:40,160

as a fossil those processes which can be

1376

00:49:46,549 --> 00:49:43,599

variable are referred to as taphonomy

1377

00:49:48,950 --> 00:49:46,559

and the taphonomic circumstances under

1378

00:49:51,589 --> 00:49:48,960

which these fossils are found are an

1379

00:49:53,510 --> 00:49:51,599

indicator of how they died

1380

00:49:54,390 --> 00:49:53,520

and how they came to be preserved

1381

00:49:57,270 --> 00:49:54,400

because

1382

00:50:00,150 --> 00:49:57,280

under normal gradualistic scenarios

1383

00:50:02,390 --> 00:50:00,160

animals that die out in the landscape

1384

00:50:04,630 --> 00:50:02,400

are not preserved as fossils

1385

00:50:07,430 --> 00:50:04,640

for example here's yeah here's two good

1386

00:50:11,430 --> 00:50:09,670

think about the bison the american bison

1387

00:50:13,109 --> 00:50:11,440

which roamed north america by the

1388

00:50:15,349 --> 00:50:13,119

millions with the arrival of the

1389

00:50:17,109 --> 00:50:15,359

europeans and were decimated down to

1390

00:50:19,349 --> 00:50:17,119

only a few hundred individuals at the

1391

00:50:20,870 --> 00:50:19,359

turn of the century it's like 40 million

1392

00:50:22,870 --> 00:50:20,880

of them at one time

1393

00:50:24,470 --> 00:50:22,880

yeah it was a huge number i i don't know

1394

00:50:27,510 --> 00:50:24,480

the exact number but

1395

00:50:29,430 --> 00:50:27,520

um it was a huge number um

1396

00:50:36,309 --> 00:50:29,440

and

1397

00:50:38,710 --> 00:50:36,319

laying on the prairie right

1398

00:50:41,030 --> 00:50:38,720

how many of those became fossils that we

1399

00:50:43,670 --> 00:50:41,040

now find and dig up from you know the

1400

00:50:46,150 --> 00:50:43,680

bison slaughter of the 19th century none

1401

00:50:48,390 --> 00:50:46,160

because under gradualistic scenarios

1402

00:50:51,510 --> 00:50:48,400

what happens is those remains are

1403

00:50:53,190 --> 00:50:51,520

recycled and consumed by scavengers

1404

00:50:56,710 --> 00:50:53,200

and and

1405

00:51:00,069 --> 00:50:58,390

literally within a matter of years even

1406

00:51:02,870 --> 00:51:00,079

in fact when when some of those first

1407

00:51:05,349 --> 00:51:02,880

droughts were hitting central uh africa

1408

00:51:07,349 --> 00:51:05,359

in the 80s you had a an enormous

1409

00:51:09,910 --> 00:51:07,359

elephant mortality several million

1410

00:51:13,589 --> 00:51:09,920

elephants perished during those droughts

1411

00:51:15,270 --> 00:51:13,599

and you would have huge uh numbers of

1412

00:51:17,349 --> 00:51:15,280

elephants that died at some of these

1413

00:51:20,309 --> 00:51:17,359

dwindling water holes

1414

00:51:23,589 --> 00:51:20,319

there have been studies done on the the

1415

00:51:26,390 --> 00:51:23,599

postmortem taphonomic circumstances

1416

00:51:28,230 --> 00:51:26,400

of these elephants that died

1417

00:51:30,710 --> 00:51:28,240

and what they discovered was is they

1418

00:51:32,870 --> 00:51:30,720

would go back to document the first year

1419

00:51:35,750 --> 00:51:32,880

there's this there's an entire intact

1420

00:51:37,829 --> 00:51:35,760

elephant skeleton there right five years

1421

00:51:39,430 --> 00:51:37,839

later they can't find anything there's

1422

00:51:41,910 --> 00:51:39,440

just if there's anything at all it's

1423

00:51:44,390 --> 00:51:41,920

just it's traces a decade later there's

1424

00:51:45,910 --> 00:51:44,400

nothing there it has not become part of

1425

00:51:47,750 --> 00:51:45,920

the fossil record

1426

00:51:50,630 --> 00:51:47,760

how does it become part of the fossil

1427

00:51:52,630 --> 00:51:50,640

record is that it has to be removed from

1428

00:51:55,109 --> 00:51:52,640

processes that would cause oxidation it

1429

00:51:57,109 --> 00:51:55,119

has to be removed from from a process

1430

00:52:00,790 --> 00:51:57,119

that was would cause um

1431

00:52:02,549 --> 00:52:00,800

you know consumption by microorganisms

1432

00:52:04,470 --> 00:52:02,559

and in order to do that it has to be

1433

00:52:05,829 --> 00:52:04,480

buried rapidly

1434

00:52:08,470 --> 00:52:05,839

and what's the most effective way of

1435

00:52:10,630 --> 00:52:08,480

bearing things rapidly well

1436

00:52:12,069 --> 00:52:10,640

getting caught on a flood would be one

1437

00:52:14,069 --> 00:52:12,079

um you know getting caught in a

1438

00:52:16,710 --> 00:52:14,079

pyroclastic flow from a volcanic

1439

00:52:19,109 --> 00:52:16,720

eruption that would be another one um

1440

00:52:21,990 --> 00:52:19,119

but whatever the case it it has to be a

1441

00:52:24,230 --> 00:52:22,000

circumstance of rapid burial and clearly

1442

00:52:27,030 --> 00:52:24,240

like the barossa commandment from uh

1443

00:52:28,549 --> 00:52:27,040

siberia was was a rapid burial and and

1444

00:52:32,230 --> 00:52:28,559

that

1445

00:52:33,430 --> 00:52:32,240

conditions under which the fossil was

1446

00:52:38,790 --> 00:52:33,440

found

1447

00:52:42,309 --> 00:52:38,800

of like flowers in the stomach yes

1448

00:52:45,349 --> 00:52:42,319

that's amazing right 20 species of of

1449

00:52:47,910 --> 00:52:45,359

plants edges and and flowering plants

1450

00:52:50,710 --> 00:52:47,920

suggesting it was probably fall time

1451

00:52:53,190 --> 00:52:50,720

when the mammoth perished

1452

00:52:55,589 --> 00:52:53,200

there was still food in its mouth that

1453

00:52:57,910 --> 00:52:55,599

it was chewing right right all of its

1454

00:52:59,510 --> 00:52:57,920

hip bones were broken

1455

00:53:01,190 --> 00:52:59,520

because it was sitting on his haunches

1456

00:53:04,230 --> 00:53:01,200

and really one of the pictures i sent

1457

00:53:07,670 --> 00:53:04,240

you was the recreation of that

1458

00:53:09,349 --> 00:53:07,680

mammoth in the saint petersburg museum

1459

00:53:10,549 --> 00:53:09,359

we could pull that out let's see if i

1460

00:53:12,870 --> 00:53:10,559

can find it i don't remember that i'll

1461

00:53:14,790 --> 00:53:12,880

take a look very first one 4c the

1462

00:53:17,510 --> 00:53:14,800

barosovka

1463

00:53:21,829 --> 00:53:17,520

flash frozen mammoth

1464

00:53:25,670 --> 00:53:23,589

the very first i think we may have

1465

00:53:27,430 --> 00:53:25,680

gotten a couple different folders

1466

00:53:28,630 --> 00:53:27,440

um because i'm not i'm not seeing that

1467

00:53:30,950 --> 00:53:28,640

one either

1468

00:53:32,950 --> 00:53:30,960

really okay yeah

1469

00:53:36,870 --> 00:53:32,960

um

1470

00:53:38,710 --> 00:53:36,880

images for everything

1471

00:53:40,390 --> 00:53:38,720

no i don't have that

1472

00:53:42,950 --> 00:53:40,400

what is the first folder you've got

1473

00:53:45,510 --> 00:53:42,960

martin i mean the first image you've got

1474

00:53:48,230 --> 00:53:45,520

yeah that was the 10 22.

1475

00:53:49,829 --> 00:53:48,240

oh so yeah there was

1476
00:53:52,069 --> 00:53:49,839
yeah there was about two dozen that

1477
00:53:55,109 --> 00:53:52,079
preceded that it wasn't possible that

1478
00:53:57,910 --> 00:53:55,119
it's possible only one folder

1479
00:53:59,109 --> 00:53:57,920
download it but uh anyway

1480
00:54:01,349 --> 00:53:59,119
yeah well there's plenty of other

1481
00:54:03,270 --> 00:54:01,359
interesting stuff with what you've got i

1482
00:54:05,190 --> 00:54:03,280
mean we could go on to um

1483
00:54:08,069 --> 00:54:05,200
figure 10 28.

1484
00:54:09,750 --> 00:54:08,079
yeah well before we do um

1485
00:54:13,750 --> 00:54:09,760
i kind of like this the subject we're on

1486
00:54:14,950 --> 00:54:13,760
a little bit is is interesting the um

1487
00:54:16,390 --> 00:54:14,960
because you never think i mean when you

1488
00:54:18,630 --> 00:54:16,400

hear that there were these strange

1489

00:54:21,670 --> 00:54:18,640

creatures on you know roaming in north

1490

00:54:23,270 --> 00:54:21,680

america um that

1491

00:54:24,390 --> 00:54:23,280

i think was called a camelop or

1492

00:54:26,870 --> 00:54:24,400

something like that it wasn't really a

1493

00:54:28,470 --> 00:54:26,880

camel but it was something like a camel

1494

00:54:29,910 --> 00:54:28,480

there's the dire wolf

1495

00:54:31,910 --> 00:54:29,920

direwolf

1496

00:54:34,390 --> 00:54:31,920

and then there's a short-faced

1497

00:54:36,790 --> 00:54:34,400

bear is that what that was called

1498

00:54:38,549 --> 00:54:36,800

the giant short-faced bear

1499

00:54:40,630 --> 00:54:38,559

yeah he stood six feet tall with his

1500

00:54:43,109 --> 00:54:40,640

shoulder was considered to be probably

1501
00:54:45,589 --> 00:54:43,119
the most uh formidable predator of the

1502
00:54:47,270 --> 00:54:45,599
ice age

1503
00:54:49,190 --> 00:54:47,280
and so do you think

1504
00:54:51,430 --> 00:54:49,200
at the time do you think that it's

1505
00:54:52,630 --> 00:54:51,440
possible in like let's just say north

1506
00:54:53,910 --> 00:54:52,640
america that

1507
00:54:55,430 --> 00:54:53,920
there were

1508
00:54:57,829 --> 00:54:55,440
people encountering these you know i

1509
00:54:59,270 --> 00:54:57,839
mean there's a lot of controversy when

1510
00:55:01,430 --> 00:54:59,280
you know where there was people across

1511
00:55:03,190 --> 00:55:01,440
north america you hear uh you know

1512
00:55:04,790 --> 00:55:03,200
possibly a lot more ancient than

1513
00:55:07,990 --> 00:55:04,800

mainstream science

1514

00:55:09,510 --> 00:55:08,000

science uh suggests that there were

1515

00:55:12,230 --> 00:55:09,520

um do you think that people weren't

1516

00:55:14,150 --> 00:55:12,240

counting the encountering these

1517

00:55:17,109 --> 00:55:14,160

oh absolutely they were we know they

1518

00:55:19,589 --> 00:55:17,119

were because you know um

1519

00:55:21,990 --> 00:55:19,599

we found there's been apogeas uh from

1520

00:55:23,270 --> 00:55:22,000

from ancient native americans that

1521

00:55:25,750 --> 00:55:23,280

appear to be

1522

00:55:27,829 --> 00:55:25,760

carvings of mastodons uh we know they

1523

00:55:30,309 --> 00:55:27,839

were hunting oh that's right yeah

1524

00:55:31,670 --> 00:55:30,319

because we found uh clovis spear points

1525

00:55:33,589 --> 00:55:31,680

embedded in

1526

00:55:35,750 --> 00:55:33,599

mammoth rib cages

1527

00:55:38,230 --> 00:55:35,760

um yeah there we were definitely

1528

00:55:40,069 --> 00:55:38,240

coexistence between i mean the clovis

1529

00:55:41,589 --> 00:55:40,079

culture which was the the culture that

1530

00:55:44,069 --> 00:55:41,599

was here in north america right at the

1531

00:55:46,630 --> 00:55:44,079

very end of the last ice age disappeared

1532

00:55:49,349 --> 00:55:46,640

right along with the megaphone

1533

00:55:51,430 --> 00:55:49,359

and uh but there's a lot of evidence now

1534

00:55:54,870 --> 00:55:51,440

to suggest that people were here much

1535

00:55:56,710 --> 00:55:54,880

much longer than that and it probably i

1536

00:55:58,870 --> 00:55:56,720

mean there's there's a there's a

1537

00:56:01,589 --> 00:55:58,880

paleontological site

1538

00:56:04,390 --> 00:56:01,599

i'm sorry an archaeological site in

1539

00:56:06,069 --> 00:56:04,400

south carolina that has uh

1540

00:56:09,190 --> 00:56:06,079

dating that they've dated back it might

1541

00:56:11,349 --> 00:56:09,200

be as old as 50 000 years and i have not

1542

00:56:13,510 --> 00:56:11,359

yet had a chance to really go into the

1543

00:56:15,589 --> 00:56:13,520

details of that so i'm not

1544

00:56:17,349 --> 00:56:15,599

gonna affirm it a hundred percent yet

1545

00:56:18,789 --> 00:56:17,359

but it certainly does seem plausible and

1546

00:56:20,390 --> 00:56:18,799

what i've initially looked at it it

1547

00:56:22,309 --> 00:56:20,400

certainly does seem like

1548

00:56:24,230 --> 00:56:22,319

uh there's a strong case for the fact

1549

00:56:25,910 --> 00:56:24,240

that there were people here tens of

1550

00:56:27,910 --> 00:56:25,920

thousands of years ago which of course

1551

00:56:30,309 --> 00:56:27,920

then means that

1552

00:56:33,990 --> 00:56:30,319

our ancestors were coexisting with the

1553

00:56:38,150 --> 00:56:36,870

um and then probably experienced a major

1554

00:56:40,870 --> 00:56:38,160

population

1555

00:56:43,190 --> 00:56:40,880

bottleneck or disruption

1556

00:56:45,190 --> 00:56:43,200

at the same time that so many of these

1557

00:56:47,510 --> 00:56:45,200

megafauna went extinct there was

1558

00:56:49,190 --> 00:56:47,520

in north america there were 35

1559

00:56:52,230 --> 00:56:49,200

genera or north south america there were

1560

00:56:53,670 --> 00:56:52,240

35 genera that went extinct and

1561

00:56:56,870 --> 00:56:53,680

depending on how you divide up the

1562

00:56:58,390 --> 00:56:56,880

species at least 100 maybe up to 120

1563

00:57:00,549 --> 00:56:58,400

some species

1564

00:57:03,750 --> 00:57:00,559

that went extinct all within a very

1565

00:57:08,230 --> 00:57:05,589

which would have coincided interestingly

1566

00:57:10,069 --> 00:57:08,240

exactly with the major episodes of

1567

00:57:12,470 --> 00:57:10,079

flooding and the major episodes of

1568

00:57:14,230 --> 00:57:12,480

climate change that that

1569

00:57:17,109 --> 00:57:14,240

brought the planet lurching out of the

1570

00:57:18,870 --> 00:57:17,119

depths of the ice age between 11 and 13

1571

00:57:20,630 --> 00:57:18,880

000 years ago

1572

00:57:24,069 --> 00:57:20,640

now i know there's a there's different

1573

00:57:26,630 --> 00:57:24,079

theories on how ice ages start

1574

00:57:28,470 --> 00:57:26,640

one is the wobble i've heard that

1575

00:57:31,030 --> 00:57:28,480

um but there's

1576

00:57:33,190 --> 00:57:31,040

there's no real hard science in how

1577

00:57:35,829 --> 00:57:33,200

ice ages start and we've had a number of

1578

00:57:37,990 --> 00:57:35,839

them i i don't know exactly how many but

1579

00:57:40,950 --> 00:57:38,000

a number of them over the

1580

00:57:44,390 --> 00:57:40,960

you know the life of the planet um

1581

00:57:46,549 --> 00:57:44,400

but you know the interesting part is how

1582

00:57:50,069 --> 00:57:46,559

again you know i come back to

1583

00:57:52,150 --> 00:57:50,079

how this all melted to cause all this um

1584

00:57:54,390 --> 00:57:52,160

these earth changes

1585

00:57:55,030 --> 00:57:54,400

that uh that you point out the potholes

1586

00:57:57,829 --> 00:57:55,040

and

1587

00:57:59,430 --> 00:57:57,839

you know because that water is so

1588

00:58:01,349 --> 00:57:59,440

powerful we saw that

1589

00:58:03,349 --> 00:58:01,359

examples of that and

1590

00:58:05,190 --> 00:58:03,359

just watching the videos of the tsunamis

1591

00:58:07,190 --> 00:58:05,200

you know and what that could do

1592

00:58:09,510 --> 00:58:07,200

and and you know that's just minor

1593

00:58:12,150 --> 00:58:09,520

compared to what you're talking about

1594

00:58:14,150 --> 00:58:12,160

yeah those those tsunamis were

1595

00:58:16,069 --> 00:58:14,160

in some cases they were up to 30 to 50

1596

00:58:18,470 --> 00:58:16,079

feet but in most cases they

1597

00:58:22,309 --> 00:58:18,480

were up 20 to 25 feet

1598

00:58:24,069 --> 00:58:22,319

uh in height when they made landfall

1599

00:58:25,430 --> 00:58:24,079

you know you look yeah anybody who's

1600

00:58:27,829 --> 00:58:25,440

watching this who wants to get a better

1601
00:58:29,910 --> 00:58:27,839
idea just youtube those those tsunamis

1602
00:58:32,230 --> 00:58:29,920
and watch some of those clips and you'll

1603
00:58:34,470 --> 00:58:32,240
get a sense of the power of

1604
00:58:37,430 --> 00:58:34,480
20 or 30 foot deep

1605
00:58:39,109 --> 00:58:37,440
water moving and then

1606
00:58:41,270 --> 00:58:39,119
in case that we're looking at here in

1607
00:58:43,270 --> 00:58:41,280
some of these cases we're talking about

1608
00:58:46,710 --> 00:58:43,280
if you go to uh

1609
00:58:48,630 --> 00:58:46,720
let's see if you go to image 1037 which

1610
00:58:51,109 --> 00:58:48,640
you should have

1611
00:58:52,870 --> 00:58:51,119
okay i'll pull that up go ahead

1612
00:58:54,549 --> 00:58:52,880
1037 yeah

1613
00:58:56,230 --> 00:58:54,559

okay what you see there is a giant

1614

00:58:56,950 --> 00:58:56,240

current ripple field

1615

00:58:59,910 --> 00:58:56,960

yeah

1616

00:59:02,829 --> 00:58:59,920

if you go back one to 10 36 you'll see a

1617

00:59:04,710 --> 00:59:02,839

modern example for comparison

1618

00:59:09,109 --> 00:59:04,720

okay

1619

00:59:13,190 --> 00:59:09,119

took this picture in the aftermath of

1620

00:59:15,349 --> 00:59:13,200

hurricane ivan back in 2003

1621

00:59:17,829 --> 00:59:15,359

and what you see here is that this was

1622

00:59:19,829 --> 00:59:17,839

the flood plain of the modern creek

1623

00:59:22,230 --> 00:59:19,839

which had not been submerged for at

1624

00:59:24,390 --> 00:59:22,240

least 50 years and when hurricane ivan

1625

00:59:28,309 --> 00:59:24,400

came through the water rose up out of

1626

00:59:30,630 --> 00:59:28,319

the creek bed and spread out over the

1627

00:59:32,950 --> 00:59:30,640

the uh flood plain which is now mostly

1628

00:59:34,549 --> 00:59:32,960

ball fields but in this particular area

1629

00:59:36,390 --> 00:59:34,559

you can see the rippled sand that it

1630

00:59:38,870 --> 00:59:36,400

left behind now anybody who's walked on

1631

00:59:40,710 --> 00:59:38,880

the beach or walk along a river or a

1632

00:59:43,030 --> 00:59:40,720

creek and walk on a sandbar is going to

1633

00:59:44,230 --> 00:59:43,040

see something similar to this

1634

00:59:46,950 --> 00:59:44,240

the water

1635

00:59:48,390 --> 00:59:46,960

that that deposited this sand was right

1636

00:59:50,309 --> 00:59:48,400

at two feet deep

1637

00:59:52,390 --> 00:59:50,319

uh easy to tell because we could see the

1638

00:59:54,470 --> 00:59:52,400

high water line on trees and on

1639

00:59:57,829 --> 00:59:54,480

buildings and so forth that were very

1640

00:59:59,990 --> 00:59:57,839

close to this spot right here so we'd be

1641

01:00:01,589 --> 01:00:00,000

able to look at this and i've got a

1642

01:00:02,789 --> 01:00:01,599

measuring tape spread out there's as you

1643

01:00:04,789 --> 01:00:02,799

can see that the

1644

01:00:07,109 --> 01:00:04,799

the wavelength of these ripples is

1645

01:00:09,829 --> 01:00:07,119

varies between two and four inches and

1646

01:00:11,750 --> 01:00:09,839

the amplitude varies between a half inch

1647

01:00:14,470 --> 01:00:11,760

and an inch roughly

1648

01:00:18,230 --> 01:00:14,480

and you get this elegant rippled path

1649

01:00:19,349 --> 01:00:18,240

now martin go to the next slide

1650

01:00:20,630 --> 01:00:19,359

and

1651

01:00:23,030 --> 01:00:20,640

you will see

1652

01:00:24,470 --> 01:00:23,040

an example of

1653

01:00:27,430 --> 01:00:24,480

current ripples

1654

01:00:29,990 --> 01:00:27,440

on an altogether different scale

1655

01:00:32,150 --> 01:00:30,000

and that was 10 37

1656

01:00:34,069 --> 01:00:32,160

that would be

1657

01:00:36,230 --> 01:00:34,079

10 37 yes

1658

01:00:37,030 --> 01:00:36,240

all right i'll get to that

1659

01:00:45,829 --> 01:00:37,040

there

1660

01:00:48,150 --> 01:00:45,839

the same phenomena

1661

01:00:49,670 --> 01:00:48,160

beautiful beautiful example of scale and

1662

01:00:50,950 --> 01:00:49,680

variance that i was talking about

1663

01:00:54,470 --> 01:00:50,960

earlier

1664

01:00:55,510 --> 01:00:54,480

see the the the small scale that we just

1665

01:00:57,030 --> 01:00:55,520

saw

1666

01:00:57,910 --> 01:00:57,040

now we're looking at a current ripple

1667

01:00:59,990 --> 01:00:57,920

field

1668

01:01:01,109 --> 01:01:00,000

that's 10 miles long and the largest

1669

01:01:03,349 --> 01:01:01,119

ripples

1670

01:01:06,789 --> 01:01:03,359

have an amplitude of 30 to 50 feet and a

1671

01:01:08,390 --> 01:01:06,799

wavelength of between two and 500 feet

1672

01:01:11,190 --> 01:01:08,400

and for scale you can see there's

1673

01:01:12,870 --> 01:01:11,200

actually a highway going down there

1674

01:01:15,270 --> 01:01:12,880

there are clumps of trees right down at

1675

01:01:17,670 --> 01:01:15,280

the lower left is a farm with a with a

1676

01:01:19,750 --> 01:01:17,680

farm building

1677

01:01:21,430 --> 01:01:19,760

if you go um

1678

01:01:24,789 --> 01:01:21,440

and we're standing actually in the

1679

01:01:26,390 --> 01:01:24,799

troughs between some of those largest of

1680

01:01:28,150 --> 01:01:26,400

the ripples

1681

01:01:29,750 --> 01:01:28,160

you wouldn't be able to see over

1682

01:01:31,349 --> 01:01:29,760

you could have a two-story even a

1683

01:01:33,030 --> 01:01:31,359

three-story house

1684

01:01:35,670 --> 01:01:33,040

where you could be standing on the roof

1685

01:01:37,910 --> 01:01:35,680

and not be able to see over the top

1686

01:01:40,630 --> 01:01:37,920

of the adjacent ripple that's how big

1687

01:01:42,390 --> 01:01:40,640

this thing is the water the river that

1688

01:01:45,430 --> 01:01:42,400

flowed through here

1689

01:01:47,510 --> 01:01:45,440

that left this now now picture this

1690

01:01:49,589 --> 01:01:47,520

we're just talking about the tsunami

1691

01:01:52,069 --> 01:01:49,599

right we're talking about those japanese

1692

01:01:54,150 --> 01:01:52,079

tsunamis and the indonesian tsunamis

1693

01:01:56,789 --> 01:01:54,160

which typically made landfall

1694

01:01:58,470 --> 01:01:56,799

at a depth of 20 to 30 feet

1695

01:02:00,230 --> 01:01:58,480

okay we were talking about the small

1696

01:02:02,549 --> 01:02:00,240

scale ripples in the previous slide that

1697

01:02:05,109 --> 01:02:02,559

were deposited by a water flow that was

1698

01:02:08,549 --> 01:02:05,119

two feet deep and that water flow was a

1699

01:02:10,549 --> 01:02:08,559

result of a 100 year which was

1700

01:02:13,030 --> 01:02:10,559

considered at the time a hundred year

1701
01:02:14,470 --> 01:02:13,040
flood in that particular creek

1702
01:02:16,230 --> 01:02:14,480
right

1703
01:02:19,750 --> 01:02:16,240
what we're looking at here

1704
01:02:23,670 --> 01:02:19,760
is a river a temporary swiftly turbulent

1705
01:02:25,270 --> 01:02:23,680
flowing river probably flowing 40 to 50

1706
01:02:28,069 --> 01:02:25,280
miles an hour

1707
01:02:29,910 --> 01:02:28,079
it's 10 miles wide and 1

1708
01:02:31,430 --> 01:02:29,920
400 feet deep

1709
01:02:34,309 --> 01:02:31,440
wow

1710
01:02:37,030 --> 01:02:34,319
now the best way to describe that is in

1711
01:02:39,270 --> 01:02:37,040
effect if you were standing on this spot

1712
01:02:42,309 --> 01:02:39,280
this is not a flood that came on like a

1713
01:02:45,750 --> 01:02:42,319

gradual rising of a typical river flood

1714

01:02:47,510 --> 01:02:45,760

this flood came on as a tsunami

1715

01:02:49,190 --> 01:02:47,520

but you have to picture

1716

01:02:51,990 --> 01:02:49,200

what does a tsunami that's over a

1717

01:02:54,230 --> 01:02:52,000

thousand feet deep do to the landscape

1718

01:02:56,470 --> 01:02:54,240

what does it leave in the aftermath what

1719

01:02:58,150 --> 01:02:56,480

is going to happen to a forest

1720

01:03:01,190 --> 01:02:58,160

it's it that's in its path what's going

1721

01:03:03,670 --> 01:03:01,200

to happen to a village or a town what's

1722

01:03:05,349 --> 01:03:03,680

going to happen to a herd of

1723

01:03:06,710 --> 01:03:05,359

woolly mammoths

1724

01:03:08,390 --> 01:03:06,720

you see

1725

01:03:10,950 --> 01:03:08,400

now when people don't understand that

1726

01:03:13,910 --> 01:03:10,960

this scale of events were playing out

1727

01:03:16,470 --> 01:03:13,920

all over the planet at the same time

1728

01:03:18,950 --> 01:03:16,480

it was a very dangerous time

1729

01:03:21,029 --> 01:03:18,960

to be a living organism on planet earth

1730

01:03:26,069 --> 01:03:21,039

when it was making its shift out of the

1731

01:03:29,109 --> 01:03:26,079

ice age and the the the species loss

1732

01:03:31,829 --> 01:03:29,119

of the megaphone is a measuring stick if

1733

01:03:34,150 --> 01:03:31,839

you will a yardstick of how severe the

1734

01:03:36,309 --> 01:03:34,160

habitat loss would have been because the

1735

01:03:39,270 --> 01:03:36,319

species loss is a direct function of

1736

01:03:40,150 --> 01:03:39,280

habitat loss habitat destruction

1737

01:03:41,190 --> 01:03:40,160

um

1738

01:03:42,870 --> 01:03:41,200

and so

1739

01:03:46,390 --> 01:03:42,880

what we see is that there are enormous

1740

01:03:48,230 --> 01:03:46,400

swaths of land utterly destroyed by

1741

01:03:50,150 --> 01:03:48,240

these things i mean look at this picture

1742

01:03:52,150 --> 01:03:50,160

that you're superimposed on those cliffs

1743

01:03:53,589 --> 01:03:52,160

are 400 feet high

1744

01:03:55,829 --> 01:03:53,599

the water that flowed over this

1745

01:03:58,150 --> 01:03:55,839

landscape was 400 feet deep

1746

01:04:00,710 --> 01:03:58,160

approximately so if you can picture the

1747

01:04:01,750 --> 01:04:00,720

water flow was as deep as that cliff is

1748

01:04:04,390 --> 01:04:01,760

high

1749

01:04:09,029 --> 01:04:04,400

now imagine a water flow that comes by

1750

01:04:10,549 --> 01:04:09,039

and rips out 400 feet of bedrock

1751

01:04:12,230 --> 01:04:10,559

how do you have any idea what would have

1752

01:04:13,029 --> 01:04:12,240

been there before that water flow came

1753

01:04:14,789 --> 01:04:13,039

through

1754

01:04:16,309 --> 01:04:14,799

how can you state affirmative well we

1755

01:04:18,230 --> 01:04:16,319

know this and that about what people

1756

01:04:19,349 --> 01:04:18,240

were doing there at that particular

1757

01:04:21,510 --> 01:04:19,359

location

1758

01:04:23,510 --> 01:04:21,520

when you don't take into account an

1759

01:04:25,670 --> 01:04:23,520

event like this

1760

01:04:27,510 --> 01:04:25,680

no you all your speculations are futile

1761

01:04:30,710 --> 01:04:27,520

you you need to see this is where the

1762

01:04:32,789 --> 01:04:30,720

paradigm has to shift we have to realize

1763

01:04:35,190 --> 01:04:32,799

that we are inhabiting a planet that's a

1764

01:04:37,270 --> 01:04:35,200

hell of a lot more dynamic than anybody

1765

01:04:39,190 --> 01:04:37,280

had imagined for most of the last

1766

01:04:41,589 --> 01:04:39,200

century

1767

01:04:45,109 --> 01:04:41,599

and these types of events these

1768

01:04:47,829 --> 01:04:45,119

catastrophic events are part of the norm

1769

01:04:50,150 --> 01:04:47,839

and this is why i get so impatient with

1770

01:04:51,750 --> 01:04:50,160

people that get hysterical over the

1771

01:04:53,990 --> 01:04:51,760

climate change

1772

01:04:55,910 --> 01:04:54,000

question and controversy because i say

1773

01:04:58,230 --> 01:04:55,920

yes we should of course be concerned

1774

01:05:01,510 --> 01:04:58,240

with climate change however

1775

01:05:02,630 --> 01:05:01,520

the entire planet is basically shouting

1776

01:05:04,390 --> 01:05:02,640

to us

1777

01:05:06,230 --> 01:05:04,400

in no uncertain terms that yes the

1778

01:05:09,190 --> 01:05:06,240

climate has changed before it has done

1779

01:05:11,430 --> 01:05:09,200

so on scales that we even can't begin to

1780

01:05:13,270 --> 01:05:11,440

imagine and it has done so without any

1781

01:05:14,870 --> 01:05:13,280

help from us and we still don't

1782

01:05:17,510 --> 01:05:14,880

understand why

1783

01:05:20,230 --> 01:05:17,520

so until we can understand that don't

1784

01:05:22,150 --> 01:05:20,240

tell me that the science has settled

1785

01:05:26,069 --> 01:05:22,160

that the debate is over because it

1786

01:05:28,230 --> 01:05:26,079

hasn't really even begun yet

1787

01:05:29,670 --> 01:05:28,240

well you know getting back to

1788

01:05:32,150 --> 01:05:29,680

the natural

1789

01:05:36,470 --> 01:05:32,160

uh climate changes that have happened is

1790

01:05:39,029 --> 01:05:36,480

is it totally a is it a total mystery

1791

01:05:40,789 --> 01:05:39,039

on how they believe so no i think what

1792

01:05:43,109 --> 01:05:40,799

we have to do now is and again part of

1793

01:05:45,109 --> 01:05:43,119

this paradigm shift is

1794

01:05:46,390 --> 01:05:45,119

you know kind of in a way

1795

01:05:48,630 --> 01:05:46,400

reconnecting with sort of the

1796

01:05:52,789 --> 01:05:48,640

perspectives of our ancestors

1797

01:05:53,990 --> 01:05:52,799

who you know were confirmed sky watchers

1798

01:05:56,470 --> 01:05:54,000

and we i think there's enough

1799

01:05:59,349 --> 01:05:56,480

information at hand now that we know at

1800

01:06:03,029 --> 01:05:59,359

least since the 1980s

1801
01:06:04,470 --> 01:06:03,039
that we are part of a cosmic ecosystem

1802
01:06:06,789 --> 01:06:04,480
and that if we want to talk about

1803
01:06:09,430 --> 01:06:06,799
ecology and understand the processes

1804
01:06:11,589 --> 01:06:09,440
that have played out in the biosphere

1805
01:06:14,230 --> 01:06:11,599
down here below on the surface of this

1806
01:06:16,789 --> 01:06:14,240
planet we have to take the much larger

1807
01:06:19,190 --> 01:06:16,799
framework perspective into account and

1808
01:06:21,829 --> 01:06:19,200
recognize that um

1809
01:06:23,670 --> 01:06:21,839
the cosmos has played an integral role

1810
01:06:25,109 --> 01:06:23,680
in all of the things that have happened

1811
01:06:27,510 --> 01:06:25,119
on this planet

1812
01:06:29,750 --> 01:06:27,520
since four and a half billion years ago

1813
01:06:32,150 --> 01:06:29,760

and have continued to do so and will

1814

01:06:34,230 --> 01:06:32,160

continue to do so into the future the

1815

01:06:36,309 --> 01:06:34,240

primary way that it does this in my

1816

01:06:39,270 --> 01:06:36,319

estimation is through the accretion of

1817

01:06:42,230 --> 01:06:39,280

cosmic matter whether through asteroids

1818

01:06:44,630 --> 01:06:42,240

or disintegrating comets

1819

01:06:47,109 --> 01:06:44,640

but also perhaps through other events

1820

01:06:49,109 --> 01:06:47,119

like solar proton events or

1821

01:06:52,710 --> 01:06:49,119

coronal mass ejections

1822

01:06:54,950 --> 01:06:52,720

nearby uh supernovas we're recognizing

1823

01:06:57,829 --> 01:06:54,960

now that that the universe that we

1824

01:06:59,270 --> 01:06:57,839

inhabit is a much much more active place

1825

01:07:01,910 --> 01:06:59,280

we're beginning to understand that near

1826
01:07:04,390 --> 01:07:01,920
earth space is not an empty void because

1827
01:07:06,789 --> 01:07:04,400
every month now we're seeing the debris

1828
01:07:08,230 --> 01:07:06,799
flying by the earth uh making close

1829
01:07:10,230 --> 01:07:08,240
passages i'll predict probably in the

1830
01:07:12,069 --> 01:07:10,240
next month or two there'll be another

1831
01:07:14,470 --> 01:07:12,079
close passage of some

1832
01:07:17,109 --> 01:07:14,480
uh cosmic body flying by the earth we

1833
01:07:19,910 --> 01:07:17,119
know from 1908 that one of these small

1834
01:07:21,349 --> 01:07:19,920
little specks of cosmic debris did

1835
01:07:24,309 --> 01:07:21,359
encounter the earth it was only about

1836
01:07:26,950 --> 01:07:24,319
150 feet in diameter which was just a

1837
01:07:29,029 --> 01:07:26,960
baby on the cosmic scale but it was able

1838
01:07:31,270 --> 01:07:29,039

to penetrate the atmosphere

1839

01:07:33,990 --> 01:07:31,280

down to uh to a height of about five

1840

01:07:37,190 --> 01:07:34,000

miles altitude where it exploded with

1841

01:07:40,069 --> 01:07:37,200

the force of a 15 megaton hydrogen bomb

1842

01:07:43,270 --> 01:07:40,079

which is an extremely big explosion and

1843

01:07:46,150 --> 01:07:43,280

it completely decimated about 820 some

1844

01:07:47,349 --> 01:07:46,160

square miles of old growth diego forest

1845

01:07:49,990 --> 01:07:47,359

in russia

1846

01:07:54,630 --> 01:07:50,000

yeah in siberia and it it utterly

1847

01:07:57,430 --> 01:07:54,640

incinerated um about 100 to 200 miles of

1848

01:08:00,069 --> 01:07:57,440

forest in a fireball that was as hot or

1849

01:08:01,670 --> 01:08:00,079

hotter than the surface of the sun

1850

01:08:03,829 --> 01:08:01,680

now this was just

1851

01:08:06,870 --> 01:08:03,839

most likely a member of the meteor

1852

01:08:09,190 --> 01:08:06,880

system uh which includes comet inky and

1853

01:08:11,510 --> 01:08:09,200

a whole family of interesting debris and

1854

01:08:14,069 --> 01:08:11,520

if anybody has not yet read the

1855

01:08:17,269 --> 01:08:14,079

interesting new research that has come

1856

01:08:18,229 --> 01:08:17,279

out on gobekli tepe in turkey

1857

01:08:19,990 --> 01:08:18,239

uh

1858

01:08:22,229 --> 01:08:20,000

it's very interesting and it dovetails

1859

01:08:23,110 --> 01:08:22,239

exactly with what i'm talking about here

1860

01:08:25,269 --> 01:08:23,120

um

1861

01:08:26,789 --> 01:08:25,279

because according to the uh

1862

01:08:28,550 --> 01:08:26,799

interpretation of these scottish

1863

01:08:30,470 --> 01:08:28,560

engineers what it's doing is

1864

01:08:31,910 --> 01:08:30,480

memorializing a date of around twelve

1865

01:08:35,110 --> 01:08:31,920

thousand eight to twelve thousand nine

1866

01:08:37,430 --> 01:08:35,120

hundred years ago uh in which uh during

1867

01:08:39,910 --> 01:08:37,440

which the earth encountered a swarm of

1868

01:08:42,950 --> 01:08:39,920

torrid meteor objects and this is

1869

01:08:45,829 --> 01:08:42,960

exactly the scenario i had envisioned at

1870

01:08:47,749 --> 01:08:45,839

least two decades ago for triggering the

1871

01:08:50,229 --> 01:08:47,759

melting of the ice sheet was it there

1872

01:08:51,910 --> 01:08:50,239

was no terrestrial mechanism that could

1873

01:08:53,829 --> 01:08:51,920

melt the ice that fast and the

1874

01:08:54,709 --> 01:08:53,839

milankovitch forces that you mentioned

1875

01:08:57,110 --> 01:08:54,719

earlier

1876

01:08:59,269 --> 01:08:57,120

certainly do have an effect on climate

1877

01:09:02,550 --> 01:08:59,279

over a long period of time but they are

1878

01:09:04,149 --> 01:09:02,560

so slow and so gradual and cumulative

1879

01:09:07,829 --> 01:09:04,159

that they're not going to trigger the

1880

01:09:10,149 --> 01:09:07,839

kinds of melting we saw uh you know 12

1881

01:09:12,229 --> 01:09:10,159

000 13 000 years ago that that caused

1882

01:09:14,149 --> 01:09:12,239

these mega floods

1883

01:09:16,470 --> 01:09:14,159

we have to look for something else much

1884

01:09:18,229 --> 01:09:16,480

much more powerful something that's

1885

01:09:20,390 --> 01:09:18,239

superimposed on top of the more

1886

01:09:22,630 --> 01:09:20,400

gradualistic processes

1887

01:09:25,030 --> 01:09:22,640

such as the milankovitch which for those

1888

01:09:29,110 --> 01:09:25,040

who don't know the milankovitch

1889

01:09:31,669 --> 01:09:29,120

forces are the three forces uh that

1890

01:09:33,910 --> 01:09:31,679

uh result from the earth

1891

01:09:35,590 --> 01:09:33,920

sun the changing geometry between the

1892

01:09:38,390 --> 01:09:35,600

earth and sun the obliquity of the

1893

01:09:41,189 --> 01:09:38,400

ecliptic the the the um

1894

01:09:43,749 --> 01:09:41,199

the perihelion aphelion distance the um

1895

01:09:46,149 --> 01:09:43,759

eccentricity of the ellipses these three

1896

01:09:48,470 --> 01:09:46,159

you together create these milankovitch

1897

01:09:49,990 --> 01:09:48,480

forces which sometimes cancel each other

1898

01:09:51,669 --> 01:09:50,000

out and sometimes constructively

1899

01:09:53,269 --> 01:09:51,679

reinforce each other

1900

01:09:55,430 --> 01:09:53,279

but again

1901

01:09:57,590 --> 01:09:55,440

these processes are play out over tens

1902

01:09:59,990 --> 01:09:57,600

of thousands of years not a matter of a

1903

01:10:01,189 --> 01:10:00,000

few years or a decade or less we're

1904

01:10:05,110 --> 01:10:01,199

talking about something else all

1905

01:10:07,110 --> 01:10:05,120

together and of course now since 2007

1906

01:10:09,270 --> 01:10:07,120

teams of scientists have been finding

1907

01:10:11,430 --> 01:10:09,280

the fingerprints of a cosmic event

1908

01:10:14,390 --> 01:10:11,440

precisely at the uh what is called the

1909

01:10:16,149 --> 01:10:14,400

bowling allerrod younger driest boundary

1910

01:10:17,830 --> 01:10:16,159

which is now dated about twelve thousand

1911

01:10:19,750 --> 01:10:17,840

eight hundred to twelve thousand nine

1912

01:10:21,510 --> 01:10:19,760

hundred years ago

1913

01:10:23,030 --> 01:10:21,520

and what they've been finding there are

1914

01:10:24,630 --> 01:10:23,040

the are the fingerprints the the

1915

01:10:27,270 --> 01:10:24,640

nanodiamonds magnetic grains

1916

01:10:29,270 --> 01:10:27,280

microspherules there's been a huge

1917

01:10:31,350 --> 01:10:29,280

iridium spike found in the greenland ice

1918

01:10:32,870 --> 01:10:31,360

sheet um

1919

01:10:35,030 --> 01:10:32,880

and this goes along

1920

01:10:37,030 --> 01:10:35,040

totally to me fits and dovetails with

1921

01:10:39,350 --> 01:10:37,040

everything else because

1922

01:10:41,350 --> 01:10:39,360

um otherwise we we've got to explain

1923

01:10:43,350 --> 01:10:41,360

that the massive climate spasms that

1924

01:10:45,590 --> 01:10:43,360

occurred and we're talking about 10 to

1925

01:10:48,470 --> 01:10:45,600

15 degrees uh

1926

01:10:50,550 --> 01:10:48,480

climate shift in in less than a decade i

1927

01:10:52,229 --> 01:10:50,560

mean many times greater than what we've

1928

01:10:54,310 --> 01:10:52,239

experienced in the last century this is

1929

01:10:56,470 --> 01:10:54,320

why again i get frustrated when somebody

1930

01:10:58,709 --> 01:10:56,480

says oh this is the greatest most rapid

1931

01:11:01,030 --> 01:10:58,719

warming that's ever happened well no

1932

01:11:02,790 --> 01:11:01,040

then you don't know about the the the

1933

01:11:05,270 --> 01:11:02,800

the balling out or on younger driest

1934

01:11:07,110 --> 01:11:05,280

warming that occurred or 1300 years

1935

01:11:08,550 --> 01:11:07,120

later the younger driest pre-boreal

1936

01:11:09,910 --> 01:11:08,560

warming that occurred where we're

1937

01:11:12,149 --> 01:11:09,920

talking about

1938

01:11:15,350 --> 01:11:12,159

temperature shifts of up to 10 degrees

1939

01:11:17,830 --> 01:11:15,360

centigrade possibly in less than five

1940

01:11:19,430 --> 01:11:17,840

years possibly in in as short a time as

1941

01:11:21,350 --> 01:11:19,440

one or two years

1942

01:11:23,189 --> 01:11:21,360

and there's really no way to explain

1943

01:11:26,070 --> 01:11:23,199

this in my opinion except we start

1944

01:11:28,470 --> 01:11:26,080

looking at forces outside the earth what

1945

01:11:30,870 --> 01:11:28,480

the digital would be exogenic

1946

01:11:32,870 --> 01:11:30,880

exogenic forces forces from outside the

1947

01:11:34,950 --> 01:11:32,880

earth and realizing that the earth is an

1948

01:11:37,590 --> 01:11:34,960

integral part of this much larger cosmic

1949

01:11:40,070 --> 01:11:37,600

environment and that to me is the next

1950

01:11:41,110 --> 01:11:40,080

really conceptual scientific conceptual

1951

01:11:42,229 --> 01:11:41,120

breakthrough that is going to be

1952

01:11:44,790 --> 01:11:42,239

necessary

1953

01:11:46,870 --> 01:11:44,800

is for us to understand that yeah a lot

1954

01:11:48,310 --> 01:11:46,880

of what has happened in the history of

1955

01:11:50,229 --> 01:11:48,320

this planet

1956

01:11:51,990 --> 01:11:50,239

has been influenced if not governed

1957

01:11:55,110 --> 01:11:52,000

altogether by events that

1958

01:11:57,189 --> 01:11:55,120

originated outside this planet and now

1959

01:11:59,590 --> 01:11:57,199

coming full circle the realization that

1960

01:12:02,310 --> 01:11:59,600

yeah even to some extent

1961

01:12:05,110 --> 01:12:02,320

uh human history has been influenced by

1962

01:12:06,630 --> 01:12:05,120

events from outside and um this is a

1963

01:12:09,189 --> 01:12:06,640

very interesting subject that we could

1964

01:12:10,870 --> 01:12:09,199

get onto possibly for a future uh

1965

01:12:13,590 --> 01:12:10,880

discussion i would like to say though

1966

01:12:15,430 --> 01:12:13,600

that for anybody who

1967

01:12:17,510 --> 01:12:15,440

is interested in this if i'm going to

1968

01:12:20,310 --> 01:12:17,520

hold this up this is the uh the new

1969

01:12:21,750 --> 01:12:20,320

blu-ray version of the uh

1970

01:12:23,750 --> 01:12:21,760

cosmic patterns and cycles of

1971

01:12:26,470 --> 01:12:23,760

catastrophe which if they go to the

1972

01:12:27,350 --> 01:12:26,480

sacred geometry international website

1973

01:12:29,110 --> 01:12:27,360

um

1974

01:12:31,430 --> 01:12:29,120

they can get with cameron wiltshire on

1975

01:12:33,030 --> 01:12:31,440

there and get a copy of this we just got

1976

01:12:34,470 --> 01:12:33,040

done the blu-ray i think there's between

1977

01:12:35,990 --> 01:12:34,480

four and five hours of stuff there

1978

01:12:38,149 --> 01:12:36,000

there's dozens and dozens of

1979

01:12:40,149 --> 01:12:38,159

high-resolution images and a lot of the

1980

01:12:43,270 --> 01:12:40,159

stuff that we've been looking at here

1981

01:12:45,270 --> 01:12:43,280

is in here plus a lot lot more so and

1982

01:12:47,189 --> 01:12:45,280

this hopefully will um

1983

01:12:50,550 --> 01:12:47,199

the sales of this will continue help us

1984

01:12:52,310 --> 01:12:50,560

to uh to help to fund uh continued

1985

01:12:54,149 --> 01:12:52,320

research and work into this field and

1986

01:12:55,350 --> 01:12:54,159

getting this information out and making

1987

01:12:57,990 --> 01:12:55,360

it available so that people can

1988

01:13:00,310 --> 01:12:58,000

understand yes there is this larger

1989

01:13:03,910 --> 01:13:00,320

story it's not just some kind of

1990

01:13:05,830 --> 01:13:03,920

fanciful speculation but is grounded in

1991

01:13:06,630 --> 01:13:05,840

hard science and grounded in some of the

1992

01:13:08,870 --> 01:13:06,640

most

1993

01:13:09,990 --> 01:13:08,880

venerable traditions of our species

1994

01:13:10,950 --> 01:13:10,000

going back

1995

01:13:13,750 --> 01:13:10,960

dec

1996

01:13:16,630 --> 01:13:13,760

centuries and millennium and i worked

1997

01:13:19,430 --> 01:13:16,640

very hard to try to make this plausible

1998

01:13:22,149 --> 01:13:19,440

to show that that the research is there

1999

01:13:25,350 --> 01:13:22,159

the hard research the data is there the

2000

01:13:28,630 --> 01:13:25,360

story is there anybody and i i challenge

2001

01:13:31,590 --> 01:13:28,640

anybody i encourage anybody to try to

2002

01:13:32,390 --> 01:13:31,600

uh verify it for yourself by reading the

2003

01:13:35,910 --> 01:13:32,400

paper

2004

01:13:38,149 --> 01:13:35,920

importantly getting out in the field and

2005

01:13:40,470 --> 01:13:38,159

seeing this kind of stuff firsthand

2006

01:13:43,270 --> 01:13:40,480

there's nothing that will supersede that

2007

01:13:45,350 --> 01:13:43,280

in its power to in its evocative power

2008

01:13:47,510 --> 01:13:45,360

and its ability to convey

2009

01:13:49,430 --> 01:13:47,520

the kinds of events we're talking about

2010

01:13:52,070 --> 01:13:49,440

the scale of these events this is

2011

01:13:54,149 --> 01:13:52,080

spending uh time in the field and so to

2012

01:13:57,189 --> 01:13:54,159

that end i i've

2013

01:14:00,470 --> 01:13:57,199

continued my friend brad and i brad

2014

01:14:03,189 --> 01:14:00,480

young who does the geocosmic rex website

2015

01:14:04,950 --> 01:14:03,199

where a lot of this information is

2016

01:14:07,189 --> 01:14:04,960

being uh presented

2017

01:14:08,790 --> 01:14:07,199

have done i've lost count dozens of

2018

01:14:10,470 --> 01:14:08,800

expeditions

2019

01:14:13,110 --> 01:14:10,480

we're always looking for very interested

2020

01:14:15,990 --> 01:14:13,120

people who might like to come along and

2021

01:14:19,189 --> 01:14:16,000

participate in the investigations in the

2022

01:14:21,189 --> 01:14:19,199

field documenting the the geological the

2023

01:14:23,350 --> 01:14:21,199

archaeological the paleontological

2024

01:14:24,950 --> 01:14:23,360

evidence for these events and how they

2025

01:14:28,229 --> 01:14:24,960

may have affected earth history how they

2026

01:14:29,510 --> 01:14:28,239

may have affected human history so um

2027

01:14:31,430 --> 01:14:29,520

yeah if you go to either one of those

2028

01:14:33,189 --> 01:14:31,440

two websites sacred geometry

2029

01:14:35,910 --> 01:14:33,199

international there you can get your

2030

01:14:37,750 --> 01:14:35,920

copy of of this and it's a good deal

2031

01:14:39,910 --> 01:14:37,760

because a lot of work went into it and

2032

01:14:42,149 --> 01:14:39,920

again it's it's loaded it's rich with

2033

01:14:43,669 --> 01:14:42,159

stuff i know you just you just held that

2034

01:14:45,430 --> 01:14:43,679

up can you say the name of it one more

2035

01:14:48,790 --> 01:14:45,440

time someone in the chat room wants to

2036

01:14:50,310 --> 01:14:48,800

see it cosmic patterns and cycles of

2037

01:14:52,390 --> 01:14:50,320

catastrophe

2038

01:14:55,510 --> 01:14:52,400

okay what are the patterns in cycles of

2039

01:14:58,070 --> 01:14:55,520

catastrophe thank you now i i to i i

2040

01:14:59,990 --> 01:14:58,080

have a friend who is a an astronomic

2041

01:15:02,550 --> 01:15:00,000

astronomer and

2042

01:15:04,790 --> 01:15:02,560

uh he does a talk i went to a talk one

2043

01:15:07,990 --> 01:15:04,800

time where he was displaying this just

2044

01:15:11,030 --> 01:15:08,000

to give the human brain to give an idea

2045

01:15:13,350 --> 01:15:11,040

the human brain can't conceive of how

2046

01:15:16,550 --> 01:15:13,360

old the earth is and can't can only as

2047

01:15:18,950 --> 01:15:16,560

far as numbers go can only and visualize

2048

01:15:20,590 --> 01:15:18,960

like a few thousand as far as numbers

2049

01:15:23,110 --> 01:15:20,600

when it comes to

2050

01:15:25,830 --> 01:15:23,120

4.1 billion years or something like that

2051
01:15:28,070 --> 01:15:25,840
we just can't get it so basically what

2052
01:15:30,709 --> 01:15:28,080
he did i think this is pretty funny but

2053
01:15:33,990 --> 01:15:30,719
he took a roll of toilet paper

2054
01:15:35,830 --> 01:15:34,000
300 feet uh long i think it was and he

2055
01:15:38,070 --> 01:15:35,840
started okay this is the beginning this

2056
01:15:41,110 --> 01:15:38,080
was four billion years ago and he goes

2057
01:15:42,870 --> 01:15:41,120
all the way around to only about an inch

2058
01:15:44,790 --> 01:15:42,880
away from the end of the toilet paper

2059
01:15:46,390 --> 01:15:44,800
roll and he says

2060
01:15:47,910 --> 01:15:46,400
this is when humans

2061
01:15:49,510 --> 01:15:47,920
came to earth

2062
01:15:51,590 --> 01:15:49,520
and this is when the dinosaurs were only

2063
01:15:53,510 --> 01:15:51,600

like four inches out

2064

01:15:54,950 --> 01:15:53,520

you know so it's really hard to conceive

2065

01:15:56,950 --> 01:15:54,960

of how old

2066

01:15:58,229 --> 01:15:56,960

the planet is yeah you know for the

2067

01:16:00,310 --> 01:15:58,239

human brain

2068

01:16:01,669 --> 01:16:00,320

and so much has happened it's it sounds

2069

01:16:04,149 --> 01:16:01,679

like what you're talking about so much

2070

01:16:06,709 --> 01:16:04,159

has happened in such a short relatively

2071

01:16:07,910 --> 01:16:06,719

short time ago

2072

01:16:11,189 --> 01:16:07,920

yes

2073

01:16:12,790 --> 01:16:11,199

certainly in the geological time scale

2074

01:16:17,430 --> 01:16:12,800

it was just

2075

01:16:20,470 --> 01:16:17,440

yeah i mean 12 000 years ago is not long

2076

01:16:23,350 --> 01:16:20,480

at all in earth history and

2077

01:16:25,110 --> 01:16:23,360

but if you know modern humans i mean

2078

01:16:26,790 --> 01:16:25,120

there are skeletal remains now that

2079

01:16:29,750 --> 01:16:26,800

would suggest the presence of modern

2080

01:16:31,110 --> 01:16:29,760

humans going back at least 150 to 180

2081

01:16:32,709 --> 01:16:31,120

000 years

2082

01:16:34,550 --> 01:16:32,719

and we don't know really if that's the

2083

01:16:36,149 --> 01:16:34,560

bottom of it or not i mean who knows how

2084

01:16:37,830 --> 01:16:36,159

much farther back it might go but just

2085

01:16:41,270 --> 01:16:37,840

using those as a number

2086

01:16:43,669 --> 01:16:41,280

i mean i'll take the number 150 000 here

2087

01:16:46,149 --> 01:16:43,679

put it into my calculator i'll divide it

2088

01:16:48,870 --> 01:16:46,159

by 25 the number of a generation and

2089

01:16:50,229 --> 01:16:48,880

you're talking about 6 000 generations

2090

01:16:53,189 --> 01:16:50,239

of people

2091

01:16:55,510 --> 01:16:53,199

going back 150 000 years

2092

01:16:57,510 --> 01:16:55,520

well when we realized that you know most

2093

01:16:59,350 --> 01:16:57,520

of that time was spent during this

2094

01:17:01,189 --> 01:16:59,360

period of oscillating glacial

2095

01:17:03,590 --> 01:17:01,199

interglacial ages and the depths of

2096

01:17:05,830 --> 01:17:03,600

these ice ages most of that you know

2097

01:17:08,709 --> 01:17:05,840

time was spent cohabitating the earth

2098

01:17:10,149 --> 01:17:08,719

with these giant megafauna

2099

01:17:12,870 --> 01:17:10,159

it was a very interesting and different

2100

01:17:14,070 --> 01:17:12,880

time on planet earth and the thing that

2101

01:17:16,630 --> 01:17:14,080

again i

2102

01:17:18,630 --> 01:17:16,640

can't emphasize this enough is that

2103

01:17:20,950 --> 01:17:18,640

what has not been taken into account by

2104

01:17:23,910 --> 01:17:20,960

conventional scholarship

2105

01:17:27,189 --> 01:17:23,920

and again i'll challenge anyone to to to

2106

01:17:29,189 --> 01:17:27,199

to try to refute this but what has not

2107

01:17:31,430 --> 01:17:29,199

been taken into account by conventional

2108

01:17:33,189 --> 01:17:31,440

scholarship is the scale

2109

01:17:34,550 --> 01:17:33,199

at which

2110

01:17:36,550 --> 01:17:34,560

things have changed environmental

2111

01:17:38,790 --> 01:17:36,560

changes have taken place in the time

2112

01:17:39,510 --> 01:17:38,800

that say just us humans have been here

2113

01:17:42,149 --> 01:17:39,520

so

2114

01:17:44,630 --> 01:17:42,159

you know it to me it's premature to say

2115

01:17:46,470 --> 01:17:44,640

to make some definitive statement about

2116

01:17:49,590 --> 01:17:46,480

what people may or may not have been

2117

01:17:52,390 --> 01:17:49,600

doing 20 or 30 000 years ago because

2118

01:17:55,430 --> 01:17:52,400

even without intervening catastrophes

2119

01:17:57,270 --> 01:17:55,440

the trans the the the um

2120

01:17:59,189 --> 01:17:57,280

the passage of ten thousand years of

2121

01:18:01,590 --> 01:17:59,199

time uh

2122

01:18:03,830 --> 01:18:01,600

is is even even with just modern

2123

01:18:05,750 --> 01:18:03,840

gradualistic processes if anybody's ever

2124

01:18:07,750 --> 01:18:05,760

seen those interesting documentaries or

2125

01:18:09,990 --> 01:18:07,760

studies on you know the earth without

2126

01:18:11,910 --> 01:18:10,000

humans the earth without humankind or

2127

01:18:13,990 --> 01:18:11,920

whatever where it shows here's what

2128

01:18:15,990 --> 01:18:14,000

would happen if people just suddenly

2129

01:18:17,510 --> 01:18:16,000

disappeared from the earth tomorrow what

2130

01:18:20,310 --> 01:18:17,520

would happen to our cities what would

2131

01:18:22,550 --> 01:18:20,320

happen to our infrastructure that 10 000

2132

01:18:24,070 --> 01:18:22,560

years from now basically what they came

2133

01:18:26,550 --> 01:18:24,080

up with was the only two things that

2134

01:18:28,870 --> 01:18:26,560

would really still exist to show that we

2135

01:18:31,510 --> 01:18:28,880

humans had even been here were the great

2136

01:18:32,870 --> 01:18:31,520

pyramids and uh

2137

01:18:35,270 --> 01:18:32,880

mount rushmore

2138

01:18:36,470 --> 01:18:35,280

wow imagine that in that intervening ten

2139

01:18:38,790 --> 01:18:36,480

thousand years we've got a couple of

2140

01:18:40,709 --> 01:18:38,800

catastrophes superimposed

2141

01:18:42,790 --> 01:18:40,719

so if somebody's coming along ten

2142

01:18:45,270 --> 01:18:42,800

thousand years from now

2143

01:18:47,430 --> 01:18:45,280

then when we don't find any traces of

2144

01:18:49,430 --> 01:18:47,440

civilization therefore there was no

2145

01:18:51,590 --> 01:18:49,440

civilization it's kind of the same thing

2146

01:18:53,590 --> 01:18:51,600

as when they were saying to brex well j

2147

01:18:55,669 --> 01:18:53,600

harlan brett's well you can't provide

2148

01:18:58,229 --> 01:18:55,679

any explanation for the source of your

2149

01:19:01,030 --> 01:18:58,239

floods therefore there were no floods

2150

01:19:03,669 --> 01:19:01,040

you know you can't here's the problem

2151
01:19:06,390 --> 01:19:03,679
the problem is is that once you begin to

2152
01:19:09,430 --> 01:19:06,400
realize how dynamic this planet is from

2153
01:19:12,630 --> 01:19:09,440
time to time and how effectively the

2154
01:19:15,590 --> 01:19:12,640
planetary surface can be remodeled

2155
01:19:18,709 --> 01:19:15,600
uh and you begin to realize well hey

2156
01:19:20,950 --> 01:19:18,719
you know maybe it's not surprising

2157
01:19:23,590 --> 01:19:20,960
maybe what's surprising is the the stuff

2158
01:19:25,270 --> 01:19:23,600
that we do find you know because

2159
01:19:27,270 --> 01:19:25,280
again looking at this picture you got on

2160
01:19:28,790 --> 01:19:27,280
your backdrop you're talking about a 400

2161
01:19:30,630 --> 01:19:28,800
foot

2162
01:19:33,510 --> 01:19:30,640
river that's swept over this landscape

2163
01:19:35,270 --> 01:19:33,520

60 miles an hour based on the this the

2164

01:19:37,030 --> 01:19:35,280

gradient of the of the

2165

01:19:39,030 --> 01:19:37,040

rock there

2166

01:19:40,950 --> 01:19:39,040

so powerful if you can rip out 400 feet

2167

01:19:42,310 --> 01:19:40,960

of rock and it's going to do this in a

2168

01:19:43,910 --> 01:19:42,320

matter of

2169

01:19:46,390 --> 01:19:43,920

a few days to a few weeks somewhere

2170

01:19:48,470 --> 01:19:46,400

within that span of time

2171

01:19:52,550 --> 01:19:48,480

washes this stuff down obliterates

2172

01:19:54,229 --> 01:19:52,560

literally obliterates the landscape

2173

01:19:56,709 --> 01:19:54,239

what was going on wouldn't matter i mean

2174

01:19:59,510 --> 01:19:56,719

this kind of a water flow flowing over

2175

01:20:02,470 --> 01:19:59,520

any major urban area on earth today

2176
01:20:04,950 --> 01:20:02,480
would essentially erase that urban area

2177
01:20:07,590 --> 01:20:04,960
from existence yeah you know i heard i

2178
01:20:09,750 --> 01:20:07,600
heard that the great pyramids

2179
01:20:12,149 --> 01:20:09,760
will be completely vanished in 25

2180
01:20:14,709 --> 01:20:12,159
million years

2181
01:20:16,630 --> 01:20:14,719
i mean is that possible i don't know

2182
01:20:17,430 --> 01:20:16,640
25 million yeah that's a lot longer than

2183
01:20:19,990 --> 01:20:17,440
10

2184
01:20:22,390 --> 01:20:20,000
yeah yeah i would expect that to be true

2185
01:20:24,229 --> 01:20:22,400
yeah yeah they just wear you know just

2186
01:20:25,030 --> 01:20:24,239
from sand erosion i guess that's how

2187
01:20:28,390 --> 01:20:25,040
they

2188
01:20:31,270 --> 01:20:28,400

mentioned

2189

01:20:33,189 --> 01:20:31,280

the word uh supernova and now i know if

2190

01:20:35,830 --> 01:20:33,199

something like that happened within our

2191

01:20:37,669 --> 01:20:35,840

own galaxy we'd be in trouble

2192

01:20:39,350 --> 01:20:37,679

um well i think the main way we'd be in

2193

01:20:41,350 --> 01:20:39,360

trouble is that the

2194

01:20:43,270 --> 01:20:41,360

the the shock wave if you want to call

2195

01:20:45,590 --> 01:20:43,280

it that when it passes through our solar

2196

01:20:48,229 --> 01:20:45,600

system could dislodge

2197

01:20:50,229 --> 01:20:48,239

cometary bodies from the kuiper disk and

2198

01:20:52,550 --> 01:20:50,239

send them hurtling toward the sun and i

2199

01:20:55,669 --> 01:20:52,560

think that's the main mechanism by which

2200

01:20:58,390 --> 01:20:55,679

galactic forces tend to be most

2201
01:21:01,430 --> 01:20:58,400
typically modulated into a solar system

2202
01:21:03,669 --> 01:21:01,440
level is that you know outside the orbit

2203
01:21:06,149 --> 01:21:03,679
of neptune there's this vast reservoir

2204
01:21:08,229 --> 01:21:06,159
of comets vast disk of comets called the

2205
01:21:09,990 --> 01:21:08,239
kuiper belt or kuiper di right

2206
01:21:13,510 --> 01:21:10,000
now that is the earth cloud which is a

2207
01:21:15,910 --> 01:21:13,520
vast spherical cloud of comets

2208
01:21:17,350 --> 01:21:15,920
but the word cloud the inner zone of the

2209
01:21:19,270 --> 01:21:17,360
earth cloud is just outside the

2210
01:21:20,950 --> 01:21:19,280
planetary realm and so

2211
01:21:22,630 --> 01:21:20,960
studies have shown that

2212
01:21:24,630 --> 01:21:22,640
the alignments of the

2213
01:21:27,189 --> 01:21:24,640

uh big outer planets primarily uranus

2214

01:21:29,590 --> 01:21:27,199

and neptune can sometimes be enough to

2215

01:21:32,630 --> 01:21:29,600

cause uh perturbations within the inner

2216

01:21:34,950 --> 01:21:32,640

zones of the kuiper disk causing uh

2217

01:21:37,430 --> 01:21:34,960

comets within the kuiper disk to become

2218

01:21:39,910 --> 01:21:37,440

dislodged and either move to a higher

2219

01:21:41,750 --> 01:21:39,920

orbital shell or a lower orbital shell

2220

01:21:43,590 --> 01:21:41,760

moving to a lower orbital shell in other

2221

01:21:45,350 --> 01:21:43,600

words if they're because the disc is

2222

01:21:46,470 --> 01:21:45,360

slowly rotating around the sun so you

2223

01:21:49,110 --> 01:21:46,480

have to picture that each one of these

2224

01:21:51,430 --> 01:21:49,120

comet nuclei which is in deep frozen

2225

01:21:53,990 --> 01:21:51,440

state in a state of hibernation is

2226

01:21:56,310 --> 01:21:54,000

circling the sun right slowly now if

2227

01:21:58,870 --> 01:21:56,320

there's a planetary alignment in front

2228

01:22:01,750 --> 01:21:58,880

of it in effect the gravitational pull

2229

01:22:04,390 --> 01:22:01,760

act as a slingshot accelerating its

2230

01:22:07,030 --> 01:22:04,400

orbital velocity if it accelerates it

2231

01:22:10,310 --> 01:22:07,040

moves out if it's behind it and it

2232

01:22:13,189 --> 01:22:10,320

decelerates the orbital velocity what it

2233

01:22:15,669 --> 01:22:13,199

does is it drops in closer to the sun it

2234

01:22:17,110 --> 01:22:15,679

becomes comes inside the orbit of

2235

01:22:18,470 --> 01:22:17,120

neptune

2236

01:22:20,550 --> 01:22:18,480

once it becomes inside the orbit of

2237

01:22:22,310 --> 01:22:20,560

neptune it now becomes subject to the

2238

01:22:25,030 --> 01:22:22,320

gravitational perturbations of the four

2239

01:22:27,189 --> 01:22:25,040

big outer planets that also include

2240

01:22:28,870 --> 01:22:27,199

jupiter and saturn and it just so

2241

01:22:30,950 --> 01:22:28,880

happens that the masses and the

2242

01:22:31,910 --> 01:22:30,960

distances between the four large army

2243

01:22:33,750 --> 01:22:31,920

planets

2244

01:22:36,629 --> 01:22:33,760

are exactly what they need to be the

2245

01:22:38,950 --> 01:22:36,639

spacing needs to be in order to affect a

2246

01:22:41,189 --> 01:22:38,960

if she will a bucket brigade transfer of

2247

01:22:43,350 --> 01:22:41,199

commentary objects towards the inner

2248

01:22:45,430 --> 01:22:43,360

solar system

2249

01:22:46,629 --> 01:22:45,440

um i think i think i get into that in

2250

01:22:49,430 --> 01:22:46,639

this uh

2251

01:22:51,110 --> 01:22:49,440

dvd that i've got here um and maybe show

2252

01:22:53,430 --> 01:22:51,120

even some graphics or something to

2253

01:22:56,629 --> 01:22:53,440

explain that how it works but as it

2254

01:22:58,550 --> 01:22:56,639

turns out coincidentally the the the

2255

01:23:01,110 --> 01:22:58,560

masses and distances of the four outer

2256

01:23:03,830 --> 01:23:01,120

planets are such that it can create this

2257

01:23:05,830 --> 01:23:03,840

transfer of cometary nuclei

2258

01:23:08,149 --> 01:23:05,840

once the big planet the big giant

2259

01:23:11,030 --> 01:23:08,159

jupiter gets a hold of it jupiter is

2260

01:23:13,350 --> 01:23:11,040

usually either going to hurl it back out

2261

01:23:14,950 --> 01:23:13,360

or it's going to cause a deceleration

2262

01:23:16,550 --> 01:23:14,960

where it begins to fall in towards the

2263

01:23:18,870 --> 01:23:16,560

sun and now it gets locked into an

2264

01:23:21,270 --> 01:23:18,880

elliptical orbit between jupiter and the

2265

01:23:23,590 --> 01:23:21,280

sun and begins to undergo a hierarchy of

2266

01:23:25,430 --> 01:23:23,600

disintegrations creates a stream of

2267

01:23:27,669 --> 01:23:25,440

debris in near earth space that earth

2268

01:23:29,350 --> 01:23:27,679

can encounter and encounters with that

2269

01:23:30,709 --> 01:23:29,360

debris can have all kinds of

2270

01:23:32,470 --> 01:23:30,719

consequences

2271

01:23:34,870 --> 01:23:32,480

depending on whether it's micro debris

2272

01:23:36,950 --> 01:23:34,880

or macro debris if it's micro debris it

2273

01:23:39,189 --> 01:23:36,960

can just be dust celestial dust that

2274

01:23:41,030 --> 01:23:39,199

accumulates or accretes to the earth

2275

01:23:43,110 --> 01:23:41,040

this could be part of what causes the

2276

01:23:45,590 --> 01:23:43,120

onset of an ice age because

2277

01:23:47,510 --> 01:23:45,600

if the planet uh accretes a large amount

2278

01:23:50,950 --> 01:23:47,520

of cosmic dust it'll do the same kind of

2279

01:23:52,629 --> 01:23:50,960

thing as a volcanic eruption

2280

01:23:55,110 --> 01:23:52,639

that spews particulate matter into the

2281

01:23:58,709 --> 01:23:55,120

atmosphere it can reflect sun back out

2282

01:24:01,350 --> 01:23:58,719

into space and cause a a pretty extreme

2283

01:24:03,430 --> 01:24:01,360

cooling of the global climate uh the the

2284

01:24:05,430 --> 01:24:03,440

british astronomer fred hoyle has done a

2285

01:24:07,669 --> 01:24:05,440

lot of work on this

2286

01:24:10,550 --> 01:24:07,679

the book that he calls it's called i

2287

01:24:12,550 --> 01:24:10,560

think simply ice by fred hoyle he gets

2288

01:24:14,390 --> 01:24:12,560

into a theory which i think still holds

2289

01:24:17,189 --> 01:24:14,400

up actually it makes sense

2290

01:24:19,910 --> 01:24:17,199

about what happens when commentary dust

2291

01:24:22,629 --> 01:24:19,920

comes into the atmosphere in large uh

2292

01:24:24,470 --> 01:24:22,639

amounts and then of course we might have

2293

01:24:26,550 --> 01:24:24,480

encounters with the with the actual

2294

01:24:28,950 --> 01:24:26,560

debris you know because all meteor

2295

01:24:30,709 --> 01:24:28,960

streams are the remnants of comets that

2296

01:24:33,189 --> 01:24:30,719

have disintegrated in orbit around the

2297

01:24:36,390 --> 01:24:33,199

sun you know the turrets the leonids the

2298

01:24:39,669 --> 01:24:36,400

the heritage the geminids all of these

2299

01:24:42,310 --> 01:24:39,679

meteor streams were once part of a comet

2300

01:24:44,149 --> 01:24:42,320

nucleus that came in around the sun

2301

01:24:45,910 --> 01:24:44,159

being you know like almost like a ball

2302

01:24:47,990 --> 01:24:45,920

game being pitched back and forth

2303

01:24:49,750 --> 01:24:48,000

between jupiter and the sun and in the

2304

01:24:52,870 --> 01:24:49,760

process it disintegrates and

2305

01:24:54,310 --> 01:24:52,880

devolatilizes and spews nearer space

2306

01:24:55,830 --> 01:24:54,320

with the the byproducts of its

2307

01:24:57,750 --> 01:24:55,840

disintegration

2308

01:24:59,350 --> 01:24:57,760

this is probably what happened in 1908

2309

01:25:02,149 --> 01:24:59,360

with tongue as we were talking about

2310

01:25:03,590 --> 01:25:02,159

earlier with that 150 foot piece of

2311

01:25:05,270 --> 01:25:03,600

space debris that plunked into the

2312

01:25:07,350 --> 01:25:05,280

earth's atmosphere

2313

01:25:10,390 --> 01:25:07,360

uh it was probably a remnant of the

2314

01:25:13,430 --> 01:25:10,400

torrent meteor system which is likely

2315

01:25:15,430 --> 01:25:13,440

the result of a very large comet that

2316

01:25:18,390 --> 01:25:15,440

came into the inner solar system between

2317

01:25:21,189 --> 01:25:18,400

20 and 30 000 years ago and began to

2318

01:25:23,110 --> 01:25:21,199

undergo a hierarchy of disintegrations

2319

01:25:25,189 --> 01:25:23,120

and uh i think

2320

01:25:27,030 --> 01:25:25,199

maybe played a critical role in bringing

2321

01:25:29,030 --> 01:25:27,040

on the last phase

2322

01:25:31,510 --> 01:25:29,040

what's called the late wisconsin the

2323

01:25:33,590 --> 01:25:31,520

last phase of the great ice age

2324

01:25:36,550 --> 01:25:33,600

which really happened between about 25

2325

01:25:38,550 --> 01:25:36,560

and 26 000 years ago and then by 18 to

2326
01:25:41,830 --> 01:25:38,560
20 000 years ago the planet that plunged

2327
01:25:44,790 --> 01:25:41,840
into the the depths of full glacial cold

2328
01:25:47,910 --> 01:25:44,800
and it was an extremely cold time

2329
01:25:49,990 --> 01:25:47,920
and then come around 15 000 years ago

2330
01:25:51,990 --> 01:25:50,000
for between 14 and 15 000 years ago the

2331
01:25:54,070 --> 01:25:52,000
milankovitch processes that we were

2332
01:25:55,990 --> 01:25:54,080
talking about earlier were kicking in

2333
01:25:59,030 --> 01:25:56,000
and you had this uh constructive

2334
01:26:00,950 --> 01:25:59,040
amplification of the of this of the

2335
01:26:03,990 --> 01:26:00,960
earth solar geometry that caused the

2336
01:26:06,229 --> 01:26:04,000
warming and that warming caused the ice

2337
01:26:09,510 --> 01:26:06,239
sheets worldwide to begin to recede to

2338
01:26:11,510 --> 01:26:09,520

be they begin to shrink back and um

2339

01:26:12,950 --> 01:26:11,520

but then that warming process suddenly

2340

01:26:14,470 --> 01:26:12,960

around twelve thousand nine hundred

2341

01:26:16,629 --> 01:26:14,480

years ago got

2342

01:26:18,629 --> 01:26:16,639

suddenly interrupted and this was that

2343

01:26:21,350 --> 01:26:18,639

balling aloe rod younger driest event

2344

01:26:22,870 --> 01:26:21,360

and it's at that horizon line now where

2345

01:26:25,189 --> 01:26:22,880

these teams of scientists have been

2346

01:26:26,790 --> 01:26:25,199

finding the fingerprints of a cosmic

2347

01:26:28,470 --> 01:26:26,800

event

2348

01:26:29,910 --> 01:26:28,480

wow and so

2349

01:26:31,510 --> 01:26:29,920

that's an interesting story and i'm

2350

01:26:35,590 --> 01:26:31,520

working on that quite a bit now and i'm

2351

01:26:39,910 --> 01:26:37,750

i think it's going to be on the 16th

2352

01:26:41,750 --> 01:26:39,920

oh really yeah yeah and we're going to

2353

01:26:43,669 --> 01:26:41,760

be discussing this me and graham hancock

2354

01:26:45,510 --> 01:26:43,679

will be on there with michael shermer

2355

01:26:47,830 --> 01:26:45,520

who i think is going to really michael

2356

01:26:50,390 --> 01:26:47,840

sherman he's been i had him on a show

2357

01:26:52,070 --> 01:26:50,400

before that should be very interesting

2358

01:26:53,830 --> 01:26:52,080

because he'll counter about everything

2359

01:26:55,110 --> 01:26:53,840

you're talking about

2360

01:26:57,189 --> 01:26:55,120

don't try

2361

01:26:58,550 --> 01:26:57,199

yeah but i mean the facts are the facts

2362

01:27:01,590 --> 01:26:58,560

i mean you know i'm not making this

2363

01:27:03,669 --> 01:27:01,600

stuff up i'm it's this stuff you know

2364

01:27:06,149 --> 01:27:03,679

it's coming right out of my if it's not

2365

01:27:07,990 --> 01:27:06,159

coming from the the um you know the

2366

01:27:09,030 --> 01:27:08,000

peer-reviewed literature which i've you

2367

01:27:11,110 --> 01:27:09,040

know

2368

01:27:12,629 --> 01:27:11,120

are justly worked through thousands over

2369

01:27:14,470 --> 01:27:12,639

the years of of

2370

01:27:15,830 --> 01:27:14,480

you know scientific papers dealing with

2371

01:27:17,510 --> 01:27:15,840

all of this stuff that we're talking

2372

01:27:19,510 --> 01:27:17,520

about and then i've gone out and

2373

01:27:21,669 --> 01:27:19,520

interviewed key individuals working on

2374

01:27:24,310 --> 01:27:21,679

this stuff and spent

2375

01:27:26,709 --> 01:27:24,320

i mean thousands of hours in the field

2376

01:27:27,430 --> 01:27:26,719

exploring for myself documenting myself

2377

01:27:29,189 --> 01:27:27,440

so

2378

01:27:31,030 --> 01:27:29,199

you know i i don't think michael will

2379

01:27:33,030 --> 01:27:31,040

have done this so you know he's probably

2380

01:27:34,390 --> 01:27:33,040

going to be pretty much trying to defend

2381

01:27:36,709 --> 01:27:34,400

the the the

2382

01:27:38,550 --> 01:27:36,719

status quo ideas

2383

01:27:39,750 --> 01:27:38,560

but listen there's so much evidence out

2384

01:27:41,990 --> 01:27:39,760

there now

2385

01:27:45,910 --> 01:27:42,000

that to contradict the status quo you

2386

01:27:48,070 --> 01:27:45,920

know for example the idea that humans uh

2387

01:27:48,790 --> 01:27:48,080

killed off the megaphone you know that's

2388

01:27:50,390 --> 01:27:48,800

just

2389

01:27:51,430 --> 01:27:50,400

it makes no sense and really what we

2390

01:27:54,229 --> 01:27:51,440

know now

2391

01:27:56,629 --> 01:27:54,239

from the studies of uh you know cultural

2392

01:27:58,470 --> 01:27:56,639

remains like the clovis people

2393

01:28:00,310 --> 01:27:58,480

they disappeared there appears that

2394

01:28:01,830 --> 01:28:00,320

there was a major human bottleneck at

2395

01:28:04,229 --> 01:28:01,840

the same time

2396

01:28:05,750 --> 01:28:04,239

that there was uh this mass extinction

2397

01:28:08,070 --> 01:28:05,760

of megaphone

2398

01:28:10,149 --> 01:28:08,080

and but even even without that i mean

2399

01:28:11,750 --> 01:28:10,159

it's like really you mean you're gonna

2400

01:28:12,790 --> 01:28:11,760

say that

2401

01:28:15,910 --> 01:28:12,800

uh

2402

01:28:18,550 --> 01:28:15,920

paleo indian hunters on foot with spears

2403

01:28:19,910 --> 01:28:18,560

small roving bands were able to utterly

2404

01:28:20,990 --> 01:28:19,920

annihilate

2405

01:28:23,910 --> 01:28:21,000

over

2406

01:28:25,590 --> 01:28:23,920

120 species of megafauna on four

2407

01:28:28,310 --> 01:28:25,600

continents within a matter of a few

2408

01:28:29,910 --> 01:28:28,320

centuries or even a thousand years i

2409

01:28:31,669 --> 01:28:29,920

don't think so it just doesn't make

2410

01:28:33,910 --> 01:28:31,679

sense no when you start thinking about

2411

01:28:36,390 --> 01:28:33,920

it it doesn't make sense the problem is

2412

01:28:38,629 --> 01:28:36,400

now see is that that was proposed back

2413

01:28:39,750 --> 01:28:38,639

in the 1960s and became the dominant

2414

01:28:41,830 --> 01:28:39,760

theory

2415

01:28:44,310 --> 01:28:41,840

within the last decade or two that idea

2416

01:28:45,990 --> 01:28:44,320

had began to decline because for one

2417

01:28:47,750 --> 01:28:46,000

thing there was a lot of studies

2418

01:28:49,990 --> 01:28:47,760

showing that you know that the people

2419

01:28:53,189 --> 01:28:50,000

that did live here simultaneous with the

2420

01:28:56,149 --> 01:28:53,199

megafauna yeah sure some of them were

2421

01:28:57,430 --> 01:28:56,159

hunting megaphone yeah no question uh

2422

01:28:59,270 --> 01:28:57,440

but at the same time they were also

2423

01:29:00,629 --> 01:28:59,280

hunting a lots of small game they were

2424

01:29:03,669 --> 01:29:00,639

fishing they were doing a lot of

2425

01:29:04,790 --> 01:29:03,679

foraging they had very diversified diets

2426

01:29:06,550 --> 01:29:04,800

and i mean

2427

01:29:08,709 --> 01:29:06,560

you have to go okay

2428

01:29:10,229 --> 01:29:08,719

40 million is the s frank frank c hibb

2429

01:29:12,070 --> 01:29:10,239

and the anthropologist from university

2430

01:29:13,750 --> 01:29:12,080

of new mexico back in the 40s and 50s

2431

01:29:16,870 --> 01:29:13,760

estimated that there was somewhere

2432

01:29:18,390 --> 01:29:16,880

between 40 million individual

2433

01:29:20,790 --> 01:29:18,400

um

2434

01:29:22,390 --> 01:29:20,800

megafauna that died at the end of the

2435

01:29:23,910 --> 01:29:22,400

last ice age

2436

01:29:25,590 --> 01:29:23,920

it was like all these species like we

2437

01:29:28,470 --> 01:29:25,600

just been talking about you know four

2438

01:29:31,750 --> 01:29:28,480

species of mammoths the mastodons the

2439

01:29:33,830 --> 01:29:31,760

camelots the giant beavers the the the

2440

01:29:36,790 --> 01:29:33,840

the cave bears the giant short-faced

2441

01:29:39,590 --> 01:29:36,800

bear the the the um you know the dire

2442

01:29:42,229 --> 01:29:39,600

wolves the giant irish elk that had a an

2443

01:29:43,110 --> 01:29:42,239

amber span up to 16 feet

2444

01:29:45,189 --> 01:29:43,120

um

2445

01:29:46,709 --> 01:29:45,199

incredible incredible animals giant

2446

01:29:49,830 --> 01:29:46,719

armadillos

2447

01:29:52,229 --> 01:29:49,840

uh the myelodon you know um the list

2448

01:29:53,189 --> 01:29:52,239

goes on to giant ground slaws all of

2449

01:29:54,709 --> 01:29:53,199

these

2450

01:29:56,709 --> 01:29:54,719

boom within

2451
01:29:57,510 --> 01:29:56,719
you know a geological instance they're

2452
01:30:00,550 --> 01:29:57,520
gone

2453
01:30:02,790 --> 01:30:00,560
and are you going to tell me that

2454
01:30:05,110 --> 01:30:02,800
roving bands of paleo indian hunters

2455
01:30:07,510 --> 01:30:05,120
that have may have been a few dozen

2456
01:30:09,669 --> 01:30:07,520
individuals up to up to 100 individuals

2457
01:30:12,950 --> 01:30:09,679
or so were able to exterminate these

2458
01:30:14,950 --> 01:30:12,960
animals so fast so simultaneously over

2459
01:30:16,709 --> 01:30:14,960
broad areas of the of the earth's

2460
01:30:19,590 --> 01:30:16,719
surface that they couldn't even

2461
01:30:22,310 --> 01:30:19,600
reproduce but what we now know is from

2462
01:30:24,709 --> 01:30:22,320
the evidence is i'll say what we suspect

2463
01:30:26,870 --> 01:30:24,719

strong from the evidence is that there

2464

01:30:29,750 --> 01:30:26,880

was a human population decline that went

2465

01:30:32,070 --> 01:30:29,760

right along with it and so really rather

2466

01:30:34,229 --> 01:30:32,080

than humans being the perpetrators of

2467

01:30:36,229 --> 01:30:34,239

the mass extinction they were also

2468

01:30:37,990 --> 01:30:36,239

victims of the events that caused the

2469

01:30:40,790 --> 01:30:38,000

mass extinction and i think that's going

2470

01:30:42,629 --> 01:30:40,800

to be the truth that a lot of the um

2471

01:30:44,950 --> 01:30:42,639

defenders of the status quo are sooner

2472

01:30:46,950 --> 01:30:44,960

or later going to have to face

2473

01:30:49,750 --> 01:30:46,960

the problem now is though

2474

01:30:52,229 --> 01:30:49,760

that we are being told that we are now

2475

01:30:54,950 --> 01:30:52,239

humans are now triggering the sixth

2476

01:30:56,950 --> 01:30:54,960

great mass extinction in earth history

2477

01:31:00,070 --> 01:30:56,960

which would compare to the late

2478

01:31:02,950 --> 01:31:00,080

ordovician the the permian triassic the

2479

01:31:06,070 --> 01:31:02,960

cretaceous tertiary the late devonian

2480

01:31:07,510 --> 01:31:06,080

the mid-jurassic or yes

2481

01:31:09,110 --> 01:31:07,520

when you begin to look at these mass

2482

01:31:12,629 --> 01:31:09,120

extinction events

2483

01:31:14,149 --> 01:31:12,639

you go wait a second time out time out

2484

01:31:15,669 --> 01:31:14,159

how can we be in the middle of an event

2485

01:31:18,390 --> 01:31:15,679

that's comparable to one of those if we

2486

01:31:19,590 --> 01:31:18,400

take just the cretaceous tertiary event

2487

01:31:21,750 --> 01:31:19,600

alone

2488

01:31:23,270 --> 01:31:21,760

which um

2489

01:31:25,270 --> 01:31:23,280

it was kind of in the middle of the

2490

01:31:27,590 --> 01:31:25,280

spectrum of of

2491

01:31:29,669 --> 01:31:27,600

of severity right

2492

01:31:32,310 --> 01:31:29,679

well you start aggregating all the

2493

01:31:34,070 --> 01:31:32,320

studies on that and you realize okay

2494

01:31:37,350 --> 01:31:34,080

here we had over a short period of time

2495

01:31:39,110 --> 01:31:37,360

what almost certainly was a period of uh

2496

01:31:41,270 --> 01:31:39,120

multiple bombardment

2497

01:31:43,750 --> 01:31:41,280

uh we know that there was a gigantic

2498

01:31:46,390 --> 01:31:43,760

embargo bombardment in down in what is

2499

01:31:48,310 --> 01:31:46,400

now the yucatan region of mexico

2500

01:31:51,510 --> 01:31:48,320

might have gouged a hole in the ground

2501
01:31:53,110 --> 01:31:51,520
you know 30 miles deep and 150 to 200

2502
01:31:54,470 --> 01:31:53,120
miles wide

2503
01:31:56,550 --> 01:31:54,480
through so much

2504
01:31:59,110 --> 01:31:56,560
debris into the atmosphere that the

2505
01:32:01,350 --> 01:31:59,120
planet went dark for months

2506
01:32:03,110 --> 01:32:01,360
when it struck there were

2507
01:32:05,910 --> 01:32:03,120
seismic waves that encompassed the

2508
01:32:07,430 --> 01:32:05,920
entire planet some geophysicists that

2509
01:32:08,790 --> 01:32:07,440
have looked at the event have said well

2510
01:32:10,790 --> 01:32:08,800
you know it's likely that an event of

2511
01:32:13,910 --> 01:32:10,800
that magnitude would cause every fault

2512
01:32:16,310 --> 01:32:13,920
line on the planet to fail uh there was

2513
01:32:18,870 --> 01:32:16,320

fallback debris that covered a

2514

01:32:21,430 --> 01:32:18,880

hemisphere all this stuff is on fire

2515

01:32:22,870 --> 01:32:21,440

it's coming back now it ignites a global

2516

01:32:25,590 --> 01:32:22,880

fire

2517

01:32:27,830 --> 01:32:25,600

wendy wohlbach has done uh i think a

2518

01:32:30,470 --> 01:32:27,840

dupreeh university has done a lot of

2519

01:32:33,590 --> 01:32:30,480

work on looking at the charcoal and soot

2520

01:32:35,830 --> 01:32:33,600

deposits at the kt boundary and has

2521

01:32:37,590 --> 01:32:35,840

figured out that there was a massive

2522

01:32:38,470 --> 01:32:37,600

biomass burning

2523

01:32:41,430 --> 01:32:38,480

which

2524

01:32:43,189 --> 01:32:41,440

in order to leave the amount of soot and

2525

01:32:45,350 --> 01:32:43,199

uh

2526

01:32:47,430 --> 01:32:45,360

material left over from the fire would

2527

01:32:49,590 --> 01:32:47,440

require the consumption of a biomass

2528

01:32:51,990 --> 01:32:49,600

roughly equivalent to

2529

01:32:53,910 --> 01:32:52,000

that which is on the whole planet today

2530

01:32:55,750 --> 01:32:53,920

i mean so i mean this list of stuff

2531

01:32:58,070 --> 01:32:55,760

could go on and then of course in the

2532

01:33:00,149 --> 01:32:58,080

aftermath of the darkness and the fire

2533

01:33:01,189 --> 01:33:00,159

then comes the cold because you've got

2534

01:33:03,030 --> 01:33:01,199

this

2535

01:33:04,149 --> 01:33:03,040

shroud of particulate matter in the

2536

01:33:06,070 --> 01:33:04,159

atmosphere

2537

01:33:07,110 --> 01:33:06,080

keeping the sun from coming in so you

2538

01:33:09,350 --> 01:33:07,120

would have had

2539

01:33:11,750 --> 01:33:09,360

you know what what um the british

2540

01:33:12,709 --> 01:33:11,760

neocatastrophis referred to as a cosmic

2541

01:33:14,870 --> 01:33:12,719

winter

2542

01:33:18,470 --> 01:33:14,880

than when it would then enshroud the

2543

01:33:20,310 --> 01:33:18,480

planet so i mean you had a period of

2544

01:33:23,189 --> 01:33:20,320

centuries or even millennium where it

2545

01:33:25,350 --> 01:33:23,199

was literally hell on earth and as the

2546

01:33:27,669 --> 01:33:25,360

question becomes how could any really

2547

01:33:28,470 --> 01:33:27,679

how did anything survive right right

2548

01:33:30,390 --> 01:33:28,480

right

2549

01:33:32,790 --> 01:33:30,400

but now when somebody says well what's

2550

01:33:35,910 --> 01:33:32,800

going on now is equivalent to the great

2551

01:33:37,910 --> 01:33:35,920

mass extinctions in earth history i go

2552

01:33:41,030 --> 01:33:37,920

you know excuse me but i don't think

2553

01:33:43,669 --> 01:33:41,040

you've really understood the scenario as

2554

01:33:45,910 --> 01:33:43,679

it's now been described through the hard

2555

01:33:48,790 --> 01:33:45,920

scientific studies going back for for

2556

01:33:50,470 --> 01:33:48,800

decades now no what's i maybe you just

2557

01:33:52,229 --> 01:33:50,480

need to get outside more because the

2558

01:33:54,070 --> 01:33:52,239

last time i checked

2559

01:33:56,870 --> 01:33:54,080

the planet was not enshrouded in

2560

01:33:59,030 --> 01:33:56,880

darkness there was not global firestorms

2561

01:34:01,270 --> 01:33:59,040

the outpouring of the deck and traps

2562

01:34:03,430 --> 01:34:01,280

there was enormous volcanic eruptions

2563

01:34:04,470 --> 01:34:03,440

that occurred at the same time probably

2564

01:34:07,830 --> 01:34:04,480

because

2565

01:34:10,390 --> 01:34:07,840

of the releasing of of these tremendous

2566

01:34:12,790 --> 01:34:10,400

internal forces endogenic forces as a

2567

01:34:15,189 --> 01:34:12,800

result of this impact

2568

01:34:17,350 --> 01:34:15,199

the whole deck and traps of india became

2569

01:34:18,709 --> 01:34:17,360

uh extruded and

2570

01:34:21,030 --> 01:34:18,719

would have filled the atmosphere with

2571

01:34:22,709 --> 01:34:21,040

things like sulfur dioxide and and you

2572

01:34:24,550 --> 01:34:22,719

would have had acid rain i mean there

2573

01:34:27,189 --> 01:34:24,560

were studies that suggest there was acid

2574

01:34:29,510 --> 01:34:27,199

rain in places with a ph similar to

2575

01:34:30,870 --> 01:34:29,520

battery acid for crying out loud wow so

2576

01:34:32,870 --> 01:34:30,880

i mean when you start putting all of

2577

01:34:36,390 --> 01:34:32,880

this together it's like

2578

01:34:38,470 --> 01:34:36,400

yeah i don't think what's happening now

2579

01:34:41,350 --> 01:34:38,480

are humans causing extinction of species

2580

01:34:43,030 --> 01:34:41,360

no doubt are they causing circumstances

2581

01:34:45,910 --> 01:34:43,040

that can be compared to the permian

2582

01:34:48,149 --> 01:34:45,920

triassic which was more severe than the

2583

01:34:50,229 --> 01:34:48,159

cretaceous tertiary or the late or

2584

01:34:53,510 --> 01:34:50,239

division or the great spot because when

2585

01:34:56,070 --> 01:34:53,520

they say the sixth great mass extinction

2586

01:34:59,110 --> 01:34:56,080

the previous five are these these great

2587

01:35:01,510 --> 01:34:59,120

mass extinctions in earth history um

2588

01:35:03,830 --> 01:35:01,520

and i'm saying you know i've studied

2589

01:35:06,390 --> 01:35:03,840

these things i've i've studied in depth

2590

01:35:08,310 --> 01:35:06,400

the cretaceous tertiary extinction event

2591

01:35:12,229 --> 01:35:08,320

in the permian triassic and the late

2592

01:35:14,310 --> 01:35:12,239

devonian the later edition um and i know

2593

01:35:16,550 --> 01:35:14,320

at least i have a concept of what we're

2594

01:35:18,470 --> 01:35:16,560

talking about here and what what played

2595

01:35:20,950 --> 01:35:18,480

out on this planet and no

2596

01:35:23,430 --> 01:35:20,960

no you can't do that you can't just say

2597

01:35:25,910 --> 01:35:23,440

what's going on now because you're mad

2598

01:35:27,910 --> 01:35:25,920

at capitalism or industry or whatever

2599

01:35:29,910 --> 01:35:27,920

the case is that it colors your

2600

01:35:31,990 --> 01:35:29,920

perceptions but you just can't do it

2601
01:35:33,270 --> 01:35:32,000
it's not realistic

2602
01:35:35,270 --> 01:35:33,280
somebody of course is going to hear me

2603
01:35:37,030 --> 01:35:35,280
saying this and go oh you know i i don't

2604
01:35:39,110 --> 01:35:37,040
care about you know protecting the

2605
01:35:40,790 --> 01:35:39,120
environment or whatever and you know you

2606
01:35:42,550 --> 01:35:40,800
that i'm somehow saying that humans

2607
01:35:44,629 --> 01:35:42,560
aren't playing a role in climate change

2608
01:35:46,390 --> 01:35:44,639
i'm certainly not saying that because we

2609
01:35:48,390 --> 01:35:46,400
are playing a role

2610
01:35:50,790 --> 01:35:48,400
but i think these things need to be put

2611
01:35:52,470 --> 01:35:50,800
in perspective and when all these

2612
01:35:54,790 --> 01:35:52,480
discussions of global change and climate

2613
01:35:56,629 --> 01:35:54,800

change and everything have been playing

2614

01:35:59,270 --> 01:35:56,639

out through mainstream media in the last

2615

01:36:01,430 --> 01:35:59,280

few decades i'm sorry but the reality is

2616

01:36:02,870 --> 01:36:01,440

is that these issues have gone from the

2617

01:36:04,070 --> 01:36:02,880

realm of science to the realm of

2618

01:36:07,590 --> 01:36:04,080

politics

2619

01:36:09,510 --> 01:36:07,600

and so what has happened now is because

2620

01:36:10,790 --> 01:36:09,520

one of the things that's being used to

2621

01:36:13,830 --> 01:36:10,800

reinforce

2622

01:36:15,669 --> 01:36:13,840

the believability of humans being the

2623

01:36:18,310 --> 01:36:15,679

trigger for the sixth grade mass

2624

01:36:20,709 --> 01:36:18,320

extinction which is now underway is that

2625

01:36:22,629 --> 01:36:20,719

ah well look there's a precedent we've

2626

01:36:23,990 --> 01:36:22,639

already wiped out

2627

01:36:26,790 --> 01:36:24,000

the great megaphone at the end of the

2628

01:36:30,709 --> 01:36:26,800

last ice age in a blitzkrieg or the

2629

01:36:34,310 --> 01:36:30,719

overkill hypothesis that's been called

2630

01:36:35,910 --> 01:36:34,320

well so if you come along and you say no

2631

01:36:38,070 --> 01:36:35,920

humans didn't do it humans were probably

2632

01:36:40,070 --> 01:36:38,080

victims of the same natural forces that

2633

01:36:41,590 --> 01:36:40,080

took down the megafauna there are

2634

01:36:43,430 --> 01:36:41,600

factions now that don't want to hear

2635

01:36:45,590 --> 01:36:43,440

that because exhibit a

2636

01:36:47,270 --> 01:36:45,600

in in putting forth the scenario that

2637

01:36:49,030 --> 01:36:47,280

humans are now

2638

01:36:50,149 --> 01:36:49,040

the cause of the sixth great mass

2639

01:36:52,629 --> 01:36:50,159

extinction

2640

01:36:55,030 --> 01:36:52,639

is this precedent of the late place the

2641

01:36:56,950 --> 01:36:55,040

scene megaphone extinction so if you

2642

01:36:59,189 --> 01:36:56,960

come along and say well no i think it

2643

01:37:00,870 --> 01:36:59,199

was something from out there that did it

2644

01:37:02,229 --> 01:37:00,880

they don't want to hear it because no no

2645

01:37:04,950 --> 01:37:02,239

we're firmly

2646

01:37:07,350 --> 01:37:04,960

devoted to this idea that humans did it

2647

01:37:08,950 --> 01:37:07,360

humans we don't need any comets or

2648

01:37:10,790 --> 01:37:08,960

things from space so get out of here

2649

01:37:13,510 --> 01:37:10,800

with that and there's been an actually

2650

01:37:16,790 --> 01:37:13,520

kind of a backlash against this idea

2651
01:37:20,550 --> 01:37:16,800
specifically because it undermines

2652
01:37:22,390 --> 01:37:20,560
the the conclusion that humans have have

2653
01:37:24,390 --> 01:37:22,400
been responsible for this great mass

2654
01:37:25,669 --> 01:37:24,400
extinction that occurred 13 000 years

2655
01:37:26,629 --> 01:37:25,679
ago

2656
01:37:28,870 --> 01:37:26,639
wow

2657
01:37:30,310 --> 01:37:28,880
well you know that does it for our show

2658
01:37:31,990 --> 01:37:30,320
this evening

2659
01:37:35,189 --> 01:37:32,000
and i want to thank you so much it's

2660
01:37:37,109 --> 01:37:35,199
been a

2661
01:37:39,189 --> 01:37:37,119
well thank you for having me martin and

2662
01:37:41,350 --> 01:37:39,199
just one more reminder we've got this

2663
01:37:43,350 --> 01:37:41,360

it's fresh off the presses high

2664

01:37:44,950 --> 01:37:43,360

definition blu-ray i think people will

2665

01:37:48,070 --> 01:37:44,960

enjoy it

2666

01:37:49,350 --> 01:37:48,080

excellent so um thank you everyone for

2667

01:37:51,350 --> 01:37:49,360

uh for

2668

01:37:53,990 --> 01:37:51,360

tuning in and thank you for joining in

2669

01:37:55,109 --> 01:37:54,000

the chat room and next week we're going

2670

01:37:58,149 --> 01:37:55,119

to be back

2671

01:38:01,189 --> 01:37:58,159

um with mike labicki and he is an

2672

01:38:03,990 --> 01:38:01,199

extreme explorer and uh american

2673

01:38:05,430 --> 01:38:04,000

explorer explores all around the world

2674

01:38:08,310 --> 01:38:05,440

and he's also going to be talking about

2675

01:38:10,229 --> 01:38:08,320

the diet love pass incident which is

2676

01:38:12,149 --> 01:38:10,239

real interesting uh

2677

01:38:12,910 --> 01:38:12,159

incident that happened back

2678

01:38:16,229 --> 01:38:12,920

in the