

1  
00:00:00,200 --> 00:00:07,219  
hello listeners and welcome to the mad

2  
00:00:03,680 --> 00:00:10,939  
scientist podcast I am your host Marie

3  
00:00:07,219 --> 00:00:15,559  
Mayhew and I am joined today by a very

4  
00:00:10,939 --> 00:00:18,320  
very special birthday boy join me in

5  
00:00:15,558 --> 00:00:31,278  
wishing a happy birthday to our own dr.

6  
00:00:18,320 --> 00:00:33,649  
Chris Cogswell I'm gonna milk this

7  
00:00:31,278 --> 00:00:35,749  
birthday for everything it's got I have

8  
00:00:33,649 --> 00:00:37,819  
been every like I wake up in the morning

9  
00:00:35,749 --> 00:00:39,079  
like it's bills my birthday I better

10  
00:00:37,819 --> 00:00:44,449  
have a cupcake for breakfast

11  
00:00:39,079 --> 00:00:46,579  
of course lifestyle and the other voice

12  
00:00:44,448 --> 00:00:48,439  
you hear is our awesome very special

13  
00:00:46,579 --> 00:00:49,878  
guest I don't think she is although

14  
00:00:48,439 --> 00:00:52,338  
she's probably feeling like she's aged

15  
00:00:49,878 --> 00:00:55,039  
incredibly since having to take on this

16  
00:00:52,338 --> 00:01:00,228  
this assignment of working with us it is

17  
00:00:55,039 --> 00:01:03,499  
desi from our lead researcher with I Gor

18  
00:01:00,228 --> 00:01:07,399  
or do you pronounce it Igor I don't

19  
00:01:03,499 --> 00:01:11,990  
pronounce it Oh honestly you've ever had

20  
00:01:07,399 --> 00:01:13,939  
to say it yeah it's so desi why don't

21  
00:01:11,989 --> 00:01:15,108  
you tell her our beloved listening

22  
00:01:13,938 --> 00:01:18,169  
audience just a little bit about

23  
00:01:15,108 --> 00:01:19,938  
yourself oh well I think about this oh

24  
00:01:18,170 --> 00:01:23,920  
it's okay

25  
00:01:19,938 --> 00:01:32,839  
I normally I normally fake something

26  
00:01:23,920 --> 00:01:36,349  
true no I obviously do lots of research

27  
00:01:32,840 --> 00:01:39,530  
for you guys um which we need and

28  
00:01:36,349 --> 00:01:43,248  
appreciate greatly and I do a lot of

29

00:01:39,530 --> 00:01:47,149  
doodling and I cosplay sometimes when I

30  
00:01:43,248 --> 00:01:50,269  
have time yep this is my favorite thing

31  
00:01:47,149 --> 00:01:52,759  
about you is that you do cosplay because

32  
00:01:50,269 --> 00:01:55,158  
you you've posted some pictures on

33  
00:01:52,759 --> 00:01:58,188  
Instagram and on Twitter and like you're

34  
00:01:55,159 --> 00:01:59,990  
literally fashioning and making all of

35  
00:01:58,188 --> 00:02:03,288  
your stuff it seems like from scratch

36  
00:01:59,989 --> 00:02:07,188  
yes I'm currently making a suit of armor

37  
00:02:03,289 --> 00:02:09,679  
sort of damn it's so intense like it's

38  
00:02:07,188 --> 00:02:11,408  
so much more intense than any of my like

39  
00:02:09,679 --> 00:02:13,650  
I mean okay podcasting is like a hobby

40  
00:02:11,408 --> 00:02:15,689  
but it's like this

41  
00:02:13,650 --> 00:02:17,158  
I mean it's a hobby but like we don't

42  
00:02:15,689 --> 00:02:19,769  
have to we'd make stuff but it's like

43  
00:02:17,158 --> 00:02:23,939

digital right I have to sit there and

44

00:02:19,769 --> 00:02:26,908

stand hate and then sand and then paint

45

00:02:23,939 --> 00:02:28,829

but I could listen to all the podcasts

46

00:02:26,908 --> 00:02:30,750

while they do it let me go that's it and

47

00:02:28,830 --> 00:02:32,879

that's that's you know what that's the

48

00:02:30,750 --> 00:02:34,860

only thing that's important because it

49

00:02:32,878 --> 00:02:37,530

takes like zero brainpower to just sit

50

00:02:34,860 --> 00:02:39,329

there and say well your your stuff is

51

00:02:37,530 --> 00:02:44,400

amazing like what's been your favorite

52

00:02:39,329 --> 00:02:46,379

recent kind of cosplay character well I

53

00:02:44,400 --> 00:02:49,379

mean when to divulge I'm more than one

54

00:02:46,378 --> 00:02:54,179

coming up that's secret no I'm working

55

00:02:49,378 --> 00:02:55,649

on Sabre from the Fate series and that's

56

00:02:54,180 --> 00:02:58,019

the armor that I'm making so it's

57

00:02:55,650 --> 00:03:02,489

probably the most work that I've put

58  
00:02:58,019 --> 00:03:06,120  
into one but I had a lot of fun with my

59  
00:03:02,489 --> 00:03:09,750  
last bigger project where I got to make

60  
00:03:06,120 --> 00:03:12,289  
a wizard hat or witch's hat hmm that's

61  
00:03:09,750 --> 00:03:14,848  
cool that's so cool that's so cool

62  
00:03:12,289 --> 00:03:17,729  
that is so cool I'm so jealous cuz that

63  
00:03:14,848 --> 00:03:22,679  
is a craft like that's a skill on a

64  
00:03:17,729 --> 00:03:24,899  
craft I've you know if I get like the

65  
00:03:22,680 --> 00:03:26,879  
cookie dough it is already made into

66  
00:03:24,900 --> 00:03:28,169  
like little lumps of cookie dough but

67  
00:03:26,879 --> 00:03:32,549  
all you have to do is unwrap and

68  
00:03:28,169 --> 00:03:36,329  
literally put in the oven I'm all Martha

69  
00:03:32,549 --> 00:03:39,900  
Stewart yeah so that's all I got I don't

70  
00:03:36,329 --> 00:03:41,129  
cook either it's okay oh let's do it cuz

71  
00:03:39,900 --> 00:03:43,319  
you're busy doing all this awesome

72  
00:03:41,128 --> 00:03:46,348  
cosplay stuff I'm I'm jealous and so I

73  
00:03:43,318 --> 00:03:48,149  
we want to see pictures and also please

74  
00:03:46,348 --> 00:03:50,518  
tell the people where they can find all

75  
00:03:48,150 --> 00:03:52,949  
of your wonderful designs which are

76  
00:03:50,519 --> 00:03:55,709  
awesome and you need to get t-shirts and

77  
00:03:52,949 --> 00:03:58,590  
other things immediately people right

78  
00:03:55,709 --> 00:04:01,469  
after listening to yes so all of my

79  
00:03:58,590 --> 00:04:03,689  
things are available either on RedBubble

80  
00:04:01,469 --> 00:04:08,870  
or designed by humans under the name

81  
00:04:03,689 --> 00:04:12,870  
Desdemona with a Y so it's des D Y mo na

82  
00:04:08,870 --> 00:04:15,389  
and everywhere else I'm either does

83  
00:04:12,870 --> 00:04:17,819  
Damona or sprinkle face that is true

84  
00:04:15,389 --> 00:04:19,348  
that is true it's very it's very hard to

85  
00:04:17,819 --> 00:04:21,930  
keep the tags on her because it's like

86

00:04:19,348 --> 00:04:24,509  
too many names to me Elias is what are

87  
00:04:21,930 --> 00:04:27,740  
you hiding and she's incognito of it's a

88  
00:04:24,509 --> 00:04:31,879  
very it's so mysterious

89  
00:04:27,740 --> 00:04:34,740  
mr. clearly hiding something terrible

90  
00:04:31,879 --> 00:04:36,629  
just hiding from my students and my day

91  
00:04:34,740 --> 00:04:40,470  
job yeah that's okay I understand I know

92  
00:04:36,629 --> 00:04:41,759  
that game good stuff all right well this

93  
00:04:40,470 --> 00:04:45,300  
episode marine we're talking about the

94  
00:04:41,759 --> 00:04:47,788  
color blue the color blue probably like

95  
00:04:45,300 --> 00:04:50,759  
my third favorite color it's vicious

96  
00:04:47,788 --> 00:04:52,500  
awesome you know third favorite you're

97  
00:04:50,759 --> 00:04:54,900  
like this is my 27th favorite it's

98  
00:04:52,500 --> 00:04:56,519  
alright okay I'm a fan so listen I'm

99  
00:04:54,899 --> 00:05:00,209  
afraid of a lot of colors I gotta say

100  
00:04:56,519 --> 00:05:02,120

color of my favorite Pokemon Vaporeon it

101

00:05:00,209 --> 00:05:05,310

is it's a good color blues a good color

102

00:05:02,120 --> 00:05:09,360

now the reason that we're doing this

103

00:05:05,310 --> 00:05:13,110

episode is because we des actually

104

00:05:09,360 --> 00:05:14,129

suggested to us this topic because there

105

00:05:13,110 --> 00:05:16,590

had been some stuff going around on the

106

00:05:14,129 --> 00:05:18,330

internet where people were claiming that

107

00:05:16,589 --> 00:05:20,788

there was no evidence for the color blue

108

00:05:18,329 --> 00:05:25,228

existing basically before the Middle

109

00:05:20,788 --> 00:05:27,870

Ages and it kind of comes from like that

110

00:05:25,228 --> 00:05:29,878

stupid dress that everyone remembers you

111

00:05:27,870 --> 00:05:30,930

know dressed and talking about yeah the

112

00:05:29,879 --> 00:05:33,419

one that was supposed to be blue and

113

00:05:30,930 --> 00:05:39,269

gold or like white and gold or something

114

00:05:33,418 --> 00:05:41,818

like that whatever and so yeah and it's

115

00:05:39,269 --> 00:05:44,519

it's a really interesting blue is it

116

00:05:41,819 --> 00:05:45,778

gold is it blue is it gold it's it's a

117

00:05:44,519 --> 00:05:47,879

whole big thing and it's a really

118

00:05:45,778 --> 00:05:50,490

interesting concept because this

119

00:05:47,879 --> 00:05:51,569

suggests something really I think it's

120

00:05:50,490 --> 00:05:53,278

fascinating because it gets into

121

00:05:51,569 --> 00:05:56,460

something deeper than just the color

122

00:05:53,278 --> 00:05:58,408

itself but more about cognition and how

123

00:05:56,459 --> 00:06:00,388

do we even communicate cognition to each

124

00:05:58,408 --> 00:06:02,389

other and do we do we ever really

125

00:06:00,389 --> 00:06:04,528

communicate cognition in that way so

126

00:06:02,389 --> 00:06:08,598

that's what this episode is about and

127

00:06:04,528 --> 00:06:08,598

I'm excited to get into it absolutely

128

00:06:09,149 --> 00:06:13,569

[Music]

129  
00:06:10,649 --> 00:06:16,769  
welcome to the mad scientist podcast

130  
00:06:13,569 --> 00:06:16,769  
today's episode

131  
00:06:20,870 --> 00:06:28,019  
you know this boondoggle excellent ok so

132  
00:06:24,689 --> 00:06:29,990  
before we get into arguing if the if the

133  
00:06:28,019 --> 00:06:34,349  
dress was truly blue or gold or the

134  
00:06:29,990 --> 00:06:36,480  
abstracts behind color and sort of what

135  
00:06:34,350 --> 00:06:40,830  
are the social constructs around color

136  
00:06:36,480 --> 00:06:42,689  
how do your eyes actually see color so a

137  
00:06:40,829 --> 00:06:46,919  
little bit of the science background is

138  
00:06:42,689 --> 00:06:50,370  
among vertebrates which humans and apes

139  
00:06:46,920 --> 00:06:55,470  
are amongst one of them one

140  
00:06:50,370 --> 00:06:58,530  
classification the result of having

141  
00:06:55,470 --> 00:07:00,720  
specialized light receptors so these

142  
00:06:58,529 --> 00:07:03,869  
structures in your eye is known as rods

143

00:07:00,720 --> 00:07:06,810  
and cones in the back of your eye in the

144  
00:07:03,870 --> 00:07:10,110  
retina so rods are extremely sensitive

145  
00:07:06,810 --> 00:07:14,220  
to even the most dim of light but

146  
00:07:10,110 --> 00:07:17,250  
provide very coarse fuzzy colorless

147  
00:07:14,220 --> 00:07:19,890  
images right the cones provide the

148  
00:07:17,250 --> 00:07:22,829  
sharpest images and are responsible for

149  
00:07:19,889 --> 00:07:25,289  
the ability to see color but the only

150  
00:07:22,829 --> 00:07:30,689  
function effectively when the light is

151  
00:07:25,290 --> 00:07:33,330  
bright right so as a consequence Verte

152  
00:07:30,689 --> 00:07:36,600  
all vertebrates such as ourselves and

153  
00:07:33,329 --> 00:07:39,089  
apes are more or less blind to color in

154  
00:07:36,600 --> 00:07:40,320  
the dark of the night right so if you go

155  
00:07:39,089 --> 00:07:43,409  
outside and you're trying to find your

156  
00:07:40,319 --> 00:07:46,349  
car after drinking in a club and it's

157  
00:07:43,410 --> 00:07:49,350

like 4 a.m. you're gonna have a harder

158

00:07:46,350 --> 00:07:54,330

time finding it not just because you've

159

00:07:49,350 --> 00:07:56,910

had 14 jello shots but because your eyes

160

00:07:54,329 --> 00:07:59,399

are not wired to actually see color when

161

00:07:56,910 --> 00:08:03,080

it is dark out yes you're like how

162

00:07:59,399 --> 00:08:03,079

that's going like I had to work that in

163

00:08:04,699 --> 00:08:11,459

summary well you know interesting

164

00:08:09,360 --> 00:08:13,110

because their thing being too is if you

165

00:08:11,459 --> 00:08:15,750

are color blind you cannot tell the

166

00:08:13,110 --> 00:08:18,480

difference between sherry jello shots

167

00:08:15,750 --> 00:08:21,569

and lime green jello shots very true so

168

00:08:18,480 --> 00:08:23,160

just let that just let that cultivate in

169

00:08:21,569 --> 00:08:25,800

the old noggin for a little very dream

170

00:08:23,160 --> 00:08:27,090

yes okay so different types of cones are

171

00:08:25,800 --> 00:08:29,180

tuned to different portions of the

172  
00:08:27,089 --> 00:08:31,679  
narrow vision of the spectrum and

173  
00:08:29,180 --> 00:08:33,839  
electromagnetic radiation right

174  
00:08:31,680 --> 00:08:37,549  
near the surface of the cones in your

175  
00:08:33,839 --> 00:08:42,839  
eyes are very sensitive proteins called

176  
00:08:37,549 --> 00:08:45,778  
protein pigments called ops ops and

177  
00:08:42,839 --> 00:08:47,820  
options this is probably options you

178  
00:08:45,778 --> 00:08:51,778  
probably know all this not really not

179  
00:08:47,820 --> 00:08:58,740  
enough to say hablo really absence okay

180  
00:08:51,778 --> 00:08:59,909  
so since options are different cones

181  
00:08:58,740 --> 00:09:03,360  
they're sensitive to different

182  
00:08:59,909 --> 00:09:06,059  
wavelengths of lights and so colors are

183  
00:09:03,360 --> 00:09:08,399  
identified by the brain based on these

184  
00:09:06,059 --> 00:09:11,458  
responses from these options so a

185  
00:09:08,399 --> 00:09:15,629  
wavelength comes in these options

186  
00:09:11,458 --> 00:09:17,909  
translate it into your brain track and

187  
00:09:15,629 --> 00:09:24,600  
so far oh yeah absolutely sounding great

188  
00:09:17,909 --> 00:09:27,569  
yes so humans vertebrates are basically

189  
00:09:24,600 --> 00:09:29,730  
trichromatic so we have three colors

190  
00:09:27,570 --> 00:09:31,050  
that we can definitely see the

191  
00:09:29,730 --> 00:09:33,149  
difference between and three different

192  
00:09:31,049 --> 00:09:36,199  
kinds of options on our cones which

193  
00:09:33,149 --> 00:09:41,129  
allow us to discriminate between blue

194  
00:09:36,200 --> 00:09:44,070  
green and red so those are the big ones

195  
00:09:41,129 --> 00:09:46,919  
and some people think that this comes

196  
00:09:44,070 --> 00:09:51,629  
about through the necessity to be able

197  
00:09:46,919 --> 00:09:55,679  
to identify ripe food or berries or be

198  
00:09:51,629 --> 00:09:58,740  
able to use the colors to hunt and

199  
00:09:55,679 --> 00:10:02,659  
gather sure with invertebrates sure sure

200

00:09:58,740 --> 00:10:05,639  
now what's really interesting with these

201  
00:10:02,659 --> 00:10:09,480  
so just because you can just because

202  
00:10:05,639 --> 00:10:12,419  
physically you have the ability to take

203  
00:10:09,480 --> 00:10:14,909  
in the information of a color doesn't

204  
00:10:12,419 --> 00:10:17,909  
actually mean that you can sense a color

205  
00:10:14,909 --> 00:10:18,990  
or even so this gets into the kind of

206  
00:10:17,909 --> 00:10:24,199  
really interesting philosophical

207  
00:10:18,990 --> 00:10:26,759  
territory of what does it mean to is

208  
00:10:24,200 --> 00:10:28,290  
gathering information enough or like

209  
00:10:26,759 --> 00:10:31,439  
what does it mean to know something what

210  
00:10:28,289 --> 00:10:32,909  
does it mean to recognize something and

211  
00:10:31,440 --> 00:10:34,770  
be able to use that information in a way

212  
00:10:32,909 --> 00:10:39,240  
that we would consider knowing right so

213  
00:10:34,769 --> 00:10:42,629  
you might be able to you know you might

214  
00:10:39,240 --> 00:10:45,480

be able to physically sense the color

215

00:10:42,629 --> 00:10:48,509

red but if your brain doesn't have

216

00:10:45,480 --> 00:10:49,949

a place where colors are processed just

217

00:10:48,509 --> 00:10:51,088

because you can physically take in the

218

00:10:49,948 --> 00:10:53,939

color red doesn't mean that your mind

219

00:10:51,089 --> 00:10:58,649

can actually deal with that color right

220

00:10:53,940 --> 00:11:00,240

in the same way just because you just

221

00:10:58,649 --> 00:11:01,948

because you can hear music doesn't mean

222

00:11:00,240 --> 00:11:03,600

that you are a musician or you can

223

00:11:01,948 --> 00:11:05,549

compose it in a way right you don't

224

00:11:03,600 --> 00:11:09,110

really know music you might hear music

225

00:11:05,549 --> 00:11:12,778

you don't necessarily know musical

226

00:11:09,110 --> 00:11:15,028

theory or whatever but on top of that -

227

00:11:12,778 --> 00:11:16,948

there is a difference philosophically

228

00:11:15,028 --> 00:11:20,350

between

229

00:11:16,948 --> 00:11:21,818  
experiencing something and are

230

00:11:20,350 --> 00:11:25,439  
physically experiencing something and

231

00:11:21,818 --> 00:11:27,878  
then cognate in it or thinking it were

232

00:11:25,438 --> 00:11:30,328  
so I guess I guess that realized think

233

00:11:27,879 --> 00:11:35,019  
yeah so I guess the best example this is

234

00:11:30,328 --> 00:11:37,748  
again just because you see like there

235

00:11:35,019 --> 00:11:41,230  
might be something in front of you that

236

00:11:37,749 --> 00:11:42,490  
has no meaning to you right you can have

237

00:11:41,230 --> 00:11:44,678  
a word in front of you that means

238

00:11:42,490 --> 00:11:46,209  
something in someone else's language and

239

00:11:44,678 --> 00:11:49,088  
just but just because you're seeing

240

00:11:46,208 --> 00:11:50,318  
those letters written doesn't mean that

241

00:11:49,089 --> 00:11:53,939  
you're actually understanding the word

242

00:11:50,318 --> 00:11:57,128  
right and that's kind of analogous to

243  
00:11:53,938 --> 00:11:58,868  
what might occur if you say could not

244  
00:11:57,129 --> 00:12:00,490  
perceive color you might be able to see

245  
00:11:58,869 --> 00:12:02,439  
something that is green or blue or

246  
00:12:00,490 --> 00:12:04,419  
whatever but you won't be able to

247  
00:12:02,438 --> 00:12:07,058  
recognize that as a color or as a

248  
00:12:04,419 --> 00:12:08,678  
differentiating factor you know as like

249  
00:12:07,058 --> 00:12:11,230  
another piece of information on top of

250  
00:12:08,678 --> 00:12:14,169  
this other thing now the question of if

251  
00:12:11,230 --> 00:12:15,369  
colors exist or not is a really

252  
00:12:14,169 --> 00:12:20,139  
interesting philosophical question

253  
00:12:15,369 --> 00:12:21,639  
actually the but that's that's something

254  
00:12:20,139 --> 00:12:23,259  
we're gonna get into more later but

255  
00:12:21,639 --> 00:12:25,528  
basically what we're trying to lay the

256  
00:12:23,259 --> 00:12:28,629  
groundwork here for is this idea of a

257

00:12:25,528 --> 00:12:31,028  
just seeing a color physically being

258  
00:12:28,629 --> 00:12:32,379  
able to mechanically see a color isn't

259  
00:12:31,028 --> 00:12:33,789  
really what we're talking about here

260  
00:12:32,379 --> 00:12:35,050  
when we say that blue doesn't exist

261  
00:12:33,789 --> 00:12:37,480  
right mm-hmm

262  
00:12:35,049 --> 00:12:42,578  
it's it's something just like it's like

263  
00:12:37,480 --> 00:12:46,240  
jello shots all right so you see a

264  
00:12:42,578 --> 00:12:48,099  
perhaps a green or a red jello shot and

265  
00:12:46,240 --> 00:12:51,009  
you might think okay

266  
00:12:48,100 --> 00:12:53,558  
my vertebrate mind thinks that that's

267  
00:12:51,009 --> 00:12:57,308  
edible it's a berry and it's good for me

268  
00:12:53,558 --> 00:12:59,338  
but you are processing it you there's no

269  
00:12:57,308 --> 00:13:04,789  
one way of processing that information

270  
00:12:59,339 --> 00:13:06,080  
hmm right because red or green or blue

271  
00:13:04,789 --> 00:13:08,329

the color of a lot of different things

272

00:13:06,080 --> 00:13:11,060

Red's the color of a stop sign Red's the

273

00:13:08,330 --> 00:13:14,710

color of a jello shot

274

00:13:11,059 --> 00:13:18,519

so it's contextually how are you able to

275

00:13:14,710 --> 00:13:21,560

identify that that's that color is

276

00:13:18,519 --> 00:13:23,389

context ly tied to the symbol that it

277

00:13:21,559 --> 00:13:24,829

represents and there's a lot of

278

00:13:23,389 --> 00:13:26,330

different symbols and symbols mean

279

00:13:24,830 --> 00:13:28,580

different things throughout different

280

00:13:26,330 --> 00:13:34,160

cultures right right and so this concept

281

00:13:28,580 --> 00:13:37,129

of this concept of color as a so for

282

00:13:34,159 --> 00:13:40,669

example right we all think that the sky

283

00:13:37,129 --> 00:13:43,309

we obviously the sky is existed since

284

00:13:40,669 --> 00:13:45,229

the beginning of time beginning of time

285

00:13:43,309 --> 00:13:46,699

this is the beginning of Earth since the

286  
00:13:45,230 --> 00:13:49,100  
beginning of the planet this is the

287  
00:13:46,700 --> 00:13:50,780  
beginning of humans the sky has existed

288  
00:13:49,100 --> 00:13:51,769  
in pretty much the same way right I

289  
00:13:50,779 --> 00:13:55,039  
think we can all agree on that

290  
00:13:51,769 --> 00:13:57,549  
yes okay that means that the sky has

291  
00:13:55,039 --> 00:14:01,219  
been blue this whole time on good days

292  
00:13:57,549 --> 00:14:02,449  
yes yes yeah am I in yes yeah we're

293  
00:14:01,220 --> 00:14:04,790  
gonna buy in we're gonna say yeah the

294  
00:14:02,450 --> 00:14:07,820  
color blue has always been that color

295  
00:14:04,789 --> 00:14:12,409  
this whole time now the challenge though

296  
00:14:07,820 --> 00:14:14,000  
is that without other things to come so

297  
00:14:12,409 --> 00:14:17,929  
there's there's two ways to look at this

298  
00:14:14,000 --> 00:14:20,870  
thing this idea of color the color blue

299  
00:14:17,929 --> 00:14:24,289  
debate basically is coming about because

300  
00:14:20,870 --> 00:14:27,289  
it seems like the color blue the word

301  
00:14:24,289 --> 00:14:33,099  
for blue doesn't exist in cultures until

302  
00:14:27,289 --> 00:14:35,779  
a long time after they form right so the

303  
00:14:33,100 --> 00:14:40,279  
so a good example of this that's given

304  
00:14:35,779 --> 00:14:42,019  
is the Greeks right now supposedly in

305  
00:14:40,279 --> 00:14:45,049  
this book by Jules

306  
00:14:42,019 --> 00:14:49,370  
Davidoff or not dual Jules Davidoff this

307  
00:14:45,049 --> 00:14:50,479  
is a different book in this basically

308  
00:14:49,370 --> 00:14:52,070  
there's there was this book that was

309  
00:14:50,480 --> 00:14:56,899  
formed or this book that was written

310  
00:14:52,070 --> 00:14:59,510  
about the color blue right and seemingly

311  
00:14:56,899 --> 00:15:02,199  
that the color blue didn't exist in

312  
00:14:59,509 --> 00:15:04,100  
literature for quite some time right

313  
00:15:02,200 --> 00:15:06,920  
mm-hmm and so they said for instance

314

00:15:04,100 --> 00:15:11,960  
that um in Homer's Odyssey he describes

315  
00:15:06,919 --> 00:15:13,759  
the the ocean has wine dark right and he

316  
00:15:11,960 --> 00:15:16,519  
describes these other things in kind of

317  
00:15:13,759 --> 00:15:18,039  
these weird ways like you know he just

318  
00:15:16,519 --> 00:15:19,480  
doesn't seem to mesh

319  
00:15:18,039 --> 00:15:21,549  
the way that we think of things now so

320  
00:15:19,480 --> 00:15:23,710  
for instance this is a quote from the

321  
00:15:21,549 --> 00:15:25,629  
Sun the this is from the third book of

322  
00:15:23,710 --> 00:15:27,670  
the Odyssey where Homer talks about the

323  
00:15:25,629 --> 00:15:30,549  
ascent of the Sun God Helios he says and

324  
00:15:27,669 --> 00:15:33,459  
now the Sun leaving the beauteous water

325  
00:15:30,549 --> 00:15:35,679  
surface sprang up into the brazen heaven

326  
00:15:33,460 --> 00:15:38,080  
to give light to the more immortals and

327  
00:15:35,679 --> 00:15:40,719  
the mortal men on the earth he doesn't

328  
00:15:38,080 --> 00:15:43,240

mention the color blue the blue sky of

329

00:15:40,720 --> 00:15:45,570

the Greek islands right which we think

330

00:15:43,240 --> 00:15:48,190

of as being so stunningly obviously blue

331

00:15:45,570 --> 00:15:49,930

that for us calling it blue is like a

332

00:15:48,190 --> 00:15:52,960

second thing raised it's second nature

333

00:15:49,929 --> 00:15:54,759

almost right yeah and he also doesn't

334

00:15:52,960 --> 00:15:56,320

easily associate right and he also

335

00:15:54,759 --> 00:15:57,700

doesn't described the sea in that way

336

00:15:56,320 --> 00:16:00,550

this is another quote from the Odyssey

337

00:15:57,700 --> 00:16:02,830

he says quote him I saved when he was

338

00:16:00,549 --> 00:16:04,870

most writing the keel and all alone for

339

00:16:02,830 --> 00:16:07,150

Zeus had struck his Swift ship with his

340

00:16:04,870 --> 00:16:11,169

bright thunderbolt and had shattered it

341

00:16:07,149 --> 00:16:14,319

in the midst of the wine-dark sea again

342

00:16:11,169 --> 00:16:15,879

no mention of the color blue hmm that

343  
00:16:14,320 --> 00:16:17,560  
seemed weird to these guys and so they

344  
00:16:15,879 --> 00:16:19,230  
looked through Greek literature and

345  
00:16:17,559 --> 00:16:22,389  
found that actually there really was no

346  
00:16:19,230 --> 00:16:24,909  
mention of the color blue anywhere well

347  
00:16:22,389 --> 00:16:27,879  
and the Greek word so the Greeks did

348  
00:16:24,909 --> 00:16:30,579  
have words that could mean dark blue but

349  
00:16:27,879 --> 00:16:33,039  
they also represented other colors so

350  
00:16:30,580 --> 00:16:36,550  
their word for dark blue Cayenne 'us

351  
00:16:33,039 --> 00:16:41,019  
pianos could also mean dark green violet

352  
00:16:36,549 --> 00:16:45,779  
black brown which is kind of a pretty

353  
00:16:41,019 --> 00:16:49,299  
big swath of the spectrums right yeah

354  
00:16:45,779 --> 00:16:53,189  
and their word for light blue glucose

355  
00:16:49,299 --> 00:16:58,479  
could also be light green gray or yellow

356  
00:16:53,190 --> 00:17:00,310  
so kind of a fairly again that that

357  
00:16:58,480 --> 00:17:03,490  
doesn't really mean it doesn't really

358  
00:17:00,309 --> 00:17:07,720  
mean or is evocative of

359  
00:17:03,490 --> 00:17:11,199  
a of the Mediterranean water or of the

360  
00:17:07,720 --> 00:17:14,410  
sky in fact it could be for other colors

361  
00:17:11,199 --> 00:17:17,019  
just as easily yeah now this this really

362  
00:17:14,410 --> 00:17:19,209  
started with the book a studies on homer

363  
00:17:17,019 --> 00:17:22,119  
in the Homeric Age by william ewart

364  
00:17:19,209 --> 00:17:25,750  
gladstone and that book came out in 1858

365  
00:17:22,119 --> 00:17:27,549  
and it's not really a super well known

366  
00:17:25,750 --> 00:17:29,650  
book except for this except for this

367  
00:17:27,549 --> 00:17:31,750  
chapter this area where they talk about

368  
00:17:29,650 --> 00:17:34,600  
the problem of coloring

369  
00:17:31,750 --> 00:17:36,730  
Odyssey right and the problem of color

370  
00:17:34,599 --> 00:17:39,730  
in the ancient Greek you know writing

371

00:17:36,730 --> 00:17:41,559  
now we're gonna there is an interesting

372  
00:17:39,730 --> 00:17:43,450  
there's an interesting answer to this

373  
00:17:41,559 --> 00:17:46,119  
that actually I haven't even shared with

374  
00:17:43,450 --> 00:17:48,130  
you or des yet for this episode so I'm

375  
00:17:46,119 --> 00:17:49,839  
hoping I'm hoping that it'll just be

376  
00:17:48,130 --> 00:17:53,710  
like you know I'll flip the table over

377  
00:17:49,839 --> 00:17:55,149  
thing at the end here but then we'll all

378  
00:17:53,710 --> 00:17:56,500  
have jello shots I'm telling you this

379  
00:17:55,150 --> 00:17:58,750  
big great blue ones

380  
00:17:56,500 --> 00:18:00,819  
it's who this is running theme people

381  
00:17:58,750 --> 00:18:02,319  
it's and so this this led to a bunch of

382  
00:18:00,819 --> 00:18:04,000  
you know when this cop so this

383  
00:18:02,319 --> 00:18:06,669  
controversy kind of comes about pretty

384  
00:18:04,000 --> 00:18:08,950  
regularly almost kind of and so when it

385  
00:18:06,670 --> 00:18:11,560

came about more recently he wasn't in it

386

00:18:08,950 --> 00:18:14,259  
was in an article in Business Insider

387

00:18:11,559 --> 00:18:15,879  
right and it was it was titled no one

388

00:18:14,259 --> 00:18:17,950  
could describe the color blue until

389

00:18:15,880 --> 00:18:22,900  
modern times by Kevin Lauria who's

390

00:18:17,950 --> 00:18:24,279  
published in 2015 now that's again it's

391

00:18:22,900 --> 00:18:25,810  
it's saying that they couldn't have

392

00:18:24,279 --> 00:18:28,240  
described the color blue but wheat but

393

00:18:25,809 --> 00:18:30,549  
they they saw blue right right

394

00:18:28,240 --> 00:18:32,230  
they must have they must have seen the

395

00:18:30,549 --> 00:18:35,289  
color blue so then what are they talking

396

00:18:32,230 --> 00:18:36,940  
about here the culturally could not

397

00:18:35,289 --> 00:18:38,799  
describe the color blue or draw the

398

00:18:36,940 --> 00:18:42,720  
difference between blue and other colors

399

00:18:38,799 --> 00:18:46,690  
until they were able to replicate it in

400  
00:18:42,720 --> 00:18:48,160  
studies or from nature in studies okay

401  
00:18:46,690 --> 00:18:52,779  
so that's one that's one possibility

402  
00:18:48,160 --> 00:18:54,940  
right that they did not maybe so

403  
00:18:52,779 --> 00:18:58,359  
let me rephrase the argument a little

404  
00:18:54,940 --> 00:19:03,250  
bit the argument here would be that the

405  
00:18:58,359 --> 00:19:04,689  
Greeks had so few reasons to describe

406  
00:19:03,250 --> 00:19:07,630  
the color blue that they just didn't

407  
00:19:04,690 --> 00:19:13,059  
they used other colors right it's just

408  
00:19:07,630 --> 00:19:14,770  
like mmm not worth noticing yeah yeah I

409  
00:19:13,059 --> 00:19:16,960  
don't know it seems like there's a lot

410  
00:19:14,769 --> 00:19:20,920  
of blue out there you'd kind of you

411  
00:19:16,960 --> 00:19:22,269  
would think so thank you come up with

412  
00:19:20,920 --> 00:19:23,980  
something you'd think so but that is

413  
00:19:22,269 --> 00:19:27,519  
actually one argument that's made about

414  
00:19:23,980 --> 00:19:31,299  
this right that um that the color blue

415  
00:19:27,519 --> 00:19:33,039  
is sort of this like it was such a you

416  
00:19:31,299 --> 00:19:35,230  
know because really in nature besides

417  
00:19:33,039 --> 00:19:38,500  
the sea in the sky right

418  
00:19:35,230 --> 00:19:40,630  
what other Blues are there hmm

419  
00:19:38,500 --> 00:19:43,240  
well you don't see it food there's

420  
00:19:40,630 --> 00:19:45,549  
flowers maybe this and a lot of the

421  
00:19:43,240 --> 00:19:48,778  
flowers or light blues

422  
00:19:45,548 --> 00:19:51,759  
that are kind of closer to maybe greens

423  
00:19:48,778 --> 00:19:54,519  
or darker blues which are closer to

424  
00:19:51,759 --> 00:19:56,649  
Purple's yeah I would say that violet is

425  
00:19:54,519 --> 00:19:58,690  
definitely out there an uneven violets a

426  
00:19:56,648 --> 00:20:01,199  
hard one to find kind of in nature you

427  
00:19:58,690 --> 00:20:03,548  
think like red like red is only in blood

428

00:20:01,200 --> 00:20:05,769  
right really as far as I can tell in

429  
00:20:03,548 --> 00:20:08,829  
terms of like natural coloration red for

430  
00:20:05,769 --> 00:20:11,288  
blood and the main rocks right clay clay

431  
00:20:08,829 --> 00:20:13,178  
could have some soil that's close enough

432  
00:20:11,288 --> 00:20:15,069  
but blue but blue is a pretty hard

433  
00:20:13,179 --> 00:20:16,179  
pigment pigment to make right the only

434  
00:20:15,069 --> 00:20:21,038  
people that really had blue were the

435  
00:20:16,179 --> 00:20:22,840  
Egyptians hmm right so that's one which

436  
00:20:21,038 --> 00:20:24,970  
I think are still before the Middle Ages

437  
00:20:22,839 --> 00:20:26,858  
absolutely absolutely it's a wandering

438  
00:20:24,970 --> 00:20:30,819  
little bed we're a little bit a little

439  
00:20:26,858 --> 00:20:33,158  
bit before Murray so what are you need

440  
00:20:30,819 --> 00:20:35,259  
that they culturally didn't ever need to

441  
00:20:33,159 --> 00:20:37,389  
describe blue so they just didn't right

442  
00:20:35,259 --> 00:20:40,269

and actually that's a that's a spouse

443

00:20:37,388 --> 00:20:43,048

pretty that's that's kind of I think the

444

00:20:40,269 --> 00:20:45,190

position almost taken by most classical

445

00:20:43,048 --> 00:20:46,628

experts as far as I could tell in

446

00:20:45,190 --> 00:20:49,028

reading I don't know if you guys had the

447

00:20:46,628 --> 00:20:51,488

same experience pretty much where they

448

00:20:49,028 --> 00:20:53,589

argued that like for the Greeks color

449

00:20:51,489 --> 00:20:55,179

wasn't about the hue it was about the

450

00:20:53,589 --> 00:20:58,538

darkness or lightness of the color

451

00:20:55,179 --> 00:21:01,570

mm-hmm right and so to the Greeks saying

452

00:20:58,538 --> 00:21:03,308

that something was so this kind of gets

453

00:21:01,569 --> 00:21:04,658

into my table flipping moment almost but

454

00:21:03,308 --> 00:21:09,128

Oh God

455

00:21:04,659 --> 00:21:10,330

all right brace for it so okay so is it

456

00:21:09,128 --> 00:21:11,829

gonna be it's gonna be a reference to

457  
00:21:10,329 --> 00:21:16,449  
it's always sunny it won't be I promise

458  
00:21:11,829 --> 00:21:18,460  
not this time oh come on ma'am so V

459  
00:21:16,450 --> 00:21:20,379  
sleep at the wheel with those telling

460  
00:21:18,460 --> 00:21:22,119  
you but we're making Arrested

461  
00:21:20,378 --> 00:21:25,028  
Development references this time oh

462  
00:21:22,118 --> 00:21:32,829  
right because we blew ourselves that's

463  
00:21:25,028 --> 00:21:35,169  
right like Tobias dr. fume K Oh we're

464  
00:21:32,829 --> 00:21:36,878  
killing it right now we're killing it so

465  
00:21:35,169 --> 00:21:39,038  
this argument would be that the color

466  
00:21:36,878 --> 00:21:40,839  
blue so we have this argument that it's

467  
00:21:39,038 --> 00:21:42,339  
it's a cultural thing we also have

468  
00:21:40,839 --> 00:21:44,888  
another argument that's kind of silly

469  
00:21:42,339 --> 00:21:46,480  
which is that we we literally physically

470  
00:21:44,888 --> 00:21:50,108  
did not see the color blue like we were

471  
00:21:46,480 --> 00:21:50,940  
colorblind stare straight up no evidence

472  
00:21:50,108 --> 00:21:55,118  
for any of that

473  
00:21:50,940 --> 00:21:57,639  
ridiculousness well in science wise its

474  
00:21:55,118 --> 00:21:58,959  
disproven you have a certain amount of

475  
00:21:57,638 --> 00:22:01,990  
rods and cones that

476  
00:21:58,960 --> 00:22:04,240  
in that are you have yeah so you do see

477  
00:22:01,990 --> 00:22:08,140  
yeah now a mixture of these two ideas

478  
00:22:04,240 --> 00:22:10,559  
though is that human your brain the

479  
00:22:08,140 --> 00:22:12,430  
whether you actually perceive colors or

480  
00:22:10,559 --> 00:22:14,649  
categorize them in some ways is

481  
00:22:12,430 --> 00:22:18,279  
described by the way that you will you

482  
00:22:14,650 --> 00:22:19,900  
learn as a child right mm-hmm this is

483  
00:22:18,279 --> 00:22:21,819  
kind of the same argument that goes into

484  
00:22:19,900 --> 00:22:25,360  
you like nature versus nurture kind of

485

00:22:21,819 --> 00:22:27,309  
stuff right where if you had a kid if

486  
00:22:25,359 --> 00:22:29,859  
you if you had a if you had a child who

487  
00:22:27,309 --> 00:22:31,329  
lived in the jungle their entire you

488  
00:22:29,859 --> 00:22:34,000  
know with no human contact they just

489  
00:22:31,329 --> 00:22:36,579  
live like a wild existence you know

490  
00:22:34,000 --> 00:22:38,170  
almost like raised by wolves right would

491  
00:22:36,579 --> 00:22:41,019  
you be able to teach them language if

492  
00:22:38,170 --> 00:22:42,400  
you got them after the age of five right

493  
00:22:41,019 --> 00:22:44,500  
over the age of ten in the age of

494  
00:22:42,400 --> 00:22:47,680  
fifteen or right like where is the

495  
00:22:44,500 --> 00:22:52,630  
cutoff between being able to learn

496  
00:22:47,680 --> 00:22:55,900  
language versus not being able to write

497  
00:22:52,630 --> 00:22:59,200  
and then on top of that the question of

498  
00:22:55,900 --> 00:23:00,759  
is the way that we learn are the things

499  
00:22:59,200 --> 00:23:04,000

that are available to us from a young

500

00:23:00,759 --> 00:23:05,319

age that we get used to do those in some

501

00:23:04,000 --> 00:23:08,740

way shape the way that our brain

502

00:23:05,319 --> 00:23:11,200

perceives the world around us so is that

503

00:23:08,740 --> 00:23:13,200

is it the world itself that changes the

504

00:23:11,200 --> 00:23:15,730

way that we think so is our cognitive

505

00:23:13,200 --> 00:23:19,240

framework developed by the world around

506

00:23:15,730 --> 00:23:21,430

us or do we build the world around us or

507

00:23:19,240 --> 00:23:25,089

in a way that matches our cognitive

508

00:23:21,430 --> 00:23:27,400

framework right and so this argument

509

00:23:25,089 --> 00:23:29,589

part of this argument would be if you

510

00:23:27,400 --> 00:23:32,530

grew up without the notion that the

511

00:23:29,589 --> 00:23:34,449

color blue was a concept you might have

512

00:23:32,529 --> 00:23:37,149

a much harder time differentiating the

513

00:23:34,450 --> 00:23:39,400

color blue from greens and reds and

514  
00:23:37,150 --> 00:23:45,700  
yellows then someone who grew up with

515  
00:23:39,400 --> 00:23:47,140  
the color blue and in some ways that's

516  
00:23:45,700 --> 00:23:49,330  
actually in some ways that's actually

517  
00:23:47,140 --> 00:23:55,600  
borne out by the body by the research by

518  
00:23:49,329 --> 00:23:58,509  
the evidence right so they did studies

519  
00:23:55,599 --> 00:24:00,459  
with they did studies in Namibia where

520  
00:23:58,509 --> 00:24:02,288  
the Himba tribe this was done by Jules

521  
00:24:00,460 --> 00:24:04,750  
David off a psychologist from

522  
00:24:02,288 --> 00:24:06,429  
Goldsmith's University of London and so

523  
00:24:04,750 --> 00:24:09,009  
this this culture this this tribe

524  
00:24:06,429 --> 00:24:11,048  
doesn't have a does not have a word for

525  
00:24:09,009 --> 00:24:14,910  
blue and they don't make a distinction

526  
00:24:11,048 --> 00:24:17,889  
between green and blue right hmm and so

527  
00:24:14,910 --> 00:24:20,048  
this test basically was you have a big

528  
00:24:17,890 --> 00:24:21,580  
you know you have a bunch of green tiles

529  
00:24:20,048 --> 00:24:24,548  
then you have a blue tile in the center

530  
00:24:21,579 --> 00:24:26,019  
of them and trying to try to ask them

531  
00:24:24,548 --> 00:24:30,759  
well which tile is a different color

532  
00:24:26,019 --> 00:24:33,038  
here right and they were not able to

533  
00:24:30,759 --> 00:24:36,029  
tell the difference they could not get

534  
00:24:33,038 --> 00:24:38,679  
the blue tile from the green tile hmm

535  
00:24:36,029 --> 00:24:40,720  
suggesting that our color perception is

536  
00:24:38,679 --> 00:24:42,038  
linked to what we're taught and linked

537  
00:24:40,720 --> 00:24:44,230  
to our language and link to our

538  
00:24:42,038 --> 00:24:47,048  
literally link to how we're taught

539  
00:24:44,230 --> 00:24:48,370  
cognition right mm-hmm the event they've

540  
00:24:47,048 --> 00:24:51,548  
had other studies like this too so

541  
00:24:48,369 --> 00:24:54,189  
there's an MIT study in 2007 that showed

542

00:24:51,548 --> 00:24:57,038  
that native Russian speakers so there is

543  
00:24:54,190 --> 00:24:58,509  
no there is no word for blue and Russian

544  
00:24:57,038 --> 00:25:02,048  
there's a word for light blue in a world

545  
00:24:58,509 --> 00:25:05,019  
a word for dark blue and what they found

546  
00:25:02,048 --> 00:25:06,849  
was that actually these native Russians

547  
00:25:05,019 --> 00:25:08,619  
are have a much easier time

548  
00:25:06,849 --> 00:25:12,119  
distinguishing between light blue and

549  
00:25:08,619 --> 00:25:14,199  
dark blue then English speakers are so

550  
00:25:12,119 --> 00:25:16,538  
it's kind of a chicken and the egg thing

551  
00:25:14,200 --> 00:25:18,429  
if you don't have a word for the color

552  
00:25:16,538 --> 00:25:20,829  
blue you might not see the color blue as

553  
00:25:18,429 --> 00:25:21,940  
easily right and so you won't have the

554  
00:25:20,829 --> 00:25:23,889  
color blue you won't have the word for

555  
00:25:21,940 --> 00:25:27,100  
the color blue right and at the same

556  
00:25:23,890 --> 00:25:28,840

time that even if you did notice it even

557

00:25:27,099 --> 00:25:31,658

if you know functionally you were able

558

00:25:28,839 --> 00:25:33,699

to see the color blue you might not make

559

00:25:31,659 --> 00:25:36,549

a distinction between blue and black

560

00:25:33,700 --> 00:25:39,490

let's say or blue and purple or blue and

561

00:25:36,548 --> 00:25:42,808

dark or something if you'd if your brain

562

00:25:39,490 --> 00:25:47,409

wasn't trained to pick out that color

563

00:25:42,808 --> 00:25:49,389

hmm if it couldn't contextualise why

564

00:25:47,409 --> 00:25:50,890

picking out that color was important

565

00:25:49,390 --> 00:25:52,419

exactly draw a distinction from

566

00:25:50,890 --> 00:25:54,070

everything exactly it goes back to that

567

00:25:52,419 --> 00:25:56,500

initial thing that you said Marie which

568

00:25:54,069 --> 00:25:58,119

is people you know one of the eyes ideas

569

00:25:56,500 --> 00:26:00,369

of why we developed the ability to see

570

00:25:58,119 --> 00:26:02,949

color is because it helped us be better

571  
00:26:00,369 --> 00:26:05,918  
hunter-gatherers mm-hmm right helped us

572  
00:26:02,950 --> 00:26:08,769  
survive better we could if a plant was a

573  
00:26:05,919 --> 00:26:09,430  
bright color we would know not to eat it

574  
00:26:08,769 --> 00:26:14,009  
because it was

575  
00:26:09,430 --> 00:26:17,140  
poisonous right or whatever mm-hmm it's

576  
00:26:14,009 --> 00:26:18,789  
again though your brain is constantly

577  
00:26:17,140 --> 00:26:20,860  
like the things you see your brain is

578  
00:26:18,789 --> 00:26:23,159  
constantly filtering filtering out bad

579  
00:26:20,859 --> 00:26:26,559  
information or extraneous information

580  
00:26:23,160 --> 00:26:28,269  
right mm-hmm and it's the same reason

581  
00:26:26,559 --> 00:26:29,829  
that that stupid dress seems to be two

582  
00:26:28,269 --> 00:26:33,759  
different colors to different people

583  
00:26:29,829 --> 00:26:35,439  
right it's because your brain it's

584  
00:26:33,759 --> 00:26:37,720  
basically an optical illusion right your

585  
00:26:35,440 --> 00:26:39,190  
brain is kind of forgetting or not

586  
00:26:37,720 --> 00:26:41,350  
forgetting your brain is just ignoring

587  
00:26:39,190 --> 00:26:44,220  
the color blue because you've never

588  
00:26:41,349 --> 00:26:47,638  
trained your brain to see it

589  
00:26:44,220 --> 00:26:49,889  
or you have already made up your mind

590  
00:26:47,638 --> 00:26:52,408  
what color of a dress is going to be

591  
00:26:49,888 --> 00:26:54,750  
before you even see it maybe based on

592  
00:26:52,409 --> 00:26:56,759  
what you've read yeah absolutely

593  
00:26:54,750 --> 00:27:00,509  
so you're yourself yourself editing yeah

594  
00:26:56,759 --> 00:27:02,538  
which is yeah it's but it's so crazy

595  
00:27:00,509 --> 00:27:05,190  
because going back to the Greeks

596  
00:27:02,538 --> 00:27:07,288  
basically they're surrounded by the

597  
00:27:05,190 --> 00:27:10,500  
Mediterranean which is blue they're

598  
00:27:07,288 --> 00:27:14,220  
surrounded by sky which is blue but they

599

00:27:10,500 --> 00:27:16,200  
have no word for blue won't see so it's

600  
00:27:14,220 --> 00:27:19,679  
like is there almost is it almost like

601  
00:27:16,200 --> 00:27:22,528  
an if is it almost just too much blue

602  
00:27:19,679 --> 00:27:25,559  
and so is it just becomes either sea and

603  
00:27:22,528 --> 00:27:29,759  
sky and there it is agnostic about color

604  
00:27:25,558 --> 00:27:30,720  
okay which could be Homer Homer was the

605  
00:27:29,759 --> 00:27:33,569  
other one that came up with

606  
00:27:30,720 --> 00:27:36,240  
rosy-fingered dawn right which is what I

607  
00:27:33,569 --> 00:27:38,878  
remember from from all my early Greek

608  
00:27:36,240 --> 00:27:42,028  
texts from like a long time ago in

609  
00:27:38,878 --> 00:27:45,388  
college which speaks to like rosy finger

610  
00:27:42,028 --> 00:27:47,638  
so it's red in the sunrise but no no

611  
00:27:45,388 --> 00:27:49,408  
language around other around blue but

612  
00:27:47,638 --> 00:27:50,638  
you're about ready to flip the table so

613  
00:27:49,409 --> 00:27:53,519

hold on hold on

614

00:27:50,638 --> 00:27:57,199

flip it I'm embracing okay so this is

615

00:27:53,519 --> 00:28:00,269

from this is from this is from

616

00:27:57,200 --> 00:28:01,500

philosophers and the color blue mm-hmm

617

00:28:00,269 --> 00:28:04,019

okay

618

00:28:01,500 --> 00:28:07,919

this is chapter one of a of a book that

619

00:28:04,019 --> 00:28:10,230

I found online mm-hmm and so here is the

620

00:28:07,919 --> 00:28:13,830

quote that I'm gonna say here okay

621

00:28:10,230 --> 00:28:15,720

quote careful linguistic study has

622

00:28:13,829 --> 00:28:18,109

resolved this riddle by revealing that

623

00:28:15,720 --> 00:28:20,399

two ancient Greeks including Aristotle

624

00:28:18,109 --> 00:28:23,519

luminosity was more important than hue

625

00:28:20,398 --> 00:28:25,739

in characterizing color for example the

626

00:28:23,519 --> 00:28:27,419

Greek word MELAS and Lucas can be

627

00:28:25,740 --> 00:28:30,298

translated not only as black and white

628  
00:28:27,419 --> 00:28:32,278  
but also as dark and light the use of

629  
00:28:30,298 --> 00:28:34,619  
the color term cyan O's is equally

630  
00:28:32,278 --> 00:28:36,659  
ambiguous it is usually translated as

631  
00:28:34,619 --> 00:28:40,018  
blue and gave rise to our modern color

632  
00:28:36,659 --> 00:28:41,879  
term cyan mm-hmm cyanosis referred to a

633  
00:28:40,019 --> 00:28:43,769  
dark color in general and was used to

634  
00:28:41,878 --> 00:28:46,109  
describe emeralds but it could also

635  
00:28:43,769 --> 00:28:48,480  
manifest itself as a blue and could even

636  
00:28:46,109 --> 00:28:50,308  
mean black the difference between black

637  
00:28:48,480 --> 00:28:52,110  
and blue then was not so crucial to the

638  
00:28:50,308 --> 00:28:54,210  
Greeks it was much more important to

639  
00:28:52,109 --> 00:28:56,250  
them that blue bordered on black or dark

640  
00:28:54,210 --> 00:28:57,319  
and that both of them constituted the

641  
00:28:56,250 --> 00:28:59,720  
dark end of a scale

642  
00:28:57,319 --> 00:29:01,970  
colors if we keep this meaning of the

643  
00:28:59,720 --> 00:29:03,649  
word chaos in mind then much that is

644  
00:29:01,970 --> 00:29:05,690  
found in Greek literature becomes clear

645  
00:29:03,648 --> 00:29:08,388  
in a book on precious stones

646  
00:29:05,690 --> 00:29:11,360  
Aristotle's pupil Theophrastus describes

647  
00:29:08,388 --> 00:29:13,668  
the blue lapis lazuli as Keon owes

648  
00:29:11,359 --> 00:29:15,500  
colored homer's iliad on the other hand

649  
00:29:13,669 --> 00:29:18,259  
could describe not only the color of

650  
00:29:15,500 --> 00:29:20,990  
steel but also the probably black hair

651  
00:29:18,259 --> 00:29:23,450  
of King Priam some Hector as Keyon owes

652  
00:29:20,990 --> 00:29:26,509  
a cloak can also be can owes colored a

653  
00:29:23,450 --> 00:29:30,980  
dark-hued veil then which was no raiment

654  
00:29:26,509 --> 00:29:32,419  
more black end quote so the issue isn't

655  
00:29:30,980 --> 00:29:34,190  
that they didn't see black is that they

656

00:29:32,419 --> 00:29:36,980  
didn't describe it they just didn't care

657  
00:29:34,190 --> 00:29:39,889  
about the word for blue or they had no

658  
00:29:36,980 --> 00:29:43,009  
particular need for this stuff and

659  
00:29:39,888 --> 00:29:47,628  
actually this comes back to Aristotle's

660  
00:29:43,009 --> 00:29:50,210  
theory of colors right so on Aristotle's

661  
00:29:47,628 --> 00:29:53,558  
on the census he describes a number of

662  
00:29:50,210 --> 00:29:55,548  
colors and he he breaks them up into

663  
00:29:53,558 --> 00:29:58,128  
basically he breaks them up into the

664  
00:29:55,548 --> 00:29:59,778  
darken or the or the light end right and

665  
00:29:58,128 --> 00:30:02,808  
so the color scale went from white

666  
00:29:59,778 --> 00:30:04,730  
yellow red purple green blue and black

667  
00:30:02,808 --> 00:30:10,158  
and he actually does specifically

668  
00:30:04,730 --> 00:30:12,919  
describe blue hmm okay now this is a

669  
00:30:10,159 --> 00:30:14,210  
quote from on the census quote one

670  
00:30:12,919 --> 00:30:16,100

possibility is that white and black

671

00:30:14,210 --> 00:30:17,778

particles alternate in such a way that

672

00:30:16,099 --> 00:30:20,178

while each by itself is invisible

673

00:30:17,778 --> 00:30:22,759

because of its smallness the compound of

674

00:30:20,179 --> 00:30:24,889

the two is visible this cannot appear

675

00:30:22,759 --> 00:30:26,929

either as white or as black but since it

676

00:30:24,888 --> 00:30:29,089

must have some color and cannot have

677

00:30:26,929 --> 00:30:31,610

either of these it must evidently be

678

00:30:29,089 --> 00:30:33,769

some kind of mixture ie some other kind

679

00:30:31,609 --> 00:30:35,449

of color it is thus possible to believe

680

00:30:33,769 --> 00:30:37,399

that there are more colors than just

681

00:30:35,450 --> 00:30:38,389

white and black and that their number is

682

00:30:37,398 --> 00:30:40,939

due to the proportion of their

683

00:30:38,388 --> 00:30:43,428

components and so what he basically did

684

00:30:40,940 --> 00:30:46,370

was he said okay well we're gonna call

685  
00:30:43,429 --> 00:30:47,960  
white is pure white particles and then

686  
00:30:46,369 --> 00:30:51,288  
yellow would be a lot of white and a

687  
00:30:47,960 --> 00:30:53,538  
little bit of black red would be you

688  
00:30:51,288 --> 00:30:55,849  
know slightly more black but still

689  
00:30:53,538 --> 00:30:58,308  
mostly white purple would be the equal

690  
00:30:55,849 --> 00:31:02,740  
mixing of the two and then the other way

691  
00:30:58,308 --> 00:31:06,288  
right mm-hmm and so Aristotle had

692  
00:31:02,740 --> 00:31:08,269  
Aristotle had actually a color wheel

693  
00:31:06,288 --> 00:31:11,089  
that included blue and included violet

694  
00:31:08,269 --> 00:31:14,269  
included green red yellow and

695  
00:31:11,089 --> 00:31:16,279  
actually Theophrastus specifically goes

696  
00:31:14,269 --> 00:31:18,230  
into this a little bit more when he

697  
00:31:16,279 --> 00:31:20,930  
talks about the cut he specifically

698  
00:31:18,230 --> 00:31:23,660  
discusses the color of the sky and the

699  
00:31:20,930 --> 00:31:27,230  
color of the ocean and how the reason

700  
00:31:23,660 --> 00:31:30,259  
that the the sky itself appears to be

701  
00:31:27,230 --> 00:31:32,809  
blue just like the ocean it's because

702  
00:31:30,259 --> 00:31:35,049  
water and air are mixed together in some

703  
00:31:32,809 --> 00:31:37,240  
way in the sky

704  
00:31:35,049 --> 00:31:39,039  
right so it's it's actually injection

705  
00:31:37,240 --> 00:31:41,529  
and pretty close actually really

706  
00:31:39,039 --> 00:31:43,059  
interesting right and and so what I

707  
00:31:41,529 --> 00:31:44,470  
found to be most fascinating about these

708  
00:31:43,059 --> 00:31:45,039  
theories that the color blue didn't

709  
00:31:44,470 --> 00:31:47,860  
exist

710  
00:31:45,039 --> 00:31:49,629  
was just like the absolute lack of read

711  
00:31:47,859 --> 00:31:52,479  
it like the absolute lack of reading

712  
00:31:49,630 --> 00:31:54,580  
that was done cuz like Aristotle is like

713

00:31:52,480 --> 00:31:57,640  
one of three Greeks everyone is

714  
00:31:54,579 --> 00:31:59,409  
heard about I mean like how did you miss

715  
00:31:57,640 --> 00:32:01,930  
Aristotle when you were looking for

716  
00:31:59,410 --> 00:32:03,700  
colors he's literally has a book called

717  
00:32:01,930 --> 00:32:06,370  
on the census where he describes the

718  
00:32:03,700 --> 00:32:08,140  
rainbow and the color wheel and he talks

719  
00:32:06,369 --> 00:32:11,439  
about blue and purple and green like

720  
00:32:08,140 --> 00:32:14,250  
it's fascinating to me like it's just a

721  
00:32:11,440 --> 00:32:18,100  
swing and a miss hard swing and a miss

722  
00:32:14,250 --> 00:32:20,170  
bad work business insider bad work not

723  
00:32:18,099 --> 00:32:23,500  
great well maybe business insight I mean

724  
00:32:20,170 --> 00:32:25,269  
I if I look if I can logic dictates if

725  
00:32:23,500 --> 00:32:27,400  
it's called Business Insider they're

726  
00:32:25,269 --> 00:32:30,240  
probably not gonna be too sharp on the

727  
00:32:27,400 --> 00:32:33,370

whole color thing not science insider

728

00:32:30,240 --> 00:32:35,769

not nature and they're not alone there's

729

00:32:33,369 --> 00:32:37,389

so many of these articles out there oh

730

00:32:35,769 --> 00:32:40,269

my goodness is a huge number of them

731

00:32:37,390 --> 00:32:41,890

right no the the thing that I actually

732

00:32:40,269 --> 00:32:43,569

think the part of this I think is

733

00:32:41,890 --> 00:32:45,160

actually relevant and really interesting

734

00:32:43,569 --> 00:32:47,559

still regardless of the fact that yes

735

00:32:45,160 --> 00:32:50,740

they had blue you know we've had blue

736

00:32:47,559 --> 00:32:53,200

forever is the idea of like the cultural

737

00:32:50,740 --> 00:32:54,549

stuff that we were getting into right

738

00:32:53,200 --> 00:32:56,710

yeah absolutely

739

00:32:54,549 --> 00:33:01,480

Marie you brought up a great point which

740

00:32:56,710 --> 00:33:06,220

was you know blue wasn't very common

741

00:33:01,480 --> 00:33:07,779

right no and so like where did we find

742  
00:33:06,220 --> 00:33:10,450  
blue in the ancient world really i mean

743  
00:33:07,779 --> 00:33:11,710  
of course the sea and the sky but think

744  
00:33:10,450 --> 00:33:15,580  
about it like if you were living in

745  
00:33:11,710 --> 00:33:19,170  
england during the Middle Ages you know

746  
00:33:15,579 --> 00:33:22,000  
you might not ever see the ocean right

747  
00:33:19,170 --> 00:33:24,220  
and even if you did it would appear to

748  
00:33:22,000 --> 00:33:25,660  
be it would appear to be dark it would

749  
00:33:24,220 --> 00:33:28,299  
not appear to be blue it's not like a

750  
00:33:25,660 --> 00:33:31,210  
Caribbean blue right it said it would be

751  
00:33:28,299 --> 00:33:34,329  
very rare to see the color blue

752  
00:33:31,210 --> 00:33:35,200  
especially especially in the in the

753  
00:33:34,329 --> 00:33:39,970  
Middle Ages

754  
00:33:35,200 --> 00:33:42,580  
and if something is rare scarce it is by

755  
00:33:39,970 --> 00:33:45,880  
Nature again if you're talking you know

756  
00:33:42,579 --> 00:33:48,538  
if we if we go with Business Insider if

757  
00:33:45,880 --> 00:33:53,519  
it's rare and scarce it's more valuable

758  
00:33:48,538 --> 00:33:59,848  
so within the Middle Ages the color blue

759  
00:33:53,519 --> 00:34:04,739  
is now used more to denote wealth and

760  
00:33:59,848 --> 00:34:07,979  
nobility sure right so in they've it

761  
00:34:04,739 --> 00:34:12,829  
looks like they were able to cultivate I

762  
00:34:07,979 --> 00:34:18,210  
believe in France England and Germany a

763  
00:34:12,829 --> 00:34:20,909  
flower okay the word flower hmm

764  
00:34:18,210 --> 00:34:24,210  
which is a flowering plant native to the

765  
00:34:20,909 --> 00:34:28,528  
Mediterranean so they were able to use

766  
00:34:24,210 --> 00:34:31,980  
this this road this flowering plant to

767  
00:34:28,528 --> 00:34:36,480  
create dyes but again very in very

768  
00:34:31,980 --> 00:34:38,940  
scarce very scarce production and so

769  
00:34:36,480 --> 00:34:41,878  
they were able to so the Kings at this

770

00:34:38,940 --> 00:34:45,148  
time were blue all the way into the 15th

771  
00:34:41,878 --> 00:34:50,568  
century where you see Charlemagne and

772  
00:34:45,148 --> 00:34:57,058  
Louis quatorze you know with you know

773  
00:34:50,568 --> 00:35:00,420  
blue blue silk cushions blue robes blue

774  
00:34:57,059 --> 00:35:04,140  
and gold together signifying wealth and

775  
00:35:00,420 --> 00:35:05,309  
power and prestige so it's sort of like

776  
00:35:04,139 --> 00:35:07,949  
mm-hmm

777  
00:35:05,309 --> 00:35:09,359  
it's literally it's I mean it's

778  
00:35:07,949 --> 00:35:10,469  
literally because it's impossible to get

779  
00:35:09,358 --> 00:35:12,750  
yes right

780  
00:35:10,469 --> 00:35:16,949  
it requires a huge amount of this this

781  
00:35:12,750 --> 00:35:19,768  
plant to create the color blue right and

782  
00:35:16,949 --> 00:35:22,588  
the idea to but it's there's a scarcity

783  
00:35:19,768 --> 00:35:24,899  
of it in everywhere around you right cuz

784  
00:35:22,588 --> 00:35:28,670

again like if food is blue you're not

785

00:35:24,900 --> 00:35:28,670  
going to eat it because it is bad

786

00:35:34,440 --> 00:35:42,139  
yes blue ray agreed you see science can

787

00:35:38,130 --> 00:35:45,059  
stop there with 711s blue raspberry um

788

00:35:42,139 --> 00:35:46,949  
but yeah like so if it's food it's not

789

00:35:45,059 --> 00:35:50,579  
gonna be good if it's if it's a flower

790

00:35:46,949 --> 00:35:53,759  
it's perishable if it's a gem it's even

791

00:35:50,579 --> 00:35:55,680  
more rare and more valuable and again

792

00:35:53,759 --> 00:35:58,528  
like the water of the sky there's not a

793

00:35:55,679 --> 00:36:01,828  
lot of ways to get to or make blue so it

794

00:35:58,528 --> 00:36:05,608  
becomes the symbol of of

795

00:36:01,829 --> 00:36:08,400  
of rarity of refinements and ergo power

796

00:36:05,608 --> 00:36:11,009  
within within the Middle Ages and going

797

00:36:08,400 --> 00:36:13,108  
forward kind of see a little bit of a

798

00:36:11,009 --> 00:36:14,608  
change you know moving into the

799

00:36:13,108 --> 00:36:17,818

Renaissance where and again you're

800

00:36:14,608 --> 00:36:21,239

you're able to have more access having

801

00:36:17,818 --> 00:36:24,659

more access to pigments but blue becomes

802

00:36:21,239 --> 00:36:27,778

moves from sort of a social status of

803

00:36:24,659 --> 00:36:31,920

power and nobility almost to the

804

00:36:27,778 --> 00:36:35,278

ethereal or the the Virgin Mary shares

805

00:36:31,920 --> 00:36:40,680

often seen dressed in blue so again it's

806

00:36:35,278 --> 00:36:42,989

representing purity or humility the

807

00:36:40,679 --> 00:36:45,449

divine is now blue which is again more

808

00:36:42,989 --> 00:36:49,039

of an association of the vast sky and

809

00:36:45,449 --> 00:36:52,338

sort of this this larger than human

810

00:36:49,039 --> 00:36:56,969

color you don't actually it strikes me

811

00:36:52,338 --> 00:37:00,630

really oddly is can you mat like can you

812

00:36:56,969 --> 00:37:02,369

imagine we often see this with there's a

813  
00:37:00,630 --> 00:37:04,289  
lot of this is kind of an interesting

814  
00:37:02,369 --> 00:37:06,660  
like I'm not really an obstacle illusion

815  
00:37:04,289 --> 00:37:07,979  
with this idea of a new color or a color

816  
00:37:06,659 --> 00:37:10,858  
you've never seen before

817  
00:37:07,978 --> 00:37:14,129  
mm-hm right and there actually is a test

818  
00:37:10,858 --> 00:37:16,078  
that you can do like something like if

819  
00:37:14,130 --> 00:37:17,249  
you there's an optical illusion that you

820  
00:37:16,079 --> 00:37:19,019  
can do it's on the Internet

821  
00:37:17,248 --> 00:37:20,338  
that's where I saw it a camera or the

822  
00:37:19,018 --> 00:37:23,189  
exact name of it at the moment but it's

823  
00:37:20,338 --> 00:37:26,608  
basically if you're if you if you close

824  
00:37:23,190 --> 00:37:29,519  
your eye and you look at like a red like

825  
00:37:26,608 --> 00:37:31,469  
a very very bright red square you just

826  
00:37:29,518 --> 00:37:34,139  
stare at it and you close that eye and

827

00:37:31,469 --> 00:37:36,088  
you look at a very very dark blue square

828  
00:37:34,139 --> 00:37:37,858  
and then you open up both of your eyes

829  
00:37:36,088 --> 00:37:40,318  
and try to focus it like a center point

830  
00:37:37,858 --> 00:37:41,639  
between the two the colors will merge

831  
00:37:40,318 --> 00:37:44,608  
and it will actually create a new color

832  
00:37:41,639 --> 00:37:47,038  
that you've never perceived before and

833  
00:37:44,608 --> 00:37:51,208  
the reason that it happens is something

834  
00:37:47,039 --> 00:37:54,809  
like your eye your eye isn't your I

835  
00:37:51,208 --> 00:37:57,358  
can't your eyes can't get that color

836  
00:37:54,809 --> 00:37:59,309  
that hue on its own like if it was just

837  
00:37:57,358 --> 00:38:01,170  
on a piece of paper or something but

838  
00:37:59,309 --> 00:38:03,839  
your brain will mix them together to

839  
00:38:01,170 --> 00:38:05,068  
make something new it's right something

840  
00:38:03,838 --> 00:38:07,708  
I don't even know if it's true or not

841  
00:38:05,068 --> 00:38:10,619

but the thing so I'm just spewing

842

00:38:07,708 --> 00:38:12,088  
or listeners but the thing the

843

00:38:10,619 --> 00:38:14,050  
thing I find fascinating though I mean

844

00:38:12,088 --> 00:38:17,710  
imagine Srman

845

00:38:14,050 --> 00:38:22,660  
Hey imagine you're a peasant in you know

846

00:38:17,710 --> 00:38:25,269  
I don't know 14th century England and

847

00:38:22,659 --> 00:38:28,089  
the King comes and he's wearing a deep

848

00:38:25,269 --> 00:38:29,130  
blue robe that is a color you've never

849

00:38:28,090 --> 00:38:32,260  
seen before

850

00:38:29,130 --> 00:38:35,920  
mm-hmm really right like even if you've

851

00:38:32,260 --> 00:38:37,600  
seen light blue because the sky you

852

00:38:35,920 --> 00:38:41,470  
might not have ever seen like a deep

853

00:38:37,599 --> 00:38:45,009  
navy blue or royal blue that's me is I

854

00:38:41,469 --> 00:38:46,659  
mean that in itself was probably a like

855

00:38:45,010 --> 00:38:49,540  
an ethereal experience of just being

856  
00:38:46,659 --> 00:38:53,170  
like I don't know having something so

857  
00:38:49,539 --> 00:38:56,009  
completely new right in your vineyard

858  
00:38:53,170 --> 00:38:58,840  
vision a sense that we take for granted

859  
00:38:56,010 --> 00:39:00,580  
mm-hmm you know yeah agreed

860  
00:38:58,840 --> 00:39:02,050  
I find it fancy I mean it's amazing it's

861  
00:39:00,579 --> 00:39:05,259  
so it's so weird

862  
00:39:02,050 --> 00:39:08,140  
and even more recently though Yves Klein

863  
00:39:05,260 --> 00:39:12,730  
yeah the artist the French artist which

864  
00:39:08,139 --> 00:39:17,500  
has like he actually so French artist

865  
00:39:12,730 --> 00:39:20,829  
painter worked and perfected what he

866  
00:39:17,500 --> 00:39:22,690  
considered and what I would say modern

867  
00:39:20,829 --> 00:39:24,880  
art historians to this day would

868  
00:39:22,690 --> 00:39:29,860  
consider the purest blue of all which is

869  
00:39:24,880 --> 00:39:33,550  
called Klein blue and it's this it's

870  
00:39:29,860 --> 00:39:37,349  
almost painful to look at because it is

871  
00:39:33,550 --> 00:39:39,940  
this deep ultramarine and it is it is it

872  
00:39:37,349 --> 00:39:42,279  
literally makes the back of your teeth

873  
00:39:39,940 --> 00:39:45,579  
her and your eyeballs shake if you look

874  
00:39:42,280 --> 00:39:49,180  
at it too long it's so it's such an

875  
00:39:45,579 --> 00:39:54,849  
intense color even like so he did this

876  
00:39:49,179 --> 00:39:57,909  
between like 1947 and 1957 so for a

877  
00:39:54,849 --> 00:40:00,730  
decade this you know this French artist

878  
00:39:57,909 --> 00:40:03,159  
worked on perfecting this the color blue

879  
00:40:00,730 --> 00:40:07,809  
and he would just do huge wide swaths of

880  
00:40:03,159 --> 00:40:09,099  
it on camp on canvas and even now like

881  
00:40:07,809 --> 00:40:10,840  
if you see it and if you see it

882  
00:40:09,099 --> 00:40:13,179  
replicated cuz of course it is now

883  
00:40:10,840 --> 00:40:16,750  
trademarked and it's you know it's

884

00:40:13,179 --> 00:40:20,739  
probably a Pantone color if you see it

885  
00:40:16,750 --> 00:40:23,079  
it is so visually different than other

886  
00:40:20,739 --> 00:40:25,599  
blue but it's it is almost physically

887  
00:40:23,079 --> 00:40:27,309  
jarring yeah and it's very cool but it's

888  
00:40:25,599 --> 00:40:27,630  
like I don't know if you'd want to suit

889  
00:40:27,309 --> 00:40:31,529  
me

890  
00:40:27,630 --> 00:40:33,150  
out of that it is it's really weird you

891  
00:40:31,530 --> 00:40:38,550  
know and it's such an again it's such a

892  
00:40:33,150 --> 00:40:40,440  
strange concept of yeah I don't know

893  
00:40:38,550 --> 00:40:41,670  
it's such a weird thing it's such a

894  
00:40:40,440 --> 00:40:44,159  
weird thing Klein

895  
00:40:41,670 --> 00:40:47,340  
yeah Klein himself even said his blue

896  
00:40:44,159 --> 00:40:49,319  
was extra dimensional and that it would

897  
00:40:47,340 --> 00:40:51,930  
like if you looked at it long enough it

898  
00:40:49,320 --> 00:40:53,970

would take you outside of your body and

899

00:40:51,929 --> 00:40:58,049

outside of the canvas so it was almost

900

00:40:53,969 --> 00:41:01,619

like a meditative an extreme meditative

901

00:40:58,050 --> 00:41:04,500

state but this color could actually

902

00:41:01,619 --> 00:41:07,529

drive you to which you know four colors

903

00:41:04,500 --> 00:41:10,050

is really you know something you don't

904

00:41:07,530 --> 00:41:11,670

think about necessarily but it's still

905

00:41:10,050 --> 00:41:13,140

really fascinating well you know it

906

00:41:11,670 --> 00:41:17,970

reminds me of have you guys heard of

907

00:41:13,139 --> 00:41:20,819

vantablack yet or vantablack no okay

908

00:41:17,969 --> 00:41:24,480

so vantablack is a it's a trademarked

909

00:41:20,820 --> 00:41:26,640

material it is owned by serene a no

910

00:41:24,480 --> 00:41:29,519

system is limited and basically what it

911

00:41:26,639 --> 00:41:32,670

is is it's it is the darkest material

912

00:41:29,519 --> 00:41:36,239

ever created and I mean that I mean that

913  
00:41:32,670 --> 00:41:40,980  
literally it absorbs something like it

914  
00:41:36,239 --> 00:41:44,119  
absorbs something like 99.97% of visible

915  
00:41:40,980 --> 00:41:49,740  
radiation mm-hm

916  
00:41:44,119 --> 00:41:52,039  
extremely toxic voids so you couldn't

917  
00:41:49,739 --> 00:41:56,429  
use it as black out NoHo it's super

918  
00:41:52,039 --> 00:41:58,230  
super super super what's it it's it's

919  
00:41:56,429 --> 00:42:00,629  
pretty pretty dangerous so what it is

920  
00:41:58,230 --> 00:42:02,460  
vantaa stands for so first off let's get

921  
00:42:00,630 --> 00:42:04,410  
it a little bit into how color is

922  
00:42:02,460 --> 00:42:05,639  
perceived I guess or like we got into it

923  
00:42:04,409 --> 00:42:07,469  
a bit we got it we got into it pretty

924  
00:42:05,639 --> 00:42:11,779  
well in the beginning um thanks to

925  
00:42:07,469 --> 00:42:14,429  
Murray's hard hard detective work but um

926  
00:42:11,780 --> 00:42:20,190  
talking about eyeballs about eyeballs

927

00:42:14,429 --> 00:42:21,960

again take that sorry dear list you're

928

00:42:20,190 --> 00:42:23,789

squeamish listeners out there of which

929

00:42:21,960 --> 00:42:26,820

we have a few so the way the way that a

930

00:42:23,789 --> 00:42:28,110

material has a color is it's interesting

931

00:42:26,820 --> 00:42:30,600

because again this is a bigger

932

00:42:28,110 --> 00:42:31,620

philosophical question so there's

933

00:42:30,599 --> 00:42:34,949

actually kind of an interesting quote

934

00:42:31,619 --> 00:42:38,839

that I wanted to read that was this is

935

00:42:34,949 --> 00:42:41,500

from Galileo right so he he writes in

936

00:42:38,840 --> 00:42:45,608

yellow statutory or the

937

00:42:41,500 --> 00:42:47,530

the assayer he says quote colors hold

938

00:42:45,608 --> 00:42:49,750

their resistance solely in the sensitive

939

00:42:47,530 --> 00:42:51,730

body so that I have the animal were

940

00:42:49,750 --> 00:42:54,460

removed every such quality would be

941

00:42:51,730 --> 00:42:57,340  
abolished and annihilated so in other

942  
00:42:54,460 --> 00:43:00,070  
words Galileo believed that color was

943  
00:42:57,340 --> 00:43:03,460  
not a physical quality it was purely a

944  
00:43:00,070 --> 00:43:05,380  
conscious quality of human so we gave

945  
00:43:03,460 --> 00:43:08,470  
things color things did not have color

946  
00:43:05,380 --> 00:43:10,450  
on their own mm-hmm right so it's kind

947  
00:43:08,469 --> 00:43:12,719  
of that question of so Galileo in other

948  
00:43:10,449 --> 00:43:14,649  
words was not a was it was a color

949  
00:43:12,719 --> 00:43:17,469  
functionalist I guess as opposed to a

950  
00:43:14,650 --> 00:43:20,079  
color realist right so the color

951  
00:43:17,469 --> 00:43:22,209  
realists believed that objects had color

952  
00:43:20,079 --> 00:43:24,489  
regardless of humans perceiving that

953  
00:43:22,210 --> 00:43:28,179  
color mm-hmm right so what is what is

954  
00:43:24,489 --> 00:43:29,618  
red red is literally a physical quality

955  
00:43:28,179 --> 00:43:32,289

of an object as opposed to being

956

00:43:29,619 --> 00:43:34,030

something that we perceive but the non

957

00:43:32,289 --> 00:43:36,250

realists the functionalist would say

958

00:43:34,030 --> 00:43:38,440

that color actually only really has

959

00:43:36,250 --> 00:43:42,599

meaning in the way that we perceive it

960

00:43:38,440 --> 00:43:44,769

but again because we very we so often

961

00:43:42,599 --> 00:43:46,838

don't talk about the way that we

962

00:43:44,769 --> 00:43:48,190

actually cognate or you know we don't

963

00:43:46,838 --> 00:43:49,588

often talk about the way that we

964

00:43:48,190 --> 00:43:53,470

actually think about the world

965

00:43:49,588 --> 00:43:58,420

mechanically it's very hard to pinpoint

966

00:43:53,469 --> 00:44:02,348

exactly what is red versus maroon versus

967

00:43:58,420 --> 00:44:05,829

purple versus blue right um and a good

968

00:44:02,349 --> 00:44:08,019

example this is when you think when you

969

00:44:05,829 --> 00:44:10,380

have a thought Murray or or DES listen

970  
00:44:08,019 --> 00:44:14,559  
let's desk you didn't say anything yet

971  
00:44:10,380 --> 00:44:16,470  
des when you think of something do you

972  
00:44:14,559 --> 00:44:20,019  
see it in your when you have an idea

973  
00:44:16,469 --> 00:44:22,989  
right like I know I need to get I need

974  
00:44:20,019 --> 00:44:25,630  
to get orange juice right or I want

975  
00:44:22,989 --> 00:44:27,279  
orange juice mechanically what does that

976  
00:44:25,630 --> 00:44:32,470  
look like in your head would describe

977  
00:44:27,280 --> 00:44:35,769  
that process to us interesting um for me

978  
00:44:32,469 --> 00:44:38,259  
it's probably a list like I see it like

979  
00:44:35,769 --> 00:44:40,119  
I see the word okay okay

980  
00:44:38,260 --> 00:44:42,910  
no no so that's good let's just go you

981  
00:44:40,119 --> 00:44:45,070  
so you see you see the word I need

982  
00:44:42,909 --> 00:44:47,618  
orange juice you see that word weird

983  
00:44:45,070 --> 00:44:51,010  
like yeah like just orange juice okay

984  
00:44:47,619 --> 00:44:53,190  
Murray how about you well I would then

985  
00:44:51,010 --> 00:44:55,640  
say but you're going to put together

986  
00:44:53,190 --> 00:44:59,929  
like in your cosplay

987  
00:44:55,639 --> 00:45:01,309  
then I see like the amethyst yes you see

988  
00:44:59,929 --> 00:45:03,169  
so when you're like okay I have to do

989  
00:45:01,309 --> 00:45:07,150  
amethyst what's like do you see the

990  
00:45:03,170 --> 00:45:09,400  
color then oh absolutely whenever and

991  
00:45:07,150 --> 00:45:11,930  
probably even more when I'm creating

992  
00:45:09,400 --> 00:45:14,269  
anything like when I'm drawing something

993  
00:45:11,929 --> 00:45:19,399  
or something like creating cosplay like

994  
00:45:14,269 --> 00:45:21,409  
I can have a pile of random crap and I

995  
00:45:19,400 --> 00:45:24,530  
can see the finished product in my head

996  
00:45:21,409 --> 00:45:26,359  
okay and the color right the color

997  
00:45:24,530 --> 00:45:28,940  
though everything how it all mesh

998

00:45:26,360 --> 00:45:30,769  
interesting see now on the other hand

999  
00:45:28,940 --> 00:45:33,349  
which is sort of both right because

1000  
00:45:30,769 --> 00:45:35,690  
she's seeing it as she's seeing orange

1001  
00:45:33,349 --> 00:45:39,860  
juice as literally quicklist because I'm

1002  
00:45:35,690 --> 00:45:44,030  
a London list right which is very linear

1003  
00:45:39,860 --> 00:45:46,970  
so you're kind of saying yeah now on the

1004  
00:45:44,030 --> 00:45:50,380  
other hand I hear that in my head really

1005  
00:45:46,969 --> 00:45:53,829  
I I actually have a really hard time

1006  
00:45:50,380 --> 00:45:56,420  
like pinning down images in my head

1007  
00:45:53,829 --> 00:45:59,659  
never really hard time doing that but I

1008  
00:45:56,420 --> 00:46:01,250  
can hear things like I hear things it

1009  
00:45:59,659 --> 00:46:04,219  
when I ever thought it's my own voice

1010  
00:46:01,250 --> 00:46:06,590  
saying that thought to me I don't get

1011  
00:46:04,219 --> 00:46:08,179  
like a good image I don't get a vision

1012  
00:46:06,590 --> 00:46:09,829

anything like that it's my own its

1013

00:46:08,179 --> 00:46:11,119

unless it's something I'm specifically

1014

00:46:09,829 --> 00:46:12,769

trying to remember the look of or

1015

00:46:11,119 --> 00:46:14,690

something like that and even then I have

1016

00:46:12,769 --> 00:46:17,420

a hard time with that it is always a

1017

00:46:14,690 --> 00:46:21,250

there's always a word or a saying or a

1018

00:46:17,420 --> 00:46:24,470

sound or something yeah see dressed and

1019

00:46:21,250 --> 00:46:26,980

we it's all context so in here kind of

1020

00:46:24,469 --> 00:46:29,059

also based on how your neurology is

1021

00:46:26,980 --> 00:46:30,829

scrambled up and yeah absolutely but

1022

00:46:29,059 --> 00:46:32,299

that's the thing we don't ever talk

1023

00:46:30,829 --> 00:46:35,569

about that kind of stuff to other people

1024

00:46:32,300 --> 00:46:40,400

so like you you know it was one of the

1025

00:46:35,570 --> 00:46:42,950

weirdest things for me was reading the

1026

00:46:40,400 --> 00:46:49,099

reading like existential philosophy as a

1027  
00:46:42,949 --> 00:46:50,659  
freshman in college and thinking how we

1028  
00:46:49,099 --> 00:46:52,190  
were talking about how you know people

1029  
00:46:50,659 --> 00:46:53,929  
were reading these books and being like

1030  
00:46:52,190 --> 00:46:55,490  
I just don't understand what they're

1031  
00:46:53,929 --> 00:46:57,769  
saying cuz like I don't think that way

1032  
00:46:55,489 --> 00:47:00,799  
and I was like I think that way that's

1033  
00:46:57,769 --> 00:47:03,110  
exactly how I think right and getting

1034  
00:47:00,800 --> 00:47:04,730  
into the sense of like you know how does

1035  
00:47:03,110 --> 00:47:06,650  
someone else's brain actually operate

1036  
00:47:04,730 --> 00:47:08,960  
that's a really interesting question but

1037  
00:47:06,650 --> 00:47:11,420  
anyways it's an interesting

1038  
00:47:08,960 --> 00:47:12,530  
experiment ask ask the bartender next

1039  
00:47:11,420 --> 00:47:14,240  
time you're in a bar and really freak

1040  
00:47:12,530 --> 00:47:16,550  
him or her out and then get kicked out

1041  
00:47:14,239 --> 00:47:19,659  
of the bar it's great after you've had a

1042  
00:47:16,550 --> 00:47:23,030  
couple jello shots but absolutely so a

1043  
00:47:19,659 --> 00:47:27,618  
quick way to short-circuit that though

1044  
00:47:23,030 --> 00:47:31,580  
is with idioms right so even in and this

1045  
00:47:27,619 --> 00:47:33,710  
again changes changes culturally right

1046  
00:47:31,579 --> 00:47:37,730  
so culturally you'll have different ways

1047  
00:47:33,710 --> 00:47:41,659  
of describing things using color versus

1048  
00:47:37,730 --> 00:47:44,059  
other cultures but Western idioms based

1049  
00:47:41,659 --> 00:47:47,149  
on color based on the color blue if I

1050  
00:47:44,059 --> 00:47:50,179  
was to tell you that somebody is true

1051  
00:47:47,150 --> 00:47:53,059  
blue you would know what that means

1052  
00:47:50,179 --> 00:47:54,469  
yeah hypothetically right hmm some of

1053  
00:47:53,059 --> 00:47:58,670  
them are a little dated I mean true blue

1054  
00:47:54,469 --> 00:48:00,919  
Madonna Madonna album excellent um but

1055

00:47:58,670 --> 00:48:03,490  
you would also know but that is somebody

1056  
00:48:00,920 --> 00:48:08,900  
who's very loyal or very faithful sure

1057  
00:48:03,489 --> 00:48:09,489  
mm-hmm right or or another one a blue

1058  
00:48:08,900 --> 00:48:12,410  
blood

1059  
00:48:09,489 --> 00:48:15,858  
what's a blue blood someone who's rich

1060  
00:48:12,409 --> 00:48:20,868  
what's a blue man a blue man lumen troop

1061  
00:48:15,858 --> 00:48:24,079  
twice you the rest of element is totally

1062  
00:48:20,869 --> 00:48:26,030  
true again yeah we kind of we ascribe to

1063  
00:48:24,079 --> 00:48:28,670  
colors like specific like green with

1064  
00:48:26,030 --> 00:48:33,019  
envy right great with your base colors

1065  
00:48:28,670 --> 00:48:36,920  
nice these things the blues yeah not

1066  
00:48:33,019 --> 00:48:41,059  
just the music but also but also to feel

1067  
00:48:36,920 --> 00:48:43,849  
unhappy or sadness interesting blue so I

1068  
00:48:41,059 --> 00:48:46,460  
would say the blues and another very

1069  
00:48:43,849 --> 00:48:50,720

famous blue object denim our blue jeans

1070

00:48:46,460 --> 00:48:53,780

are uniquely American constructs the

1071

00:48:50,719 --> 00:48:58,579

blues oh yeah yeah came out of you know

1072

00:48:53,780 --> 00:49:01,040

came out of came out of America and so

1073

00:48:58,579 --> 00:49:02,420

did so did denim

1074

00:49:01,039 --> 00:49:05,989

well denim was made in France but the

1075

00:49:02,420 --> 00:49:08,210

idea of the popular arity of the jeans

1076

00:49:05,989 --> 00:49:09,529

what is there anything more American

1077

00:49:08,210 --> 00:49:14,389

than taking someone else with someone

1078

00:49:09,530 --> 00:49:17,650

else made and saying we made it that is

1079

00:49:14,389 --> 00:49:17,650

exactly America

1080

00:49:18,500 --> 00:49:25,230

jeans blue jeans but again American

1081

00:49:23,309 --> 00:49:28,259

constructs like when you say the Blues

1082

00:49:25,230 --> 00:49:29,940

or when you say blue jeans and you say

1083

00:49:28,260 --> 00:49:32,430

where are those things from yeah totally

1084  
00:49:29,940 --> 00:49:35,639  
unique Katy yet for better for worse

1085  
00:49:32,429 --> 00:49:37,769  
Katy had a boss who was from another

1086  
00:49:35,639 --> 00:49:40,379  
country and he didn't get idioms mm-hmm

1087  
00:49:37,769 --> 00:49:44,190  
and so he would say things like don't

1088  
00:49:40,380 --> 00:49:47,730  
put all of your eggs in one carton and

1089  
00:49:44,190 --> 00:49:51,570  
when when the cat's away the mice will

1090  
00:49:47,730 --> 00:49:53,039  
dance which is cute that's a much cuter

1091  
00:49:51,570 --> 00:49:57,000  
one than the mice will play

1092  
00:49:53,039 --> 00:49:58,409  
that's cute okay so okay so we kind of

1093  
00:49:57,000 --> 00:50:00,119  
we kind of got into like a deep dark

1094  
00:49:58,409 --> 00:50:02,420  
consciousness hole which is good to kind

1095  
00:50:00,119 --> 00:50:09,410  
of the best hole to get into some ways

1096  
00:50:02,420 --> 00:50:10,980  
mm-hmm but that was out of the blue that

1097  
00:50:09,409 --> 00:50:14,579  
was strange

1098  
00:50:10,980 --> 00:50:16,829  
um but okay so the way that you actually

1099  
00:50:14,579 --> 00:50:18,989  
perceive color physically at least would

1100  
00:50:16,829 --> 00:50:20,639  
be through the rods and the cones but

1101  
00:50:18,989 --> 00:50:22,949  
the way that a material itself has color

1102  
00:50:20,639 --> 00:50:25,379  
is interesting in the sense that it's

1103  
00:50:22,949 --> 00:50:27,419  
actually the color that you see is the

1104  
00:50:25,380 --> 00:50:32,280  
it's the color that the material does

1105  
00:50:27,420 --> 00:50:34,500  
not absorb okay so when a chemical when

1106  
00:50:32,280 --> 00:50:37,530  
a chemical bond of some sort gets hit

1107  
00:50:34,500 --> 00:50:40,380  
with a photon it will absorb some of

1108  
00:50:37,530 --> 00:50:42,720  
that radiation and the absorbance of

1109  
00:50:40,380 --> 00:50:46,519  
that radiation is determined by

1110  
00:50:42,719 --> 00:50:48,629  
basically the the energy level of the

1111  
00:50:46,519 --> 00:50:51,170  
electrons in the orbitals that are

1112

00:50:48,630 --> 00:50:53,160  
bonding the two things together and

1113  
00:50:51,170 --> 00:50:54,539  
actually that's really useful in

1114  
00:50:53,159 --> 00:50:57,059  
chemistry because it means that we can

1115  
00:50:54,539 --> 00:50:58,679  
shoot light at chemicals and be able to

1116  
00:50:57,059 --> 00:51:01,079  
get a kind of sense of what sort of

1117  
00:50:58,679 --> 00:51:03,809  
bonds are there so a carbon-carbon bond

1118  
00:51:01,079 --> 00:51:05,219  
always absorbs the same around the same

1119  
00:51:03,809 --> 00:51:08,880  
type of radiation no matter what

1120  
00:51:05,219 --> 00:51:10,618  
molecule it's in right so you can this

1121  
00:51:08,880 --> 00:51:13,760  
is the basis of things like infrared

1122  
00:51:10,619 --> 00:51:17,608  
spectroscopy or really any spectra spec

1123  
00:51:13,760 --> 00:51:20,640  
any spectroscopic tool is based on this

1124  
00:51:17,608 --> 00:51:22,799  
idea now in terms of physical color that

1125  
00:51:20,639 --> 00:51:25,139  
we observe this means that when you see

1126  
00:51:22,800 --> 00:51:27,869

a red object what's actually happening

1127

00:51:25,139 --> 00:51:30,059  
is light is coming through the

1128

00:51:27,869 --> 00:51:31,088  
atmosphere it hits the surface of the

1129

00:51:30,059 --> 00:51:33,670  
object

1130

00:51:31,088 --> 00:51:36,759  
and then the only wavelength of light

1131

00:51:33,670 --> 00:51:40,389  
that isn't being absorbed by the object

1132

00:51:36,759 --> 00:51:42,869  
is the red wavelength that then you're

1133

00:51:40,389 --> 00:51:44,558  
seeing and picking up with your eyes

1134

00:51:42,869 --> 00:51:48,489  
does that make sense

1135

00:51:44,559 --> 00:51:50,829  
so yes light light beams come down they

1136

00:51:48,489 --> 00:51:52,329  
get absorbed by a surface and then some

1137

00:51:50,829 --> 00:51:53,769  
of those beams they'll get reflected

1138

00:51:52,329 --> 00:51:55,298  
back and that's what's being picked up

1139

00:51:53,768 --> 00:51:56,258  
by your eyes that's what you're seeing

1140

00:51:55,298 --> 00:51:58,119  
okay yes

1141  
00:51:56,259 --> 00:51:59,949  
with the rods in the PS now what that

1142  
00:51:58,119 --> 00:52:02,338  
means though is that materials that

1143  
00:51:59,949 --> 00:52:07,449  
appear to be black or appear to have no

1144  
00:52:02,338 --> 00:52:09,338  
no color are actually um actually

1145  
00:52:07,449 --> 00:52:12,308  
absorbing a lot of light and that's why

1146  
00:52:09,338 --> 00:52:15,248  
black objects tend to get hotter in the

1147  
00:52:12,309 --> 00:52:16,298  
Sun mm-hmm then white objects because

1148  
00:52:15,248 --> 00:52:20,978  
they're actually taking in more

1149  
00:52:16,298 --> 00:52:24,518  
radiation now this material Vantaa black

1150  
00:52:20,978 --> 00:52:27,848  
or vantablack I guess it stands for

1151  
00:52:24,518 --> 00:52:31,169  
vertically aligned nanotube arrays and

1152  
00:52:27,849 --> 00:52:33,729  
so basically what a nanotube is is a

1153  
00:52:31,170 --> 00:52:36,159  
it's a carbon structure made up of

1154  
00:52:33,728 --> 00:52:38,018  
carbon carbon bonds in a big tube and

1155  
00:52:36,159 --> 00:52:41,739  
you can vertically align them onto a

1156  
00:52:38,018 --> 00:52:43,778  
surface by there's different ways but

1157  
00:52:41,739 --> 00:52:45,429  
like you can basically seed the surface

1158  
00:52:43,778 --> 00:52:46,960  
and then have them grow in a chemical

1159  
00:52:45,429 --> 00:52:48,669  
solution or vapor to position or

1160  
00:52:46,960 --> 00:52:50,889  
whatever it doesn't really matter how

1161  
00:52:48,670 --> 00:52:54,130  
it's grown but the fact that these

1162  
00:52:50,889 --> 00:52:56,348  
carbon tubes are aligned next to each

1163  
00:52:54,130 --> 00:52:58,269  
other in this way means that when light

1164  
00:52:56,349 --> 00:53:03,338  
hits that surface it really cannot

1165  
00:52:58,268 --> 00:53:05,108  
escape so this is 99.97% of all

1166  
00:53:03,338 --> 00:53:07,509  
radiation in the visible spectrum is

1167  
00:53:05,108 --> 00:53:10,298  
being taken in by this material and then

1168  
00:53:07,509 --> 00:53:12,998  
not released so this is to date the

1169

00:53:10,298 --> 00:53:15,969  
darkest material out there and if you

1170  
00:53:12,998 --> 00:53:19,568  
see it it looks very strange like it

1171  
00:53:15,969 --> 00:53:25,239  
looks it looks weird um so it's vent

1172  
00:53:19,568 --> 00:53:29,528  
vive black and chemistry actually has a

1173  
00:53:25,239 --> 00:53:31,900  
lot of a lot of interesting stories

1174  
00:53:29,528 --> 00:53:35,978  
where we create new colors or we create

1175  
00:53:31,900 --> 00:53:37,568  
new hues or dyes or whatever right so

1176  
00:53:35,978 --> 00:53:41,469  
it's it's it's extremely interesting in

1177  
00:53:37,568 --> 00:53:44,289  
my mind yeah so yeah it is

1178  
00:53:41,469 --> 00:53:45,730  
yes but don't eat it first of all don't

1179  
00:53:44,289 --> 00:53:47,170  
eat it don't touch the reason why it's

1180  
00:53:45,730 --> 00:53:48,849  
so dangerous the reason that it's so

1181  
00:53:47,170 --> 00:53:50,650  
dangerous I see it why is it dangerous

1182  
00:53:48,849 --> 00:53:53,680  
it sounds so nice no the reason it's so

1183  
00:53:50,650 --> 00:53:56,588

dangerous is that it's so these carbon

1184

00:53:53,679 --> 00:53:57,699

nanotubes are really small and so that

1185

00:53:56,588 --> 00:54:00,429

means that if they get into the body

1186

00:53:57,699 --> 00:54:02,500

they can be really irritating right so

1187

00:54:00,429 --> 00:54:05,108

thinking about asbestos like honestly

1188

00:54:02,500 --> 00:54:07,480

I'm saying it's dangerous half the stuff

1189

00:54:05,108 --> 00:54:09,880

you work with have no the majority of

1190

00:54:07,480 --> 00:54:11,829

stuff you work with kills you it does

1191

00:54:09,880 --> 00:54:14,019

just kill the thing is like with these

1192

00:54:11,829 --> 00:54:16,568

new what are you doing man what couldn't

1193

00:54:14,019 --> 00:54:18,400

you have just been a marketing my

1194

00:54:16,568 --> 00:54:20,920

problem is I don't my damn problem is

1195

00:54:18,400 --> 00:54:26,858

you you with the with the with the with

1196

00:54:20,920 --> 00:54:30,838

the nanoparticle death wish oh my god

1197

00:54:26,858 --> 00:54:30,838

that's the best speed metal band ever

1198  
00:54:33,369 --> 00:54:39,579  
oh my god tell me I might break a

1199  
00:54:35,139 --> 00:54:41,078  
theremin the so the reason it's

1200  
00:54:39,579 --> 00:54:42,460  
dangerous with all these like

1201  
00:54:41,079 --> 00:54:44,349  
nanomaterials like this we actually have

1202  
00:54:42,460 --> 00:54:46,568  
no idea if they're dangerous or not but

1203  
00:54:44,349 --> 00:54:48,130  
um like but they could be and that's why

1204  
00:54:46,568 --> 00:54:49,929  
we treat them as being dangerous but

1205  
00:54:48,130 --> 00:54:53,050  
this one in particular anything with

1206  
00:54:49,929 --> 00:54:54,848  
nanotubes and stuff it's like a lot of

1207  
00:54:53,050 --> 00:54:57,039  
the reason why breathing in like

1208  
00:54:54,849 --> 00:54:59,500  
particulate and soot and stuff is bad

1209  
00:54:57,039 --> 00:55:02,380  
for you is because it basically like

1210  
00:54:59,500 --> 00:55:03,969  
creates tiny scars on your lungs or a

1211  
00:55:02,380 --> 00:55:07,150  
king you know I can like get in and just

1212  
00:55:03,969 --> 00:55:09,250  
like mess with your system literally by

1213  
00:55:07,150 --> 00:55:11,530  
leaving physical marks and bruises and

1214  
00:55:09,250 --> 00:55:13,780  
scratches and whatever and so this stuff

1215  
00:55:11,530 --> 00:55:14,859  
is like asbestos times a million you

1216  
00:55:13,780 --> 00:55:18,369  
know I mean it's really really small

1217  
00:55:14,858 --> 00:55:20,250  
really really hard really sharp totally

1218  
00:55:18,369 --> 00:55:23,250  
bad for you

1219  
00:55:20,250 --> 00:55:24,929  
that would be the that never might I was

1220  
00:55:23,250 --> 00:55:30,630  
gonna make another joke about another

1221  
00:55:24,929 --> 00:55:32,699  
good band name so goddamn it so

1222  
00:55:30,630 --> 00:55:34,380  
basically though there is no reason to

1223  
00:55:32,699 --> 00:55:36,568  
think the color blue didn't exist before

1224  
00:55:34,380 --> 00:55:38,280  
the Middle Ages no and you know what

1225  
00:55:36,568 --> 00:55:41,789  
else in the reading which I thought was

1226

00:55:38,280 --> 00:55:44,160  
interesting color of Krishna I was gonna

1227  
00:55:41,789 --> 00:55:46,050  
bring that up actually that this you

1228  
00:55:44,159 --> 00:55:47,608  
know it's again it's a really

1229  
00:55:46,050 --> 00:55:52,019  
interesting thing I think it says more

1230  
00:55:47,608 --> 00:55:54,449  
about our um but see but I couldn't find

1231  
00:55:52,019 --> 00:55:57,469  
how early back do we have depictions of

1232  
00:55:54,449 --> 00:55:59,368  
Krishna as being or Vishnu as being blue

1233  
00:55:57,469 --> 00:56:01,049  
always blue I think

1234  
00:55:59,369 --> 00:56:02,880  
well not all right you know I don't know

1235  
00:56:01,050 --> 00:56:05,579  
that for sure but the majority of the

1236  
00:56:02,880 --> 00:56:07,349  
representation has been almost an eve

1237  
00:56:05,579 --> 00:56:10,560  
Klein blue I mean it's it's like

1238  
00:56:07,349 --> 00:56:12,869  
interesting it's interesting to me again

1239  
00:56:10,559 --> 00:56:17,039  
this idea that blue didn't exist like

1240  
00:56:12,869 --> 00:56:18,930

it's a problem of it's both a problem

1241  
00:56:17,039 --> 00:56:22,440  
like people misunderstanding I guess

1242  
00:56:18,929 --> 00:56:24,989  
almost how um I don't know like language

1243  
00:56:22,440 --> 00:56:27,260  
works almost and then also a

1244  
00:56:24,989 --> 00:56:29,789  
misunderstanding though ultimately of

1245  
00:56:27,260 --> 00:56:31,380  
you know this Cano it's one of those

1246  
00:56:29,789 --> 00:56:33,989  
weird things where I think this is

1247  
00:56:31,380 --> 00:56:37,740  
partly why ancient aliens theories are

1248  
00:56:33,989 --> 00:56:40,049  
so popular and why even there's that

1249  
00:56:37,739 --> 00:56:42,649  
idea out there that the was it like a

1250  
00:56:40,050 --> 00:56:45,750  
whole century didn't exist or something

1251  
00:56:42,650 --> 00:56:52,349  
right oh god help us like it's the same

1252  
00:56:45,750 --> 00:56:56,190  
it's the same thing we're yeah no no

1253  
00:56:52,349 --> 00:56:58,380  
idea that like a king um basically got

1254  
00:56:56,190 --> 00:57:00,659  
rid of a whole century was like now it's

1255  
00:56:58,380 --> 00:57:02,460  
like the Year 200 or whatever because

1256  
00:57:00,659 --> 00:57:04,529  
they wanted to be on like a special

1257  
00:57:02,460 --> 00:57:08,818  
anniversary or something they wanted a

1258  
00:57:04,530 --> 00:57:10,920  
rule that's how you rule but um but it's

1259  
00:57:08,818 --> 00:57:13,108  
to me it's just it's crazy because I

1260  
00:57:10,920 --> 00:57:14,789  
think it's harder for us to understand

1261  
00:57:13,108 --> 00:57:17,880  
these things now because you have so

1262  
00:57:14,789 --> 00:57:20,699  
many idioms you have so much reference

1263  
00:57:17,880 --> 00:57:23,670  
and sort of this contextualization in

1264  
00:57:20,699 --> 00:57:27,719  
many different forms that can identify

1265  
00:57:23,670 --> 00:57:32,608  
blue right because it's like if you as a

1266  
00:57:27,719 --> 00:57:34,348  
21st century Westerner think of blue you

1267  
00:57:32,608 --> 00:57:36,449  
can contextualize it

1268  
00:57:34,349 --> 00:57:39,869  
multitude of different ways through

1269  
00:57:36,449 --> 00:57:42,538  
multitude of different means so that is

1270  
00:57:39,869 --> 00:57:45,869  
a different to your point a different

1271  
00:57:42,539 --> 00:57:48,630  
mindset a different time than someone

1272  
00:57:45,869 --> 00:57:51,450  
who doesn't have that same that same

1273  
00:57:48,630 --> 00:57:53,548  
prerogative right and we're also almost

1274  
00:57:51,449 --> 00:57:55,528  
this is and this is kind of a point that

1275  
00:57:53,548 --> 00:57:58,739  
always gets brought up with like

1276  
00:57:55,528 --> 00:58:01,739  
classics or philosophy or whatever we

1277  
00:57:58,739 --> 00:58:03,539  
are also a we're also at a point in time

1278  
00:58:01,739 --> 00:58:06,749  
or we have been since maybe the

1279  
00:58:03,539 --> 00:58:08,430  
Enlightenment or the Renaissance we're

1280  
00:58:06,748 --> 00:58:11,088  
also at a point in time where people are

1281  
00:58:08,429 --> 00:58:13,548  
wealthy enough and well-off enough and

1282  
00:58:11,088 --> 00:58:16,828  
Society is developed enough that people

1283

00:58:13,548 --> 00:58:22,460  
can spend time worrying about questions

1284  
00:58:16,829 --> 00:58:26,009  
like this right that yes you know before

1285  
00:58:22,460 --> 00:58:29,099  
really literature literature as such

1286  
00:58:26,009 --> 00:58:31,108  
didn't really exist philosophy as such

1287  
00:58:29,099 --> 00:58:37,170  
didn't really exist right I mean we have

1288  
00:58:31,108 --> 00:58:40,078  
these areas where they happen right but

1289  
00:58:37,170 --> 00:58:42,269  
in some ways it kind of I mean you know

1290  
00:58:40,079 --> 00:58:44,249  
at least in Western thought

1291  
00:58:42,268 --> 00:58:48,028  
it all kind of gets washed away by the

1292  
00:58:44,248 --> 00:58:51,058  
Middle Ages right one story it was a

1293  
00:58:48,028 --> 00:58:54,079  
verbal story right so they probably

1294  
00:58:51,059 --> 00:58:56,970  
again had the same amount of descriptive

1295  
00:58:54,079 --> 00:58:59,789  
abilities but their frame of reference

1296  
00:58:56,969 --> 00:59:01,949  
would be foreign to us right right just

1297  
00:58:59,789 --> 00:59:05,309

like us being able to have all these

1298

00:59:01,949 --> 00:59:08,429

different context of one different color

1299

00:59:05,309 --> 00:59:10,548

would be foreign to them yeah it would

1300

00:59:08,429 --> 00:59:13,078

just be a different set of a different

1301

00:59:10,548 --> 00:59:15,150

verbal set of cues that we would not

1302

00:59:13,079 --> 00:59:17,220

have any idea about it's very which is

1303

00:59:15,150 --> 00:59:19,048

kind of fast it's amazing to me I bet if

1304

00:59:17,219 --> 00:59:21,118

we went through like I bet we would I

1305

00:59:19,048 --> 00:59:22,768

bet we could go through really and look

1306

00:59:21,119 --> 00:59:24,900

with a fine-tooth comb and find out that

1307

00:59:22,768 --> 00:59:27,179

the same kind of logic that was used for

1308

00:59:24,900 --> 00:59:29,608

this could be used to prove that you

1309

00:59:27,179 --> 00:59:35,669

know the ancient people didn't have no

1310

00:59:29,608 --> 00:59:39,869

strawberries or they didn't have jello

1311

00:59:35,670 --> 00:59:41,548

shots roots fruits a hard one because

1312  
00:59:39,869 --> 00:59:43,430  
it's like the fruit that we think of

1313  
00:59:41,548 --> 00:59:47,369  
today is not at all what fruit was like

1314  
00:59:43,429 --> 00:59:47,909  
even a hundred years ago right so you

1315  
00:59:47,369 --> 00:59:51,390  
clicked

1316  
00:59:47,909 --> 00:59:53,759  
and stuff but you know yeah depends if

1317  
00:59:51,389 --> 00:59:55,739  
you're on Hawaii right if you aren't

1318  
00:59:53,760 --> 00:59:57,720  
units in a tropical air and the bananas

1319  
00:59:55,739 --> 00:59:59,368  
even now are so much different than the

1320  
00:59:57,719 --> 01:00:01,558  
bananas you'd pick up at Safeway

1321  
00:59:59,369 --> 01:00:03,000  
absolutely yeah you know you know like I

1322  
01:00:01,559 --> 01:00:04,530  
don't know I bet we could pick out

1323  
01:00:03,000 --> 01:00:05,880  
something and be able to go back and be

1324  
01:00:04,530 --> 01:00:07,710  
like well I thought I always thought

1325  
01:00:05,880 --> 01:00:09,539  
that they had this back then and then

1326  
01:00:07,710 --> 01:00:12,240  
look and there's just no reference to

1327  
01:00:09,539 --> 01:00:14,400  
that thing right I mean I wonder how

1328  
01:00:12,239 --> 01:00:17,038  
many references there are for belts in

1329  
01:00:14,400 --> 01:00:18,420  
the Odyssey belts you know I mean in

1330  
01:00:17,039 --> 01:00:19,859  
Homer's Odyssey like belts like

1331  
01:00:18,420 --> 01:00:23,670  
literally like the like the kind of belt

1332  
01:00:19,858 --> 01:00:25,889  
that holds up your pants right well you

1333  
01:00:23,670 --> 01:00:27,030  
would have some sort of like because it

1334  
01:00:25,889 --> 01:00:31,108  
would be the same sort of thing that

1335  
01:00:27,030 --> 01:00:34,048  
would hold a weapon though that's not

1336  
01:00:31,108 --> 01:00:36,119  
pants that's not a belt for pants a belt

1337  
01:00:34,048 --> 01:00:38,130  
would maybe have the same form and

1338  
01:00:36,119 --> 01:00:44,099  
function at that point yeah okay and

1339  
01:00:38,130 --> 01:00:45,568  
indigo is bloomery God blue Greek shell

1340

01:00:44,099 --> 01:00:53,309  
over here for me

1341  
01:00:45,568 --> 01:00:54,960  
big big belt pan Marie you don't know

1342  
01:00:53,309 --> 01:00:56,670  
you know I'm saying right like I bet I

1343  
01:00:54,960 --> 01:00:59,429  
bet we can go back and pick something

1344  
01:00:56,670 --> 01:01:02,039  
weird like an esoteric thing and go back

1345  
01:00:59,429 --> 01:01:04,528  
and look and see you know where was this

1346  
01:01:02,039 --> 01:01:06,359  
described anywhere you know and it's

1347  
01:01:04,528 --> 01:01:08,730  
just it's it's it I don't know I think

1348  
01:01:06,358 --> 01:01:12,778  
it's an interesting question so hey is

1349  
01:01:08,730 --> 01:01:17,510  
this what we're doing tomorrow control

1350  
01:01:12,778 --> 01:01:17,510  
elf belts control F belts in the Odyssey

1351  
01:01:19,429 --> 01:01:25,949  
belts knows the string count as belt I

1352  
01:01:22,769 --> 01:01:28,170  
don't know see no it's a string but what

1353  
01:01:25,949 --> 01:01:30,419  
the string is acting as a bell no cuz

1354  
01:01:28,170 --> 01:01:32,849

it's no how do you define belts it holds

1355

01:01:30,420 --> 01:01:34,559

up I need to find blue now we have to

1356

01:01:32,849 --> 01:01:37,019

think about both Oh God we're all the

1357

01:01:34,559 --> 01:01:38,278

way around again you guys this is

1358

01:01:37,019 --> 01:01:40,559

neither here over there have you guys

1359

01:01:38,278 --> 01:01:43,079

seen the have you guys seen that thing

1360

01:01:40,559 --> 01:01:44,579

online where it's some guys like I was

1361

01:01:43,079 --> 01:01:46,289

waiting you know waiting in the dentist

1362

01:01:44,579 --> 01:01:49,230

office and then he just starts chanting

1363

01:01:46,289 --> 01:01:50,970

teeth oh god now right in the lady

1364

01:01:49,230 --> 01:01:54,329

behind the counter starts you know it's

1365

01:01:50,969 --> 01:01:57,058

like teeth teeth teeth teeth she starts

1366

01:01:54,329 --> 01:02:00,940

like banging going to Jade teeth oh I

1367

01:01:57,059 --> 01:02:05,050

find that so funny like it

1368

01:02:00,940 --> 01:02:07,380

no but this is again this is why I don't

1369  
01:02:05,050 --> 01:02:11,980  
go to the dentist I'm choosing um I

1370  
01:02:07,380 --> 01:02:12,519  
haven't I haven't seen that funny that's

1371  
01:02:11,980 --> 01:02:14,409  
really funny

1372  
01:02:12,519 --> 01:02:16,329  
are you sure about that that wasn't you

1373  
01:02:14,409 --> 01:02:18,699  
wanted me that's all that wasn't me

1374  
01:02:16,329 --> 01:02:20,710  
all right dear listeners thank you again

1375  
01:02:18,699 --> 01:02:23,019  
for joining the mad scientist podcast

1376  
01:02:20,710 --> 01:02:24,849  
what a weird episode this was a good

1377  
01:02:23,019 --> 01:02:29,380  
episode first of all happy birthday

1378  
01:02:24,849 --> 01:02:30,760  
Chris plenty of virtual jello shots and

1379  
01:02:29,380 --> 01:02:33,190  
which I hope you did many for your

1380  
01:02:30,760 --> 01:02:35,740  
birthday and Dez thank you so much for

1381  
01:02:33,190 --> 01:02:37,960  
joining us and bringing this this this

1382  
01:02:35,739 --> 01:02:40,929  
rabbit hole of a question to our

1383  
01:02:37,960 --> 01:02:42,639  
attention and also for all of the

1384  
01:02:40,929 --> 01:02:48,159  
awesome work that you're doing with our

1385  
01:02:42,639 --> 01:02:49,929  
fun with our fun t-shirts and super-fun

1386  
01:02:48,159 --> 01:02:54,219  
merch that we're going to be having soon

1387  
01:02:49,929 --> 01:02:58,838  
yeah and patreon and patreon love love

1388  
01:02:54,219 --> 01:03:04,618  
gifts people it's awesome it's awesome

1389  
01:02:58,838 --> 01:03:04,619  
stuff guys all right Oh group hug

1390  
01:03:13,710 --> 01:03:15,769  
you